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92d Congress
2d Session

JOINT COMMITTEE PRINT

THE ECONOMICS OF FEDERAL SUBSIDY PROGRAMS

A COMPENDIUM OF PAPERS

SUBMITTED TO THE

JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES

PART 4—Higher Education and Manpower Subsidies

AUGUST 28, 1972

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE
72-463 WASHINGTON : 1972

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 65 cents

LETTERS OF TRANSMITTAL

AUGUST 25, 1972.

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the Members of the Joint Economic Committee and other Members of Congress is the fourth part of a compendium of papers entitled, "The Economics of Federal Subsidy Programs," submitted to the Joint Economic Committee.

The views expressed in these papers do not necessarily represent the views of members of the committee or the committee staff. They represent studies of a number of subsidy programs, which it is hoped will provide a focus for further hearings and public debate.

WILLIAM PROXMIRE,
Chairman, Joint Economic Committee.

AUGUST 24, 1972.

Hon. WILLIAM PROXMIRE,
Chairman, Joint Economic Committee, Congress of the United States, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is the fourth part of a compendium of papers entitled "The Economics of Federal Subsidy Programs."

The Joint Economic Committee has invited some 40 experts to contribute papers to this compendium which will be published in several parts. The papers in this fourth part are concerned with subsidies that affect the development and use of human resources. They deal with subsidies to finance higher education and subsidies to utilize manpower and reduce poverty.

The committee is indebted to these authors for their excellent contributions which, in conjunction with the study prepared by the staff, should stimulate widespread discussion among economists, policymakers, and the general public on the Federal subsidy system. It is hoped that by focusing attention on the subsidy system this study series will contribute substantially to improvements in public policy and the efficient management of public funds.

Mr. Jerry J. Jasinowski of the committee staff is responsible for planning and compiling this compendium with suggestions of other members of the staff. He was assisted in research and editorial work by Douglas Lee and Jo Culbertson and in administrative and secretarial work by Beverly Park.

The papers contained herein should be interpreted as representing only the opinions of their authors, and not necessarily reflective of the views of committee members or staff.

Sincerely yours,

JOHN R. STARK,
Executive Director, Joint Economic Committee.

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COMPENDIUM AUTHORS

[Alphabetical listing]

FEDERAL AID TO HIGHER EDUCATION: AN ANALYSIS OF FEDERAL SUBSIDIES TO UNDERGRADUATE EDUCATION

By DAVID S. MUNDEL*

SUMMARY AND CONCLUSIONS

Federal higher education policy suffers from a lack of serious review and analysis. Support programs continue to be justified on the grounds that they stimulate certain activities, while their effects are directly contrary to those intended. Higher education policy goals are often public expressions of private wants, rather than socially desired results. Even when stated goals are, in fact, social goals, they are often better served by public support of other, noncollege levels of the education system or of activities which lie totally outside of this system. This paper is an attempt to provide a rational analytic framework to assist the Federal higher education policy process.

There are two general criteria on which higher education policy should be judged:

1. Is the policy appropriate?
2. Is the policy effective?

A Federal higher education policy is appropriate if it directs resources toward students and institutions which produce socially desired outcomes. A Federal higher education policy is effective if it directs resources toward those students and institutions whose educational behaviors (e.g. enrollment) can most significantly be influenced by the provision of subsidies.

Analysis of both of these criteria point in the direction of a Federal higher education policy which targets resources and attention to low- and moderate-income youth. In general, the social benefits which are produced by higher education result more from the education of these students than from that of others. Government subsidies also influence the enrollment behaviors of low- and moderate-income students more than others. Thus an appropriate and effective Federal higher education policy should provide higher subsidies for lower and moderate income youth.

Most existing Federal higher education policies do not target their resources in this direction. Federal student aid programs provide subsidies which are received predominantly by low- and moderate-income youths, but other forms of Federal support tend to counteract their progressivity. One finds that students from higher income families receive subsidies which are essentially equal to those received by lower income students. This is perhaps best illustrated by the following summary table.

*Assistant professor of public policy, John F. Kennedy School of Government, Harvard University.

Average Federal student subsidies,[1] 1966–67

Family income level:	*Dollars per student*
Less than $4,000	640
$4,000 to $6,000	358
$6,000 to $8,000	288
$8,000 to $10,000	280
$10,000 to $15,000	303
$15,000 to $20,000	310
$20,000 to $25,000	304
$25,000 to $30,000	294
$30,000 plus	350

[1] See table 25 of text for derivation.

This analysis of the inappropriateness and ineffectiveness of current Federal higher education policy leads one to dismiss recommendations for simple expansion of existing programs. The following outline of a Federal higher education policy seems much more desirable:

1. Direct grants to students based on family income and college costs.
2. Guaranteed student access to loan funds which have long-term repayment periods and some form of low-income insurance.
3. A program of regulated vouchers to federally aided students for supplementary and compensatory educational activities.
4. A program of grants to institutions based on their enrollment of federally aided students—the size of these grants would be a function of number of students, student grant eligibilities, and the proportion of institution's student body which is eligible for Federal assistance.
5. Contingent loans to institutions with repayment based on the amount of Federal student grant funds expended.

I. Introduction

Federal higher education policy suffers from a lack of serious review and analysis.[1] Support programs continue to be justified on the grounds that they stimulate certain activities, while their effects are directly contrary to those intended. Federal higher education goals are often public expressions of private wants, rather than socially desired results. Even when stated goals are, in fact, social goals, they are often better served by public support of other, noncollege levels of the education system or of activities which lie totally outside the traditionally defined education system.

Without an increase in the review and analysis of higher education policy, the likelihood of Federal policy improving in the future is slight. Federal higher education policy has expanded in scope and magnitude since its beginnings in 1787 when Federal land grants were made to States for the support of institutions of higher learning,[2] but this expansion has not always occurred in response to or with the influence of substantive analysis of the appropriate roles and styles of Federal policy. This lack of analysis has often meant that policies which serve one Federal objective do so at great disservice to other objectives. For example, Federal support for research and development

[1] Higher education policy is not alone in suffering from this affliction.
[2] Alice M. Rivlin, "The Role of the Federal Government in Financing Higher Education," p. 1.

in higher education institutions may have produced more and better science but at the cost of lower quality, undergraduate education in R. & D. performing institutions.[3] Often the lack of analysis, or simple understanding, has meant that Federal policies have had negative impacts on just the objectives toward which they were supposedly aimed. For example, Federal aid for higher education facilities may actually have caused fewer facilities to be constructed than would have been constructed had Federal aid programs not existed.[4] The current debate over future Federal aid strategies appears to have followed the traditional pattern of limited analysis.

"The Current Debate"

In December 1968, the Carnegie Commission on Higher Education issued a special report and recommendations for Federal higher education policy—"Quality and Equality: New Levels of Federal Responsibility for Higher Education." [5] The Commission described "The Nation's needs for higher education."

> Today, the Nation looks to our institutious of higher learning to meet many of our most important needs:
>
> More and more Americans, with aspirations for a better life, assume the necessity of a college education.
>
> Equality of opportunity through education, including higher education, is beginning to appear as a realistic goal for the less privileged young members of our society.
>
> The economy is dependent upon basic research and advancing technology, and upon the higher skills needed to make that technology effective, to assure national economic growth and well being.
>
> More managers, teachers, and professionals of all sorts are required to serve our complex society. More health personnel are essential to staff the fastest growing segment of the national endeavor.
>
> The cultural contributions of higher education take on wider dimensions as rising levels of education and growing affluence and leisure make possible greater concern with the quality of life in the United States.
>
> Above all, the Nation and the world depend crucially upon rigorous and creative ideas for the solution to profoundly complex issues.[6]

In brief, the Commission found "* * * the American Nation needs and expects from higher education * * * quality of result and equality of access." In order to fulfill these needs, the Commission recommended expansion of almost every existing form of Federal aid to higher education plus the development of a sizable institutional aid program which took the form of "cost-of-education supplements." The Commission recommended a federal expenditure level of $13.22 billion for academic year 1976–77 as compared with the 1967–68 level of $3.45 billion.[7] At no point did the Commission's report make explicit either the connection between its policy recommendations and its list of Federal objectives or the meaning of the objectives themselves. The connection is implicit in the following chain of reasoning which one can infer from the report and subsequent Commission documents which deal with the financial problems facing institutions of higher education:

(1) Higher education provides important benefits to individuals and to society at large;

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[3] Orlans found that faculty members felt that "research does reduce the time spent on class preparation" especially for undergraduate instruction. Harold Orlans, "The Effects of Federal Programs on Higher Education," p. 58.

[4] This perverse result is described in D. S. Mundel, "Federal Aid to Higher Education and the Poor," (unpublished), chapter VII.

[5] This report will be called "The Carnegie Report."

[6] "The Carnegie Report," p. 1.

[7] "The Carnegie Report," p. 53.

(2) The level of these benefits which can be expected in the future is a function of the resources which are applied to higher education; and

(3) Non-Federal—that is, private, philanthropic, State, and local—resources for higher education are not likely to be of sufficient magnitude to allow the system to provide the level of benefits which society and individuals "need". Therefore:

(4) The Federal Government should increase the level of support in its existing policy instruments in order to provide more resources for the higher education system.

The logic of this reasoning is clear but the assistance it provides to the making of Federal higher education policy is, to say the least, somewhat limited. In fact, the reasoning provides little help in making allocation decisions between aid to higher education and aid to any sector of the economy. Unless statements regarding objectives are concrete or specific enough to develop criteria by which alternative policies can be evaluated, they are unlikely to lead to an improved choice of policies.

Subsequent to the Carnegie Commission report, a report—"Toward a Long-Range Plan for Federal Financial Support for Higher Education"—was prepared within the U.S. Department of Health, Education, and Welfare in the Office of the Assistant Secretary for Planning and Evaluation.[8] This report went somewhat beyond the Carnegie report in the development of Federal objectives and attempted to develop the connections between policy instruments and Federal goals and to present a view of the conflicts between alternative goals. The Federal objectives it dealt with were as follows: [9]

(1) Increasing the number and proportion of educated people.

(2) Increasing equality of opportunity for higher education.

(3) Improving the quality of higher education.

(4) Preserving diversity in higher education and advancing institutional autonomy and academic freedom.

(5) Strengthening graduate education and institutional research and the public service capabilities of higher educational institutions.

(6) Encouraging the efficient use of resources in higher education.

The limitations in the DHEW report result from a failure to develop an understanding of the Federal goals or needs which are served by the higher education objectives it mentions. For example, the report described the rationale for the first objective in the following way:

> The increasing technological and social complexities of our society demand a larger number of people. Moreover, a larger and larger proportion of Americans aspire to education beyond the high school. Although many other countries restrict opportunities for higher education to a small proportion of the population, it is in the American tradition to expand the proportion of young people receiving higher education.[10]

The Federal goal of following tradition seems unlikely to develop or promote new policy devices which may improve higher education policy.

Private commission reports and Government panel deliberations are not alone in their failure to significantly enhance the higher education policymaking process. Most academic studies of education policy

[8] Note should be made that the author was a principal consultant to the staff preparing this report.
[9] U.S., DHEW, "Toward a Long-Range Plan for Federal Financial Support for Higher Education," p. 3.
[10] U.S., DHEW, op. cit., p. 3.

also tend to neglect the objectives which Government policy is supposed to serve and to ignore the fact that all higher education policies are not justified because some government goal is potentially served by higher education.

A classic treatise on the economics of education is Charles Benson's "The Economics of Public Education." Benson argues that the basis for public support for education rests on the fact that "education provides substantial amounts of social, as distinct from private, benefits." [11] Benson describes two grounds for Government intervention in the private decisions within the education sector: [12]

(1) Divergence between private and social costs—that is, externalities.

(2) Existence of "collective goods" which are not subject to the "exclusion principle."

Benson finds it hard to find strong distinctions between (1) and (2) and concludes that "we should settle for the point that public support of education is justified by the fact that school services produce significant amounts of social, as distinct from private benefits, then proceed to see what some of these social benefits are." [13] Benson's social benefits fall into three broad classes.

The first class includes the impacts resulting from knowledge created by creative, educated men. Benson notes that Alfred Marshall wrote that "the economic value of great industrial genius is sufficient to cover the expenses of the education of a whole town" in his description of education as a national—or public—investment.[14] The second class of benefits concerns the "improvement" in society which results from a more educated populace.

"In a free society, (education) helps to develop greater awareness of, and ability to participate effectively in, the democratic process." This point can be documented by studying, for example, the relation between voter participation and level of education. Further, educated people find it good to live in a society in which they can share insights with other educated people and engage others in discussions to challenge their ideas, et cetera. Education supports the development of the arts and thus offers a contribution to the esthetic environment.[15]

Benefits of this second type provide little insight for the policymaker which helps him to choose among aid to various levels of education or proper aid strategies within any given level of education.

The third class of "collective/social goods" which Benson describes result from the contribution of education to the rate of economic growth. Benson describes neither the level of education from which economic growth is most stimulated nor the "collective goods" which come from a high national income or product. If national income is simply the sum of all individual incomes—from both labor and capital—and if the impact of education on individual income is represented by salary and wage increases which are then summed to create national income gains, then national income is simply the sum of private benefits. Only that part of national income which results from the advancement of knowledge and its application to productive enterprise and for which the knowledge creator is not fully compensated—that is, Benson's first class of social benefits—can be correctly called a collective good.[16]

[11] Charles S. Benson, "The Economics of Public Education" (second edition), p. 30.
[12] Benson, op. cit., pp. 32-35.
[13] *Ibid.*, p. 35.
[14] Alfred Marshall, "Principles of Economics," MacMillan, 1966, p. 179.
[15] Benson, op. cit., p. 35—Quoted in Benson from Burton Weisbrod, "Investing in Human Capital," Journal of Human Resources, summer 1966, p. 16.
[16] Even if all workers are paid their true marginal product, there may still be a part of economic growth which is received publicly and thus may be considered a public good.

Alfred Marshall provides a set of objectives—or orientations—with which an analyst can potentially begin some evaluation of education policy. He makes no pretense of developing policy or connecting policy instruments with Government goals. Marshall writes that "A high education will increase the efficiency of the lower grades of industry" by stimulating the ordinary workman to be mentally active, wisely inquisitive, and more trustworthy. But Marshall is quick to point out that "We must look in another direction for a part, perhaps the greater part, of the immediate economic gain which the *Nation* may derive from an improvement in the general and technical education of the mass of the people." [17] (Emphasis added.) Making explicit the distinction between private and public benefits, Marshall describes the public benefits which result from the creative genius who comes up from the lower classes through education and creates the advances in knowledge and the arts.

> There is no extravagance more prejudicial to the growth of national wealth than the wasteful negligence which allows genius that happens to be born of lowly parentage to expend itself in lowly work. No change would conduce so much to a rapid increase of material wealth as an improvement in our schools, and especially those of the middle grades, provided it be combined with an extensive system of scholarships, which will enable the clever son of a workingman to rise gradually from school to school till he has the best theoretical and practical education which the age can give.[18]

More recently, Milton Friedman has continued to debate the appropriate bases for Government higher education policy.[19] Friedman's famous statement on Government education policy—"The Role of Government in Education" [20]—is basically an attempt to develop "market-failure" basis for Government intervention in education. Friedman identified three basic causes for market failures: (1) the existence of natural monopolies or other market imperfections which limit effective competition; (2) the existence of "neighborhood effects" or externalities; and (3) the ambiguity in ultimate private objectives caused by the beneficiaries of education—children—not being responsible for their own decisions.[21]

Friedman presumes the social benefits to be greatest from the lowest levels of education but says this measurement is beyond the scope of the economist's analytical devices. "The role of an economist is not to decide those questions for the community but rather to clarify the issues to be judged by the community in making a choice," [22]

Thirteen years later, Friedman found that the arguments about the social benefits resulting from higher education "are always vague and general, and always selective in that negative externalities are never mentioned. Even more important, (he knew) of no serious attempt to identify true external effects systematically in such a way as to permit even a rough estimate of their quantitative importance * * *" [23]

Until substantiation of the social benefit claims is done, Friedman (and many critics of large scale federal aid to higher education) feel that "the demand for subsidy in the 'public interest' must be regarded as special pleading pure and simple." [24]

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[17] Marshall, op. cit., p. 175-6.
[18] *Ibid.*, p. 176.
[19] In addition to Friedman, the debates have included John Vaizey, Roger E. Bolton, Gary S. Becker, Martin Meyerson, and other economists and social scientists.
[20] This paper appeared in "Economics and the Public Interest," Robert A. Solo, ed., 1955.
[21] Milton Friedman, "The Role of Government in Education," p. 124 in Solo, *op. cit.*
[22] *Ibid.*, p. 127.
[23] Milton Friedman, "The Higher Schooling in America," The Public Interest, No. 11, spring 1968, p. 111.
[24] *Ibid.*

Special pleading, by self-interested institutions or individuals is unlikely, by itself, to lead to appropriate national policy to serve national goals. It is more likely to lead to national policy which serves the private interests of the special pleaders. This is true whether the pleader is the president of General Motors who claims "what is good for General Motors is good for the United States" or the president of a major university. This paper is an attempt to clarify some issues which will enable national interest to become more dominant in the choice of national higher education policy.[25]

II. The Role of Government in the Higher Education Sector of a Free Society

The proper role of governments in all societies is to provide programs and to promote policies which serve to maximize the social welfare of their constituents. The individual decisionmaker—whether it be a bureau, a profit-making firm, a not-for-profit organization, a family or an individual—attempts to maximize his own private welfare. The basis of government actions is thus the existence of results from private maximization behaviors which prevent the maximization of social welfare.

In some societies, the "rules of the game" which concern the freedom of individual actors to promote their own welfare are of little social value in comparison to the output or consumption of certain goods and services. In such societies, "proper" government policies would be those which increase the production of these valued outputs at the expense of lowering individual freedom. In other societies,[26] these same "rules of the game" may be strongly valued and thus 'proper' government policies are those aimed at protecting individual freedoms—even at the expense of some decline in output. The American society values individual freedom highly and has an established free private exchange economy. In such an economy, the government's proper role is to insure the free operation of the exchange marketplaces and to establish marketplaces in areas in which exchange or transaction are desired by constituents, but for which traditional modes of exchange are either impractical or inappropriate if freedom (in a broad sense) is to be maintained.[27]

As described in *The Economics of Federal Subsidy Programs*,[28] the basis of subsidy programs should be the existence of (1) Public Goods and Social Benefits, (2) Externalities and (3) Market Imperfections. The role of Government in higher education should be based on grounds which are no different from those on which Government action in any other sector is based. Higher education possesses no "sacred attributes" which allow one to do otherwise, although the religious proclamations of its advocates might, if taken at face value, lead one to think otherwise. A wide diversity of objectives is present within each

[25] It should be strongly noted that this analysis will deal with Federal policy toward education (i.e., the transfer of knowledge and information) and not with the Federal role in the production of new knowledge. With this distinction, education will be treated as the process of passing knowledge from one set of individuals to another.

[26] These "other" societies may even be societies at different stages of development. For example, many underdeveloped countries have limited individual freedoms in their efforts to stimulate economic and social development and have later removed or lessened these limitations after development has progressed.

[27] Included in these latter nonmarketable transactions are those by which government establishes and maintains a desired income distribution.

[28] This volume was prepared by the staff of the Joint Economic Committee as a companion to a series of studies of Federal subsidy programs—of which this study is a part.

of these rationales for Federal aid to or intervention in higher education. This diversity makes the development of an appropriate and effective higher education policy a complex and difficult problem.

If all Federal goals were the result of one behavior within the higher education sector—for example, enrollment—then policy choice would be relatively easy in spite of the complex set of Government objectives. The policymaker would simply have to evaluate the impact of each policy or set of policies on total enrollment and choose the one which maximized enrollment. But this level of simplification is regrettably unavailable. Not only is the simultaneous achievement of all Federal goals difficult, if not impossible, when the Government's higher education budget is constrained, but it may also be limited by the operational characteristics of the higher education system itself.

In order to properly evaluate and subsequently make Federal higher education policy, one needs the following components:

(1) A thorough analysis of the impact of each Federal program (and each set of programs) on behaviors within the higher education system and the effect of these behaviors on each of the governmental objectives.

(2) A comparative weighting (or valuation) system which measures the social value of each of the objectives or sets of objectives.

(3) A thorough analysis of the impact of nonhigher-education policies on these same Government objectives.[29]

Combining these components, one could develop an optimal Federal higher education policy. Developing the components themselves is, itself, beyond the scope allowed by our current understanding of either Government objectives or the impact of most Government policies on achieving them. The most common strategy of dealing with complex systems of behaviors and goals under extreme knowledge constraints is to concentrate on each goal separately. Using whatever information is available, the analyst develops a policy mechanism which "best" serves a particular goal. After doing this for each goal, the analyst develops a menu of appropriate policies or programs among which the governmental higher education budget is divided.[30] This form of analysis is appropriate when particular policies have only an impact on a single objective and have no important effects elsewhere in the higher education system. But, higher education is a complex market system in which individuals and institutional behaviors affect several governmental goals simultaneously and the assumption of independence or noninteraction is highly inaccurate. This complexity might force one to await the development of a general higher education system theory before attempting to develop policy, but the luxury of this delay is simply unavailable.

One approach to the policy development problem might be to choose a particular objective and analyze the impact of a range of programs—including some oriented toward other goals—on this objective. An

[29] For example, an important Government objective served by higher education might be crime prevention, but in order to see if a higher education policy is justified for this purpose, one must compare it with alternative crime prevention policies or programs; e.g., street lighting.

[30] This analytical framework is rarely explicit in any analysis or policy recommendation, but it appears to be characteristic of higher education policy analyses. For example, the Carnegie Commission Report, "Quality and Equality: New Levels of Federal Responsibility for Higher Education," contains recommendations for almost every possible type of Federal higher education program because the Commission found them all to serve some possible Government objective.

alternative approach would be to concentrate on a particular group of individuals or institutions within the higher education system and examine the impact of their behaviors on Government objectives and the effect of various Government policies on these behaviors. A third approach is to examine, in detail, the justifications for Federal aid to higher education and attempt to develop an overall framework of guidelines within which policy alternatives may be tested. This third approach is taken in this paper. The framework which is developed will describe the appropriate and effective pattern of Federal higher education subsidies among individuals from different economic backgrounds.

There are two basic reasons why Government support or subsidy programs should treat different individuals differently. They both result from the role of Government in the maximization of social welfare. The first reason is that some individuals may produce more of the benefits which are desired by the society at large. For example, public welfare programs tend to give support to poor families rather than rich ones on the premise that changing the economic position of the former produces more social benefits than similar changes in the latter. The second reason is that Government ought to be efficient in its efforts to stimulate the production of social benefits and thus it ought to avoid paying for public benefits which would have been produced in the absence of such payments. For example, Government health programs may want to subsidize, and thus increase, the care available to poor families as opposed to rich ones, not because the health of the poor is more socially beneficial than that of the rich, but because subsidizing the latter will simply cut their costs and not improve their health. Analytically, these reasons lead to two general guidelines which direct the evaluation of higher education policy alternatives: [31]

I. All else being equal,[32] the individuals whose education provides the larger marginal social welfare should receive the larger subsidies (or fractional price cuts) in order to maximize the the social welfare resulting from the "aid to education" budget.

II. All else being equal, the individuals whose price elasticity for education is greater (i.e., whose amount of education is changed the most, given a price cut or subsidy) should receive higher rates of subsidy.[33]

III. Whose Education Produces Which Socially Desired Outcomes

Public goods and social benefits

The following categories of public goods and social benefits may result from higher education and thus be possible grounds for Government subsidization:

(1) Knowledge.

(2) Economic growth.

[31] These guidelines hold under a constrained Government budget and are rigorously developed in D. S. Mundel, "Federal Aid to Higher Education and the Poor," (unpublished), pp. 96–97.

[32] In this and subsequent contexts, "all else being equal" refers to the other criteria which affect the subsidy distribution guidelines.

[33] If different individuals pay different prices this guideline becomes based on "price elasticity to price ratios" rather than on "price elasticity" alone. (This result is derived in D. S. Mundel, "Federal Aid to Higher Education and the Poor," pp. 222 plus ff.

(3) Political, social, and economic system behaviors.
(4) Geographic mobility.
(5) Social and economic mobility.
(6) Intergenerational benefits.

The first two categories seem, at first glance, to have little if anything to do with the income level or social-economic status of the individual who is being educated. The value of a particular piece of knowledge or the spillover economic growth benefits of a particular technological advance are not determined by the type of family the educated individual was in when he was a youth. The likelihood of a person's education resulting in creative activities which lead to these benefits may, however, be partially, a function of his family as well as the type of education which is acquired.[34] Some families may stress creative behaviors and risk taking in the upbringing of their children while others may encourage their children to perform strictly according to the rules and to avoid "rocking the boat" with behaviors which deviate from the norm. Hypothetically, one would assume that children brought up in the former, rather than the latter, mode would tend to be more creative, and thus when educated, to produce more of the public benefits resulting from knowledge and the resulting economic growth. There appears to be little hard information about the distribution of these family socialization styles among various family types.

This lack of data does not strongly influence our effort to develop decision rules regarding undergraduate education for two reasons. Firstly, undergraduate education probably has considerably less impact on the sort of benefits under consideration than graduate level education. Therefore, interest in creativity benefits should lead to graduate-level support forms rather than to development of undergraduate mechanisms. Secondly, the predictability of eventual creativity is probably so minimal that almost any conceivable subsidy instrument aimed at producing these benefits would be so blunt that its impact would, in all likelihood, be limited. Thus, a more effective set of policies would be those which tend to reward behaviors which create these benefits as opposed to subsidizing training which may develop persons who may be creative. Improving the patent process, supporting research and development efforts, and subsidizing creative artists are examples of policies which fall within this more desirable set.

A second source of national income—economic growth public benefits is probably more affected by undergraduate education. This source results when the improvement of one productive input—in the case of higher education: labor—increases the productivity of other inputs—for example, capital—within the economy.

Although this relationship is relatively easy to conceptualize, making it specific enough to yield insights regarding higher education policy is somewhat more difficult. If education is a good measure of labor quality and average labor quality is the determinant of productivity gains by other inputs, the increases in education would be equally valued regardless of who received them and at what level they were received. This would lead to the decision rule: If all else is equal,

[34] Although this is the first mention of type of education, it does not mean that all education is equally valued from the social welfare point of view. Little is known about the social benefits resulting from the education of different types of people, but even less is known about those resulting from various types or kinds of higher education. Wherever possible, an attempt will be made to develop a theoretical view of these latter effects, but the reader should be readvised about the concentration on the differential treatment of different individuals of this analysis.

all individuals should receive the same subsidy per unit of education acquired. If, on the other hand, these external benefits decline as the level of education—or level of achievement, and so on—increases, the lower levels of education should be more highly subsidized. The reverse may also be true. Knowledge of these relationships might help in developing rules for the subsidization of various levels of education, but they do not, by themselves, lead to social evaluations of education which depend on the family background of the student. If, however, the distribution of human capital[35] among college eligibles is nonrandom with respect to family characteristics, the society may wish to use family background characteristics as subsidy criteria even though they have little causal relationship to the desired social output.[36] For example, if the marginal social output decreases with increasing quality of labor and college eligibles from low-income families tend to have less human capital, higher subsidies to lower-income youth, all else being equal, are justified. As the distribution of human capital among high school graduates became more random—compensatory and redistributive elementary and secondary education programs are aimed at accomplishing this—the justification for this differential subsidy would decline. If this social or public output of human capital exhibits increasing marginal returns, then higher subsidies should go to higher-income youth.

The public benefits from the third category of education-changed behaviors—political, social, and economic system behaviors—which result from higher education, as opposed to lower levels of education, are probably small and thus should not have a major impact on our choice of government higher education policies. The one reason for considering these impacts at the college and university level may be that the increased complexity of a society demands more highly educated individuals to participate in public policymaking. The electorate itself needs to be more educated—but probably not to the college level. But, interest groups within the electorate need even more highly educated spokesmen and leaders to articulate the groups' self interest at the detailed levels of policymaking. These leaders provide important public benefits to the groups which they represent. These benefits decline rapidly as more of the leaders and/or more of the interest group becomes educated, but in general, the smaller the number—or proportion—of a group's members who are college educated, the larger the public benefit created by an additional graduate or enrollee. On these grounds, and the fact that college enrollment increases with income, higher education subsidies aimed at these benefits should vary inversely with income.

The fourth public benefit rationale for Federal Government intervention in higher education is the geographic mobility of educated individuals. If educated individuals produce localized public benefits but are highly mobile, it has been argued that local—or less than national—jurisdictions would tend to undersupport education. If mobility increases with level of education, higher levels would tend to be undersupported to a higher degree than lower levels of education.

[35] Human capital can be considered to be that stock of attributes from which the flow of labor services results. The greater the stock the larger the potential flow.

[36] Using a correlated attribute rather than the one which is the causal factor would make the policy instrument less than optimal, as some losses—due to misspecification—will occur. The higher the correlation, the lower these losses will be.

If localized benefits also increase with education, the effect of this undersupport will be significant. On the whole, both of these hypotheses seem to be supported. Numerous census studies have shown geographic mobility to increase with education—especially at higher levels of education. Most studies of local benefits, especially at the State level, have looked—at least implicitly—at the tax yields resulting from college educated individuals.[37] If local tax receipts are elastic with respect to income and college education has high income rates-of-return, the undersupport caused by mobility will create significant losses. The most appropriate instrument for correcting these effects might be the Federal establishment of an exchange marketplace through which payments flowed from net importers of college educated manpower to net exporters. If certain groups of graduates are the principle source of these benefits—for example, teachers—then this market might be established solely for these groups.[38] If such a market cannot be established, Federal higher education support might be justified to bring about the properly increased level of college and university training.

If the locally received benefits vary either according to the student who acquires the education or the type of education acquired, differential subsidy amounts are justified on the marginal social benefit grounds. For example, if, on the margin, the local social benefit of a college graduate is an increasing function of his ability, higher subsidies for higher ability students may be justified. Some observers have argued that local social benefits are proportional to an individual's income.

Most studies of income changes resulting from higher education have found the income gains to increase with ability, although the pattern is not as strong as most "ability liturgy" would have one believe. Daniere and Mechling estimated the following relationship:[39]

TABLE 1.—DISCOUNTED DIFFERENTIAL LIFETIME EARNINGS,[1] TO AGE 18, OF MALE COLLEGE GRADUATES BY COLLEGE APTITUDE[2] AND INSTRUCTIONAL QUALITY[3]

Instruction cost level	Aptitude				
	1	2	3	4	5
A	$64,566	$65,645	$57,231	$54,210	
B	52,708	50,229	37,223	33,651	$30,202
C		38,146	29,707	21,823	14,088

[1] Net of graduate instruction costs, discounted at 6 percent, net of high school graduate earnings.
[2] Aptitude dimension is based on SAT verbal score percentiles: 1. over 98.5; 2. 90 to 98.5; 3. 70 to 90; 4. 25 to 70; 5. under 25.
[3] Quality is measured by per student instructional cost in 1963–64: A: Over $1,900; B: $1,000 to $1,899; C: Under $1,000.

If the local external benefits were directly proportional to these income gains and these gains were good approximations of the marginal

[37] The argument regarding the appropriate definition of public benefits resulting from tax payments is outlined in D. S. Mundel, *Federal Aid to Higher Education and the Poor*, chapter IV, pp. 66–71. Examples of these studies are the following: W. Lee Hansen and Burton A. Weisbrod, *Benefits, Cost, and Finance of Public Higher Education*, (Chicago: Markham Publishing Co., 1969) and Donald C. Lelong and William R. Mann, "Systems Analysis for Institutional Output Decisions," *Institutional Research and Academic Outcomes*—Proceedings of the Eighth Annual Forum on Institutional Research, edited by Cameron Fincher, 1968.

[38] Although this market appears idealistic to most observers, a similar one actually exists in Great Britain. Several local education authorities operate teacher education institutions (both 2-year and 4-year schools) and the national Government operates an exchange system in which local authorities contribute a set level of funds for each teacher they hire who was trained elsewhere. These contributions are allocated, in turn, among the authorities which trained the teachers.

[39] Andre Daniere and Jerry Mechling, "Direct Marginal Productivity of College Education in Relation to College Aptitude of Students and Production Costs of Institutions," *The Journal of Human Resources*, vol. V, No. 1, winter 1970, p. 56.

yields which new graduates were likely to produce, then differential subsidies on the order of 1:1.2 to 1:2.71 between lower- and upper-ability groups would be justified on the benefit side of the subsidy decision rule. These yield estimations also support differential subsidies among different colleges on the basis of quality.[40] Using 1949 census data, Becker estimated the overall rate-of-return of college education to be approximately 13 percent with approximately one-quarter of this return—3 percent—based on the ability difference between college enrollees and nonenrollee high school graduates.[41] If the returns among college students vary on the basis of ability in the same ratio as those between enrollees and nonenrollees, a differential subsidy on the order of 1:1.3 between upper- and lower-ability groups might be justified. If ability—or achievement—is highly correlated with family background, then differential subsidies of the same order of magnitude among students from different families might be found if discrimination on the basis of ability were being attempted.

The fifth category of public benefits results from the *social and economic mobility* stimulated by higher education. These benefits result from the redistribution of income and mobility chances among members of society. A wide range of studies have shown that more education generally produces more income. Daniere and Mechling see table 1, showed the high present value of college education to individuals from all ability groups, while Becker calculated the internal rate-of-return from a college education to be approximately 13 percent. A more thorough and recent study based on 1960 census data performed by Giora Hanoch showed the income effect of education—especially higher education—to be sizable.[42] Depending on the other variables held constant, Hanoch found the annual earning effect of completing college; that is, 16 years of education, to be between $2,857 and $1,886.[43] The latter estimate was arrived at holding occupation and industry fixed which tends to ignore the labor market mobility which higher education enables.[44]

But, the public benefits of income redistribution may not be simply a function of private income gains. If they were, public support for all private behaviors which produce income gains—for example, personal investing in stocks and bonds or corporate acquisition of capital equipment—might be justified. Most public redistribution benefits arise from giving income—in kind or in money—to individuals and families who are poor or, in the case of redistribution of income producing wealth, would be poor in the absense of redistribution. The public benefits are the increases in welfare among taxpayers which result from the increases in income or income-related position of the recipients. In general, these benefits increase with increasing receipts by the recipients, although the marginal benefits probably decrease, and decrease with increasing presubsidy income of the recipients. Higher education support can be thought of as either subsidies to families whose children are enrolled in college or as subsidies to individuals who are, themselves, enrolled.

Interpreting educational support as family subsidies requires either that public benefits result from changing the economic position of

[40] If instructional cost is a good indicator of college quality.
[41] Gary S. Becker, *Human Capital*, (New York: National Bureau of Economic Research, 1964).
[42] Giora Hanoch, *Personal Earnings and Investment in Schooling*, unpublished Ph. D. dissertation (University of Chicago, 1965).
[43] *Ibid.*, table 1, pp. 24-25.
[44] Thus, the Hanoch estimates of income gains are overcorrected or underestimates of the actual income effects.

families whose youth are being educated, or, that the family is an important source of encouragement for student investment in public benefit-producing education. If the latter is true, society, in its search for means of acquiring these benefits, should create a system which rewards families for producing these motivating forces. If changing the economic position of families whose children are being educated is the grounds for subsidization, subsidies should increase as family income decreases if social benefits result more from improving the position of the poor.

