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CHAPTER 16

A Proposal for Student Loans

*William Vickrey**

IT IS ONE of the most striking failings of the affluent society that it seems to be unable to find a way to finance to anywhere near its potential economic limits the most productive investment opportunity open to it: the education of its people to the full extent of their capabilities. Expansion of State universities with no or low tuition fees, though a large step, is not the complete answer: It fails to meet the needs of students whose families cannot afford to provide them with the complementary support in terms of board, lodging, books, and other supplies. It fails, also, to strengthen our private colleges and universities, whose role is so vital to educational achievements in the United States.

The classical individualistic economic answer to this problem would be to arrange for loans to individuals who show such promise that it is reasonably certain that investment in their further education would be an investment capable of yielding at least the normal rate of return on comparably risky investment.[1] The present chapter is designed to outline a proposal that follows through on the major premises of this classical economic answer. While this proposal is here developed in some detail, it is not suggested as an exclusive solution to the problem of financing higher education. Rather it is a scheme which, if implemented, would supplement other institutional arrangements for such financing. While the more familiar sources of support for institutions of higher education need to be expanded, and aid to students greatly enlarged, there is also need for new financial arrangements to facilitate the flow of capital into development of human resources through education.

The trouble with student loans in the past has been that students have on the whole been understandably reluctant to saddle themselves with a fixed repayment obligation, and to a lesser extent that potential lenders have been reluctant to make investments where the risk is so highly variable and subjective and where arrangements

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[1] Milton Friedman, "The Role of Government in Education," in Robert A. Solo, ed., *Economics and the Public Interest*. New Brunswick, N.J., Rutgers University Press, 1955. p. 135–143.

for enforcing claims for repayment over a long period of years are so tenuous and potentially costly. The fact that many of our larger universities find that student loan funds are under very light pressure, if indeed they are not in some instances going begging, indicates that something is wrong with the terms on which these loans are being made available.

The main difficulty seems to be the fear that the obligation of repayment might under some circumstances prove a severe burden.[1] Though on the average it can be shown that the student's additional earning power that is generated by better education can by itself take care of this added burden with a wide margin, individual students may have a legitimate fear that they will not come up to this average. Furthermore, while the pressure for repayment tends to be minimal, many of the potential beneficiaries of such loans feel that the burden of repayment might possibly become a heavy weight on their shoulders which they could not conscientiously repudiate. To be sure, there is sometimes specific provision for remission of the debt if the beneficiary enters the ministry, or teaching, or some similar line of public service that carries a relatively low salary. But the line between such public service and other less specific lines of low-paid service is difficult to draw. The funds available on such terms are fairly limited in any case; and the mere offering of such funds would hardly meet the problem even if unlimited funds could be obtained for loans with special remission provisions.

Another difficulty is that such funds are still provided largely in an atmosphere of philanthropy rather than of financial investment. Subsidized interest rates tend, on the one hand, to limit the availability of the funds, and on the other, to fix the charity stigma the more firmly.

A third factor, stemming from the first two, is that such loan funds are rather severely rationed, both as to the level of scholarship achievement required for eligibility and as to the amount to be supplied to any one person. Where the burden of repayment can become substantial, it is natural to protect the applicant from getting in too deep; where there is an element of subsidy in the loan, the worthiness of the applicant becomes a consideration. In many cases the amount potentially available is inadequate to meet the needs of a student under heavy pressure to begin earning to meet family obligations.

In spite of this equivocal experience, given the high profitability of investment in education both to the individual and to the community, it should be possible, by a combination of the techniques of mutual investment, the limited-dividend corporation, pension funds, and income taxation to provide whatever funds are needed to finance educa-

[1] See Richard Eckaus, ch. 8 of this publication, for mention of assessments of the risk of borrowing by different income groups and in different regions.

tion up to the point where the marginal returns are comparable with those from other forms of investment. With ingenuity, arrangements can be devised that will promise reasonable returns and security to the investor, while at the same time offering the student terms that he can accept as readily as he mortgages his house or borrows to buy an automobile.

ESSENTIALS OF THE PROPOSAL

In brief, it is suggested that funds for the financing of the student's education be made available in liberal amounts in return for an agreement to return dividends, computed as a share of later earnings according to the concepts of income taxation. The exemptions and the rate scale of the dividend repayments should be so arranged that the dividend with respect to the amount advanced at any stage of educational advancement would come out of that portion of his income above the level of earnings that would be expected if education had stopped at that point. For example, for loans taken out to finance the freshman and sophomore years, the return dividend could be computed as a share of income after an exemption of, say, $4,000—this exemption being determined to reflect the average level of earnings to be expected by a student who is intellectually eligible for college but who goes no further than high school. At the other extreme, funds advanced to pay for a third year of graduate training might call for a dividend share to begin only after an exemption of $8,000. In this way the typical student who is on the verge of stopping his education for financial reasons can continue it with very little financial risk. Even if the educational investment fails to enhance his earning power, he will be no worse off than before.

The principal exception to this would be a type of student who sees himself earning, say, $30,000 a year through his native genius even if he goes no further than high school, but takes such a dim view of the value of a college education that he believes it would boost his earnings only to $32,000. In this case, if he were to finance his education in a manner that entailed the payment of a dividend of, say, 12 percent of $26,000, he would be financially worse off than if he had not pursued his education beyond high school, whereas even in this case the investment would have paid off adequately from a social point of view. Situations of this sort should be rare enough not to constitute a serious problem.

One of the main difficulties with any such plan for student loans is, of course, that the projection for 40 years or more into the future of the relation between education and earnings is so uncertain that it would be impossible to determine in advance a system of earnings-dividend rates that would return any specified yield on the investment.

Yet it is necessary to achieve at least some minimum yield in order to preserve from undue impairment any endowment funds that might be diverted to this form of investment and possibly also to obtain additional outside funds on a competitive basis from lenders of various types. Too high a return, however, either as an "ex post" experience or as an expectation, warranted or unwarranted, might give rise to a feeling that the student borrowers were being unduly exploited.

APPLICATION OF MUTUAL-FUND PRINCIPLE

The problem of assuring a net yield that is fair but not excessive can be met by adapting the mutual fund principle, in a form slightly different from that used by cooperatives and mutual investment funds. The earnings-dividend schedules could be initially so set as to yield, on conservative assumptions, a yield of at least 6 percent, and possibly as much as 8 or 10 percent. The higher rates would be desirable at least in part as a means of providing for the growth of the scheme through internal accumulation, as well as making it possible to attract outside capital on a reasonably low-interest basis. Subsequently, as experience makes it possible to evaluate the equities of the various participants in the scheme somewhat more closely, it would be possible to adjust matters by the payment of "patronage dividends" or the downward adjustment of the earnings-dividend rates in such a manner as to reduce the net yield to whatever figure is deemed reasonable. This figure and even the procedure by which it is to be reached could be specified, if desired, in original contracts.

Even here, the divergent aims of lowering the net eventual cost to the students and at the same time accumulating capital funds for expansion can to a considerable extent be reconciled by deferring the payment of these patronage refunds as long as possible. Indeed, an appropriate form of refund would be in the form of a death benefit or a retirement annuity. Then, in effect, if the net yield aimed at were set somewhat high for the sake of rapid expansion from internal funds, this would be less of an inequity. While students on the average would be required to pay fairly high rates of interest on their loans, they would later be compensated by being able to invest in their turn in the education of succeeding generations at similarly high rates of interest so as to obtain their annuities at relatively low cost.

COORDINATION WITH INCOME TAXES

The fact that the repayment takes the form of a share of income above an exemption raises the problem of the relation of such repayments on earnings-dividends to Federal and other income taxes. It would be at least awkward if the combined rates got up near 100 percent for any substantial number of persons. The simplest remedy,

and one that should prove readily acceptable, would be to make the earnings-dividends a deduction in computing net income for tax purposes. To the extent that this might be considered to constitute a breach of the basic principles of income taxation, it could well be justified on the basis of the benefits derived by the community at large from a rise in the educational level of individuals.

Actually even the strictest interpretation of the situation would call merely for considering the original payments to the student as taxable income to him at that time, presumably taxed at lower bracket rates. Subsequent earnings-dividend payments would then clearly be completely deductible. The analogous situation would be that of an artisan who borrows money to pay himself a salary to construct an income-earning asset. Interest and amortization payments on this loan would then be deductible, either directly or as amortization or depreciation of the cost of the asset over its life. However, it would be proper to exclude from the student's taxable income the payments going to defray tuition and other expenses that are clearly for training and similar enhancement of earning power. Such exclusion would not apply to educational costs undertaken for current satisfaction or future cultural enrichment unrelated to earning power. This is analogous to the exclusion from the artisan's income of the part of the proceeds of his loan that is used to pay assistants or buy materials rather than for his own living expenses. It is clearly difficult to draw any sharp line between technical training and cultural enrichment. Here again the general public interest in cultural enrichment would probably justify a policy of excluding all tuition payments and similar fees from the student's taxable income, by allowing them to be deducted where appropriate. Whatever is done would in any case be coordinated with the tax treatment of educational outlays financed by the student or his family. The principles involved here are closely related to those set forth by Richard Goode in chapter 17 of this publication.

One could go further than this and exclude from the income of the student even amounts advanced for living expenses. This would indeed have the advantage of making whatever funds are initially available go farther. However, such a treatment would raise the question of the degree to which subsequent earnings-dividend payments would properly be deductible. To make them fully deductible would clearly be something of a breach with the basic concepts of the tax. A satisfactory solution would be to allow deduction each year only for earnings-dividends exceeding, say, 10 percent of the aggregate amount advanced tax free for living expenses. When the nondeductible earnings-dividends have aggregated 110 percent of the total tax-free advance for living expenses, all earnings-dividends

thereafter would be deductible. The use of 110 percent rather than 100 percent is to allow for the fact that in some individual cases the earnings-dividends will fall short of the advance. The figure is intended to insure that for the group as a whole, the aggregate amount included in taxable income is approximately correct and that there would thus be no "ex ante" expectation of ultimate tax avoidance through the use of the plan.

There is also the possibility of deferring the payment of tax from the student years to later years. In general, this will shift income from the low brackets of the student years to the higher brackets of the later years. The computations involved in a procedure such as this should be no obstacle, as these can easily be taken care of by the agency to which the dividends are to be paid.

Some question may well be raised as to whether it is the entire later-life income that should be made the basis for the earnings-dividends, or merely the earned income. Although again there would seem to be no grounds for requiring higher repayments from a student who receives a large inheritance subsequent to his graduation than from one who does not, there is good reason for including unearned income in the case of the individual whose income comes through stock options or similar quasi-earnings, or who acquires a fortune by stock-market trading, using skills acquired in business school. In practice the two types of case would be difficult to distinguish sharply. On full examination the argument for the more inclusive base seems compelling. There are, of course, other problems relating to the treatment of family incomes for this purpose, but such details need not detain us in this preliminary discussion.

Enforcement should not be too difficult. A condition of the original advance would presumably be an agreement to provide on request copies of Federal income tax returns, with stipulations that such information would be confidential. It might be necessary to limit the scheme to citizens of the United States. Even so limited, it would be a benefit to foreign students in that it would permit more of the outright scholarship funds and other student aid funds to go to students not eligible for advances under this plan.

IMPACT ON FINANCING

The amounts available as advances under this plan should be as liberal as the available financial support permits. Ideally it should extend to sums intended to cover not only the ordinary costs of tuition and books but also, in cases where even minimal evidence of such need can be shown, amounts needed as a substitute for the earnings that the student is foregoing to meet obligations for family support or other necessities. A student should be enabled to complete his educa-

tion to the limit of his abilities without financial hardship. Ideally this would mean being prepared to advance to a student amounts ranging up to $4,000 for a freshman year, and scaling up to $8,000 for a third year of graduate study.

Unfortunately, few if any colleges possess endowment funds sufficient to meet the potential demand on a scale such as this, even if the institutional and testamentary obstacles to the diversion of funds to such use can be overcome. Conceivably a university might be able to borrow in the financial markets on the security of the earnings-dividend contracts that it would enter into, or perhaps arrange for the setting up of an auxiliary limited-profit corporation to do this. The novelty of the proposal, however, may make it extremely difficult to finance it adequately on reasonable terms unless more substantial backing is given to it than can be supplied by most individual colleges or universities. Somewhat more promising might be the setting up of one or more "educational finance corporations" sponsored jointly by groups of colleges and universities.

It is rather hard to say just what the schedule of earnings-dividends for the various types and amounts of advances should be and how the insurance or pension benefits should be arranged. It is possible, nevertheless, to indicate some of the general principles that it would be desirable to follow. It is of course important that, when considered in relation to associated pension and other benefits, the repayment terms not be so onerous as to appear unattractive to potential students. On the other hand, the schedule should provide adequate security for the suppliers of the original funds, even in the face of considerable initial uncertainty as to the magnitude and distribution of the income base to which the schedule would apply. In addition, it would be desirable that the derived funds provide scope for a substantial amount of internal financing of growth in the magnitude of the operation. To a considerable extent these objectives can be met by borrowing from the insurance field two well-established features: rating and mutuality.

MINIMIZING ADVERSE SELECTION

As with any risk-pooling plan, in the absence of risk rating there would be a tendency for a certain adverse selection of risks to develop. Applications would tend to run heavier from students who felt their future income prospects to be below average for their level of education and who, in anticipation of future repayments based on comparatively low incomes, considered the advances a bargain. Conversely, students with great confidence in their own economic future would tend to minimize their use of the plan, stretching their own resources to the limit, possibly to the detriment of their studies, to avoid any

large share in making up the deficits produced by the less successful students. A cumulative adverse selection of risks might so burden the plan with mediocre students that it would be attractive to the better students only as a last resort.

The more liberal the amounts available, the more serious the tendency toward adverse selection would be. Even among students who did use the plan, there would be a possibility of wide variation in the amounts applied for and advanced, and thus for adverse selection of amounts, as well as of students. The amounts advanced can be limited administratively to estimated needs in individual cases, unless the administrative standards are so stringent as to discourage some students from continuing a potentially profitable course of study. The standards would have to be flexible, rather than specific, so that considerable range would remain for individual choice. In any case, imposition of any such standard of need would infringe on what is intended to be a basic philosophy of this proposal, namely, that funds should ultimately be available on a sufficiently ample scale so that each student could be left free to determine for himself the amount of the advance that he wishes to apply for, up to an amount equal to the sum of his tuition fees and his estimated current earning capacity.[8]

While adverse selection of risks can seldom be eliminated entirely in a voluntary risk-sharing scheme, rating of risks usually can reduce its scope. If the rating process is an effective one, this can be done to the point where adverse selection is no longer a serious problem. The mutuality elements of the scheme can also be made to contribute to the minimization of adverse risks if the "ex post" adjustments are made in a way which reflects individual experience. But as long as there is an important risk-sharing element, the rating of risks must bear the major burden of guarding against excessive adverse selection.

In the case of student loans, we have available a readymade basis for risk rating in the form of grades, test scores, and other evidence of educational potential. At the time of application for an advance (t_a), the applicant might be assigned a rating in terms of which an estimate could be made of the expected earnings $E(t)$ at each future time t that the applicant might obtain if he terminates his education immediately, and also of the expected earnings potential $P(t)$ that the applicant might obtain at each future time t if he completed his education to the full extent of his currently apparent potential. The student

[8] Kingman Brewster, Jr., in the June 1961 *Yale Alumni Magazine* (p. 13–14), advances a proposal for student loans very similar to this one. He, however, would limit loans to amounts sufficient to cover all students expenses *except tuition*. He excludes tuition costs because—

> . . . it is probably impossible to draw up a loan or grants scheme which would subsidise the payment of tuition without driving a very harmful wedge between our public and private institutions. That is why I would limit the subsidy to what can be roughly calculated as the costs of higher education—*excluding tuition*.

would then be offered a contract under which he might obtain an advance with respect to the forthcoming school year of any amount he chooses up to a maximum equal to the sum of his tuition fees and the amount $E(t_e)$ that he could be expected to earn currently if he terminates his education. The contract would then specify that the corresponding future earnings dividend to be paid back at time t would be computed on the basis of an exemption equal to $E(t)$, with mildly progressive rates applied to income in excess of this exemption, such that if the future income is actually $P(t)$, the earnings-dividends will, over the lifetime of the student, amount to, say, a 9-percent rate of return on the amount of the advance.

Each succeeding year a new contract could be made available, based on the rating provided by the further record made by the student, with a new exemption level and schedule of rates dependent on the amount of loan requested. In this way at each stage the student who shows any promise of being able to benefit adequately from further education would be offered a chance to finance this further education on a virtually "no cure, no pay" basis. The redistributive element in the scheme would be limited roughly to the unpredictable element in the variation of future incomes. On an "ex ante" basis, the applicants might well be brought to feel that the potential advantages of the plan are reasonably comparable for all concerned. Adverse selection would thus be limited to cases in which the student has a genuinely better basis for the appraisal of his prospects than that provided by the rating. The number of cases in which students have a superior basis of appraisal should not be sufficient to cause difficulty. At the same time a direct and tangible incentive for scholastic excellence would be provided, both as to the amount of advance available and as to the terms offered. This incentive would not be limited as it is at present to the students who are now prospects for scholarships, but would be extended to a major fraction of all students.[4]

It might be desirable to move somewhat cautiously in this direction lest more pressure be placed on the grading or rating system than it can stand. But if the plan is to remain voluntary and be liberal in scope, some degree of risk rating would seem to be essential to preserving its financial integrity. It might be necessary to borrow an element from the field of property taxation and have some form of grade equalization process among institutions or even among instructors. This equalization in turn might have its own salutary effects. But these are ramifications that would take us too far afield at this stage of consideration.

[4] If this aspect of the proposal sounds a bit reminiscent of the practices of Upper Upanishad University, as reported by William R. Mueller, this is not entirely a random coincidence. See "Report from Upper Upanishad," *AAUP Bulletin*, American Association of University Professors, 43 : 477–488, September 1957.

MUTUALITY AND RETIREMENT BENEFITS

Of course, the 9-percent return aimed at in the setting of the earnings-dividend schedules would not represent the net cost of the advance to the student, by reason of the mutuality element in the scheme. Records would be kept of the total amounts advanced to, and the earnings-dividends returned by, various groups of student beneficiaries, and beyond a certain point further earnings-dividend payments would generate rights to retirement pensions. For example, amounts credited to the account of a given cohort of students could first be used to amortize the amount advanced by investors at 5 percent interest. When this amortization has been completed, further earnings-dividends could be divided in some specified proportions, say one-third for the account of investors and two-thirds to a "cohort equity account" until such time as the payments to investors have become equivalent to an amortization at 7 percent interest, after which all further earnings-dividends would be credited to a cohort equity account. Amounts thus accumulated in the cohort equity account would then become available to be invested on behalf of this cohort in the making of advances to further generations of students. The older cohort thus assumes the role of investor vis-a-vis the younger cohorts of students, and the advances thus made would in their turn be capable of yielding up to 7 percent in favorable circumstances.

As the members of the original cohort reach retirement age, earnings would cease to be subject to the earnings-dividend payment, and the amount standing to the credit of cohort would become the basis for the payment of retirement benefits. If it is desired to keep the redistributive element of the scheme to a minimum, a step that would assist materially with the problem of adverse selection, these retirement benefits could be made proportional to the excess of each individual's earnings-dividend payments over the sum needed to amortize his advances at 7 percent. In this way a student who felt that his economic prospects were considerably brighter than his scholastic record indicated would then be able to feel free to make full use of the scheme, since even if his earnings-dividend payments turned out to be much larger relative to his advance than for the average student of his rating, he would in turn benefit through higher retirement payments.

If the numbers of student beneficiaries in some of the cohort or groups are too small to prevent significant random fluctuations among the experiences of different cohorts, it is desirable to provide for the fitting of smooth curves to the experience of the various cohorts, and for equalizing intercohort transfers to bring the funds into line with what would have obtained if each cohort had had an experience equivalent to that shown by the smooth curve. This is essentially

no different in principle, but perhaps somewhat more complex in application, from the methods actually adopted for the determination of dividend schedules on mutual life insurance policies.

AMOUNTS OF LOANS AND REPAYMENTS

The possible variations on a plan such as this are, of course, manifold, and there is room here only to sketch out roughly some typical possibilities. As an example for a student of average capabilities, one might set the exemption level $E(t)$ for the freshman and sophomore years at an amount averaging about $4,000 a year over his working life, varying possibly from one period to another from perhaps $3,000 to $6,000. The exemption level might be raised for the junior year to an amount averaging $4,500; for the senior year, to $5,000; and for the subsequent 3 years of graduate work, to $6,000, $7,000, and $8,000. Then as a rough order of magnitude, for each $1,000 advanced during any particular year of study, the earnings-dividend rate might be 0.5 percent of the first $1,000 of income above the corresponding exemption level, 1.0 percent of the next $1,000 of income, and 1.5 percent on all income in excess of $E(t) + \$2,000$.

Such a schedule is at least of the right general order of magnitude. Miller estimates that the lifetime earnings of the average college graduate amount to $435,000 at 1958 earnings levels.[8] Taking account of advances in average earnings, a lifetime-earnings figure of at least $500,000 or an average of $12,500 a year over a working lifetime of 40 years seems reasonable for students graduating in 1963. On that basis if an average student were to borrow $2,000 to complete his senior year, he would be paying an earnings-dividend of $195 on an income of $12,500 ($10 on first $1,000 above the $5,000 exemption, $20 on the next $1,000, and $165 on the remaining $5,500, the rates being of course twice the rates for a $1,000 advance). After allowing for lower earnings during the early years, this should provide a gross rate of return of between 9 and 10 percent, so that after the amortization of the advance at 7 percent interest has been completed, there should be a substantial margin for the financing of retirement benefits through advances made to succeeding generations of students.

An average-rated student completing 4 years of college and drawing an advance of $2,000 for each of the 4 years, or a total of $8,000, would on this basis be contracting for an earnings-dividend payment of 2 percent on the first $500 of any income above $4,000 (in a year of average exemption level), of 3, 6, 7, 10, and 11 percent, respectively, on the succeeding $500 brackets, and 12 percent on all income above

[8] See Herman P. Miller, chapter 9 of this publication; also Richard Goode, chapter 17.

$7,000; on an average income of $12,500, this would amount to $855. In an extreme case a student who went through 7 years of undergraduate and graduate training and contracted for the maximum advance obtainable would be receiving advances ranging from $4,000 for freshman year ($3,000 as a substitute for earnings forgone and $1,000 for tuition fees) to $8,000 for the third year of graduate work, a total of $38,500; in return for this he would be contracting for earnings-dividend payments on a scale ranging up to 57¾ percent on that part of his income in excess of $10,000 for the years in which his earnings are expected to reach their average annual lifetime level.

The income level above which this rate would apply would be somewhat higher in the years of his peak earning power, and somewhat lower in the years before his full earning power is expected to be achieved. Also, for students showing the degree of promise typical of those for whom graduate study is usually considered warranted, the exemption level and the income brackets might tend to be somewhat higher than in this example, which applies to students of average scholastic rating. While this may even so seem at first glance to be a fairly stiff price to pay for an education, yet for students who have no other means of financing their education and whose immediate financial needs, whether arising from family obligations or other sources, are such as to make the completion of their education difficult or impossible without advances of this magnitude, even such a schedule should not be a prohibitive obstacle to the full use of the loan plan, particularly as the offer is practically on a "no cure, no pay" basis and is likely to provide as a byproduct a substantial amount of additional old age security. There is, of course, the possibility that the 54-percent dividend rate on the excess over $10,000 when combined with rates of the income tax proper would add up to a serious incentive problem at the higher earnings levels, even after allowing for the deductibility of the earnings-dividend in computing taxable income. But the number of cases in which this amount of financing would be required is likely to be small enough not to make this a serious problem. The example is useful chiefly as an illustration of the lengths to which educational finance on a liberal scale can profitably be pushed.

ULTIMATE SCOPE

If funds can be made available to students in adequate amounts on such a basis, then, of course, the way will be open to raising tuition fees to levels that will make it possible for faculty salaries to be raised to levels more nearly in line with earnings in other comparable occupations. (This would eventually make it possible for professors to make significant earnings-dividend payments on the cost of *their*

education.) If the preservation of private and independent colleges and universities—a significant segment of our educational system—is important, as insurance against impairment of the spirit of free inquiry and as an element in the basic freedom of our culture, some such method of financing may well be an important means to this end. To continue to rely solely on private philanthropy, plus the paying of fees by students on their own, is likely to keep private education from fulfilling its proper role. Besides, such reliance places a heavy strain on philanthropic resources that can be used effectively in many other areas. Even if State support for private higher education can be arranged in a manner that will preserve the independence and specific character of these institutions, it seems doubtful whether the amount of such support actually forthcoming will prove sufficient and timely. Equity investment in education may well provide a major part of the solution to this problem.

But a plan such as this need not be limited to private universities and colleges, though this is perhaps the area of most intense need. The financing of nontuition expenses and of family maintenance requirements for students in State universities is an even greater problem in terms of the numbers and amounts that could eventually be involved. Given the availability of such a plan, there would even be the possibility on equity grounds of making higher education more nearly self-supporting in terms of tuition fees. An individual whose earning power or social position had been enhanced through public expenditures could well be considered to owe an extra quantum of financial support to the State, as compared with an individual reaching a comparable status by his own relatively unaided efforts. Such financing might also induce a more liberal attitude toward the fulfilling of educational requirements on the part of budget-minded and tax-conscious legislators.

Such equity investment in the education of individual students on a mutual basis that is nevertheless fully competitive with other investments will not provide the entire answer to the financing of higher education, but it would seem that the availability of some such procedure on a scale limited only by the demand would be capable of greatly improving the financial basis for utilization of a vast store of potential intelligence.

CHAPTER 17

Educational Expenditures and the Income Tax

*Richard Goode**

A TAX ON NET INCOME should provide for tax-free recovery of the expenditures entailed in earning income, including investment outlays. Although this principle is generally applied in the Federal income tax, it is not applied consistently with respect to the costs of acquiring an income through personal services. Among these costs are educational expenditures that increase earning capacity or that are made for that purpose. In computing taxable income, no allowance is made for the costs of general education or of basic professional or vocational education, and only limited deductions are allowed for other educational expenses.

The present tax treatment of educational costs gives rise to inequities and is especially questionable at a time when the need for highly trained persons is growing. The income tax discriminates against persons whose earned income represents in part return of capital previously invested in education compared with persons who have invested little in preparation for their occupations. There is also discrimination against persons who invest in themselves compared with those who invest in physical assets. For example, a person who attends engineering school is usually not allowed to deduct his educational expenditures from his earnings, whereas a taxpayer who buys a truck can recover the cost through depreciation allowances. A physician who takes graduate courses to qualify himself for a new specialty cannot write off the cost against taxable income, though he can amortize outlays for office equipment, laboratory facilities, or waiting room furniture. When income tax rates are high, discrimination against investment in education may discourage entry into occupations requiring expensive training, and may discourage persons already at work from preparing themselves for more skilled and responsible jobs.[1]

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[1] Richard Goode. The Income Tax and the Supply of Labor. *Journal of Political Economy*, 57: 428–437, October 1949. Reprinted in American Economic Association, *Readings in the Economics of Taxation*, Richard A. Musgrave and Carl S. Shoup, eds., Homewood, Ill., Richard D. Irwin, 1959. p. 456–469.

Two factors greatly mitigate the discrimination against education. First, tuition and fees are not charged in public elementary and secondary schools; and in colleges and universities the charges are usually much lower than the costs of instruction, with the difference being made up by State and local government funds, gifts, and endowment income. Secondly, a large part of students' investment in education consists of opportunity costs in the form of foregone earnings. These costs are already free of income tax.

Many proposals have been advanced in recent years for deductions or credits under the income tax law for certain educational expenditures. Most of these proposals are intended to grant tax relief to parents of college students. There has been little systematic discussion of broad questions of tax policy respecting educational expenses or technical problems that would be involved in development of new income tax provisions relating to education.

This paper reviews the present treatment of educational expenditures under the Federal income tax and considers the possibility of permitting certain educational expenditures to be charged against taxable income through current deductions or amortization allowances.[3] Attention is given to the technical difficulties of devising a feasible plan for this purpose and to the probable effects of such a plan on Government revenues, on enrollments and tuition charges, on the amount of educational expenditures, and on occupational choice. Proposals for deductions or tax credits allowed to parents of college students are briefly compared with the more general approach to the problem.

I. Present Treatment of Educational Expenditures

The Federal income tax makes no provision for current or future deductions for expenditures incurred for education or training undertaken to prepare oneself for a vocation or profession or to meet the minimum qualifications for any employment. Deductions are allowed for expenditures for certain kinds of supplementary, continuation, or refresher courses. Official regulations adopted in 1958 provide that—

> Expenditures made by a taxpayer for his education are deductible if they are for education (including research activities) undertaken primarily for the purpose of:
>
> (1) Maintaining or improving skills required by the taxpayer in his employment or other trade or business, or

[3] "Amortisation" is a procedure by which the cost of an asset is charged against income over a period of time through annual allowances or charges. The word is often used as a synonym of "depreciation," but is more commonly applied to intangibles than to tangible property.

> (2) Meeting the express requirements of a taxpayer's employer, or the requirements of applicable law or regulations, imposed as a condition to the retention by the taxpayer of his salary, status, or employment.[5]

The regulations state that deductions will ordinarily be allowed for the cost of education for the purpose of maintaining or improving skills "if it is customary for other established members of the taxpayer's trade or business to undertake such education." Deductions for required education are restricted to expenditures "for the minimum education required by the taxpayer's employer, or by applicable law or regulations, as a condition to the retention of the taxpayer's salary, status, or employment."

On the other hand, the regulations provide:

> Expenditures made by a taxpayer for his education are not deductible if they are for education undertaken primarily for the purpose of obtaining a new position or substantial advancement in position, or primarily for the purpose of fulfilling the general educational aspirations or other personal purposes of the taxpayer. The fact that the education undertaken meets express requirements for the new position or substantial advancement in position will be an important factor indicating that the education is undertaken primarily for the purpose of obtaining such position or advancement, unless such education is required as a condition to the retention by the taxpayer of his present employment. In any event, if education is required of the taxpayer in order to meet the minimum requirements for qualification or establishment in his intended trade or business or specialty therein, the expense of such education is personal in nature and therefore is not deductible.[6]

Illustrating the meaning of these rules, the authors of the regulations mention the case of A, who is employed by an accounting firm and who takes courses to enable him to qualify as a certified public accountant. Expenditures for these courses are not deductible, as they were made before A became qualified as a CPA. B, a general practitioner of medicine, takes graduate courses in order to become a specialist in pediatrics and is allowed no deductions for his expenses. C, a less ambitious general practitioner, takes "a 2-week course reviewing developments in several specialized fields, including pediatrics, for the purpose of carrying on his general practice" and is entitled to deductions for his expenses. D is a schoolteacher who is required by his employer or by law "either to read a list of books or to take certain courses" in order to hold his job. After completing the prescribed courses, he receives a master's degree and is given an automatic salary increase. D can deduct his educational expenses. G, a graduate student at a university, aspires to become a professor and must obtain

[5] Regulations, 1.162–5 (T.D. 6291, *Internal Revenue Bulletin*, Cumulative Bulletin, 1958–1, p. 67).
[6] Ibid.

an advanced degree to do so. While working toward the degree, G is a part-time teacher at the university. His educational expenses are not deductible since he has not completed the education required to become qualified as a regular faculty member.

In attempting to limit deductions to educational expenditures that are clearly related to the taxpayer's income from his current employment, the authors of the regulations have excluded educational outlays that contribute to future earning capacity and which for this reason have great economic significance for the individual and for society. If a similar attitude were taken toward physical capital, deductions from taxable income presumably would be allowed for maintenance expenditures and capital replacement costs, but would be denied for depreciation on capital outlays intended to establish new firms, to enlarge existing enterprises, or to introduce new products. The regulations concerning educational expenditures discriminate against the new man and the ambitious, compared with the established and the timeserver. Unsatisfactory as the present rules may seem, readers may wish to suspend judgment on the regulations until they consider the difficulties that would be involved in formulating more liberal rules without opening loopholes. These problems are examined in a later section of this chapter.

Two other features of the income tax that relate to educational expenditures are the provision excluding scholarship and fellowship aid from taxable income [8] and the provision allowing parents to claim a $600 exemption for a son or daughter over 19 years of age who is a student and who receives more than half his support from his parents, even though he would otherwise not qualify as a dependent because his gross income exceeds $600.[9]

II. Possible Plan for Deduction or Amortization of Educational Expenditures

The logic of the net income tax seems to imply that persons who make expenditures for education that increases their earning power, or that is intended to do so, should be permitted to capitalize these outlays and write them off against taxable income through depreciation or amortization allowances. Income-producing educational expenditures are investments with a limited life and, if it is feasible, they should be given the same tax treatment as other investments. Failure to allow tax-free recovery of educational outlays means that the income tax falls in part on the return of capital rather than on net income.

Though they may suffer discrimination under the income tax, persons who obtain much formal education benefit from the fact that

[8] Internal Revenue Code, sec. 117.
[9] Internal Revenue Code, secs. 151, 152.

tuition charges are generally far lower than the costs of instruction. On balance, those who attend a college or university no doubt receive favorable treatment from society. The present income tax treatment, however, does not reflect a conscious recognition of the subsidy received by students. The income tax discrimination is most severe against those who receive the smallest subsidy in the form of below-cost tuition charges. Low average tuition charges do not wipe out inequities that are due to failure to allow educational expenses to be written off against taxable income, but the lowness of tuition charges does reduce the possible adverse effect of the income tax on private investment in education and on occupational choice.

Although an allowance for income-increasing educational expenditures is consistent with the theory of net income taxation and might be highly desirable from the point of view of social policy, great practical difficulties would be encountered in devising and administering an acceptable plan to put the principle into effect. These difficulties are attributable to the mixed nature of educational expenditures, which include consumption as well as investment elements, the lack of legal and accounting conventions formalizing the economic aspects of education, and other complications. In order to bring out some of the more significant issues, I shall attempt to give the broad outlines of a plan that might prove acceptable. My suggestions are highly tentative, and on some points I have not been able to make definite recommendations. I recognize the need for further debate and technical work on the subject.

ALLOWANCE TO WHOM?

The general principle is that costs incurred to acquire a taxable income should be charged against taxable income. Applied to education, the principle indicates that the personal costs[1] of that education which increases earning capacity should be written off against the taxable income attributable to the education. This means that the writeoff should be available to the person receiving the education and the income.