Some critics may argue that society is interested in improving the economic position of low-income families regardless of whether or not their children are enrolled in college. If this is so, then higher education subsidies ought not to be treated as family subsidies and family income, by itself, should not be a basis for differential educational subsidies.[45]

If higher education support is thought of as a subsidy to individuals and is aimed at producing income-redistribution benefits, consideration must be given to the recipients' presubsidy economic position. The relevant measure of this position is neither the current income of students who are not full-time participants in the labor market nor the incomes of high school graduates who did not go on to college. The measure is the expected income of subsidy recipients if they did not receive subsidies and did not enroll in college. Becker found that approximately one-quarter of the 13 percent, that is, 3 percent, rate-of-return of college education can be attributed to student ability and thus in the absence of their higher education, college graduates would tend to earn more than other high school graduates. In the absence of Government subsidies, many potential students would still invest heavily in education and thus the income-effect of the subsidies would tend to be less than the total difference between current college and high school graduate incomes. Hanoch's research provides us with a starting point from which to evaluate the presubsidy-economic position. Table 2 shows the earnings of high school graduates and estimated income gains for college enrollees.

TABLE 2

		Estimated expected earnings for high school graduates, 1959	Estimated expected additional earnings of college enrollees by age and amount of college [1]	
Age	Race/region	Expected earnings	Completed 1 to 3 years of college	Completed 4 years of college
27	Whites/North	$4,461	$97	$1,141
	Whites/South	3,847	399	1,118
	Nonwhites/North	3,201	−335	48
	Nonwhites/South	1,976	−144	193
37	Whites/North	6,052	967	2,661
	Whites/South	5,520	928	2,472
	Nonwhites/North	3,989	−113	1,157
	Nonwhites/South	2,597	82	1,389
47	Whites/North	6,281	1,464	3,828
	Whites/South	5,802	1,413	3,307
	Nonwhites/North	4,305	−122	175
	Nonwhites/South	2,868	−247	392

[1] Persons out of school, 1959.

[45] A complication arises if Government cannot be a perfect discriminator in the distribution of aid to students. If this inability exists, student subsidies create family income benefits for families who would have been willing to send their children to school in the absence of subsidies or who would be willing to pay more than the subsidy rules demand. Most feasible Government policies will probably treat large classes of individuals similarly, for example, all students from families with $4,000 annual incomes will receive a $1,000 grant, and assuming perfect discrimination among students or their families is therefore clearly inadequate. Thus, family income benefits must be considered for all policies even if these are not the primary aim of the policy instruments.

Assuming Becker's estimate of the effect of ability is accurate, we can add 25 percent of the college graduates' expected income differential to the expected high school graduates' income in order to estimate the noncollege expected income of individuals who went to college. The results of this calculation appear in table 3.

TABLE 3.—ESTIMATED EXPECTED EARNINGS FOR COLLEGE GRADUATES HAD THEY NOT ATTENDED COLLEGE, 1959

Age	Race/region	Expected noncollege earnings
27	Whites/North	$4,746
	Whites/South	4,142
	Non-whites/North	3,213
	Non-whites/South	2,024
37	Whites/North	6,717
	Whites/South	6,138
	Nonwhites/North	4,278
	Nonwhites/South	2,944
47	Whites/North	7,238
	Whites/South	6,629
	Nonwhites/North	4,349
	Nonwhites/South	2,966

Between 1959 and 1969, compensation per man-hour increased 80 percent for all employed manpower.[46] While this series does not completely parallel that of earnings for high school graduates, it is probably adequate to develop an estimate of the expected noncollege earnings for 1969 income levels. Table 4 presents these estimates.

TABLE 4.—ESTIMATED EXPECTED EARNINGS FOR COLLEGE GRADUATES HAD THEY NOT ATTENDED COLLEGE, 1969

Age	Race/region	Expected noncollege earnings
27	Whites/North	$8,543
	Whites/South	7,456
	Nonwhites/North	5,783
	Nonwhites/South	3,643
37	Whites/North	12,091
	Whites/South	11,048
	Nonwhites/North	7,700
	Nonwhites/South	5,299
47	Whites/North	13,028
	Whites/South	11,932
	Nonwhites/North	7,828
	Nonwhites/South	5,339

If these estimates are accurate [47] and the public benefits of redistributing income decrease as recipient pre-redistribution income increases, there seems to be little justification for subsidizing higher education in order to produce these public benefits. The presubsidy incomes of almost all recipients would be in excess of almost every commonly stated poverty line even if no education were acquired in the absence of subsidies. But table 4 shows only average income levels, whereas the distribution of incomes of individuals within any of the

[46] U.S. Department of Labor "Manpower Report of the President," March 1970, p. 37.

[47] These income/earning data are average values and not the marginal value faced by the additional nonenrollees. It should be strongly noted that any major program or social event—for instance, a significant decline in the college-going rate—would change the income distribution and incomes of both college and noncollege educated workers. Thus, these estimates are somewhat less than accurate although given the small likelihood of major events and the sizable gap between these estimates and most poverty line, the estimates are adequate for our interpretations.

age/race/region categories may include some incomes which fall below some poverty lines. If the income distributions for each race/region group vary around the expected value in the same way—that is, equal standard deviations—the lower the expected value, the higher the percentage of individuals of a particular group falling below a specified poverty line. Thus, the redistribution benefits would increase as one moves from subsidizing white/North to white/South to nonwhite/North to nonwhite/South.

There may also be important distributional grounds for the support of higher education which do not specifically involve redistributions of income or income-producing wealth. If higher education stimulates or allows greater social and economic mobility and if public or external benefits result from this mobility, then Government subsidization of higher education may be justified. The second hypothesis, like most concerning nontechnical social benefits, is difficult to prove. The first is more easily proven, but is still a subject of much debate over its correctness.

Social and economic—or status—mobility has long been an important focus of commentary on the American society. Some reviewers have called the claimed existence of mobility to be the "great American myth," while others find ample evidence for the reality of Horatio Alger's climb to success. Whether or not mobility actually exists, the privately received benefits of upward mobility are relatively easy to conceptualize. Getting ahead and improving one's economic position confers large and important benefits on the individual who does so. The publicly derived benefits—or costs—of mobility are more difficult to conceptualize, let alone measure.

One source of these benefits might simply be the existence of interdependent individual welfare functions in which one individual's success (or failure) enters into the welfare functions of another or others. People may simply derive benefits from observing the mobility of others. These benefits may be negative if person A's welfare position is a function of his economic position relative to that of person B, and B's upward mobility decreases A's relative position. In somewhat more concrete terms, the wealthy may experience losses if the children of the poor are, as a result of education, enabled to compete with their own offspring. It is difficult to specify the direction of impact of mobility on these individual welfare functions. Without any firm analytical basis, I would assume that upward mobility produces positive public benefits, and the level of these benefits varies inversely with the original position of the mobile individual's family.

Most studies of the American economy have found intergenerational mobility to be minimal.[48] In general, these studies support the hypotheses that both parental position and human capital combine to define an individual's social and economic position.[49] Blau and Duncan's study, "The American Occupational Structure," is probably the most complete recent review of mobility. They found that college graduates were the group most likely to experience high upward mobility and the least likely to experience any downward status movement. Their findings are illustrated in table 5.

[48] This observation, of course, is purely in the eyes of the beholder.

[49] An example of these studies is Elton F. Jackson and Harry J. Crockett, Jr., "1964 Occupational Mobility in the United States: A Point Estimate and Trend Comparison," *American Sociological Review* 219: 5-15. (Quoted in Herbert Goldhammer, "Social Mobility," *International Encyclopedia of the Social Sciences*, 1968, p. 432.)

TABLE 5.—OBSERVED INTERGENERATIONAL MOBILITY[1] (SON'S STATUS—FATHER'S STATUS) BY EDUCATIONAL ATTAINMENT

Mobility	Educational attainment				
	High school		College		
	1 to 3	4	1 to 3	4	5 plus
High upward	18.4	27.7	31.1	45.7	53.1
Upward	26.1	25.8	23.1	23.4	22.9
Stable	31.3	24.5	19.1	13.8	12.3
Downward	17.2	13.6	15.1	11.7	9.2
High downward	6.9	8.4	11.6	5.4	2.5
Total	100.0	100.0	100.0	100.0	100.0

[1] Peter M. Blau and Otis Dudley Duncan, "The American Occupational Structure" (New York: John Wiley & Sons, Inc., 1967) p. 499.

These data show the proportion of men who experience some upward mobility increases steadily with education while the proportion which is immobile (i.e., stable) declines steadily. Downward mobility does not, however, decline linearly with education. The discontinuity occurs for men who have some, but not 4 years of college—they are more likely to be downwardly mobile than those who either have less or more years of education. This pattern is important in the design of a mobility stimulation policy because a policy might encourage enrollments without causing greater numbers of individuals to complete 4 years of college. If table 5 provides an accurate prediction, such a policy would create both a small increase in upward mobility and a larger increase in downward mobility.

Critics of mobility studies have generally found the independent effects of education to be significantly less than those presented above. They argue, correctly, that parental position is an important factor in determining the amount and quality of education acquired by an individual, and thus the impact of education on mobility illustrated above is an overestimate of the independent effects of education alone. They also argue that mobility studies have generally misspecified occupational status, and these misspecifications have tended to overestimate whatever mobility exists, and, thus, overestimate the impacts of education.

The impact of these criticisms on a mobility-stimulating higher education policy is complex. The finding that family position affects education, and, thus, the independent mobility effects of education are lower than observed, should cause one to switch resources from education to other mobility-creating efforts. The relative allocations within education—among education at levels and family types—may remain constant. If the strength of the critics finding is so great as to show no influence of education on mobility, then supporting education on mobility grounds is clearly unjustifiable. In all likelihood, education (and increasingly higher education) is a necessary—although not sufficient—condition for upward mobility of youth from lower income/status backgrounds. If this mobility creates externally received benefits and the remaining conditions which allow mobility are met (e.g., ending discriminatory labor market barriers), the education of these youth ought to be subsidized.

Other public benefits may also result from mobility and be important grounds for public subsidization. Wohlstetter and Coleman argue that:

* * * The growth of the nonwhite middle class and of a class of high-level managers, professionals, or entrepreneurs who make, say, $26,000 or more might be directly associated with the economic improvement of other nonwhites—through savings and investment, by helping to build information networks, and through key positions of influence that affect entry, promotion, and profit in higher paying occupations.[50]

Although only directed toward the effect of developing an upper class of nonwhites, this same argument may hold for other economically disadvantaged groups. In general, the incremental public benefits resulting from educating a youth from a particular group would decrease (although remain positive) as more of the group became educated. On these grounds, public or group subsidies should decline as both group income and as unsubsidized enrollment increases.

Public or external benefits may also result from stimulating mobility if a lack of mobility results in socially costly behaviors—for example, crime. As urbanization and access to information increase, individuals have a greater knowledge of the opportunities which surround them, and this increased awareness may make them more dissatisfied if a large share of the opportunities remain inaccessible. Some theorists view a major cause of delinquency and criminal behaviors to be blocked goal attainment. Nearly all youth are exposed to and internalize the goals of educational attainment and resulting economic and social success, but some youth are less able to achieve these goals.[51] If this inability to achieve these goals is a result of family or other conditions which are beyond the influence of the youth and if he is able to attribute the cause of some of these conditions to society at large—for example, a black youth may correctly attribute part of his family's poverty to discriminatory practices by the white majority—it is easy to understand how his blocked goal achievement might result in antisocial behavior. Schaefer and Polk also argue that lack of significant chance of eventually enrolling in college may contribute to adolescent delinquency among some youth. If high school is predominantly designed to prepare an individual for college and college is seen as unavailable, then high school becomes irrelevant. Publicly required participation in an irrelevant exercise may be a source of motivation toward delinquent behaviors.[52] In reality, how significant are these goal attainment-delinquent mechanisms?

The following table shows the college plans and eventual college attendance of high school students by family income.

TABLE 6.—COLLEGE PLANS AND COLLEGE ATTENDANCE OF HIGH SCHOOL SENIORS (OCTOBER 1965)

	Percent responding "yes" for planning college [1]	Percent having attended college by February 1967 [2]	Percent of college goals unachieved
Family income:			
Under $3,000	46	17.2	63
$3,000 to $4,999	47	31.7	33
$5,000 to $7,499	58	36.8	37
$7,500 and over	71	56.8	20

[1] Unpublished tabulation by A. J. Jaffe and Walter Adams of a Bureau of Census Study, quoted in Joseph Froomkim, "Aspirations, Enrollments, and Resources," (U.S. Government Printing Office: 1970) OE-50058, p. 20.
[2] Computed from tables 3 and 8, current population reports, series P–20, No. 185, July 11, 1969, "Factors Related to High School Graduation and College Attendance, 1967."

[50] Albert Wohlstetter and Sinclair Coleman, "Race Differences in Income" (the RAND Corp., Santa Monica, 1970), R–578–OEO, pp. 19–20.
[51] Walter E. Schaefer and Kenneth Polk, "Delinquency and the Schools," "Task Force Report: Juvenile Delinquency and Youth Crime." Presidents Commission on Law Enforcement and Administration of Justice (Government Printing Office, 1967) p. 226.
[52] *Ibid.*, p. 232.

Table 6 probably underestimates the unfulfilled goals of lower income youth because the low probability of their going on to college would tend to reduce the number reporting college plans. Although there are no data which show the antisocial behavior of specifically those youth whose goals are unmet, the following results of a Swedish study are somewhat suggestive.

TABLE 7.—THE CRIME RATES OF BOYS BORN IN STOCKHOLM IN 1940, BY EDUCATIONAL ATTAINMENT AND THE SOCIOECONOMIC STATUS OF THEIR FAMILIES [1]

[Percent with criminal records]

	Upper class	Middle class	Working class
Highest educational attainment:			
Gymnasium	1.7	1.6	4.2
Realskola	5.3	8.6	8.0
Primary school	([2])	20.0	20.7

[1] Unpublished study of comparative adolescent delinquency reported in Jackson Toby, "Affluence and Adolescent Crime," task force report: "Juvenile Delinquency and Youth Crime," President's Commission, p. 143. The impact of social class on reporting of crime on this data should be carefully considered.
[2] No data.

If crime and other socially costly behaviors result, in part, from a failure to achieve individually desired economic and social mobility, society might wish to avoid these costs by stimulating increased mobility. This stimulation might take the form of increasing individuals' possession of attributes which allow mobility (for example, education) or removing discriminatory barriers (racial and class-oriented discrimination) which inhibit mobility. Mobility oriented higher education policies would, on the basis of the above analysis of their benefits, give higher subsidies to individuals from lower class—generally lower income—backgrounds.

The fifth type of public benefits are intergenerational benefits. There are two sources of these benefits: (1) the impact of current education on future generations—"publics" and families; and (2) the freedom of current youth. The impact on future generations is twofold. Firstly, current education buys an income distribution for future publics. But as argued earlier, the income redistribution benefits, from higher education are probably slight. Secondly, current education influences future upward mobility by creating an infrastructure which benefits future generations. As discussed above, these benefits would justify higher subsidization of youth from lower enrollment rate (for example, low income) groups.

The second and more important source of intergenerational benefits concerns the protection of the freedom of current youth. If parental support plays an important role in higher education finance, individuals growing up in families who don't value education or in families whose income is limited would tend to have restricted access to educational support. This restriction would limit their free choice among colleges or between college and nonschool alternatives, and thus public intervention may be justified. This justification increases as the limitation becomes more "crucial" to the individual's eventual condition. On these grounds, intervention aimed at improving health or nutrition would be highly valued, while that oriented to providing colored television sets would be less justified. Support for education falls more nearly at the former end of this spectrum. Graphic evidence

of the resource contraints imposed on students from lower income families is provided by the amounts of parental support which lower income students receive. These amounts are shown in table 8.[53]

TABLE 8.—*Net parent support of college students* [1]

Family income:	*Average support*
$4,000	$349
$4,000 to $6,000	610
$6,000 to $8,000	664
$8,000 to $10,000	719
$10,000 to $15,000	895
$15,000 to $20,000	1, 167
$20,000 to $25,000	1, 531
$25,000 to $30,000	1, 696
Over $30,000	1, 740

[1] Net of Social Security and Tax Expenditure Subsidies.

Other factors than income alone may also influence the amount of family resources available to potential college students. Larger families would tend to have smaller available per student support levels holding income constant. Evidence of this relationship was found by Lansing in 1959.[54]

TABLE 9.—RELATION BETWEEN FAMILY SIZE AND EDUCATIONAL SUPPORT CONSTRAINTS

[Percentage of families who have had a child in college since 1955]

	Number of children in family				
	1	2	3	4	5 or more
Parents found it difficult to finance children's education or felt their financial support was inadequate	11	18	17	22	44

Although this pattern is not as strong as one might expect, it should be remembered that families who do not have children in college are not reported in table 9 and children from larger families are less likely to enroll in college.[55] Thus, the amount of the financial constraint within large families is underreported in table 9.

In general, we observe that lower income and larger size families devote fewer financial resources to the college education of their children. This pattern of assistance is not the result of any decisions made by these children, and thus shielding them from the influence of this pattern would increase their free, individual control over their futures. A higher education policy aimed at insuring or increasing this freedom would give subsidies which decline with increasing family income and increase with increasing family size.

[53] David S. Mundel (with S. H. Zeckhauser) "Who Pays the Higher Education Bill?—for which students?—"

[54] John B. Lansing, et al., *How People Pay for College* (Ann Arbor; Survey Research Center, Institute for Social Research, the University of Michigan, 1960) p. 80.

[55] Medsker and Trent found that 60 percent of the high school graduates from one-child families enrolled in college while only 33 percent of those from five-children families enrolled. Leland L. Medsker and James W. Trent, "The Influence of Different Types of Public Higher Institutions on College Attendance From Varying Socioeconomic and Ability Levels" (Berkeley: The Center for Research and Development in Higher Education, 1967) p. 67.

TABLE 10.—SUMMARY OF PUBLIC GOOD AND SOCIAL BENEFIT EFFECTS

Category of benefits	Strength of impact by undergraduate education	Recommended subsidy distribution (decision rules based on marginal social benefits)	Is family income actual factor (or correlated)?	Comments
Knowledge	Slight	Higher income (class); higher subsidy	Correlated with creativity	
Economic growth	Slight	Lower income; higher subsidy	(?)	
Political, social, and economic system behaviors.	Slight (plus)	Lower income; higher subsidy	Correlation with low enrollment rate	Declines rapidly as enrollment increases.
Geographic mobility	Slight	Higher income; higher subsidy	Correlation with ability	Higher education support is blunt; improper instrument for this goal.
Social and economic mobility:				
Income redistribution	Slight	Lower income; higher subsidy	Yes?	Income redistributed to moderate and higher income levels.
Mobility redistribution	Major	Lower income; higher subsidy	Yes	Probably most important effect.
Intergenerational benefits:				
Income effects	Slight	Lower income; higher subsidy	Yes	Same criticism as income redistribution.
Protection effects	Sizable	Lower income, higher subsidy	Yes	Capital availabilities might be almost as influential as subsidies.

Externalities

The following categories of externalities or external effects are often noted as justifications for Federal support for higher education:

(1) Lower welfare and transfer program costs.
(2) Lower crime and crime prevention costs.
(3) Increased tax yields.
(4) External effects among students within the educational process itself.

Most *welfare and transfer programs* are based on society's desire to raise the standard of living of families and individuals whose income is at the lower end of the income distribution. The costs of these programs can be lowered by either decreasing the number of families and individuals whose incomes fall below the level at which eligibility for support begins (i.e., the "poverty line" for particular transfer programs) or by decreasing the amounts of support recieved by eligibles by narrowing the gap between their incomes and the eligibility limits. As discussed above, higher education adds significantly to the incomes of individuals who would have had above-poverty incomes without college or university education. Higher education does, however, have some slight impact on the incidence of poverty-level incomes.

Two factors must be carefully evaluated in order to develop subsidization guidelines if this latter effect is being sought. Firstly, if the decrease in the probability of poverty of the college enrollee is matched by an increase in the probability that a non-enrollee will experience poverty, no cost saving can be achieved as the transfer payments will be simply redirected. This result would occur if on the margin college-educated individuals simply fill positions in the labor market which would have been filled by non-enrollees ("labor market bumping"). Secondly, one must evaluate which individuals are more likely to experience poverty in the absence of higher education. If there are significant economic returns to ability, higher ability individuals would be less likely to experience poverty than lower ability ones if both groups were simply high school graduates. Thus, the higher education of lower ability youth is more likely to yield reductions in transfer program costs and their education should be more highly subsidized than that of higher ability youth. Because of family wealth, economic returns of "style," and the inculcation of certain attitudes toward or tastes for work and earning a living, youth from higher SES families may be less likely to experience later poverty than lower SES youth at equal, non-college levels of education. If this is so, the higher education of lower class (i.e., poor) youth should be more highly subsidized if transfer program cost avoidance is the socially sought objective. On balance, these two factors and the minimum poverty-lessening effects of higher education, if "labor market bumping" does not occur, lead to a slight justification of higher education subsidization with greater subsidies going to lower ability and lower SES youth.

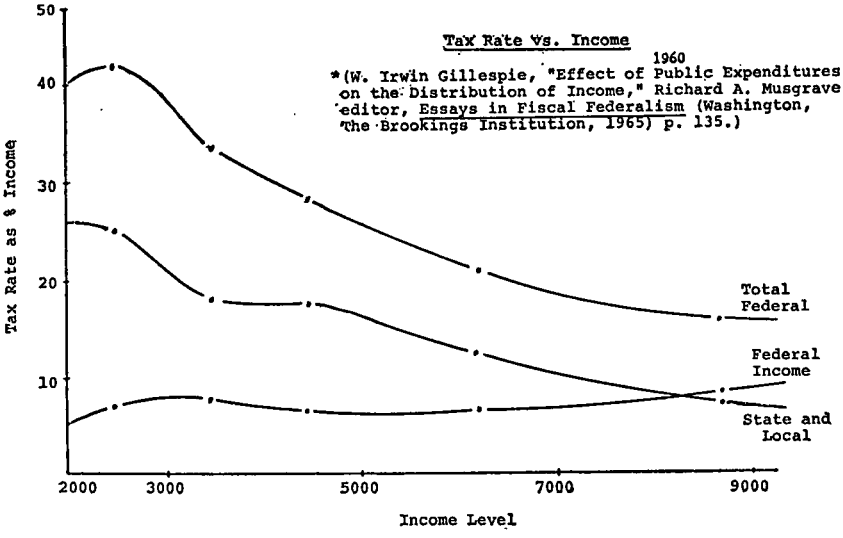
A second source of external effects is the *reduction of crime and the costs of crime prevention.* Crime data are notoriously bad and the impact of education in general—to say nothing about a particular

level of education—on criminal behaviors and the comparative impact of alternative prevention strategies is poorly understood. There is little analytical thought, beyond that presented above in the discussion of social and economic mobility effects, which can be added to the understanding of crime prevention goals achievable through higher education support. In all likelihood, the efficiency of crime prevention through increased enrollment in higher education is so low in comparison with other strategies, that justifying support for higher education on these grounds is inappropriate and incorrect. Thus, the impact of the lack of knowledge of the impact of higher education on crime on the choice of higher education policies is slight.

The third, and most frequently mentioned, category of external effects is the *increased tax yields*[56] which result from the increased incomes of college-educated individuals. The external effects of these tax yields are not as easy to specify, let alone measure, as most studies which concentrate on them would lead one to believe. The external effects depend on the impact of higher education on the educated individual (do his tax payments increase?); the impact of higher education on the labor market and thus the income distribution of the society-as-a-whole (do total tax payments increase?); and on the underlying philosophical basis of the tax system itself ("ability to pay" vs. "benefit" taxation?).

There is little doubt that higher education increases an individual's income and thus increases the level of his income tax payments. An estimate of this effect can be derived in the following manner starting with the expected income levels of college graduates with and without their college educations.

FIGURE 1



[56] And the increased output of public goods and services which they finance.

TABLE 11.—ESTIMATED COLLEGE AND "NONCOLLEGE" EARNINGS OF COLLEGE GRADUATES (1959)

Age and race/region	Expected "noncollege" earnings[1]	Expected college graduate earnings[2]
27 years old:		
Whites/North	$4,746	$5,602
Whites/South	4,142	4,965
Nonwhites/North	3,213	3,249
Nonwhites/South	2,024	2,169
37 years old:		
Whites/North	6,717	8,713
Whites/South	6,138	7,992
Nonwhites/North	4,278	5,146
Nonwhites/South	2,944	3,986
47 years old:		
Whites/North	7,238	10,109
Whites/South	6,629	9,109
Nonwhites/North	4,349	4,480
Nonwhites/South	2,966	3,260

[1] Table 2, p. 25.
[2] Hanoch, table 4, pp. 55–56.

In order to estimate the tax effects of these income changes, it is necessary to determine the percentage of income devoted to taxes at various income levels. This is shown in figure 1 (see p. 429).

Combining table 11 and figure 1, we can derive an estimate of the changes in tax payments which resulted from the college education of college-educated individuals. (We assume that taxes as a percentage of income remained constant between 1959 and 1960.)

TABLE 12.—CHANGES IN TAX PAYMENTS DUE TO COLLEGE EDUCATION (1959) CORRECTED ESTIMATES

Age and race/region	Changes in tax payments			
	Federal		State and local	Total taxes
	Individual income tax	Total		
27 years old:				
Whites/North	$41.87	$18.24	($11.34)	$6.90
Whites/South	17.07	48.30	102.66	150.96
Nonwhites/North	2.81	14.08	7.64	21.72
Nonwhites/South	20.26	74.05	33.36	107.41
37 years old:				
Whites/North	257.71	86.99	(120.98)	(33.99)
Whites/South	220.70	23.56	(76.23)	(52.67)
Nonwhites/North	22.13	48.48	72.97	121.45
Nonwhites/South	52.33	83.51	80.17	163.68
47 years old:				
Whites/North	406.02	369.51	(101.41)	268.10
Whites/South	314.38	119.24	(124.71)	5.47
Nonwhites/North	4.17	11.11	22.66	33.77
Nonwhites/South	28.86	29.31	(7.92)	21.39

Table 12 appears to be accurate, although the negative changes in tax payments which appear in the State and local tax column are somewhat disturbing. A source of this result may be the distribution of taxpayers among State and local tax jurisdictions in Gillespie's 1960 sample from which figure 1 is derived. Although no individual jurisdiction's tax structure may be so regressive as to cause tax payments to decline as income increases, lower income taxpayers may be located (on average) in jurisdictions with "higher taxes" while higher income individuals are more likely to be found in jurisdictions with "lower taxes." Averaging the tax payments of income groups over all jurisdictions might thus show lower income individuals paying higher

absolute tax amounts. If State and local revenues in 1960 were used disproportionately to support services demanded by or related to the presence of low-income families (e.g., welfare, housing, etc.), this result would tend to occur.

If the "ability to pay" approach forms the basis of the Federal tax system and little labor market bumping occurs, the overall rank of external tax benefit producers from table 12 from large to small is Whites/North; Whites/South; Non-Whites/South; Non-Whites/North. If interregional mobility is slight, this pattern is also the appropriate pattern for educational subsidies based on marginal social welfare effects alone. Given the regional and racial income differences, this subsidy pattern would tend to give higher subsidies to youths from higher income families in 1959. If regional income differences are declining as the markets for college-educated labor become more national and the discriminatory practices which influence college-educated non-whites are diminishing in importance, the tax-producing subsidy pattern should become flatter or more equal over time. If, on the margin over which Government policy influences higher education enrollments, labor market bumping is an important result of Government-stimulated graduates, the tax effects of the policy are limited and subsidization is unjustified.

If Federal taxation is based on the "benefit approach," the evaluation of public or external benefits is complicated by the following concerns:

1. The individual's altered tax payments are not external benefits, but in actuality, private payments for privately received benefits which result from publicly supplied or supported goods and services.

2. The change in an individual's tax payment may cause external effects among other taxpayers, but the level of these effects may be larger than, equal to, or less than the change in his tax payments.

The complexity of the second concern severely limits any effort to design appropriate subsidy format.

The remaining category of external effects are those which occur within the higher education process itself, rather than between educated individuals and the remainder of society. The general pattern of these effects is that higher ability or higher achievement youth tend to create benefits for their colleagues within academic institutions. These colleagues include both students who receive educational benefits and faculty members who are permitted to provide less education and receive more intellectual stimulation. Some schools use admissions criteria and variations in financial aid offers in order to generate an "externally productive" student body. Other schools use strict continuation criteria (that is, dismissal for poor performance) in addition to or instead of the above practices in order to assemble a desired set of students. Still other schools make no effort to assemble "productive" student bodies and rely almost entirely on faculty instruction to create desired educational outcomes.[57]

Each of the various restriction procedures produces benefits for those individuals who enroll in institutions in which they are practiced and

[57] The majority of institutions in this latter set is probably made up of so-called open access, community or junior colleges which are largely commuter institutions in which little interaction (at least in comparison to that found on residential compuses) occurs among students and for which high school graduation is the sole admission's criterion.

imposes costs or welfare losses on those who are denied admission. Potential students who would be willing to pay high prices for education at selective institutions but who fall below the admissions standards of such institutions are denied enrollment and thus prevented from acquiring, what they feel to be, an optimal education. These restrictive policies may also impose costs on the society-at-large if the individuals whose education would be most socially productive (on any of the public good or externality grounds discussed above) are denied entrance to institutions by the application of privately beneficial restriction policies. What should be the Government policy response to these restrictive private policies?

The Government might decide that colleges and universities are simply—like restaurants and theaters—places of public business and thus consumers cannot be denied (on other than price grounds) ability to acquire the services of these businesses. This decision follows the pattern of civil rights decisions which state the rights of blacks to be served even though their presence imposes "costs" on white proprietors and their white customers. This policy would tend to redistribute benefits from those classes of students formerly acceptable to the restrictive institutions to those formerly rejected but desirous of enrolling. Alternatively, colleges and universities might be considered to be more like private country clubs and thus their discriminatory admissions processes would be considered legal. One major factor which would point in the direction of the latter interpretation is the fact that students do not pay the entire cost of their education. Higher education is supported, in part, by private gifts and endowments which are under the control of institutions. It seems likely that no policy would be adopted which would limit the freedom of benefactors to choose to support the students whose education they find most valuable or which would limit the freedom of institutions to use endowment incomes to serve the objectives of past contributors. Institutions which charge full costs are more likely to be the appropriate objects of antidiscrimination policies.

If the restrictive entry policies of institutions are found to be legal, their impact on society's efforts to achieve its goals must be carefully considered. For example, the social and economic mobility goal might be limited by the nonprice restrictive policies which limit the entry of lower achievement youth into more prestigious institutions. In an effort to overcome this inhibition, society may wish to offer "bounties" to institutions which admit these "less productive" students. A bounty system would establish a dual price system for institutions. Less productive students would bring more revenues to the institutions while the students would still face a single institutional price. The operation of such a system of institutional supplements poses a number of problems. First, a student's educational productivity is a function of his position relative to that of the other students at a particular institution. Thus, an efficient bounty system would make the bounty variable across institutions. Second, the nonprice rationing may influence the enrollment possibilities of lower achievement youth from all SES groups, but only the limitations which influence particular segments of the population may cause social costs. Thus, the social bounties should only be attached to these segments. Some efficiency losses would occur within the program if the distribution of bounties could not follow these desired discriminatory patterns.

Market Imperfections

The three important market imperfections which affect higher education are:

1. Capital market imperfections.
2. Monopoly and oligopoly behaviors.
3. Not-for-profit character of colleges and universities.

Each of these factors has important impacts on the operation of the higher education system as a whole, and is thus an appropriate orientation for public or social intervention.[58] Although these impacts probably are experienced by all students and potential students, they may be greater and more perverse among specific segments of the population—particularly youth from poor and disadvantaged families.

The imperfections in the capital market and the nonexistence of a risk insurance market are likely to cause greater hardship among disadvantaged youth. If capital funds are limited and college enrollment requires sizable outlays from current cash resources, youth from lower income families would tend to be more limited in their attempts to obtain a higher education than would those whose families have greater financial resources. If a range of prices exists within the higher education system, we would expect (all else being equal) that youth with lower resource availabilities would tend to enroll disproportionately in lower priced colleges and universities. Both of these expectations are shown to be true by aggregate and detailed enrollment data.

The impact of the lack of an insurance or risk-exchange market or an income contingent feature in the existing loan programs is also likely to be greater on youth from disadvantaged backgrounds. If these youth must borrow greater amounts to attend college because of lack of alternative sources of resources, the riskiness of their investing is greater than that of youth who do not have to resort to mandatory repayment resources. Thus, the absence of an insurance market will have larger effects on the enrollment choices of youth from lower income families. This effect is further compounded by the impact of factors other than a college education on income. High ability, high quality of elementary and secondary education, high family social status, and being white may all have positive effects on income. Thus, individuals with these attributes will have higher postcollege incomes than those who do not, even though the net income effect of college itself for each group may be the same. If the marginal utility of income decreases with increasing income, individuals with higher expected postcollege incomes will experience less risk in borrowing than will those with lower expectations. If the noncollege income producing factors are correlated with family income, youth from lower income families would be more affected by the lack of an ability to insure against risks. Another factor which increases the effect of imperfections in the student loan market on lower income youth is their relative lack of assets which can serve as collateral for other types of loans. Even if no student loan market existed, families or students could borrow funds to finance college attendance if they possess other assets—for example, homes or automobiles—which can serve as loan collateral. Asset ownership declines significantly as income declines. Thus, youth from lower income families are more

[58] Although regulation and intervention are usually the appropriate mechanisms for correcting market imperfections, the impact of imperfections on subsidy programs and the possible amelioration of the impact of imperfections by subsidy programs should also be considered.

reliant on the student loan market for capital funds, and thus more subject to the detrimental impacts of imperfections in this market.

The monopoly, oligopoly, and not-for-profit characteristics of the higher education supply system may impose disproportionate losses on lower income youth for several reasons. If these youth desire forms or types of higher education which differ from those which have been traditionally provided—for example, ethnic studies—the lack of a demand-responsive supply system may inhibit their ability to fulfill their wants. Secondly, although disadvantaged youth may desire to leave higher education with the same range of skills and attributes as their higher income colleagues, their poor secondary school experiences may inhibit their ability to benefit from current levels and styles of college instruction. If the supply side were responsive to demand, compensatory activities would tend to be developed to upgrade those students who wish to enter these traditional programs. The correlation between high school achievement levels and family income is sizable enough to indicate that this lack of supply responsiveness is felt more strongly among lower income youth. A third factor which may result from these market imperfections if the colleges' goal is to maximize the quality of their graduates as opposed to maximizing the net gains achieved by their students. An effective strategy for attaining this goal is to accept only the brightest students. If an institution is successful in this strategy, the quality of its future graduates would seem to be relatively assured. If student quality and income are highly correlated, the colleges' motivation toward maximizing the absolute quality of their graduating classes will tend to limit the enrollment and resulting gains achievable by lower income youth.

IV. Patterns of Demand for Higher Education

There are several reasons why the patterns of higher education demand and enrollment are of interest in the process of making Federal higher education policy. The first was discussed briefly above:

> * * * all else being equal, the group whose price elasticity for education is greater—that is, whose amount of education is changed the most, given a price cut or subsidy—should receive higher rates of subsidy.[59]

This guidance is basic to the development of an efficient subsidization scheme which maximizes the social benefits resulting from higher education. A second reason is that the enrollment patterns, themselves, may be an important source of social benefits, and thus knowledge of their form may provide important guidance to the policy process. For example, if a principal socially received benefit from higher education results from its randomizing effect on social and economic mobility, the pattern of enrollment among socioeconomic groups is an important indicator of the level of social benefits produced. A third reason for interest is to provide guidance for the development of appropriate policy instruments. Although the levels of social or external benefits which result from the education of individuals from particular population groups are important factors in deciding appropriate subsidy levels, they do not necessarily define the appropriate form or style of the subsidization instruments. If the higher education marketplace were a perfect one in the classical economists' sense—free

[59] See page 415 above for a fuller discussion of this point. It should be strongly noted that "all else" refers to other subsidization criteria (including the marginal social welfare resulting from an individual's enrollment).

of all external and discriminatory effects and one in which participants possessed essentially perfect information—and if all the social benefits resulted from the same intermediate behaviors, the choice of an appropriate policy instrument would be made more simple. But, this is, unfortunately, not the case.