Students might properly be allowed current or deferred deductions for their own educational expenditures and for outlays on their behalf by their parents, relatives, or friends. Expenditures by parents or other persons could be considered as equivalent to gifts to the student. He would be allowed to recover free of income tax the value of these gifts just as he can now write off against income the cost of a depreciable asset acquired as a gift or through the expendi-

[1] The phrase "personal costs" is intended to mean costs met by students or by parents or other individuals on behalf of students, as distinguished from costs met by publicly or privately controlled educational institutions, governmental bodies, foundations, or other organizations.

ture of money received as a gift.[8] As a rule, no gift-tax problem would be involved because the amounts advanced by parents and others for amortizable expenditures would ordinarily fall within the $3,000 annual exemption under the gift tax. (Logically, this approach would imply that eligible educational expenditures should not be considered "support" in determining whether a student is a dependent.) The privilege of writing off against taxable income the value of gifts in the form of education probably should not extend to the value of scholarships and other aid received from educational institutions, governmental units, corporations, or other organized bodies. These awards are presumably intended to promote the general welfare rather than the economic interests of the recipient.

Most past discussions of the relation between the income tax and educational expenditures have centered on the question of who pays the personal costs rather than who receives the return. This approach has led to proposals for income tax deductions or tax credits to parents or others who finance education. Deductions or credits allowed to parents, however, cannot be justified on the basis of a general definition of income; they must be regarded as a means of subsidizing and encouraging family support of students. Proposals of this nature are briefly examined in a later section.

ELIGIBLE ITEMS

If an allowance is to be made for educational costs, decisions will have to be made concerning the kinds of education that will be eligible and the components of total educational expenditures that will be charged against income. General income tax principles suggest that deductions should be granted, either currently or through amortization allowances, for education that is undertaken for the purpose of adding to earning power. The emphasis on the purpose of the expenditures, rather than on their results, is in accord with established practice. "Ordinary and necessary" business and professional expenses are deductible without a showing that any gross income is directly attributable to the particular items of expense. In doubtful cases and in respect of nontrade or nonbusiness expenses for the production or collection of income, the intent of the taxpayer is highly important in determining deductibility, although not always controlling. Usually some reasonably objective evidence can be adduced to corroborate or refute a claim that an expenditure was made in order to obtain income.[9]

[8] Internal Revenue Code, secs. 167, 1011, 1015.

[9] Internal Revenue Code, secs. 162(a), 212; Regulations 1.162–1, 1.212(1). The intent of the taxpayer is highly significant in indicating whether an activity is a business or a hobby and in determining whether deductions will be allowed for expenditures for items such as professional association or club dues, specialised books and journals, attendance at conventions, travel, entertainment, and rental of safe deposit boxes.

In determining whether expenditures for a class of education should be considered costs of earning income, primary reliance might be placed on the intent of the taxpayer. The apparent influence of the education on earning capacity would constitute an important secondary criterion that might be decisive when motivation was uncertain. A precise measure of earning capacity would not be required, but merely an indication whether a significant influence could reasonably be expected on the basis of the experience of other persons who have acquired similar education, or other evidence.

Basic professional, technical, and vocational education may be presumed to be motivated primarily by economic considerations, and the same may be said of a refresher course and supplementary training relating directly to the occupation of the person taking it. The connection between such education and earning capacity is fairly clear, and current deduction or amortization could properly be allowed so long as the amounts were reasonable. On the other hand, elementary education seems to have little economic motivation and to have no claim for consideration as an investment for income tax purposes. It is much more difficult to classify college liberal arts education and high-school education. General college education increases earning capacity and is surely motivated in part by this consideration even when pursued primarily for its cultural and civic values. An attempt to distinguish clearly between general education and vocational or professional education in colleges and universities, furthermore, would encounter serious difficulties. Undergraduate students in business administration, teacher-training, engineering, and other professional fields take general courses as well as specialized courses, and many courses are hard to classify. General education, moreover, is less subject to obsolescence than highly specialized training and may often constitute a better investment from the strictly economic standpoint. The high-school curriculum also combines general education with vocational training, but economic considerations seem less important in high-school than in college. Rising standards of living and compulsory attendance laws, together with the development of public high schools, have greatly extended secondary education and reduced its personal costs. Although high-school attendance is still not universal, children can go to high school in their home communities at little direct monetary cost to their parents.[10]

[10] Theodore W. Schultz outlines a somewhat similar ranking of attitudes toward different kinds of education, but places more emphasis on the investment aspect of high school attendance ("Education and Economic Growth," in National Society for the Study of Education, 60th yearbook, Nelson B. Henry, *ed., Social Forces Influencing American Education, 1961*, Part 2, Chicago, University of Chicago Press, p. 52–53). In his 1960 presidential address to the American Economic Association and in private correspondence, Schultz suggests that educational expenditures be classified as investment or consumption by reference to their influence on earnings rather than by the purpose of the outlay. See his "Investment in Human Capital," *American Economic Review*, 51 : 1–17, March 1961. I hesitate to

Perhaps the best plan would be to allow the deduction or amortization of educational expenditures relating to: (1) any program of study leading toward a degree from an accredited college or university; (2) vocational training at a recognized trade school, business college, or similar institution; and (3) a supplementary, continuation, or refresher course of a predominantly professional or vocational nature taken at a recognized or accredited institution. Presumably the new treatment should apply only to expenditures made after its authorization. "Degree-credit students" at colleges and universities, in the terminology of the Office of Education, would qualify regardless of whether they obtained degrees or not. Part-time studies and correspondence courses as well as full-time resident study should be eligible. Expenditures for ordinary high-school studies would be classified as personal expenses rather than costs of earning income.

As regards college and university studies, this plan would err on the side of liberality. The allowance for all kinds of college and university courses would cover some educational expenditures that are in the nature of consumption, as judged by presumed motivation or apparent influence on income. At the present time, however, most college and university education seems to add to earning capacity, and it is difficult to rule out the possibility of economic motivation in connection with any part of it. The rate of private monetary return on total private costs of college education appears to be high—about 12½ percent net of income tax in 1940 and 10 percent in 1950, according to Becker's estimates.[11] If a large fraction of college costs were classified as consumption expenditures, the calculated rate of return on the remaining outlays would be high indeed. The imperfection due to a liberal allowance for college costs seems less objectionable, from the point of view of income theory and broad public policy, than that due to the present practice of permitting virtually none of these expenditures to be charged against taxable income.

The diversity of trade schools, business colleges, and similar institutions and the absence of a comprehensive accrediting system for them would complicate the application of administrative checks to assure that the expenses of study at these institutions were legitimate educational expenditures. Under the veterans' educational program

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recommend this approach for tax purposes for fear that it would discriminate against education, particularly new and unusual kinds of education, and because most existing measures of educational yield are very crude. Some estimates indicate higher rates of return on elementary education than on high-school and college education (Schultz, "Education and Economic Growth," op. cit., p. 81); this finding seems implausible and of doubtful relevance for tax policy.

[11] Gary S. Becker, Underinvestment in College Education? *American Economic Review*, Papers and Proceedings of the American Economic Association, 50: 346–354, May 1960. Becker's estimates are for urban white males. His figures on costs include forgone earnings, and returns are adjusted for differential ability. The decline in the rate of return between 1940 and 1950 is due almost entirely to higher income tax rates.

after World War II, difficulties and abuses were reported with respect to many of these institutions, particularly proprietary schools below college level. Standards were tightened in 1948 and again in the legislation providing benefits for Korean war veterans.[12] The need for controls of quality would presumably be less acute under a tax deduction or amortization plan than under the veterans' program inasmuch as the Government's share of the cost would be much smaller under the tax scheme.

The principal difficulty in connection with supplementary training and continuation or refresher courses, which are often undertaken on a part-time basis, would be to distinguish vocational courses from other courses. Many extension courses, evening classes, and correspondence courses are almost entirely consumption, dealing with subjects such as hobbies, arts and crafts, current events, and music appreciation. Courses cannot always be distinguished on the basis of their content. A music course, for example, may be vocational training for one person but avocational for another. It seems that the best rule would be to allow current deductions or amortization charges only for expenses relating to education which the taxpayer represents as being primarily vocational or professional and which the authorities consider reasonably related to his occupation or occupational plans. The difficulties in applying this standard would be greater than those arising under the present rule, but they seem little if any more serious than the problems associated with deductions for items such as entertainment, travel expenses, and club memberships. The amounts involved may be smaller and many may feel that it is better public policy to be liberal with respect to educational expenses than with respect to some of the items now deductible.

The suggestion that no income tax allowance be made for ordinary high-school education is debatable. There is considerable overlap between high-school courses and the training offered by trade schools and business colleges, on the one hand, and by liberal arts colleges, on the other. For pupils in public high schools, however, the amount that could be written off would be small even if the plan were extended to them. Since most young people now go to high school, the principal effect of an income tax allowance for the personal costs of secondary education would be to encourage attendance at private schools.[13]

An alternative plan would be to treat as investment varying proportions of the personal costs of different kinds of education with

[12] U.S. President's Commission on Veterans' Pensions, *Readjustment Benefits: Education and Training, and Employment and Unemployment*, Staff Report IX, part B. House of Representatives Committee on Veterans' Affairs, House Committee Print No. 291, 84th Cong., 2d sess., 1956.

[13] In 1959, 10.9 percent of high-school pupils were enrolled in private schools (*Statistical Abstract of the United States, 1960*. p. 107).

the objective of reflecting differences in normal contribution to future earnings. For example, the proportions to be capitalized might range as follows: 100 percent for professional schools, postgraduate courses, and vocational training; 75 percent for general college and university studies; and 25 percent for high-school courses.[14] This approach has the merit of recognizing the mixed nature of educational expenditures. Any set of percentages chosen for the schedule, however, would be almost as arbitrary as the all-or-none rule previously suggested. The difficulty of distinguishing between professional or vocational studies and general studies would remain.

Current or deferred deductions might be allowed for expenditures for tuition and fees, books and equipment, and necessary travel relating to eligible education. No deduction should be granted for normal living expenses since these expenses would be incurred in any event. Although additional living expenses necessary to the educational purpose should in principle be deductible, the difficulty of distinguishing necessary additional expenses from normal or optional expenses would be great, and it seems advisable to deny deductions for living expenses. Alternatively, a small, fixed allowance for additional living expenses might be deductible for students while they are away from home.

Although foregone earnings of students are a large part of the real cost of education, it would not be necessary to allow this item to be written off against taxable income. This part of educational costs is already free of income tax. Students and others who directly invest their time and energy in the creation of an income-yielding asset, in effect, enjoy an immediate writeoff of investment costs. Because of time discount and uncertainty, an immediate writeoff is more valuable than a series of charges. Furthermore, the income tax does not directly reduce the capacity of a student to invest his time in his education. In contrast, a person who works for wages must pay an income tax, which leaves him less to invest.[15]

INCOME AGAINST WHICH EXPENDITURES ARE CHARGED

A strict rule would be to allow educational expenses to be charged only against income earned in the occupation for which the education prepared the taxpayer. This degree of refinement does not seem feasible or desirable in view of the great difficulty of establishing a clear connection between different kinds of education and activities. Professional education, for example, may be adaptable to the requirements of work in fields that are only loosely related to the specialty. A

[14] I am indebted to Prof. Theodore W. Schultz for this suggestion.

[15] The student's advantage is reduced if, as is likely, the marginal tax rate that would have applied to his earnings while he is a student is lower than the rate that applies to his later earnings.

striking illustration is legal education, which has often been the route to leadership in business and politics. If a specific linkage between the kind of education and the source of earnings is not required, interruption of professional or vocational studies before completion of the course or failure to pursue the occupation for which one prepared should not disqualify one for the allowance for educational expenditures.

It would seem reasonable to limit the deductions or amortization charges to earned income. Although education may make one a better investor, the relation between property income and amount of education is rather tenuous. If educational expenditures could be written off against property income, this might give an undue advantage to persons with inherited wealth. Even with the earned-income limitation, the applicable marginal tax rate and hence the value of the deduction would be influenced by the amount of property income received.

A politically sensitive problem would be presented by the case of housewives who do not work outside the home. It is suggested that no amortization allowance be granted for a housewife during any period in which she has no taxable earned income. Although the housewife's services have economic value and her contribution to the family's economic welfare is enhanced by her education, the value of her services does not enter into taxable income. Hence denial of a writeoff for educational costs that qualify the housewife to perform her services more effectively cannot be regarded as discriminatory in the same way as failure to take account of costs of earning a taxable income.

TIMING

By analogy with the treatment of the cost of physical assets, educational expenditures should be capitalized and written off against taxable income over the period in which they contribute to earnings. Ordinarily this period would be the whole normal working life of the person. This approach, however, might be cumbersome for major expenditures and ridiculous for small items.

It is tempting to suggest that the taxpayer be allowed to write off expenditures at any rate he chooses. This would leave him complete freedom in selecting the beginning date for amortization and would permit him to deduct his expenditures currently if that were most beneficial. Most students do not have enough income to be liable for tax, and in professions such as medicine and law, earnings are often small in the first few years of practice. Usually therefore students would wish to postpone the beginning of amortization until they left school or perhaps a few years later. On the other hand,

students who earn enough to be subject to income tax would find it especially helpful to deduct educational expenditures currently. If the deductions were taken currently, much of the recordkeeping that would be involved in amortization over a long period of time would be avoided. Complete freedom to the taxpayer in timing the amortization of educational expenditures, however, may be considered too liberal so long as similar treatment is not accorded to those who invest in physical assets. Because of time discount, an immediate writeoff of the cost of a capital investment may be much more advantageous than a writeoff extending over a long period of time. At a compound interest rate of 5 percent, for example, the present value of a series of annual deductions of equal size extending over 20 years in the future is only 62 percent of the face amount of the deductions. A precedent for liberality respecting the timing of deductions exists in the treatment of research and experimental expenses of a trade or business. These expenses may be currently deducted, or capitalized and written off over a period of 5 years or more, at the option of the taxpayer.[16]

A possible compromise would be to allow persons incurring major educational expenses to capitalize their outlays and amortize them over a fixed period of say 20 years, or the period ending when the taxpayer reaches age 65 if that is shorter. The taxpayer could appropriately be given some leeway as to the date at which amortization would begin. Taxpayers incurring minor educational expenses might be given the option of capitalizing their outlays or deducting them currently. Major and minor expenses could be defined in terms of percentages of current income. Outlays by full-time students would nearly always be major expenses. Most expenditures for supplementary training or refresher courses would qualify as minor expenses and thus would be currently deducted or capitalized at the taxpayer's option.

Persons who die before the end of the amortization period would not have completed the writeoff of their educational expenses. In such cases it would seem reasonable to allow the unamortized balance to be deducted in the last taxable year.[17] If this deduction reduced the income below zero, a carryback of net loss might be allowed and a refund of taxes for prior years granted. Similar treatment could be justified for a person who becomes totally and permanently disabled. It might be urged for women who marry and withdraw from the labor force, but the termination of the amortization period would not be clearly appropriate in these cases since many married women leave their jobs but later resume employment outside the home.

[16] Internal Revenue Code, sec. 174.

[17] Under present law, when depreciable property (tangible or intangible) suddenly loses its usefulness and is discarded, the difference between its depreciated cost and salvage value, if any, may be deducted from income (Income Tax Regulations 1.167(a)–8).

III. Effects of Revised Treatment of Educational Expenditures

The effects of allowing educational expenditures to be charged against taxable income may be considered from the standpoint of Government revenues, college and university tuition charges and enrollments, and occupational choice.

REVENUES

Government revenues would be reduced unless offsetting increases in tax rates were adopted. Under a plan allowing current deduction of minor educational expenses and amortization of major outlays for education, the full impact would be felt only after a period of years roughly equal to the amortization period. Over the transition period the annual charges would build up year by year. They would increase thereafter to reflect the growth of population and of educational expenditures.

The available data permit rough estimates of expenditures for education in colleges and universities, but not for trade schools, correspondence schools, and other educational institutions. Reliable statistics are available for tuition and fees paid to colleges and universities, including tuition and fees for extension courses, adult education, and instruction by mail, radio, and television. There are data on which estimates of other expenditures of students at colleges and universities can be based. Some of the relevant information is summarized in table 1. The estimates given in the table for books and supplies and for travel may be somewhat too high. Mean expenditures of full-time students were used in developing the estimates, but were applied to enrollment figures that include part-time students as well.

In estimating the revenue loss, an allowance has to be made for the expenditures of women who marry and withdraw from the labor force before completing the amortization of their educational outlays and for the expenditures of those who die before completing the amortization period. In March 1957 one-half of the women in the age group 25 to 64 who had one or more years of college education were in the labor force.[18] Rates of participation in the labor force were higher among younger women who had attended college but who were not currently enrolled, and were also higher among women with 4 or more years of college attendance than among those with briefer attendance. Many college women who were not in the labor force in 1957 had previously been employed or would be employed in the

[18] U.S. Bureau of the Census, *Current Population Reports*, Series P–20, No. 77, Population Characteristics (Dec. 27, 1957), and Series P–50, No. 78, Labor Force, November 1957.

TABLE 1.—Estimated expenditures of students for selected items: colleges and universities, United States, 1953–54; 1955–56; 1957–58; and projected, 1969–70

[In millions]

Item	Expenditures by year			
	1953–54	1955–56	1957–58	1969–70
Total	$827	$1,038	$1,324	$3,101
Tuition and fees [1]	508	667	873	2,209
Books and supplies [2]	129	152	194	367
Travel [2 3]	190	219	257	525

[1] Estimated from U.S. Department of Health, Education, and Welfare, Office of Education, Biennial Survey of Education in the United States 1953–54, *Statistics of Higher Education, Receipts, Expenditures and Property, 1953–54*, and similar statistics for 1955–56; and from unpublished data compiled by the Office of Education for the 1957–58 edition. The figures represent tuition and fees from students for instruction and for plant expansion or debt retirement, minus the amount of tuition and fees covered by fellowships, scholarships, and prizes administered by colleges and universities (estimated at two-thirds of the institutions' expenditures for these awards). See John F. Meck, testimony on behalf of American Council on Education, House Ways and Means Committee, *Hearings on General Revenue Revision*, 85th Cong., 2d sess. (1958), pt. I, p. 1065. The total includes college and university tuition receipts from extension courses and instruction by mail, radio, and television.

The 1969–70 figure is based on the estimate of $2,437 million for total tuition and fees projected by Robert D. Calkins ("Government Support of Higher Education" in *Financing Higher Education, 1960–70*, Dexter M. Keezer, ed. New York, McGraw-Hill Co., 1959, p. 197), reduced by estimated sums from scholarships, fellowships, and prizes which are assumed to amount to 9 percent of total tuition and fees (the 1957–58 percentage).

[2] Derived by multiplying the number of students enrolled by the amount of estimated mean expenditures for the item. Enrollment figures are from the U.S. Office of Education academic year enrollment series reported in the Biennial Survey of Education 1953–54; and by Seymour E. Harris in *Financing Higher Education, 1960–70*, op. cit., p. 74. Mean expenditures are estimated from survey data for 1952–53 (adjusted for price changes) by Ernest V. Hollis and associates, *Costs of Attending College* (U.S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1957, No. 9.) p. 40.

For books and supplies, the price index used is the "Reading and recreation" component of the Bureau of Labor Statistics Consumer Price Index; for travel, the "Transportation" component. The 1969–70 figure is based on mean expenditures computed at 1959–60 price levels.

[3] Travel between home and college or university; excludes travel between college address and campus and "other" travel.

future. On the other hand, some of those who were employed would work only a short time. I assume that one-fourth of eligible expenditures of women students at colleges and universities could not be amortized under a general plan because of lack of earned income against which to claim the deductions. In recent years women students accounted for about one-third of college and university enrollment.[19] On the assumption that average expenditures of women students are equal to those of men students, it follows that the "wastage" of amortization deductions of women students would amount to about 8 percent of total outlays for eligible items by college and university students. Even with a final-year adjustment, as suggested above, death or disability would prevent some men and women from completing the amortization of their investment.[20] An allowance for unemployment should perhaps be added, but this should not be large if prosperity is fairly well maintained inasmuch as short-

[19] U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 1959*, p. 106.

[20] On the basis of 1956 mortality rates for white males (*Statistical Abstract of the United States 1959*, p. 60), it may be calculated that, of a group aged 25, about 4 percent would die before reaching age 45, and that on the average about 98 percent would be living during the 20-year period. I have not found comparable statistics of disability.

term unemployment would usually not prevent amortization. All told, the wastage of amortization deductions might be about 10 percent.

It seems safe to assume that, so long as income tax exemptions remain at approximately their present level in relation to average income, nearly all former college students will have incomes large enough to be subject to tax when they are employed. Selection of an appropriate marginal rate of income tax is more difficult. The average income of persons who have attended college is considerably higher than the average income of others, but apparently not high enough to raise a large proportion of them into upper tax brackets. In 1958, 23 percent of male college graduates with money income received more than $10,000; only 1.5 percent of women graduates with money income were in this class.[21] I assume that, with present rate schedules, the weighted average marginal rate of income tax applicable to former college students is about 25 percent. (Under present law the marginal rate for a married couple with two dependent children rises from 22 percent to 26 percent at an income of approximately $12,000.)

These estimates and assumptions indicate an ultimate revenue loss of roughly $300 million if amortization or deduction had been allowed for 1957–58 expenditures of college and university students for tuition and fees, books and supplies, and travel (see table 1). The total revenue loss would be associated with 1 year's expenditures, but would occur only over a period of 20 years if the suggestions made above concerning amortization were adopted. After introduction of the plan, the annual revenue loss would increase year by year as successive groups began to claim deductions or amortization allowances for expenditures made in later years. If students' expenditures remained constant at the 1957–58 level, the annual revenue loss would stabilize at approximately $300 million after 20 years. Educational expenditures, however, can be expected to increase rapidly with the growth of enrollment and with probable increases in tuition charges. On the basis of projected increases in enrollment and tuition charges, but assuming no change in prices of other items, amortizable or deductible expenditures made in 1969–70 may be placed at $3.1 billion or more. On the assumption of a 25-percent marginal tax rate and 10 percent "wastage" of deductions, the ultimate revenue loss with respect to that year would amount to $0.7 billion, spread over two decades. These estimates make no allowance for an increase in taxable income due to a stimulus to education provided by tax revision.

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[21] U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P–60, No. 33, Consumer Income, Jan. 15, 1960, p. 33.

INFLUENCE ON TUITION CHARGES AND ENROLLMENTS

The adoption of a plan allowing educational expenditures to be written off against taxable income would probably encourage colleges and universities to raise their tuition charges and fees. Tuition charges are well below instructional costs at most institutions, and the institutions face financial problems. The extent of the increase in charges cannot be forecast with confidence, but informed observers have generally agreed that tax relief for parents of students would lessen the reluctance of colleges and universities to raise charges. Amortization for students is less closely related to the ability of parents or students to meet increased charges, but the adoption of an amortization plan would no doubt increase to some degree capacity and willingness to pay tuition charges.

The amortization plan would complement an arrangement providing higher tuition charges and long-term credit facilities to enable needy students to pay the charges. That system would formalize the resemblance between educational expenditures and investment in physical assets. If liberal credit and tax amortization were available, much could be said for a policy of raising tuition charges high enough to cover the full marginal costs of instruction in courses that are predominently vocational or professional in nature.[28] The argument for higher tuition charges would be especially persuasive in regard to professional fields such as medicine, where educational costs and earnings are much above the average. Students in these fields now pay only a small fraction of the costs of their education.

Any action that reduces the net cost of tuition payments or facilitates borrowing to cover educational expenses should induce some students who would otherwise have attended public institutions to apply for admission to private colleges and universities. Adoption of an amortization plan would result in tax savings ultimately amounting to perhaps one-fourth of expenditures for tuition and fees and other eligible items. As already noted, however, the fact that the tax savings would be realized in installments over a period of years would considerably reduce their significance. Although it seems clear that the plan would stimulate enrollment in private institutions compared with that in public ones, the probable extent of this influence is hard to appraise.

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[28] Milton Friedman. "The Role of Government in Education," in *Economics and the Public Interest*, Robert A. Solo, ed. New Brunswick, N.J., Rutgers University Press, 1955. p. 123–144.

INFLUENCE ON EDUCATIONAL EXPENDITURES AND OCCUPATIONAL CHOICE

In present circumstances, it seems unlikely that adoption of a plan for amortization of educational expenditures would have a great influence on the total investment in education and on the choice between occupations requiring different amounts of such investment. The role of economic calculations in educational and occupational choices is uncertain, and the tax benefits of an amortization plan would equal only a small proportion of the total personal costs of college and university education. Forgone earnings of college and university students, which are a part of personal costs but which would not be amortizable, are much larger in the aggregate than expenditures for items which might properly be subject to amortization (tuition and fees, books and supplies, and travel). In academic years 1955–56 and 1957–58, the amortizable items accounted for only about 15 to 17 percent of estimated total personal costs of college and university education, exclusive of any additional living expenses of students; the remaining 83 to 85 percent of personal costs consisted of forgone earnings.[21]

On the assumption of a 25-percent marginal tax rate, it appears that the tax saving attributable to amortization of educational expenditures would have equaled only about 4 percent of total personal costs of college and university education under conditions prevailing recently. This figure should be discounted because of the distribution of the tax saving over a period of years. An item as small as this can hardly be a strong influence on the amount of educational expenditures or on occupational choice.

The tax benefits from amortization would not represent a major fraction of personal costs of even the most expensive kinds of education. Although students' outlays for tuition and fees and other expenses at certain prestige colleges and at professional schools of private universities are much larger than average expenditures for all colleges and university students, forgone earnings are still the largest item of personal education costs. For example, I estimate that, at approximately 1959–60 prices and wage rates, the total personal cost of a medical education at private institutions, including a 4-year premedical course at an "Ivy League" college, 4 years at a private medical school, and a 1-year internship, averaged roughly $45,500. (Many physicians also serve residencies in order to qualify as specialists.)

[21] See estimates of expenditures for tuition and fees, books and supplies, and travel, table 1. Theodore W. Schultz estimates forgone earnings of college and university students at $5,821 million in 1955–56. See "Capital Formation by Education," *Journal of Political Economy*, 68: 580, December 1960. Applying Schultz's method, I estimate forgone earnings in 1957–58 at $6,570 million. My estimate, however, relies on the Department of Labor figure for unemployment rather than on the series compiled by Clarence D. Long, which Schultz uses for 1955–56.

Of the $45,500, about $33,500 represented forgone earnings and $12,000 tuition and fees, books and supplies and equipment, and travel (see table 2). Under an amortization plan, $12,000 could be written off against taxable income at a rate of, say $600 a year. Although this sum is not insignificant, the tax saving, assuming a 30-percent marginal tax rate, would amount to only 8 percent of the personal investment in the physician's education.[34]

TABLE 2.—Estimated personal cost of medical education (at 1959–60 prices and wages)

Cost item	1 year	Total
Premedical course		
Tuition and fees [1]	$1,280	$5,120
Books and supplies [2]	57	228
Travel [3]	109	436
Subtotal	1,546	6,184
Forgone earnings [4]	2,146	8,584
Total, premedical course	3,692	14,768
Medical school		
Tuition and fees [5]	1,110	4,440
Books and supplies [6]	150	600
Microscope [7]	350	350
Travel [3]	109	436
Subtotal	1,719	5,826
Forgone earnings [8]	5,441	21,764
Total, medical school	7,160	27,590
Internship: Forgone earnings [9]	3,093	3,093
Total, all items	.....	45,451

[1] Mean for 8 "Ivy League" colleges (Brown, Columbia, Cornell, Dartmouth, Harvard, Pennsylvania, Princeton, and Yale), 1959–60, *American Universities and Colleges*, Mary Irwin, ed. Washington, D.C., American Council on Education, 8th edition, 1960.

[2] Mean expenditures of undergraduates in private colleges in 1959–63, adjusted for price changes. For derivation, see table 1, footnotes 2 and 3.

[3] Average for all college and university students, 1960, derived by the method used by Theodore W. Schultz in "Capital Formation in Education," *Journal of Political Economy*, 68 : 573, December 1960. Adjustment for unemployment based on a Department of Labor estimate of the unemployment rate as a percentage of the civilian labor force (*Economic Indicators March 1961* prepared for the Joint Economic Committee by the Council of Economic Advisers, U.S., 87th Cong., 1st Sess., House of Representatives).

[4] Median minimum expenses of first-year medical students in 45 private medical schools, 1960–61, from American Medical Association, Council on Medical Education and Hospitals, *Medical Education in the United States and Canada*, reprint from *Journal of the American Medical Association*, 174, 1423–1476, Nov. 12, 1960.

[5] Median, 1956–57, from U.S. Congress, *Medical School Inquiry*, Staff Report to House Committee on Interstate and Foreign Commerce, 85th Cong., 1st sess., House of Representatives, 1957 Committee print, p. 226.

[6] Median starting salary of $5,280 for inexperienced male graduates in chemistry with a B.S. degree, 1959–60, from American Chemical Society, "1960 Starting Salary Survey," *Chemical and Engineering News*, 38 : 107, Oct. 31, 1960, reduced by $420, the estimated earnings of the student during the year. The student's current earnings were estimated by increasing the estimated average for dental students in 1963–64 (American Dental Association, *How Students Finance Their Dental Education*, 1958, p. 49) by an index of average gross weekly earnings in manufacturing (derived from U.S., *Economic Report of the President*, transmitted to the Congress Jan. 20, 1960, p. 194; and *Economic Indicators March 1961*, op. cit.). The total for this item is 4 times the 1-year figure.

[7] Difference between: (a) entrance salary (General Services, grade 9, $6,235 a year) under the Federal civil service for one who has successfully completed graduate study in biochemistry equivalent to the requirements for a doctor's degree, including the thesis (U.S. Civil Service Commission Announcement No. 163B, issued July 22, 1958, supplemented May 2, 1960); and (b) estimated annual compensation of interns in university-affiliated hospitals in 1959–60. The average salary of interns in hospitals affiliated with medical schools was $166 a month, $1,992 for 12 months, as reported in Graduate Medical Education in the United States, *Journal of the American Medical Association*, 174 : 575, Oct. 8, 1960. Many interns also receive room, board, and other maintenance, and these items were valued at $1,200 for 12 months. The median cost of room and board at private medical schools in 1959–60 was $800, presumably for 9 months (*Medical Education in the United States and Canada*, op. cit.). Total compensation is therefore estimated at $3,192 and forgone earnings at $3,093.

[34] Unpublished estimates by Roy B. Moor for the U.S. Public Health Service indicate that physicians (M.D.'s) in the United States received an average net income of $16,500 from medical practice in 1958. A married person with this income would be subject to a 30-percent marginal rate of Federal income tax.

If tuition and fees were increased to cover a much larger fraction of total educational costs, the amortization plan would become more significant; nevertheless, amortizable expenses would still represent only a minor part of total costs, owing to the importance of forgone earnings. If, for example, in 1955–56 and 1957–58 tuition and fees had covered all educational costs of colleges and universities, amortizable expenses of students would have equaled only about 40 to 44 percent of total costs.[28] In fields such as medicine and dentistry, where instructional costs are high, the fraction might be somewhat greater but probably not strikingly so, inasmuch as forgone earnings are larger for students in professional schools than for the average student.

It could be argued that, in appraising the influence of amortization of educational expenses, students' benefits from the tax provision should be related to their money outlays for education rather than to total personal costs, including forgone earnings. One basis for this approach might be the hypothesis that, in decisions relating to education and occupational choice, opportunity costs are given much less weight than money expenditures. Granted that many students and parents may not carefully calculate forgone earnings, I do not believe that we should assume that opportunity costs have no influence. Opportunity costs are taken into account partly in the form of students' living expenses, which are included in most published material on educational costs, but not in the estimates presented in this paper. The calculation of opportunity costs requires less sophistication and foresight than the evaluation of the tax benefits due to amortization of educational expenses, and those who ignore opportunity costs might also overlook the more remote advantages of amortization.

A more persuasive reason for concentrating on money outlays, including living expenses but not all forgone earnings, is the possibility that these costs will be financed by borrowing. The availability of tax amortization might increase the willingness of students to borrow and might cause creditors to regard these loans as better risks.

IV. Deductions or Tax Credits Allowed to Parents of Students

In recent years there has been considerable discussion of the possibility of allowing income tax deductions or credits for certain educa-

[28] Based on estimated total costs of $9,692 million in 1955–56 and $11,681 million in 1957–58. These totals include my estimates of students' expenditures on books and supplies and travel (table 1); Schultz's estimates of forgone earnings and institutional costs in 1955–56 ("Capital Formation by Education," op. cit., p. 579–580); and, for 1957–58, my estimates of forgone earnings ($6,570 million) and institutional costs ($4,660 million), made by Schultz's method. The figures for institutional costs include all college and university operating costs (except costs of auxiliary enterprises) and implicit interest and depreciation on physical property, thus covering costs of research and administration as well as costs of instruction.

tional expenditures. In 1953 the House Ways and Means Committee selected college and educational expenses as one of 40 topics for study in preparation for a revision of the Internal Revenue Code.[26] The President's Committee on Education Beyond the High School recommended in 1957 that

> . . . the Federal revenue laws be revised, with appropriate safeguards, in ways which will permit deductions or credits on income tax returns by students, their parents or others, who contribute to meeting the expenditures necessarily incurred in obtaining formal education beyond high school; and, further, that provisions be included which will grant proportionately greater tax benefit to those least able to afford those expenditures.[27]

The 1960 platform of one of the major political parties favored "consideration of means through tax laws to help offset tuition costs" without specifying the form of the assistance.[28]

A large number of bills relating to expenses of attending college or university have been introduced in Congress in recent years. Although the bills commonly provide a deduction or tax credit for a person incurring expenditures for himself or for a dependent, the following comments relate solely to the tax relief that would be offered to parents of college students. The analysis, although incomplete, deals with the more important aspect of the bills. Parents, on the average, pay a larger fraction of the money costs of college education than students do and parents also have higher taxable incomes.[29]

Proposals for the deduction from taxable income of educational expenditures have been criticized on the grounds that they would grant proportionately more relief to high-income families than to those with low incomes. The tax saving attributable to any deduction varies directly with the marginal tax rate, and in the graduated schedules employed in the United States, marginal rates rise to high levels for large incomes. Critics have pointed out that a deduction for college expenses would give the largest benefits to families with the least need for financial assistance, and they have expressed the fear that such a plan would accentuate the tendency for college enrollment to be drawn from families with incomes much above the national average.

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[26] U.S., 83d Cong., 1st sess., part I, *General Revenue Revision*. Hearings before the Committee on Ways and Means, House of Representatives, 1953. p. 177–201.

[27] U.S., The President's Committee on Education Beyond the High School, *Second Report to the President*, July 1957. p. 11.

[28] *Platforms of the Democratic Party and the Republican Party, 1960* (Ralph R. Roberts, Clerk, U.S. House of Representatives, September 1960). p. 68.

[29] U.S. Department of Health, Education, and Welfare, Office of Education, *Costs of Attending College*, Ernest V. Hollis *and associates*, OOE Bull. 1957, No. 9, p. 48; John B. Lansing, Thomas Lorimer, *and* Chikashi Moriguchi, *How People Pay for College*, Ann Arbor, Mich., Survey Research Center, Institute for Social Research, University of Michigan, 1960; American Dental Association, *How Students Finance Their Dental Education*, 1956. p. 49; U.S. Department of Health, Education, and Welfare, Public Health Service, *Physicians for a Growing America*, Report of the Surgeon General's Consultant Group on Medical Education, PHS Pub. No. 709, 1959, p. 20.

These objections have prompted the suggestion that parents or others be allowed a tax credit equal to a stated percentage of certain expenditures rather than a deduction for these expenditures. A credit is subtracted from the tax liability otherwise due rather than from taxable income. To illustrate, a 30-percent credit would give a $300 tax reduction to parents who incur $1,000 of eligible expenses for a son or daughter in college. For persons whose tax liability would exceed the amount of the credit, a uniform credit offers benefits equal to the same fraction of eligible expenditures regardless of income level and marginal tax rate. Parents whose incomes are so low that they pay no income tax would receive no assistance, and those whose tax liability is less than the amount of the credit would not be able to take full advantage of it. It appears, however, that only a small minority of parents of college students would be subject to these limitations under most of the tax credit proposals. A considerably greater part of the total tax reduction would accrue to low-income and middle-income families under a tax credit than under a deduction plan costing the Government the same amount of revenue.[30] The credit approach has been endorsed by the American Council on Education [31] and has been embodied in several bills introduced by Members of Congress.

The proposed tax credits or deductions allowed to parents of college students would provide immediate tax relief. Government revenues would therefore be reduced more quickly than by an amortization plan covering the same expenditures. In the long run, however, the revenue effects of current deductions and amortization allowances would be much the same, provided the same items were charged against income. A tax credit for particular items would bring about more or less of a revenue loss than a deduction of the same items, depending on whether the credit rate was higher or lower than the weighted marginal rate of income tax. The two approaches would have qualitatively similar influences on the amount of educational expenditures, enrollment at public and private educational institutions, tuition charges, and occupational choice. But in all these respects an immediate deduction or credit allowed to parents would doubtless be more powerful than amortization allowances for stu-

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[30] For a statistical comparison, see *Stimulating Voluntary Giving to Higher Education and Other Programs*, prepared for the American Association for the Advancement of Science, Washington, Surveys and Research Corporation, 1958, p. 109–130.

[31] The council's proposal called for a 30-percent credit for college tuition and fees, subject to a limit of $450 of credit per student year. See U.S., 85th Cong., 2d sess., pt. I, *General Revenue Revision*, hearings before the Committee on Ways and Means, House of Representatives, 1958, p. 1061–1068; and John F. Meck, "The Tax-Credit Proposal," in *Higher Education in the United States: the Economic Problems*, Seymour E. Harris, ed., supplement to *Review of Economics and Statistics*, Cambridge, Mass., Harvard University Press, 1960, 42: 93–95, August 1960.

dents that would bring about the same loss of revenue over a period of years.

As already asserted, tax credits or deductions for parents or others who meet the expenses of students cannot be regarded as an improvement of the definition of taxable income. Granted that certain educational expenditures should be considered an income-producing investment, general income tax principles indicate that the costs should be charged against the yield over the life of the investment. Credits or deductions to parents are inconsistent with these principles because they apply to the tax liability or income of the parents rather than to the investment yield in the form of students' earnings. Neither the Internal Revenue Code nor popular opinion treats parents and their adult sons and daughters as a single economic unit. A second criticism of credits or deductions to parents is that the tax relief would accrue before the receipt of the investment income. A less fundamental objection is that nearly all of the proposals that have received public attention have been limited to college and university expenses and would therefore discriminate against other kinds of training. This defect could be eliminated by broadening the credit or deduction.

The proposals for credits or deductions to parents are intended to subsidize and encourage socially meritorious activity. For this reason, questions about the efficacy of the plans in stimulating additional expenditures, the distribution of benefits among income classes, and the needs of beneficiaries are more pertinent to these plans than to the proposals for refining the definition of income by allowing students to write off certain educational expenditures.[22] A deduction or tax credit granted to parents can be justified only on the grounds that educational expenditures are more meritorious or more burdensome than other socially desirable expenditures that do not receive special tax treatment. It is also necessary to argue that tax relief is more efficient or otherwise more acceptable than additional Government expenditures as a means of encouraging education. Some such considerations seem to underlie the approval of deductions for charitable contributions, and several personal deductions have been attacked for failure to conform to similar standards. Deductions that are recognized as necessary for the computation of net income, on the other hand, are not usually expected to meet such exacting requirements.

The difference between a current deduction or credit to parents and a deferred deduction to students may not seem important to most of those who are eager to do something to help education.

[22] C. Harry Kahn. *Personal Deductions in the Federal Income Tax.* Princeton, N.J., Princeton University Press, 1960. p. 15–16.

Although the general public can hardly be expected to be as concerned as tax experts are with refinements of income concepts, the public should recognize that there are important advantages in adhering to the general principles of the income tax. These principles set up a desirable bulwark against erosion of the tax base. Many of our difficulties and discontent with the income tax can be attributed to the lack of adherence to a logical and consistent definition of income. Modification of the income tax for the purpose of subsidizing a desirable activity invites proposals for more questionable tax subsidies.

No great difficulties of administration or compliance would be involved in the tax credit or deduction plans if they were restricted, as is usually suggested, to tuition and fees and perhaps a few other designated expenditures of full-time students at recognized colleges and universities. If an effort were made to extend the plans to expenditures for part-time studies and for courses at trade schools and other institutions, many of the same difficulties would be encountered as under the amortization and deduction plans discussed in a preceding section of this chapter. The same marginal distinctions between eligible and ineligible expenditures would have to be made. Any plan providing current deductions or credits would have one administrative advantage over the amortization plans: it would not require the maintenance of accounts for individual taxpayers over a long period of years. This advantage may become less significant with the installation of automatic data-processing systems by the Internal Revenue Service.

V. Conclusion

More liberal deductions and amortization allowances for educational expenditures can be supported as a refinement of the income tax and as a means of encouraging investment in education and entry into occupations requiring expensive education. Current and deferred deductions for students pursuing education that increases their earning capacity are consistent with income tax principles, whereas deductions or tax credits for parents of students must be regarded as a special subsidy or incentive device. The design and administration of an acceptable scheme of current deduction and long-term amortization of educational costs would be difficult but does not seem impossible. The case for modification of the income tax would become stronger if tuition charges were raised to cover a larger fraction of college and university instructional costs. Even in those circumstances, forgone earnings, an item which could not

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properly be amortized, would be the major component of the costs of education beyond the high-school level. It seems unlikely that the adoption of a tax amortization plan would greatly influence educational expenditures. Nevertheless, the recognition for tax purposes that certain educational expenditures are investments would help establish an important principle that is often overlooked. Further study and public discussion of the subject are desirable.

CHAPTER 18

Research and the Financing of Higher Education

*Herbert H. Rosenberg**

LAST YEAR the Nation spent about $1.4 billion for research in institutions of higher education—an increase of $300 million over the $1.1 billion level of 1960 (table 1). This represents $1 out of every $5 spent for higher education in 1960, as compared with $1 out of $10 in 1950 and $1 out of $25 in 1940. Between 1930 and 1960, expenditures for research increased 5.5 times as rapidly as total expenditures by colleges and universities. This trend clearly indicates the mounting significance of research in the financing of higher education.

Higher education in the United States has been defined as "that convenient abstraction which permits one to deal coherently with not far from 2,000 institutions of learning, diverse in character and involving millions of people engaged in a bewildering variety of activities."[1] This abstraction is not, however, very convenient for appraising the impact of research upon the financing of higher education because 186 universities and technological schools—less than 10 percent of the 2,000 institutions—consistently account for 97 percent of the research funds.

Research activities do not now affect in any major or direct sense the financing of other equally vital institutions—liberal arts colleges, teachers colleges, theological and other professional schools, junior colleges, and technical schools. *But research does play a powerful role, sometimes the dominant one, in financing the activities of the 186 universities and technological schools. These institutions award more than one-half of all the bachelor's degrees granted in this country and constitute the Nation's main resources for graduate and professional training. In these institutions, research influences the intellectual climate of graduate and undergraduate education, the character of physical facilities, the size, composition, and ambitions of the faculty, the nature of instruction, the aspira-*

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[1] National Manpower Council, *Education and Manpower*, Henry David, ed. New York, Columbia University Press, 1960. p. 290.

tions of students; it affects significantly the financing of all their other educational activities.

Someone has likened reading Proust to peeling the successive layers of an onion. In this chapter I intend to peel away the gross impressions derived from aggregate data and qualitative speculations in order to describe the impact of sponsored research upon the financing of higher education.

TABLE 1.—Expenditures of institutions of higher education: total, for educational and general purposes, and for organized research, selected years, 1930–60

Year	Expenditures in millions			Organized research as percent of—	
	Total [1]	Educational and general	Organized research	Total	Educational and general
1930	$608.5	$379.1	$18.1	3.5	4.8
1940	678.6	525.5	28.1	4.1	5.4
1950	2,260.0	1,717.9	227.3	10.1	13.2
1952	2,486.2	1,933.6	320.4	12.9	16.4
1954	2,902.5	2,288.4	374.9	12.9	16.4
1956	3,524.7	2,788.8	506.1	14.3	18.1
1958	4,543.6	3,634.1	733.9	16.1	20.2
1960 (estimate)	[2] 5,700.0	[2] 4,500.0	[3] 1,100.0	19.3	24.4
1961 (estimate)	.....	.....	[3] 1,400.0	.....	.....
Ratio 1960/1930	11:1	12:1	60:1	5:1	5:1

[1] In addition to educational and general expenditures, includes student aid expenditures, other current expenditures, and expenditures for auxiliary enterprises.

[2] Author's estimate, taking into account the increase in expenditures for organized research and the growth curve for total expenditures between 1952 and 1958.

[3] Author's estimate, computed from data on Federal support of research in universities (National Science Foundation, *Federal Funds for Science X*)—1960 actual $782.8 million, 1961 estimate $964.3 million—by assuming that the Federal share continues to approximate 70 percent of the total.

SOURCE: Data for 1930–58 for the aggregate United States from U.S. Department of Health, Education, and Welfare, Office of Education, *Biennial Survey of Education*. Data for 1960, author's estimates.

Growth of Research

As a component of university expenditures, research was of little consequence prior to World War II. In 1940, the institutions of higher education in the United States spent $28 million for organized research—5 percent of their total expenditures for educational and general purposes.[2]

For the three periods for which data from the Office of Education biennial surveys permit closer scrutiny by type of institution and control, 1953–54, 1955–56, 1957–58, it is evident that: (1) Universities and technological schools consistently account for about 97 percent of organized research expenditures by institutions of higher education; (2) the distribution of research funds among public and private universities closely approximates their numerical relationship, 81 public,

[2] Expenditures for educational and general purposes do not include items such as student aid and auxiliary enterprises not directly relevant to financing educational activities, *per se*, and therefore provide a more appropriate base for comparison with expenditures for organized research than do total expenditures.

60 private; (3) the 21 private technological schools receive substantially more research funds than the 24 public ones; and (4) the proportion of expenditures for educational and general purposes devoted to research is largest for the technological schools, especially those privately controlled, and it is substantially larger for universities than for the remaining types of institutions (table 2).

TABLE 2.—Expenditures for organized research in institutions of higher education, by type and by control of institution, 1954, 1956, 1958

[Amounts in millions]

Type of institution	Expenditures for organized research						Organized research as percentage of educational and general expenditures		
	1954		1956		1958		1954 percent	1956 percent	1958 percent
	Amount	Percent	Amount	Percent	Amount	Percent			
Total	$374.9	100.0	$506.1	100.0	$733.9	100.0	16.4	18.1	20.2
Universities	302.3	81	422.8	84	600.6	82	22.3	24.5	27.0
Public (81)	184.6	49	264.3	52	381.4	52	.....	.....	.....
Private (60)	117.7	32	158.5	32	219.2	30	.....	.....	.....
Technological schools	57.2	15	67.2	13	107.6	15	33.0	37.4	41.3
Public (24)	8.0	2	2.2	.....	2.9	.....	.....	.....	.....
Private (21)	49.2	13	65.0	13	104.7	14	.....	.....	.....
All other	15.4	4	16.1	3	25.7	3	2.0	1.8	2.2

SOURCE: Resources Analysis Section, Office of Program Planning, National Institutes of Health: Special analysis of data reported by the U.S. Department of Health, Education, and Welfare, Office of Education, Biennial Survey of Education.

During this period of growth, research has expanded in two distinct patterns. One pattern is represented by the creation of large-scale, off-campus research centers wholly supported by the Federal Government and staffed almost exclusively with full-time researchers. About one-half of all the expenditures for organized research is concentrated in a few major research centers such as Los Alamos, the Jet Propulsion Laboratory, the Applied Physics Laboratory, and Argonne Laboratories, operated and managed as off-site installations by the University of California, California Institute of Technology, Johns Hopkins University, and the University of Chicago, respectively. These university-managed operations contribute significantly to the Nation's research effort. They do not, however, usually engage in the instruction of students or impinge upon the use of classroom and laboratory space.

The other pattern provides support for the work of individual faculty members, usually engaged in research part time, on campus, usually in the traditional departmental setting where graduate and postdoctoral training is tightly integrated into the warp and woof of the total research activity. This pattern also provides support for

full-time research staff, generally in a departmental or research institute framework, and involves a substantial number of graduate students and postdoctoral research fellows. The distinction between the large-scale center operation and the faculty research pattern is not a matter of black and white; there is a substantial gray area where neither classification fits precisely. Nevertheless I have focused upon support of the research being carried on by individual faculty members and have excluded university-managed research centers from the first two sections of this analysis for two reasons: (1) Only a few of the leading educational institutions operate research centers, but almost all of the major institutions sponsor faculty research; and (2) faculty research affects the financing of virtually all departments and activities within a university—the recruitment, compensation, and retention of faculty; the utilization of facilities; and the instruction of students and the training of scientists.

In its quadrennial surveys the National Science Foundation identifies the support of research carried on by individual faculty members as "Separately Budgeted Research by Colleges and Universities, Proper." Expenditures for such research increased from $205.5 million in 1954 to $327.5 million in 1958—4 years ago (table 3). The number of institutions reporting such research jumped 75 percent between 1954 and 1958, while research expenditures rose 60 percent. Analysis by expenditure interval (table 4 and chart 1) shows: (1) Increasing concentration of research expenditures in fewer institutions: about 6.5 percent of the institutions accounted for 57 percent of the total in 1958 as compared with 45 percent in 1954; (2) growing participation by a much larger number of colleges and universities with modest expenditures for research: 48 percent of those reporting spent under $100,000 for research in 1958 as compared with 27 percent in 1954; and (3) substantial increase in the number of institutions with research expenditures exceeding $1 million and, in particular, in the number exceeding $5 million.

TABLE 3.—Expenditures for and number of institutions reporting separately budgeted research by colleges and universities, proper, 1954 and 1958 [1]

Item	1954 [2]	1958 [3]	Increase	
			Amount	Percent
Expenditures (in millions)	$205.5	$327.5	$122.0	59
Number of institutions reporting	173	302	129	75

[1] Excludes agricultural experiment stations and Federal contract research centers.
[2] National Science Foundation, *Scientific Research and Development in Colleges and Universities, Expenditures and Manpower, 1953–1954*, table 9, p. 33.
[3] National Science Foundation, "Funds for Research and Development in Colleges and Universities, Fiscal Year 1958, a Preliminary Report," *Reviews of Data on Research and Development*, No. 19, April 1960, table 2, p. 6.

CHART 1

TRENDS IN DISTRIBUTION OF SEPARATELY BUDGETED R & D IN COLLEGES AND UNIVERSITIES PROPER, 1954-58:

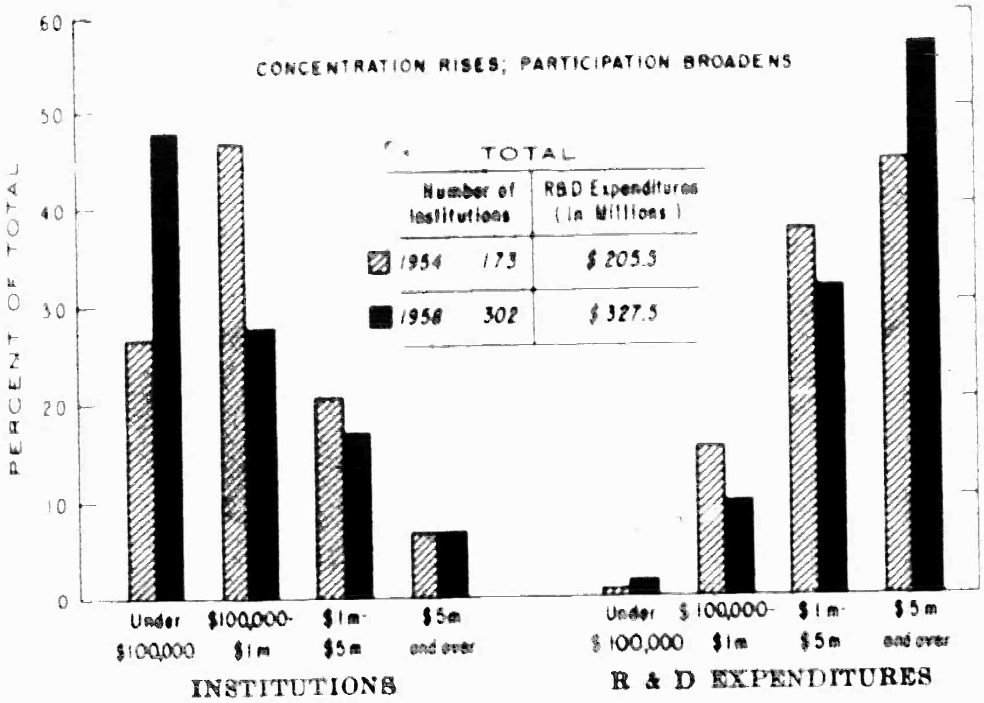


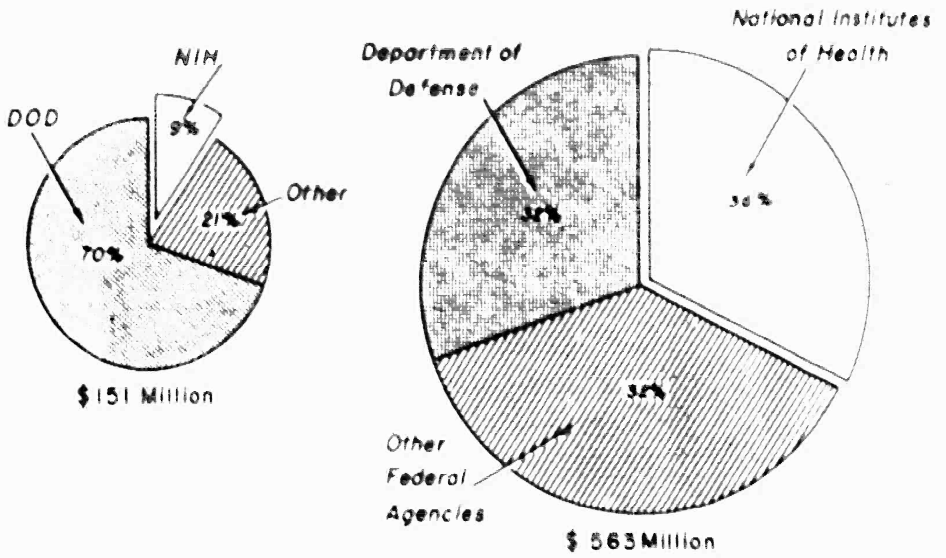
TABLE 4.—Expenditures by colleges and universities, proper, for separately budgeted research and development, by expenditure interval, 1954 and 1958 [1]

Research and development expenditure interval (In thousands)	Percentage distribution of—			
	Institutions		Research and development expenditures	
	1954 [2]	1958 [3]	1954 [2]	1958 [3]
Total	100.0	100.0	100.0	100.0
Under $100	26.6	47.7	.8	1.3
Under $10	10.4	8.9	.1	(4)
$10–$24		19.2		.3
$25–$99	16.2	20.2	.7	1.0
$100–$999	46.8	28.8	14.4	9.8
$100–$249	20.2	13.6	2.7	2.0
$250–$499	13.3	7.9	4.2	2.7
$500–$999	13.3	7.3	8.5	5.1
$1,000–$4,999	20.2	16.8	38.6	31.9
$1,000–$2,999	15.0	14.6	20.7	24.6
$3,000–$4,999	5.2	2.3	17.9	7.3
$5,000–over $10,000	6.4	6.6	45.2	57.0
$5,000–$9,999	6.4	4.6	45.2	30.4
$10,000 and over		2.0		26.6

[1] Excludes agricultural experiment stations and Federal-contract research centers.
[2] Data from 178 institutions reporting $205.5 million expenditures for research and development; from National Science Foundation, *Scientific Research and Development in Colleges and Universities, Expenditures and Manpower, 1953–54*, table 9, p. 33.
[3] Data from 302 institutions reporting $327.5 million expenditures for research and development; from National Science Foundation, "Funds for Research and Development in Colleges and Universities, Fiscal Year 1958, a Preliminary Report," *Reviews of Data on Research and Development*, No. 19, April 1960, table 2, p. 6.
[4] Less than 0.1 percent.

CHART 2

TRENDS IN FEDERAL SUPPORT OF RESEARCH AT COLLEGES AND UNIVERSITIES, 1952-1961



Source: Derived from Federal Funds for Science, X I X, National Science Foundation, Washington, D.C.

Shift in Character and Composition of Federal Support

Between 1940 and 1952, Federal support of this research in institutions of higher education increased tenfold: from $15 million to over $150 million. In 1940 the Department of Agriculture provided the bulk of all Federal support for such research. In 1952, the academic community depended heavily upon the military agencies for sponsorship of research. Since 1952, this situation with respect to Federal support for faculty research has changed gradually—almost imperceptibly—as these facts show:

(1) Support by the military agencies has dropped from 70 percent to 32 percent of federally sponsored research in universities;[a]

(2) The nonmilitary agencies now support more than two-thirds of the total; and

(3) The National Institutes of Health has emerged as the leading Federal sponsor of university research; the National Institutes of Health and National Science Foundation together now provide nearly one-half of all Federal funds for separately budgeted research by colleges and universities, proper—meaning research by individual faculty members (table 5 and chart 2).

This radical but little-heralded shift in the composition of Federal agency support has been accompanied by an equally significant shift

[a] This analysis is limited to support for faculty research. It excludes university-managed research centers such as those described earlier.

in the mechanism by which support is provided. Today the dominant mode of support is by grant rather than by contract. This change has influenced the character of review, the freedom of inquiry, and the stability of support. Research proposals are usually reviewed by the applicant's scientific peers, employing the criteria of scientific merit, promise, and feasibility. The terms and conditions of research grants have been liberalized to give the scientist greater freedom of inquiry. What is more important, most research grants now provide long-term support, assuring greater stability for the investigator and transforming "soft" into hard money for the institution.

TABLE 5.—Federal support of separately budgeted research and development in colleges and universities, propr., by agency, selected years, 1952–61 [1]

Agency	1953	1954	1956	1958	1960	1961 (estimate) [2]
	AMOUNTS IN MILLIONS					
Total	$151.2	$160.9	$171.8	$282.3	$449.0	$563.8
Department of Defense	106.8	80.8	82.6	118.2	184.8	180.8
Atomic Energy Commission	13.4	16.4	18.3	30.2	52.6	46.2
Department of Health, Education, and Welfare	14.4	23.4	30.6	78.9	157.8	222.0
(National Institutes of Health)	(14.4)	(23.4)	(29.7)	(74.7)	(143.6)	(204.0)
Department of Agriculture	13.1	14.0	25.0	31.1	31.6	32.2
National Science Foundation	1.0	8.5	10.9	20.7	55.0	62.7
Other agencies	3.3	8.8	4.4	3.2	15.8	19.7
	PERCENTAGE DISTRIBUTION					
Total	100	100	100	100	100	100
Department of Defense	70	57	48	42	39	32
Atomic Energy Commission	9	12	11	11	8	8
Department of Health, Education, and Welfare	9	17	18	28	35	39
(National Institutes of Health)	(9)	(17)	(17)	(26)	(32)	(36)
Department of Agriculture	9	10	15	11	7	6
National Science Foundation	1	3	6	7	12	11
Other agencies	3	2	3	1	4	4

Detail may not add to 100 because of rounding.

[1] Excludes Federal-contract research centers. Data from National Science Foundation, *Federal Funds for Science*, series.

[2] Estimate published in *Federal Funds for Science*.

Linked to these two changes has been a third development of equal significance. The agencies involved, their advisory groups, and congressional committees have taken the view that support of research in universities encompasses support for research facilities and the training of manpower for tomorrow's research. To implement this objective, the National Institutes of Health, the National Science Foundation, and other agencies have initiated manpower and facilities resources programs designed to strengthen the Nation's research structure and to increase its capabilities for future growth. Taken together, these three developments—the rising tide of civilian agency dominance, the swing from contracts to grants, and the initiation of

substantial resource programs aimed at enlarging the supply and improving the quality of scientific manpower and providing research facilities and equipment—have exerted a profound influence upon the financing of higher education.

Impact

The general impact of research on the financing of higher education is self-evident. In some institutions the cost of this research represents more than half of the university's total budget. It accounts for over one-fourth of the Nation's expenditures for educational and general purposes in universities. But to determine the impact of research funds upon the financing of higher education, we must look behind these aggregates and examine their influence on costs, staffing, facilities, and students.

THE ISSUE OF PAYING FULL COSTS

Many university officials claim that the funds received for the support of research do not cover the full cost to the institutions of such activities.[4] To remedy this condition, universities have sought by negotiation with the military agencies to: (1) Obtain reimbursement for the full indirect costs, and (2) devise formulas which are now embodied in the "blue book" for establishing universitywide rates that would vary with the unique cost conditions at each institution. However, a new situation has arisen as National Institutes of Health and National Science Foundation research grants have become the dominant mode of Federal support for faculty research in universities. Such grants provide a flat rate for indirect costs as a percentage of total direct costs. This procedure differs from the military practice of paying a separately negotiated rate that varies from institution to institution.

The issue has shifted from reimbursement for indirect costs to reimbursement for the full costs, both direct and indirect, of grant-supported research. By and large, this issue has been answered in the affirmative insofar as the Federal Government is concerned, with the reservation that cost sharing is always subject to negotiation. I say "by and large" for these reasons:

(1) The House Appropriations Committee, unconvinced that a flat 15-percent rate is inadequate for indirect costs of research supported by the National Institutes of Health grants, has rejected proposals to raise that rate; and

(2) The National Science Foundation has consistently favored a flat rate for all grants instead of varying rates negotiated with each institution.

[4] Admittedly, this statement oversimplifies a complex problem, which cannot be fully unraveled within the scope of this chapter.

The reservation of the House committee rests in part upon the knowledge that: (1) Funds for direct costs may be used to pay faculty salaries, including the institution's contribution to social security and other insurance and annuity plans; (2) title to equipment purchased for use on a research-grant project is vested in the institution, and such equipment is likely to be used by many scientists and science graduate students not connected with the project; and (3) advance payments provide a tangible fringe benefit in the form of short-term investments. The reluctance of the committee is rooted deeply in the conviction that general aid constitutes a better solution for bridging the gap between income and expenditures than raising the indirect cost rate.

Thus, the issue ahead with respect to full costs is not *whether* they are to be paid by the Federal Government, but *how* they are to be determined and *how much* they may amount to. Approximations that are roughly equitable, administratively feasible, and politically acceptable may prove adequate. On the other hand, it may be necessary to resort to cost determination and negotiation procedures such as those currently applied to research contracts.

STAFFING

The terms and conditions of sponsored research in universities have influenced college and university staffing in a number of ways. They have—

(1) Attracted research-oriented scientists to academic careers, but predominantly in nontenure positions;
(2) Increased the number of faculty-research staff far out of proportion to enrollment growth, especially at the graduate and professional levels;
(3) Reduced the teaching workload of individual faculty members;
(4) Increased the proportion of faculty time devoted to research as compared with teaching;
(5) Shifted a larger share of the salary burden to the sponsors of research, and especially to the Federal Government. (To some extent this is social bookkeeping pure and simple. To the extent that universities use this opportunity to expand their faculties, then each dollar of the institution's funds buys a larger quantity of total faculty effort);
(6) Enabled the institutions to cope more easily with the 6-percent annual increase in faculty salaries, especially where a rising proportion of science-faculty salaries is paid through research grants and contracts; the added costs are absorbed by a third party not involved in the negotiations; and
(7) Facilitated the recruitment of junior faculty members through subsidising their period of postdoctoral training either through employment as research associates or more directly as postdoctoral research fellows.

Research has had a substantial impact in terms of the sheer number of university scientists and engineers engaged in this activity either

part time or full time: between 1954 and 1958 the number of scientists and engineers (including graduate students in faculty research) rose from 43,315 to 61,635, a total increase of 40 percent and an average annual increase of approximately 4,500. (See table 6; to insure comparability, I have included graduate students employed as research assistants in the totals for both years because it is not possible to distinguish them within the aggregate for 1958). The number of faculty members engaged full time in research rose from 7,000 to 10,400—roughly a 50-percent increase—between 1954 and 1958.[5]

More significant than the sharp increase in faculty members engaged full time in research is the steadily rising proportion of faculty salaries paid from research funds. In 1958, the salaries of nearly three-fifths of all university scientists in research were paid from grant or contract funds, either wholly or partially, and more than one-third of them entirely from grant or contract budgets. The figures are given in table 7. Unfortunately, these data indiscriminately mix faculty with graduate students, and a further breakdown is unavailable at this time.

TABLE 6.—Scientists and engineers engaged in faculty research at colleges and universities, 1954 and 1958

Type of personnel	1954	1958 [1]	Increase	
			Number	Percent
Total	43,315	[2] 61,635	18,320	42
Scientific and professional personnel	[3] 31,455			
Graduate students	[4] 11,860			

[1] 1958 total: National Science Foundation, "Scientists and Engineers Engaged in Research and Development in Colleges and Universities, 1958, a Preliminary Report," *Reviews of Data on Research and Development*, No. 27, April 1961, table 3, p. 4.
[2] In 1958 graduate students engaged in research were included in the total but not identified separately.
[3] 1954 Scientific and professional personnel from National Science Foundation, *Colleges and Universities, Expenditures and Manpower*, 1953–54, p. 62–63.
[4] 1954 Graduate students: National Science Foundation, *Graduate Student Enrollment and Support in American Universities and Colleges*, 1954, p. 35.

TABLE 7.—Scientists and engineers engaged in research and development in 377 colleges and universities, by source of salary support, 1958 [1]

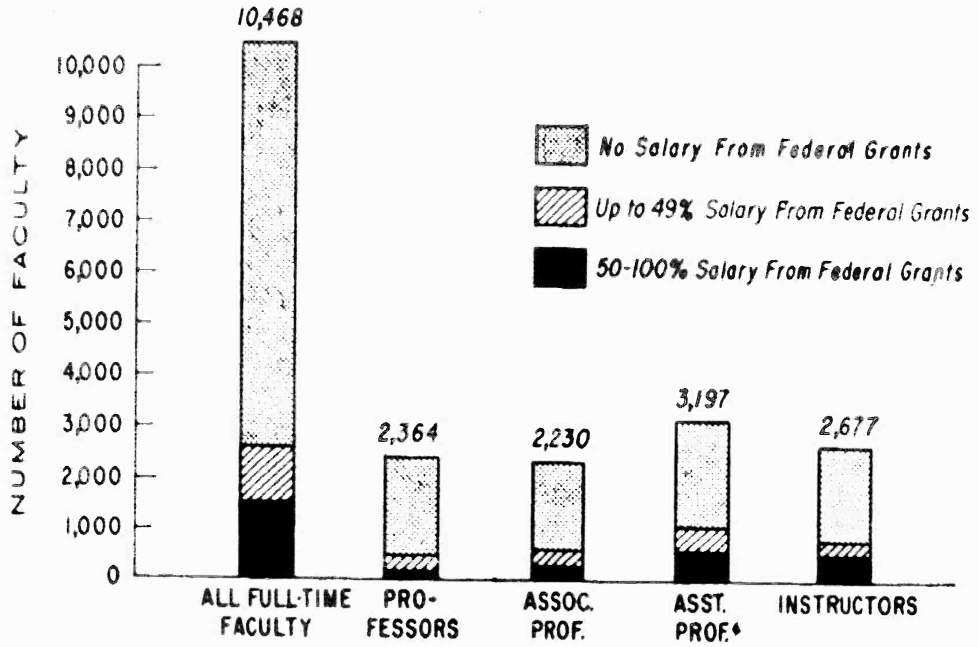
Source of salary support	Number	Percent
Total [2]	50,294	100.0
Entirely by grant or contract	17,565	34.9
Partly by grant or contract, and partly by institution	11,560	23.0
Entirely by institution	21,169	42.1

[1] National Science Foundation, "Scientists and Engineers Engaged in Research and Development in Colleges and Universities, 1958, a Preliminary Report," *Reviews of Data on Research and Development*, No. 27, April 1961, table 3, p. 4.
[2] Excludes Federal research centers and agricultural experiment stations.

[5] National Science Foundation, "Scientists and Engineers Engaged in Research and Development in Colleges and Universities, 1958, a Preliminary Report," *Reviews of Data on Research and Development*, No. 27, April 1961.

CHART 3

NUMBER OF FULL-TIME MEDICAL SCHOOL FACULTY RECEIVING A PORTION OF THEIR SALARY FROM FEDERAL TRAINING AND/OR RESEARCH GRANTS



SOURCE: *Journal of American Medical Association*, Education Number, 1959–60, 174: 1442, Nov. 12, 1960.

Information for a breakdown of faculty and graduate students in research is available for medical schools. In the academic year, 1959–60, about 25 percent of the full-time faculty members in medical schools were paid partly through support from Federal research or training grants; more than 50 percent of the salary of roughly one out of every seven came from such sources (chart 3). These data indicate the average for all 85 medical schools taken together. Such an analysis does not differentiate between those institutions that paid faculty salaries from Federal grant funds and those that prohibited this practice. If the analysis were limited to the former group only, the proportion of faculty paid more than half their salaries from Federal grant funds would increase, perhaps substantially.

The wisdom and propriety of paying faculty salaries with research funds were touched upon only gingerly by the National Science Foundation in its 1958 report, *Government-University Relations*. However, in 1960 the Seaborg Panel of the President's Science Advisory Committee firmly grasped this nettle when it recommended that universities, as a matter of national policy, should "strengthen their fac-

ulties for both research and graduate teaching by accepting and using Federal as well as non-Federal support for faculty salaries."[6]

In the interim between the two reports, many institutions had already changed their policies with respect to payment of faculty salaries from grant or contract sources; others may be expected to follow their lead in the direction recommended by the Seaborg Panel. As a consequence, the continued availability of research funds for the payment of faculty salaries is crucial for budgetary planning in a steadily increasing number of institutions of higher education.