A number of factors influence the overall pattern of demand for and enrollment in higher education. Included in these are student ability and achievement; student motivations, tastes; and aspirations; the price of college enrollment (including transportation and living costs); institutional program offerings; and the income or wealth of a student's family.[60] A major problem encountered in describing the empirical effects of the various demand-affecting factors is the lack of any observations of demand alone. As discussed earlier, a number of market imperfections—including restrictive entry practices by colleges and universities—exist within the higher education marketplace. These imperfections may make the observed enrollment pattern diverge from the actual demand pattern in significant ways. For example, students from low-income families may be observed attending lower price colleges not because these colleges represent optimal choices for these students (that is, their "demanded" colleges), but simply because capital market restrictions prevent them from borrowing sufficient levels of funds to pay the bills associated with enrollment at more expensive schools. Thus, the enrollment of low-income youth at lower price schools may signify that they prefer these options to nonenrollment, but it does not signify that they prefer these options to more expensive alternatives.

Ability/Achievement

Ability and achievement affect an individual's demand for higher education in many ways. As noted earlier, Daniere and Mechling found that higher aptitude (verbal SAT) male college graduates tended to experience higher income gains after acquiring college education than did their lower aptitude colleagues. If college is viewed as an investment by potential students, those students with high expectations for income gains should, on average, invest more (that is, enroll more). The higher returns of higher ability individuals may result from several phenomena, all of which complement the view that higher ability youth have a higher demand for higher education.[61]

The strength of the impact of ability on demand for higher education is perhaps more difficult to measure than the impact of any other factor. This difficulty results from several imperfections in the higher education marketplace. Ability or achievement is the most often used admission criterion among restricted-entry colleges and universities. Thus, observing higher ability youth enrolled in higher quality schools or having higher overall enrollments does not necessarily indicate that their demand for higher education is greater. Because students are both consumers and producers of education, higher ability (that is, more educationally productive) students may pay less than their lower ability colleagues for the same education. This hypothesis was confirmed in a recent study for the College Scholarship Service—

[60] A more thorough analysis of these impacts occurs in M. G. Kohn, C. F. Manski, D. S. Mundel, "A Study of College Choice," (unpublished, interim working paper, November 1971).

[61] These phenomena are discussed in D. S. Mundel, "Federal Aid to Higher Education and the Poor," pp. 183–186.

CEEB. This study found that higher ability students tended to receive larger fractions of their financial aid in grant form rather than less subsidized loan or work-study assistance.[62] Other studies have shown that the overall effect of Government higher education support is to give larger (per student) subsidies to institutions enrolling higher ability students, and consequently, subsidies tend to increase with ability.[63]

A wide variety of studies have shown that college enrollment rate increases with student ability, even when important family background variables are controlled. In spite of these strong confirmations of the ability-enrollment hypothesis, we remain some distance from developing a subsidy rule (that is, policy guideline) regarding subsidies versus student ability. Previously, we noted that the optimal subsidy pattern gave greater subsidies to students whose price elasticity was greatest (all else being equal). If the price elasticity of ability groups varies and if the Federal Government can implement a policy which discriminates among ability groups, the price elasticity data is an important input to the higher education decision process.

Few of the higher education demand studies have used models or data from which price elasticities of various ability groups can be estimated. Corazzini et al. used linear models to estimate the demand/enrollment equations of 1960 10th graders from various SES groups and found that enrollment was positively related to ability for all groups.[64] The use of linear models guarantees that equal price changes will cause equal enrollment changes for all ability groups in a given SES group, and thus the group with lowest presubsidy enrollment will have the greatest elasticity. This results from the model's structure as opposed to the underlying phenomenon itself. In a more recent study, Radner and Miller separated the effect of price on students in such a way as to inhibit price elasticity calculations for various ability groups.[65]

A third study by Feldman and Hoenack [66] gives some limited insight into the price elasticities of various ability groups. Feldman and Hoenack report changes in enrollment proportions at various ability-income points which would result from $100 increases in tuition at various types of colleges private 4-year, public 4-year and 2-year institutions. Adding up the enrollment proportion changes which result from each of the price changes for particular population cell and dividing the sum by the enrollment rate for that cell gives an estimate for the percentage enrollment change caused by the tuition change.[67] Assuming that a $100 price cut across all institutions causes

[62] "Report of the Panel on Student Financial Need Analysis," College Scholarship Service, College Entrance Examination Board, Feb. 12, 1971. (This report is also known as the Cartter Commission Report.)

[63] This result was shown in W. Lee Hansen and Burton A. Weisbrod, "Benefits, Cost, and Finance of Public Higher Education", (Chicago: Markham Publishing Co., 1969), and D. S. Mundel, "Federal Funds and Subsidies to Students of Various Ability Levels," (undated, unpublished).

[64] A. J. Corazzini et al., "The Determinants of Enrollment in U.S. Higher Educations" undated background paper for the Massachusetts Board of Higher Education study—"Higher Education in the Boston Metropolitan Area."

[65] R. Radner and L. S. Miller, "Demand and Supply in U.S. Higher Education: A Progress Report," "American Economic Review—Papers and Proceedings," May 1970, pp. 326 plus ff.

[66] Paul Feldman and Stephen A. Hoenack, "Private Demand for Higher Education in the United States," "The Economics and Financing of Higher Education in the United States," the Joint Economic Committee, pp. 375 plus ff.

[67] This method tends to overestimate the enrollment change because it ignores enrollment switches among institutions.

equal proportional price changes $\Delta P/P$ for all ability groups, the ratios of the previous calculated sums is equal to the ratio of price elasticities.[68]

The general pattern of subsidies derived from this pattern of price-elasticities is one in which low ability/low achievement high school youth should receive larger college subsidies.[69] This pattern is in agreement with that derived from the following casual observation. It would seem that the larger the enrollment rate for a group, the more enrollees who would be subsidized without altering their college-going behaviors. In its search for efficient subsidy programs, the Federal Government should concentrate its support on those whose behaviors it can influence. Thus, in the case of ability groups, lower enrolling, lower ability youth would be more highly subsidized. Of course, if market imperfections and supply unresponsiveness are such that, even when highly subsidized, lower ability youth cannot enroll in colleges, concentrating subsidies on them will have little impact.

Family financial ability

In addition to his ability or high school achievement, the financial ability (income, assets, etc.) of a high school graduate's family is a principal factor in his college-going decisions. The influence of family economic position on college-going probably occurs through as complex a set of causative mechanisms as that described above for ability effects.

The principal impact of family income occurs simply because college enrollment costs money. Even if the benefits of college enrollment greatly exceed the out-of-pocket and opportunity costs, the lack of available capital for student borrowing will tend to limit enrollment. This limitation varies inversely with family income for several reasons. Firstly, potential students from higher income families have greater internal family financial resources which can be used for college costs. If there is a decreasing marginal utility of money, one would expect that higher income families would experience lower opportunity costs in supporting their children as students than would lower income families. This family financing can either be considered a private loan or a gift/subsidy. In either case, the ability to meet college costs will tend to increase with income.

A second effect of family income on ability to finance college results from the lending policies of banks which are the principal source of nonfamily cash resources. Even under a Federal Guaranteed Student Loan Program, banks have tended to restrict loans to students whose families are perceived to be good credit risks or who have other, more traditional banking relationships—for example, mortgages or business loans.[70] College and university administered loan programs have tended to discriminate less against student borrowers from lower-income families, but other program criteria—for example, the National

[68] This ignores the fact that higher ability students tend to attend higher priced schools. This would tend to overestimate the relative price elasticity of higher ability students because $100 divided by their average price is less than the comparable figure for lower ability students. If college price is a small part of the cost of higher education to the student, this overestimation is lessened.

[69] "All else being equal."

[70] J. Philip Hinson, "Student Loan Programs for Higher Education," New England Business Review, June 1968 (pt. 1), July 1968 (pt. 2).

Defense Student Loan Program has traditionally been targeted toward more academically able students—may still constrain the capital access of low-income students.

In spite of these restrictions on borrowing by lower-income students from nonfamily sources, the amount of student borrowing declines as family income increases.[71] This observation does not, however, weaken the argument that capital market restrictions limit college enrollment by lower-income youth; rather it strengthens it. The greater borrowing by lower-income students in spite of their general enrollment in lower-prices colleges shows them to be, as expected, more reliant on nonfamily financial resources. Thus, any restrictions on capital availability—even if they were uniform across all levels of family income—would influence the enrollment of lower-income youth more than those from higher-income families. In addition to influencing the aggregate college enrollment rates of lower-income students, the limitations on family and external sources of capital may also be a source of the enrollment pattern of lower income students: they enroll more frequently in less expensive colleges.

The chief effects of family income on the college enrollment of high school graduates appear to be price effects rather than basic motivations of the type which were found to cause the observed ability-enrollment relationships. On balance, the family income effect tends to make lower-income students face higher "effective prices" for college and university enrollment. Thus, the conclusion that lower-income high school graduates—even with achievement or ability held fixed—have a lower demand for college cannot be based on simple observations of their enrollment rates relative to those of higher-income students.

If the marginal utility of income is lower in higher-income families (i.e. lower opportunity cost for family support) and if nonfamily capital access is more limited for lower-income families, we would expect that the price elasticity should decline with increasing family income.[72] The price elasticity (responsiveness) for both the college-going decision and the choice-among-colleges decision should follow this pattern. A number of studies confirm (to some degree) this hypothesis.[73]

Using Project TALENT data on 1960 10th graders, Corazzini et al.[74] found that lower-income students tended to be more responsive to college price changes than upper-income students. Using data on 1967 California high school graduates, Hoenack found that the short-run price elasticity varied from 1.12 for students from the lowest

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[71] David S. Mundel, with S. Zeckhauser, "Who Pays the Higher Education Bill—for Which Students?" (unpublished).

[72] The principal nonloan source of financing college costs is student work. The opportunity cost of work—in terms of its detraction from education—would tend to increase at lower-family income levels given the lower levels of college preparedness of students from these backgrounds.

[73] Although the methodological errors of most of these studies are such that the validity of their results are highly questionable, they do provide some insight for the policy choice process and will thus be reported here. These errors are described in depth in D. S. Mundel, "Patterns of Student Demand for Higher Education: A Research Proposal."

[74] Arthur J. Corazzini et al., "Higher Education in the Boston Metropolitan Area—A Study of the Potential and Realized Demand for Higher Education in the Boston SMSA," (1969). Massachusetts Board of Higher Education.

income quartile to .71 for those from the highest income quartile.[75] Both the Corazzini and Hoenack studies suffer from specification errors—tuition and fees rather than actual student charges were used as the price variable—and identification problems—college eligibility was largely ignored. Nevertheless, their results give some support to the elasticity versus family income hypothesis.

Additional support for the hypothesis results from a longitudinal survey of 1966 high school graduates—the SCOPE sample.[76] The SCOPE survey asked parents of those graduates who enrolled in college: "What changes would be necessary in the education plans of your son or daughter if the cost of going to college should increase?" Parents were asked to predict the response to three levels of price increase—$200, $400, and $600—and several alternative responses were allowed. Table 13 summarizes the parental responses to the $400 question.

In general, the SCOPE data support the hypothesis that price changes have greater effects on the college enrollment rates and patterns of lower income youth. The data are not directly comparable to price elasticity measurements because they do not—by themselves—include the college prices paid by students and their families. Table 14 shows some calculated "elasticities" for students from various income families.

Table 14 shows that enrollment rate elasticity declines as family income increases above $5,000 but that changes in college plans (including work and residence decisions) are more affected by equal percentage price changes as family income increases. This latter result is largely accounted for by the increased student work which would be demanded of higher income students when price increased by $400. The third elasticity estimate tends to indicate that equal proportion price cuts would influence greater proportional movements toward less expensive schools among higher income students. This last set of estimates is probably the result of the fact that higher income students go to higher cost schools (thus equal proportional price changes are greater absolute dollar changes for higher income students) and the larger enrollment of lower income students in the least expensive colleges or universities (thus, they cannot choose to enroll in less expensive institutions).

Because students from different income groups pay different prices for college, table 14 must be corrected before we can examine the impact of price responsiveness on the choice of subsidy patterns. (See p. 438, footnote 72, for the basis of this correction.)

Using table 14 data, we can estimate the "Elasticity to Price" ratios of students in different income groups. The result of this estimate is shown in table 15.

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[75] Stephen A. Hoenack, "The Efficient Allocation of Subsidies to College Students," American Economic Review, June 1971, pp. 302–311.

[76] SCOPE (school to college: Opportunities for postsecondary education) is a study of 1966 high school seniors and freshmen in four States—California, Illinois, Massachusetts, and North Carolina. The project is formally sponsored by the Center for Research and Development in Higher Education and the College Entrance Examination Board.

TABLE 13.—PREDICTED CHANGES IN COLLEGE PLANS RESULTING FROM PRICE INCREASES

[Amounts in percent]

$400 price increase	Family income							
	Less than $2,000	$2,000 to $3,499	$3,500 to $4,999	$5,000 to $7,499	$7,500 to $9,999	$10,000 to $14,999	$15,000 to $19,999	More than $20,000
No change in plans	31	14	18	20	23	32	46	68
Student must live at home	3	3	3	5	5	7	6	3
Must work or work more	34	40	38	42	44	40	33	19
Must shift to less expensive college	11	15	14	15	15	13	10	5
Must temporarily discontinue education	9	11	10	10	6	4	2	1
Must give up plans for education	4	7	6	3	2	1	0	0
No answer	8	11	11	6	4	3	3	4

Note: Percentages may not add to 100 percent due to rounding.

TABLE 14.—ESTIMATED PRICE 'ELASTICITIES' OF ENROLLMENT PATTERNS AND RATES

Family income	Average parent and student costs [1]	Percentage change in cost by $400 increase	Elasticity estimates		
			Change higher education plans [2]	Short-run enrollment rate change [3]	Shift to less expensive college [4]
Less than $2,000	$710	56	−1.18	−0.25	−.21
$2,000 to $3,499	780	51	−1.72	−.40	−.33
$3,500 to $4,999	930	43	−1.86	−.42	−.37
$5,000 to $7,499	1,020	39	−2.02	−.35	−.41
$7,500 to $9,999	1,060	38	−2.00	−.22	−.41
$10,000 to $14,999	1,280	31	−2.16	−.17	−.43
$15,000 to $19,999	1,500	27	−1.95	−.08	−.38

[1] Calculated in D. S. Mundel et. al., "Who Pays the Higher Education Bill?"
[2] Percentage of students changing plans (normalized for nonrespondents) divided by percentage change in price (all plan changes included).
[3] Percentage of students leaving school temporarily and permanently (normalized for nonrespondents) divided by percentage change in price.
[4] Percentage of students shifting to less expensive institutions (normalized for nonrespondents).

TABLE 15.—AVERAGE "ELASTICITY" TO PRICE RATIOS FOR DIFFERENT INCOME GROUPS

Family income	Short-run enrollment rate, elasticity divided by price [1]	Shift to less expensive college, elasticity divided by price [1]
Less than $2,000	−0.35	−0.30
$2,000 to $3,499	−.51	−.42
$3,500 to $4,999	−.45	−.40
$5,000 to $7,499	−.34	−.40
$7,500 to $9,999	−.21	−.39
$10,000 to $14,999	−.13	−.34
$15,000 to $19,999	−.05	−.25

[1] Multiplied by 1,000.

The elasticity/price ratios show that if enrollment maximization is desired, lower income students should receive substantially higher subsidies than higher income students. If a shift toward more expensive schools is socially desired, the pattern of subsidies should be flatter. Except for the lowest income students, subsidy amounts should still decline as family income increases. Other subsidy versus family income patterns would result from policies oriented toward other social goals;

but, in general, the influence of family income on enrollment is such that, all else being equal, lower income students should receive larger subsidies than those from higher income families.

Summary

In section IV, we have attempted to develop an understanding of the pattern of college-going and college-going decisionmaking in order to develop guidelines for appropriate Federal subsidization policy. The general policy guidance which results from this analysis is as follows:

Student attribute:	*Pattern of subsidies*
Ability/achievement	Subsidy decreases with increasing ability/achievement
Family income	Subsidy decreases with increasing family income

V. Which Students Get Federal Subsidies?

In section III, we found that, in general, social benefit considerations should lead to higher subsidies for lower income youth. In section IV, we found that the influence of subsidies on enrollment decreased with increasing family income. On these two grounds, lower income youth should receive larger Federal higher education subsidies. Five major categories of Federal programs account for most Federal higher education support and student subsidies:

(1) Institutional support (including research).
(2). Student aid programs.
(3) Tax expenditures.
(4) Social security benefits.
(5) Veterans benefits.

The pattern of subsidies versus student family income is different in each program and they must, therefore, be treated separately.

In this section, we will examine the pattern of subsidies which currently [77] result from these Federal higher education policies.[78]

Institutional Support

In 1966–67, over $3 billion of Federal funds were given to higher education institutions through direct Government appropriations,[79] Government-sponsored educational programs, and Government-supported research activities. The distribution of these funds among institutions was a major determinant of the overall distribution of Federal support. The allocation of these funds is shown in table 16 below.

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[77] The most recent year for which reasonable complete data were available at the time of this analysis was 1966–67. Wherever possible, data from this year will be presented. Although these data are 4 years out of date, the lack of major shifts in Federal higher education policy during the intervening years makes the 1966–67 pattern of subsidization a reasonably accurate estimate of the current pattern. The pattern of subsidies has shifted somewhat toward lower income students because student assistance programs have tended, since 1968–69, to increase more than other higher education programs—some of which have actually contracted.

[78] It should be noted that many of these policies were designed to serve goals different from those included in this analysis; for example, national prestige and expansion of knowledge. Thus, their limited impact on lower income youth should not be surprising.

[79] Direct appropriations are funds whose use is not restricted to a particular institutional activity. Federal appropriations include Federal funds allocated to State government, which in turn, allocate them to colleges and universities.

TABLE 16.—FEDERAL FUNDS TO HIGHER EDUCATION INSTITUTIONS (CURRENT FUND REVENUES, 1966-67-OE-52010-67)

[In millions of dollars]

	Private institutions			Public institutions		
	University	4-year	2-year	University	4-year	2-year
Government appropriations	39.8	16.6	1.6	144.5	114.3	24.2
Sponsored education programs	116.6	54.1	2.8	225.0	85.5	18.8
Sponsored res.:						
Contract res. centers	321.4	257.1	.4	367.6	9.4	.02
Other (acad.) res	587.1	80.3	1.1	557.2	38.3	.2

Dividing these funds among the students enrolled in each type of institution yields the average Federal funds received per student. Three alternative views of this average are shown in table 17 below.

TABLE 17.—AVERAGE FEDERAL FUNDS PER STUDENT IN 1966-67 [1]

	Private institutions			Public institutions		
	University	4-year	2-year	University	4-year	2-year
A. Government appropriations plus sponsored education programs	$224	$59	$42	$216	$149	$51
B. "A" plus acad. research	1,064	127	52	541	177	51
C. "B" plus contract res. centers	1,524	343	56	755	184	52

[1] The derivation of this table is described in D. S. Mundel, "Federal Aid to Higher Education and Equality of Opportunity—The Distribution of 1966-67 Federal Funds," December 1969 (Xerox) (attached as app. A).

It is difficult, if not impossible, to calculate the subsidy levels which students receive from these institutional support programs. It is not clear whether research funds should be counted as education subsidies or simply as payments for research produced by university personnel. In general, they support noninstructional activities, but often they subsidize faculty or administrative costs which would otherwise have to be borne by other sources—for example, the institutions' students. It is also not clear whether these costs would be borne by students in general or predominantly by graduate students. Even support for Federal contract research centers may subsidize instructional or instruction-related activities. Studies of MIT's relationships with the Instrumentation and Lincoln Laboratories have estimated that, if the Laboratories were separated from the Institute, the Institute would have to receive an additional $3 to $7 million in revenues to operate its current academic and academic research programs.

Federal appropriations and sponsored education programs, on the other hand, seem to be more appropriately viewed entirely as subsidies for instruction. There remains the problem of deciding which students or types of students benefit from these subsidized instructional activities.

Although it is impossible to settle on one definition for the subsidies which result from these Federal programs, table 18, below, illustrates the subsidy resulting from one plausible definition. This definition assumes that all nonresearch programs are subsidies, 33 percent of academic research support subsidizes education activities, and that

7 percent of the funds received by contract research centers result in educational subsidies. It also assumes that graduate and undergraduate students receive equal subsidies.[80]

TABLE 18.—*Average subsidies resulting from institution-oriented programs (dollars per student)*

Private institutions:	
University	$534
4-year	97
2-year	46
Public institutions:	
University	338
4-year	159
2-year	51

Using table 18 and the income distribution of students at various types of colleges and universities (app. A, table 6), the average annual subsidies received by students from different income levels can be estimated. This result is shown in table 19.

TABLE 19.—*Average annual higher education subsidy resulting from Federal institution-oriented programs (1966–67)*

Family income:	*Per student*
Less than $4,000	$165
$4,000 to $6,000	172
$6,000 to $8,000	179
$8,000 to $10,000	190
$10,000 to $15,000	205
$15,000 to $20,000	218
$20,000 to $25,000	236
$25,000 to $30,000	241
Over $30,000	261

One category of Federal institutional support has been omitted from this analysis—grants and subsidized loans for construction. The major reason for this omission was the lack of 1966–67 data on these programs. An earlier calculation of the impact of these programs in 1965–66 showed the subsidy effects to be slight.[81] Thus, this omission will not seriously affect the validity of our results.

Federal Student Aid Programs

In 1966–67, academic institutions disbursed approximately $370 million of Federal student aid funds to undergraduates.[82] These funds were distributed as grants, subsidized loans, and Federal contributions to the salaries of student employees. (See app. A, table 4, for the distribution of Federal student aid funds.) The average amount of Federal student aid funds received by undergraduate students is shown in table 20 below.

[80] The assumption that research support subsidies are received equally by graduate and undergraduate students is probably the weakest of these assumptions. If we were to assume that undergraduates received no research subsidies, the average per student subsidies would be those shown in table 16, line A.

[81] D. S. Mundel and J. D. Steinbruner, "A Preliminary Evaluation of PPB" (Center for International Studies, Massachusetts Institute of Technology), September 1969.

[82] Except for work-study funds these revenues are not included in the institutional support programs discussed above. Because of this and our assumption about the subsidy effects of work-study funds (discussed below) there is no double counting in this estimate.

TABLE 20.—DISTRIBUTION OF STUDENT AID FUNDS DISBURSED BY ACADEMIC INSTITUTIONS[1] (1966–67)

[In dollars per student]

Family income	Private institutions			Public institutions		
	University	4-year	2-year	University	4-year	2-year
$4,000	$344	$275	$167.0	$372	$263	$131
$4,000 to $6,000	304	237	139.0	296	201	75
$6,000 to $8,000	251	186	102.0	194	117	12
$8,000 to $10,000	200	138	66.0	99	44	
$10,000 to $15,000	82	26	.3			

[1] The derivation of this table is described in app. A.

All student aid funds should not be counted as subsidies. "Work-study" jobs which require the student to work for his "aid" may not subsidize the recipient student as much as they subsidize his fellow students by enabling them to receive the benefits of his work for a small fraction of his wages.[83] Loan programs provide subsidies only to the extent that their interest rates are below that of the market in which students could otherwise borrow and repayment cancellations are allowed. Assuming that all grants are subsidies, 33 percent of the loan principals are subsidy,[84] and that work-study funds do not represent a subsidy to the working student, the following average subsidies resulted from institutionally disbursed Federal student aid to undergraduates in 1966–67.

TABLE 21.—*Average student aid subsidies (institution-disbursed Federal aid)*

Family income:	*Dollars per student*
$4,000	$91
$4,000 to $6,000	73
$6,000 to $8,000	49
$8,000 to $10,000	31
$10,000 to $15,000	5

The Guaranteed Loan Program (GLP) is another form of student aid which results in student subsidies. This program provides subsidized loans through commercial lending institutions [85] and thus is not included in the institution-disbursed student aid reported in table 21.

Through interest subsidies and payments, the GLP distributed approximately $118 million in student subsidies in 1967–68 (no detailed data are available for 1966–67). Table 22 (below) shows the distribution of these subsidies.

[83] This does not mean the student work programs do not stimulate enrollment, because capital market restrictions make any source of funds have enrollment stimulation effects.

[84] The assumption is discussed in app. A.

[85] Recently the GLP has been modified to allow colleges to be lending agents. This may cause problems in using institutionally reports of more recent years than 1966–67.

TABLE 22.—AVERAGE STUDENT SUBSIDIES RESULTING FROM THE GLP [1]

Gross family income (1)	1967–68 subsidy [2] (2)	Subsidy per student (3)
Less than $3,000	$9.69	$23
$3,000 to $6,000	9.69	
$6,000 to $7,500	11.41	19
$7,500 to $9,000	11.41	
$9,000 to $12,000	26.14	28
$12,000 to $15,000	25.04	
Greater than $15,000	25.12	19
Total	118.50	

[1] Cols. (1) and (2) appear in Hartman, "Public Policy for Higher Education Student Loans," Brookings, pp. 6–10. Col. (3) results from dividing col. (2) by the number of undergraduates in each income class in 1966–67.
[2] Median.

Federal Tax Expenditures

Most studies of government subsidy programs deal solely with explicit government expenditures or payments. Another, entirely separate flow of subsidies results from special tax provisions which allow the tax payments to be a function of specific behaviors rather than simply income and other normal tax bases. The effects of those provisions on the taxes paid can be called tax expenditures because they result in decreased tax payments. Several forms of tax expenditure influence the higher education sector.

Approximately $170 million of this revenue loss resulted from the tax deductible nature of private gifts to colleges and universities. The subsidies which result from this form of tax expenditure increase with increasing family income because approximately 80 percent of contributions were given to private universities and colleges. Another $50 million of the revenue loss was accounted for by the tax-free status of student grants and fellowships. The subsidy impacts of this revenue loss are less regressive than that resulting from the treatment of gifts because of the concentration of grants among low-income undergraduates.[86] The remainder of the revenue loss resulted from the ability of parents to classify their college-going children as dependents regardless of the student's income.[87] This last source of tax revenue loss provides larger subsidies to higher income students because:

(1) The progressive income tax system makes dependents "worth more" to higher income families;

(2) Higher income families are more likely to support their children as students, and thus more likely to be able to claim them as dependents; and

(3) Students from higher income families are likely to have higher support costs, and thus these students can earn more than those from low-income families without their families losing their status as dependents.

[86] Table 13 of "Who Pays the Higher Education Bill?" (D. S. Mundel et al.) shows that student aid subsidies are not solely concentrated among lower income students.
[87] This allowance exists as long as the parent contributes at least 50 percent of the student's support costs.

Table 23 (following) shows the average subsidies which result from the IRS regulations affecting student dependents.

TABLE 23.—*Subsidies resulting from IRS student dependent regulations* [1]

Family income:	*Average family tax saving (per student)*
$4,000	$4
$4,000 to $6,000	14
$6,000 to $8,000	11
$8,000 to $10,000	18
$10,000 to $15,000	35
$15,000 to $20,000	50
$20,000 to $25,000	34
$25,000 to $30,000	34
Over $30,000	70

[1] The full derivation of this table is shown in D. S. Mundel, "Tax Impact of Special IRS Regulations for Student Dependents," March 1970 (Xerox).

Another source of higher education tax expenditures is the tax exempt status of State and local borrowings for construction of college facilities. These expenditures benefit both public institutions, which directly receive capital funds from State and local governments, and private institutions, which often have access to State loans or are able to rent facilities of public higher education facilities authorities. These tax expenditures have been omitted from this analysis because of the lack of detailed 1966–67 data on capital investments. A preliminary analysis of the tax losses caused by 1965–66 tax-exempt borrowings showed them to be slight and thus, this omission probably does not seriously compromise the validity of our overall results.

Student Aid From the Social Security System

Approximately $256 million of student subsidies were distributed during 1966–67 as a result of the changes in the social security system which allowed 18 to 22-year-old children of deceased, disabled, or retired workers [88] who were full-time students to continue to be beneficiaries. Table 24 (below) shows an estimate of the distribution of these funds.

TABLE 24.—IMPACT OF SOCIAL SECURITY-DISTRIBUTED STUDENT AID [1]

Family income	Percent of social security student aid recipients in income class	Number of social security student aid recipients	Percent of students in income class receiving social security aid	Average subsidy resulting from social security aid
Less than $4,000	45	150,000	47	$357
$4,000 to $6,000	15	50,000	10	76
$6,000 to $8,000	10	33,000	4	30
$8,000 to $10,000	8	27,000	3	23
$10,000 to $15,000	16	53,000	4	30
$15,000 to $20,000	5	17,000	3	23
$20,000 to $25,000	2	7,000	2	15
Total	100	337,000		

[1] This estimate results from assuming the 337,000 students each receive $760 and are distributed among income groups in the pattern of families reporting both social security receipts and college students on the 1967 Survey of Economic Opportunity.

[88] In one sense, the social security program can be considered as a replacement for student support from non-wage-earning parents.

Veterans' Benefits

Student benefits resulting from the GI bill were a large source of noninstitutionally administered student aid in 1966–67. Unfortunately, the data necessary to attempt an adequate assessment of the distribution of these benefits among students from different family backgrounds do not exist. Thus, the distribution of the funds will not be included in this analysis.

Aggregate Distribution of Federal Student Subsidies

Given the various definitions of subsidies and the strengths and weaknesses of the data, several alternative aggregations are possible. Table 25 shows several of these alternative aggregations of these student subsidies.

TABLE 25.—AVERAGE FEDERAL STUDENT SUBSIDIES,[1] 1966–67

Family income level	Dollars per student		
	Subsidy resulting from institutional programs and IRS dependency regulations	Col. (1) plus subsidy resulting from addition of social security	Col. (2) plus subsidy resulting from addition of GLP subsidies
	(1)	(2)	(3)
Less than $4,000	$260	$617	$640
$4,000 to $6,000	259	335	358
$6,000 to $8,000	239	269	288
$8,000 to $10,000	238	261	280
$10,000 to $15,000	245	275	303
$15,000 to $20,000	268	291	310
$20,000 to $25,000	270	285	304
$25,000 to $30,000	275	275	294
$30,000 plus	331	331	350

[1] Col. (1) is summation of tables 18, 20, 22; col. (2) is summation of tables 18, 20, 22, 23; col. (3) is summation of tables 18, 20, 22, 23, and 21 with interpolation.

Table 25 shows that Federal student subsidies—not solely student aid—are distributed in a progressive manner among families with incomes below $10,000 and in a regressive manner for the group of families at higher income levels. The level of progressivity at the lower income levels is extremely dependent on the inclusion of social security benefits. In general, the pattern of subsidies among students from different income levels does not follow the guidelines which were developed in sections III and IV. Even more graphic information on the inordinate attention paid to higher income students by Federal programs is shown in table 26 which shows the total subsidy received by students from varying income levels.

TABLE 26.—*Total Federal student subsidies 1966–67*

Family income level:	*Total subsidies* [1] *(millions)*
Less than $4, 000	$205
$4, 000 to $6, 000	190
$6, 000 to $8, 000	230
$8, 000 to $10, 000	244
$10, 000 to $15, 000	424
$15, 000 to $20, 000	180
$20, 000 to $25, 000	82
$25, 000 to $30, 000	38
over $30, 000	88
Total	1, 681

[1] Using column (3) table 25.

VI. CONCLUSION: AN OUTLINE OF AN APPROPRIATE FEDERAL HIGHER EDUCATION POLICY [89]

In section II, an outline of the reasons for Government support of higher education [90] was presented and developed. Sections III and and IV have shown that most of these justifications lead toward the desirability of a Federal higher education policy which concentrates its attention and resources on students and potential students from lower income families. The analysis of existing Federal higher education policy contained in section V illustrates the wide gap which exists between the subsidy impacts of existing programs and those which are normatively desired.

A Policy Aimed at Equalizing the Higher Education Opportunities of Lower Income Youth

The basic program in Federal higher education policy should aim at equalizing the opportunity of lower income youth to go on to college. A wide variety of programs can conceivably accomplish this task. General grants to institutions—whether based on enrollment levels of not—grants to institutions based on their enrollment of lower income students, or direct grants to low income students would all lower the cost of college attendance for lower income students and thus encourage their enrollment. The choice among these alternatives is largely a matter of efficiency—are Government resources being used in a manner which maximizes socially-received benefits.

General grants to institutions could result in either an increase in institutional quality without a corresponding price change, a general price reduction for all students, or an institutionally administered price reduction for a specific group of students—for example, the poor.[91] Only if the latter result occurred would the impact of Federal resources be concentrated on lower income students and thus, social benefits could, in some sense, be maximized. If grants to institutions

[89] Parts of this chapter have appeared previously in David S. Mundel, "A Proposal for Federal Higher Education Policy," July 1971.

[90] The distinction between an education—spreading existing knowledge—and a knowledge creation program should be kept carefully in mind. This analysis deals solely with the former.

[91] Any combination of these results is also possible.

were based on their enrollment of lower income youth, there would be a greater incentive for the impact of resources to be concentrated on lower income students. The effect of these incentives would still be, in part, a function of institutional goals and orientations.

A program of direct grants to students insures that Federal resources will lower the effective cost of college to grant recipients, unless colleges alter their tuition policies so that federally aided students are required to pay higher amounts. Except if this latter pricing policy occurs, a program of direct grants maximizes the potential equality of opportunity impacts of Federal resources. A direct grant program also provides a vehicle in which the distribution of subsidies among students can be restricted to follow the efficiency guidelines which maximize their effects. Other programs allow intermediate decision-makers—for example, institutions—to alter the subsidies so that they serve their own goals in addition to national goals. In most cases this alteration would result in a decline of the impact of the subsidies on national goals.

A program of direct student grants can also have several attributes which increase its effectiveness. Like the Social Security program, a direct grant program can produce a reasonably certain and well understood source of funds for college financing. This certainty and understanding mean that a grant program can influence long-term college preparation and enrollment decisions and thus be more efficient in influencing demand. In order to achieve these benefits, a direct grant program must be somewhat insulated from the annual appropriation process and its operations must include early communications with high school students.

A program of direct grants to students should have grants which are based on family income—if income is the principal source of current inequities and if income is the "discrimination factor" which creates an efficient subsidy pattern. One of the most often recommended income basis is the "family ability to pay" (such as that calculated by the College Scholarship Service [92]). In this type of program, the amount of the grant is simply the maximum grant minus the amount the family is judged able to pay (the family's "expected contribution"). The major problem with the "ability to pay" criterion is that it lacks direct correspondence to the Federal goal of establishing an efficient pattern of subsidization. The same criticism can be made of a grant program which subtracts parental tax payments from a maximum grant amount to calculate a student's grant eligibility. The correct pattern of grants versus income is one which maximizes the achievement of national goals within a given level of Federal support. There is currently little analytical evidence as to what the optimal pattern of grants should be, although several research projects have promise of yielding some preliminary estimates. The operational style of a Federal grant program should be carefully designed to yield more accurate estimates.