FACILITIES

As research activities have expanded and exerted pressure upon limited space, some institutions have responded to this space squeeze by allocating to research some space previously utilized for other activities.

In recent years this pressure has been alleviated—though by no means adequately—by the availability of matching funds for the construction of health research facilities and computer facilities, and the purchase of costly laboratory equipment. The Health Research Facilities program, for example, has awarded more than $180 million in Federal funds to universities since 1957. This program has resulted in capital expenditures of nearly $500 million for health research and related facilities, and assisted more than 300 academic and research institutions, in every State, in constructing or renovating approximately 20 million square feet of research space. Thus, every Federal dollar has stimulated the investment of nearly two non-Federal dollars. The construction of modern, well-equipped research facilities not only enables the institution to expand its research effort but also provides sorely needed space for graduate research training in the sciences.

On the one hand, the availability of matching funds for research facilities has channeled university building funds away from construction of new classroom space. On the other, this availability of funds has stimulated large-scale fundraising campaigns so that many institutions have been able to take advantage of the booster effect of matching funds. All in all, however, there can be little doubt that the university's building priorities have been strongly influenced and perhaps distorted because Federal matching funds have been available for research space but unavailable for classroom space.

STUDENTS

The rapid growth of research activities has generated fellowship and training programs designed to expand the supply of research

[6] The President's Science Advisory Committee, *Scientific Progress, Universities and the Federal Government*, 1960, p. 23.

scientists. These programs, which are inextricably linked to the support of research itself, have revolutionized the financing of graduate education. For the most able students in the sciences, graduate education is almost entirely subsidized. More than 30,000 graduate students in the sciences in 1960 were employed as research assistants on projects supported by Federal grants or contracts.[7] About 5,000 full-time predoctoral students in selected science fields were receiving stipends through fellowships and under training grant programs at 80 leading schools.[8]

These programs have—

(1) Relieved universities of a substantial burden of support of graduate students;

(2) Released funds that can be allocated to support students in nonscience fields;

(3) Accelerated the flow of students through graduate training and thereby expanded the supply sooner than it could have been expanded without such support; and

(4) Provided in some programs a cost-of-education allowance paid to the institution, and thereby directly aided the university in financing its graduate training programs.

IMPLICATIONS

Available data indicate that federally sponsored research programs have brought tremendous benefits to universities and technological schools in terms of staff, facilities, students, and fringe benefits, and that such programs now constitute a vital form of aid to higher education. However, it must be noted that research has been purchased by the military agencies as a service or commodity—not to aid higher education, but rather to utilize the most competent suppliers. Similarly, research of interest to the sponsoring agencies has been supported on the basis of scientific merit or promise in the arena of national competition. Support of research in higher education strictly on the basis of competence or merit has avoided the issues of racial discrimination and religious preference that have stymied nearly all attempts to provide general Federal aid to higher education.

There are many indications that Federal agencies have dropped their laissez faire attitude toward the effect of Federal sponsorship of research upon higher education. Civilian agencies such as the National Institutes of Health and the National Science Foundation have become increasingly concerned with the "university as a whole" and with the total effect of Federal research programs upon the

[7] *Budget of the United States Government* for Fiscal Year 1961, Special Analysis of Federal Research and Development Programs, p. 10.

[8] U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, "Trends in Graduate Enrollment and Ph. D. Output in Selected Science Fields at 80 Leading Schools, 1959–60 and 1960–61," *Resources Analysis Memo*, No. 3, June 1961.

structure, character, and financing of higher education. We can understand their concern if we consider the probable future growth of research in higher education and the problems that will very likely result from it.

PROJECTION FOR 1970

This projection treats higher education as a sector of the research economy. Hence, it includes research in university-managed research centers as well as the type of faculty research which has been the main focus of the preceding discussion in this chapter. A 1970 projection of $3.5–$4.0 billion for such research expenditures by institutions of higher education seems reasonable. The projection is limited to current expenditures for research. It does *not* include outlays for research plant and equipment or the costs of research training, both of which are classified as capital expenditures for research resources.

The 1970 projection has been developed by assuming that (1) the Nation's expenditures for research and development will continue to rise as a percentage of the gross national product; (2) the proportion of higher education's expenditures going to research and development will increase slightly, from 9 to 10 percent of the total; and (3) expenditures for research in higher education will continue to grow at the rate of $250 to $300 million annually, whether or not total expenditures for research and development grow as rapidly as my projections indicate.

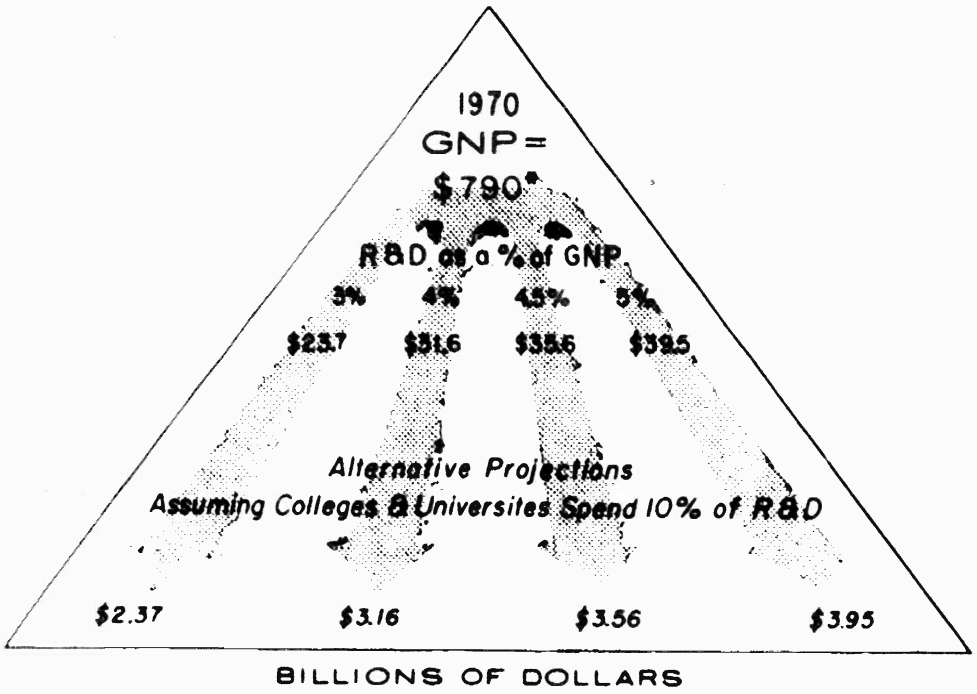
Such projections are useful in establishing probable ranges of expenditures in terms of general orders of magnitude; they are essential in appraising the potential impact of research upon the financing of higher education in the decade ahead. Inevitably, such projections draw upon past experience, take account of prevailing trends, and then reflect the judgment and the bias of the person making the projection.

The Nation's total expenditures for research and development more than quadrupled during the fifties, from $2.9 billion in 1950 to an estimated $13.5 billion in 1960 (table 8). Expenditures for this research in institutions of higher education more than kept pace, rising from $227 million to $1.2 billion—an increase of 430 percent as compared with 365 percent for total research and development. College and university research expenditures fluctuated as a proportion of total research and development—hovering around 8 percent between 1950 and 1955, dropping to 6 percent in 1957, and then moving upward steadily to 8.9 percent in 1960.

Expenditures for research and development have increased steadily as a share of the gross national product, from 1.02 percent in 1950 to

CHART 4

ALTERNATIVE PROJECTIONS OF 1970 EXPENDITURES FOR R & D AND FOR RESEARCH IN COLLEGES AND UNIVERSITIES



*Based on Gerhard Colm's "Judgment" Model for 1970, National Planning Association, *Long-Range Projections for Economic Growth*, Oct. 1959.

2.68 percent in 1960. Simple extrapolation of this 0.166 percent average annual increase would raise the research and development share to 4.34 percent by 1970. I have taken a more flexible approach by developing a range of projections, assuming that expenditures for research and development will approximate from 3 to 5 percent of the gross national product by 1970 (chart 4). For this purpose, I have used the $790 billion judgment model published by the National Planning Association. If gross national product stated in current prices reaches $880 billion by 1970, as suggested earlier in this volume, the upper range of the projection shown in chart 4 would rise roughly 10 percent to $4.4 billion. Application of the same projection technique suggests a range of $5.7 to $7.5 billion when carried forward to 1975.

National security needs provided the impelling force for the growth of research and development during the fifties. Consequently, I have assumed that any reduction in research and development expenditures for national security will be offset by increased expenditures in other areas such as space exploration, atmospheric sciences, oceanography, automation, protection against environmental

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hazards, and the development of new products for the civilian market. Admittedly, this assumption cannot easily be tested.*

We can, however, examine the feasibility of the derived projections, which assume that research expenditures by institutions of higher education will approximate 10 percent of the total. The ultra-low projection of $2.37 billion anticipates a doubling of college and university research expenditures in the next decade, in contrast to a five-fold expansion in the fifties; it would call for an average annual increment of $100 million as compared with the present increment of $250 million. For all practical purposes, both the ultra-low projection of $2.37 billion and the low projection of $3.16 billion are products of an arithmetical exercise. I regard them as outside the range of probability.

The high projection of $3.95 billion would require an increase of $2.8 billion, or an average annual increment of $280 million. Even if the Nation's total expenditures for research and development should expand less rapidly as a proportion of the gross national product than is projected, it seems likely that expenditures for research in institutions of higher education will continue to grow at the rate of $250 million to $300 million per year.

While I am personally inclined toward the probability of $4.0 billion or more for college and university research expenditures by 1970, a range of $3.5 to $4.0 billion takes into account the growing participation of more and more educational institutions in research, the continued expansion of research facilities, the future supply of manpower now in the graduate and postdoctoral research training pipeline, and the mounting attraction of research careers for the Nation's youth. Such a projection offers a feasible framework within which we can identify the issues likely to confront college and university presidents, faculty, and research staff, on the one hand, and Federal agencies with major investments in university research, on the other.

THE TASK AHEAD

Rapport between higher education officials and Federal administrators has greatly improved as they have recognized the bond between science policy and higher education. The national interest in research is firmly established. These considerations increase the Nation's ability to confront the issues posed by a continuing expansion of research.

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* My assumption differs, for example, from Dexter Keezer's as expressed in "The Outlook for Expenditures on Research and Development During the Next Decade," *American Economic Review*, 50: 355–367, May 1960. Keezer's estimate of $22.2 billion for total research and development expenditures in the United States in 1969 is strongly influenced by the assumption that defense research spending will decline and not be compensated for by increase in nondefense research.

TABLE 8.—Growth of gross national product and of expenditures for research and development in the Nation and in colleges and universities, 1950–60

Year	Gross national product,[1] Amount (in billions)	Expenditures for research and development			
		Total, national[2]		Colleges and universities[3]	
		Amount (in billions)	Percent of gross national product	Amount (in millions)	Percent of total national expenditure for research and development
1950	$284.6	$2.9	1.02	$227.3	7.8
1951	329.0	3.4	1.03	273.8	8.1
1952	347.0	3.8	1.10	320.4	8.4
1953	365.4	5.2	1.41	385.2	7.4
1954	363.1	5.6	1.55	450.0	8.0
1955	397.5	6.4	1.61	480.0	7.5
1956	419.2	8.5	2.02	530.0	6.2
1957	442.8	10.0	2.27	600.0	6.0
1958	444.5	11.2	2.51	735.0	6.6
1959	482.8	12.4	2.57	880.0	7.3
1960	504.4	14.0	2.78	1,100.0	7.9
Percentage increase, 1950–60	77.2	382.8	.....	383.9	.....

[1] Department of Commerce, *Survey of Current Business*, July 1, 1961.
[2] For years 1950–52 from Department of Defense, *The Growth of Scientific Research and Development*, 1953; for years 1953–59 from National Science Foundation, "Funds for Research and Development in the United States, 1953–59," *Reviews of Data on Research and Development*, No. 16, December 1959, chart 2, p. 2; 1960, National Science Foundation, "Funds for Performance of Research and Development in American Industry, 1960," *Review of Data on Research and Development*, No. 30, September 1961.
[3] For years 1950 and 1952: from U.S. Department of Health, Education, and Welfare, Office of Education, *Statistics of Higher Education*, ch. 4, sec. II; 1951 and 1953 derived from straight line projection based on data from 1950, 1952, and 1954; 1954–58, National Science Foundation, "Funds for Research and Development to Colleges and Universities, Fiscal Year 1958," *Reviews of Data on Research and Development*, No. 19, April 1960, table 1, p. 3; 1959 and 1960, author's estimates.

FULL COST

Payment for the full cost of research by sponsoring agencies is the immediate bread-and-butter issue that dominates the attention of college and university business officers. The more pressing problem, however, is how to bridge the gap between the mounting costs of higher education and the revenues received from research and all other sources. Higher indirect cost rates will help, but I strongly believe that action taken on other issues inherent in the expansion of research will alleviate the situation sooner and more effectively.

MORE GENERAL SUPPORT FOR PROGRAMS AND INSTITUTIONS

Support for individual project applications on the basis of scientific merit without reference to institutional considerations has developed a top quality *national* research program. However, exclusive reliance upon the project system has engendered some problems with respect to the optimum development of research in colleges and universities. To overcome these problems, several Federal agencies have moved toward new and less restrictive forms of research support, bearing in mind the President's Science Advisory Committee's admo-

nition that: "Not only the Nation's security, but its long-term health and economic welfare, the excellence of its scientific life, and quality of American higher education are now fatefully bound up with the care and thoughtfulness with which the Government supports research." [10]

These new forms of support provide general assistance to programs and institutions in a variety of ways: (1) training grants, (2) program grants, (3) institutional grants, and (4) general research support grants.

The training grants, for example, provide general support for research training in specific fields of science. These grants, awarded to academic departments, include provision for faculty salaries, equipment, supplies, and stipends for graduate and postdoctoral students. Training grants invest in academic strength at the point of maximum leverage in the sense that the faculty transmits knowledge, instills competence, and evokes the spirit of inquiry that must provide the essential foundation for research training. A strengthened university department not only gives better research training today, but will also be better prepared to take larger numbers of graduate and professional students in the future and to give them better training than it would otherwise be able to. In this connection, the Seaborg Panel took note of the successful pioneering experience of the National Institutes of Health and urged both the Government and the universities to take energetic action to broaden the scope of training programs.

Program grants are another mode of more general support for research in a broad field of science or a problem area. These grants have been made, for example, to biology departments and to centers for the study of aging. Such grants may also arise from the packaging of individual projects that have been awarded on a piecemeal basis over time and have come to constitute a coherent, integrated program of research. Program grants provide a broader, more flexible basis of support than grants for separate research projects and reduce the administrative minutiae encumbering both the sponsor and the institution.

Perhaps more significant than either of these two is the movement toward institutional grants and general research support grants. This movement recognizes that—(1) institutions have encountered difficulty in maintaining control over the content, emphasis, and direction of their research and training activities; (2) lacking any significant amount of unrestricted money for research, some schools attempt to expand in areas where funds are readily available, while other prob-

[10] The President's Science Advisory Committee, *Strengthening American Science*, 1958, p. 2.

lems of a less dramatic nature but of no less scientific significance have been given lesser priority; (3) strong departments with outstanding researchers attract grant support and grow stronger, while weak departments experience greater difficulty in obtaining research support that could give them the necessary impetus for improvement.

The real issue is not that restriction of Federal funds to certain areas has caused some schools to develop programs that they do not want. It is, rather, that there is a lack of financial resources to develop equally important activities that may be of less interest to Federal agencies, but which the dean, faculty, and research staff know would give greater balance and direction to their research and training programs. In response to this need for more general support, the National Science Foundation has initiated an institutional grant program aimed at strengthening the scientific potential of colleges and universities receiving research grants from the Foundation. The National Institutes of Health is authorized by Public Law 86–798 to set aside an amount not exceeding 15 percent of its research project funds to be used for grants-in-aid for the general support of research and research training in the sciences related to health. Under this authorization, NIH has awarded general research support grants to strengthen research and research training capabilities of institutions of higher education and other nonprofit research organizations.

In the early years, these two general support programs will provide substantial fluid funds—$40 to $50 million in fiscal year 1963—for universities with large-scale research programs, but only "bootstrap" money for lesser institutions, because the procedures currently governing the amounts to be awarded to eligible institutions are closely geared to the level of current research activity. In subsequent years, however, as the total amount available rises, grants for the general support of research and research training may well become one of the more significant forms of aid to higher education. Each of these new developments illustrates the significant strides that have already been taken toward meeting the need for more general support of research in institutions of higher education.

Scientific merit—the criterion of excellence—governs today's decisions to support university research. If the projected expansion of research in the university sector is to be realized, many new centers of excellence must be developed. To some extent this development will take place in the natural course of events as weaker institutions are enabled to provide opportunities for topflight teachers and scientists and their younger proteges, who in turn will attract better students.

However, the Nation can ill afford to leave this critical transition entirely to the forces of the marketplace. No Federal agency now has a mandate to facilitate either the upgrading of faculties, buildings, and equipment of weaker institutions or the creation of new ones. This

constitutes a serious gap in national policy which must be bridged if we are to provide positive support for existing institutions with potential and to foster the creation and development of new centers of excellence and research competence—especially in the more rapidly growing regions of the country.

EXPANSION OF THE RESOURCE BASE

Achievement of a $4 billion college and university research effort by 1970 will demand substantial expansion of the Nation's facilities and trained manpower for research. Fortunately, the device of matching grants has proved its worth as an incentive to encourage timely construction of needed research facilities at colleges and universities. Applications for such assistance, however, clearly indicate the need for wider latitude for matching requirements, for more nearly adequate authorization, and for longer range planning. The prevailing 50–50 matching ratio now imposes severe burdens on the less affluent schools and States, and often diverts funds from construction of educational facilities. This drain upon institutional finances will be reduced as matching requirements are modified and the inseparable relation between research and research training is recognized.

The matching incentive, however, is not appropriate for financing costly, highly specialized facilities, constructed and operated in the national interest. Such facilities, adequate for sustained and complex research activities, are becoming increasingly strategic for the advancement of science in an ever-widening range of fields. Although these facilities are utilized by university scientists and contribute to graduate and postdoctoral training, they are wholly financed by the Federal Government and, in all likelihood, will continue to be so financed.

With respect to the expansion of manpower resources, the outlook is generally favorable. There are abundant opportunities for careers in research. However, it will probably be necessary to modify existing mechanisms for the support of fellowship and training programs in order to provide a more nearly adequate and flexible framework for expanded activities at the graduate and postdoctoral levels. Moreover, the potential pool of talented youth for research (and for all other intellectual endeavors) could be dramatically expanded if the incentives and opportunities now available for graduate education were extended to the undergraduate level.

MORE SPECIALIZED ORGANIZATION OF RESEARCH ACTIVITY

Universities have sought to encourage research as a necessary and fruitful complement to teaching by encompassing it within the aca-

demic departmental structure. However, as the volume of research expands, it behooves universities and their sponsors to take full cognizance of the emergence of research as a full-time, highly specialized activity. Nearly a decade ago, the president of the Massachusetts Institute of Technology cogently stated the need to evolve new organizational arrangements for research that would foster optimum utilization of scarce talent and costly facilities:

> We would be lacking in our responsibility if we were to fail to push the organization of scientific research to its ultimate conclusion. This road apparently leads to larger laboratories, a growing costliness of facilities, and an increasing need for the planning of programs.
>
> There is a basic incompatibility between the true spirit of a university and those elements of management which tend to creep into the organization of projects, the planning of programs, and the utilization of costly facilities. One must recognize that there may be an ultimate need to establish central institutions to supplement the universities in fundamental research . . . . If we strive to contain the widening scope of research entirely within our large universities, we shall end by changing their character and purpose. In so doing, we shall render the greatest possible disservice to the cause of research itself."

This problem will become acute in the years ahead. In some cases, the best solution will be to establish research institutes affiliated with universities or research centers operated by groups of universities; in other cases, to establish independent research organizations outside the academic environment. I cannot agree with those who counsel universities not to regard such institutes as competitors; they will compete for funds, talent, facilities, and recognition of excellence. The real challenge is how to develop research institutes that on balance will complement, not weaken, the Nation's structure for higher education.

FEDERAL POLICY

We are witnessing a basic transition in the role of the Federal Government in the advancement of research in higher education. Moving from a limited base of operations concerned with project-type research support for individual scientists, the Federal Government is undertaking a more difficult role aimed at bringing into being a new concept and framework for the support of university research in the years ahead. This more creative role involves anticipation of future needs, stimulation and development of research resources essential to future growth, concern with terms and conditions that increase the vigor of institutions and foster the freedom and productivity of investigators,

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[11] J. A. Stratton. Research and the University. *Chemical and Engineering News*, 31 : 2582, June 22, 1953.

and expansion of international research activities in consonance with the National interest.

In this new role, the Federal Government will have to—

(1) Reconcile the virtues of diversity of sources of Federal support and multiplicity of programs with the growing necessity for central policy direction and control of Federal programs within the executive branch;
(2) Develop mechanisms that will provide a continuing, effective appraisal of the total impact of research upon all major aspects of higher education, including financing;
(3) Provide a focal point where universities can present their total needs and resources;
(4) Develop a method of communication whereby all institutions of higher education may be informed about the status and prospects of all Federal programs directly involving the academic community.

I shall not labor the first three points concerning which there is sufficient consensus to permit me to assume they have become self-evident propositions. With respect to the issue of systematic communication, it has been said that—

> To realize the possibilities for Federal support, a university needs—and a small college cannot afford one—a full-time specialist in Washington, perhaps more than one, who has entries into a dozen or more agencies. The university lacking such a ubiquitous figure is not represented as a university.[9]

Although this view may exaggerate the situation, it is true that many institutions have been unable to keep abreast of rapidly evolving opportunities scattered among many agencies and spanning a wide variety of programs and mechanisms. To help cope with this problem, I would propose an annual assembly of university representatives and Federal officials. Such an assembly would: (1) enable Federal officials to brief university representatives on major new developments, and (2) provide each institution with an opportunity to obtain complete information on programs of special relevance to its interests and capabilties. The assembly perhaps might also convene in workshops, each devoted to a major topic; for example, facilities, cooperative studies, international programs, research centers. When compared with the potential benefits of improved communication, wiser choice, and more effective utilization of university research resources, the obstacles to staging such an enterprise seem small indeed.

GENERAL AID

Educational institutions desperately need new sources of support to meet steadily rising operating expenditures. Although federally spon-

[9] The American Assembly: *The Federal Government and Higher Education*. New York. Columbia University Press. 1960, p. 161.

sored research contributes a cash flow of considerable dimensions and has a crucial impact upon the financing of many institutions of higher learning, it is no substitute for general aid. However, as the Federal Government moves toward general aid, accumulated research experience is both relevant and reassuring. It has demonstrated that Federal funds can be provided without restricting the freedom of academic institutions.

CHAPTER 19

Financing Higher Education in the United States and in Great Britain

*Dennis S. Lees**

THE DEMAND for higher education is rising sharply. In the United States total college and university enrollments rose from 1.5 million in the academic year 1938–39 to 3.5 million in 1958–59, and are estimated to rise to 7 million by 1970. In Great Britain enrollment in universities alone doubled to 100,000 in the 20 years before 1958–59 and may rise to 170,000 by the early seventies. In part this is a natural response to the postwar rise in birth rates, higher per capita real incomes, and increasing awareness of the payoff of college education in terms of increased earnings and status. But these factors are powerfully reinforced by a growing realization on the part of governments in the free world of the fundamental contribution of higher education to strong and growing economies. This gives urgency to the current quest of free societies to secure adequate resources for institutions of higher learning and that makes international comparisons of more than academic concern. Its most recent expression in Britain is the appointment of an official committee under the chairmanship of Lord Robbins, formerly professor of economics at the University of London, "to review the pattern of full-time higher education in Great Britain, and in the light of national needs and resources to advise Her Majesty's Government on what principles its long-term development should be based."

FINANCING EXPENDITURES: POSITION IN THE FIFTIES

It is a remarkable fact that there are in Britain no consolidated official statistics on higher education. The data are scattered in numerous published documents, both official and private, or tucked away in the files of governmental departments. To get anything like a complete picture would require a major piece of research, and this I have been unable to undertake. For the most part I shall be concerned with

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the universities.[1] As these account for over half of the total annual expenditure by institutions of higher learning and are the main focus for increasing student numbers over the next decade, it should be possible to identify the major differences in the financing of such institutions in the United States and Britain and to establish their broad significance.

In 1958–59, the latest year for which adequate data are available, the number of students aged 18 and over in all institutions of higher learning was 3.5 million for the United States and 190,000 for Britain, representing 20 percent and 4 percent, respectively, of their young people aged 18 to 24 years.[2] From this point of view, Britain in that year was in the position held by the United States in 1920; and it had the smallest proportion of young people in institutions of higher learning in the major countries on either side of the Iron Curtain.[3] Differences in quality may narrow the gap somewhat but, with that taken into account, there can be no question that the quantum of higher education in the United States is far greater than in Britain.

The same can be seen for expenditure. Again in 1958–59, current expenditures of colleges and universities in the United States were approximately $4 billion, representing almost 1 percent of the gross national product, or $23 per head of the population. The corresponding figures for Britain were £112 million—representing 0.5 percent of the gross national product or rather more than £2 per head.[4] In other words, such institutions in the United States spent twice as much in proportion to its gross national product and four times as much in proportion of population[5] as did those in Britain.

There are marked differences between the two countries in the way this expenditure is financed. This can be seen from the table 1. For the United States the latest year for which complete data are published is 1957–58; this is compared with 1958–59 for Britain.

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[1] Twenty-one universities and three colleges. This greatly understates the number of institutions concerned. For example, Oxford is made up of 31 self-governing colleges, and Cambridge of 22. The University of London includes 33 self-governing colleges and 10 institutes directly controlled by the university. Institutions of higher education other than universities include 200 teacher-training colleges, 8 colleges of advanced technology, 22 regional colleges of technology, and in addition almost 500 other recognised institutions of higher education, which vary considerably in size and importance.

[2] The student population of British universities amounted to 100,000, of whom all but 10,000 were residents of Great Britain (Great Britain, Central Statistical Office, *Annual Abstract of Statistics*, 1960, table 124). The figure of 90,000 students in other institutions of higher learning is a necessarily rough estimate, converting what are mainly part-time courses into 3-year equivalent courses.

[3] See *The Economist*, London, 197 : 1211, Dec. 17, 1960.

[4] The methods of estimation of the British figure are indicated in table 4, notes and sources, given at the end of this chapter.

[5] At the current rate of exchange ($2.80), British expenditure per head is approximately $6.

The major differences lie in the roles of students fees and governmental payments. In the United States a quarter of the institutions' income is derived from fees; in Britain, less than one-eighth. Payments by government at different levels make up slightly more than half of the institutions' income in the United States as compared with over two-thirds in Britain.

TABLE 1.—Percentage distribution of current income[1] of institutions of higher learning in United States and Great Britain, by source

Source of income	United States,[2] 1957–58	Great Britain,[3] 1958–59
All sources	100.0	100.0
Student fees	26.0	12.3
Government:		
National	18.9	67.1
State	30.7	
Local	3.4	2.6
Endowments, etc.	13.5	8.0
Other	8.5	10.0

[1] Represents income sources for all educational and general purposes and is not limited to income for student higher education.
[2] U.S. Department of Health, Education, and Welfare, Office of Education, Biennial Survey of Education data for 1957–58.
[3] Great Britain. University Grants Committee: *Returns from Universities and University Colleges in Receipt of Treasury Grant, Academic Years, 1958–59*, London, Her Majesty's Stationery Office (Cmnd. 1166, 1960, table 11); amounts reported plus author's estimates for colleges at Oxford and Cambridge Universities.

The contrast becomes even sharper if we exclude the Oxford and Cambridge colleges (as distinct from the universities), whose income is derived solely from fees and endowments. Student fees in Britain then fall to one-ninth of the institutions' income, and governmental payments rise to nearly three-quarters. Endowments fall from 8 percent to under 5 percent, compared with 13.5 percent in the United States. Furthermore, these proportions are virtually uniform for all the universities. Except for Oxford and Cambridge, no university depends on student fees for more than 16 percent of its income, nor on endowments for more than 9 percent, nor on governmental payments for less than two-thirds. In the United States, on the other hand—

> For 1,025 privately sponsored colleges and universities, it is estimated that in the academic year 1957–58, student charges provided 46 percent of educational income. For 364 publicly sponsored colleges and universities, the proportion of income for educational purposes obtained from student charges has been estimated at 8 percent.[6]

The variation in governmental payments for operational budgets can be inferred from the fact that less than 4 percent of such payments goes to private institutions.[7] Thus, although British univer-

[6] John D. Millett. "The Role of Student Charges," in *Financing Higher Education, 1960–70*, Dexter M. Keezer, ed. New York, McGraw-Hill Book Co., 1959. p. 162.
[7] W. Homer Turner. "The Prospects for Private-Sector Support of Higher Education," in ibid., p. 244.

sities are private, autonomous institutions, all but the Oxford and Cambridge colleges resemble U.S. public institutions of higher learning in their sources of finance. How, in spite of this, they retain their independence of governmental control is an issue to which we shall turn in a moment.

This extremely heavy reliance by British universities on governmental payments is a post-1945 development. As table 2 shows, in prewar years fees and endowments together provided over 50 percent of the universities' income, with governmental payments constant around one-third. Since 1945 the position has been revolutionized, with governmental payments rising to two-thirds of income in 1959 and fees and endowments falling to less than a quarter. Further, the Central Government now accounts for virtually all governmental payments, whereas before the war its share was less than four-fifths.

There has been a similiar trend, though far less marked, in the United States. From 1929–30 to 1955–56, revenues from student fees fell from 30 percent to 25 percent and endowments from 20 percent to 16 percent; governmental support rose from 36 percent to 50 percent.[8] And a growing proportion of governmental support has come from the Federal Government, principally in payments for research. This last is the opposite of the position in Britain, where Central Government support takes the form of grants to meet operating expenses in general and where payments for research equal only 3 percent of university income as against 12 percent in the United States.

TABLE 2.—Percentage distribution of income of British universities, by source, specified academic years, 1924–25, to 1958–59 [1]

Source of income	1924–25	1934–35	1947–48	1954–55	1958–59
	PERCENTAGE DISTRIBUTION				
All sources	100.0	100.0	100.0	100.0	100.0
Student fees	28.3	30.9	22.2	13.5	12.3
Parliamentary grants	26.9	26.0	47.2	62.4	64.0
Local governments	8.9	7.3	4.2	3.2	2.6
Endowments, etc.	26.6	22.8	13.8	8.7	8.0
Other income [2]	9.3	13.0	12.6	12.2	13.1
	AMOUNTS IN MILLIONS				
Total income (in pounds)	5.3	8.0	18.2	35.1	57.0

[1] For 1924–25 to 1954–55, years ended Mar. 31; for 1958–59, the year ended Sep. 30.
[2] Includes payments by central Government for research, amounting to £1.8 million in 1958–59.

SOURCE: Data for 1924–25 to 1954–55 from John Vaizey, *The Costs of Education*, London, George Allen & Unwin, 1958, p. 200; 1958–59 source given in table 1, footnote 3, this chapter.

[8] Robert D. Calkins. "Government Support of Higher Education," in *Financing of Higher Education, 1960–70*, Dexter M. Keezer, ed. New York, McGraw-Hill Book Co., 1959. p. 192.

FINANCING STUDENT MAINTENANCE AND FEES

The amount of public support in Britain is understated in table 2, as the figures do not report governmental payments to persons as distinct from institutions. In 1958–59, 79,000 resident British students were taking first-degree courses in the universities, and over three-quarters of these had received awards from public funds that paid full student fees.[9] Although fees differ somewhat as between universities, we shall not be far in error in assuming that three-quarters of the institutions' income from fees comes from public funds. This works out at roughly £5 million. Governmental payments to universities—directly or through student fees—in 1958–59 were made then as follows:[10]

Source of income	*Payments to universities (millions of pounds)*
Total	44.7
Central Government:	
Parliamentary grants	36.4
Payments for research	1.8
Local governments	1.5
Students fees paid from public funds	5.0

Since British universities' income is equal to their estimated expenditure of £57 million (see table 4 and notes), they as a whole are dependent on Government for almost four-fifths of their current income. When the figures for the Oxford and Cambridge colleges are excluded, this proportion rises to 85 percent, and for some universities it is over 90 percent.

The total cost to public funds of university awards in 1958–59 was £17 million.[11] Deducting the estimated £5 million for student fees, this leaves £12 million for maintenance. Any figure for annual maintenance costs of the 79,000 first-degree students must of necessity be a guess, but £300 per student seems reasonable, amounting to an annual total of £24 million.[12] Thus public funds bear something like half of student maintenance and 55 percent of maintenance and fees combined.

Likewise, the amount of payments to institutions in the United States understates the Federal Government's support for higher education. In 1957–58 these Federal payments for student education

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[9] Great Britain. *Grants to Students*, Report of the Committee appointed by the Ministry of Education and the Secretary of State for Scotland in June 1958 (the "Anderson report"), London, Her Majesty's Stationery Office, Cmnd. 1051, May 1960, par. 311 and appendix 8.

[10] Great Britain, University Grants Committee, op. cit., table 11. Fees for universities, excluding Oxford and Cambridge colleges, amounted to £5.7 million. One and three-tenths million pounds has been added for Oxford and Cambridge colleges, making a total of £7 million. Three-quarters of this amounts roughly to £5 million.

[11] "Anderson report," op. cit., par. 11.

[12] The £300 is based on data on term-time maintenance grants, given in "Anderson report," op. cit., app. 9.

purposes are estimated at less than $100 million.[13] But Federal contributions for higher education excluding research are estimated at $616.4 million, of which $363.3 million originated in the Veterans' Administration and consisted largely of payments to veterans.[14] The proportion of this and other public funds that went for student fees is not known, but it is clear that, in the financing of students' maintenance and tuition expenses, the United States differs radically from Britain.

In 1959, 40 percent of U.S. college students' expenses came from family income, 20 percent from long-term family savings, 25 percent from part-time and summer earnings of students themselves, and the remaining 15 percent from scholarships, veteran benefits, and loans.[15]

It seems reasonable to suppose that a small proportion of student expenses came from public funds in the United States, compared with our estimate of 55 percent for Britain. The British proportion rises sharply beginning October 1961, when the parents' contribution to maintenance and tuition costs will be reduced and the governmental contribution correspondingly increased.[16]

FINANCING EXPENDITURE: OUTLOOK FOR THE SIXTIES

The requirements of higher education in the United States over the next decade and alternative methods of financing them have been widely discussed, and a brief summary is all that is necessary here. Enrollment is estimated to rise from 3.6 million in 1960–61 to 7 million in 1970–71. Current expenditures for student higher education are estimated to increase from the $2.4 billion level of 1957–58 to $9 billion, and total educational and general expenditures to increase to about $10 billion without inflation and to about $14 billion with a price rise. (See ch. 11 of this publication.)

There is wide disagreement on the best or most practicable ways of financing the increase in expenditure. This is brought out in table 3, which summarizes projections from four economists.

Harris, for example, argues for a steep increase in tuition fees, financed mainly by massive long-term loan programs. His grounds are practicability (sufficient finance cannot be expected from the other sources—governmental payments and private philanthropy) and equity (higher education is a form of investment in human beings which pays off in higher future incomes and is thus most appropriately

[13] See ch. 11 of this publication.
[14] See ch. 13 of this publication.
[15] Devereux C. Josepha. College on Credit. *Think*, 25: 3, May 1959.
[16] Great Britain. *Parliamentary Debates* (Hansard), House of Commons Official Report, vol. 634, No. 50, Feb. 9, 1961, London, 1961, cols. 88–90.

financed by loans rather than grants). In his view, tuition fees will rise from 25 percent to 40 percent of the institutions' income, and governmental payments will fall.[17] Even so, the absolute amount of governmental contribution will more than double.

TABLE 3.—Percentage distribution of income for educational and general purposes and for student higher education: United States, 1957–58, and projected 1969–70 and 1970–71

Source of income	1957–58		1969–70, educational and general			1970–71 student higher education [6]
	Educational and general [1]	Student higher education [2]	Harris [3]	Musgrave [4]	Calkins [5]	
All sources	100	100	100	100	100	100
Student fees	25	36	40	35	26	37
Federal Government	19	4	18	27	14	4
For research	14	----	13	5	3	----
For other purposes	5	4	5	22	11	4
State governments	31	42	17	19	39	41
Local governments	3		2	2		
Endowments, etc	14	15	12	12	13	15
Other income	8	3	11	5	9	3

[1] U.S. Department of Health, Education, and Welfare, Office of Education, Biennial Survey of Education, data for 1957–58.
[2] Based on ch. 11 of this publication.
[3] Seymour E. Harris. "Financing Higher Education, Broad Issues" in *Financing Higher Education 1960–70*, Dexter M. Keezer, ed. New York, McGraw-Hill Book Co., 1959, table 9. p. 72.
[4] Robert D. Calkins. "Government Support of Higher Education," ibid., table 3, p. 197.
[5] Richard A. Musgrave. "Higher Education and the Federal Budget." *Review of Economics and Statistics*, 42: 98 (sup. August 1960, pt. 2).
[6] Derived from data used in ch. 11 of this publication, and based on percentage distribution of first approximation of income, illustration I.

Musgrave also expects fees to provide a larger share of income (though he does not expect so large an increase as does Harris) on the grounds that "Not only will rising family incomes be available to pay for tuition, but a growing awareness of the profit of higher education may be expected to increase the parents' willingness to contribute." [18] In contrast to Harris, he expects the governmental share to remain roughly constant, with a sharp tendency for the share of the Federal Government to increase. Again differing from Harris, he expects the bulk of the increased Federal support to be in the form of contributions to general operating expenses rather than payments for research.

Calkins, on the other hand, is at odds with Harris (and by inference with Musgrave) in assuming that student fees need do no more

[17] Seymour E. Harris. "Financing of Higher Education: Broad Issues," in *Financing Higher Education, 1960–70*, Dexter M. Keezer, ed. New York, McGraw-Hill Book Co., 1959. p. 35–78.
[18] Richard A. Musgrave. "Higher Education and the Federal Budget." *Review of Economics and Statistics*, 42: 98, (Sup. August 1960, pt. 2.)

than maintain their share of the institutions' income. "Professor Harris," he says, "assumes tuition increases for private institutions that are higher than will be necessary or likely, if present forms of public support are continued and his assumed tuition increases for public institutions are higher than seem to be feasible or probable in view of the low-charge tradition of many of these institutions." [19] He differs again with Harris in assuming both that the share of the Federal Government will fall (though biased more in favor of general contributions rather than research) and that the share of State and local governments will rise.[20] Indeed, the only settled point in the controversy seems to be that income from endowment will double over the next decade and will do rather less than keep pace with rising expenditure.

The projections of expenditures for student higher education assume that income from the various sources will expand roughly in proportion to previous income, with the substantial proportion of needed additional funds being supplied from the other sources, public and private.[21]

Harris, Musgrave, and Calkins emphasize the need for growing Federal support of a general kind for higher education. The obstacles in the way are set out by Musgrave:

> . . . Federal aid to education involves collateral issues of a highly controversial sort. These include concern over infringements of centralized direction on educational freedom and with it the States' rights issue. There is a fear that Federal aid be made contingent on compliance with policies for racial integration, . . . People are aware that publicly financed education will be supported by more or less progressive taxes if the finance is Federal, and by more or less regressive taxes if the finance is State and local. Hence, questions of income distribution are involved. Also, there is a further aspect of redistribution between high- and low-income States. And last but not least, there is a question of how Federal aid will affect the relative positions of public and private institutions.[22]

To the extent that obstacles to Federal aid to colleges and universities prevent an adequate flow of such aid, tuition fees will need to be increased further. As the increase is likely to be more pronounced in private than in public institutions, the effect will be to divert more students to public institutions, thus aggravating the problem of State governmental support.

Britain avoids most of these problems through its unitary constitution and a responsibility for higher education placed firmly in the hands of the Central Government. There is not, as yet at least, much

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[19] Robert D. Calkins. "Government Support of Higher Education," in *Financing of Higher Education, 1960–70*, op. cit., p. 196.

[20] Ibid., p. 183–219.

[21] See projections by Selma J. Mushkin in ch. 11 of this publication.

[22] Richard A. Musgrave, op. cit., p. 100.

in the way of real competition between the private universities and public institutions such as technical colleges. And the threat to the independence of the universities that is implicit in their heavy and growing dependence on central funds has so far been averted by an institution unique even in Britain itself, the University Grants Committee.

The "UGC," as it is known, acts as an intermediary between the Central Government and the universities. The 18 members of the committee are appointed by the Chancellor of the Exchequer. Somewhat more than half of these are university professors and the rest also are prominent figures in the academic or the business world. The committee is directly responsible to, and works closely with, the Treasury and advises the Chancellor concerning the financial needs of the universities. The Treasury and the universities have no direct contact with each other; communication takes place via the UGC. Likewise, government aid is channeled through the committee. Aid for operation of budget (recurrent grants) is based on a 5-year period and takes the form of general grants to the university. Within certain broad limits, agreed upon with the committee (for example, range of salary scales and staffing ratios), each university is then free to allocate the funds as it thinks fit. Aid for capital expansion (nonrecurrent grants) is agreed upon annually and, unlike the recurrent grants, is earmarked for specific purposes.[23]

The large postwar growth of parliamentary grants has sharpened the "inevitable conflict between the general desire to maintain the independence of the universities and the need for the exercise of proper financial control both by the University Grants Committee and by Parliament."[24] For the 10 years after 1946, the Public Accounts Committee was persistent in its efforts to induce the Treasury to open the books and accounts of the universities to inspection by the Comptroller and Auditor-General, in line with the practice in other institutions that received the greater part of their income from public funds.[25] This the Treasury successfully resisted on the grounds that—

> . . . the relationship between the Universities, on the one hand, and Parliament and the Government, on the other, was a very special one. The Treasury had never examined the universities' books and did not aim at detailed control. If the Comptroller were brought in, the Treasury would, before long, be compelled to expand their intervention in university

[23] Nonrecurrent grants, with which we are not concerned in this paper, totaled £16.5 million in 1958–59.

[24] Great Britain, The Grant in Aid of Colleges and Universities, in the *Fifth Report from the Select Committee on Estimates*, Sess. 1951–52, House of Commons 163, London, 1952, par. 28.

[25] For a detailed account of this episode, *see* H. V. Wiseman, Parliament and the University Grants Committee, *Public Administration*, London, 34: 75–92, spring 1956.

matters and to enlarge their control in a way which would certainly change and, the Treasury believed, be prejudicial to the present harmonious relationships between the universities and the UGC."[26]

And there for the time being the matter rests, with the committee functioning as successfully as ever. But we shall have cause to doubt in a moment whether even this remarkable administrative device will be capable of withstanding probable future strains.

Students in the United States are fortunate in having a plethora of estimates of future requirements about which to disagree. In Britain there are no estimates at all; in some way, to look ahead as far as 1970 is to be thought lacking in proper pragmatic spirit. The figures that follow are thus necessarily rough, though they should illuminate the major issues.

The Government's aim is to expand university enrollments from their present 100,000 to 170,000 (not including enrollments in other institutions) by 1970.[27] The financial implications would seem to be as follows: If cost per student remains constant, current expenditure by universities will rise from £57 million to £100 million. But salaries will need to rise sharply if a sufficient number of faculty of quality are to be recruited, and the emphasis on science courses will raise operating costs. It seems reasonable to assume that cost per student will increase by 50 percent (a similar assumption is being made in the United States), bringing total expenditure up to £150 million. This assumes no inflation; if prices rise, as they are likely to do, the expenditure will be so much greater.

How will this sum be financed? Let us assume provisionally that tuition fees will remain unchanged at their present average of £70 per student will produce £12 million in 1970. Endowments, and so forth, now amount to approximately £5 million and they have barely doubled since 1930 (compared with a more than fourfold increase in the United States), they are unlikely to do more than this in the next 10 years. Let us put them at £10 million by 1970. All other income, excepting governmental aid, will do well to maintain its present proportion of income and might reach £18 million in 1970. This leaves a gap to be filled by governmental aid of £110 million, or about triple the present amount of such aid. The great bulk of this would come from the Central Government. This means that over three-quarters of the universities' income would be derived from direct governmental aid, compared with two-thirds today. Payments for research and public support for student fees bring that proportion to over four-fifths. If the colleges at Oxford and Cambridge universities

[26] Ibid., p. 82.

[27] Great Britain. University Grants Committee. *Returns from Universities and University Colleges in Receipt of Treasury Grant, Academic year 1958–1959.* London, Her Majesty's Stationery Office, Cmnd. 1166, 1960, par. 7.

are excluded, the proportion of expenditure financed by Government approaches nine-tenths. For all practical purposes British universities would be wholly maintained out of tax-financed public funds and would be akin to schools and colleges financed directly by the Ministry of Education and local governments.

It is extremely doubtful if the independence of universities could survive these circumstances, or, from the constitutional point of view, whether it should do so. The curious mystique of the UGC, so successful up to now, may prove an inadequate shield. As we have seen, the Public Accounts Committee grew restive as parliamentary grants increased from their prewar level of £2 million to £27 million in 1955–56. Since then it has been quiescent while grants have been rising to £36 million. But it is difficult indeed to believe that it would not insist on detailed inquiry into the spending of well over £100 million of the taxpayers' money. From then on, detailed state control of university affairs would follow—and constitutionally should follow—as a matter of course. The deep-rooted forbearance of state interference with universities may hold this up for a time, but it is hard to see that it could be long delayed.

Nor would the pressures come solely from parliamentary concern with the proper use of public funds. There is a growing and articulate demand by the general public for a rapid expansion of university places to promote equality of opportunity, to diminish wasting of talent, and to lift Britain from the bottom of the list of wealthy nations. Even the expansion to 170,000 students by 1970 will provide a *university* education for only 3 percent of persons aged 18–24—a little more than the 2.5 percent of today. Institutions almost wholly dependent on compulsory levies from persons making the demands are in no strong position to resist. At best, the *pace* of expansion will be out of their hands; at worst, a *type* of expansion may be forced upon them which they deeply believe to be against the long-run interests of the universities. Only the colleges of Oxford and Cambridge, secure with their fees and endowments, would be immune.

The obvious answer to this threat is to raise student fees. If the prewar share of 30 percent could be restored, the present need for Central Government aid would be cut from £36 million to £24 million, and the estimated need in 1970 from £110 million to £75 million. Although large in amount, this latter sum would represent no more than half of current income. Universities would then at least have more of a chance against parliamentary control. But, while this course is evidently feasible for the United States, it is not for Britain. The reason is that the bulk of the fees are themselves paid out of public funds.

> The amount received from this source [fees] has remained relatively stable because there has been no general change in the rates of fee in force during the period under review [1952–57]. In general, the universities would be glad to develop any source of income which would reduce their growing dependence on Treasury grants, but they have hesitated to vary rates of fee when the greater part of their fee income is derived from public funds . . .[8]

To raise fees in these circumstances is simply to replace one form of governmental aid by another. Thus the universities are in a cleft stick: governmental grants are high because fees are low, and fees are low because governmental grants are high.

There is general agreement that the independence of the universities should be preserved. It is in real danger of being lost through inappropriate methods of financing. New methods must be sought. The solution is to be found in a program of loans to students to replace the present system of tax-financed grants. Universities could then raise their fees to whatever level seemed appropriate. Dependence on the Treasury could be sharply reduced. The cleft stick would be broken.

This is an unusual argument for student loans as against grants and may well be peculiar to Britain. It strongly reinforces the more orthodox argument that a college education pays off in higher future income and is best regarded as a personal investment. The general principle was stated long ago by Adam Smith. One part of fixed capital, he said:

> . . . consists . . . of the acquired and useful abilities of all the inhabitants or members of the society. The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realised, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise of that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour, and which, though it costs a certain expense, repays that expense with a profit.[9]

Unfortunately, this notion never became part of the main stream of economic thought. Instead, economists placed almost exclusive emphasis on investment in *physical* capital to the neglect of invest-

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[8] Great Britain. University Grants Committee. *University Development, 1952–57.* London, Her Majesty's Stationery Office, Cmnd. 584, 1958, par. 150.

[9] Adam Smith. *The Wealth of Nations,* 6th edition, Edwin Cannan, *ed.*, 1950, Book II, ch. 1, p. 264–265.

ment in *human* capital—a neglect which is now fast being remedied.[30]

The personal profitability of an investment in a college education has been established by several studies.[31] When due allowance has been made for such factors as the greater natural talent of college graduates and education by experience after leaving college, college education would still seem to yield a substantial monetary rate of return on investment, and it may readily be presumed that the psychic rate of return in terms of more congenial employment, higher social status, and so forth is even greater.

It need hardly be said that higher education is eminently defensible on noneconomic grounds. But the hard fact is that most students go to college primarily for economic reasons. Thus, even if higher education conferred large benefits on society in general as well as on the individual in particular, there would be no justification for a subsidy as long as the rate of return was attractive and was known to be so. "Neighborhood effects" are a necessary, but in my view not a sufficient condition, for public intervention. But the fact that the majority of students take vocational degrees means that the benefits accrue overwhelmingly to the individual. It is for these reasons—profitability, motive, and individual benefit—that the costs of higher education are appropriately financed by loans.

Two conditions would be needed to enable the loan system to work well. The first is adequate information given to students on the expected yield of the various courses. Only if this were provided could rational choices be made. The second is adequate capital. It is unlikely that private capital markets would be capable, for some time at least, of supplying at reasonable rates of interest, all, or even the major part of the money required. It would be up to the Government to make the funds available.

In Britain there has been virtually no discussion of a student loan program.[32] The Anderson committee on student grants dismissed the idea in a paragraph:

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[30] See, for example, Theodore W. Schultz, Investment in Man: An Economist's View, *Social Service Review*, 33: 109–117, June 1960, and Capital Formation by Education, *Journal of Political Economy*, 68: 571–583, December 1960; Moses Abramovitz, "Resource and Output Trends in the United States since 1870", New York, *National Bureau of Economic Research*, Occasional Paper No. 52, 1960; Solomon Fabricant, "Basic Facts on Productivity Change," *National Bureau of Economic Research*, Occasional Paper No. 63, 1958; Simon Kuznets, "Toward a Theory of Economic Growth," in *National Policy for Economic Welfare*, R. Lekachman, ed., New York, Doubleday & Co., 1955, p. 39–42.

[31] For example, J. R. Walsh, Capital Concept Applied to Man, *Quarterly Journal of Economics*, 49: 255–285, February 1935; Milton Friedman and Simon Kuznets, *Income from Independent Professional Practice*, New York National Bureau of Economic Research, 1945. For a contrary view, see Gary S. Becker, Underinvestment in College Education? *American Economic Review*, 50: 346–354, May 1960, Papers and Proceedings, American Economic Association.

[32] The only references I can find on this subject are J. Wiseman, The Economics of Education, *Scottish Journal of Political Economy*, (February 1959), and A. T. Peacock, *The Welfare Society* (Unservile State Group, London). Both favor a student loan program.

> We were . . . struck by the official use of the system of loans to students in, among other countries, Norway and the United States, and we felt it right to consider the merits of some such system; but, though we recognise that a loan may occasionally be a reasonable way of meeting a particular difficulty, we have had no hesitation in rejecting loans as an integral part of the national awards system. The principle of using loans as a standard means of financing students has now been abandoned by public authorities in Great Britain, and our evidence disclosed no wish to see it revived. The obligation to repay, no matter how easy the terms, must represent an untimely burden at the outset of a career. We far prefer the system of outright grants with the safeguards against misuse, contained in our recommendations.[83]

A majority of the committee recommended larger grants to students.[84]

CONCLUSION

In both Britain and the United States the current expenditure of institutions of higher learning is estimated to increase by approximately three times or more during the sixties. While large in absolute money terms, the sums required are comparatively small when related to growing national products and governmental budgets. Raising these sums should present no fundamental problems to increasingly prosperous societies. The difficulties lie rather in the devising of appropriate means.

In the simplest terms, the principal danger is that, in the United States, government will provide too little money, overstraining private sources as they are at present organized; and, in Britain, that government will provide too much money, threatening the preservation of academic freedom. In both countries the most hopeful measure of reform is a loan program for financing student costs. This would enable tuition fees to be raised sharply—in the United States to meet the expected deficiency in governmental payments and in Britain to reduce a growing and unhealthy dependence on public funds.

Nor, as we have seen, is the proposal for a loan program tied to these contingencies. Higher education is in large measure a personal investment, and, while there would continue to be ample scope for public funds and private philanthropy, it is therefore right in principle that loans to students should play a major role.

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[83] "Anderson report," op. cit., par. 24.

[84] Through the abolition of the parents' contribution.

TABLE 4.—Estimated current expenditures of British institutions of higher education, academic year 1958–59

Type of institution	Estimated current expenditures (in millions of pounds)
All institutions	111.6
A. Universities	56.9
1. Colleges at Oxford and Cambridge	5.4
2. Other universities	51.5
B. "Further education" establishments	48.7
1. In England and Wales	44.3
2. In Scotland	4.4
C. Teacher-training colleges	6.0

NOTES AND SOURCES

A–1. P. J. D. Wiles estimates expenditures for 1952–53 at £3 million (The Nation's Intellectual Investment, *Bulletin of the Oxford University Institute of Statistics*, 18: 279–283, August 1956). We assume that expenditures by the colleges at Oxford and Cambridge increased at the same rate between 1952–53 and 1958–59 as did those of the universities.

A–2. Great Britain, University Grants Committee, *Returns From Universities and University Colleges in Receipt of Treasury Grant, Academic Year 1958–1959*, London, Cmnd. 1166, 1960, table 12.

B–1. Great Britain, Central Statistical Office, *Annual Abstract of Statistics, No. 97, 1960*, table 106. (For a description of "further education," see *A Guide to the Educational System of England and Wales* (Ministry of Education Pamphlet No. 2, Great Britain, HMSO, London, 1945, pars. 97–100.)

B–2. Assumed to be 10 percent of such expenditures in England and Wales. Based on the total number of students in "further education" establishments (*Annual Abstract of Statistics, No. 97, 1960*, op. cit., tables 97 and 109).

C. The published cost of teacher training includes maintenance. From detailed analysis, Vaizey suggests a figure for expenditures by teacher-training colleges, *excluding* maintenance, of £4.6 million for the academic year 1954–55 (John Vaizey, *The Costs of Education*, London, George Allen & Unwin, 1958, table 26). Rising costs suggest a figure approaching £6 million in 1958–59.

Part IV

ECONOMIC RESEARCH IN HIGHER EDUCATION

CHAPTER 20

101 Questions for Investigation

*Willard L. Thorp**

SOME ASPECTS of higher education have been explored extensively, others have had only limited examination. Thus the academic library shelves contain many more printed pages about the philosophy of education than about the management of educational institutions. There is a much more nearly complete public record of railroad conductors' salaries than of college professors'. And we have many more sociological interpretations of trade union behavior than of faculty mores, unless fiction is included.

The social scientist has tended to concentrate his attention either upon the individual or upon the economic and political aspects of society, and to overlook education, although it could qualify under all three headings. The economist also has looked away because the pecuniary calculus is not readily available and there is great difficulty in defining and measuring the "product." Many of the economists' technical devices, such as marginal analysis, demand elasticity, product differentiation, cost behavior, comparative advantage, and input-output analysis, would seem to be relevant to various problems in the education field, but they seldom have been applied.

Similarly, the political scientist has concerned himself with only a few fringe problems in this field, perhaps because higher education has such a tradition of being a private operation even though State universities now carry the heavier load. Some few, like some sociologists, have studied the similarities of academic communities to other groups, and their differences, but the study has been more casual and episodic than systematic. The psychologist has been more deeply interested in the learning process than in the working conditions of the teacher.

This state of affairs is changing rapidly. Although the problems of education were important in the past, it seems clear that we are faced

*This paper was first drafted after discussions held at the Merrill Center for Economics in Southampton, N.Y., in June 1958. Twenty-two economists and educators assembled for a week under the auspices of Amherst College and The Fund for the Advancement of Education to identify problem areas in the field of education where it was believed that research might be valuable. The author, director of the center, who presided at the sessions, made his own summary at the time, and has now amended and elaborated it somewhat further.

today with educational choices of increasing importance and difficulty, in terms both of public policy and of organizational structure and behavior. Greatly increased resources of capital, labor, and management are being demanded to carry education forward and to raise the standards of the weaker institutions. We cannot disregard the implications for education of the rate of population growth and the accelerating expansion of knowledge. The accumulations of data of various types, development of new research techniques and methods of analysis, and the recent availability of funds for research all suggest that much will be done to shed light on these problems during the present decade.

It seems clear that higher education is and must remain a process with wide differences among institutions. Although they may have quite different objectives, they do compete for students, faculty, and financial support. The wide spread in amounts of tuition in public and private institutions tends to create another source of conflict. And the national process of growth is pushing all of them to increase their productivity, whatever that means, within their limited resources.

These conflicts and pressures raise problems and some of them are listed below. It is obvious that it is an economist's list, although luckily the interdisciplinary boundaries among social scientists have rather low visibility. For the purposes of the list of questions given below, a number of broad and basic problem areas are not included, such as "What are the objectives of higher education?" or "How much higher education should there be and for whom?" or "What preparation is essential for teaching at various educational levels and in various types of institutions?" Problems concerning the nature and scope of the curriculum or the actual teaching process itself have been disregarded. Finally, the infinite possibilities of comparisons over time and space (especially international comparisons) have not been included in the list, although some of them might be very fruitful.

Many of the questions may be asked in terms of all education, of some type or level, or even of a single institution. It is important to note that research does not need to start with a broad coverage and an electronic machine. It is quite likely that some of the problems can only be stated properly after some individuals have made local and limited studies at their own college-level institutions, or in their own communities with respect to the public grammar- and high-school level. Analysis of costs, for example, needs to be developed in a number of individual institutions.

It is also important to realize that many of the questions asked should be considered with reference to various time intervals. A problem can be stated in its current phase, or in terms of a historical perspective, or in terms of forecasting the future. All these elements

need to be considered, for the spot survey is likely to be difficult to evaluate unless one has some notion as to what the trends are.

The 101 questions do not present a complete or detailed set of problems in the field of higher education. They are intended to start the process of inquiry, and often a dozen or more questions are hidden in a single one. Although an attempt has been made to group questions that seem to be closely related, other schemes of arrangement would probably do just as well.

I. Extent and Structure of Higher Education

1. What is the direct contribution to national income which is [has been, can, should be] made by education? How should it be defined and measured?

2. To what extent does the demand for higher education reflect general business conditions and employment? How does the business cycle affect the resources available—the yields on endowment, legislative appropriations, scholarship needs, alumni gifts, and so forth.

3. What shares of various types of economic resources are devoted to educational activity in the United States? It might be useful to develop such data both in a product and in an industrial classification. Data as to capital employed are weak or nonexistent. In fact, capital goods like buildings are often not treated like capital; that is, with respect to depreciation, earned return, and so forth. Labor input needs to be examined in terms of degrees of skill and of divisions such as teaching, managerial, administrative, and maintenance.

4. How are resources (using national income subdivisions) distributed through the educational structure by level and type of education and by type and size of institution? At what points would additional resources be most productive?

5. Is there unused capacity in terms of plant and faculty? Where? Why? What appear to be present standards of use? Where does [should] obsolescence come into the picture? What motivation is there for change?

6. What is the relation between various inputs (and combinations thereof) and the level of student performance and accomplishment? Is it possible to develop meaningful concepts and techniques that would permit comparisons of performance among educational units, making appropriate allowance for differences in student potential?

7. What assumptions should be made as to future demands for higher education? What assumptions should be made concerning quality, quantity, and types of education?

8. What are the relative economic and other costs involved in creating a new institution, setting up a geographically separate branch

of an established institution, and expanding an established institution?

9. What are the relative economic and other costs involved in carrying on higher education in urban, suburban, and nonurban locations?

10. To what extent can the student "bulge" be met by expanding trade training and junior colleges? What effect would this have on resource requirements?

11. At what level should various subjects be taught? Can any appreciable saving be made by shifting the level and timing? Are extra costs incurred through not doing the right thing at the right time in the right place? What shifts and changes can be made in language study? What about remedial work and its proper location?

12. What adjustments may be needed at the college level if more "college work" is done in the high schools? How will this affect costs? Is there a similar adjustment problem between the college and the graduate or professional school?

13. What resources are now used in nonformal types of education; for example, music lessons and clubs for young people of school or college age?

14. What will be the future economic requirements for graduate and professional schools? How do their resource requirements and costs differ from those of college level institutions? How sensitive are graduate and professional schools to changes in demand?

15. How much specialized training is given and never used? What elements in past training have proved obsolete?

16. To what extent is there [will there be] further training added after the completion of formal education? What alternative methods are possible for providing specialized training and "refresher" courses? How would the costs of these methods differ?

17. What is the relation of research to teaching time and to availability of faculty to students? What is the basis for the financing of research and how much is contributed by the institution? To what extent is research a source of supplementary income to faculty and graduate students? What is involved in providing research facilities? How can [should] research interest be maintained in smaller institutions?

18. What peripheral activities affect income and cost and in what way—athletics, dramatics, university press, soil testing, employment agencies, and the like?

19. Who participates in the decision-making process in various educational institutions? In what ways do individuals or committees or other groups participate, both inside and outside the institution?

Is there any relation between faculty participation in decision making and allocation of resources as well as in the obtaining of resources? What are the limitations on freedom of planning in publicly supported institutions? In private institutions?

20. What is the effect on colleges and universities of such market situations as location and competition? What are the competitive elements in the picture? To what extent and with regard to which matters are there trade agreements and interstate compacts? Do they contribute to more efficient resource use?

II. The Student Body

21, How can one define enrollment? What is the trend in enrollment by type and level of education?

22. What factors affect the demand for college entrance? How important are the tuition charges and other costs to the students? What is the likely trend of student costs? How is college entrance affected by changes in the level and distribution of family incomes? How many students are unable to enter because of faulty preparation?

23. What is the extent and character of the enrollment in private preparatory schools? What are the charges for tuition and other costs?

24. What is the basis for student choice among various types of institutions (public and private, rural and urban, large and small, etc.)? To what extent and at what levels of education do students first leave home for schooling?

25. Are there established geographical controls indicating that a locality requires an institution? To what extent do students go to State universities outside their own States, despite tuition differentials? Should there be a national travel allowance for students?

26. How much do differences in tuition charges among institutions affect the distribution of enrollments? (In connection with the more obvious facts, there might be an examination of multiple applications to see to what extent applicants apply to—and choose among—colleges of varying tuition levels.) Similarly, how much does the amount offered for scholarships appear to control choice?

27. How extensive are scholarship programs? On what should they be based? Ability? Need? High-school record? What should the scholarship cover? How does the development of national scholarship programs affect the operation of individual institutions' programs? Are sufficient fellowships available for graduate study?

28. How would substitution of low-cost, long-term loans for direct subsidization of tuition (low or no tuition charges) alter the college

entrance of students in various economic and social groups? What are the good and the bad elements in the various student loan plans in operation? What is the potential of a loan program and what is its likely cost, on a national scale, under various assumptions of coverage?

29. To what extent are educational institutions able to make intelligent selections among applicants? What are the existing methods of selection, their effectiveness, and their cost (in dollars and in tension among applicants)? What is [should be] the extent of formal education obtained by the high-school graduates of the highest brain power (perhaps the top 20 percent)?

30. Disregarding tuition and scholarship differentials, what other methods exist for competing for students? Advertising? Bonuses? Entertainment? Solicitation? Alumni persuasion or pressure? And how much are all standards distorted by special abilities such as forward passing or oboe playing?

31. Is there a tendency for prestige institutions, including graduate schools, to develop preferred sources for students? Are there observable geographical, racial, religious discriminations?

32. To what extent, when, and why do students drop out? How many return after an interval? What would be the saving if the attrition rate were higher or lower?

33. What is the possibility that junior-college graduates will enter 4-year college? How much does [can, should] this happen?

34. How extensive (and how desirable) are transfers?

35. What organizational requirements and costs are involved in the giving of advanced credit or of advanced standing or of acceleration?

36. What is the relationship of military service to the educational process? What can be learned from the GI bill experience? Any insight into college education and age, marital status, and experience?

37. What significance, if any, does the summer vacation have for students as to economic costs or earnings, and experience? Could it be utilized to greater advantage?

38. To what extent do college students work on the side? Would it be possible to substitute employment for scholarships to a greater extent?

39. Are there any observable consequences when the educational process is delayed or interrupted? What about intervals between college and graduate school?

40. What is the effect of early marriage on the students' financial needs and financial resources? On attrition of students in the colleges? On the education of husband and wife?

41. To what extent is there a trend for a semester or year abroad to be included for college credit? How is this inclusion organized? What costs are involved? What are the faculty requirements? What scholarships are required? Is such inclusion feasible on any considerable scale?

42. What are the apparent trends in the enrollment of foreign students in American educational institutions by level and type of institution? What special burdens are involved? How much special support is [should be] provided for this activity? Should it be more concentrated in a few institutions? Can these programs be evaluated?

43. What controls the enrollment in graduate and professional schools? Can one compare the number who go on with the number who might meet existing standards yet do not continue? How is selection made by students? How is their decision affected by tuition costs? Scholarships? Opportunities for employment? What is the attrition rate and why? Is there any apparent change in the quality of applicants and if so why? Do they tend to make multiple applications?

44. Is there any way of rating graduate and professional schools on an objective basis rather than relying on historical prestige? What information might improve student choice? Is there a danger of too much concentration of the better students in a few institutions?

III. Educational Costs

45. How adequate are present cost-accounting definitions and methods for educational institutions in terms of their relevance for managerial purposes, for comparative purposes, and for social evaluation?

46. What controls allocations of funds between departments and among various functions? How can costs be ascertained when teachers instruct at both undergraduate and graduate levels? Is there any basis for comparability? What variations in cost exist? Why are high-cost activities tolerated?

47. What has been the trend in the cost of education of various types and at various levels in recent years? What has been the trend in physical requirements, such as for classroom space, laboratories, library books? How has administrative cost behaved? Are there some resources which are more fully utilized than others?

48. What is the relation in marginal terms between cost and total number of students for various sizes and types of institutions? What is the relation in marginal terms between actual resource requirements and number of students?

49. What is the minimum cost of a 4-year college education and what are the added costs resulting from additions, decorations, and

diversions? What is the added cost of community living (dormitories and eating halls)?

50. What is the cost of operating a college for each of the academic years? How do junior-college costs compare with 4-year college costs?

51. What can be learned about the economics of class size?

52. What costs are involved in administering "independent study"? Reading courses? Honors work? Doctoral theses?

53. What are the material requirements for college operation? How can purchasing methods be improved? What about methods of buying and handling books?

54. What is the relationship between cost and multiunit operation?

55. Are there improved methods of space utilization and control?

56. What are [can be, will be] the effects on the cost of education and on faculty requirements of various innovations in instructional and administrative techniques and in utilization of new media of communication such as television?

57. What are the economic implications of a changed college calendar? Of an accelerated college course reducing the time to 3 years? The use of reading periods on or off campus? A year abroad as a part of the formal educational process?

58. What is the actual elapsed time for graduate work? What is the estimated cost of a Ph. D. and of the various professional degrees to the individual? To the institution? To society?

59. Can costs be reduced by additional cooperation between schools within a university and among universities?

IV. Teacher Supply and Salaries

60. What can be said as to the derived demand for teacher services, in terms of predictions as to enrollments?

61. What in fact does a faculty member do? What is his real teaching load? How much service does he give to the profession? How much time is devoted to personal scholastic maintenance and development? To what extent are nonteaching demands made on the faculty by the educational institution? What are the noncompensated demands made by the community? How equitably and by whom are these claims on the teachers' time distributed? To what extent are teachers required to perform tasks that might be performed by less expensive personnel?

62. What factors affect the supply of teachers—salaries and fringe benefits, degree requirements, social position, and so forth? How extensive is the move of high-school teachers into college teaching?

63. To what extent have faculties absorbed foreign scholars, and at what level of the college course have these foreign scholars been absorbed permanently or temporarily? In which fields? At what rank? Have any special costs been involved?

64. To what extent are graduate students engaged in teaching? In research? Are they teaching elementary or advanced courses? With how much supervision? At what scales of pay? How does this affect the overall budget? Does it delay the graduate work of the teaching fellow?

65. Where do graduate students finally go and why?

66. What has been the historical record of teacher salaries, with appropriate allowances for fringe benefits, conditions of work (including availability of outside employment), and the age and qualifications of the teacher?

67. How adequate are retirement arrangements for faculty and for other employees?

68. To what extent do teachers earn additional income through other employment? How do institutions safeguard effective instruction? How much variation is there in their procedures on outside employment and why?

69. How are faculty administrative positions handled, such as that of head of a department? Is extra compensation granted? Reduced teaching load? What should be the division of labor between faculty and administration?

70. What would be involved in more "refresher" or developmental activity for teachers? How costly, how necessary, and how valuable are sabbatical leaves?