[92] The College Scholarship Service estimation procedure is fully explained in the "Manual for Financial Aid Officers," 1970 edition, (College Entrance Examination Board, New York) 1970. The basic concept of the CSS calculation is an attempt to estimate the amount a given family can pay for its child's education without substantially reducing its standard of living. The estimate is based on income, assets, family size, and several other financial and demographic (for example, age) factors.

Should Grant Size Be Based on College Costs?

Whether or not student grants should also be based on factors other than family income depends on the goals which a grant program is designed to serve. If the equalization goal is measured solely in terms of overall enrollment rates of students from given income groups, the size of the grant should be solely a function of family income.[93] If the equality goal is measured both in terms of overall enrollment and the distribution of enrollees among different priced colleges and universities, the size of the grant should be a function of both income and college costs. As with the dependency on income, a wide variety of patterns of grants versus college costs is possible. The desirable pattern is one which leads toward maximum achievement of the relevant social goals.

Because of the wide variety of college costs, an interesting set of grant versus cost choices is possible at every level of total government support. If grant recipients are required to self-finance an amount of college costs before they are eligible for grant assistance, the level of grant which can be offered (at a given government budget level) can be made larger. The larger the amount of self-financing required, the larger the grant which can be offered. The following table is illustrative of a range of possible "grant-self-finance" patterns which might be possible at a given government budget level. (The table is purely descriptive.)

TABLE 27

Amount of self-financing required before receiving grant:	*Amount of maximum grant*
$0	$1,200
$200	1,300
$400	1,400
$600	1,500
$800	1,600
$1,000	1,700

It is important to note that each increase in the amount of self-financing required will result in a decline in overall enrollment of grant eligible students, but the accompanying increase in the maximum grant amount will result in more eligible students attending higher cost institutions, and thus, an improved distribution of grant recipients among types of colleges and universities.

Although the choice of a desired pattern of grants versus income and college costs will be the result of a complex process of meshing equality and other social goals and potential student enrollment patterns, the resulting pattern should be kept as simple as possible. A program's simplicity can be an important determinant of the level of its eventual impact. In general, the more simple a program's format is, the more understandable it will be to the student decisionmakers who it is attempting to influence. The following is the basic outline into which a grant program should fit:

[93] This is so unless making grants depend on college costs will result in greater enrollments.

Outline:	*Possible ranges of "ceilings"*
1. The student and/or his family should self-finance the first [1] dollars of college costs	$500–$1, 000
2. The government will pay 100 percent of all additional costs up to a maximum of [1] dollars	1, 000–1, 500
3. The government will pay 30 to 60 percent [1] of the costs over the No. 2 ceiling up to a total additional grant of [1] dollars	500–1, 000

[1] Each of these factors may depend on the student's family income.

Student and Family Self-Financing

In order for the desired "grant-self-financing" policy to function effectively, a student loan market which insures access to capital by low income youth must be instituted. It is unrealistic to expect the parents of low-income students to contribute extensively, if at all, to their children's college expenses. The availability of the alternative of borrowing must be guaranteed.[94] [95]

Although there is a strong requirement for guaranteed loan availability there is little, if any, need for these loans to be subsidized. Firstly, loan subsidies are more difficult to target toward achievement of national goals than are grants such as those outlined above. Secondly, loan subsidies probably have little impact on an individual student's willingness to borrow, while, in total, they represent large implicit or explicit amounts of Federal expenditure. As such, loan subsidies fail to use scarce Federal resources efficiently to influence behavior.[96] The limited impact of loan subsidies on willingness to borrow results from the small effect of changes in interest rates on repayment amounts. This is illustrated below:

TABLE 28

Annual interest rate:	*Annual cost of repaying $1,000 loan over 10 years*
0 percent	$100
3 percent	116
7 percent	138

It is difficult to imagine that even if the amount of the loan and the difference in interest rates were $5,000 and 7 percent (0 percent versus 7 percent) respectively that the annual repayment difference—$185 (or $15.42 per month)—would strongly influence student willingness to borrow. If student willingness to borrow is influenced by the size of annual loan payments (and if this willingness affects the achievement of national goals), the size of payments can be drastically cut by lengthening the time period over which loans are repaid (without using scarce Federal subsidy funds).

TABLE 29

Length of repayment period:	*Annual cost to repay $1,000—7 percent loan*
10 years	$138
20 years	91
25 years	83

[94] This guarantee must also be extended to nonfederally aided students who wish to self-finance their educations.

[95] The issues involved in correcting the student capital market are treated more fully in Robert W. Hartman, "Credit for College", (McGraw-Hill Book Co.; New York) 1971.

[96] Loan subsidies are, however, often politically attractive because they transfer costs from current administrations to future ones.

In addition to annual repayment levels, the risks involved in incurring large-scale, long-term debt may be an important cause of limited student willingness to borrow and thus limited enrollment rates. A number of proposals have been made to limit the riskiness of student loans:

(1) Repayments can be made a function of post-college income with the percentage of income calculated to make the average return on all loans equal the appropriate interest rate or cost of funds ("full contingent loans").

(2) Repayments can be canceled if borrower income falls below some predetermined level.

Each of these alternatives and the wide range of other proposed income-contingent plans are essentially different forms of income insurance—"if the student's college education does not pay off, he doesn't have to pay for it." They all suffer from a number of significant problems which affect all insurance systems. The first is the problem of adverse selection—students with high income expectations are unlikely to be willing to borrow in fully contingent loan programs and those who plan to enter lower paying careers are more willing to do so.[97] The second is the problem of equity—different careers have different mixtures of monetary and non-monetary returns, but in order to be feasible, a contingent (or insured) loan program must be based on a reasonably simple measurement of monetary income. Thus, students who receive equal levels of benefits from college enrollment may repay different amounts.[98] The equity problem is made more difficult if some borrowers can negotiate with employers to obtain large future rather than current incomes (for example, retirement pay) which will be received after the loan repayment period.

The problems of risk aversion, adverse selection, and equity effects can probably be best handled by a loan program which requires income contingent repayments over a range of low incomes and constant repayments over middle and upper income ranges. This type of program is really a form of limited low income insurance for student borrowers. The income at which payments are no longer a function of income must fall between the levels of involuntary and voluntary poverty and between the levels of excessive and acceptable loan burdens (as a proportion of income). This latter definition of a possible boundary is a function of loan amount while the former is not. The insurance feature of this partially contingent loan program may be supported by either an interest premium (charged to borrowers) or by the Government. Reliance on Government support can only be justified if the interest premium necessary for lossless program operation is such that it interferes with the achievement of Government higher education goals.

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[97] Although this may not directly influence lower income students who probably have limited expectations of large post-college incomes and limited access to alternative sources of capital, they would be indirectly affected if the loan program were open to but not used by all potential borrowers. One means of limiting the impact of adverse selection is to incorporate an "opt-out" provision. This provision establishes a maximum total repayment which a student could be required to make.

[98] Some observers have commented that this would create incentives for college-educated individuals to enter lower paying occupations and that this is a desirable effect. The level of this effect and its desirability are both somewhat questionable.

Supplementary Student Services

A Federal grant program will, in most cases, make lower income students much less reliant on institutional sources of student aid. But, their poorer high school preparations will limit their ability to successfully compete with other students—especially if the program stimulates their enrollment in higher quality institutions. Thus, in addition to student grants and loans, a program of supplementary or compensatory educational services for federally aided students is probably needed if equalization goals are to be achieved.

A wide variety of programs could potentially support these supplementary services. A program of grants could be developed which provided funds to colleges for the operation of special service programs.[99] A system of grants in response to proposals may suffer from several potentially important difficulties. Project grants would have to be made by a central Federal organization and thus would probably soon come to follow federally-approved formats. Regrettably, there is little reason to believe that Federal-college negotiations would yield the needed diversity of programs. Alternatively, grants for special service programs could be given to colleges based on their enrollment of federally-aided students. Although the use of these funds could be restricted to such activities and no federal project approval process would be required, it is not difficult to imagine that some institutions would conduct programs which diverged from those needed by their students. Another potential danger of both of these forms of support is that a college may provide a set of compensatory services which are needed by most of its poorly prepared students, but which ignore the needs of others.

A third style of program is one in which federally-aided students are given vouchers with which they can "purchase" supplementary and compensatory educational services. This type of program might create greater incentives for institutions to provide the needed range of compensatory and supplementary service programs. Many colleges and universities report that a significant constraint on the extent of their admission of lower-income students is the greater expense of these students due to their need for extensive supplementary services. Providing students with resources to pay for these services would lessen the impact of this constraint. Allowing students to spend resources (vouchers) for programs which they desire (or withhold support from programs which they judge not to be fulfilling their needs) would create important incentives for colleges to provide programs which are valuable to students rather than simply judged valuable by university administrators or government officials. These incentives could also have impacts on reform in higher education.

Changing Institutional Incentives

Although the combination of the loan-grant and supplementary service programs should go a long way toward making the higher

[99] This is essentially the character of the existing Special Services for the Disadvantaged Program.

education of federally-aided students financially feasible, these students (being, on average, more poorly prepared academically) may still be less attractive than other students to some institutions. Thus, their enrollment opportunities will remain constrained. Large numbers of institutions have already altered their recruitment, admissions, and instructional processes in order to educate lower income students. Further alterations in these institutions and initial changes in others can only come at large costs to both the institutions and their traditional, student clienteles. These costs—which are in addition to financial aid costs and the costs of special instructional services—are effectively a disincentive to the socially desired enrollment of federally-aided students.

For example, a portion of an institution's educational output results from the interaction of students with one another. If an institution admits students who have lower academic skill levels, the remainder of the student body will experience lower interaction-educational effects. Either the institution will have to allocate more resources to instruction or the educational quality will decline. In either case, the admission of lower academic skill students will be costly.

In order to overcome these disincentives and thus increase the enrollment chances of federally-aided students, it may be desirable to reward institutions which enroll these students. This reward could take the form of grants to institutions who enroll federally-aided students. The use of these grant funds should not be restricted and their magnitude should be based on the level necessary to achieve national enrollment goals. Although in theory it would be desirable to aid only those institutions who admit federally-aided students who differ (in other than family income terms) from their traditional students, the operation of such a program may be needlessly complex.

One potentially useful measure of the difference between federally aided students and others is the amount of grant aid for which the student is eligible (not the amount he receives). The pattern of grant eligibility amounts probably corresponds closely to the pattern of costs which federally aided students place on their institutions and fellow students. Another possible useful measure is the proportion of a school's student body which is eligible for Federal aid. It seems likely that the impact of these students increases as their concentrations increase. If these two measures of impact are correct, an appropriate institutional incentive program would be one which gives a grant to the institution based on the number of federally aided students, their grant eligibilities, and their concentration within the institution's student body.

Another factor which will limit institutional enrollment of federally aided students is uncertainty as to the continuation of Federal financing. Although colleges and universities are uncertain about all sources of financing, recent experience would dictate greater levels of uncertainty with regard to Federal financial resources. This uncertainty will limit institutional willingness to build up both existing and new forms of capacity to serve federally aided students. Although there is

no way for the Federal Government to completely guarantee its commitments, there is an intermediate strategy which could overcome much of the effects of federally induced uncertainty—contingent loans to institutions. The Federal Government could loan money to institutions to be used in the development of new capacity—not solely facilities—to serve federally aided students. The repayment of these loans could be a function of the level of Federal student grants during repayment years. For example, the Government might wish to guarantee that it would commit $1 billion in student grant funds annually. If, during a repayment year, the Government only supported $500 million in grants, institutions would only be required to repay 50 percent of their annual repayment.[1] The loan repayments should not be contingent on the number of federally aided students who enroll in particular institutions. This would make an institution's repayment totally a function of its admissions decisions.

In brief, the desired Federal higher education policy aimed at lower income students should include the following programs:

(1) Direct grants to students based on family income and college costs.

(2) Guaranteed student access to loan funds which have long-term repayment periods and some form of low-income insurance.

(3) A program of regulated vouchers to federally aided students for supplementary and compensatory educational activities.

(4) A program of grants to institutions based on their enrollment of federally aided students—the size of these grants would be a function of number of students, student grant eligibilities, and the proportion of institution's student body which is eligible for Federal assistance.

(5) Contingent loans to institutions with repayment based on the amount of Federal student grant funds expended.

[1] If institutions can borrow funds for this expansion of offerings from non-Federal sources, the contingent repayment feature can be instituted by Federal commitments to subsidize non-Federal loan repayments if Federal grant support declines.

APPENDIX A[2]

FEDERAL AID TO HIGHER EDUCATION AND EQUALITY OF OPPORTUNITY

THE DISTRIBUTION OF 1966–67 FEDERAL FUNDS

Historically, the objectives of federal aid to higher education have been:

- to increase the number, proportion and quality of educated people within the society;
- to increase the advanced knowledge accessible to the society; and
- to increase the equality of opportunity for higher education among members of the society.

Although each of the objectives has been used as a justification for support, achieving "equality of opportunity" is increasingly a principal objective of higher education policymakers. Higher education is viewed as an important avenue to social, intellectual, and economic advancement of individuals and factors such as family income, race and education appear to have large effects on an individual's chance of college enrollment. Thus a major goal of higher education policies aimed at the achievement of equality of opportunity has been the lessening of the impact of these enrollment-affecting factors.

In other sectors of the economy, improving the equality of opportunity has generally meant the removal of illegal and discriminatory barriers which have limited the private decisions of both producers and consumers. In higher education, the meaning of improving equality of opportunity has been expanded to include the lowering of economic barriers (i.e., the provision of capital access and the lowering of price levels through subsidies) which limit the enrollment of students from low and moderate income families in the nation's colleges and universities. Although the major response to this expanded objective has been increased level of funding for Federal student aid programs—grants, subsidized loans, and work-study activities—institution-aiding programs have also been supported because of their impact on economic barriers. This support is based on the assumption that these programs either lower the cost or improve the quality of higher education acquired by students from low income families.

This assumption, along with many others regarding higher education, remains largely untested. Little systematic evidence has been developed to show either the enrollment patterns of low income students among the various institutions or types of institutions which receive Federal support or the enrollment-increasing effects of these various subsidies.[3] This paper is a preliminary attempt to analyze the distribution of subsidies which resulted from the Federal funds which supported programs in higher education institutions in the academic year 1966–67. The programs included account for $3.6 billion of the approximately $600M of Federal student aid funds (administered by the Veteran's Administration, the Social Security Administration and the Office of Education's guaranteed-student loan program) are not included in the $3.6 billion analyzed because of the almost total lack of information regarding their distribution.

The largest amount of Federal funds which affect the higher education sector of the economy is found in programs which either directly support educational institutions or work which is undertaken by the institutions or their staffs. These

[2] This appendix was prepared in December 1969 as a separate manuscript.

[3] A recent paper by Paul Feldman and Stephen Hoenack, "Private Demand for Higher Education in the United States" attempts to analyze the enrollment effects of subsidies and my previous paper "A Preliminary Evaluation of PPB" (with J. D. Steinbruner) outlined an analysis of the distribution of 1965–66 funds.

funds result from direct Government appropriations, federally sponsored educational programs, and federally sponsored research. Table 1 (below) shows the 1966–67 fundings for these categories.

TABLE 1.—FEDERAL FUNDS TO HIGHER EDUCATION INSTITUTIONS [1] (CURRENT FUND REVENUES) (NONSTUDENT AID), 1966–67

[In millions of dollars]

	All institutions	Private institutions			Public institutions		
		University	4 year	2 year	University	4 year	2 year
Government appropriations	340.4	39.8	16.6	1.6	144.5	114.3	24.2
Sponsored res.:							
Federal contract res. centers	955.9	321.4	257.1	.4	367.6	9.4	.02
Other Federal	1,262.1	587.1	80.3	1.1	557.2	38.3	.2
Sponsored education programs	502.8	116.6	54.1	2.8	225.0	85.5	18.8

[1] "Financial Statistics of Institutions of Higher Education: Current Funds Revenues and Expenditures 1966–67," OE–52010–67.

It is not clear whether research funds should be counted as education subsidies or simply as Government payments for outputs produced by university personnel. In general, they support noninstructional activity, but they often subsidize faculty and administrative costs which would otherwise have to be borne by the institutions' students. These "noninstructional" activities probably have varying degrees of connection with the educational process and thus simply adding them into general institutional subsidies seems somewhat questionable. Because Federal contract research centers generally have a minimum connection with the undergraduate education in most institutions, they will be omitted from subsequent subsidy calculations. On the other hand, because other research support may or may not subsidize undergraduate education, all calculations will show subsidies when it is both included and excluded.

In order to estimate the distributional effect of Federal funds, it is first necessary to evaluate the per-student subsidies which result from Federal programs. Table 2 (below) shows the degree credit enrollment in 1966–67 in higher education institutions.

TABLE 2.—DEGREE CREDIT ENROLLMENT IN HIGHER EDUCATION INSTITUTIONS,[1] FALL 1966

	Private institutions			Public institutions		
	University	4 year	2 year	University	4 year	2 year
Undergraduate	453,784	1,186,216	105,000	1,226,661	1,343,339	840,000
Graduate	243,000	----------	----------	387,000	----------	----------

[1] These estimates were derived from the "Projections of Education Statistics to 1977–78" with the assumptions that the university/4-year splits within both public and private institutions were the same as the "Projections * * *" reported for fall 1965, that "4 year" institutions had no graduate students, and that graudate students were divided between public and private institutions as reported in "HEW Trends: 1966–67 Edition" pt. 1.

Using these enrollment figures and assuming that undergraduate and graduate students benefit similarly from the institutional revenues described in table 1, we can calculate the per-student revenue resulting from these Federal programs. This calculation assumes that all students within a given type of institution are essentially equally affected by institutional aid or support programs regardless of their level of income.

TABLE 3.—AVERAGE FEDERAL SUBSIDY PER STUDENT RESULTING FROM INSTITUTIONAL AID OR SUPPORT PROGRAMS, 1966-67

[Amount per student]

	Private institutions			Public institutions		
	Universities	4-year	2-year	Universities	4-year	2-year
Government appropriations	$57.10	$13.55	$15.08	$84.34	$85.06	$28.82
Sponsored programs	163.30	45.58	26.69	131.29	63.65	22.42
Research (excluding contract research centers)	839.67	67.67	10.65	325.16	28.48	.25
Total	1,064.07	126.80	52.42	540.79	177.19	51.49
Total excluding research	224.40	59.13	41.77	215.63	148.71	51.24

The programs described above are not specifically aimed at students from a particular income group and thus their resultant subsidies probably affect all students in a particular institution or type of institution in essentially the same manner. Hence, the average per-student subsidy can be approximately viewed as being received by each student. Federal programs which subsidize facilities and other capital goods probably have a somewhat similar effect, but the 1966–67 data on their distribution is not yet available. Calculations of the subsidy effects of these programs' funds in previous years, however, show them to be small. Thus, omitting them will not seriously lessen the validity of this analysis.

The remainder of the Federal programs whose funds flow through institutions are student aid programs. These include Federal funds for grants, subsidized loans and work-study programs which "stimulate" student employment. The guaranteed student loan program (GLP) which is run through banks is not included. Table 4 (below) shows the distribution of institution-disbursed Federal student aid funds.

TABLE 4.—FEDERAL STUDENT AID FUNDS DISBURSED BY HIGHER EDUCATION INSTITUTIONS,[1] 1966-67

[In millions of dollars]

	Private institutions			Public institutions		
	University	4 year	2 year	University	4 year	2 year
Purpose:						
Work assignments	21.969	22.715	2.324	55.130	34.327	13.355
Undergraduates	7.743	21.227	2.324	34.611	32.938	13.355
Grants	60.647	25.281	0.736	86.090	26.124	2.468
Undergraduates	13.424	16.797	0.736	23.557	21.977	2.468
Loans	38.922	67.954	2.505	61.690	48.418	3.905
Undergraduates	21.959	63.199	2.505	41.831	45.664	3.905
Total to Undergraduates	43.126	101.223	5.567	99.999	100.579	19.729
Percent to undergraduates	35	87	100	49	92	100

[1] "Financial Statistics of Institutions of Higher Education—Student Financial Aid, 1966–67," OE-52011-67.

The amount of the subsidy resulting from these student aid funds is not simply the sum of the Federal funds. Clearly, a grant is worth more to a student than a loan of the same amount which must be repaid. Similarly, a work-study assignment should not be counted as a full subsidy as the student is required to work in order to receive the Federal funds. In fact, work-study funds may be seen as subsidizing the recipient student's fellow students in that they are able to buy his labor services at a below-market price. (In the current work-study program the college pays only 20 percent of the salary.)

The subsidy resulting from a $1 grant is clearly $1 as the student simply receives the grant outright. The effect of the below-market interest rate and repayment delays in the Federal student loan program makes the student only repay approximately 67 cents for every $1 of loan principal. The additional subsidies which result from teaching and other cancellations of principal may actually allow the student not to repay any of the loan. Thus in the extreme the loan may have virtually the same subsidy effect as a grant. Work-study funds seem more appropriately viewed as having no, or small, subsidy effects for the recipient students.[4]

Table 5 (below) shows the result of several alternative definitions of the subsidy effects of the undergraduate student aid funds.

TABLE 5.—SUBSIDIES RESULTING FROM FEDERAL STUDENT AID FUNDS 1966–67

[Dollars of subsidy/dollars of total Federal funds]

	Private institutions			Public institutions		
	University	4-year	2-year	University	4-year	2-year
Definition:						
I. All grants plus 0.33 of loans	$0.48	$0.37	$0.28	$0.37	$0.37	$0.19
II. All grants plus all loans	.82	.79	.58	.65	.67	.32
III. All grants, 0.33 loans plus all work-study	.66	.58	.70	.72	.70	.87
IV. All Federal funds	1.00	1.00	1.00	1.00	1.00	1.00

Now it is necessary to calculate the distribution of the student aid funds among the students within each type of institution. First it is necessary to describe the income distribution of students. Table 6 (below) shows the income distribution of freshmen in 1968. Although these distributions probably do not completely parallel those of the 1966–67 undergraduates, they are the only ones available and thus will be assumed to be good approximations.

TABLE 6.—FAMILY INCOME DISTRIBUTION OF FALL 1968 FRESHMEN[1]

[Percent of students in a particular type of institution reporting family income with the specified range]

	Private institutions			Public institutions		
Family income	University	4-year	2-year	University	4-year	2-year
<$4,000	2.7	5.7	4.8	4.3	8.4	8.1
$4,000 to $6,000	5.2	8.2	11.1	8.1	12.0	13.9
$6,000 to $8,000	9.3	12.2	17.9	13.1	17.7	19.5
$8,000 to $10,000	12.5	15.0	17.0	16.3	18.2	18.9
$10,000 to $15,000	26.4	26.1	25.0	30.0	27.5	25.6
$15,000 to $20,000	14.3	13.0	11.5	13.3	9.8	8.2
$20,000 to $25,000	9.5	7.2	4.8	6.6	3.5	3.0
$25,000 to $30,000	5.5	4.1	3.2	3.0	1.4	1.0
$30,000 plus	14.7	8.6	4.7	5.2	1.5	1.8

[1] (American Council on Education, "National Norms for Entering College Freshmen-Fall 1968.")

Student aid funds are probably distributed largely to low income or "needy" students rather than evenly among all students in a particular type of institution. Lacking data on the exact distribution of these funds, some assumptions must be made regarding their allocation. I have assumed that the funds are distributed to students on the basis of the College Scholarship Service definition of need—that is, cost minus expected parental contribution—with the funds being distributed in such a way that the percentage of the "need" filled by Federal funds is equal for all income groups (who have need) within a given type of institution. I have also assumed that all recipient students within a given type of institution received the same mix of the alternative types of student aid.

The student costs were based on W. Lee Hansen's calculations of costs (tuition fees plus room plus board plus other expenses) for the academic year 1968–69 and the USOE "Trends" for the school year ending 1967. Table 7 (below) shows the results of these calculations.

[4] A fuller discussion of the subsidy effects of student aid funds appears in Mundel and Steinbruner, "A Preliminary Evaluation of PPB," 1969, sec. IV, app. A.

TABLE 7.—STUDENTS' COSTS IN ACADEMIC YEAR 1966–67 [1]

	Private institutions			Public institutions		
	University	4-year	2-year	University	4-year	2-year
Resident	$3,098	$2,636	$2,244	$1,794	$1,559	$1,284
Commuter (Res. —$400)	2,698	2,236	1,844	1,394	1,159	884

[1] These figures were derived from W. Lee Hansen, "An Examination of Existing Financial Barriers to Attendance at Degree-Credit Institutions" (unpublished ms.) with the assumption that the relative levels of university and other 4-year institution costs within both the private and public sector remained unchanged between 1966–67 and 1968–69. USOE "Trends" was used for the 1966–67 price levels within the public and private sectors.

Using Hansen's assumed commuting rates, we find the 1966–67 price levels to be:

TABLE 8.—ASSUMED STUDENTS' COSTS (1966–67)

	Private institutions			Public institutions		
	University	4 year	2 year	University	4 year	2 year
Percent commuters (assumed)	40	40	50	30	30	100
Resulting cost	$2,938	$2,476	$2,044	$1,674	$1,439	$884

In order to calculate the financial need of students it is first necessary to calculate the expected contribution of their families. Table 9, below, shows the 1966–67 college scholarship service, CSS, contribution expected from families with two children.

TABLE 9.—*Expected parental contribution to college costs,*[1] *1966–67*

Family income:	*Expected parental contribution*
$2,500	0
$3,000	0
$4,500	240
$5,500	470
$6,500	690
$7,500	890
$8,500	1,130
$9,500	1,380
$10,500	1,660
$12,500	2,240
$15,500	3,220

[1] College scholarship service. Based on two-parent families with two dependent children and no financial complications.

Using these assumed parental contribution levels and the student costs, table 8, we can calculate the need of students from each family income level within each type of institution. Distributing the student aid among students in a given type of institution in such a way as to fill the same fraction of need in all income groups results in the following distribution of student aid funds:

TABLE 10.—DISTRIBUTION OF STUDENT AID FUNDS DISBURSED BY ACADEMIC INSTITUTIONS, 1966–67

[Dollars per student]

	Private institutions			Public institutions		
Family income	University	4-year	2-year	University	4-year	2-year
Less than $4,000	$344	$275	$167.0	$372	$263	$131
$4,000 to $6,000	304	237	139.0	296	201	75
$6,000 to $8,000	251	186	102.0	194	117	12
$8,000 to $10,000	200	138	66.0	99	44	
$10,000 to $15,000	82	26	.3			

It is now possible to calculate the total "subsidy" resulting from Federal funds by adding the student aid subsidies to the institutional aid program funds described in table 3 (above). The calculations are shown in table 11 below:

TABLE 11.—SUBSIDIES RESULTING FROM FEDERAL HIGHER EDUCATION PROGRAMS, 1966–67

[Amount per student]

Family income	Private institutions			Public institutions		
	University	4-year	2-year	University	4-year	2-year
A. All Federal funds count as subsidies:						
Less than $4,000	$1,408	$401	$219	$913	$440	$183
$4,000 to $6,000	1,369	364	192	837	378	126
$6,000 to $8,000	1,315	313	154	735	294	64
$8,000 to $10,000	1,264	265	119	639	221	51
$10,000 to $15,000	1,146	153	53	541	177	51
Greater than $15,000	1,064	127	53	541	177	51
B. All Federal funds (excluding research) count as subsidies:						
Less than $4,000	569	334	209	588	412	183
$4,000 to $6,000	529	296	181	512	350	126
$6,000 to $8,000	475	245	143	410	266	64
$8,000 to $10,000	425	197	108	314	192	51
$10,000 to $15,000	306	85	42	216	149	51
Greater than $15,000	224	59	42	216	149	51
C. All Federal institutional aid funds plus 100 percent of student aid grants plus 33 percent of loans count as subsidies:						
Less than $4,000	1,229	228	99	678	275	76
$4,000 to $6,000	1,210	214	91	650	252	66
$6,000 to $8,000	1,184	196	81	513	220	54
$8,000 to $10,000	1,160	178	71	577	193	51
$10,000 to $15,000	1,103	136	52	541	177	51
Greater than $15,000	1,064	127	52	541	177	51
D. All Federal institutional funds (excluding research) plus 100 percent of student grants plus 33 percent of loans count as subsidies:						
Less than $4,000	390	161	88	353	246	76
$4,000 to $6,000	371	147	81	325	223	65
$6,000 to $8,000	345	128	70	287	192	54
$8,000 to $10,000	320	110	60	252	165	51
$10,000 to $15,000	264	69	42	216	149	51
Greater than $15,000	224	59	42	216	149	51

There are several observations that one can make regarding the distribution of funds described in table 11.

1. When research funds are included as educational subsidies for undergraduates, the subsidies are heavily oriented to students attending universities and high-income students receive substantial Federal subsidies.

2. Depending on the definition of the subsidy resulting from student aid funds, students from high-income families may receive annual subsidies which are more than 10 times as large as those received by low-income students.

3. Even when research funds are excluded from the calculation of subsidies, high-income students often receive annual subsidies in excess of those received by students from low-income families.

4. Student aid funds seem to make the overall impact of Federal aid somewhat more progressive—or less regressive—but these effects are quite small. The small magnitude of these effects is illustrated by the fact that the largest difference between the annual aid received by the rich and the poor in table 11D is $165. Even when all student aid funds are viewed as subsidies—table 10—the largest difference is still only $372.

So far our analysis has concentrated on the annual subsidy effects of Federal higher education funds. Because undergraduate students typically attend college for more than 1 year, it is important to evaluate the subsidies which they receive over their entire higher education experience. In the absence of detailed enrollment patterns for a given group of students and detailed funding data for a number of

consecutive years, table 12, below, represents an attempt to evaluate these subsidies. In making this calculation, we have assumed that a student remains in the institution in which he was enrolled in 1966–67 for 4 years if the institution is either a university or a 4-year college and for two if the institution is a 2-year institution.[5]

We have also assumed that the 1966–67 pattern and level of Federal funds continues for all the years in which students are enrolled as undergraduates.

TABLE 12.—AVERAGE UNDERGRADUATE SUBSIDIES RESULTING FROM FEDERAL HIGHER EDUCATION FUNDS [1]

[Dollars per student]

	Definition of subsidy			
	A	B	C	D
Family income	All Federal funds	All Federal funds excluding research	100 percent of student aid grants plus 33 percent of loans plus all institutional aid	100 percent of student aid grants plus 33 percent of loans plus institutional aid: excluding research
Less than $4,000	$1,871	$1,428	$1,257	$811
$4,000 to $6,000	1,729	1,231	1,247	757
$6,000 to $8,000	1,539	995	1,220	671
$8,000 to $10,000	1,430	814	1,238	629
$10,000 to $15,000	1,293	578	1,264	540
$15,000 to $20,000	1,360	541	1,360	547
$20,000 to $25,000	1,529	557	1,529	552
$25,000 to $30,000	1,597	553	1,597	553
More than $30,000	1,791	561	1,791	564

[1] Using assumptions noted in the previous paragraph.

The surprising finding from the calculation of total undergraduate subsidies is their unexpected distributional impacts. With all Federal funds counted as subsidies (12–A), students from the poorest income groups receive only $80 more than do those of families with incomes in excess of $30,000 and students from middle income groups receive somewhat less than do students from either of the two extremes. If all research funds are excluded and all other funds are counted as subsidies (12–B), the overall impact of the Federal funds is somewhat more progressive. If only the "subsidy portion" of student aids is counted as a subsidy and all institutional aid is counted as subsidizing education (12–C), the impact of the Federal support is peculiarly regressive. In this case students from families with incomes below $15,000 receive essentially the same subsidy ($1,220–$1,264) for their undergraduate training, while students from higher income families receive subsidies which increase with income. When the subsidies resulting from research are subtracted from this summation (12–D), the overall impact becomes slightly progressive. In this calculation students with family incomes in excess of $10,000 receive essentially equal subsidies ($541–$561), and students with lower incomes receive subsidies which increase with decreasing income. As noted before, however, low income students do not receive subsidies which are much greater than those received by students from much higher income backgrounds ($814 versus $561). In general, analysis of table 12 shows that whatever progressive effects may result from Federal higher education funds are largely nullified by support for research at academic institutions. Table 13, below, shows the nature of the support for academic research.

[5] This assumption will probably tend to overestimate the relative subsidies received by students in 2-year institutions because they probably do not on the average attend half as many years as do students in 4-year institutions. On the other hand, the assumption completely ignores the transferring of students and the fact that transfers from 2- to 4-year institutions are more prevalent than the reverse flow. This would tend to distort the relative subsidies in the opposite direction. (In a later paper, I hope to evaluate these assumptions more fully.)

Table 13.—Average total undergraduate subsidy resulting from academic research [1]
(dollars per student)

Family income:	*Research subsidy*
<$4,000	$443
4,000 to 6,000	497
6,000 to 8,000	544
8,000 to 10,000	616
10,000 to 15,000	716
15,000 to 20,000	819
20,000 to 25,000	972
25,000 to 30,000	1,043
>30,000	1,230

[1] Except for rounding errors this is simply column A–column B of table 12.

Even if all research expenditures are not viewed as subsidizing student education, a small subsidy resulting from research can easily limit the progressivity of the other funds' impacts. For example, if only 32 percent of the research expenditures are viewed as education subsidies, the subsidies received by students from families with income less than $4,000 and those from families with more than $30,000 are equalized. If this same breakeven percentage is applied to all students the following subsidy pattern emerges.

TABLE 14.—*Average total undergraduate subsidy resulting from Federal programs* [1]
(dollars per student)

[With 100 percent of student grants plus 33 percent of student loans plus 32 percent of research funds plus other institutional aid programs counted as subsidies]

Family income:	*Federal subsidy*
<$4,000	$956
$4,000 to $6,000	909
$6,000 to $8,000	851
$8,000 to $10,000	819
$10,000 to $15,000	778
$15,000 to $20,000	803
$20,000 to $25,000	868
$25,000 to $30,000	887
>$30,000	955

[1] Using assumptions used in table 12.

Again, the resulting subsidy pattern is mildly progressive up to a $10,000 to $15,000 family income level ($956 versus $778) and regressive at higher income levels.

SUMMARY

In general, the overall impact of Federal aid to higher education on "equality of opportunity" appears to be slight. Except for the student aid programs, the impact of Federal funds on the economic barriers (price levels) faced by students from various income levels is somewhat regressive. Student aid funds generally improve the progressivity (lessen the regressivity) of the impacts for students from families with less than $10,000 annual incomes, but these improvements are not large. It must be remembered that these findings are based on the 1966–67 funds disbursed by higher education institutions and that no attempt has been made to evaluate the enrollment effects of these subsidies.

HIGHER EDUCATION SUBSIDIES: AN ANALYSIS OF SELECTED PROGRAMS IN CURRENT LEGISLATION

By ROBERT W. HARTMAN*

SUMMARY AND POSTSCRIPT

This paper is an analysis of selected features of the Education Amendments of 1972, written before the act emerged from conference in late May 1972. Now that the conference has reported and both houses of Congress have voted in favor of the amendments, it is proper to summarize the paper in its proper historical perspective by comparing the amendments as passed with the alternatives discussed in the paper.

This study had three broad policy points to make. First, all considerations of equity and effectiveness point toward a student aid program that "entitles" students to aid given their economic circumstances, that does not distort relative prices of various institutions to different students, and that "targets" funds on students from the lowest income classes. Second, the paper called for recognition of the fiscal problem faced by private institutions, and recommended that programs be designed to attack the cause of these difficulties, rather than attempt to ameliorate their consequences. Finally, there is a discussion of the need to limit subsidies to well-defined purposes and to guard against unproductive subsidies especially when they are not easily controllable through appropriations.

In light of these considerations, the paper analyzes the Basic Educational Opportunity Grants and concludes that the version passed by the Senate is flawed. An ideal program would offer students grants based solely on their families' economic circumstances with an upper limit on aid that should be independent of the cost of attending any particular college. Moreover, the paper argues that the equitable treatment of different students requires that, in the event of insufficient appropriations, the method of reducing a student's entitlement be related to his economic prospects, unlike the Senate proposal where low-income students would suffer the largest cutbacks in grants.

The final bill that emerged from the Congress deserves a mixed score by these criteria.** At full funding, the Education Amendments still contain the "half-cost provision" (limiting a student's grant to no more than half the cost of attendance at the institution he attends). This provision is analyzed in detail in the paper and is found to be unfair and to cause distortions in the choices faced by different

*The Brookings Institution. This paper was supported in part by a grant from the Ford Foundation to the Brookings Institution. The views presented are those of the author and not necessarily those of the officers, trustees, or other staff members of the Brookings Institution or the Ford Foundation.

**The final bill and conference report appear in the Congressional Record, Tuesday, May 23, 1972, pp. H4832–H4896.

students. With regard to the provisions of the final bill on the method of reducing entitlements in the event of insufficient appropriations, an attempt was made to improve on the "ratable reduction" method discussed in my paper, but the improvement is very small.

Appendix B presents estimates of the effects of the Education Amendment provisions at funding levels of $1 billion and at $500 million. These may be compared to table 9 in the text. The result of the comparison is that at the budget levels indicated, basic grants will not be well-targeted on students from low-income homes.

The paper discusses in detail the advantages of the State Scholarship Incentive Program as an attempt to get at the root causes of the fiscal malaise of private colleges. There is also a discussion of how and why the Insititutional Aid Proposals in the Senate and House bills fail to deal with causes but instead promise to be wasteful subsidies.

The Education Amendments, as passed, again draw a mixed review in the area of institutional aid. First, the State Scholarship Incentive Program survived the legislative hurdles and, as the analysis in the paper suggests, this program could be an important and effective one. Second, the Institutional Aid provisions of the Education Amendments are a compromise between the House and Senate versions—and that is about all that one can say about them. In appendix B, the provisions are explained and their impact on different institutions is estimated. By comparing the table in the appendix to table 12 in the text, it is clear that the primary impact of the new formulation is to further lower the assistance to public 2-year institutions in favor of universities and the private sector, in general. This means that the incidence of the subsidies on students will be even more regressive than those shown in table 11 in the text, especially when institutional aid is funded at a low level.

In a number of places, the paper warns against unnecessary subsidies, especially when they cannot be controlled by the appropriations process. With reference to the insured loan program, several reasons are given for expecting the legislation to result in huge untargeted subsidies, that are really not controlled by appropriations. The Education Amendments do not significantly change these conclusions. In addition, the Amendments put some new constraints (in the form of "triggers") on future Congresses that are almost certain to guarantee waste.

The amendments specify that payments on basic grants cannot be made unless Congress first appropriates $653 million for existing student aid programs (Supplementary Educational Opportunity Grants, College Work-Study, National Defense Student Loans). This means that future sessions of Congress will be locked into $653 million worth of programs which at least partly overlap with the new Basic Grant entitlement, with no opportunity to trade one off against the other. Moreover, if (as described in the text of the paper) the Basic Grant Program becomes decidely untargeted at low funding levels, the implication of this trigger device is that Congress will have to choose between $653 million in existing programs (no Basic Grants) and, say, $1.653 billion (existing program plus a "minimum" Basic Grant Program of $1 billion). There is a mighty wide gap between those two

budget points and Congress's hand is unnecessarily tied in trying to aim in between the two.

Another "trigger" written into the Amendments pertains to institutional aid. Forty-five percent of the Institutional Aid appropriation cannot be spent unless Basic Grants are funded at least at 50 percent of the full entitlement level. That 45 percent slice is the funds to be allocated among institutions on the basis of basic grant recipients. While the intent of Congress in establishing this trigger provision may have been to establish the primacy of the Basic Grant Program, what the trigger really does is withhold funds from public junior colleges until Basic Grants are generously funded (see appendix B). Such discriminatory treatment seems unwarranted for any public purpose.

The last section of the paper is a plea for more intensive staffwork and information-gathering so that Congress may be better informed in formulating higher education legislation. I see no reason to change this conclusion, except perhaps to amend it to cover the study of potential revisions of recently enacted laws.

At the time this paper is being written Congress is considering higher education legislation that will set the course for Federal aid for at least the next 5 years. Too often in the course of the legislative process, the relation between the public goals of a bill and the details of programs to be authorized under it are obscured. This paper is an attempt to review some key aspects of the House and Senate versions of the higher education legislation and to relate these provisions to the major public objectives in higher education.

The program elements to be emphasized are:

- In the Senate bill: Basic educational opportunity grants, State scholarship incentives, and cost-of-instruction allowances.
- In the House bill: Institutional aid, amendments to the insured loan program.

Most of these provisions provide for direct subsidies to students; the competing institutional aid provisions are first efforts to provide general aid to institutions of higher education. This paper will discuss various legislative alternatives in terms of their effects on the Federal budget, on the distribution of benefits among students and institutions, and on the choice students and institutions make.

Basic Educational Opportunity Grants

Introduction

The Senate version of the higher education legislation provides in section 131 for a program of basic educational opportunity grants. Under this proposal every undergraduate student in eligible institutions would be entitled to a Federal grant equal to $1,400 minus the expected family contribution for that student, or one half of the actual cost of attendance, whichever is less. No grant would be given to a student entitled to less than $200. Proposals of this sort—for a national student grant program—have a long history. The most recent and

perhaps influential reports supporting a "basic grant approach" are "Quality and Equality" (the Carnegie Commission report) and "Toward a Long Range Plan for Federal Financial Support for Higher Education" (Rivlin report). Each of these reports advocated a Federal student grant program as the keystone of the Federal Government's assistance to higher education.

The reasons usually adduced for a basic grant program are:

Such a program is necessary to raise college-attendance rates for students from lower income homes, thereby furthering equal educational opportunity.

A national basic grants program would insure that all low-income students receive a federal subsidy, unlike the existing student grant program which funnels money through states and institutions, often missing eligible low-income students.

A national schedule of entitlements will insure that Federal subsidies are concentrated among students in accordance with their lack of ability to pay for college.

Analysis

1. COSTS WITHOUT INDUCED ENROLLMENTS

The program of basic grants adopted in the Senate bill if fully funded would involve a major increase in budgetary commitments for Federal student aid programs. Undergraduate student support programs are estimated to be at the level of $2.4 billion for 1971–72. In the Office of Education programs alone, the estimated total program level is $1.2 billion, serving as many as 2.7 million students.

The basic grant program's cost depends critically on two factors:

The policy decision made on what is to be included in the expected family contribution and the shape of the expected contribution schedule at different levels of family income.

The impact of the basic grants program on student enrollment and retention rates.

Family contribution schedules can include a variety of income sources that students would be expected to draw on: parents' and students' own income, assets, social security aid to dependent students, veteran's benefits, and so forth. Once the sources of income have been settled upon, the schedule of expected family contribution can be drawn up after certain judgments are made as to what is a fair contribution at different income-wealth levels. In table 1 below are two estimates of what the cost of a basic grant program would have been in 1970–71. These estimates assume that 1970–71 attendance levels are maintained in all institutions, and that the College Scholarship Service (CSS) tables for 1967 and 1971 would be used for the schedule of expected family contributions. Although the Senate's higher education bill calls for the Commissioner of Education to promulgate a new schedule of expected family contributions, the resulting schedule is not likely to be very different from these CSS tables.

TABLE 1.—COST OF BASIC GRANTS FOR 1970–71, BY INCOME CLASS OF STUDENTS

[In millions of dollars]

Income class	Basic grants based on 1967 college scholarship service tables	Basic grants based on 1971 college scholarship service tables
0 to $2,999	122.6	122.6
$3,000 to $4,999	217.7	225.8
$5,000 to $7,499	358.0	479.0
$7,500 to $9,999	[1] 125.5	466.9
$10,000 to $11,100	0	118.2
Total full-time students	823.8	1,412.4
Part-time students	59.9	101.7
Total	883.7	1,514.1

[1] Under the 1967 CSS tables, grants reach 0 (i,e,, go below $200) for families with 2 dependents at about $9,200 income, Under the 1971 tables grants go below $200 at $11,100 family income, All income data in this paper are based on before tax income and on the assumption that each family has two dependent children.

Source: Based on calculations and sources outlined in app, A, I–VI,

It should be noted that the cost of the basic grant program is strongly affected by the choice of a family contribution schedule, with the total cost estimates ranging from $884 million to $1.5 billion in the two estimates shown in table 1. Most of the difference is accounted for in the higher income classes where large numbers of students are eligible only under the 1971 tables.[1]

2. INDUCED ENROLLMENT

These estimates, as noted above, do not account at all for any increase in enrollment induced by the basic grants program. Such induced enrollees are, of course, a major raison d'être of the program. To estimate how many new students would be attracted to higher education by a basic grants program, one would need estimates of the pool of students who do not now attend college and of how many of these students would enroll if entitled to a basic grant. Unfortunately reliable estimates of the latter are not available.

Table 2 shows estimates of induced enrollments in 1970–71 on the following assumptions:

TABLE 2.—INDUCED FULL-TIME UNDERGRADUATE ENROLLMENTS UNDER BASIC GRANTS ,1970–71

Income	Induced enrollment (thousands) under 3 assumptions		
	(A)	(B)	(C)
Under $3,000	53	291	122
$3,000 to $4,999	110	297	86
$5,000 to $7,499	126	279	279
$7,500 to $9,999	172	172	172
Total	461	1,039	659

Source: See app. A, VI.

[1] The Senate bill provides that "one-half of veterans benefits and payments under the Social Security Act shall not be included" in determining expected family contributions. The estimates in table 1 ignore this provision in large part because of the ambiguity of the requirement. If half of the payments to discharged or disabled, veterans or dependents of deceased veterans were added to family income in determining family contributions, the Federal budget cost would go down by as much as $88 million in 1970–71 using the 1971 CSS table. Similarly if aid to students aged 18 to 21 who are beneficiaries of the social security program aiding children of deceased, retired and disabled workers were included in family income, Federal budget savings could amount to about $41 million in 1970–71 under the 1971 CSS table. Thus the cost estimate using 1971 tables may be 8 to 9 percent too high. On the other hand, vocational school students, many of whom would be eligible for basic grant benefits are omitted from our calculations for lack of available data.

Assumption A.—The full-time undergraduate enrollment rate of each income class is raised to the rate of the income class immediately above it. Under this assumption, the number of undergraduate full-time students in 1970–71 would have increased by 461,000, or about 8.7-percent.

Assumption B.—Nonstudents are raised to the undergraduate full-time college going rate of students from $10,000 to $14,999 income-families, since basic grants provide all such students with the "buying power" of students from $12,000 homes. In this case enrollments would rise by about 20 percent.

Assumption C.—Nonstudents from family incomes between $5,000 and $10,000 are raised to the 1970–71 enrollment rate of the students in the $10,000 to $14,999 family income class. Students from families with less than $5,000 income attend at 60 percent of that rate.

The budgetary implications of induced enrollments can now be estimated under each assumption provided that we know the attendance patterns of the induced enrollees. We have assumed that the enrollment patterns (i.e. public or private college, 2-year, 4-year or university) would follow those of students now enrolled in the same income class. Table 3 shows the additional Federal program cost for a basic grants program with induced enrollments using the 1971 CSS tables.

TABLE 3.—ADDITIONAL COST OF BASIC GRANTS PROGRAM DUE TO INDUCED ENROLLMENT, 1970–71

[Dollar amounts in thousands]

Income class	Original cost estimate using 1971 college scholarship service	Additional cost[1] under 3 assumptions		
		A	B	C
Under $3,000	$122,600	$49,665	$273,680	$115,020
$3,000 to $4,999	225,800	108,115	292,175	84,380
$5,000 to $7,499	478,970	120,580	267,165	267,165
$7,500 to $9,999	466,870	111,960	111,960	111,960
$10,000 to 11,100	118,200	0	0	0
Total: Full-time only	1,412,440	390,320	944,980	573,195
Percent increase		27.5	66.5	40.3

[1] Additional students are assumed to receive same average grant as others in their income class.

When induced enrollments are taken into account, the Federal budgetary requirement for the basic grants program would be increased by 27 percent to 66 percent over the estimates based on no change in enrollments. To the extent that we view increased enrollments as a major program output of the basic grants program, the budget costs estimated here imply that each induced enrollee annually costs the Federal Government between $2,300 (assumption B) and $3,900 (assumption A).[2] The per-induced enrollee costs are, naturally, much higher than the average grant to a beneficiary because induced enrollees are only a small fraction of all grant recipients. The larger the induced enrollment (as in assumption B), the lower is the per induced enrollee cost of the basic grants program, but the larger is the aggregate budget required for full funding.

[2] Estimates based on full-time undergraduate costs and enrollments only.

In summary, assuming that the Federal Government will employ an expected contribution schedule similar to the 1971 CSS tables, the budget for full funding of basic grants would have been between $1.8 billion (excluding part time; with 461,000 induced enrollees) to $2.4 billion (excluding part time; with 1 million induced enrollees) for an annual per induced enrollee cost of $2,300 to $3,900. Under the low induced enrollment assumption A, most of the new enrollees (table 2) and most of the program costs (table 3) would be incurred on behalf of students from families with incomes between $5,000 and $10,000. Under the high enrollment growth assumption B most of the new enrollees would come from families with incomes under $5,000, but most of the costs would be incurred on behalf of the students in the $5,000 to $10,000 range. These data all pertain to 1970–71 enrollments using 1971 CSS family contribution schedules. If the 1971 schedule is employed, and budget requirements are estimated for later years, costs will be lower since incomes have risen. Judging by past practice, however, family contribution schedules are scaled down as incomes rise and, to the extent that this practice were maintained, the budget estimates presented here would hold beyond 1970–71.

3. HORIZONTAL EQUITY AND TARGETING SUBSIDIES

Many students from low-income (under $6,000) families now attend college and receive no Federal grants at all. One of the primary goals of a basic grant program is to establish national standards entitling all such needy students to a Federal subsidy.[3]

Table 4 summarizes how effective a basic grant program, if fully funded, would be in broadening entitlement to Federal grants. Out of the 516,000 full-time undergraduates from families with income below $6,000, only 211,000 were receiving educational opportunity grants (EOG's) in 1970–71. Moreover, 79,000 students from higher income families were receiving Federal grants in that year in preference to the excluded 305,000 low-income students.

TABLE 4.—DISTRIBUTION OF BASIC GRANTS AND EDUCATIONAL OPPORTUNITY GRANTS, 1970–71

Income Class	Educational opportunity grants		Basic grant[1]	
	Students aided	Average grant[2]	Students aided	Average grant
Under $3,000	89,400	586	132,000	929
$3,000 to $5,999	121,600	573	384,000	973
$6,000 to $7,499	44,400	545	353,000	920
$7,500 to $8,999	22,900	490	358,000	820
Over $9,000	11,900	477	781,000	395
Total	290,200		2,008,000	

[1] Based on 1971 CSS tables, no induced enrollment.
[2] Based on 1969–70 data. From 1969–70 to 1970–71, EOG increased from 280,600 students to 290,200 and obligations rose from $144,800,000 to $164,600,000.

Source: EOG students aided, U.S. Office of Education, Bureau of Higher Education, "Higher Education Fact Book, 1971," EOG. Average grant from Nathalie Friedman, "The Federal Educational Opportunity Grant Progtam" (Columbia University, Bureau of Applied Social Research, May 1971, p. 55). Basic Grant data are own estimates, based on data and sources in app. A.

[3] Many low-income students do, of course, receive aid in the form of Government-subsidized wages (as under the college work-study program) or loans (as under the low interest national defense student loan program), but these payments entail work or repayment obligations and are not pure subsidies.

The basic grant program as shown in table 4 would remove the horizontal inequity of treating equals unequally by offering full coverage to students in low-income families. (The number of students aided under basic grants in table 4 is computed without regard to any induced enrollment.) However, in raising the number of students receiving Federal grants by over 1,700,000 students, the fact remains that most of the increases in students aided would come from families with incomes in excess of $6,000. The basic grant program, in short, fills a disgraceful subsidy gap in the present student grant program by offering aid to all low-income students. It also fills the gap for middle-income students, a matter of, in my opinion, less social urgency.

Under the EOG program, the per-student subsidy for the very poor is only about $100 more than the per student grant at $9,000 family income. The basic grant program under the Senate bill, would be much more generous, on the average, but the gap between the subsidy received at zero income versus $9,000 income would still be about $100. This result is entirely due to the provision in the Senate bill that limits a student's grant to one-half the cost of his college (see below). Thus, to the extent that the basic grant approach is expected to target larger grants on the most needy, the Senate bill fails to achieve this goal.

4. EFFECT OF BASIC GRANTS ON OTHER COMPONENTS OF STUDENT AID

One difficulty in making even a rough estimate of the final incidence of basic grant subsidies is the impact of such a program on other Federal student aid programs, especially those operated by the U.S. Office of Education. Several alternative scenarios seem plausible, ranging from substitution of basic grants for all other forms of student aid to continuation of present programs at present funding levels on top of basic grants.

The most likely possibility is that existing programs will continue, but will be changed to serve a new clientele. Under the Senate version of S. 659, for example, the existing EOG program would become the "supplemental educational opportunity grants" to be awarded by institutions that receive Federal allotments. It seems likely that the allotments for these grants will shift more toward institutions with high student charges than is now the case. The reason for this is that the practice has been to allocate EOG funds according to the "financial needs" reported by institutions. Since basic grants will, if funded at a high level, fulfill most of the "financial need" in institutions with low charges, most of the "unmet need" will be in higher charging institutions. Since the higher charge institutions can demonstrate need even for fairly wealthy students (an institution whose student budget totals $4,000 can show unmet need under the 1971 CSS tables for students (in 2-dependent-child families) whose family income falls below $19,500.) Thus, many students from middle-income backgrounds who are presently not receiving Federal student aid may become recipients as a result of the basic grants program The degree to which such shifting occurs will depend on the relative appropriation levels of the basic grants versus existing programs and on the administrative procedures to be followed in the allotment process for the existing programs.

Summary

At full entitlement levels, using 1971 CSS tables and the assumptions noted previously, the basic educational opportunity grants would provide between $1.5 to $2.5 billion in new Federal subsidies for higher education. For the first time all students from low-income homes would receive grants but the average subsidy received in the various income brackets would differ very little. Existing college-based student aid programs would probably become less targeted on low-income students under full funding of basic grants.

5. REDUCING THE COST OF BASIC GRANTS

Full funding of the basic grants program would raise budget outlays for higher education by a considerable sum. As a result, legislative draftsmen have paid considerable attention to cost-cutting devices. In the Senate bill, three provisions seem to have been designed to reduce the budget for basic grant subsidies:

(1) The entitlement to the basic grant cannot exceed one-half the cost of the institution.

(2) No basic grants are to be awarded to students whose entitlement is less than $200.

(3) In the event appropriations fall short of the amount required for full funding under the Federal formula, an equal proportionate reduction in each student's grant is provided for.

Each of these apparently innocuous provisions may have a substantial impact on the incidence of the subsidies in the basic grant program. In addition, some of the provisions introduce distortions in the relative price of different institutions facing various students. The following paragraphs discuss these effects of the cost saving provisions and put forward some alternatives.

a. Half-cost

The basic grant provision of the Senate bill provides first of all that each student receive $1,400 minus the expected family contribution. The logic of such a provision is that it provides, in principle, that every student have at least the buying power of a student whose family's income position allows them to contribute $1,400 to the student's education. In 1971, this provision translates into providing all students with the same financial opportunity as faces a student from a home in which the family income level is $12,000.[4] Alternatively, the logic of the basic grant formula can be explained as an intent on the part of Congress that every child be enabled to attend an institution which costs $1,400 without incurring debt or working.

The provision limiting the payment to one-half of the institution's cost is a major compromise on the policy philosophy just described. The half-cost limit works as follows: each student would receive either $1,400 minus expected family contribution or half the cost of the institution, whichever is less. Table 5 shows the difference between the two formulations at various school cost and family contribution combinations.

[4] In the 1971 CSS tables, a family contribution of $1,400 is reached at an income level of $12,000 for two dependent child families.

TABLE 5.—BASIC GRANT ENTITLEMENTS UNDER HALF COST RESTRICTIONS

Family income	And family contribution (2 dependent children)	Cost of institution			
		$1,000	$1,600	$2,000	$2,800
Less than $6,000	0	$1,400(F) 500(C) 900(D)	$1,400(F) 800(C) 600(D)	$1,400(F) 1,000(C) 400(D)	$1,400(F) 1,400(C) 0(D)
$8,000	$500	900(F) 500(C) 400(D)	900(F) 800(C) 100(D)	900(F) 900(C) 0(D)	900(F) 900(C) 0(D)
$10,000	1,000	400(F) 400(C) 0(D)	400(F) 400(C) 0(D)	400(F) 400(C) 0(D)	400(F) 400(C) 0(D)

KEY TO SYMBOLS

F=Is the entitlement under $1,400 minus family contribution.
C=Is the entitlement under $1,400 minus family contribution or ½ cost whichever is less.
D=Is the difference between F and C.

As can be seen from the table, the major losers from the half-cost provision are the students from families with low income who attend public sector institutions (that is, the ones who attend institutions that cost under $2,800) and lower middle-income students who attend public junior colleges (that is, at the $500 family contribution level the half-cost provision reduces the basic grant if the cost of the institution is under $1,800). Students who are at the upper end of the income range eligible for grants are not affected at all by the half-cost provision. Since most very low income students attend public institutions and most middle-income students do not attend public junior colleges, the concentration of the losses from the half-cost provision will significantly affect the total subsidies received by the lowest income groups.

Table 6 shows the distribution of the cost savings to the basic grants program of the half-cost provision under the assumption that existing enrollment patterns are not changed by basic grants. Half of the $322 million in costs saved are at the expense of students from families with incomes below $6,000, almost all of whom are affected by the provision. Comparison of table 6 and table 4 indicates that if the half-cost provision were eliminated basic grants would be a highly targeted subsidy program.

TABLE 6.—BUDGETARY SAVINGS FROM HALF COST PROVISION [1]

Income class	Amount	Per student	Percent of total students in class affected
Under $3,000	$62,200,000	$471	87.9
$3,000 to $4,999	99,000,000	427	79.3
$5,000 to $7,499	147,200,000	291	75.2
$7,500 to $9,999	13,500,000	19	23.4
$10,000 to $11,100	0	0	
Total	322,000,000	160	42.3

[1] Based on existing enrollments only.

Source: See app. A.

In addition to the unfortunate equity effects of the half-cost provision is its impact on the relative price of different schools faced by different students. The prices of different colleges that a student faces under a basic grant program are determined by the charges (that is, what we have been calling costs) the colleges make minus the Federal grant received. Table 7 shows the prices faced by three students eligible for a basic grant under the Senate bill's half-cost rule and one student whose family contribution is too high to qualify him for a basic grant. (The numbers in the table are equal to the cost of school minus the basic grant under the half-cost formula.)

TABLE 7.—PRICES OF VARIOUS SCHOOLS FACED BY 4 STUDENTS

Family contribution	Cost of school			
	$1,000	$1,600	$2,000	$2,800
0	$500	$800	$1,000	$1,400
$500	500	800	[1] 1,100	1,900
$1,000	600	1,200	1,600	2,400
$2,000	1,000	1,600	2,000	2,800

[1] $1,100 is computed as follows: First, compute the basic grant as the lesser of $1,400 minus family contribution or half-cost. In this case, the basic grant is $900. Then compute the cost of school minus basic grant to arrive at price. In this case, it is $2,000 minus $900 or $1,100.

The unsubsidized student can choose to attend the school whose cost is $1,000 or, if it is worth an extra $1,800 to him, he can invest in the services offered by the $2,800 college. Each unsubsidized student presumably looks at the extra costs of attending colleges of varying quality levels and compares his expected return, which may be in the form of enhanced cash income, or prestige, or the pleasures of the intellect at the various institutions, to these incremental costs before settling on the college of his choice. Assuming that he is admitted, the implication of the choice of the $2,800 college, for example, is that its services represents to the consumer-buyer exactly $1,800 more than those of the $1,000 college. In other words, the value of the return expected to be earned from attending the higher-priced college is measured by the excess of its price over the lower-priced college. One of the great advantages of the diversity in American colleges is that it allows students to choose among colleges and this supplies a market test of whether higher priced schools are worth their extra cost.

Some of the subsidized students, under the half-cost rule, face the same relative price for the colleges on our table as the unsubsidized student, but others don't. The lowest income student, whose family contribution is zero, is faced with a set of prices that signal him that the $2,800 cost college is only $900 more expensive than the cheapest college shown. To the next student in the table, the high cost school is $1,400 more expensive than the least costly. This means that the student from the lowest income home would be led by the basic grant formula with a half-cost provision to invest in the highest cost school as long as he calculates its return to be at least $900, while the unsubsidized student invests only if the return is at least $1,800. The effect of the half-cost provision then is to reduce the relative price of

high cost schools the most for the poorest students, less for middle-income students who are eligible for basic grants, and not at all for unsubsidized students.

There are two points to note about the consequences of this shift in relative prices. First, the students from the poorest homes, if they are responsive to relative prices, will be led to attend higher cost institutions. Middle-income students will receive a lesser incentive and the students at the top of the basic grant eligibility list will receive no such incentive. It follows that the cost savings from the half-cost provision may never be realized: Many students for whom the savings are planned will opt for institutions whose costs put them out of the range in which the half-cost provision is operative. Second, the question arises as to what is the reason for the half-cost provision in the first place. If it is intended as a special means of "helping the private sector," what is the sense of helping that sector by channeling to it, students only of the most modest circumstances? As we shall discuss below, the private sector may need help, but distorting the relative prices faced by basic grant eligible students is not a sensible means to provide such aid.

Another, more plausible rationale, for the relative cheapening of high-cost institutions for low-income students is that there is some social benefit to be derived from a greater mixing of socio-economic classes in the higher cost institutions. Although there is not much hard evidence to substantiate it, some people believe that social mobility of children from low-income homes requires that they attend prestige institutions. If one takes such social mobility as an externality—that is, a benefit accruing mainly to society in general, rather than to the student—a case can be made for providing special incentives for low-income students to attend high cost schools. One such incentive is the relative price effect of the half-cost provision.

The Senate bill contains at least four other programs that compete with the half-cost provision in providing incentives for students from low-income families to attend high-cost institutions. These are the proposed supplementary educational opportunity grants and the proposed cost-of-instruction allowances and an expanded loan program. Cost of instruction allowances and loan programs will be discussed below. Supplementary EOG's would be payable in amounts up to $1,000—$1,200 if the student ranks in the upper half of his class—provided that the supplementary EOG not exceed one-half the total student aid, including basic grants. Since such grants are limited to those of "exceptional financial need"—presumably after the basic grant has been accounted for—the supplementary EOG program seems to be designed primarily as a program to aid students at high-cost colleges.

It is my judgment that, if any grant program is necessary, the supplementary EOG program should be the vehicle for providing subsidies for low-income students to attend high-cost schools. The main reason for this position is that the Congress will be able to control, through appropriations and regulations, the amount of resources it wishes to place on the encouragement of low-income students to attend high-cost institutions. This goal is quite separate from the general access-to-college goal that the basic grant program is designed to serve.

It has a weaker social consensus behind it. Is the general public as willing to subsidize a poor kid to go to Harvard as it is to provide him with a college education? Moreover, provision of incentives for students to attend high-cost institutions is interwined with the financial problems of private colleges, which necessitates that we separate the program so that it can be "traded off" against other programs specifically designed to aid these private institutions. (See below.)

Summary and conclusion

The elements of an ideal basic grant program are evident:

- It should provide all students with access to college by guaranteeing them a certain sum of money from Federal grants and family contributions.
- It should provide grants to students from homes with different expected family contributions such that the sum of the family contribution and the basic grant is the same for all students.
- It should provide that all basic grant recipients face the same set of relative prices among colleges as is faced by all unsubsidized students.

There is only one basic grant formula that meets these criteria. If we pick $1,400 as the guaranteed amount of money for access to college, the formula would be "$1,400 minus expected family contribution" period. This formula would:

Guarantee access to institutions whose costs are $1,400 or less to all students, without work or repayment obligations;

Fully equalize the college financing ability of all students whose expected family contribution is less than $1,400; and

Not affect the relative price of different colleges as viewed by aided students.

By contrast, the half-cost provision in the basic grant program is regressive and it distorts relative prices.

b. The $200 minimum grant

The Senate bill provides that students whose basic grant eligibility is under $200 shall receive no grant. The effect of this provision, under the 1971 CSS tables, is to remove from eligibility all students (from two-child families) with incomes between $11,100 and $12,000. Since there are about 230,000 students in this income bracket, the provision saves the Federal budget about $21 million.

The $200 minimum grant provision is basically unfair. It creates one class of students who will not be guaranteed $1,400 through a combination of basic grant and family contribution. Lower income students would be guaranteed the $1,400 under the Senate bill and higher income families are expected to be able to contribute $1,400 to the student's education.

There are two justifications for the provision. First, it can be argued that the administrative cost of making many small grants is not worth the benefits that students would receive. The Senate bill is not too clear on the exact procedures to be used in disbursing grants, so it is difficult to evaluate what administrative costs would be involved.

However, it should be noted that the bill does provide for payments less than $200 in the event that appropriations are insufficient to meet entitlements, and the logic of the excessive administrative cost argument would seem to apply in that event as well. Second, the $200 minimum grant is a budget-cutting item, as noted above. However, the case can be made that the entitlement provisions are no place to cut the budget, expecially not by arbitrarily depriving one economic group of fair treatment. The place to worry about budget savings in a basic grant program is in the provisions for how the entitlements are to be adjusted in the event that appropriations are insufficient to provide full funding. This is the subject to which we now turn.

c. Ratable reduction

The Senate bill provides that in the event appropriations are insufficient to meet entitlements under basic grants, each eligible student's basic grant shall be "ratably reduced," that is reduced by the same percentage. The costs of full entitlement are so large that the reduction provision is much more than a matter of academic interest. Reduction is certain to be necessary.

Ratable reduction is the worst possible method to handle the need to meet an insufficient basic grant budget. Since the basic grant program is so structured that students with the lowest family income background would receive the largest grants it follows that equal percent reduction of grants means that the largest dollar cutbacks would be suffered by the poorest students. Put another way, ratable reduction means that the guarantee level (family contribution plus grant) will be driven down the most for the student with the least means.

Two superior alternative approaches to reducing basic grants are available. The first is called the "floating ceiling" method. Under this adjustment the guarantee level of $1,400 in the basic grant formula would be reduced until appropriations are sufficient to meet the new entitlement levels. Each student's grant, compared to full funding, is reduced by the same dollar amount. This approach has the advantage of maintaining equalized guarantee levels (the adjusted grant plus the family contribution level) for all students. The floating ceiling method implies that if basic grant recipients are to attend any given college, they will have to borrow, or squeeze out of their parents, money over and above the expected family contribution. These additional sums will be the same for all students, regardless of their family's income.

A second method of adjusting the basic grants program to insufficient appropriations is the "additional family contribution" method. Under this technique the basic grant to be awarded to any student would be determined by $1,400 minus the expected family contribution and minus an additional family contribution which is a fixed percent of the family income of the basic grant recipient. This method has the virtue that the student's borrowing (or the additional sums that his parents will have to give him) are scaled to his family's income. The family's income serves as at least a rough measure of the student's access to capital markets and to his family's ability to put up additional funds. The additional family contribution method is the one alternative among those considered here that maintains the full guarantee level for the most needy students.

The effects of the three alternative methods of reducing the basic grant entitlement can be illustrated simply. Our estimates indicate that if appropriations for the basic grant program were approximately $1 B, each of the three reduction methods would work as follows. Under ratable reduction, each basic grant student would receive 55.4 percent of his full-funding entitlement. The floating ceiling method, at the $1 B funding level, would result in a $900 ceiling. Under the additional family contribution method, each student's full funding entitlement would be reduced by 5 percent of his family's income (see table 10).

Table 8 illustrates the effect of the three reduction methods for five hypothetical students (all are assumed to attend high-cost institutions, so that the half-cost provision has no effect) at a $1 B basic grant budget level. It is clear that only under the floating ceiling or additional family contribution methods is there even the remotest likelihood that low-income students would have any real choice of college. For a college costing $3,000, the lowest income student, under ratable reduction, would have to borrow over $2,200 per annum while the student from a $10,000 income home would have to borrow only $1,800 (provided his parents make the expected family contribution) to attend the same institution. The floating ceiling approximately equalizes the borrowing needs of the two students, while the additional family contribution method implies borrowing of about $1,650 for the poorest student shown and $2,050 for the wealthiest.[5]

TABLE 8.—BASIC GRANTS UNDER $1,000,000,000 FEDERAL BUDGET

Income	Family contribution	Amount of basic grant: Ratable reduction	Floating ceiling	Additional family contribution
$1,000	0	$776	$900	$1,350
$4,000	0	776	900	1,200
$8,000	$510	493	390	490
$10,000	960	244	0	0

Tables 9 and 10 show the budgetary consequences and the distri butional implications of the three reduction methods. The first lesson to be learned from the tables is that it is difficult to think of the basic grant program being undertaken at low appropriation levels. At a $500-million budget level, the grant program would serve only students whose family incomes are less than about $8,000, and would pay a maximum Federal grant of $510 under the floating ceiling method. Under ratable reduction, the average grant would only be $203 and few students would receive much more that that (the low income student in public junior college would receive about $165!). Even the additional family contribution method at a $500-million budget level would result in students having to borrow the equivalent of over 10 percent of their family's income in order to attend an institution costing $1,400.

[5] Ratable reduction combined with the half cost provision of the Senate bill really does in the low-income student attending a public junior college. If his schools' cost is $1,200 the maximum basic grant—at full funding—would be $600. Under ratable reduction with a Federal budget for basic grants of $1 B, the grant would be slashed to about $330. For a student whose family cannot contribute anything to his higher education, this grant is not much better than nothing. On the other hand, the floating ceiling method provides somewhat more aid to students who attend low cost colleges than does the additional family contribution method under the half-cost provision.

TABLE 9.—DISTRIBUTION OF BASIC GRANTS UNDER 3 REDUCTION METHODS, 1970–71 [1]

Income class	Ratable reduction			Floating ceiling			Additional family contribution		
	Total amount (millions)	Percent of total	Dollars per student	Total amount (millions)	Percent of total	Dollars per student	Total amount (millions)	Percent of total	Dollars per student
At budget level of $1,494,400,000:									
Under $3,000	$142.8	9.6	$772	$166.8	11.2	$902	$166.2	11.1	$898
$3,000 to $4,999	276.8	18.5	809	318.0	21.3	930	307.5	20.6	899
$5,000 to $7,499	497.0	33.3	788	558.0	37.3	884	524.5	35.1	831
$7,500 to $9,999	479.8	32.1	540	417.8	27.8	470	460.4	30.8	518
$10,000 to $11,100	97.8	6.6	232	33.8	2.3	80	35.8	2.4	85
At budget level of $998,700,000:									
Under $3,000	95.4	9.6	516	147.0	14.5	795	155.6	15.6	841
$3,000 to to $4,999	185.0	18.5	541	274.9	27.2	804	262.1	26.2	766
$5,000 to $7,499	332.1	33.3	526	438.4	43.6	695	394.5	39.5	625
$7,500 to $9,999	320.7	32.1	361	138.4	14.9	156	186.3	18.7	210
$10,000 to $11,100	65.5	6.6	155	0	0	0	0	0	0
At budget level of $501,200,000:									
Under $3,000	47.9	9.6	256	94.5	18.9	510	137.3	27.4	742
$3,000 to $4,999	92.8	18.5	271	174.5	34.8	510	183.1	36.5	535
$5,000 to $7,499	166.7	33.3	264	220.9	44.1	350	168.9	33.7	268
$9,500 to $9,999	160.9	32.1	181	11.3	2.3	13	11.9	2.4	13
$10,000 to $11,100	32.9	6.6	78	0	0	0	0	0	0

[1] All reduction methods assume basic grants with half-cost provision limited to current full-time undergraduate students, based on 1971 CSS tables and to induced enrollment using assumption A.