71. What are the trends as to leaves of absence? How important are fellowships and grants for temporary absence from the campus as a factor in reducing the supply of teachers on duty?

72. To what extent is faculty housing provided? How are housing provisions administered? What is their economic rôle?

73. What salary differentials are [should be] found within institutions, and among institutions? By subject area? By character of preparation? By seniority? By type, character, and location of the institution? What would be the result of substantial increases in the top salaries?

74. To what extent do civil service requirements reach into public colleges and universities?

75. What costs would be involved in expanding the supply of teachers for junior colleges?

76. What is the nature of the labor market for teachers? Can it be improved? Is there enough, too much, or too little mobility and turnover?

77. To what degree does academic tenure prevent the management of an educational institution from behaving like a rational employer, removing "expensive" or incompetent employees?

78. To what extent do mature individuals otherwise employed shift to the academic world, and vice versa? What fields have the most mobility? Could not more women over 40 be attracted back to teaching or research?

V. Financing

79. What are the trends in the sources of financing of privately and of publicly supported institutions, including tuition as source?

80. Are any considerable number of private institutions under severe financial strain? What is the death rate of private institutions? Is the problem caused by competing low-tuition public institutions? Is there similar pressure on junior colleges? On graduate schools?

81. What is the economic effect of church sponsorship? On contributions? On faculty recruitment? Are special costs involved?

82. What is the actual burden on the taxpayers of public educational institutions? Of private institutions via tax exemption of gifts?

83. What is likely to be the future trend of private gifts? How is this related to income levels? To tax levels? What economic considerations enter into gifts from individuals, corporations, and philanthropic bodies to private institutions and to public institutions?

84. What is the record of alumni contributions? How do they vary by age of donor and by type of institution? Do they bear any relation to capacity to pay? To what extent do alumni contributions represent the equivalent of a delayed payment?

85. How are educational endowments administered? What economic principles should be applied?

86. To what extent are State and local governments in a position and willing to finance educational expansion at the junior-college or the 4-year college level? At the graduate and professional-school level? How would the situation be changed by various Federal programs of guaranty, credit, or grant?

87. How much income is the result of using facilities for noneducational purposes (campus for summer conferences, and so forth)?

88. What has been the experience—advantages and disadvantages—of Federal programs relating to education? What has been the

experience in land-grant colleges? In Government contracts? In the Reserve Officers' Training Corps? What bases might be used for allocating Federal aid to higher education? To what extent and on what basis should public funds be available to private colleges?

89. On the basis of estimated future enrollments, what plant construction will be required in the future? What costs are involved, broken down into public and private, geographical location, and type of facility?

90. With particular reference to capital requirements, what methods of financing, including tax sources, should be used for public schools and public colleges? What has been the financial experience with dormitory and other financing up to the present? When and for what purposes do [can, should] various types of institutions of higher learning engage in borrowing?

91. What forms of aid from foundations appear to have had the greatest impact upon educational institutions? Can directed aid in fact be prevented from spreading through the budget?

VI. Evaluation

92. Are there criteria and measurements of the historical development of education which might indicate its relation to American society? What seem to be the forces that controlled the development of education? Has education adapted itself speedily to changing needs? In turn, what was its impact?

93. Is it possible to break down the "product" into such elements as training for citizenship, general tools for living, and specialized tools, and then measure the allocation of resources to each purpose?

94. What part have institutions of higher education played as pools of skilled manpower and research resources in time of national emergency?

95. What resources do educational institutions devote to the advancement of knowledge? What is [ought to be] their future role in view of the expansion of industrial and governmental research and development programs?

96. What is the cost, or the benefit, involved in keeping young people off the labor market?

97. What part can education [educational institutions, educational resources] play in the development of less developed countries? How can this activity best be organized? What are the chief costs involved? How much priority should it be given as compared with other demands?

98. What is the level of educational input and output by States (with particular reference to possible criteria for Federal contribu-

tions)? Can specific benefits and results be attributed to publicly supported institutions? What is the relation, if any, between the level of education in the State and the level of productivity and of incomes? Of outmigration or inmigration?

99. What is the relationship between the degree of education and the level of personal income? (This not only involves the estimation of present worth of various levels and types of education, but also the development of a method of imputation to education when corrected for different initial endowments and economic and social advantages.)

100. What is the relationship between education and other measures of personal achievement? (Here also "value added" concepts must be developed along with methods of measurement.)

101. What is the present amount and productivity of resources now being spent in studying problems of education? And how can a greater number of competent scholars be induced to apply their skills and techniques to answering some of the above questions—and raising others?

Perhaps the last question should be the first.

CHAPTER 21

Research in the Economics of Higher Education: Progress and Problems

*Alice M. Rivlin**

THE ECONOMICS OF EDUCATION is a new field of study. Until very recently most economists viewed the problems of educational enterprises as outside their sphere of interest and competence, and educational decision makers showed little disposition to call on economists for help.

This situation is changing. Within the last few years the economics of education has become a respectable, even a fashionable field in which to write a doctoral dissertation or direct a research project. A president of the American Economic Association has even devoted a presidential address to the subject.[1] Economists have begun to investigate the return on investment in education, the demand for and supply of persons with specific types of training, the economic advantages and disadvantages of alternative means of financing education, the comparative costs of different ways of organizing an educational system and so forth. Those who make decisions affecting education have also begun to realize that this type of research may be useful to them and to call for more of it.

Several conferences have been held on the economics of education, both here and in Europe, and some of the papers delivered at these meetings have been published. A few articles on the economics of education have appeared in professional economic journals. Much work, however, is still in progress, and the results have been distributed in processed form, if at all, or published in journals not easily accessible. It is the purpose of this article to review as much as possible of the recent research in this field, mentioning some studies in progress, as well as some which have been completed, to assess roughly what has been accomplished so far, and to suggest some of the problems on which future efforts should be concentrated.

As in the rest of this publication, the focus will be on higher education—that is, education beyond the high-school level—although refer-

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[1] Theodore W. Schultz. Investment in Human Capital. *American Economic Review*, 51 : 1–17, March 1961.

ences to other levels of education are necessarily included, since higher education cannot meaningfully be viewed in isolation from the rest of the educational system.

What Good Are Economists?

The reluctance of educators and educational decision makers to turn to economists for advice and counsel has by no means entirely disappeared. Some research in the economics of education—especially attempts to compute rates of return on investment in education, or consideration of the costs of alternative teaching methods—has met with protests from educators. The protests have been directed not so much against the methods and conclusions of the economists, but against the whole idea of doing this kind of research. Education, say some educators, is far too precious to be compared in crass money terms with the ordinary commodities and services that are bought and sold in the marketplace. The instruction of our children is, or should be, so important to us that we are willing to devote to it whatever resources are "required," regardless of cost. Not all educators take such extreme positions, but even those who do not are often fearful that if economists are turned loose on educational problems they will recommend cheaper methods of doing things even though these methods produce inferior results. These educators have visions of economists pointing out that it would be cheaper to teach students in classes of 400 than in classes of 15, or that money can be saved by substituting television tapes for live teachers—without bothering to investigate how much the students really learn in these different situations. Or they imagine economists estimating that the rate of return to an individual on investment in a college education is lower than on other investments (a conclusion *not* supported by any evidence so far) and advising that fewer students be sent to college—without considering the cultural and spiritual values of education to the individual or the benefits of his education to others besides himself.

The answer is that if economists behave in this irresponsible fashion—and almost none of them have—they are not being good economists. The educators' fears are based largely on misconceptions about what economics is, and hence it may be useful to spend a few paragraphs considering just what it is that economists may be expected to contribute to the solution of educational problems if they do their job well.

It is not the job of the economist to tell people or nations what they ought to want. Rather it is his job to assist them in making choices which will bring them as close to what they want as possible. It is his job to point out— what should be obvious, but often is not—that their resources are never adequate to do all the things they want to do and

that they must make choices among alternative uses of these resources. Raw materials and labor and machinery and time devoted to one use must be taken away from others. At a given moment more of one thing generally means less of another. More in the present generally means less in the future. The basic function of the economist is to show those who make these decisions what alternatives they face and what the consequences of various choices seem likely to be. He should point out which combinations of objectives are not feasible (in the sense that they cannot be attained simultaneously with the resources available), which methods of using resources are inefficient (in the sense that the same objectives can be attained at a smaller cost), and what are the consequences of applying various explicitly specified criteria of choice to the alternatives that remain.

If a nation's representatives are deciding whether to spend a certain amount of tax money either on schools or on superhighways, the proper role of the economist is not to express his own subjective preference, but to marshal what evidence he can about the probable consequences of each choice—to point out what the immediate and the eventual benefits of each seem likely to be and to whom they will go, and to show what the impact on the economy as a whole might be in the near and the distant future. It is not obvious that the Nation's representatives should choose the alternative that maximizes expected national income, although this would be one criterion of choice which an economist might suggest, but it is clear that the impact on national income, among other things, is relevant to an intelligent choice.

Some educators have the idea that an economist cannot be of any help with a problem unless all the elements of the problem are easily translatable into money terms. This is not really true. A problem of choice is usually easier to handle if all the costs and benefits of the various alternatives can be made commensurable by expressing them in some common unit such as money, but this is not always necessary or even useful. If an economist were addressing himself to the problem of how best to utilize the existing resources of an educational institution, he might not want to introduce the subject of money at all. He might just concern himself with the educational output that could be produced by making use of professors' and students' time and of buildings in different ways—the output being expressed in test scores or in measures of student satisfaction. The main usefulness of an economist in this kind of situation is that, being in the habit of thinking about alternatives and measurable costs and benefits, he may ask the right questions and get other people started thinking in these terms, too.

The difficulties are much greater when the costs and the benefits cannot be measured. Nobody thinks we can measure—in money or

in any other units—the cultural and spiritual benefits of education to a person or to a nation. These benefits are certainly very great and they should not be ignored just because they cannot be measured. On the other hand, their existence should not preclude all objective thinking about costs and benefits in education. Many of the benefits of education *are* measurable, at least approximately, in achievement tests, expressed satisfaction, job performance, and income. Almost all of the resources used in education are measurable—in physical units and their monetary equivalents. Since these resources are far from unlimited, it certainly makes sense to think about their efficient use in achieving the measurable benefits of education—as long as the measurements are not taken too seriously and the immeasurable benefits are not forgotten.

Somewhat arbitrarily, I have divided studies in the economics of higher education into three groups. The first group consists of studies of the Nation's total investment in education and the return on that investment. The second, discussed somewhat more briefly, consists of studies of the supply of, and the demand for, educated persons—studies of college enrollment and manpower. The third includes research on the financing of education.

I. Total Investment in Education and the Return on the Investment

Generations of economists, going back at least as far as Adam Smith, have paid lipservice to the importance of education, not only for its own sake but as a contribution to economic growth. There are a great many motives for getting an education, but clearly, when people take resources away from present consumption to devote them to training and education that enable them to earn more income in the future, they are, whether they plan to or not, making an investment in themselves—one that has many similarities to an investment in a factory or a machine.

Until quite recently paying lip service was about all that economists did with regard to investment in human beings. In order to simplify the world with which they had to deal, economic theorists generally assumed it to be peopled with homogeneous laborers working with a fixed technology. Output in such a simplified world could, of course, grow only as the number of workers grew or as the amount of capital or natural resources per worker increased. With this simple picture in mind, economists concentrated much of their effort on studying the process of physical capital accumulation, neglecting changes in the skills and knowledge of the human agents that work with this capital.

Regrettably—at least for the economists—increases in the amount of physical capital per worker proved only a partial explanation of the fantastic increase in production that actually occurred in the real, unsimple world in which we live.

Some recent hard work on historical statistics for the United States has made this particularly obvious. Among the most quoted statistics are those brought together by Fabricant, who indicates that the total physical output of our private domestic economy grew 3.5 percent per year between 1889 and 1957.[2] Part of this growth, he found, was attributable to an increase in the size of the labor force, but by no means all of it, for output per man-hour increased by about 2.0 percent per year in this period. Some of this increased productivity per man-hour in turn, he concluded, can be attributed to increased capital, but not very much of it, for output per (weighted) unit of capital and labor combined grow at a rate of 1.7 percent per annum.

Others have come to similar conclusions. Solow, for example, approaching the problem somewhat differently, estimated that only about 10 percent of the increase in output per man-hour in the period he was observing (1909–49) could be attributed to increases in the amount of capital.[3]

The failure of physical capital accumulation and increases in the number of workers to explain economic growth has forced economists to look for other possible explanations, long mentioned, but hitherto largely neglected. They have turned principally in two directions. First, they have begun to study the mechanism of technological change—how improvements in the methods of production come about. The economics of research, invention, and innovation are now the subjects of a rapidly burgeoning literature. Secondly, they have begun to study changes in the quality of the labor force and the process of investment in human beings, especially investment in health and education.

The first step toward determining how important investment in education is to economic growth is to find some way of measuring the amount of such investment. Defining and measuring educational investment is every bit as difficult as defining and measuring physical investment, maybe more so, and a great deal of recent effort has gone

[2] Solomon Fabricant. *Basic Facts on Productivity Change*. National Bureau of Economic Research, Occasional Paper No. 63. New York, The Bureau, 1959.

[3] Robert M. Solow. Technical Change and the Aggregate Production Function. *Review of Economics and Statistics*, 39: 312–323, August 1957.

For a computational correction, *see* Warren P. Hogan, Technical Progress and Production Functions, *Review of Economics and Statistics*, 40: 411–413, November 1958. For similar findings, *see also* Benton F. Massell, Capital Formation and Technological Change in United States Manufacturing, *Review of Economics and Statistics*, 42: 182–183, May 1960, and Aukrust, Odd, and Bjerke, Juul. Real Capital and Economic Growth in Norway, 1900–1956, in *The Measurement of National Wealth*, Raymond Goldsmith *and* Christopher Saunders, *eds*. (Income and Wealth Series, vol. 7), London, Bowes & Bowes, 1959, p. 80–118.

into simply finding ways of measuring investment in education in the United States and other countries at different points in time. Various possible approaches to the problem and some of the difficulties are elucidated by Bowman and by Eckaus.[4]

One difficulty is that while factories and machines are seldom wanted for their own sake, apart from the goods they can produce, much education is considered desirable in itself, as a contribution to the good life rather than as a means to future income. Education is partly investment and partly consumption, and it is very difficult to separate the two. It is so difficult that many economists have decided to ignore the problem and treat all education as though it were investment.

The simplest way of measuring this investment in education in a given year is to add up the number of years of schooling acquired by the population in the period. This, however, is nearly as unsatisfactory as measuring physical capital investment in numbers of machines. It makes about as much sense to equate a year in second grade with a year of advanced chemical engineering as it does to equate a small lathe with a turbine generator. The school years, like the machines, have to be weighted in some way if comparisons between different times and places are to have any meaning at all.

One way to weight them is in terms of their costs—a procedure often used in measuring physical capital. The costs used may be either costs of production or costs of reproduction; that is, a unit of schooling acquired in a past year can be valued either in terms of the resources actually devoted to its production in that year or in terms of the resources that would have to be devoted to replacing it with an equivalent unit in the present.

Another distinct possibility is to focus on the yield of the education, valuing a unit of schooling either in terms of its expected contribution to productive activity at the time it was acquired (its capitalized expected earnings) or in terms of the expected contribution of an equivalent unit in the present.

Schultz has taken the cost of production approach in making estimates of gross investment in education in the United States in the period 1900–56.[5] He limits his attention to formal schooling at the elementary, secondary, and college or university level. His estimates include both the direct cost of education (outlays for teachers' salaries, books, equipment, maintenance of buildings, etc.) and the indirect cost of the earnings forgone by students who would have been working if they had not been studying. The main outlines of the picture emerging are that since 1900, gross investment in education has

[4] Mary Jean Bowman, *and* R. S. Eckaus, chs. 6 and 8 of this publication.

[5] Theodore W. Schultz. Capital Formation by Education. *Journal of Political Economy*, 48 : 571–583, December 1960.

been far from an insignificant part of total investment in the United States and that it has been growing rapidly relative to gross physical investment, rising from 9 percent to 34 percent of gross physical investment between 1900 and 1956.[6] Also income forgone by students has been an increasingly important part of total educational investment, partly because enrollment has grown faster at the high school and college levels than in elementary schools.

Some refinements of this general approach are suggested by Blitz.[7] In particular, he has attempted to include in the cost of education the value of the free services rendered to tax-exempt educational institutions by State and local governments—such services being assumed to be roughly equal to the estimated value of the property and sales taxes which these institutions would have paid if not exempt. Blitz also believes that Schultz' estimates of income forgone by college students are too low, since they are based on the average earnings of college-age workers actually in the labor force. College students, with their generally superior ability could presumably earn more than this on the average if they decided to quit school in search of permanent full-time jobs. Blitz offers some alternative estimates. Schultz, incidentally, has pointed out that his own estimates of earnings forgone may also have an upward bias, since he did not subtract the earnings of students while they are in college (income not forgone).[8]

There has been some confusion over the question of whether food and maintenance of students should be included in the resources devoted to education. Clark and Sobkov estimated the total cost of education in the United States in 1956–57, including on-the-job and adult education, as $59 billion, or 17 percent of the national income.[9] Over 40 percent of this startling total consisted of an estimate ($600 each) of the minimum cost of feeding, clothing, and sheltering the more than 40 million students enrolled in the regular school system from kindergarten to college. That cost, however, is not properly a cost of education. It is simply a cost of having these young people in the population. They would have to be fed whether they were in school or not. On the other hand, the contribution to national income which these young people would have made if they had been working instead of studying *is* a proper cost of education. It is a real cost, not only to the students but to the economy, which is deprived of a certain amount of production (roughly measured by the students' forgone earnings) if part of the potential labor force is in school.

[6] Ibid., p. 583.

[7] Rudolph C. Blitz, ch. 10 of this publication.

[8] For some other discussions of Schultz' estimates, *see* R. S. Eckaus, ch. 8 and app. B of this publication.

[9] Harold F. Clark and Ruth E. Sobkov. How Much Can the People of the United States Afford To Spend on Education? New York Teachers College, Columbia University, processed, table C, undated (about 1958).

It is a real cost to the economy which should be considered in deciding whether it would be economically advantageous to increase the number of young people going to school. The only question is how this forgone income should be measured. As we have seen, Schultz and Blitz take as their measure the income that an average person with the characteristics of a student can presently earn if he is not in school (although they differ in their estimates of this income), multiplied by the number of students. This approach will yield a valid enough approximation if there is little unemployment and if one is concerned with measuring the amount of national investment involved in small or gradual changes in the number of students. It is not valid if there is substantial unemployment or if one is concerned only with large or rapid changes. If half our present college population suddenly left college, for example, national income would not increase by anything like as much as the Schultz or Blitz estimates of income forgone by these students. Many of them would be unemployed and would be absorbed by the economy only slowly and at lower rates of pay than now commanded by persons in the same age group.

To go back to Clark and Sobkov, another reason why their estimate of the total cost of education is so high is that they include not only the costs of formal education in schools and colleges, but the costs of other types of education—business and industry courses for employees, study in organized groups (extension, adult education, labor union and club courses, etc.), and "systematic self-education" (correspondence courses and the like). Clark and Sobkov stress the unreliability of their statistics concerning these other kinds of education, but their study at least directs attention to the fact that much educational activity goes on outside the regular school and college system and to our need to know more about these activities.

One should not leave this subject without mentioning that parallel efforts to measure the resources devoted to education are going on in other countries besides the United States. In estimating educational investment in the United Kingdom for 1953, Wiles attempted to include the costs of industrial apprenticeships and of adult education.[10] His study was followed by a thorough attempt by Vaizey to piece together estimates of total expenditures on education in the United Kindgom in the years 1920–55.[11] Vaizey has also attempted some tentative international comparisons in a document prepared for the Organization for European Economic Cooperation.[12]

[10] P. J. D. Wiles. The Nation's Intellectual Investment. *Bulletin of the Oxford University Institute of Statistics*, 18: 279–90, August 1956.

[11] John Vaisey. *The Costs of Education*. London, George Allen & Unwin, 1958.

[12] John Vaisey. Some Notes on the Relation Between Economic Growth, Social Change, and Investment in Education. Paris, Organisation for European Cooperation, 1959, processed. *See also* F. Edding. *Internationale Tendenzen in der Entwicklung der Ausgaben für Schulen und Hochschulen*, Kiel, processed, 1958.

So far we have been talking about attempts to measure the gross investment in education or the value of new education acquired in a given year. There have also been attempts to measure *net* investment, or additions to the stock of education, minus depletions of that stock in a given year, and to measure the stock itself. There are some difficult problems here, just as there are in measuring the stock (or net additions to the stock) of physical capital. Among other things it is necessary to distinguish between the stock of education embodied in the labor force, which might be called the active stock, and the stock of education embodied in the whole population or the population of working age, some of which is not actively in use.

Schultz makes a start by simply aggregating the number of years of education embodied in the labor force at different points in time, adjusting for changes in the length of the school year.[13] (He makes a similar computation for the population over 14.) He evaluates different stocks in terms of the cost of reproducing them in 1956 prices. The differences between these estimates for successive years would yield estimates of net investment in education in the following sense: the cost of education of new entrants to the labor force, minus the cost of the education of those dying or leaving the labor force. This is the sense in which Wiles computes net investment in education in the United Kindgom.[14]

Schultz and Wiles do not allow for depreciation of human capital. They treat a man's education as having a constant value over his lifetime, a value which drops suddenly to zero when he dies or leaves the labor force. Physical capital, however, is generally treated as though it were used up, not all at once, but gradually over its lifetime, its value falling to zero over a period of time. Human capital ought to be treated in the same way if meaningful comparisons are to be made, either over time or with physical capital. Clearly the same number of completed school years is more valuable if embodied in a relatively young labor force than if embodied in a relatively old labor force, since the young labor force will be producing for a longer time in the future—a point that Schultz recognizes, but does not adjust for. Moreover, educational capital, like physical capital, not only depreciates, it obsolesces. Some would question whether the quality of education has risen over time, but few would deny that recently acquired knowledge is most applicable to current problems and procedures.

[13] Theodore W. Schultz. Education and Economic Growth. In National Society for the Study of Education, Sixtieth Yearbook, Nelson B. Henry, *ed.*, part 2, *Social Forces Influencing American Education, 1961*, Chicago, University of Chicago Press, 1961.

[14] Wiles, op. cit.

Hansen computes the value of the stock of education in the United States at the college level in 1949—applying Schultz' cost of production estimates to the college education held by each age group and then allowing for straight-line depreciation (but not for obsolescence).[15]

One way of avoiding the depreciation problem (and acquiring some others) is to abandon the cost-of-production approach altogether and to estimate the value of the stock of educational capital on the basis of its expected future yields, discounted at some appropriate interest rate. The value of a given amount of education embodied in a young man in this type of computation is high because it is expected to yield an income over a long period, while the value of the same education embodied in an older man is less, since much of the income yield is a thing of the past. There are at least three difficulties, however: (1) The only measure we have of the yield of education is the average difference in income between persons with different amounts of schooling. This may not be a very good measure, because amount of education is closely related to ability and to other things that affect incomes. (2) One cannot predict future incomes according to education with much confidence and must generally rely on cross-sectional distributions of income by age and education at a given moment. (3) The results depend heavily on the discount rate chosen.

Renshaw has made some rough calculations of the present value of the educational capital embodied in the labor force by this method and finds that they do not differ drastically from Schultz' cost-of-production estimates.[16]

Along the same lines a recent paper by Weisbrod suggests some interesting comparisons between regions on the basis of the value of their human capital.[17] He makes the point that for some purposes the value of human capital in different regions as measured by expected future income is a better gage of economic well-being than is current income. A region with a high proportion of young people may have a comparatively low per capita income, especially if a large proportion of the young are enrolled in school and college, but it may have much better income prospects than a region with an older population, a higher proportion of which is in the labor force. Weisbrod computes expected income per capita for four cities on the assumption that income, survival rates, and labor-force participation rates by age remain constant. He does not explicitly intro-

[15] W. Lee Hansen. Rates of Return on Human Versus Non-human Investment. Economics Department, University of California at Los Angeles, draft papers October 1960.

[16] Edward F. Renshaw. Estimating the Returns to Education. *Review of Economics and Statistics*, 42 : 318–324, pt. 1, August 1960.

[17] Burton A. Weisbrod. An Expected-Income Measure of Economic Welfare. St. Louis, Washington University, Economics Department, processed, March 1961.

duce education into his computations, although this would be a logical improvement and might yield some interesting suggestions about the incentives for interregional migration by people at different age and education levels.

Although the "expected income" approach has not been employed very much in estimating the total value of educational stock in being, it has frequently been used in computing the value of a specific amount of education to an individual planning to undertake it. Several years ago Glick and Miller wrote an article in which they estimated the lifetime incomes of persons with varying amounts of education, based on average (mean) income by age and education in 1949.[18] They were not the first to look into this question. Walsh, for example, had written an article in 1935 in which he estimated lifetime incomes by education, including specific types of professional education, from an assortment of cross-sectional age-income studies.[19] The Glick and Miller study, however, received a great deal of attention and set off a chain reaction of other related work. The most quoted figure from the Glick and Miller article was their estimate that the lifetime income of the average male college graduate was about $100,000 more than that of the average male who never went beyond high school. Despite the explicit objections of Glick and Miller to this interpretation, $100,000 was widely referred to as "the value of a college education."

Some of the arguments against this interpretation were stressed by others. Houthakker, for example, pointed out that estimates of the Glick and Miller type were based on income before taxes and that no attempt had been made to discount future incomes back to the time at which the decision to acquire the education was made.[20] A dollar now is clearly more valuable than a dollar 10 years from now, and the rate at which the future income is discounted is important. The income of college graduates is more heavily concentrated in the later years of life than is the income of high-school graduates, so that the college graduate's advantage dwindles as the rate at which the future is discounted goes up. This is very clearly shown in Houthakker's illustrative computations.

Bridgman focused on another difficulty: the fact that college graduates have higher average ability than high-school graduates.[21] This,

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[18] Paul C. Glick and Herman P. Miller. Educational Level and Potential Income. *American Sociological Review*, 21: 307–312, June 1956. *See also* Herman P. Miller, ch. 9 of this publication.

[19] J. Raymond Walsh. Capital Concept Applied to Man. *Quarterly Journal of Economics*, 49: 255–286, February 1935.

[20] H. S. Houthakker. Education and Income. *Review of Economics and Statistics*, 41: 24–28, February 1959.

[21] D. S. Bridgman. Problems in Estimating the Monetary Value of a College Education. *Review of Economics and Statistics*, 42: 180–184, August 1960, pt. 2.

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coupled with fragmentary evidence that persons with more ability have larger incomes even when they do not have more education, would indicate that part of the "value of a college education" is just the value of being more intelligent. Bridgman also emphasized the very wide dispersion in the incomes of both high-school and college graduates.

Whatever the interpretation of the differentials between college and high-school graduates' lifetime incomes, it would be interesting to know whether they have been widening or narrowing over time. The number of college graduates has been increasing so fast that one might expect their relative advantage over high-school graduates to have declined. According to a recent article by Miller, however, there is no evidence of such a decline since 1939.[22] In fact, after adjustment for price changes, the ratio of average lifetime income of college graduates to that of high-school graduates (as shown by cross-sectional data for 1939, 1946, 1949, 1956, and 1958) has been very nearly constant between 1.5 and 1.7.[23]

Renshaw [24] suggests that there may have been a substantial fall in the lifetime-income advantage of college graduates between 1926 and 1939, but the reliability of the data for 1926 is open to question.

The main reason for wanting to know the "value" of a higher education is to compare this value with the cost in order to see whether higher education is a profitable financial investment. Another way of looking at the same problem is to compute the rate of return obtained on the cost of a higher education and compare this with rates obtained on alternative investments.

The profitability of higher education can be looked at from the point of view of the individual or from the point of view of society as a whole. The individual, presumably, is interested in the relation between the expected increase in his own income if he invests in higher education and the cost of that education to himself. This, among other considerations, is relevant to his choice of career.

Walsh, and Friedman and Kuznets, looked into the profitability of various types of higher education from the point of view of the individual—the *average* individual, that is. Walsh found the average value of a college education, as well as of legal and business school training, to be considerably greater than the cost to the average recipient (discounting at 4 percent).[25] Friedman and Kuznets, though critical of some of Walsh's procedures, supported his general con-

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[22] Herman P. Miller. Annual and Life-time Income in Relation to Education, 1939–1959. *American Economic Review*, 50: 962–985, December 1960.

[23] Ibid., p. 984.

[24] Renshaw, op. cit. (Note that Renshaw's estimates are of median, rather than mean, lifetime incomes.)

[25] Walsh, op. cit.

clusions.[26] They were principally interested in explaining the existing income differentials between professional and other workers and among the various professions. They came to the conclusion that training costs alone explained only part of these differentials. For example, they estimated that in order to earn a reasonable return (4 percent) on the average direct and indirect cost of the additional training required to enter medicine, the average physician would have to have an annual income 17 percent higher than the average dentist.[27] In fact, the average income of physicians seemed to be about 32 percent higher than that of dentists in the period they were examining, indicating that the average physician was receiving a good deal more than a 4-percent return on the costs of his training.

More recent and more complete evidence on rates of return in the professions and their implications for career choice is being examined by Hansen.[28]

A thorough review of the evidence on rates of return on investment in higher education has been undertaken by Becker at the National Bureau of Economic Research.[29] Becker is not much concerned with the rate of return to individuals on the costs to them, although he does compute such rates. After adjustments for differences in color, ability, unemployment, and certain other factors—adjustments not made by Walsh or by Friedman and Kuznets—Becker estimates that the mean lifetime income advantage (after taxes) of college graduates over high-school graduates, as computed from age-income data for 1940, represented about a 12.5-percent return on the average private costs of college attendance. This estimate is for urban white males only, the returns for other population groups being apparently somewhat lower. By 1950, the private rate of return seems to have dropped to about 10 percent largely because of increases in the income tax.

These returns seem high enough to encourage a considerable increase in college going, but as Becker points out they are not really relevant to the question he wants to answer: Could national income be increased by changing our level of investment in higher education? To answer this question one needs to know what rate of return society as a whole is getting on the resources devoted to higher education and how this compares with rates of return obtained on resources devoted to other types of investment. The social return on education will differ from the private return for two reasons: (1) because not all the costs of higher education are borne by the individual, and (2) because not all

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[26] Milton Friedman *and* Simon Kuznets. *Income From Independent Professional Practice.* New York, National Bureau of Economic Research, 1945, chs. 3 and 4.

[27] Ibid., p. 126.

[28] W. Lee Hansen. "Shortages" and Investment in Professional Training. Economics Department, University of California at Los Angeles, draft paper, 1961.

[29] Preliminary results are reported in his article, Underinvestment in College Education? *American Economic Review,* 50: 346–354, May 1960.

the income produced by the education accrues to the individual who obtains it.

The first point is easier to cope with than the second, since reasonably good estimates can be made of the total resources going into higher education. On the second point, one component of the social return on educational investment is the income tax paid by an individual on additional income attributable to his education. Other components, such as the spillover effects on the incomes of other people, are not so easy to measure, and Becker does not attempt to measure them. He simply computes the rate of return that equates the average total cost of college education per student with the value of the average difference in lifetime incomes of high-school and college graduates before taxes (after adjustments for ability and other differences). Becker estimates that for urban white males, this rate was about 9 percent both in 1940 and in 1950, and that for other population groups it was probably lower. The 9 percent does not seem very high when compared with Becker's estimate of an average rate of return on business capital of about 8 percent. Becker concludes that, if his computations are substantially correct, persons who argue that increasing investment in higher education relative to other investment will enhance economic growth will have to show that this increased educational investment is likely to contribute to raising national income through effects on the incomes of others than those educated.

Even though Becker's full study has not yet been published, it has already aroused considerable discussion. The discussion centers on the implications for economic growth of his comparisons between rates of return on educational investment and rates of return on business investment. Becker has been criticized—perhaps somewhat unfairly, since he explicitly limits himself to consideration of direct returns—for neglecting the indirect economic benefits of educational investment. If investment in the education of individuals raises, not just their income, but the whole income distribution—through its effects on research and development or through other indirect means—then the total rate of return on education will be higher than the private return measured by Becker. Attention has also been called to Becker's omission of the fact that education is desired as a public and private consumption good for its own sake, not just as an investment in future income. If a part of the resources devoted to education is intended as consumption, then the rate of return on that part which is intended as investment is higher than the rate of return on the total.[30]

In this connection, Denison has pointed out that whether the persons spending for education think of themselves as consuming or investing

[30] Both of these points are made in Henry H. Villard's discussion of Becker's paper in the *American Economic Review*, 50 : 355–378, May 1960.

is not as important as whether these resources would have been used for consumption or investment if they had not been spent on education. Families that reduce their consumption in order to pay for education might not do so to make other types of investment even at a higher return; and the taxes that support public spending for education reduce consumption as well as investment. Hence, additional investment in education may make a positive net contribution to economic growth even if the rate of return on this education is considerably lower than that on business investment.[21]

On somewhat more technical grounds, Becker's juxtaposition of different types of rates of return has been questioned. Hansen points out that Becker averages the return on the stock of business capital (current income expressed as a percentage of the value of existing business capital) and compares it with an internal rate of return on education (the rate that equates the present value of expected income from education with its cost). According to Hansen's computations, the average rate of return on the stock of educational capital is considerably higher than the comparable rate of return on capital in manufacturing.[22]

It should be noted that even if one could compute comparable rates of return in education and in business for the recent past, one would have to be cautious in their interpretation, not only for the reasons already stated, but also because the education "industry" is not composed of profit-maximizing firms. When one compares rates of return in two segments of the business sector to see which one seems to be more profitable, one is assuming that the firms in the industry are already exploiting the most profitable opportunities since they are forced to do so by the necessity of competing with each other in the marketplace. This assumption is dubious, even in manufacturing, and it is much more so in education. Heavily subsidized educational institutions are not forced to compete with each other to increase the economic benefits passed on to the student. They may be missing opportunities on which the rates of return are high.

Taking quite a different approach, Denison has attempted to measure the role of education in economic growth in the United States from 1929–57 and its possible role in future growth.[23] In a series of computations too complicated to describe here, he uses adjusted income differentials between education groups in 1949 to convert changes in the amount of formal education embodied in the labor force into changes in the size of the labor force that are estimated to have the same impact on output. He assumes that a given percentage change

[21] Edward F. Denison. *The Sources of Economic Growth in the United States and the Alternatives Before Us*, draft of a book, March 1961, p. 126–128.
[22] Hansen, op. cit. See footnote 15.
[23] Denison, op. cit., ch. 7.

in the size of the labor force and in the value of capital produces a constant percentage change in output throughout the period—what the economists call constant returns to scale. On these assumptions he attributes over a fifth of the 2.9-percent average annual growth rate in the period 1929–57 to increases in the quality of the labor force associated with more formal education. He also indicates that prospects for further contributions from education to raising the growth rate in the future, while by no means negligible, are less spectacular than in the past, on account of the high level of education already achieved.