Sources: Estimated from data in appendix A and from 1971 CSS tables.

TABLE 10.—BUDGET CONSEQUENCES OF 3 REDUCTION METHODS

Budget (millions)	Ratable reduction			Floating ceiling			Additional family contribution		
	Percent of full funding	Number of recipients (in thousands)	Amount per recipient	New ceiling	Number of recipients (in thousands)	Amount per recipient	Tax rate of AFC (percent)	Number of recipients (in thousands)	Amount per recipient
$1,802.4	100.0	[1] 2,469	$730	$1,400	[1] 2,469	$730	----------	[1] 2,469	$730
$1,494.4	82.9	2,469	605	1,200	2,469	605	1.8	2,469	605
$998.7	55.4	2,469	404	900	1,887	529	5.0	1,914	522
$501.2	27.8	2,469	203	510	1,266	396	10.5	1,266	396

[1] Of 2,469,000 recipients, 461,000 represents estimated induced enrollment, as follows:

Under $3,000	132+ 53= 185
$3,000 to $4,999	232+110= 342
$5,000 to $7,499	505+126= 631
$7,500 to $9,999	717+172= 889
$10,000 to $11,100	422+ 0= 422
Total	2,008+461=2,469

Source: See table 9; for induced enrollment, see table 2; for other enrollment, see app. A.

Only at the $1 billion level does the basic grant program begin to resemble a meaningful new Federal student aid program. At that budget level, table 9 shows that ratable reduction would distribute about 28 percent of the subsidies to the students from families with incomes under $5,000, while the other two methods would distribute about 42 percent of the subsidies to that income class.

A cautionary note is warranted on the data presented in this section. The budget estimates and the distribution tables assumed that over 460,000 new enrollees would be induced to enroll in college by the basic grants program, even when it is funded at low levels. These

students account for about 20 percent of the grant recipients in the two tables, and it is likely that all these students would not enroll if basic grants were, in fact, funded at a low level. On the other hand, all the budget estimates were based on a basic grants program with a half-cost provision and with the assumption that students would enroll in the same types of institutions in which they now enroll. For reasons stated previously, the half-cost provision is likely to induce students to attend higher cost institutions and this change would result in higher cost estimates than are shown here.

Summary

The method used to reduce the basic grant in the event of insufficient appropriations has a substantial effect on the distribution of the subsidies under the program and, consequently, on the equitability of the program. Both the floating ceiling and additional family income methods concentrate funds on the neediest students much more than does ratable reduction. Ratable reduction is unfair and creates too high barriers to higher education for low-income students at plausible Federal budget levels for the basic grants program. The appropriations level required to make the basic grants program meaningful is in excess of $500 million and a case can be made that $1 billion is a reasonable minimum budget for this program.

GRANTS TO STATES FOR STATE SCHOLARSHIP INCENTIVES

General Provisions

The Senate bill provides for a new subsidy program to encourage States to undertake and expand State scholarship programs that are based on financial need. Without getting into details here, the program specifies that the Federal Government would pay 50 percent of the increased amount of State scholarship grants provided over a base year. Up to $50 million is authorized in each fiscal year 1973–75 to support initial recipients of State scholarship programs and an unlimited authorization is provided to support a 50-percent share for renewals. The implication of these provisions is that they authorize sufficient Federal support for a growth in State scholarship programs from about $270 million in 1971–72 to as much as $570 million in fiscal year 1975[6] if all existing needs-based scholarship programs qualify and if all States enter the program and make full use of the $50 million available for increased initial year State scholarships. Under these assumptions the Federal subsidy would be about $150 million in fiscal year 1975.

Effects on Private Institutions

This program is potentially one of the most important parts of the higher education legislation now under consideration in the Congress. One of the major problems in financing higher education

[6] The current (1971-72) estimate is based on Joseph Boyd's tabulation of $191 million in State scholarship programs in 1969–70 increased at 19.5 percent per annum thereafter. This is the rate of increase from 1968–69 to 1969–70 estimated by Boyd for competitive state programs. (See U.S. Office of Education, *Trends in Postsecondary Education*). After 1971–72, programs are assumed to grow by $100 million per year.

has been the increasing difficulty faced by many private institutions to compete with public sector institutions most of which maintain very low student charges. As many observers have pointed out, the tuition gap between public and private institutions has been growing and this has made it difficult for private institutions to attract students. The major reason for the growing tuition gap is the higher education subsidy policy of all of the States. This policy is to channel nearly all of the State-financed higher education subsidies into the public institutions in the form of institutional subsidies which allows the public sector to keep tuition down.

The State scholarship incentive program under the Senate bill should have the effect of changing the form of State subsidies to higher education. The only form of State-financed higher education subsidy to be matched under the bill is a needs-based student grant program. In effect, this provision changes the price State legislators will face in making their decisions on higher education financing. If the legislature wishes to put $1 into institutional subsidies, a full $1 in State revenues will be required. But if the legislature chooses to put $1 (including those dollars now spent on institutional assistance) into State scholarships, the State budget will only have to support 50 cents of the program as the Federal Government supplies the remainder. No one can be certain that State legislatures will respond to this lure, but to the extent that they do the long-run outlook for the private sector of higher education would brighten considerably.

First, even if public and private colleges freeze tuition at current levels, a State scholarship program in which the grants are usable at private institutions [7] may induce many more students to attend private colleges. Under present circumstances, increased State aid for higher education can be enjoyed by a student only by attending the public institution which received the grant; under an increased State scholarship program the student can choose which kind of institution to attend.

Second, private institutions will probably divert some of their own student aid funds to other purposes under a state scholarship program.

Third, some private institutions who have held back on tuition increases will be able to raise charges and still maintain enrollments because the increased State grants can be used by some students to offset the increase in price.

Finally, and most important for the private sector in the long-run, as State legislatures shift resources to State scholarship programs, there inevitably will be increases in tuition at public institutions. Since wages and other costs in public institutions will continue to rise, legislatures that choose not to meet the cost increases through larger institutional appropriations, will automatically be raising tuition at public colleges. Of course it is possible that legislatures will both expand support for public colleges through institutional grants and increase State scholarship programs. But it is not likely: one of

[7] I am assuming that a provision requiring States to allow students to use State scholarships at private institutions would be a mandatory requirement imposed by the Commissioner of Education. To permit a State to limit its scholarships to public institutions would convert the State scholarship incentive program into a Federal general aid program for the public sector, which seems to be far removed from the congressional intent.

the major political arguments for low tuition at public institutions has always been that it provides access to college for low-income students. As low-income students receive State scholarships (and basic grants as well) it is clear that the "access to the poor" argument for low tuition is eroded.

The expenditure of $150 million by fiscal year 1975 for a State scholarship incentive program can thus be best viewed as the Federal Government's response to the growing inability of private institutions to compete with the public sector. Seen that way, the State scholarship incentive program competes with the half-cost provision of the basic grant program, the supplementary EOG program, and the institutional aid programs, all of which have been defended on the grounds of providing special support for private institutions.

In my opinion, a State scholarship incentive program (although not necessarily the one appearing in the Senate bill) is a superior vehicle for improving the financial position of private institutions. It provides a solution to the long-run structural problem of private institutions which is the unfair price competition of the public sector. By contrast, the supplementary EOG program (or the institutional aid program), which could be used to target money on the private sector promises to be a bottomless pit. As costs and charges rise at private institutions, while tuitions at public institutions are held down, there will be increasing demands placed on Congress to increase funds for a supplementary EOG program (or for institutional aid—or both). Private schools will demonstrate (correctly) that they cannot attract low and middle-income students given the nature of the competition and that they are therefore in danger of financial collapse and/or in danger of becoming exclusive institutions. It will be impossible for Congress to know whether the private institutions they are being asked to bail out could have prospered under a truly competitive market or whether their real problem was that they had little to offer to students. The State scholarship incentive program responds to this dilemma by encouraging States to put money in the hands of students, supplying thereby a market test to distinguish between institutions whose main problem is price and those whose main problem is the quality of their program or the competence of their management.

An additional advantage of the State scholarship incentive approach should be noted. As compared to alternative means for aiding the private sector, the encouragement of State scholarship programs ranks low in the likelihood of increased Federal interference with the conduct of higher education. The State scholarship provisions of the Senate bill provide Federal fiscal control and audit procedures for State agencies who administer scholarships. Such limited Federal control can be contrasted to the provision in the supplementary EOG program that the grant shall be "increased to $1,200 in the case of a student who, during the preceding academic year, is *determined in accordance with regulations to have ranked in the upper half of his class*" (italic added). What will the regulations say about the institution that has decided to employ a pass-fail grading system? Or one that forswears class rankings? Similarly, the House bill's institutional

aid title [8] specifies that "the Commissioner [of Education] shall by regulation prescribe (1) the number of earned credits which constitute enrollment on a full-time basis and (2) a definition of 'credit' to be used for such determinations which shall be substantially uniform for all institutions." Even with the best of intentions, provisions such as this one will force Federal officials into the details of how colleges set academic policy. Forced to choose, both higher educators and wise public officials ought to prefer the controls of the market—as promised by the State scholarship incentive program—to the controls of Federal regulations.[9]

Some Anomalies

The State scholarship incentive program as passed in the Senate bill is not without flaws. First, there is a formula in the bill dividing the appropriation among the States in accordance with enrollment. Since States differ in terms of public-private mix and since new State scholarship programs may be necessarily lumpy decisions, the State allotment procedure is unnecessarily constraining. In this case, a procedure for ratable reduction of State grants in the event appropriations are insufficient would be a preferable procedure for allocation of funds. Second, the bill is technically imperfect in two respects, both, I think, inadvertent: (*a*) The condition for rewarding States for expansion of their programs is stated in terms of "individuals who have not previously been awarded" State scholarships. This wording covers all freshmen—a State with rapid turnover of students counts as a State making high effort to expand State scholarships. What is intended, I believe, is to reward States whose program, in budget terms, has grown; (*b*) the bill fails to specify that grants must be made available to students who attend private institutions. This is a must.

Summary and Conclusion

The State scholarship incentive program would be an inventive and important use of Federal subsidies for higher education. Its purpose is to change the behavior of State legislators, moving them to support higher education policies that reduce the tuition gap between public and private institutions. Compared to alternative means in the higher education legislation for aiding private institutions and providing freer choice for students, the State scholarship incentive program should play a major role. A number of revisions in the State allotment formula and in the language of the bill would improve the effectiveness of this subsidy program.

INSTITUTIONAL ASSISTANCE

Distribution of Subsidies Among Income Classes and Institutions

Both the Senate and House versions of the higher education legislation provide for funds to be used for general purposes by colleges and universities. In each bill, an institution's share would be deter-

[8] Russell Edgerton called this provision to my attention, and I am indebted to him for useful comments on this point.

[9] For a development of this argument, see my comment on a paper by James Buchanan: "An Alternative View" (AGB Reports, vol. 14, No. 4, January 1972).

mined by a formula. In the bill passed by the House of Representatives, the institutional aid program is the major provision, both because the budget implications of the House institutional aid program are substantial and because little new was proposed in the student aid programs under that bill. In the Senate bill, the cost-of-instruction allowance program is of substantial magnitude, but is subordinate to the basic grants provisions.

The approach of the two bills to distributing Federal funds for general assistance appear, on the surface, to differ considerably. The basic determinant of an institution's share of Federal subsidies under the House bill is total enrollment, while under the Senate bill the major determinant is the number of students receiving basic grants. Thus, it would seem that the Senate version would tend to divert a larger proportion of funds toward those institutions who serve a relatively large number of low- to middle-income students. There is, of course, a major question as to which students would benefit from the institutional aid granted. In this section we assume that each institution uses its institutional grant for across-the-board lowering of cost to its entire student body. To the extent that Federal funds are used for across-the-board subsidies to students, the Senate version could be expected to target subsidies for the benefit of lower-income students more than the House version.

Table 11 shows the percentage distribution among students of the institutional aid subsidies in the Senate and House bills. The table assumes that each institution distributes its total subsidy among all of its students—graduate and undergraduate—equally. (We have included graduate students as one "income group," because detailed information on the family income background of graduate students in different types of institutions is not available.) The table shows very little difference between the subsidy distributions of the two bills, although the Senate bill distributes a larger share of the funds to low- and middle-income students and a smaller share to graduate students than the House bill.

TABLE 11.—INSTITUTIONAL AID UNDER 2 BILLS

[Dollars in millions]

Income class	Senate bill		House bill	
	Amount at full funding	Percent of total	Amount at full funding	Percent of total
Under $3,000	$13.2	2.6	$33.2	2.1
$3,000 to $4,999	23.4	4.6	60.4	3.8
$5,000 to $7,499	51.4	10.2	133.3	8.5
$7,500 to $9,999	67.0	13.2	187.6	11.9
$10,000 to $14,000	176.3	34.8	513.8	32.7
$15,000 and over	138.5	27.4	466.9	29.7
Graduate students	36.1	7.1	176.3	11.2
Total	506.0	100.0	1,571.4	100.0

Sources: For Senate bill, distribution of schools by size and type taken from U.S. Office of Education, "Digest of Educational Statistics, 1970," table 113, p. 85. Within type of school, basic grant recipients were distributed to various size schools in proportion to total enrollment. For House bill, enrollment by level was taken from U.S. Office of Education, "Opening Fall Enrollment in Higher Education, 1970: Report on Preliminary Survey," table 2, p. 10, and "Opening Fall Enrollment in Higher Education, 1969: Supplementary Information, Summary Data," table 6, pp. 36–62. Portion for cost of instruction allowance was taken from Carnegie Commission on Higher Education, "Institutional Aid: Federal Support to Colleges and Universities," table F–27, p. 186, adjusted to Office of Education institutional categories. In all cases, all students (both graduate and undergraduate) were assumed to benfit equally from the institutional aid.

TABLE 12.—DISTRIBUTION OF INSTITUTIONAL AID AMONG INSTITUTIONS UNDER FORMULAS

Institution	Based on number of basic grant recipients	Senate bill formula	Based on enrollment	House bill formula
Public:				
University	21.8	11.5	28.6	25.4
4-year	28.7	26.0	24.1	24.5
2-year	26.8	29.5	20.9	14.4
Total	77.3	67.0	73.6	64.3
Private:				
University	4.8	4.0	8.4	9.2
4-year	15.9	25.5	16.4	24.1
2-year	1.9	3.5	1.6	2.5
Total	22.6	33.0	26.4	35.8

Sources: See table 11 for Senate and House bill distributions. Distribution of basic grant recipients from app, A (assumes all students with family income under $11,100 are eligible). Enrollment distribution calculated by adjusting the undergraduate totals of app, A for the share of full-time equivalent enrollments represented by graduate students in each type of school in 1969–70 from U.S. Office of Education, "Opening Fall Enrollment in Higher Education, 1969," table 6.

Several adjustments to the basic formulas in the Senate and House bills have the effect of shifting dollars among types of institutions, but their impact on the distribution of subsidies by income class is small.

The House bill makes several adjustments to a simple enrollment formula, which tend to divert funds from public 2-year colleges to private 4-year institutions. (See table 12 for a comparison of institutional aid based simply on full-time equivalent enrollment and the House bill.) Among these provisions are those that specify larger per capita sums for upper division and graduate students than for lower division students (diverts money toward universities and away from public 2-year colleges); a provision that gives an additional bonus for schools with small enrollments (diverts funds to private 4-year colleges) and a provision that one-third of the funds be distributed on the basis of the existing Office of Education student aid programs (in which public 2-year colleges are underrepresented and private institutions are overrepresented).[10] The effect of these provisions is to lower the share of the subsidy going to the public sector to 64 percent compared to 74 percent share that would be received if allocations to institutions were based solely on full-time equivalent enrollments.

The Senate bill also contains adjustments that aid the private sector. This goal is accomplished by a formula that very severely penalizes institutions with large enrollments and very generously rewards small colleges and universities. For example, the cost of instruction allowance in the Senate bill would provide a grant of $250 per student to an institution with a 1,000 enrollment, half of whom are eligible for basic grants. In a 30,000-student college, half of whose enrollment is eligible for basic grants, the Federal payment would be $55 per student. Public institutions, especially universities, tend to have large enrollments; thus, these provisions

[10] The House bill includes veterans benefits as well as Office of Education student aid programs in the one-third component. We have omitted veterans payments for lack of data on veterans' enrollment.

of the Senate bill draw funds away from public universities compared to what they would have received under a distribution based solely on the number of basic grants recipients. The major beneficiary of the shift is the 4-year private college as shown in table 12.

Table 11 shows the full funding implications of the institutional aid approaches. The House bill provides for over $1.5 billion in institutional aid, an order of magnitude comparable to the cost of the Senate's basic grant program. The Senate bill provides only $506 million in institutional aid. To the extent that the Congress foresees a limited pot of money available for higher education subsidies, it is clear that the basic student grant program and the House version of institutional aid will compete for the lion's share of the money. It is, therefore, not inappropriate to compare the incidence pattern of basic grants with the institutional aid program of the House. Such a comparison shows the basic grants program being much more redistributive than institutional aid, with 24 percent of basic grants going to children from families with under $5,000 income compared to about 6 percent for the House version of institutional aid.

Goals of Institutional Aid

An important question to settle in one's mind in evaluating institutional aid is what goal it is striving to achieve. A careful reading of the public record fails to make clear the case for institutional aid. One argument frequently used is that institutional aid is necessary to relieve the "financial crisis" facing higher education. But to my knowledge, no one has ever defended the specific formulas accepted by the House or Senate as even crude measures of financial distress. Cost of instruction allowances are also defended as cures for the financial problems of colleges, but also as a program that would carry out a "national purpose."

The national purpose that is supposed to be served by cost-of-instruction allowances is to offer an incentive (bribe) to all institutions to admit students from families with incomes below $11,000 (basic grant eligibles). This purpose would seem to require some kind of evidence to the effect that, even with a generous basic grant program, institutions will be loath to admit students from the family income classes that would be eligible for basic grants. To my knowledge, no such evidence has been offered.

Given the fact that neither body of Congress may have been aware of the full implications of all the detailed provisions of the bills that were passed, it is perhaps more relevant to ask what the effects of institutional aid will be, rather than what was intended to be.

We have no clear idea of what the impact of institutional aid will be. For some high-quality institutions, with stable enrollments, and very inelastic student demand curves, the result of institutional aid will probably be a greater outlay of funds per student. In many cases, this will mean an increase in the quality of education being offered (for example, new programs will be started), but in some cases it will mean higher faculty salaries or lighter teaching loads than would have occurred otherwise. At the other extreme, in institutions with excess capacity, and highly elastic student demand, there may be tuition

reductions and enrollment expansion. In the aggregate, it is likely that institutional aid would: (*a*) lower nominal tuition increases; (*b*) raise enrollments; and (*c*) enhance the dollar resources expended per student compared to the state of the world before institutional aid. But the mix of these elements at particular institutions or the overall share of each component in the national total demands a more complete knowledge of how institutions of higher education behave than is presently available.

The bribe incentive effect on enrollment of the specific form of institutional aid embodied in the Senate bill is likely to be small compared to the basic grants provision of that bill, with one possible exception. The exception is that the Senate bill has a very unusal "notch" feature which provides, for example, that in colleges with enrollment over 5,000 but not over 10,000, the cost-of-instruction allowance to be paid is equal to $200 for each of the first 499 basic grant recipients, $85,200 for the next basic grant recipient, and $200 for each subsequent basic grantee. It is clear that an institution in this size category whose enrollment of basic grant students is below, but near to, 500 students may well be induced to bring basic grantee enrollments up to that level. (Our last table assumed that all institutions would react that way.) On the other hand, the bill provides that for institutions in the size class between 2,500–5,000 students, cost of instruction allowances are to be $300 for the first 249 recipients, $35,300 for the next basic grantee, and $300 per aided student thereafter. Thus, it is not unlikely that institutions whose enrollments are sightly above 5,000 students might not "hire" more needy students, but rather contract in size in order to cash in on the cost-of-instruction allowance.[11] So even in this case, there is some ambiguity in the admissions policy outcome.

More importantly, the school which is above the "notch," is supposed to be effectively bribed into accepting a basic grant eligible for a marginal payment of from $500 (for very small colleges) to $100 (for institutions over 10,000 enrollment), under the model that lies behind the cost-of-instruction allowance. This seems to me to miss the really important point of the Senate bill which is that every student is guaranteed, at full funding, to have $1,400 in his pocket from his parents or the Government. This point, in the mind of even a penny-pinching admissions officer, would dominate his decision on whether to grant admittance to a low- or moderate-income student, for it represents a substantial saving in institutional student aid and a potential source for increasing revenues through a tuition increase. The cost-of-instruction allowance is more likely to be treated as a windfall, rather than as a determinant of admissions behavior.

At less than full-funding of basic grants, the effect of cost-of-instruction allowances on admissions policies can best be addressed as follows. Are admissions of basic grant recipients facilitated more

[11] The table below shows the relation of the Federal payment to total enrollment and basic grant enrollment at an institution with about 5,000 students. The reader can judge whether the institution shown in line 1 is more likely to transform itself into a line 2 or line 3 school under the Senate bill.

Total enrollment	*Basic grant eligibles*	*Federal payment*
5,001	300	$60,000
5,201	500	185,000
5,000	300	125,000

by giving $506 million in cost-of-instruction allowances or by using the $506 million to raise the maximum basic grant from $900 to over $1,200? (Table 10 shows that the increased Federal budget outlay, under the floating ceiling method, of moving from a $900 to a $1,200 ceiling on basic grants is about $500 million.) No one has the detailed knowledge about the admissions behavior of colleges and universities or on student responsiveness to varying grant levels, to predict the likelihood of enrollment increases under the two alternatives. But a good case can be made for enriching the basic grant program rather than providing a bribe. (I cannot imagine that a congressional committee intent on alleviating hunger would even hesitate to enact a food stamp program costing $500 million rather than a system of bonuses costing $500 million to retailers based on the proportion of their customers who are needy.) It may be true that under the cost-of-instruction approach, basic grant eligibles are more likely to be dispersed among institutions than if the funds are channeled through the students. As indicated previously, if Congress feels that some institutions have an environment particularly well-suited to basic grant recipients they can allocate supplementary EOG's to such institutions.

Summary

Institutional aid is a response seeking a stimulus. No clear cut purpose has been adduced to defend the particular formula embodied in the House institutional aid provision. The aid provision of the Senate bill may change admissions behavior—in some instances in unintended ways—but a good case can be made that the moneys would be better spent in an enriched basic grant program.

Insured Loan Amendments

Description

It has been a recurrent theme in this essay that in higher education legislation, as in courtship, "little things mean a lot." So it is with the apparently minor amendments to the insured student loan program under the House bill especially.

The House bill, under amendments to the insured loan program, provides:

(1) An increase in the annual amount a student may borrow to $2,500 (or in some cases more) and an increase to $10,000 in the total debt a student may incur under the program;

(2) That the Federal Government will pay the student's interest liability while he is enrolled provided that his institution certifies that he is "in need" of the loan, rather than the current income test for eligibility for interest subsidies;

(3) That each college or university shall receive from the Federal Government a cost allowance of 1 percent of the insured loans extended to its students during the academic year;

(4) An increase in Government insurance of student loans to provide for a guarantee of interest as well as unpaid principal;

(5) For an extension of the Emergency Insured Student

Loan Act of 1969 to provide for Government subsidies of up to 3-percent interest on the unpaid balance of insured loans over and above the interest paid by the borrower; and

(6) For the creation of a National Student Loan Marketing Association to serve as a secondary market and warehousing facility for student loans (House and Senate).

Consequences for Loan Volume

In a nutshell, these amendments, if enacted, could provide a juggernaut for Government subsidies. Under present law, the Federal Government pays interest during a student's enrollment only for those students whose adjusted family income (interpreted under regulations to be roughly equivalent to Federal taxable income) is less than $15,000. The amendments would change this so as to provide interest subsidies to all students whose institutions certify that they are in need of the loans. Since very few institutions of higher education are themselves lenders, they have every incentive to certify the need of every student who wishes to borrow. (The legislation specifies that the college must take into account family contributions in assessing need; it does not say how the family contribution is to be calculated.) Moreover, the House version provides a payment of 1 percent of new loans made to its students to institutions of higher education, which should fortify the incentive to approve all requests for certification of need. Thus, I would expect an extension of Federal loan subsidies into the upper income ranges. (A discussion of the present distribution of loan subsidies can be found in my book, prepared for the Carnegie Commission on Higher Education: *Credit for College: Public Policy for Student Loans*, (McGraw-Hill, 1971).

In addition, the amendments should encourage a much larger annual loan volume, over and above the new demand by students from higher income families. First, the legislation allows a student to borrow up to $2,500 per annum (up from $1,500 in existing law) and an increase in the lifetime ceiling. Second, the legislation provides substantial new encouragements to lenders to make student loans. A provision enacted during the tight money period in 1969, providing that the Federal Government could pay lenders up to 3 percent interest (on top of the 7 percent paid by the student) if money market conditions warrant it, would be extended. Government insurance is extended to cover interest as well as unpaid prinicipal in the event of default. And finally, the establishment of a Sally May for student loans would make it much easier for lenders to convert such loans into cash (that is, make them more liquid) than is now the case.

Students of money and banking are drilled to learn that the qualities of a financial asset are its risk, yield, and liquidity. Whoever put together the amendments to the insured loan program learned his lesson well.

Risk.—The risk of default is effectively reduced to zero by the provision of Government insurance on interest and principal.

The risk of capital loss that might result if interest rates rise is at least partially removed by the extension of the emergency allowance of up to 3 percent additional interest. This converts a

student loan into a variable interest rate loan and makes it nearly risk-free. (See *Credit for College, op. cit.*)

Yield.—The limit on student charges of 7 percent annual interest is supplemented by the special allowance noted above. If a college is the lender, it also receives the 1 percent cost allowance, raising its gross yield.

Liquidity.—Sally May will be empowered to buy student loans outright or to lend to an institution which warehouses its loan paper with Sally May. Thus, student loans would become at least as liquid as Government-backed mortgages and probably more so, since student loans are not issued for terms in excess of 10 years.

Impact on Federal Budget

These sweeteners to the insured loan program come at a time when it is growing rapidly and when the Government subsidies to support the program are growing even more rapidly. The most rapid growth of all is in Federal payments for defaults under this program. The data to support these assertions are given in table 13.

TABLE 13.—OPERATING CHARACTERISTICS OF THE INSURED LOAN PROGRAM

[In thousands of dollars]

	Fiscal year 1970	Fiscal year 1972	Percent change
Volume of insured loans	987,583	1,178,353	19.3
Interest subsidies	112,392	196,600	74.9
Net loss of student loan insurance fund	1,848	8,479	358.8

Source: "Budget of the U.S. Government," appendix, fiscal years 1972, 1973.

Under these circumstances, it is not implausible that federally insured student loans might reach an annual volume of $2 billion in a few years. Were that to be the case, the Federal subsidies implicit in the program could be estimated as follows:

(1) $367 million for interest subsidies. At a $2 billion loan level, if it is assumed that students will remain in subsidized status for an average of 3 years, the annual Federal subsidy would be 7 percent times $2 billion or $140 million per annum. Rather than sum the $140 million over 3 years, I have noted the present value, discounted at 7 percent, of three such payments. This method of computing subsidies is superior to the practice usually used of computing annual outlays for interest subsidies, because it attributes to the budget year all the subsidies implicit in the loans made in that particular year.

(2) Up to $162 million for special allowance interest subsidies. Assuming that the $2 billion level is reached in 3 years with loan levels of $1.6 billion, $1.8 billion, and $2 billion, total outstanding principal in the final year would be about $5.4 billion. Special allowances permit a Federal payment of up to 3 percent on all outstanding balances.

(3) $20 million in cost allowances to institutions of higher education. This is 1 percent of current loan volume.

(4) All costs of default. Unless some new provisions are instituted, the cost of defaults could mount into the many tens of millions,

especially with the improved Federal insurance provisions currently proposed.

(5) Any losses of the Student Loan Marketing Association. Although Sally May would be set up as a private corporation, the Federal Government would be the guarantor of its debt. In addition, there is a proposal in the fiscal year 1973 Federal budget, for the purchase of $288 million of low-interest national defense student loans by Sally May. Since such loans are inferior (to the holder) to federally insured loans, the Federal Government would have to pay Sally May for any losses it incurs in holding such loans. Such payments could be strung out over a number of years, but I have estimated that the interest subsidy implicit in a national defense student loan is about 33 percent of its face value. (*Credit for College, op. cit.*, p. 136.) At that rate of subsidy, annual losses that the Federal Government would have to make up to Sally May would be about $96 million, plus any los es incurred under the teacher cancellation provisions of the national defense loan program.

Summary and Conclusions

The amendments to the insured loan program imply a Federal subsidy to borrowing students of as much as $600 to $700 million within a few years. These subsidies, under the amendments in the current legislation, would be entirely untargeted: in practice, they would, I believe, be available to any student who persuaded his student financial aid officer that he had "need."

I have argued at length elsewhere (*Credit for College*) that student loans should be expanded and that repayment burdens should be lessened through such devices as lengthening repayment periods or adjusting repayments to income. But I also argued, I thought persuasively, that the justification for Government interest subsidies in such a program was relatively weak. Now that the insured loan program is getting out of the peanuts category in the Federal budget, the time has come to reexamine whether it is a suitable vehicle for carrying a half billion dollars' worth of subsidies to higher education. Since such loans can be encouraged without interest subsidies to students, or special allowances to lenders, by the simple procedure of letting the market determine the interest charge in a federally guaranteed program, I believe it is clear that these subsidies are an inferior form of Federal aid.

Concluding Comments

Perhaps the most important lesson to be learned from this review of the subsidy provisions of the current higher education legislation is that very few real issues in Federal subsidy programs can be resolved by appeal to general theory. While theory can guide the general focus of Federal subsidy programs, this paper makes clear that millions of dollars often ride on apparently minor provisions in Federal legislation. These provisions deserve deep scrutiny, during the authorization legislation process, to avoid Federal subsidies getting out of hand or into the wrong hands. This scrutiny is especially important

in authorizing legislation that creates "entitlements" (as in basic grants) or creates "uncontrollable" budget items (as in the insured loan program), for in these cases the appropriations process is an inadequate check on faulty or inadvertent authorizing legislation.

As a fairly close observer of the recent legislative process, I am convinced that Congress had inadequate information on which to base decisions on the higher education legislation. Part of the reason is that data and knowledge of some crucial aspects of higher education are not available. This shortcoming hampered this paper's attempt to analyze the legislation as well. But the fact is that there is enough information and knowledge to inform Congress a lot better than was the case during the past year.

The problem seems to be that there is no staff available to the Congress whose main function is to prepare objective analyses of the detailed alternatives being considered in committee, on the floor, and in conference. Committee staff simply do not have the time necessary to do the detailed work required. Executive agency staffs are too often partisans of one particular bill or of a clause in a bill, to provide objective evidence. Or, as is often the case, several agencies are interested in a bill, and one agency's objectivity is impaired by the pressure to win a battle over another agency.

The Legislative Reform Act of 1970 provided for an expanded staff for the Congressional Reference Service (CRS), and the responsibilities of the General Accounting Office (GAO) have been broadened. Part of either of these agencies could be developed into the kind of staff that the Congress could turn to for objective analysis of detailed legislative alternatives. To be effective, such a staff would have to have the capability for relatively fast response to specific questions, and it would, naturally, need the cooperation of both the executive branch and congressional staffs. The staff performing legislative analysis would have to be free of more trivial information requests. It seems to me that it is at least worth an experiment to establish in either GAO or CRS over the next few years a staff with these functions. It would be interesting, then, to see whether the next cycle of higher education legislation will emerge from a well-informed Congress.

Appendix A [1]

DETERMINATION OF BASIC GRANTS

I. A distribution of 5.3 million full-time undergraduate students in 1970–71 was generated as follows:

[In thousands]

Income class	Public			Private		
	University	4 year	2 year	University	4 year	2 year
Under $3,000	28	41	45	3	13	2
$3,000 to $4,999	44	65	72	10	38	3
$5,000 to $7,499	92	136	152	24	89	12
$7,500 to $9,999	172	211	169	38	114	13
$10,000 to $14,999	531	570	407	115	311	32
$15,000 and over	615	332	186	171	391	35

[1] This appendix and all computations for this paper were prepared by Daniel Sullivan of the Brookings Institution.

Estimates of full-time enrollment, by income class, from U.S. Census Bureau, series P–20, No. 222, "School enrollment: October 1970," table 14 (data for "married, spouse present" were omitted), were enlarged to be consistent with the U.S. Office of Education's estimate of 5.3 million full-time undergraduates. This enlargement was made so as also to be consistent with unpublished Office of Education's estimated distribution of students by income quartile. Students were then distributed to types of institutions according to unpublished estimates from the U.S. Office of Education. This distribution was then checked for consistency with U.S. Census Bureau, series P–20, No. 231, "Undergraduate Enrollment in Two-year and Four-year College: October 1970," table 8.

II. The following estimates of average costs for each type of institution were taken from the College Entrance Examination Board, "Estimates of the Distribution of Federal Student Grant Funds" (Washington, D.C., mimeo., 1972), p. 9 (rounded to nearest $10):

Public university	$2,240
4 year	1,970
2 year	1,180
Private university	3,970
4 year	3,320
2 year	2,740

III. The following estimates of average expected family contribution were taken from College Entrance Examination Board, "Manual for Financial Aid Officers," 1967 and 1971 editions, table A (all estimates assume two dependent children family). Averages were estimated at a point calculated as 60 percent above the lower bound of the class. [2]

Year	Income class				
	Under $3,000	$3,000 to $1,999	$5,000 to $7,499	$7,500 to $9,999	$10,000 to $11,100
1967	0	160	640	1,150	1,490
1971	0	0	160	730	1,120

IV. For each cell in the distribution of students in I, an average grant entitlement was determined according to the following formula:

$$\text{Basic grant} = \text{Minimum } [\$1{,}400 - \text{family contribution, one-half cost}]$$

Hence totals estimated from these data assume that average cost and average expected contribution are representative of all students within a given cell.

V. Entitlements to part-time students were estimated as equal to 7.2 percent of entitlements to full-time students. This estimate is consistent with the results of an unpublished analysis done by the Department of Health, Education, and Welfare, Office of the Assistant Secretary for Planning and Evaluation, November 1971.

VI. Enrollment rates and the pool of nonstudents from which enrollees could be induced by a basic grants program were based on data for primary family members, aged 18 to 24, from U.S. Census Bureau, series P–20, No. 222, op. cit., table 14. The size of the cohort in each income bracket was enlarged to make the data consistent with U.S. Office of Education enrollment data cited in I above. This procedure yielded the following estimates of total college eligible population and the percentage enrolled by income class:

Income class	Eligible population	Percent enrolled
Under $3,000	1,023,000	12.9
$3,000 to $4,999	1,282,000	18.1
$5,000 to $7,499	1,899,000	26.6
$7,500 to $9,999	2,151,000	33.3
$10,000 to $14,999	4,760,000	41.3
$15,000 and over	3,078,000	56.2

[2] In the $7,500 to $9,999 class, the average contribution was based only on eligible students who are 0.7 of this income class, having incomes under $9,400, under the 1967 tables.