Before leaving the subject of human capital, we should mention other studies that have looked at somewhat the same information from the opposite point of view—namely, studies that attempt to explain features of the income distribution on the basis of differences in education (generally assuming constant returns to educational investment). In a theoretical article, Mincer has shown that, on some quite plausible assumptions, the fact that different occupations require different amounts of training can be used to explain the well-known but mysteriously unsymmetrical shape of the distribution of personal income.[34]

Others have looked at education as an explanation of income differences between particular groups. Zeman, for example, found that differences in education went a long way toward "explaining" (in the statistical sense) the differences in income between white and nonwhites in the United States.[35] Friedman and Kuznets' efforts to explain differences in income between different professions on the basis of education have already been mentioned. A recent article by Keat focuses on the narrowing of wage differentials between skilled and unskilled workers which has occurred in this century and the possible role of education in explaining this phenomenon.[36] Keat indicates that the costs associated with apprenticeship to a skilled trade (mainly income forgone) are lower than they used to be, presumably because much of the training formerly given to apprentices is now acquired by almost everyone in school. If rates of return on these apprenticeship costs had been constant, one would have expected the differentials in later-life income between skilled and unskilled workers to have narrowed over time, which is exactly what has happened.

All this adds up to no more than a good start on a very difficult set of problems. After years of neglecting the obvious, economists have finally "discovered" investment in human beings. They have begun to think of the resources devoted to education as, at least in part, a type of investment, to be considered alongside other types of

[34] Jacob Mincer. Investment in Human Capital and Personal Income Distribution. *Journal of Political Economy*, 66: 281–302, August 1958.

[35] Morton Zeman. *Quantitative Analysis of White-Nonwhite Income Differentials in the United States*. Doctoral dissertation, University of Chicago, 1955, ch. 4.

[36] Paul G. Keat. Long-Run Changes in Occupational Wage Structure, 1900–1956. *Journal of Political Economy*, 68: 584–600, December 1960.

investment as a means of achieving economic growth. They have begun to look for ways of measuring this investment in education at cost and for ways of estimating its yield.

A great deal remains to be done. Much of it will be grubby, unglamorous work—digging out statistics and making estimates of gross and net investment in education and the value of the educational stock in the United States and other countries for a sufficient number of years to permit some real analysis. Very hard work will also have to go into obtaining better measures of the economic benefits of education both to the individual who gets it and to society as a whole. Estimating private returns is the easier problem, but we must have much better information on earnings according to type of education, ability, and other complicating factors before we can have much confidence even in these estimates. Estimating social returns is much harder and it will probably never be possible to do it very satisfactorily. Nevertheless the social returns must not be forgotten and an effort must be made to identify them and to find at least approximative ways of estimating their magnitude. This is absolutely necessary if economists want to give any guidance to policy makers on desirable levels of national investment in education.

II. Supply and Demand Problems: Students and Trained Manpower

The first question which those who make decisions about education generally want answered is: How many students do we have to plan for? What will enrollment be 5 or 10 years from now? Perhaps because college enrollment has grown rapidly and fairly steadily for a good many years, educators have come to think of it as having an inexorable trend of its own with which they have to cope, rather than as something under their control. They have clamored for enrollment projections on which to base their future plans, and the Office of Education and others have attempted to produce such projections. The usual method has been to estimate enrollment ratios (college enrollment as a percentage of the population in the college age group, sometimes broken down by sex) for the recent past, to fit a trend to these ratios and project it into the future, and then apply the projected ratios to estimates of the college-age population in future years.[37]

Such trend projections can be useful if they are not taken too seriously, but several things about them should be remembered. One is

[37] For some refinements of this method, see Louis Conger, ch. 1 of this publication. Earlier examples include: Fund for the Advancement of Education, *Teachers for Tomorrow* (Fund for the Advancement of Education Bulletin No. 2), November 1955; Educational Policies Commission, *Higher Education in a Decade of Decision*, Washington, the Commission, 1957, p. 31; Ronald B. Thompson, "Projected College Enrollments, 1950–1975" [by States], *College Blue Book*, ninth edition, 1959, p. 919–934.

that the tendency of young people to go to college is influenced by their family income, their parents' education, their estimates of job opportunities, and so forth, not just by the march of time. Projecting a time trend in enrollment is therefore a substitute for trying to estimate the effect of changes in these other variables. Furthermore, enrollment projections cannot be very useful to decision makers until they are broken down into different types of enrollment (full time and part time, graduate and undergraduate, etc.). A beginning has been made toward recognition of variables in projections of enrollment, as illustrated by Conger's estimates in chapter 1 of this publication.

Finally, and most important, enrollment itself depends on the policies adopted by educational institutions, particularly as to the level of tuition, the availability of scholarships and loans, the distribution of college facilities, and the type of education offered. When educators ask, "What is enrollment going to be?" they are really asking the wrong question. The right questions are, "What would enrollment be if certain policies were adopted?" and "What policies should be chosen in order to obtain the size and quality of college enrollment the Nation needs?"

Much effort has gone into studies of college going among high school graduates in recent years, directed at finding out how many able students do not go on to college and why they do not.[28] In general, these studies have shown that the probability of a student's going to college is strongly related to his ability, his sex, and his parents' education or occupation. The nearness of a college also seems to exert a positive influence. These studies have not yielded much direct evidence on the influence of financial factors on college attendance, since little information has been collected on the income and assets of the students' parents or on how the college costs of the students that attend are financed.

A few surveys have been made of parents. One was directed at finding out how many parents expect their children to go to college, how much they think it will cost, and what plans they are making to pay the costs.[29] Another focused on the costs incurred by students

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[28] The most important national study is reported in Charles C. Cole, Jr., *Encouraging Scientific Talent*, New York College Entrance Examination Board, 1956, and Educational Testing Service, *Background Factors Relating to College Plans and College Enrollment Among Public High School Students*, Princeton, N.J., April 1957, processed. There have been at least a dozen State studies, including: Ralph F. Berdie, *After High School—What?* Minneapolis, Minn., University of Minnesota Press, 1954; J. Kenneth Little, *Explorations Into the College Plans and Experiences of High-School Graduates; a State-Wide Inquiry*, University of Wisconsin, School of Education, September 1959; Wendell W. Wright and Christian W. Jung, Why Capable High-School Students Do Not Continue Their Schooling, *Bulletin of the School of Education*, Bloomington, Ind., Indiana University, Division of Research and Field Services, vol. 35, January 1959.

[29] Elmo Roper *and Associates*. *Parents' College Plans Study* (a report to the Ford Foundation), processed, 1959. *Also see* Brazer and David, ch. 2 of this publication.

actually or recently in college, the incomes of their families, and the ways in which the expenses were paid.[40]

These studies of college going, although numerous, have been of limited usefulness because most of the samples have been too small to support statistical analysis of several variables at once, and no one study has collected information both from the students and from their families.[41] Hence we are still a long way from being able to estimate the separate effects of ability, achievement, family resources, nearness of a college, costs of different kinds of colleges, and so forth, on the probability that a student will apply for college entrance, and from being able to use these estimates to make projections of what enrollment might amount to if certain policies were adopted. In other words, we have not succeeded in making useful estimates of what economists would call "the demand for college education."

We have been talking about the market for college education—a market in which potential students furnish the demand and colleges and universities furnish the supply. When the students complete their education most of them move on into a new market—the market for labor services—in which they are among the suppliers. A good deal has been written in recent years about "shortages" and "surpluses" in this market, not all of it enlightening.

Harris published a book in 1949 in which he predicted that by the end of the 1960's, there would be a substantial "surplus" of college graduates.[42] By this he meant that large numbers of college graduates would be seeking professional and executive jobs, would be unable to find them, and would have to settle for lower status jobs in which they would be underutilized and dissatisfied. Harris estimated that 70 percent of all employed college graduates in 1940 were in professional occupations. He assumed that 70 percent of future graduates would continue to seek professional employment. If they were forced into other occupations by lack of professional openings, they would constitute a "surplus."

Harris was right in predicting that as the number of college graduates increased, the proportion going into the professions would decline—a trend already discernible at the time he wrote. But there is no evidence that many of the college graduates now going into other occupations are disappointed seekers of professional jobs. What Har-

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[40] John B. Lansing, Thomas Lorimer and Chikashi Moriguchi. *How People Pay for College.* University of Michigan, Survey Research Center, September 1960. *See also,* Ernest V. Hollis. *Costs of Attending College.* U.S. Office of Education, Bulletin 1957, No. 9. Washington, U.S. Government Printing Office, 1957.

[41] Some of these deficiencies may be remedied by a study in progress at the University of Pittsburgh. This study, referred to as "Project Talent," is based on a large national sample of high-school students.

[42] Seymour E. Harris. *The Market for College Graduates.* Cambridge, Mass., Harvard University Press, 1949.

ris did not foresee was the growing acceptance of college as preparation for a wide variety of occupations outside the professions and the accompanying shift in college curriculums toward preparation for these occupations—witness the growth of business education at the college level.

Even if college-trained persons in jobs outside the professions are not manifestly dissatisfied, one might question whether their education is being fully utilized. This suggests the possibility of trying to measure the amount of education required to operate the economy at its present level and comparing that amount with the education actually embodied in the labor force—a problem to which Eckaus addresses himself.[43]

Predictions of "surpluses" have been much less frequent in recent years than predictions of "shortages"—particularly predictions of shortages in particular professions such as teaching, medicine, and engineering. "Shortage" is an ambiguous term and has been used in several different senses, often without adequate definition.[44]

By a "shortage" of a particular type of manpower, an economist usually means a situation in which the demand for this type of specialist at current wages has suddenly increased so that some jobs are going unfilled. Unless there are wage controls or other restrictions imposed on the market, this situation will not persist for long. The firms or clients to whom these specialists are most valuable will bid them away from others and/or induce more of them to enter the labor market by offering higher wages. Firms or clients to whom it would not be profitable to pay the higher wages will have to reorganize their activities so as to use less of these specialists' services. To find a shortage in the economist's sense, one would look to see whether there were large numbers of positions open at current salaries which could not be filled, and then one would inquire what kinds of artificial restriction or market stickiness were preventing the pay from rising and eliminating the "shortage" by attracting a larger supply of specialists and allocating them to activities in which they were most valuable.

The word "shortage," however, frequently appears in the literature in quite a different sense, meaning a situation in which there are fewer of a particular type of specialist than the person alleging that a shortage exists thinks there *ought* to be. By "teacher shortage," for example, most people do not mean that there are many unfilled positions at current salaries, but that the positions are filled with persons who are not as qualified as they should be or who are teaching a larger number of students than is pedagogically desirable. Those who pre-

[43] Richard S. Eckaus. Ch. 8 of this publication.

[44] For a discussion of various possible meanings and their implications, see A. A. Alchian, K. J. Arrow, and W. M. Capron. *An Economic Analysis of the Market for Scientists and Engineers.* Santa Monica, Calif., The Rand Corp., processed, June 1958.

dict future shortages in particular professions usually mean that if present rates of entry into the profession continue, there will not be as many doctors per thousand population or as many college professors per thousand students as they believe there should be.[45] This meaning of "shortage" should be carefully distinguished from the usual economist's meaning because the remedy for it is quite different. This "shortage" will not disappear if the market mechanism is allowed to operate freely. That mechanism may be operating very well indeed. The "shortage" will only diminish if the demand for the specialists increases enough to bring about an increase in their pay and to call forth an increased supply. The "teacher shortage" will be abated only if society decides to devote more resources to hiring teachers, and whether or not it will do this depends on how it values this use against other uses of the same resources.[46]

The word "shortage" has been used in a third sense, indicating any situation in which the wages of a particular group are rising, so that a given sum of money does not purchase as great a volume of their services as it used to. This is a rather unfortunate use of the word, but a few economists have adopted it. Blank and Stigler, for example, defined a shortage as a situation in which the "number of workers available [the supply] increases less rapidly than the number demanded *at the salaries paid in the recent past*" [their italic], and hence salaries are rising.[47] Applying this standard, Blank and Stigler found that there had been no "shortage" of engineers in the period 1929–54. In fact, engineers' salaries had declined relative to those of all workers and to those of some other professions. However, Hansen has reexamined this and more recent evidence and he indicates, among other things, that a substantial Blank and Stigler type "shortage" of engineers, especially those starting in their profession, did develop between 1953 and 1958.[48]

The reason the Blank and Stigler use of the term "shortage" seems unfortunate is that "shortage" is definitely a pejorative word. If one alleges that there is a "shortage" of something, one is implying that there is some misallocation of resources, which should be corrected. But a rise in wages is no evidence of that. Indeed, it is through

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[45] For examples of this type of manpower projection, *see* Dael Wolfle, *America's Resources of Specialized Talent* (The Report of the Commission on Human Resources and Advanced Training), New York, Harper & Bros., 1954; Fund for the Advancement of Education, *Teachers for Tomorrow* (Fund for the Advancement of Education Bulletin No. 2), 1955; and National Manpower Council, *A Policy for Scientific and Professional Manpower*, New York, Columbia University Press, 1953, ch. 7–11.

[46] For a discussion of these points, *see* Procter Thompson, Manpower Allocation and the Pricing Process. *Journal of Political Economy*, 63: 441–445, October 1955.

[47] David M. Blank and George J. Stigler. *The Demand and Supply of Scientific Personnel*. New York, National Bureau of Economic Research, 1957. p. 24.

[48] W. Lee Hansen. The "Shortage" of Engineers. *Review of Economics and Statistics* 43: 251–256, August 1961.

changes in wages and prices that a free market operates to insure optimum resource allocation.

Here again, economists have just made a start on some very difficult problems. They have begun, belatedly, to apply the useful tools of supply and demand to the market for college educations and the market for college-educated people. But a great deal more work needs to be done before we can gain much understanding of how these two markets work or of the interrelations between them, and before we can use this understanding accurately to predict the effect of policy changes on the numbers of persons seeking higher educations or the job opportunities that will confront them.

III. Financing of Higher Education

American higher education is financed in an extremely complicated fashion. Anyone who is not already impressed by this should try explaining it to a foreigner. Our system, if it can be described as a "system," consists of nearly 2,000 institutions of widely different types, supported by various combinations of student fees, gifts and grants from private sources, and subventions from at least three levels of government. Ideally, economists would like to be able to provide answers to two sets of questions—questions about how the present system works and questions about the probable advantages and disadvantages of shifting to different methods in the future.

Even the first set of questions is hard to answer. The main source of information on where the money for higher education comes from and how it is spent is the Office of Education's *Biennial Survey of Education*. This provides some facts about the amounts obtained by higher educational institutions from different sources (student fees, Federal payments for research, State governments, etc.) and the broad categories of expenditure to which the funds are devoted (instruction, organized research, libraries, etc.). Although the categories are broad and may not be consistently interpreted in different years by different institutions, the Biennial Survey data provide a useful starting point for studying higher educational finance, and it is surprising that they have not been analyzed more thoroughly than they have.

For example, the Biennial Survey data have received only limited examination on a State-by-State basis. In 1952 the Council of State Governments published a useful volume, based primarily on the Biennial Survey, giving State statistics on income and expenditures of educational institutions, by sources of funds and type of institution, as well as information on enrollments, migration of students, and other subjects. Unfortunately, the last year covered by these

tables was 1950 and no attempt has been made to keep them up to date.[50]

Some State-by-State comparisons were made by Hungate, using 1951–52 data.[50] He produced tables showing State rankings in expenditures for resident instruction per full-time equivalent student and per college-age person in the State population and in relation to State income. He also studied the financial implications of student migration, indicating which States were "deficit" States—in the sense that they spent less on the education of out-of-State students than other States spent on the education of the students from deficit States.

A more detailed study of higher education expenditures and sources of income by States (1957–58) was made by Mushkin and McLoone for 16 States.[51] They separated out amounts spent by higher educational institutions in actually educating students (as contrasted with other activities) and compared the States with regard to the amount of such expenditures per college-age person in the State and per full-time equivalent student. They examined the sources of such funds in the different States and noted especially the extent to which students and their families contributed through tuition payments and the amount of tax support. They included some information on the tax support of private institutions and State scholarship aid to students, and related both the tax support and the private contributions in the 16 States to per capita personal income.

This kind of basic statistical analysis of public and private efforts to finance higher education in relation to needs and resources is useful and ought to be available for all States on a regular basis.

The role of the Federal Government in financing higher education has recently attracted particular attention, and considerable research effort has been devoted to studying Federal programs that affect higher education and in trying to establish what their impact has been. The American Assembly held a session on "The Federal Government and Higher Education" in 1960 and published a volume of background papers giving a brief history of the Federal programs and discussing some of the issues they raise.[52]

The Carnegie Foundation for the Advancement of Teaching is currently supporting a study on the relationships of the Federal Government with higher education, directed by Reuben Gross. About

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[50] Council of State Governments. *Higher Education in the Forty-eight States.* Chicago, the Council, 1952.

[50] Thad L. Hungate. *A New Basis of Support for Higher Education.* New York, Teachers College, Columbia University, 1957.

[51] Selma J. Mushkin and Eugene P. McLoone. *Student Higher Education; Expenditures and Sources of Income in Sixteen Selected States.* Washington, D.C., National Planning Association, 1960, processed. *See also* Selma Mushkin, ch. 14 of this publication.

[52] Douglas M. Knight, ed. *The Federal Government and Higher Education.* The American Assembly. Englewood Cliffs, N.J., Prentice-Hall, 1960.

20 representative institutions are participating in the study, providing information on the amount and type of Government support they receive according to department, the extent to which their faculty members are involved in federally financed programs, the criteria used in accepting or rejecting Government money, and other subjects. A report on this study is expected in 1962.

The U.S. Office of Education is also engaged in a review of Federal programs, with J. Kenneth Little of the University of Wisconsin in charge of the review. Under this program the Office is supporting a study by Harold Orlans at the Brookings Institution on the impact on higher education of Federal activities. As in the Carnegie Foundation study, information is being collected from a group of representative colleges and universities. The emphasis is on ways in which Federal activities have affected the quality of education, especially the teaching of undergraduates, and the extent to which greater use could be made of colleges and universities that are not now participating to any great extent in Federal programs.

Two other general studies of the Federal Government and its relations to higher education have recently been completed; one by Homer D. Babbidge, Jr., and Robert Rosenzweig (to be published in 1962); and one by the author of the present chapter.[58] Both of these have used information obtained mainly from Federal sources, rather than data collected from the colleges and universities themselves.

While these various studies of Federal activities in higher education have somewhat different emphases, it is clear that there has been some duplication of effort here and that more might have been learned with the same expenditure of time and money if there had been better communication among the organizations supporting research in this field. It is also clear that many questions remain unanswered, largely because no one can say what would have happened to American higher education in the absence of Federal programs.

By comparison the effort devoted to comprehensive study of State and local financing of higher education seems to have been disproportionately small. Many States have recently made studies of their own higher education systems, some covering all the institutions in the

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[58] Alice M. Rivlin. *The Role of the Federal Government in Financing Higher Education.* Washington: Brookings Institution, 1961. In addition to these general studies, there have been a number of more intensive studies of the development and functioning of particular types of Federal activities affecting higher education. *See,* for example, Charles V. Kidd, *American Universities and Federal Research,* Cambridge, Mass., Harvard University Press, 1959; Edward D. Eddy, *Colleges for Our Land and Time; The Land-Grant Idea in American Education,* New York, Harper & Bros., 1957; Gene M. Lyons and John W. Masland, *Education and Military Leadership: a Study of the ROTC,* Princeton, N.J., Princeton University Press, 1959. *See also* Roy E. Moor, ch. 18 of this publication.

State and some just those receiving State support.[54] These studies are of varying quality, but many of them contain information about costs of providing different types of higher education and the ways in which State and local governments contribute to these costs—the use of earmarked taxes and general appropriations, criteria for apportioning State money, forms of aid to private institutions, etc. No one has tried to bring together the data presented in these studies to form a national picture, or to fill in the gaps by obtaining information directly from the States.

Many of the State studies contain projections of higher educational "needs" 10 or 15 years in advance, with recommendations on how to meet these needs, and there have been some attempts to make this type of projection on a national level.[55] Typically, needs have been estimated by taking one of the trend-type enrollment projections mentioned earlier in this paper, making an arbitrary assumption about costs per student, and multiplying one by the other. Then amounts to be expected from sources such as tuition payments and contributions by private philanthropy are roughly estimated and the rest of the check is assumed to be picked up by some level of government. The amount expected from private sources may reflect, implicitly or explicitly, the views of the person making the projection about how much of the burden of higher education ought to be borne by such sources.

Making projections is a hazardous art at best, but clearly necessary to rational planning. It would be useful for someone to do a more thorough and better documented job of projecting costs of higher education and revenues for meeting them than has been done to date. The effect of specific assumptions about the future on the projections should be indicated; for example, of alternative enrollment projections, of different proportions of full-time and part-time students, of different proportions in junior colleges and other types of institutions, of alternative assumptions about class sizes, faculty salaries, and other components of costs. It should not be forgotten that enrollment itself will be affected by the means of financing (especially by the level of tuition) and by the type of facilities provided, and that costs per student may be affected by the size of enrollment.

Considerable effort has gone into estimating the capacity of the States to meet future demands for public services in general and

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[54] Council of State Governments. *Reports on Higher Education: An Annotated Bibliography of Recent Reports of State Study Commissions and Other Official Agencies.* Chicago, the Council, March 1958, processed. More recent ones are listed in the Office of Education's monthly publication, *Higher Education.* *See also* Selma J. Mushkin, ch. 14 of this publication.

[55] *See* Dexter M. Keezer, *ed. Financing Higher Education, 1960–70.* New York, McGraw-Hill Book Co., 1959, especially the papers by Seymour E. Harris and Robert D. Calkins; *also* Council for Financial Aid to Education, *Where's the Money Coming From?* New York, the Council, 1959.

public education in particular, often as a background for deciding whether or not increased Federal aid to the States would be desirable.[56] Higher education by itself, however, is a small item in State and local budgets, compared with elementary and secondary education or roads or welfare programs. Hence expenditures on higher education by State and local governments need not be closely related to their overall fiscal capacity, but depend on the priority assigned to higher education in the hierarchy of State and local needs.

One study of State and local taxes, however, should be mentioned here because of its specific focus on higher education. Pitchell of the Bureau of Government Research at Indiana University is conducting a study of State and local taxes in a group of representative States, with the object of determining the extent to which corporations support State institutions of higher education through their payments of taxes. He is endeavoring to estimate the portion of State and local taxes (exclusive of some earmarked for specific purposes) which are paid by corporations and the portion of these taxes that go to support higher education.[57]

Lastly, mention should be made of a few of the many recent proposals for altering the means of financing education, especially higher education. One of the most frequent proposals involves changing the Federal tax laws to allow parents to deduct part or all of the college expenses of their children from their taxable income or even from their Federal tax liability.[58]

A much more fundamental change in the tax treatment of education has been proposed by Goode.[59] He points out that the Federal income tax discriminates against persons who choose to invest in themselves through education rather than in physical capital. He suggests that the student himself be allowed to write off the costs of certain kinds of education against his taxable income over a period of years, just as he is presently allowed to write off investment in physical capital goods.

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[56] For general studies of State capacity, *see* Selma J. Mushkin, "The Fiscal Capacity of the States," National Tax Association, *Proceedings of the Fifty-first Annual Conference*, 1958, p. 297–306; Dick Netzer, The Outlook for Fiscal Needs and Resources of State and Local Government, *American Economic Review*, 48: 317–327, May 1958. For specific focus on education, *see* Procter Thomson, "Federal Aid to Public Education," a Study Prepared for the Committee for Economic Development, January 1959 unpublished; Seymour E. Harris, *More Resources for Education*, New York, Harper & Bros., 1960; Jesse V. Burkhead, Financing Education, *American Economic Review*, vol. 47, May 1957. Burkhead has a study in progress at Syracuse University entitled "State and Local Tax Bases for the Support of Education."

[57] *See* Robert J. Pitchell, ch. 15 of this publication.

[58] John F. Meck. The Tax Credit Proposal, in Seymour E. Harris, *ed.*, *Higher Education in the United States, the Economic Problems.* Cambridge, Mass., Harvard University Press, 1960. p. 93–95: Homer W. Turner. The Prospects for Private-Sector Support of Higher Education in Dexter M. Keezer, *ed. Financing Higher Education 1960–70.* New York, McGraw-Hill Book Co., 1959. p. 248–250.

[59] *See* Richard Goode, ch. 17 of this publication.

Among the many other tax proposals is Robert Heller's suggestion to encourage State and local governments to raise taxes for education by allowing individuals to deduct these increased payments from their Federal income tax.[60]

Harris has argued for substantial increases in tuition at both private and public educational institutions, accompanied by greater reliance on student borrowing.[61]

Friedman and Vickrey separately have made suggestions for encouraging students to borrow to finance their education by allowing them to repay a percentage of their future income rather than a fixed sum with interest.[62]

In addition, there has been an abundance of less original, but presumably more feasible proposals for expanding or otherwise altering existing programs of scholarships and loans, Federal and State grants, etc. Unfortunately, the legislators who must act on these proposals are seldom given more than sketchy guesses about their possible effects on higher education and its distribution. Economists have a great deal more work to do before they are able to provide projections of the probable effects of alternative policies so that appropriate decisions on the financing of higher education can be made.

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[60] Robert Heller. A Proposal for Financing Tax-Supported Education. *Harvard Educational Review*, 28 : 214–215, summer 1958.

[61] Seymour E. Harris. Charging the Student Tuition on the Basis of Costs. *Educational Record*, 40 : 24–29, January 1959; and College Salaries, Financing of Higher Education, and Management of Institutions of Higher Learning. *Bulletin of the American Association of University Professors*, 44 : 559–595, summer 1958.

[62] Milton Friedman. "The Role of Government in Education," in Robert A. Solo (*ed.*), *Economics and the Public Interest*. New Brunswick, N.J., Rutgers University Press 1955; and William Vickrey, ch. 16 of this publication.

APPENDIXES

APPENDIX A

Summary of the Sampling Procedures Used in "Patterns of Family Change" Study

Harvey E. Brazer and Martin David

THE MAJOR OBJECTIVES of the study "Patterns of Family Change" required a versatile sample of the United States population which would meet three major requirements. First, the sample was to provide reliable data on a group of families with relatively low incomes. For these families the study attempts to determine causal factors related to their income position, aspirations of the family, the probability that their children will receive an adequate education, and the attitudes that might be related to planning horizons, dependency, and achievement motivation. Second, the sample was to provide a group of middle- and high-income families whose aspirations, attitudes, and accomplishments could be compared with those of the low-income group. This would establish the extent to which differences in these attributes were connected with income position. Third, the sample was to provide an unbiased representation of all families in the United States for the purpose of determining the distribution of nonmoney income, property taxes, benefits from public education, and other measures which were developed in this study or which have not been available for a cross section of the United States population for some time.

These three requirements for the sample can be achieved by a variety of sampling plans. The sample design selected included interviews with a cross section of the United States and supplementary interviews with low-income families. The supplementary interviews were chosen in such a way that they could be combined with the cross-section interviews by suitable weights.

The low-income families are thus represented by twice as many interviews, reducing sampling errors of statements made about them, but these interviews have weights half the size so that they do not dominate and bias statements about the whole population, or about groups containing both low and high incomes.

In fact, the weights also adjust for differential response rates in substrata of the sample, reducing possible bias from this source as well.

We chose to oversample families with a spending unit head of working age (under 65) whose per capita income was low:

If the family contained—	*Selection was made of those whose total family income was less than—*
1, 2, or 3 members	$2,000
4 or 5	3,000
6 or 7	4,000
8 or more	5,000

The criteria for choosing low-income families selected approximately one out of every eight families for the low-income supplement. The supplement was chosen from the 1960 Survey of Consumer Finances which interviewed about 2,800 families. When nonresponse is taken into account, the supplement thus yielded interviews with spending units in about 300 families. A new, independent cross-section sample was drawn and added to bring the total sample to approximately 3,000. It was felt this sample would be sufficiently large to provide reliability in estimating the relationships which were of interest to the researchers.

The cross-section samples for both the Patterns of Family Change Study and the 1960 Survey of Consumer Finances were selected from the Survey Research Center's national sample of dwellings.[1] This

TABLE 1.—Sample size, interviews and noninterviews by spending unit and family classification for the cross section and reinterview sample

Item	Cross section sample		Reinterview sample	
	Number	Percent	Number	Percent
Occupied dwellings	3,013		381	
All spending units	3,390	100.0	[2] 390	100.0
Interviews	2,692	79.4	305	78.2
Noninterviews	698	20.6	85	21.8
Refusals	360	10.6	26	6.7
Respondents not at home, and noninterviews for other reasons	338	10.0	59	15.1
All families	[1] 3,095	100.0	[2] 427	100.0
Interviews	2,513	81.2	296	69.3
Noninterviews			90	21.1
Refusals	326	10.5	36	8.4
Respondents not at home, and noninterviews for other reasons	256	8.3	54	12.7
Families not selected in the sample [3]			41	9.6

[1] Includes 8 cases which have double weights because they were selected at half the sampling rate. Includes 1 case which was eligible for both the cross section and reinterview samples. Thus the actual number of families interviewed is only 2,800; i.e., [(2513−9)+296].

[2] 8 spending units who were interviewed are included in the nonresponse because interviews with other spending units in the family were not completed. Failure to complete interviews with all spending units in a family made it impossible to estimate the family income and several other critical financial variables.

[3] Reinterview response rates shown for family units include an estimate of the number of low-income families who were never contacted during the first wave of interviewing on the 1960 Survey of Consumer Finances. These families could not be selected for the reinterview sample as no information was available.

[1] A detailed description of this national sample is available on request from the Survey Research Center, University of Michigan, Ann Arbor.

is a multistage, area probability sample that gives equal chance of selection to dwelling units in the 48 States.[3]

Dwellings on military reservations are excluded from the universe. Also excluded are persons living in large rooming houses, residential clubs, and hotel rooms; inmate quarters or other institutional accommodations not qualifying as dwelling units; and other similar places.

Figures on actual sizes of the cross-section and reinterview samples, numbers of interviews and noninterviews by spending units and families are summarized in table 1.

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[3] For the dwelling unit definition, *see* U.S. Department of Commerce, Bureau of the Census, *1960 Census of Housing*, vol. I, pt. 1, p. xvi.

APPENDIX B

A Calculation of Income Forgone by Students: Supplement to "The Nation's Educational Outlay"

Rudolph C. Blitz

I. Schultz' Method of Calculation

IN A RECENT PAPER Prof. Theodore W. Schultz estimates by an ingenious method the earnings forgone on the part of high school and college students during the years 1900, 1910, 1920, 1930, 1940, 1950, and 1956.[1] His procedure involves the following steps:

He assumes that there are no earnings forgone on the part of students while attending the first eight grades. Because of the availability of certain key data, he takes 1949 as the base year for his calculations. Treating separately male students and female students in high school and in college and using four age groups, 14–17, 18–19, 20–24, and 25–29, he takes the actual earnings of each of these age groups and estimates from census data that show the proportion of each group that worked a certain number of weeks per year, and the average weekly income earned by each age-sex group. He assumes also that students have to forgo on the average 40 weeks of such earnings, and he therefore estimates that in 1949 a high school student had to forgo $583, and a college student $1,369. He then expresses these forgone earnings in terms of the average weekly earnings of workers in manufacturing in the United States in 1949, which amounted to $54.92. This means that a highschool student had to forgo the equivalent of 11 weeks of average earnings in manufacturing, and a college student the approximate equivalent of 25 weeks of average earnings. Assuming that the same relationship prevails between (1) the earnings of the various age groups that make up the high school and college population and (2) the average earnings in manufacturing, Schultz calculates the income forgone by students for each of the 7 years previously mentioned. Thus, according to his calculation, in 1956 the average high school student, while in school, had to forgo $881, and the average college student $2,003.

[1] Theodore W. Schultz. Capital Formation by Education. *Journal of Political Economy*, 68: 571–83, December 1960.

In this method there appears to be a downward bias, especially for the younger age groups. The main causes of the downward bias are discussed briefly.

First, the most important sources for Schultz' findings are two special census reports of 1950, one on *Employment and Personal Characteristics* and the other on *Education*.[1] One gives a percentage distribution of the persons in different age groups who in 1950 worked 1 to 13 weeks, 14 to 26 weeks, and so forth, and the other gives the median income in 1949 of persons 14 years old and over, by years of school completed. These census data do not separate earnings of casual workers from those of regular workers. Since three-quarters of the population of high-school age are actually in high school, the majority of them hold only casual jobs and do not realize their full potential in the labor market, and this in turn will cause a downward bias.

Secondly, most of the casual workers, who are attending school at the same time, are not working a full 40-hour week, but considerably less than 40 hours; yet the census calculation of "median weekly earnings" makes no allowance for this.

Thirdly, even if we had, for the population of high-school age, separate data on the median income of the "casuals" in the labor market (the actual high-school population) and on that of workers employed full time (50 weeks or up) who do not attend school, a calculation of income forgone by the students on the basis of the income earned by nonstudents would still contain a downward bias. This could occur because racial and environmental factors or the lower intelligence of the full-time workers of high-school age will reduce their income potential in comparison with that of students.

Fourthly, in the case of students the casualness is especially bunched during the summer months. In earlier years long summer vacations were largely justified by the seasonal needs of farms. With progressive mechanization of agriculture, the needs for casual agricultural labor have probably decreased, but the proportion of young persons of high-school and college age who are actually attending school is growing. It is therefore likely that comparison of the incomes of the casually and the permanently employed high-school and college age population is becoming more and more unfavorable for the casual workers who are actually attending school.

Fifthly, Schultz calculates the income forgone by the school population by multiplying the median income of each group by the number of students in the group. This procedure, however, is bound

[1] It is unnecessary to describe here in any detail the source and nature of various auxiliary data used by Schultz, because they have no effect on the biases under consideration.

to introduce a further downward bias, since for income-distribution data the mean is generally above the median. At the same time, the mean would appear to be the appropriate measure for calculation of the income forgone by students as the mean represents the total income of the group divided by the number in the group.[5] In computing the arithmetic mean from the income-frequency distribution in the estimates presented below the problem of open-end distributions was met as follows: If the lower end of the distribution was open, the midpoint was set after consideration of such factors as overall distribution, type of employment, and income supplements such as tips. If the upper end was open, Pareto's income law was used to determine graphically the midpoint of the highest group.[6]

II. Empirical Studies

Drawing on five studies of actual earnings of the school-age population, an attempt is made here to ascertain the historical trends in such earnings as a basis for estimating earnings forgone by those in school.[7]

Empirical studies used for comparison with Schultz' calculations

Years for which data are given	*High-school age*	*College age*
1899–1923	Brissenden study	
1907	1907 study	
1947	Louisville study	
1956	Harrison County (W. Va.) study	Indiana study.