APPENDIX B

I. BASIC GRANTS

The Education Amendments modified the Basic Grants entitlement formula used in Appendix A to read as follows:

Basic Grant = [$1,400 minus family contribution], with the following payment restrictions: (1) At full-funding no grant may be larger than half of cost, no grant may exceed "need" (defined as "cost minus family contribution"), and no payment may be less than $200; (2) At less than full-funding, no grant may be larger than half-need (60 percent of need if funding is over 75 percent), and no payment may be less than $50. (N.B.: There is still some debate as to whether the payment restrictions should be part of entitlements or not. This is important for determining the base on which to apply the reduction factors in the case of insufficient funding. We have assumed that payment restrictions are *not* part of the basic entitlement.) The amendments also modified the means of reducing payments, in the event of less than full-funding. They now provide that payments be reduced to the following levels: 75 percent for entitlements over $1,000, 70 percent for entitlements of $800–1,000, 65 percent for entitlements of $600–800, and 50 percent for entitlements of less than $600. If total appropriations exceed the required sums, increases are in proportion to the reductions made; if total sums are insufficient further decreases are pro rata. These rules yield the results in table B–1, which may be compared to table 9 and 10 in the text.

TABLE B-1.—DISTRIBUTION OF BASIC GRANTS BY INCOME CLASS AT $1,000,000,000 AND $5,000,000,000 BUDGETS UNDER EDUCATION AMENDMENTS FORMULA, 1970–71

Income class	Total amount (million)	Percent of total	Amount per student[1]	Number of recipients
Budget equals $1,000,000,000:				
Under $3,000	$122.6	12.3	$663	185,000
$3,000 to $4,999	227.8	22.8	666	342,000
$5,000 to $7,499	370.5	37.0	587	631,000
$7,500 to $9,999	244.7	24.5	275	889,000
Over $10,000	34.4	3.4	93	369,000
Total	1,000.0	100.0	414	2,416,000
Budget equals $5,000,000,000:				
Under $3,000	62.5	12.5	338	185,000
$3,000 to $4,999	115.5	23.1	338	342,000
$5,000 to $7,499	188.7	37.7	299	631,000
$7,500 to $9,999	124.7	24.9	140	889,000
Over $10,000	9.1	1.8	62	146,000
Total	500.0	100.0	228	2,193,000

[1] For all income classes below $10,000, all students remain eligible for all funding levels above $350,000,000. At funding levels above $850,000,000, the ½ need constraint is operative in all income classes for students attending public 2-year colleges. In the over $10,000 class, number of recipients varies with budget level because of $50 minimum payment. At $1,000,000,000 funding level, the cut-off for a 2-child family is $11,250. At $500,000,000, it is $10,500.

Source: Calculations based on data and method of app. A, using formula outlined above.

The Educational Amendments attempted to combine the Senate and House versions of Institutional Aid. The amendments provide for a single appropriation, to be distributed to schools according to a three-fold formula: (1) 45 percent on the basis of number of Basic Grant recipients, payments ranging from $100 to $500 per recipient, depending on the school's enrollment; (2) 45 percent on the basis of total supplementary EOG, CWS, and NDSL funds received, with payments ranging from 38 to 50 percent of such funds depending on the size of the institution; and (3) 10 percent on the basis of number of graduate students, payments being $200 per student. In the event of less than full funding, the Amendments provide for entitlements to be ratably reduced. In addition, they provide that the 45 percent distributed on the basis of Basic Grant recipients may not be paid out unless Basic Grants are funded at 50 percent or more of entitlements. When Basic grant funding is in excess of 50 percent of the proportion of the 45 percent part of Institutional Aid that may be spent is equal to the percent that Basic Grant appropriations bear to the full entitlement level. This formula, hence, yields a variety of results depending on Basic Grant appropriations as shown in table B–2. Comparing this table to table 12, we see that in all cases more funds are given to private institutions than under any formulation in table 12. It is also clear that the share going to public junior colleges depends critically on the level of Basic Grants funding.

TABLE B-2.—DISTRIBUTION OF INSTITUTIONAL AID BY TYPE OF INSTITUTION, 1970-71, UNDER EDUCATION AMENDMENTS FORMULA

Institution	Basic grants funded at (percent)—		
	Less than 50	50	100
Public:			
University	26.3	22.3	20.1
4-year	26.1	26.3	26.4
2-year	5.6	11.7	15.1
Total	58.0	60.3	61.6
Private:			
University	13.0	10.5	9.1
4-year	25.9	25.9	25.9
2-year	3.2	3.3	3.3
Total	42.1	39.7	38.3

Note: If basic grants funded at 50 to 99 percent, distribution will be between cols. 2 and 3.

Source: Distribution of basic grant recipients taken from table B-1 and appendix A. Distribution of SEOG, CWS and NDSL from Carnegie Commission, op. cit. Distribution of graduate students from U.S. Office of Education, "Opening Fall Enrollment in Higher Education, 1969," table 6.

UNIVERSAL WAGE-RATE SUBSIDY: BENEFITS AND EFFECTS

By MICHAEL C. BARTH*

SUMMARY AND CONCLUSIONS

This study examines the distribution of benefits and economic effects of a universal wage-rate subsidy. Such a program has been suggested as a possible component of an antipoverty strategy. While various forms of subsidy to employers have been tried, a wage-rate subsidy with the worker as intended recipient has not. Consequently and necessarily, our analysis is based upon theoretical insights and survey data which provide, at best, proxies for what we would ideally want to observe and measure. Nevertheless studies such as this can facilitate intelligent policy planning by forecasting a range of potential effects of and benefit distributions for the program under consideration.

The wage-rate subsidy examined here would pay a subsidy equal to some fraction (called the subsidy rate) of the difference between a socially determined target wage and the market-determined wage rate. The base of the subsidy is the hourly wage rate. All hours worked for which the target wage exceeds the market wage rate are eligible to be subsidized. Eligibility for the program is universal; no special categories of recipients save for age are defined. Finally, the program is work conditioned; if no labor is supplied, no wage-rate subsidy is paid.

It should be noted that the worker is the unit of analysis in the examination of a labor-market related policy such as a wage-rate subsidy. But the family is generally the unit upon which social concern is focused. This is certainly the case in the analysis of poverty. Moreover, it is of great interest to obtain program benefit distributions by demographic, economic and locational characteristics of recipients. Thus, a unique data base had to be constructed in order to obtain estimates of wage-rate subsidy benefits. Nationally representative estimates of hourly wage rates and hours worked had to be constructed and these had to be cross-tabulated with variables measuring labor-force status, status in family, family size, family income, location of residence, and age, race, and sex. The existence of the 1967 Survey of Economic Opportunity (SEO) made this feasible. The SEO, a 30,000-

*Evaluation Division, Office of Planning, Research, and Evaluation, Office of Economic Opportunity. The author is indebted to Jane Lee and George Chow who did the programing and simulation for this study and to Mark Worthington who provided able and imaginative research assistance. The views expressed in this paper are solely those of the author and do not necessarily represent those of the Office of Economic Opportunity.

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household cross-sectional survey of the U.S. population, was carried out by the Census Bureau for the Office of Economic Opportunity. It is unique in that it oversamples areas likely to have high concentrations of low-income households and in that it contains more conceptually adequate wage-rate data than can be found elsewhere.

The data base thus developed was manipulated in a microsimulation model which permitted differential effects of alternative program parameters on various population subgroups to be examined. It should be emphasized that the data reported here generally refer to the year 1966 and thus cannot be used to determine present day benefits of a universal wage-rate subsidy.

Estimates of dollar benefits (shown to be equal to transfer cost) to all recipients and numerous population subgroups were presented for target wages of $1.60 and $2.50 and subsidy rate of 50 percent. For total United States, benefits of $6.5 billion and $27.4 billion would accrue to 24 million and 42 million recipients, respectively, at the two target wages.

A principal conclusion was that while the wage subsidy may aid the "target group" to some extent, benefits tend not to be concentrated where transfer policy might desire. A typical example is that nonheads in nonpoor families comprise a large recipient group. An exception is that a disproportionate share of benefits would go to the South, a region which seems to be the target of interregional income redistribution policy.

Analysis of the wage-rate subsidy's effects on market-determined variables showed that wage rates would be bid down and hours worked increased. In all cases examined subsidy-inclusive per hour and per annum remuneration of recipients increased. Perhaps the most striking result of this analysis was the sensitivity of estimates of program effects and cost to assumptions regarding labor market structure and behavior. A clearcut conclusion is that policymakers ignore the implications of their assumptions at their, and the taxpayer's, peril.

By examining both the percent of working-poor poverty gap closed and the poverty exit rate associated with various target wage-subsidy rate combinations, measures of transfer efficiency were approximated.

A universal wage-rate subsidy is not an efficient antipoverty weapon since only between one-fourth and one-seventh of benefits accrue to the poor (for the programs we examined). It was noted that the very nature of such a program—its universality—preordains its low antipoverty efficiency. Thus, if all poor persons comprise the target group, a wage-rate subsidy clearly will not be an optimal policy tool. Moreover, any work-conditioned program excludes many persons simply because many of the poor cannot work.

If only certain classes of workers with wage rates less than the target wage were eligible, cost would be lower and benefits could be pinpointed. But it must be emphasized that categorization is not without its costs. The canon of "equal pay for equal work" would have to be violated. Unknown effects on the social structure could result from the

creation of a "class" of subsidized workers. These problems seem to be inherent in work-conditioned transfers and, indeed, characterize the present public assistance system, the distaste for which motivated the discussion of alternative antipoverty devices.

On the other hand, the wage-rate subsidy appears to be a relatively efficient labor-market device since it tends to be employment-creating. In addition, the wage-rate subsidy is likely to be noninflationary in a Phillips curve sense. Finally, relative to most other suggested antipoverty devices, the wage-rate subsidy has the most desirable static work incentive effects. While these may be neutralized when the wage-rate subsidy is integrated with other transfers, clever schemes can still capitalize on the program's work incentive advantage.

The conclusion then would seem to be that there is a clear tradeoff between transfer efficiency and labor-market efficiency. The universal wage-rate subsidy appears to have desirable labor-market effects but is inefficient at transferring funds to the poor. A final point, which may be as philosophical as it is economic, is that while a wage-rate subsidy would to some extent get at the symptoms of labormarket related causes of poverty, it would not, indeed could not, attack the causes of poverty. The phenomenon of "low wagedness" is too complex to go into here. But we should note that a wage-rate subsidy could, by appearing to shore up the earnings of certain workers, reduce the incentive to study the causes of and to initiate policies to reduce "low wagedness."

Areas which could profit from additional research may be mentioned. Since many poor persons cannot work and since a wage-rate subsidy does not adjust for family size related poverty lines, the wage-rate subsidy probably should be considered only in conjunction with other transfers. How would the wage-rate subsidy best integrate with other income-conditioned cash and in-kind transfers? In this study we have assumed 100-percent participation in the program. A socioeconomic analysis of the reasons for and likely magnitude of less than full participation would be quite valuable. The question of the impact of wage-rate subsidy on the wage structure and any consequential effects was ignored here. This would seem a particularly interesting topic.

This study has compared the pre- and post-subsidy worlds and ignored the transition from one to the other. Technically this analytic method is called comparative statics. A dynamic analysis of subsidy effects would provide insight into how soon different groups benefit, and could yield information on the crucial question of whether the wage-rate subsidy would cause displacement of workers just above the target wage by those just below. An analysis of the wage bill subsidy which permitted direct comparison to our results would surely be a contribution to policymaking in the area of wage-related transfer programs. Finally, data are needed which permit the investigator to employ conceptually meaningful economic concepts in conjunction with appropriate demographic information. Some sort of marriage of establishment and household data would help provide such a data source.

I. Introduction

During the last decade increasing concern has been directed toward the problem of income poverty [1] in the United States. Most analysts and policymakers agree that for certain groups or categories of persons—the aged, the disabled, for example—direct, unconditional income transfers comprise the solution. However, there is no such unanimity as regards the poverty of those persons who do work or are physically able to work. This debate revolves about means. The ends of increasing the remuneration of employed low wage workers and of increasing employment opportunities for low skilled persons are universally accepted.

The subject of this paper, a wage-rate subsidy, has been suggested as a possible component of any strategy to eliminate poverty.[2] Before proceeding to define and analyze such a subsidy program it may be useful to briefly examine certain causes and characteristics of what may be termed the "working poor" problem.

Officially, poverty is defined in terms of family income.[3] If family income is less than the "poverty line"—$3,970 for an urban family of four in 1970—the family is poor. Thus poverty is a family-income concept. The major source of earned income in the United States is wages and salaries. Now if wages are low for given available hours of work, or if for a given wage rate only a relatively few hours of work can be found, or if some combination of the two obtains, a family's principal earner may not be able to earn an income sufficient to keep his family out of poverty.

Census data for 1970 indicate that 5.2 million wage earners worked at least part time for at least part of the year, but remained poor.[4] Indeed, in 1970 some 26 percent of the 3.8 million nonaged (aged 22–64) heads of poor families worked full time *throughout* the year.[5] Not infrequently a second member of the family worked to supplement the primary earner's income. Indeed, in March 1971, about 1.1 million poor families had two or more earners.[6] (Table 1 presents a combination of wage rates, annual hours, and number of family members, illustrating the interrelation of the three in determining a family's poverty status. The figures preceded by a "1" indicate poverty level incomes for urban families for 1966, the year for which the subsidy estimates presented below are relevant.)

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[1] Poverty is a multidimensional phenomena with low income, however defined, being only one dimension. In this study poverty generally means income below some preassigned level. For an excellent treatment see Robert Lampman [20].

[2] See Richard Muth [21] and [22] and Jonathan Kesselman [16].

[3] The poverty concept is considered in more detail below in section V.

[4] March 1971 Current Population Survey, Special Tabulation for the Office of Economic Opportunity.

[5] *Ibid.*

[6] U.S. Bureau of the Census "Current Population Reports," P-60, No. 77, May 7, 1971.

NOTE.—Numbers in brackets in footnotes and in the text indicate references listed at the end of the paper.

TABLE I.—INTERRELATION OF HOURLY WAGE RATE, ANNUAL HOURS WORKED, NUMBER OF FAMILY MEMBERS, AND POVERTY STATUS

	Number of family members						
	1	2	3	4	5	6	7
WAGE RATE—$1							
Hours:							
500	[1] $500	[1] $500	[1] $500	[1] $500	[1] $500	[1] $500	[1] $500
1,000	[1] 1,000	[1] 1,000	[1] 1,000	[1] 1,000	[1] 1,000	[1] 1,000	[1] 1,000
1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500
2,000	2,000	[1] 2,000	[1] 2,000	[1] 2,000	[1] 2,000	[1] 2,000	[1] 2,000
WAGE RATE—$1.60							
Hours:							
500	[1] 800	[1] 800	[1] 800	[1] 800	[1] 800	[1] 800	[1] 800
1,000	[1] 1,600	[1] 1,600	[1] 1,600	[1] 1,600	[1] 1,600	[1] 1,600	[1] 1,600
1,500	2,400	2,400	[1] 2,400	[1] 2,400	[1] 2,400	[1] 2,400	[1] 2,400
2,400	3,200	3,200	3,200	[1] 3,200	[1] 3,200	[1] 3,200	[1] 3,200
WAGE RATE—$2.50							
Hours:							
500	[1] 1,250	[1] 1,250	[1] 1,250	[1] 1,250	[1] 1,250	[1] 1,250	[1] 1,250
1,000	2,500	2,500	[1] 2,500	[1] 2,500	[1] 2,500	[1] 2,500	[1] 2,500
1,500	3,750	3,750	3,750	3,750	[1] 3,750	[1] 3,750	[1] 3,750
2,000	5,000	5,000	5,000	5,000	5,000	5,000	[1] 5,000
WAGE RATE—$3							
Hours:							
500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500	[1] 1,500
1,000	3,000	3,000	3,000	[1] 3,000	[1] 3,000	[1] 3,000	[1] 3,000
1,500	4,500	4,500	4,500	4,500	4,500	[1] 4,500	[1] 4,500
2,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000

[1] Combinations of wage rates, annual hours worked and number of family members which yield subpoverty levels of family incomes.

Note.—The poverty threshold for male-headed nonfarm families having 1 family member is $1,758, 2 family members $2,198, 3 family members $2,642, 4 family members $3,424, 5 family members $4,121, 6 family members $4,686 and 7 family members $5,932.

Source: 1967 Survey of Economic Opportunity.

Clearly, then, there is a "working poor" problem. It is caused by a constellation of factors, with inadequate aggregate demand and race and sex discrimination being two of the more important. That is, the level of economic activity and the nature of certain economic institutions combine to dictate a regime of low wage rates, unemployment or underemployment, and lack of potential for advancement. As a result, many who are willing and able to work—and who do work—remain poor. Given the existence of such conditions, any program having some potential to effect amelioration deserves analysis.

This paper, then, will examine a program which affects immediately not the basic causes, but the symptoms of what we have termed the working poor problem. A wage-rate subsidy, it has been suggested, can increase the remuneration of low wage workers and/or increase employment. This paper will examine both claims, concentrating on the first. The following sections will, in turn: Define the subsidy program; provide an elementary theoretical analysis of the defined program; examine the data needed to analyze such a program; and present estimates of the magnitude and distribution of subsidy benefits, of the wage and hour effects of the subsidy, and of the efficiency of the subsidy. The final section will comprise an evaluation of the wage-rate subsidy and a conclusion.

II. A Wage-Rate Subsidy Program

The major goal of the per hour[7] wage-rate subsidy program considered here is to increase the remuneration of low-wage workers; the subsidy program is employed as an antipoverty device.

We begin by formally defining the program. The subsidy equals some fraction (called the subsidy rate) of the difference between a socially determined target wage and the market-determined wage rate. That is:

$$S=r(X-W)H \text{ for } W<X \qquad (1)$$

$$0<r\leq 1$$

where S=subsidy per worker, per annum
r=subsidy rate
X=socially determined target wage
W=market-determined wage rate
H=annual hours worked.[8]

The annual subsidy amount defined in expression (1) can be summed over all recipient workers to yield annual gross program benefits.[9] This figure will represent the subsidy whose amount, distribution, and effects are to be analyzed below.

As a first approximation subsidy-inclusive or post-subsidy earnings, E, will equal annual market wage plus annual subsidy. That is,

$$E=WH+S, \qquad (2)$$

and substituting from expression (1)

$$E=WH+[r(X-W)]H \qquad (3)$$

or

$$E=[rX+(1-r)W]H.^{10} \qquad (3a)$$

In later discussions of the antipoverty effect of the subsidy, the earnings component of total income will be that given by expression (3a).

At this point it may be useful to define some relevant terms and concepts.

The nominal recipient of a "wage-rate subsidy" is the employee. Subsidy payments may be made to workers directly by the Government via the mail, say, or through the intermediation of a worker's employer. That is, by some formula an amount is added to a worker's wage by the firm, which is then reimbursed by the Government. The point to note is that the worker is the intended recipient of the wage-rate subsidy.

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[7] Conceptually there is no reason why daily, weekly, monthly, or annual wage rates could not serve as the base of the subsidy. Relevant literature either suggests a per hour base or ignores the issue.

[8] There is no compelling reason to limit the number of hours which can be subsidized; thus all hours worked during the year for which the target wage exceeds the market wage rate (i.e., $W<X$) are subsidized. For a discussion of limitations on subsidized hours see Michael Barth [1, pp. 19–22] and Jonathan Kesselman [17].

[9] Total subsidy=$r\ (X-W_i)\ H_i, i=1, \ldots, N$, where there are N subsidy recipients. If the subsidy benefit to a subgroup is desired, the summation is over $N_k<N$ recipients, where the subgroup of interest contains N_k recipients.

[10] Note that for given values of r and X, the term "rX" is a constant. Expression (3a) is then the net income formula for a negative income tax in the case when all income consists of wages; the term "rX" is analogous to the guarantee of a negative income tax and r in the parentheses is analogous to the offset tax rate.

A "wage bill subsidy" is paid directly to the firm with no provision or intention that it be transferred. Its purpose is to directly alter the amount of the firm's wage bill and thereby encourage the firm to perform some socially desirable act. The money paid to a firm under the Manpower Development and Training Act, on-the-job training section is an example of a wage bill subsidy. This study deals only with a wage rate subsidy.[11]

A significant characteristic of the wage-rate subsidy is that it is work conditioned. Unlike public assistance, for example, under which payments are made regardless of labor input, wage-rate subsidy benefits cannot be obtained unless work is performed. Reference to expression (1) will show that if hours worked equal zero, the subsidy, too, equals zero.

Eligibility for subsidy benefits (other than the wage rate less than target wage condition) may be categorical or universal. In the former case certain categories of persons such as males or family heads or poor persons are designated as the only eligibles. Persons not members of an eligible category cannot receive subsidy benefits no matter how low their wage rate. Such a regime can provide a socially undersirable incentive to become a member of an eligible category; to become poor, for example. The well-known absentee father problem in AFDC families is another case in point. In addition, categorization would inevitably cause a violation of the canon of "equal pay for equal work." This would no doubt cause personnel and industrial relations problems which would complicate program administration.

Under a system of universal eligibility only a wage rate in excess of the target wage can cause ineligibility. Thus equity is assured, and administrative problems minimized. Universality has a major drawback in the context of an antipoverty goal. Since, as we shall see below, many low wage workers are not poor, a large percentage of benefits "leak" to the nonpoor. While we find this result undesirable, the effects of categorization seem perhaps more undesirable. Thus the program considered here is a universal one save for an age restriction. Since 65 is the most common retirement age and since we have no desire to encourage labor force entry by younger teenagers, the program analyzed here is (arbitrarily) restricted to persons from 16 through 65 years of age.

The data to be presented in section V will allow the reader to compare total benefits to those for certain categories. This data will not, however, permit one to determine the potential effects of any reactions to categorization. Finally, it should be noted that because of the large fraction of nonpoor low wage workers, a universal program by definition is not an efficient antipoverty device.

The subsidy formula contains two policy instrument variables (r and X) and two observable, market-determined quantities (W and H). The latter two will be discussed below in section IV. Cost and anti-

[11] The analytical technique employed in this study is comparative statics. The pre- and post-subsidy states are compared with no attention given to the mechanism of change. It can be shown that the comparative static results of the wage-rate and wage bill subsidies are equivalent (see N. Weiner, R. Lamson, and H. Peskin [35, ch. 5]). The analysis if formally identical to that employed in examining the shifting and incidence of a sales tax.

poverty effect of the subsidy both vary directly with the values of r and X. The choice of these values is essentially arbitrary and in practice would no doubt result from a compromise among estimates of expenditure constraints, need for the program, and program effects. In order to compute the basic set of subsidy benefit estimates presented in section V, we shall assume a subsidy rate of 50 percent and target wages of $1.60 and $2.50. The economic and antipoverty effect analyses will employ these as well as other values.

If the subsidy rate is zero, the program does not exist; if its value is one, employers' propensities to upgrade and workers' propensities to migrate, improve their efficiency, et cetera, could be seriously reduced. There does not seem to be any compelling reason to set the value of r close to zero or one; thus we choose 50 percent.

The one example of explicit congressional interest in a wage-rate subsidy [12] suggested a target wage equal to the minimum wage, now $1.60 per hour for all but farmworkers. Since many would want a more generous program we will also present data for a subsidy with a target wage of $2.50.[13]

We conclude this section by considering how the wage-rate subsidy is a subsidy.

The most general definition of a subsidy is "market price minus cost to consumer." That is, the differential between the scarcity value of a good or factor or production as determined by the market and the amount that must be paid to gain command over that good or factor is deemed a subsidy. This definition applies directly to the demand side of the market. Subsidies can, of course, arise on the supply side as well.

The supply of a given productive factor to a particular activity depends on that factor's preferences for different activities and the relative rewards of these activities in the market. Labor, of course, is a productive factor. The decisions of whether and, if so, how much to work are made by a calculation that relates the worker's (or family's) preferences for income relative to leisure to the price of leisure. Leisure's price is the market wage rate, since the wage rate is the amount foregone by not working, that is by consuming leisure as opposed to labor.[14]

An implication of the conventional theory just sketched is that the market wage rate at which the worker accepts a given amount of work is the wage rate just sufficient to call forth that amount of work. Paying more is, economically, unnecessary. The purpose of the wage-rate subsidy is precisely to raise the worker's remuneration above the market wage rate, that is, above what is economically necessary to call forth a given amount of labor. It is in this manner that an economic subsidy arises.

We return now to the demand side. In competitive labor markets the value of a worker to the firm is approximated by the monetary value of that worker's contribution to the firm's output. Technically

[12] See U.S. Congress, Senate, Committee on Finance, H.R. 16311, 91st Cong., second sess., Nov. 5, 1970, "Pilot Project to Test a Wage Subsidy Program," pp. D18–D22.

[13] For an examination of the issues involved in the choice of subsidy rate and target wage see Barth [1, ch. 2]. This reference also discusses many of the thorny administrative issues which the present study ignores.

[14] For an excellent, readable discussion of the theory of labor-leisure choice see Belton Fleisher [8, ch. 2].

this is called the value of the marginal product (VMP). The wage paid by the firm to the worker is equal (or proportional) to the value of the marginal product.

As we shall see below, the wage-rate subsidy will cause one or both of the following to occur: (1) the net wage to the worker is raised above the VMP; (2) the cost of the worker to the firm is lowered below the VMP. Both of these situations involve a subsidy. The former is the supply side subsidy considered above. The latter is the more traditional demand-side subsidy.[15]

III. Analysis of the Subsidy

The efficacy of the wage-rate subsidy in raising workers' incomes, as well as its effects on employment, will depend upon the sensitivity of both labor supply and labor demand to the wage rate. (These relations are technically known as the supply elasticity and the demand elasticity, respectively. They are defined and discussed in sec. VII below.) We assume that the immediate impact of the subsidy is on the worker and thus on the supply side of the market. Hence we initially concentrate our analysis on supply side adjustments, recognizing that similar conclusions could be obtained by assuming that the subsidy impacts on the demand side of the market.[16] Of course when market equilibrium results are desired demand factors must be introduced.

Assume first that a worker will supply more hours at higher wage rate. Figure I pictures the supply curve of such a worker.[17] The wage rate is plotted on the vertical axis and hours supplied on the horizontal axis. Line SS is a representative worker's supply curve of labor; it portrays the locus of points which relate the maximum amount of hours the worker will supply to market wage rates. For example, at wage rate W_0 the worker will supply H_0 hours of labor.

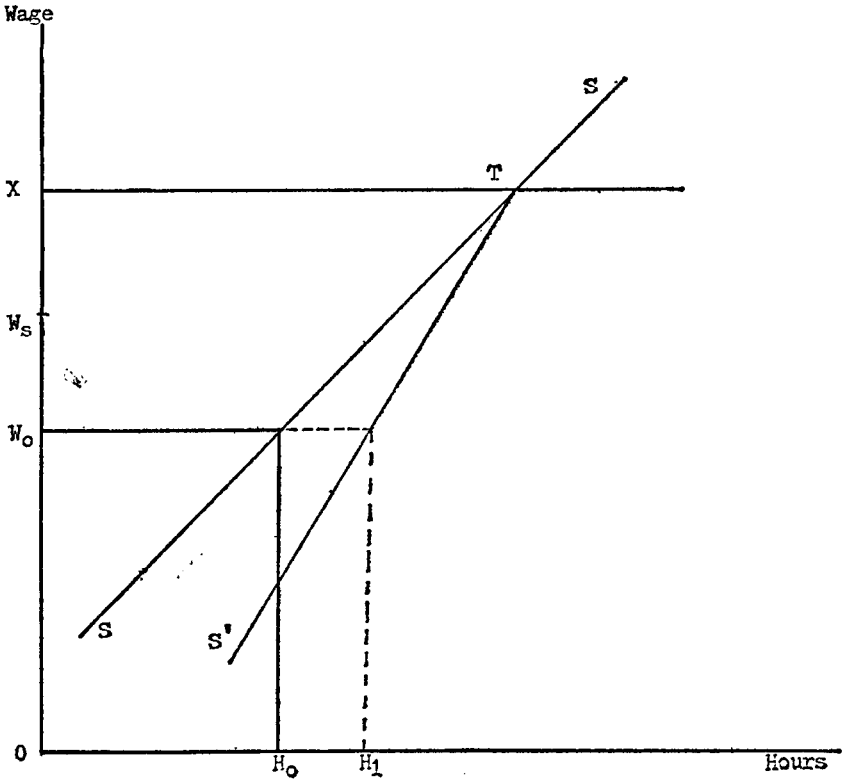
Suppose the wage-rate subsidy program target wage is set at X dollars and the subsidy rate (r) at 50 percent. The implication of this for labor supply is as follows. At any presubsidy wage rate, say W_0, the subsidy-inclusive wage of the worker will be W_0 plus 50 percent of the target wage-market wage rate differential. That is the subsidy-inclusive wage will equal $W_0+0.5\ (X-W_0)$, or W_s. The latter formulation follows directly from substitution into expression (3) above (assuming $H=1$). Now, we know that at higher wages more hours will be supplied. Thus the subsidy induces the worker to supply more hours at the old wage, W_0, since that wage is now augmented by the amount of the subsidy. The post-subsidy supply curve STS′ shows that at presubsidy wage W_0 the worker will now supply

[15] The discussion in the text depends critically on the assumption that market wage rates reflect a worker's value to the firm. There are, however, reasons why this may not be the case. Discrimination will depress wage rates below VMP's. The existence of noncompetitive elements such as few buyers of labor in a market (a condition technically referred to as monopsony or oligopsony) will have the same effect. In such cases the subsidy program may *correct* an instance of market failure. Correcting the market failure may in fact cause VMP to equal the wage rate. But in such a case a subsidy still exists. Its effect differs from the classical model because the real world so differs.

[16] In our terminology the demand-side analysis is more appropriate to the wage bill subsidy; also see footnote 11.

[17] The supply curve is fundamentally determined by the relation of the worker's preferences for income vis-a-vis leisure and the market wage rate; see footnote 14. Figure I pictures the supply curve as linear. This need not be the case; a linear supply curve is assumed for convenience only.

FIGURE I



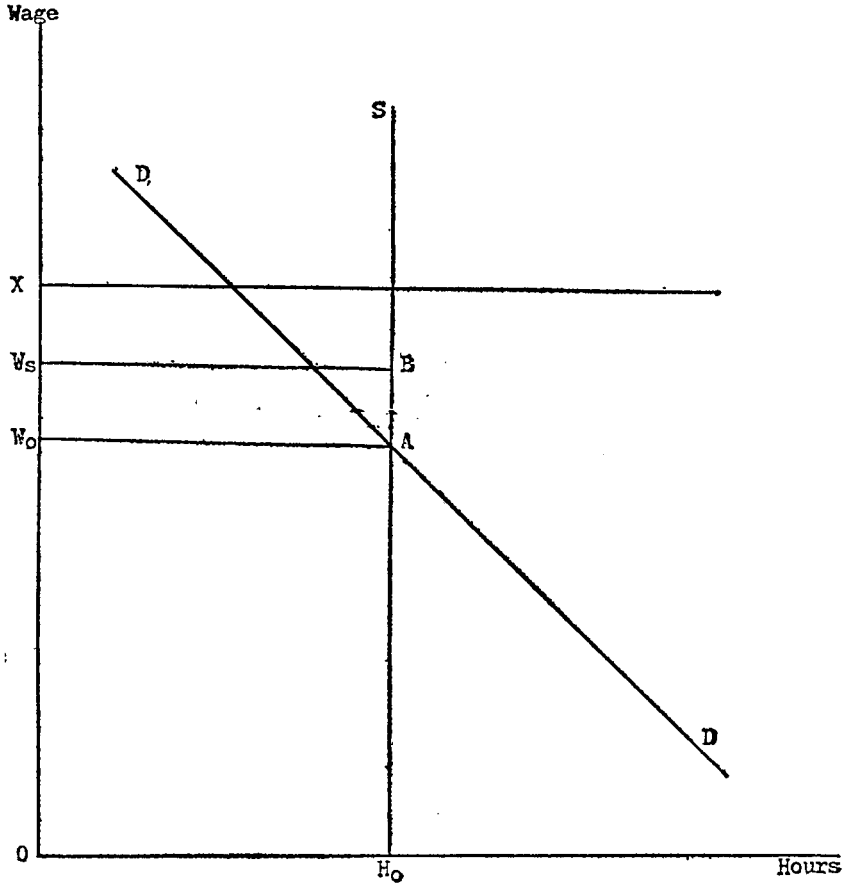
H_1, greater than H_0, hours. It is seen that for wage rates below the target wage, quantity supplied of labor increases. (Above X, of course, there is no effect.) If relations such as SS and STS' are aggregated over many workers the pre- and post-subsidy market supply curves result.

Precise subsidy results depend critically on the slope (elasticity) of the supply curve; that is, how steep it is. This question is still subject to considerable debate, but recent statistical studies provide some guidelines.[18] For prime-age males the supply curve is perhaps vertical. That is, hours supplied are unresponsive to wage rates. In fact, some studies find this function to be "backward-bending;" as wage rates rise labor supply actually declines. The labor supply of females, on the other hand, is probably responsive to wage rate changes.

In the aggregate it may be permissible to assume that the supply curve is vertical as pictured by line SH_0 in figure II. In this case since supply is not responsive to wage rates, the subsidy program does not cause the supply curve to shift. The basic subsidy estimates presented below in section V will be based on the vertical supply curve assumption. (Section VI will present the results of a simulation which assumes different slopes for SS and thus indicates to the reader the sensitivity of subsidy estimates to any particular assumption.)

[18] See the studies collected in Glen Cain and Harold Watts [6] and the references in those studies.

FIGURE II

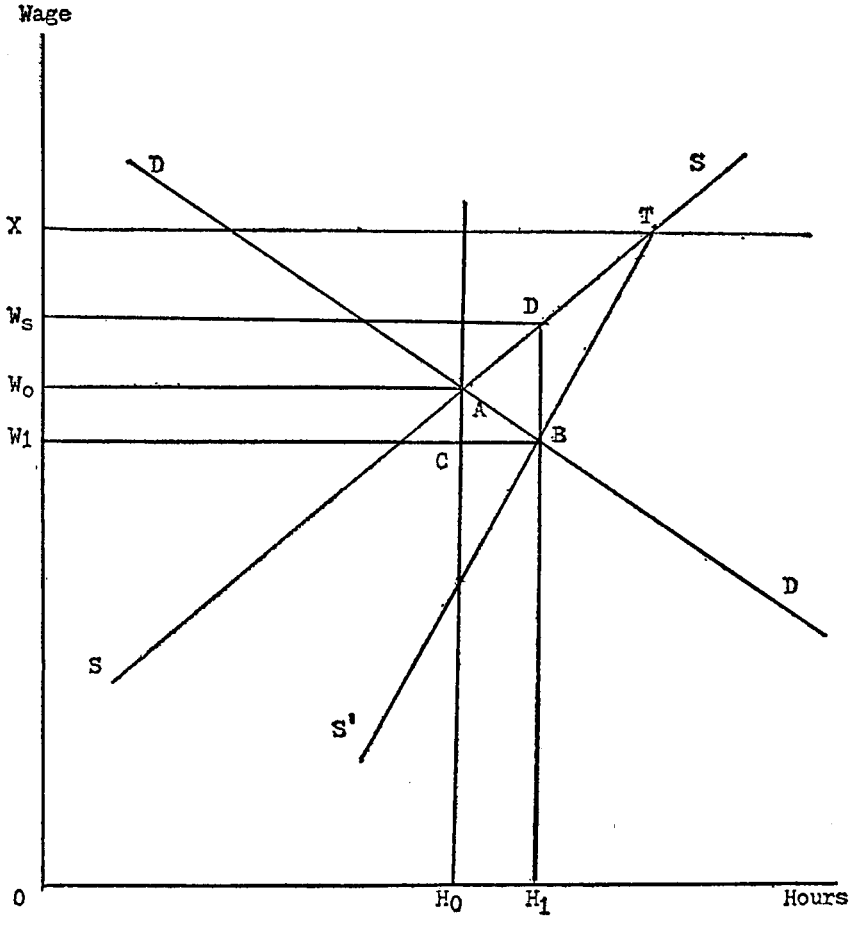


Let us now introduce the demand side of the market into the analysis. The market demand function shows the maximum amount of abor (hours) which would be demanded at various wage rates and is drawn as *DD* in figures II and III. Its negative (downward) slope implies that quantity demanded increases as the wage rate falls. Market supply and demand combine to determine equilibrium wage rates and hours worked; that is, values of these variables with which both demanders and suppliers are satisfied.[19] Geometrically, equilibrium is given by the intersection of the two curves. In figure III demanders wish to "buy" H_0 units of labor at wage rate W_0; suppliers are willing to supply H_0 units at W_0. The coincidence of desires determines the equilibrium. A shift of one of the curves will cause a new equilibrium to be attained. Such a shift will be induced by the wage-rate subsidy if the supply function has any upward slope.