[5] EDITOR'S NOTE:

Professor Schultz in commenting on an earlier draft of this study noted that four factors were omitted from his analysis of *Capital Formation by Education:* namely, (*a*) differences in ability and earning capacity between young people of school age at work and those of similar age in school, (*b*) the lower earnings levels of young persons in the labor force for brief periods only, (*c*) earnings of the students while they attend school, (*d*) the higher unemployment rate among young people than in the labor force as a whole. The first two of these factors "would increase earning forgone and two would decrease them." Schultz pointed out that in the study presented here, account is not taken of the factors which tend to decrease average earnings forgone, particularly "earnings from jobs that many students hold while they attend school—earnings that are not forgone." The earnings surveys on which the present study draws also generally do not reflect the lower earnings of agricultural workers.

[6] For a discussion of this method, see R. G. D. Allen. *Mathematical Analysis for Economists.* London, Macmillan Ltd., 1956. p. 222, 401–408.

[7] These five sources are: (1) P. F. Brissenden. *Earnings of Factory Workers,* 1899–1927, Census Monograph No. 10, Washington, D.C., 1929 (referred to hereafter as the Brissenden study). (2) *Report on Conditions of Women and Child Wage-Earners in the United States* (in 19 volumes). Vol. 7, "Conditions Under Which Children Leave School To Go to Work," S. Doc. No. 645, 61st Congress, 2d sess. (referred to hereafter as the 1907 study). (3) U.S. Bureau of Labor Standards, "Hunting a Career, a Study of Out-of-School Youth in Louisville, Kentucky," Bureau of Labor Standards, Bulletin No. 115, Washington, 1949 (referred to hereafter as the Louisville study). (4) Naomi Riches, "Education and Work of Young People in a Labor Surplus Area," *Monthly Labor Review,* 80: 7, December 1957 (referred to hereafter as the Harrison County (W. Va.) study). (5) Wendel W. Wright and Christian W. Jung, "Why Capable High School Students Do Not Continue Their Schooling," *Bulletin of the School of Education,* Indiana University, vol. 35, January 1959 (referred to hereafter as the Indiana study).

These studies indicate that the income forgone by high-school students is substantially larger than was calculated by Schultz, the difference in estimates of income forgone by college students, is not as great as for high-school students. Schultz' calculation of income forgone by high-school students is more affected by downward biases than is his calculation concerning college students. However the data drawn from the empirical studies include agricultural earnings with the exception of the Indiana study.[6] Particularly in earlier years a very large proportion of children were employed in agriculture. It is conceivable that the discrepancy between Schultz' estimate and the data of these empirical studies could be explained by the difference in earnings between children in agricultural and other jobs in agriculture are substantially lower than their wages in other occupations, and a large proportion of employed children historically were in agriculture, the wages reported in the four studies that exclude that occupation are higher than the income data used by Schultz.[7] Unfortunately we have been unable to discover any systematic study of children's earnings in agriculture. The problem is sufficiently important, however, to justify a few brief comments.

In spite of the large proportion of young people employed in agriculture, less than 10 percent of the total labor force were in agricultural employment in 1956 and only 23 percent of persons aged 15–24 were living on farms.[8] These figures are relevant to the understanding of a hypothetical situation in which the entire high-school and college population would be in the labor force. Although it is difficult to gain an accurate conception of such a situation, these figures suggest that, if the entire student body entered employment, the proportion employed in agriculture would be smaller than the proportion of employed young people in agriculture today. The fact that the latter proportion is so large may be explained in part by the relatively low agricultural incomes, which causes young people living in rural areas to seek early employment. Other factors accounting for this phe-

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[6] The Brissenden study is limited to manufacturing; the 1907 study includes all industries except agriculture; the Louisville study and the Harrison County study cover trade and service industries and manufacturing.

[7] Even as late as April 1947 one-half of the employed juveniles of 14 and 15 years in the United States were in agriculture, and a fourth of those 16 and 17 years, according to Elizabeth S. Johnson in "Employment Problems of Out-of-School Youth," *Monthly Labor Review*, 65: 673, December 1947. The *Current Population Report* of January 1956 (Series P–50, No. 64), p. 8, states that in October 1955—a month of high demand for agricultural labor—one third of the employed boys 14–17, both enrolled in school and not enrolled, were employed in agriculture. Of the employed 18- and 19-year-olds, 13.8 percent went in agriculture and enrolled in school, and only 9.6 percent of those not enrolled in school. For more detailed information on the proportions of adolescents employed in agriculture between 1870 and 1930, *see* U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population, 1940, and *Comparative Occupation Statistics for the United States, 1870–1940*, Washington, D.C., 1943, p. 97.

[8] *Statistical Abstract of the United States, 1959*, p. 24, 219.

nomenon may be the institution of the family farm and the lax enforcement of school attendance laws in many rural areas.

THE BRISSENDEN AND THE 1907 STUDIES

The Brissenden study of the earnings of factory workers between 1899 and 1927 gives figures on the average earnings of children under 16 in the years 1899, 1904, 1909, 1914, 1919, 1921, and 1923. On the basis of payroll statistics published in the *Census of Manufactures* and of other data, Brissenden estimates full-time annual earnings for various age-sex groups based on a 51-week year. I have chosen to use his estimate of "full-time annual earnings" rather than of "actual earnings," that is, full-time earnings corrected for unemployment, since the former figure is comparable with Schultz' "unadjusted" figures.

Data reported in the 1907 study are from a Department of Commerce and Labor survey of 622 children between 7 and 17 years of age in two Northern and two Southern States, who had left school and were employed. Their median age was 14. They were employed in a wide variety of manufacturing, trade, and service industries; the majority, 56.5 percent, worked in the textile industry. In 1907 the weighted average weekly wage of these boys and girls was $4.41.

In the following table, figures on annual earnings of children, quoted from these two studies, are compared with Schultz' figures for the years in question.

TABLE 1.—Earnings forgone while attending high school, as calculated by Schultz, compared with such forgone earnings as reported in two empirical studies, selected years, 1899–1923

Year	Average weekly earnings, all manufacturing [1]	Annual earnings forgone while in high school (Schultz) [2]	Annual earnings forgone while in high school, based on two empirical studies [3*]
1	2	3	4
			BRISSENDEN STUDY
1899	8.19	90.00	140.40
1904	9.17	100.87	156.80
1909	9.96	109.56	174.00
1914	11.15	122.65	191.20
1919	22.7	244.97	382.00
1921	22.69	249.59	390.00
1923	24.12	265.32	411.60
			1907 STUDY [4*]
1907	10.04	110.44	176.40

[1] *Historical Statistics of The United States, 1789–1945*, a supplement to *Statistical Abstract of the United States, 1949*, Series D, p. 134–144.

[2] Col. 2 items multiplied by 11, equivalent weeks of manufacturing earnings.

[3] For 1899–1923: P. F. Brissenden, *Earnings of Factory Workers, 1899–1927*. Census Monograph 10 Washington, D.C., 1929, p. 94.

[4] *Report on Conditions of Women and Child Wage Earners in the United States*, vol. 7, op. cit., p. 159–160.

*NOTE: For complete comparability with Professor Schultz' findings, only the earnings of children 14–17 should be included. However, Brissenden does not give income data by age, but simply for "children under 16." In the 1907 study, wage data are given by age. For consistency, we have not used this clarification in the body of the table. The text says that the children studied in 1907 ranged in age from 7 to 17, and it is probable that Brissenden's age figures cover a similar range. The average weekly wage of children 14–17 in the 1907 study was $4.60, or $184 for the 40-week period.

For each year the empirical studies give a figure for income forgone that is more than 50 percent higher than Schultz' figure for the same year.[9] In evaluating the results, however, a number of points should be kept in mind.

Different methods are used by Brissenden and Schultz in the construction of the wage series on which the figures are based, and these differences account for about half of the variation in findings. The series on average wage in manufacturing which Schultz uses in his calculation of income forgone is taken from a study by Paul H. Douglas, in which Douglas also compares his method with that of Brissenden.[10] Because of differences of method, Brissenden's figures are for the years used here consistently about 23 percent higher than Douglas' figures. The figures we have taken from the Brissenden study are, however, for the various years between 55 and 59 percent higher than those of Schultz. This explanation does not apply to the 1907 study. The data on children's wages presented in that report were obtained by direct questioning and do not depend on any estimation procedure. For this reason it is particularly interesting to note how consistent the 1907 figure is with the figures from Brissenden's study. The 1907 figures are, in fact, 60 percent higher relative to Schultz' figures and thus, slightly higher than are Brissenden's.[11]

THE LOUISVILLE STUDY AND INCOME FORGONE BY HIGH-SCHOOL STUDENTS

The Louisville study, made in the spring of 1947, contains much information on the very youngest workers in full-time employment; that is, of the 14- to 16-year-olds. The study has the additional advantage that the proportion of whites to Negroes in Louisville is close to the national average.

Almost half of the school dropouts had withdrawn because of some dissatisfaction with the school environment or because of dis-

[9] In calculating income forgone by students, I followed a procedure adopted by Schultz; namely, to calculate income forgone on the basis of 40 weeks. This assumes, of course, that students are unable to earn an income for 40 weeks because they are preoccupied with studies for this period; they are able to earn income for 11 weeks and 1 additional week is lost because of holidays.

To the extent students hold part-time jobs during the year, this framework exaggerates the income forgone. To a certain extent, however, this double counting is corrected: Many of the students cannot obtain employment for all of the summer, as we assumed. Their seasonal unemployment is really the result of being in school for the rest of the year. (See the *Baltimore Sun*, July 13, 1960, p. 1.)

[10] Paul H. Douglas. *Real Wages in the United States, 1890–1926.* Boston, Houghton Mifflin Co., 1930.

[11] Both the Brissenden study and the 1907 study use the arithmetic mean rather than the median. This may account for some of the difference between the estimates based on these studies and Schultz' findings. For a discussion of the method of computation, see p. 25–30 of the 1907 study and p. 269–286 of the Brissenden study.

couragement about poor grades; only about 20 percent had withdrawn primarily for economic reasons. This indicates that these very young full-time workers constituted an academically inferior group for this age cohort, not a representative group. The intellectual, scholastic, and economic contrast between the dropouts and the students who remained in school is brought out more clearly in the Harrison County study, to be discussed subsequently.

The mean incomes listed here were computed from the data arrived at through interviews with a sample of 524 boys and girls who were out of school and in the labor market.

Earnings of juveniles, Louisville study[1]

Age	*Mean income*	*Percent of universe in sample*
14 and 15 years	$18.32	55
16 and 17 years	28.76	7
18 and 19 years	31.36	4

[1] Data from *Hunting a Career*, op. cit., p. 7, 47. 40 percent of the oldest group had actually graduated from high school, but of the youngest group almost 90 percent had not gone beyond the 8th grade (ibid., p. 20). At the time of the survey, unemployment among these youngsters was heavy. It is probable that the "intensity of jobseeking" in this group was considerably below the average intensity that prevails among the rest of the labor force, since over 90 percent of full-time workers of high-school age live at home.

If we now use the Louisville study for the calculation of income forgone by high-school students in 1956 and compare the findings with Schultz', the following factors should be considered: (1) The Louisville study represents a potentially low-wage group, which is not representative of the high-school population of the United States. (2) The sample contained a preponderance of girls over boys of about 20 percent, but in the actual aggregate high-school population of the United States the ratio of boys to girls is about even.[12] (3) Of the highest age group, 40 percent were high-school graduates. No good method could be improvised to correct for this. However, the upward bias this may cause can only be very minor. Of the aggregate high-school population of the United States, only 7.3 percent were 18 and 19 years old, so that the oldest age group will have a very light weight in our calculation.

Applying the age weights just cited we obtain from the Louisville study an average weekly wage per high-school student of $23.50 for 1947; for the same year Schultz' estimate of the average weekly wage would come to $13.75. From 1947 to 1956, average wages in manufacturing increased from $49.97 to $79.99, or 60 percent.[13] Assuming

[12] Ibid., p. 16. Since in the Louisville study the income distributions are given only by age and not by sex, it was impossible to correct for this factor.

[13] U.S. Department of Commerce. *Business Statistics* (1959 ed.), Supplement to Survey of Current Business, p. 71.

then, as Schultz does, a proportionate increase in the income of the high-school population, we obtain for this group an average 1956 weekly wage of $37.60, or an annual income, based on 51 weeks, of $1,918.[14] This compares with Schultz' figures for the same year of a weekly wage of $22 under assumption of full employment, or $21.38 allowing for a 3-percent incidence of unemployment. The Louisville study therefore yields a figure for income forgone that is 70.7 percent higher than Schultz' full-employment figure. Income forgone per student, calculated on the basis of 40 weeks, would come to $1,504 compared to Schultz' $881, or $855 with allowance for unemployment.[15]

THE HARRISON COUNTY STUDY

The Harrison County (W. Va.) study deals with a recent year, 1956, which is also the last year covered in Schultz' paper. It treats as separate groups the dropouts and the high-school graduates and thereby allows us to get a picture of the relative earnings of the graduates and of the dropouts. In this and other respects, it supplements the Louisville study well.

Harrison County is an area with a high incidence of unemployment. The study in that county includes all who graduated from high school between 1952 and 1955, but did not go on to college, and also those who were enrolled in the 8th to the 12th grades between 1951 and 1955 and dropped out before graduating.[16]

The population of Harrison County is 98 percent white and 97 percent native born. At the time of the study it was subject to little inmigration, but heavy outmigration. One-half of the original study sample had left the county by the middle of 1956, and over 60 percent of the outmigrants were boys. For the great majority of boys, outmigration represented entering military service. By the summer of

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[14] Income forgone per student was also computed, using the median weekly incomes given in the Louisville study, op. cit. (p. 46). Income forgone, computed using the median, was 2.86 percent less than income forgone computed by the mean.

In 1955–56 the annual pay of an unmarried private in the U.S. Army came to $980. According to information obtained from the Department of Defense, the cost of food came to $400 ($1.10 per day), and of clothing, $190. Thus the total income of a private—in cash and in kind—came to $1,570. This figure falls short of any allowance for quarters, medical care, and retirement benefits. Under conditions of a draft one would expect that the military pay should be below the market price.

[15] Some calculations that I made, which cannot be presented here in detail, lead me to the conclusion that the cost of subsistence for a single individual at this time was approximately between $1,400 and $1,500, depending on the age of the individual and the location. It can thus be seen that the figure used for the potential full-time income of the average high-school student, namely, $1,917.60, is well above the subsistence level. On the other hand, Schultz' corresponding full-employment income figure would come to only $1,122. In the face of a great deal of historical evidence pointing in the opposite direction, it does not seem plausible that the average high-school student in the United States in 1956 would fall short by such a substantial margin from earning his subsistence.

[16] There were 3,305 students in these categories: 2,106 were high-school graduates and 1,199 were dropouts. The sample—940 boys and girls—was made up of 25 percent of the graduates and of 33 percent of the dropouts.

1956, 44 percent of the males of the original sample were in military service, as compared with a national figure of 20 percent for 17- to 21-year-old males.

The proportion of high-school graduates going on to college from Harrison County, and its secondary school retention rate, are very close to the national averages. Of the total group of 3,305, mentioned previously, 1,741 were girls and 1,564 were boys. However, because of a high marriage rate and consequent nonparticipation in the labor force, the proportion of girls in the labor force was much smaller. Because of a requirement of work permits for dropouts under 16, only 9 percent of the total dropouts were less than 16 years of age at the time of leaving school. One-third of the dropouts left school as soon as they reached 16. However, another third—mostly repeaters—were 18 or older at the time they dropped out. Of the graduates, none was younger than 17, almost two-thirds were 18, and 26 percent were 19 or older.

The dropouts had lower scholastic achievement and lower IQ scores than the graduates. Many of the dropouts were repeaters, and more than one-third of them, compared to 14 percent of the graduates, had IQ's of less than 85. The dropouts had taken fewer vocational courses, and in this respect were less prepared.[17]

Because Harrison County was in a state of severe depression in 1956, the earnings of these groups were probably markedly lower than those we might obtain from a nationwide sample.[18] By the method described previously, I again calculated means from the given frequency distribution. The values of the medians and means are as follows:

Item	Boys		Girls	
	Graduates	Dropouts	Graduates	Dropouts
Median [1]	$65.00	$52.00	$44.00	$38.00
Mean	75.80	56.42	44.60	32.44

[1] Source: Riches, op. cit., p. 1462.

Therefore, the mean weekly wage for all the graduates would come to $60.05 and the comparable wage for the dropouts would come to $44.43. The corresponding annual full employment incomes for 51 weeks would be $3,063 and $2,266. It will be remembered that from the data reported from the Louisville study, I calculated a potential annual income for high-school students in 1956 of $1,918.

[17] Riches, op. cit., p. 1459–1460.

[18] In the summer of 1956, 13 percent of the school leavers—both graduates and dropouts—were unemployed (ibid., p. 1463), a proportion much above the national average.

It appears, however—to the extent that this can be determined—that the dropouts in the Harrison County study, *at the time they earned the annual income of $2,266*, represented a group whose weighted average age was about 3 years above that of the total high-school population of the United States.

The Harrison County study gives the age distribution at the time of leaving school for all school leavers, boys and girls, both graduates and dropouts, for the years 1951–55.[19] From this I calculated a weighted average age at the time of leaving school, of 18.21 years for the graduates and 16.88 years for the dropouts. I assume that each year's group of graduates and dropouts between 1952 and 1955 had an age distribution closely similar to that of the aggregate group for 1952–55. On the basis of this assumption, which seems reasonable, I use the resulting weighted averages to obtain an average age for these groups as of July 1956, the date of the income figures cited previously.

In July 1956 the average age of all who graduated between 1952 and 1955 could be determined as follows:

Graduating class	*Age as of July 1956*
1955	18.21+1=19.21
1954	18.21+2=20.21
1953	18.21+3=21.21
1952	18.21+4=22.21

The average age of the graduates in July 1956 was 20.71 years, and of the dropouts 19.38 years. During the period of heavy outmigration from the county, the outmigrants probably consisted mainly of older youths who had found the job market at home unsatisfactory. To make allowance for this, the average age of both the graduates and the dropouts who were in the labor market in the county in 1956 was reduced by 1 year—to 19.71 and 18.38 years, respectively. We observe that while the high-school graduates are approximately 1 year and 4 months older than the dropouts, their income exceeds that of the dropouts by about 35.2 percent.

It does not appear possible to correct quantitatively for difference in intelligence among the groups studied and to make calculations of the income forgone by high-school students more representative of the actual capacities of the entire high-school population. The excess of income of high-school graduates over that of the dropouts found in the Harrison County study results from superiority in both intelligence and education, but it is not easy to determine how much should be allocated to one and how much to the other of these two factors. The boys and girls in the Harrison County study are too old

[19] Riches, op. cit., p. 1458.

to provide a suitable basis for an estimate of income forgone by high-school students, and at the same time, since no members of this group intended to go to college, the earnings of this group would not be suitable as a basis for calculating the income forgone by college students. The findings of the Harrison County study, however, support the data of the Louisville study and the Indiana study, both of which are small sample studies. The Harrison County study thus helps to round out the broader picture of the wage structure of adolescents and increases our confidence in the findings of the other studies used here.

THE INDIANA STUDY AND INCOME FORGONE BY COLLEGE STUDENTS

On the basis of data from two sources, I have arrived at a figure for the income forgone in 1956 by students while they were attending colleges and universities. For ages 14–24 these data were obtained from a study of high-school graduates in Indiana who did not continue their education beyond the high-school level. This study was focused on the upper 10 percent (in rank in their graduating class) of the 34,343 boys and girls who graduated from Indiana high schools in the spring of 1955. Of this group, considered to represent potential college material, 908, or 27 percent, did not go on to college. At the time of the study the median age of these high-school graduates was about 19 years. This compares with a weighted average of 20.4 for those between 14 and 24 who were enrolled in colleges or universities in 1956.[20] The mean weekly income of the boys was $49.21 and that of the girls $55.83.[21] These weekly income data were weighted for the proportion of boys and girls aged 14–24 in the college population, and the two figures were averaged, giving a figure of $51.75 as the income forgone by college students during 1 week. During the school year of approximately 40 weeks, they would forgo $2,070 in income. These data, together with other calculations, are presented in the table that concludes this section. It is important to point out that this figure of $2,070 represents the 40-week income of a group that are directly comparable to college students in age, in education (in that

[20] *Statistical Abstract of the United States, 1956*, table 126.

[21] The mean income of the graduates was $54.9 per week. At this rate they would have earned a mean income of $2,810 for a full year's work (51 weeks). This is close to the mean income of high-school graduates in the Harrison County study, which was $3,063. The median age of the two groups of graduates is very similar, 19.78 in Harrison County as compared with 19 in Indiana. In respect to other important characteristics these groups were significantly different: the Indiana study represents a very select group of high-school graduates—the upper 10 percent of the graduating class—and the Harrison County study does not. The Harrison County study represents an area of high unemployment, at the time of the study, and the Indiana study does not.

The phenomenon of the girls earning more than boys in the case of the Indiana sample seems to be explained by the fact—brought out in other parts of the study—that a larger proportion of the boys than the girls who were in the upper 10 percent of their class and did not go on to college were social deviates.

they have at least graduated from high school), and in intellectual capacity.

The calculations of income forgone by students aged 25–29 are based on data from the 1950 U.S. Census of Population special report on education.[22] Although the income figures given in this report for the younger age groups included so many casual and part-time workers that the data do not appear useful for my purposes, the bias appears to be much less in the 25–29 age group. After age 25 there is a sharp drop in the percentage of employed males who work less than 40 weeks of the year.[23] A similar drop occurs among females after age 20.

The first step in arriving at a figure for income forgone by college students in the 25–29 age group was to average, separately for males and females, the 1949 incomes of persons aged 25–29 who had completed 1–3 years of college and those with 4 or more.[24]

The 1949 figure was adjusted for the increase in wages between 1949 and 1956 by applying the percentage increase in wages in manufacturing between these years to my data.[25] For 1956 I obtained a mean income of $4,435 for males aged 25–29 with the specified education and $2,743 for females.

In order to arrive at a figure for income forgone, it was necessary to know the weekly income that these total figures represented. The census report on employment and personal characteristics[26] gives the percentage of those employed in 1949 who worked 1–13 weeks, 14–26, 27–39, 40–49, and 50–52 weeks. The midpoints of 7, 20, 33, 45, and 51 weeks were used, following Schultz' method in calculating the average number of weeks worked. For males the figure was 45 weeks and for females 36 weeks; this gives a weekly income for males of $98.57 and for females of $76.19. As was done with the Indiana data, these weekly income figures were weighted for the proportion of males and females aged 25–29 in the college population, and then averaged, giving a figure of $97.84 as the income forgone by the stu-

[22] U.S. Department of Commerce, Bureau of the Census. *U.S. Census of Population, 1950*, vol. 4. *Special Reports*, part 5, ch. B, Education. Washington, D.C., 1953, table 12, p. 109.

[23] Ibid., part 1, ch. A, "Employment and Personal Characteristics," table 14.

[24] I assumed that at least half of this group consists of graduate students and that no one in this group is a freshman. For supporting evidence see *Biennial Survey of Education, 1954–56*, ch. 4, table 22, p. 49. In his calculations of the income forgone by college students, Schultz uses the median income for each age group as given in the census report on education, weighted for the proportion of that age group in the college population, without regard to years of school completed. An estimate of income forgone by college students should, however, take into consideration the fact that they have all completed 4 years of high school and could earn an income at least equivalent to that of a high-school graduate.

[25] The percentage increase was calculated from data given in U.S. Department of Commerce, Office of Business Economics, *Business Statistics*, 1959 ed., a supplement to the *Survey of Current Business*, Washington, D.C., 1959, p. 71.

[26] U.S. Bureau of the Census, *U.S. Census of Population, 1950*, vol. 4, *Special Reports*, part 1, ch. A, Employment and Personal Characteristics, Washington, D.C., 1953, table 14.

dents during 1 week. During a 40-week school year, $3,914 of potential income would have been forgone by these college students.[27]

To calculate income forgone by all the college students, the figure for each age group was weighted according to the proportion of that age group in the total college student population, the final figure was $2,350.[28]

Income forgone by college students, 1956

Age	40 weeks	51 weeks
14–24 [1]	$2,070	$2,639
25–29	3,914	4,990
Weighted overall average	2,350	2,997

[1] I have used the data from the Indiana study relating to a group whose median age is comparable to that of college students aged 14–24, to represent the income forgone by these students. The figure is not, of course, an actual weighted average of the income of persons 14–24 years old.

III. Concluding Observations

Thus, on the basis of the data previously discussed, my estimate of the income forgone by high-school students in the United States under the assumption of full employment would come to $11,581 million, as compared to Schultz' figure of $6,784 million. For college students the estimates would be $7,041 million and $6,009 million, respectively.[29]

Schultz' calculations have the advantage of being based on the large and representative samples used in the collection of census data. But since the categories were intended for other uses than those to which he put them, it is necessary for Schultz to subject the census figures to considerable statistical manipulation and to make a number of assumptions concerning them, thus introducing a substantial downward bias.

The main weakness of my figures is that they are based on sample data for special regions of the Nation and a question may be raised about their representativeness for the Nation as a whole. The figures

[27] Insofar as it applies to graduate students, this figure is undoubtedly exaggerated, since some graduate students hold research and teaching jobs. Graduate students, however, amount to less than 10 percent of the college population. If we assume that one-quarter of the graduate students, excluding law and medical students, hold such jobs, the overstatement would affect less than 2.5 percent of the total college-student population.

[28] Since the proportion of the college-age group attending college is approximately one-half of the proportion of the high-school age group attending high school, it is probable that the estimate of the income foregone by the college population is significantly more accurate than the estimate of the income forgone by the high school population. The inability to allow for the falling marginal product is a less serious shortcoming in the case of the college population than it is of the high-school population. This means that a more accurate calculation than can be produced here would probably show a greater differential between the earnings forgone by high-school students and by college students than is indicated by my figures.

[29] In his paper Schultz assumes an incidence of 3 percent unemployment. Such an allowance, of course, would not change the relative difference between our respective estimates.

obtained from the five separate studies seem to dovetail closely. Fortuitous circumstances may have caused this consistency, but I hope it is rather due to the fact that the study areas were well chosen and are in their basic characteristics representative of the universe.[30]

The figures presented here based on the five empirical studies exceed Schultz' estimate. The figures for income forgone per high-school students in 1956 are 71 percent above his estimate; for college students the difference is only 17 percent. However, more recent data on part-time employment of students have been called to my attention by Schultz and these new data suggest revisions in the estimates of earnings forgone, which reduce the difference in estimates to 67.5 percent for earnings of high school students and 12.5 percent for earnings of college students.[31]

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[30] EDITOR'S NOTE:

Professor Schultz in commenting on the study noted: "It is exceedingly difficult to go from a few studies of small communities to the United States as a whole. Moreover, in developing estimates of earnings forgone by students, effects of agricultural earnings and of the amounts students receive from jobs while they are in school should not be excluded."

[31] These estimates need to be corrected to reflect additional information on earnings of students in part-time employment both during the school year and during summer vacations. Arnold Katz in a Special Labor Force Report on "The Employment of Students" (U.S. Bureau of Labor Statistics Report No. 6, October 1959), indicated that 22.6 percent of the students 14 to 17 years of age worked for 11.4 hours per week, and 39.8 percent of the students 18 to 24 years of age worked 25.7 hours per week, on the average. In view of the fact that October is not a typical month in a student's work-and-study pattern and also the prior allowance for part time employment, the maximum correction called for appears to be about half that indicated by the October estimates, or 3.2 percent in earnings per high-school student and 12.8 percent per college and university student. (The full allowance for the overestimate, assuming October were representative of the whole school year, may be calculated as follows: if 22.6 of every 100 students 14–17 years old work 11.4 hours per week, they earn wages for 257.64 hours; since it is assumed that they forgo weekly earnings for 40 hours each, or 4,000 hours in the aggregate for each 100 students, the number of hours not worked must be reduced 6.44 percent. The same calculation for the students of college age (18–24 years of age) suggests a correction of 25.6 percent.)

Accordingly, reducing the average earnings forgone by high school and college or university students by 3.2 percent and 12.8 percent, respectively, the resultant figures are $1,456 for 1955–56 and $1,519 for 1957–58 as the earnings forgone per high school student, and $2,049 for 1955–56 and $2,139 for 1957–58 per college or university student.

APPENDIX C

Qualification on Estimates of State Tax Moneys

Selma J. Mushkin

DESPITE THE IMPORTANCE of State governments in supporting student higher education, the facts about this support are far from precise. At times, in fact, information used to record the amount and importance of State financing obscures rather than clarifies the issues. For example, Bureau of the Census data on expenditures of institutions of higher education are used to represent the amounts of State tax funds. These expenditures, however, are financed partly by tuition fees, partly by gifts and grants, and partly by tax funds.

Even data on State and local funds received by colleges and universities as tabulated by the U.S. Office of Education are not adequate to represent State tax funds for student higher education. State and local governments finance a number of activities beyond those included in student higher education. These activities range from materials testing centers used by industry to public concerts and art exhibits. State universities and colleges are used as a base for research on public issues by both legislative and executive agencies and as experimental laboratories for types of farming and industrial operations. They help to carry out programs of rehabilitation, medical assistance, and child health. They have been an important administrative arm of both State and National agencies in agricultural programs. All these and many other similar activities are additional to both teaching and research.

The part of any source of income, such as State and local appropriations, that may be allocated to one rather than another activity of colleges and universities cannot be exactly determined. There are some guides and some information on sources specifically related to a function, for example on gifts set aside for research, or on receipts from products and services, such as sales of creamery products or fees received by a dental school clinic. But necessarily a large element of approximation is involved in attempting to estimate the sources of income used to finance a single function in a multifunction enterprise. A beginning toward identifying State and local funds for student higher education was made by the National Plan-

ning Association study in which information tabulated by the U.S. Office of Education on "current income for educational and general purposes" was used as a base. This figure excludes receipts from operating auxiliary enterprises and amounts received for scholarships and other student aids. Amounts specifically designated for research were excluded from each of the sources of income reported for educational and general purposes. Furthermore, only that part of income from "organized activities related to educational departments" and from "sales and services" of these departments that was in excess of expenditures for these same purposes was included. In addition to funds set aside for research customarily reported to the U.S. Office of Education, research funds from State and local governments and Federal funds for agricultural experiment stations were excluded also.

Additional work is needed in order to provide information on State and local government tax moneys for each of the functions of the institutions of higher education—student education, research, and public services. The data presented in chapter 11 are a beginning toward the development of such estimates. In that chapter a method was developed that offers some promise toward the separation of student higher education from other functional expenditures. The method, in brief, requires the determination of the total expenditures for student higher education and a balancing of receipts to match the aggregate expenditure by identifying receipt items appropriated with purposes clearly other than student higher education; for example, research. The remaining revenue items are then prorated to balance the expenditure total. One exception is made to this proration, namely, tuition, because tuition paid by the students is intended by the students to be used exclusively for their education.

Table 1 shows local funds for higher education and the percent that these funds are of total State and local current funds, for the various States, for the regions, and for the Nation as a whole.

TABLE 1.—Local funds for higher education (current funds only): amount and as a percentage of total State and local current funds,[1] 50 States and District of Columbia, 1957–58

[Amounts in millions]

State and region	Total, State and local[2]	Local	
		Amount	Percent of total
Total 50 States and District of Columbia	**$1,267.9**	**$121.8**	**10.4**
NEW ENGLAND	37.1	0.9	2.4
Maine	3.6	.1	1.7
New Hampshire	3.7	.1	3.6
Vermont	3.3	.1	3.6
Massachusetts	11.4	.3	2.6
Rhode Island	3.6		0
Connecticut	11.5	.3	2.3

See footnotes at end of table.

TABLE 1.—Local funds for higher education (current funds only): amount and as a percentage of total State and local current funds,[1] 50 States and District of Columbia, 1957–58—Continued

[Amounts in millions]

State and region	Total State and local[2]	Local	
		Amount	Percent of total
MIDEAST	$1,068.7	$331.6	31.0
New York	83.1	28.1	33.8
New Jersey	17.5	.6	3.5
Pennsylvania	28.6	.2	.6
Delaware	3.2		0
Maryland	20.5	.7	3.6
District of Columbia	1.8	1.8	100.0
GREAT LAKES	277.6	15.0	5.7
Michigan	60.7	6.4	7.0
Ohio	40.9	5.7	13.8
Indiana	28.5	.6	1.6
Illinois	71.0	2.6	3.3
Wisconsin	28.5	.6	2.1
PLAINS	137.2	7.6	5.5
Minnesota	22.5	.6	2.5
Iowa	28.6	.5	1.9
Missouri	21.5	1.4	6.4
North Dakota	5.7	.1	1.7
South Dakota	7.2	(3)	.1
Nebraska	14.7	1.4	9.3
Kansas	22.0	3.6	16.3
SOUTHEAST	210.6	7.9	3.6
Virginia	21.4	(3)	.1
West Virginia	14.9		0
Kentucky	12.0	1.3	11.0
Tennessee	18.5	.4	2.6
North Carolina	22.7	.3	1.4
South Carolina	12.3	.2	1.6
Georgia	17.9	1.6	8.7
Florida	27.1	.5	1.9
Alabama	16.0	.6	3.6
Mississippi	12.4	2.7	21.7
Louisiana	23.5	.5	.8
Arkansas	12.9	(3)	0
SOUTHWEST	109.5	8.7	7.9
Oklahoma	21.2	.1	.4
Texas	68.4	7.3	10.7
New Mexico	9.0	.5	5.5
Arizona	10.9	.8	7.0
ROCKY MOUNTAIN	50.1	2.8	5.6
Montana	11.9	.1	1.1
Idaho	6.6	.7	10.4
Wyoming	4.8	.4	8.3
Colorado	16.7	1.5	9.0
Utah	10.1	.1	1.1
FAR WEST	270.5	56.7	21.0
Washington	35.2	1.2	3.3
Oregon	22.0	.5	2.2
Nevada	2.6		0
California	205.4	54.9	26.7
Alaska	1.7	.1	5.8
Hawaii	3.6		0

[1] Includes State and local funds (other than research) reported as current income by colleges and universities and also State scholarship and expenditures and other expenses of State higher education agencies.
[2] Totals may not add due to rounding.
[3] Less than $50,000.

SOURCE: Computed from U.S. Department of Health, Education, and Welfare, Office of Education, unpublished preliminary data compiled for "Statistics of Higher Education," Biennial Survey of Education in the United States, 1956–58, ch. 4, sec. II, tables 1 and 2, and from unpublished data compiled from State fiscal offices by the U.S. Department of Commerce, Bureau of the Census, for *Compendium of State Government Finances in 1958*.