In the example pictured by Figure II there is no mechanism to shift supply (because of the vertical supply curve assumption) so we may

[19] For a full explanation see Paul Samuelson [25, ch. 3 and 20].

FIGURE III



now determine the amount and recipient of the subsidy. The presubsidy wage payment is given by wages times hours or rectangle OW_0AH_0. The wage-rate subsidy program increases per hour remuneration from W_0 to W_s (since W_s is half-way between X and W_0). Now the subsidy-inclusive wage payment is given by rectangle OW_sBH_0. Note that hours are unchanged as a result of the vertical supply assumption.

The subsidy of W_0ABW_s accrues to the recipient workers. This amount is the total cost (net of administrative expenses) to the Government and is the amount for which estimates will be presented below. Of particular importance to note here is the fact that all of the subsidy benefits paid by the Government accrue to the worker. The firm will not benefit since there is no obvious affect on labor's price. Only in the present case and when the demand curve is horizontal will this be true.[20]

[20] See Barth [1, ch. 3] and Weiner, Lamson ,and Peskin [35 ch. 5] for a full explanation.

Let us illustrate the subsidy result in a textbooklike market—demand, DD, is downward and supply, SS, upward sloping. In figure III presubsidy equilibrium is at point A with W and H values of W_0 and H_0, respectively. As demonstrated above the effect of the subsidy is to shift SS to STS'. The new equilibrium is at point B indicating new market wage rate W_1 (less than W_0) and new hours demanded and supplied H_1 (greater than H_0). The subsidy is calculated on the basis of the new wage-hour combination. Since W_s is halfway ($r=50$ percent) between X and W_1, the total subsidy is W_1BRW_s. The wage cost to the firm equals OW_1BH_1.

Now prior to the subsidy, for H_0 units of labor, the firm paid OW_0AH_0. After the subsidy the firm pays OW_1CH_0 for the same amount, a saving of W_0W_1CA.[21] Thus the wage-rate subsidy clearly benefits the firm by reducing its labor cost. It is in this sense that one can say the subsidy is shared between employer and employee as a function of market conditions. Market conditions are summarized by the slopes of the demand and supply curves. As the two examples given here demonstrated, the results do differ depending on these slopes.

To summarize, the basic quantitative subsidy estimates will be made on the basis of the vertical supply assumption. But, as we have seen, deviation from that assumption can materially change the result. Thus we will also present estimates based on alternative assumptions. We now turn to the data source for this study.

IV. Data Source and Variables

The data source for a study such as this must fulfill a number of requirements. First, it must provide observations on, or proxies for, the basic wage rate and annual hours worked variables. Second, the data base must be sufficiently rich in content so that subsidy recipients can be disaggregated into demographic, regional, and economic groups of interest. Third, since statistically sound national estimates of population subgroups are required the sample must be fairly large (assuming the data base is not a 100 percent census). Fourth, since the basic aim of the subsidy is to decrease poverty, and since poverty is a family income-related concept, the data source must be able to relate hourly wage rates, the base of the subsidy, to family income- and size-determined poverty lines. Fifth, since the subsidy will impact on the lower tail of the wage and income distribution, it would be desirable if the data base was rich in observations on this usually underenumerated segment of the population.[22] Finally, the data should be as up-to-date as possible.

It is unfortunately true that no one existing data source fulfills all of these requirements. If the 1970 decennial census of population collected wage rate data it would fulfill our needs (assuming it had been processed). Establishment data (such as that reported in the Bureau of Labor Statistics' *Employment and Earnings* [27]) provides the best

[21] For simplicity we ignore the remainder of area OW_1DH_1. Triangle CAB is technically referred to as producer's surplus. Its exclusion from the discussion does not affect the basic point that the incidence of the subsidy depends on the slopes of the supply and demand curves.

[22] On the census undercount problem see Dennis Johnston and James Wetzel [14].

wage rate and hours data, but does not permit cross-classification with family income or personal characteristics. For the latter purpose a household survey is required. Of the two candidates, the Current Population Survey and the Survey of Economic Opportunity, the latter is selected because of its oversampling in areas with large concentrations of nonwhites and its unique wage rate variable.

Before proceeding to a description of the Survey of Economic Opportunity, it may be useful to point out the serious data problem encountered by any study which attempts to relate a wage-related program to income poverty. First, there is no one appropriate definition of wage rates. Straight time hourly earnings are augmented by numerous fringes (pension and health insurance payments, for example), while measures of weekly or monthly wage earnings frequently include overtime premium payments. At the outset, then, some arbitrary wage rate measure must be adopted and a wage rate distribution constructed, for, as such, none is readily available.

Second, while the policy is framed in terms of wage rates, the problem is defined in terms of family-size conditioned family income units. Family income is the sum of each member's wage earnings (which of course could be zero) plus a host of potential sources of nonemployment income including interest, dividends alimony, and various forms of public assistance. Thus from existing surveys a data file must be constructed which relates wage earnings of persons to family income, for the subsidy accrues to persons, while its effect is judged in terms of the income of families.

The data file constructed for this study is perhaps the first attempt to relate wage rates, earner characteristics, and family income. As we shall see below many assumptions and imputations had to be made. Unfortunately, but necessarily, such procedures decrease the reliability of benefit level estimates. Distributional estimates are probably less subject to error.

The Survey of Economic Opportunity

The source of the data used in this study is the 1967 Survey of Economic Opportunity (SEO) carried out by the Census Bureau for the Office of Economic Opportunity. The sample contained approximately 30,000 households, divided into two parts.[23] First, about 18,000 households were selected from a national self-weighting sampling frame (technically called the "E–1 Sample"). Second, some 12,000 households were selected primarily from areas with large concentrations of poor nonwhites (called the nonwhite supplementation group or "E–2 Sample"). The aggregate is the SEO. It was conducted in the Spring of 1967, when interview units were asked a variety of questions on demographic characteristics, income and earnings, work experience, assets and liabilities, and other subjects. Information gathered in the spring of 1967 relates to both the week preceding the survey week and the previous year, 1966. Thus the year for which this study is relevant is 1966. In further discussion the term "last week" will refer to the week preceding the survey week in February 1967, and "last year" will refer to all of the year 1966.

[23] For a variety of reasons not every household in the sample was actually sampled. Hence, sample counts do not equal sample size. This is a characteristic of all surveys in which response is voluntary (and the enumerators are human).

Contained in the SEO file are person and family weights which allow the sample, or a subset thereof, to be inflated to national population, labor force, etc., totals. These weights reflect the ratio in which a given sampling unit's characteristics appear in the total population. We can thus deal with the wage subsidy as it affects individual workers (or industries via effects on individual workers) and also consider the subsidy's effect on poverty which is a family characteristic. It should be noted that the more we disaggregate the sample, the less reliable (in terms of sampling variance) are the national population totals inflated from any given subset of the sample.

Inclusion of the nonwhite supplementation group in the total sample significantly increases the utility of the data base in dealing with the lower tail of the income distribution. This follows from the inverse relation between sampling error and sample size. Increasing the coverage of poor nonwhites reduces the sampling errors of statistics associated with such groups. In particular, some of the problems usually introduced by the well-known census undercount in ghetto areas are mitigated by use of the SEO.

Hourly Wage Rates

The program analyzed in this study is a per hour wage-rate subsidy. Therefore, a measure of hourly wage rates is required. In this regard the SEO provides the best data of any household survey.

SEO enumerators obtain (where possible) information on last week's wage earnings and last week's hours worked. The quotient of these two figures is of course a measure of average hourly earnings. This average hourly earnings variable will be employed as our measure of market-determined wage rates. It will be called the actual wage rate. While it is subject to bias because of under- or over-reporting of earnings and/or hours, it is the only such wage rate collected in a survey of the SEO's size (and thus sampling reliability). The two other major data sources which could be used in a study of this type—the decennial census and the Current Population Survey—both collect only last year's earnings, and last week's hours and last year's weeks. The latter two must be multiplied to obtain annual hours, which is then divided into annual earnings to obtain average hourly earnings, or a wage rate. Such a wage rate suffers from serious bias not found in the SEO wage rate. For example, the denominator of this wage rate is the product of time periods in two different years. Thus, a good deal of faith is put into the retrospective response to the last year's weeks question.

It is possible that persons who worked for wages in 1966 will have no actual wage or a zero actual wage reported in the SEO. This may be the case because the survey week was "abnormal" in the sense that someone who normally works, say, full-time, year round did not work. Or there may have been questioning, coding, keypunching, and/or computer error. It is thus possible that a person who is eligible for the subsidy because his wage rate is below the program target wage would not be included in the sample upon which the analysis is based. Such neglect of relevant observations would introduce a negative bias into cost and coverage estimates. In such cases it is desirable to have an estimate of how much a person would earn per hour if he did work.

Such an estimate can be provided by what we shall call "imputed" wage rates.

It is reasonable to expect that, on average, persons who share characteristics which affect earnings potential will have similar earnings. By assembling data on demographic and economic characteristics of persons for whom the wage rate was reported, we can infer the wage rate appropriate for persons possessing similar characteristics for whom no wage rate was reported. This is done by a regression technique discussed in some detail elsewhere.[24] It permits us to assign a wage rate to anyone for whom no wage rate exists on the SEO file. Such imputed wage rates along with the actual wage rates discussed previously provide the wage rate variable for this study.

Hours of Work

Ideally this study requires a measure of the number of hours worked by each wage-rate subsidy-covered worker at each wage rate he worked for during the year (1966). For example, 1,000 hours may have been worked at wage rate X and 800 hours at wage rate Y. There is, unfortunately, no way to distinguish wage-hour sets in the data base we are working with. We have for each worker only one wage rate observation for the entire year and assume it to be an appropriate average of wage rates worked for during the year.

Given this condition we need for each worker only one measure of hours worked during the year (since the subsidy is to be unrestricted with respect to hours worked and since we are interested in annual subsidy benefit). Thus our task is to determine an index of annual hours worked, H, which can be assigned to each adult who worked for wages during the year. The annual hours index, H, will of course vary across individuals.

There are numerous work experience questions in the SEO. There is also information on earnings in different periods. Both sets of information could be employed to estimate H.

The basic work experience questions refer to weeks worked last year and hours worked last week. Clearly the product of hours per week and weeks per year is annual hours. But, the result is not necessarily an optimal measure of annual hours. There are two major problems. First, the census reports weeks only in the following intervals: 1–13, 14–26, 27–39, 40–47, 48–49, 50–52. It has become standard for investigators [25] to use interval midpoints; that is, if a person is in the 14–26 week class, he is assigned 20 weeks worked per year. This procedure is generally justified on the basis of a lack of a suitable alternative. But there is a crucial, never tested assumption implcit in the interval midpoint procedure. This is that the within interval distribution, appropriately weighted, is symmetric. If it is not symmetric, the interval midpoint is a biased estimator. The size of the classes at the lower tail of the hours distribution makes this problem particularly significant.

The second problem with the last week's hours times last year's weeks measure of annual hours is that the two parts of the product relate to different time periods. Thus a good deal of faith is placed in retrospective data on which there is no cross check.

[24] See Edward Kalachek and Fredrick Raines [15], Robert Hall [12], and Barth [1, appendix B].
[25] See for example, David Greenberg and Marvin Kosters [11] and Kalachek and Raines [15].

Recently Robert Hall [12] has suggested a method to estimate annual hours from earnings information. This method avoids the use of weeks worked interval midpoints and employs earnings data subject to verification. Hall divides last year's earnings by last week's hourly wage rate to obtain a measure of annual hours. Formally:

$$H = \frac{W \times Hrs \times Wks}{\frac{W \times Hrs}{Hrs}} \tag{4}$$

where H = annual hours
W = hourly wage rate
Hrs = hours per week
Wks = weeks per year

The components of the numerator of (4) are unobserved. Their product is annual wage earnings which is observed and reported in the SEO for each worker. Indeed, it is the presence of wage earnings in a given person's record which determines that he is subsidy-eligible and thus included in the subsidy analysis.

The denominator of (4) is itself a fraction. The SEO obtained information on weekly earnings and hours worked for the same week. The quotient of these two is an hourly wage rate. Thus the components of the denominator of (4) are observed. In fact, the denominator of (4) is the actual wage rate described in the previous section; it is recorded in the SEO file.

Thus, for each person who both reported wage earnings in 1966 and an actual wage rate in the survey week in 1967, we can calculate annual hours worked. But what of those who reported wage earnings in 1966, but, for whom, for some reason, we have no hourly wage rate observation? In such cases we impute annual hours to workers using a technique similar to that used for the wage rate imputations discussed above.[26]

Thus the annual hours variable, H, used in this study is the quotient of last year's wage earnings and the actual hourly wage, for those persons reporting an hourly wage. For nonreporters, the value of H is taken to be the mean of values of H computed from a cross-section of persons possessing similar characteristics.

We now turn to the estimates of wage-rate subsidy benefits.

V. Wage-Rate Subsidy Benefits

In this section we present benefit and coverage estimates for the wage-rate subsidy program defined above by expression (1). These estimates are based on the assumption of a zero elastic, that is vertical, aggregate labor supply curve. Since we ignore administrative cost, the dollar benefit figures presented are identical to governmental subsidy cost. Coverage relates to the numbers and types of subsidy recipients.

As noted previously the data source for this study is the 1967 SEO which yields income data for the year 1966. Thus the estimates refer to that year. The target wages are $1.60 and $2.50 and the subsidy rate is 50 percent. Since there has been inflation, productivity growth, and occupational and industrial mobility between 1966 and 1971, it

[26] For a detailed explanation see Barth [1, chapter 4 and appendix C].

would be incorrect and misleading to apply the 1966 estimates to the current year.

The wage-rate subsidy being analyzed in this study will benefit all wage earners whose wage rates are below program-determined target wages. Coverage under the program is thus simply determined; it is essentially a counting procedure. For a given target wage we count the number of persons in the United States, or in a subgroup of interest, whose wage rates are less than the target wage. Thus sum is the number of recipients. For each recipient the subsidy amount is computed by applying expression (1) to the data described in section IV. Summing annual subsidy over all recipients yields transfer cost, which is, as noted previously, identical to dollar benefit.

First, data will be presented for total United States; selected demographic groups; Census Regions and Standard Metropolitan Statistical Area (SMSA) [27] status; the 16 major Census industries; and the 11 major Census occupations. Then estimates which relate specifically to the poverty population will be examined. Much of this data and variation in it is self-explanatory. Occasionally interesting curiosa which are of little practical relevance crop up. Our analysis of the data will confine itself to highlighting the most significant and policy-relevant observations and trends.

U.S. Total and Selected Demographic Groups

Tables 2 and 3 present wage subsidy benefit and coverage estimates for total United States and 16 demographic groups. Subsidy benefits (= cost) are given in billions of dollars and coverage (= number of recipients) in millions of persons. Below each of these figures is the percent of the total, at the relevant target wage, which a given amount comprises. Thus the percent relevant to "Total" is always 100 percent. Tables 5–9 are similarly constructed.

TABLE 2.—WAGE-RATE SUBSIDY COST AND COVERAGE, BY DEMOGRAPHIC GROUP [1]

[In percent]

Target wage	$1.60		$2.50	
	Dollar benefits	Number of recipients	Dollar benefits	Number of recipients
Total	6.5	24	27.4	42
	100	100	100	100
Male	3.3	10	13.8	19
	51	42	50	45
Female	3.2	14	13.6	23
	49	58	50	55
16 to 24	2.3	11	7.8	16
	35	46	28	38
25 to 54	3.2	10	15.4	21
	49	42	56	50
55 to 64	1.0	3	4.2	5
	15	12	15	12
White	5.0	20	22.6	36
	77	83	82	86
Nonwhite	1.5	4	4.8	6
	23	17	18	14

[1] Selected sampling error estimates which can be applied to the data presented in this section can be found in Barth (1, app. D) Dollar benefits in billions of dollars; number of recipients in millions of persons.

Source: Special tabulations from 1967 Survey of Economic Opportunity.

[27] A Standard Metropolitan Statistical Area is defined by the Census Bureau as: A County or group of contiguous counties containing a city of at least 50,000 inhabitants or twin cities with combined population of 50,000 or more.

TABLE 3.—WAGE-RATE SUBSIDY COST AND COVERAGE BY FAMILY RELATIONSHIP

[In percent]

Target wage	$1.60		$2.50	
	Dollar benefit	Number of recipients	Dollar benefit	Number of recipients
Total	6.5 100	24 100	27.4 100	42 100
Heads	1.9 29	4 17	9.7 35	11 26
Nonheads	3.9 60	18 75	14.5 53	27 64
Unrelated individuals	.7 11	2 8	3.2 12	4 10
Heads—Male	1.5 23	3 13	8.1 30	9 21
Heads—Female	.4 6	1 4	1.6 6	2 5
Nonhead—Male	1.5 23	6 25	4.2 15	8 19
Nonhead—Female	2.4 37	12 50	10.3 38	19 45
Unrelated individuals—Male	.3 5	1 4	1.5 5	2 5
Unrelated individuals—Female	.4 6	1 4	1.7 6	2 5

Sources: Special tabulations from 1967 survey of economic opportunity.

By reading across the first row one can see both dollar benefits and number of recipients, and how these quantities vary with the target wage. A universal wage-rate subsidy program with a target wage of $1.60 would transfer $6.5 billion to some 24 million persons. As the target wage increases from $1.60 to $2.50, transfers increase by a factor of three, while coverage rises by 75 percent. There is, of course, no reason why the two quantities should increase in like proportion. Indeed, equiproportionate cost and coverage increases would require that rates of increase of market wages equal that of the target wage. In addition, the density function of recipients, and their annual hours, would have to be uniform across the wage distribution.

Consider table 4 which presents mean wages ($\overline{W}$) and annual hours ($\overline{H}$); target wage-market wage differentials, ($X-\overline{W}$); number of recipients; and dollar benefits; as well as percent changes in these, for the two target wages. The target wage increases more than the market wage. Thus the target wage-market wage differential, upon which the subsidy is based, grows as the target wage is raised. The increase in the differential significantly exceeds that in the target wage. It is also true that annual hours increase with the target wage.[28] Given these characteristics of the wage structure, the much larger growth of dollar benefits is to be expected. Thus even though there is a sizable increment to the recipient population as the target wage rises, growth of the subsidy is much larger.

[28] One reason for this positive target wage-annual hour relation is the universal nature of the subsidy. A youth earning, say, $1 per hour for 100 hours per year is eligible. As will be seen below large numbers of youths qualify. Many of these work only in the summer (about one-sixth to one-eigth of the year) at relatively low wages.

TABLE 4.—MARKET WAGE RATE AND ANNUAL HOUR VARIATION ACROSS TARGET WAGES

Target wage	$1.60	Change	$2.50	Percent change
Target wage		$0.90		56.3
$\bar{W}$	$1.05	$0.42	$1.47	40.0
$(X-\bar{W})$	$0.55	$0.48	$1.03	87.3
$\bar{H}$	1,193	266	1,459	22.3
Number of recipients (millions)	24	18	42	75.0
Dollar benefit (billions)	$6.5	$20.9	$27.4	321.5

Source: Tables 2 and 3.

By sex, subsidy benefits are equally distributed but females exceed males as recipients. The (admittedly small) decline in female share as the target wage increases is consistent with the hypothesis that females tend to be "crowded" into low wage jobs. Because of sex discrimination, females tend not to obtain jobs which require higher productivity; they tend to be concentrated in low wage jobs. This may be why we observe a larger percentage of females at the lower target wage.[29]

The benefit and recipient share of older workers (15 and 12 percent respectively) is unchanged as the target wage rises. At the lower target wage young workers comprise 46 percent of recipients versus only 42 percent for prime age workers. But as the target wage rises the recipient share is reversed, which is consistent with the normal age-earnings profile and the earnings differential between more and less experienced workers.

Both the benefit and recipient shares of white workers exceed those of blacks and this differential increases with the target wage. On the other hand, the shares of nonwhites exceed their population ratios. Together these findings reinforce prior findings of housing, educational and employment discrimination against nonwhites which result in lower wage rates, employment, and consequently lower labor force participation. To the extent that nonwhites are considered a special target of social policy, they ought to benefit disproportionately from transfer programs. By its very nature a universal program is incapable of such discrimination. Because of the low income status of nonwhites, a wage-rate subsidy could be targeted to nonwhites by making it income conditioned. But this solution in part begs the question since many nonwhites cannot find jobs or cannot work. Thus they could not benefit from the wage-rate subsidy. The efficacy of a pure labor-market remedy for the particular problems of nonwhites is therefore questionable.

The estimates which relate to family relationship (table 3) are particularly policy relevant. For unrelated individuals dollar benefit percentage exceeds number of recipient percentage by at most 3 percentage points (they are 11 and 8 percent, respectively, at $1.60). This distributional pattern and the shares themselves remain roughly constant as the target wage rises.

A quite different pattern emerges when the shares of heads and nonheads are examined. At both target wages share of benefits exceeds

[29] For a presentation of the "crowding" hypothesis see Barbara Bergmann [5].

share of total recipients for heads, while the opposite is true for nonheads. Moreover both cost and coverage shares increase for heads and decrease for nonheads as the target wage increases. The latter results from the fact that family heads generally hold the higher paying jobs and thus will have greater relative representation at the higher target wage. Benefit share exceeds coverage share because the greater number of hours worked by heads (greater by nearly 100 percent) swamps the effect of the higher wages earned by heads.

A rather striking policy-relevant point is made by the head-nonhead comparison. Heads of families, the explicit targets of the Nixon administration's welfare reform plan,[30] are not the principal beneficiaries of a universal, per hour wage-rate subsidy. As noted previously this reflects the fact that nonheads tend to work for lower wages. As will be seen below, many of these nonheads are also nonpoor.

When family relationship is crossed with sex it is seen that female, nonheads comprise between 50 percent and 45 percent of recipients. Male family heads comprise only 13 percent of recipients at $1.60 (but receive 23 percent of dollar transfers). The recipient share of male family heads increases to 21 percent at a target wage of $1.60 (and dollar transfers rise to 30 percent of the total).

The much worried over female family head receives but 6 percent of benefits and comprises only 4 percent of total recipients. These figures hardly vary as the target wage rises.

The lesson from all of this may be that those we wish to help most will not necessarily benefit most from the transfer system being analyzed here. If wage rates are low, and thus $(X-W)$ high, hours tend to be low. Moreover, a very large share of recipients are nonheads of families. This fact is thought to be troublesome in view of the place accorded (particularly male) family heads in American society. It should not be overlooked, however, that nonheads are likely to be secondary workers.[31] Certainly the low wages of some of these are helping to keep their families out of poverty.

Basically the range of problems just outlined stems from the person-oriented nature of a wage-rate subsidy. If the canon of "equal pay for equal work" is not to be violated, it is difficult to structure a wage related program differently. The solutions which are available—differential subsidy rate and/or target wage values, exclusion of certain groups, etc.—tend to provide incentives for family splitting or cause personnel or industrial relations problems. No system is perfect. If welfare reformers insist on work related transfers, then problems such as these will have to be faced.[32]

Census Region

The regional distribution of cost and coverage of any transfer program is always of interest since it describes any interregional income redistribution. As might be expected from knowledge of the North-South wage-rate differential, the South would fare relatively well under a wage-rate subsidy. Tables 5 and 6 present cost and coverage

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[30] For the version current as of this writing, see U.S. Congress, House, Committee on Ways and Means. "Report of the Committee on H.R. 1," May 26, 1971.

[31] Nonheads will be secondary workers if the head is employed.

[32] It is clear that in late 1970 at least some members of the Senate Finance Committee seriously considered a wage-rate subsidy with target wage set at the minimum wage, see, U.S. Congress, Senate, Committee on Finance, H.R. 16311, 91st Congress, 2d sess., November 5, 1970, "Pilot Project to Test a Wage Subsidy Program," pp. D18–D22.

estimates for all of the regional breakdowns of the United States considered in this study.

In 1966, the year to which the data in this study relates, the U.S. population was distributed among the four census regions as follows: [33]

	Percent
Northeast	24. 5
Northcentral	27. 7
South	31. 1
West	16. 7

As table 5 indicates the South is well above its total population share in both benefits and recipients. Benefit share exceeds recipient share, and both decline as the target wage rises. Both benefit share and recipient share for the other three regions are less than those regions' respective population share.

TABLE 5.—WAGE-RATE SUBSIDY COST AND COVERAGE BY REGION AND SMSA/NON-SMSA

[In percent]

Target wage	$1.60		$2.50	
	Dollar benefit	Number recipients	Dollar benefit	Number recipients
Total	6.5	24	27.4	42
	100	100	100	100
Northeast	1.0	5	5.4	10
	15	21	20	24
Northcentral	1.6	6	7.4	11
	25	25	27	26
South	3.2	10	11.4	15
	49	41	42	36
West	.7	3	3.2	6
	11	13	12	14
SMSA	3.1	13	14.8	25
	48	54	54	60
Non-SMSA	3.4	11	12.6	17
	52	46	46	40

Source: Special tabulations from 1967 survey of Economic Opportunity.

Interestingly, at the higher target wage the recipient share distribution is quite similar to regional population distribution. Moreover, benefit and recipient shares are relatively similar. There is, of course, nothing inherently desirable about such a set of results. Indeed, many of the most ardent supporters of a universal income maintenance system buttress their arguments with the fact that a relatively poor area, the South, would benefit disproportionately.[34]

SMSA/Non-SMSA Status

In 1966 64 percent of U.S. population lived in SMSA's and 36 percent in non-SMSA's. While there is a general and valid correspondence between an SMSA and what is generally thought of as a metro-

[33] The States in each census region are as follows: Northeast—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania; Northcentral—Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Minnesota, Missouri, North Dakota, South Dakota, Nebraska and Kansas; South—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas; West—Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii.

[34] For example under the latest version of the welfare reform (see footnote 30) the regional distribution of gross benefits is as follows: Northeast, 22.4 percent; Northcentral, 20 percent; South, 41.3 percent; and West, 16.3 percent; see "Welfare Reform: Costs and Caseloads," prepared by the Department of Health, Education, and Welfare for the House Committee on Ways and Means, February, 1971.

politan area, there are exceptions. Thus certain relatively rural areas may fall within the 1960 census-defined boundary of an SMSA while a more urbanized area may not. Nevertheless, the concept is convenient and useful.

Table 5 indicates that at the lowest target wage non-SMSA's receive 52 percent of dollar benefits and provide the residences for 46 percent of recipients. These shares decline as the target wage is increased. Nevertheless, the benefit and recipient shares of SMSA's remain less than the population share of SMSA's.

Recipient share exceeds benefit share for SMSA's while the opposite is true for non-SMSA's. This reflects the fact that SMSA mean wage levels exceed those of non-SMSA's at the same time that hours worked are virtually identical in the two areas.

Briefly considering the census region-SMSA cross in table 6, we see that in the Northeast and to a lesser extent in the West, SMSA's fare relatively better than do nonmetropolitan areas. The opposite is the case in the South and in the Northcentral region. It is particularly interesting to note that approximately one-fourth of all wage-rate subsidy benefits would go to non-SMSA residents in the South.

TABLE 6.—WAGE RATE SUBSIDY COST AND COVERAGE BY REGION CROSSED WITH SMSA/NON-SMSA

[In percent]

Target wage	$1.60		$2.50	
	Dollar benefit	Number recipients	Dollar benefit	Number recipients
Total	6.5	24	27.4	42
	100	100	100	100
NE SMSA	.7	4	4.0	8
	11	17	16	19
NE Non-SMSA	.3	1	1.4	2
	5	4	5	5
NC SMSA	.7	3	3.7	6
	11	13	14	14
NC Non-SMSA	.9	3	3.7	5
	14	13	14	12
S SMSA	1.3	4	5.0	7
	20	17	18	17
S Non-SMSA	1.9	6	6.4	8
	29	25	23	19
W SMSA	.4	2	2.1	4
	6	8	8	10
W Non-SMSA	.3	1	1.1	2
	5	4	4	5

Source: Special tabulations from 1967 Survey of Economic Opportunity.

Industry

Table 7 presents benefit and coverage data for the 16 major census industries.[35] There are enormous interindustry differences in subsidy

[35] The census industrial classification is as follows:
1. Agriculture, forestry and fisheries.
2. Mining.
3. Construction.
4. Manufacturing—Durable goods.
5. Manufacturing—Nondurable goods.
6. Transportation.
7. Communications.
8. Utilities and sanitary services.
9. Wholesale trade.
10. Retail trade.
11. Finance, insurance, and real estate.
12. Business and repair services.
13. Personal services.
14. Entertainment and recreation services.
15. Professional and related services.
16. Public administration.

benefit and coverage share. Workers in retail trade receive between one-fourth and one-fifth of total benefits, while the percent share of workers in mining is trivial. Other industries whose workers would be relatively large recipients are personal services, professional and related services, and nondurable manufacturing. As the target wage rises, the shares of the latter two rise to exceed the declining share of personal services. In large part this reflects the fact that personal service workers face a sort of wage ceiling. That is, the sorts of tasks they perform have very limited scope for productivity, and thus, wage increase.

TABLE 7.—WAGE-RATE SUBSIDY COST AND COVERAGE BY INDUSTRY [1]

[In percent]

Target wage	$1.60		$2.50	
	Dollar benefits	Number of recipients	Dollar benefits	Number of recipients
Total	6.5	24	27.4	42
I_1—Agriculture, For., and Fish	100	100	100	100
	.8	2.1	2.0	2.3
	12	9	7	5
I_2—Mining	(2)	.1	.1	.1
	(3)	(3)	(3)	(3)
I_3—Const	.3	1.1	1.4	2.1
	5	5	5	5
I_4—Mfg.-Dur	.5	1.8	3.0	5.1
	8	7	11	12
I_5—Mfg.-Nond	.6	2.9	3.8	5.6
	9	12	14	13
I_6—Trans	.1	.3	.6	.9
	2	1	2	2
I_7—Comm	(2)	.1	.2	.5
	(3)	(3)	1	1
I_8—Util	(2)	.1	.2	.4
	(3)	(3)	1	1
I_9—Whtrade	.1	.5	.8	1.3
	2	2	3	3
I_{10}—Ret. Trade	1.6	6.3	5.9	9.1
	25	26	22	22
I_{11}—Fin., Ins	.1	.6	1.0	1.9
	2	2	4	5
I_{12}—Bus. & Rep. Services	.1	.5	.5	.9
	2	2	2	2
I_{13}—Pers. Serv	1.2	3.5	3.1	4.2
	18	14	11	10
I_{14}—Entert	.1	.4	.3	.5
	2	2	1	1
I_{15}—Prof. Serv	.8	3.3	3.7	6.2
	12	14	14	15
I_{16}—Pub. Admin	.1	.5	.7	1.4
	2	2	3	3

[1] See footnote 36 for Industry Code.
[2] Less than $50,000,000.
[3] Less than 0.05 percent.

Source: Special Tabulations from 1967 Survey of Economic Opportunity.

A striking feature of the data in table 7, particularly when compared to tables 2, 3, 5, and 6, is that benefit share is quite close to recipient share. When demographic groups were compared we found systematic differentials in wage rates and/or annual hours leading to significant differences between benefit and recipient shares When economic units are being compared, systematic differentials should be less evident. The data in table 7 bears out this expectation. That is, if an industry has a low share of recipients it is unlikely to have a high share of benefits because the few recipients are unlikely to earn disproportionately lower wages or work disproportionately more hours. High wage industries have few qualifying workers because, quite simply, such an industry's workers earn high wages. Mining is an excellent example of such an industry.

Occupation

Benefit and coverage data for the 11 major census occupations are presented in table 8.[36] Operatives, service workers, and clerical workers have the largest recipient and benefit shares. Laborers, sales workers, private household workers, and farm laborers have somewhat lower and roughly equal shares which decline with the target wage. Again across both occupations and target wages, benefit shares and recipient shares are roughly equal, exhibiting the same pattern found in the industrial case.

TABLE 8.—WAGE-RATE SUBSIDY COST AND COVERAGE, BY OCCUPATION [1]

[In percent]

	$1.60		$2.50	
	Dollar benefits	Number of recipients	Dollar benefits	Number of recipients
Total	6.5	24	27.4	42
	100	100	100	100
O_1—Prof.	.3	1.0	1.4	2.4
	5	4	5	6
O_2—Farm	.2	.3	.5	.4
	3	1	2	1
O_3—Managers, prop.	.3	.6	1.2	1.4
	5	3	4	3
O_4—Clerical	.6	3.7	4.4	8.9
	9	15	16	21
O_5—Sales	.5	2.2	1.9	3.2
	8	9	7	8
O_6—Crafts	.3	1.1	2.0	2.9
	5	5	7	7
O_7—Operatives	1.3	4.9	6.6	9.7
	20	20	24	23
O_8—Private household	.7	2.0	1.6	2.1
	11	8	6	5
O_9—Service	1.2	4.8	4.5	6.9
	18	20	16	16
O_{10}—Farm labor	.6	1.6	1.4	1.7
	9	7	5	4
O_{11}—Laborers	.6	2.2	2.0	3.2
	9	9	7	8

[1] See footnote 37 for Occupation Code.

Source: Special tabulations from 1967 Survey of Economic Opportunity.

Poverty Population

Now we examine two sets of data which specifically inquire into the wage subsidy's benefits to and coverage of the poor population. The first set is identical in nature to that examined above. The second compares poor wage-rate subsidy recipients to all poor who work, or the "working poor." A 100-percent overlap does not exist because many persons work at hourly wage rates sufficiently high to disqualify them for wage-rate subsidy benefits, but do for so few hours that their earnings (plus nonemployment income) are below the "poverty line."

[36] The census occupational classification is as follows:
1. Professional, technical, and kindred workers.
2. Farmers and farm managers.
3. Managers, officials, and proprietors, except farm.
4. Clerical and kindred workers.
5. Sales workers.
6. Craftsmen, foremen, and kindred workers.
7. Operatives and kindred workers.
8. Private household workers.
9. Service workers except private household.
10. Farm laborers and foremen.
11. Laborers, except farm and mine.

In addition some who are considered "working poor" are not wage earners, but are self-employed; sharecroppers are a prime example.

Before proceeding we shall briefly consider the definition of poverty employed by the U.S. Government and adopted for use in the present study. For better or worse, in the United States poverty is defined in an absolute sense. That is, "poverty lines" or "thresholds" defined in dollar amounts per family are determined.[37] If a family's income is less than the arbitrary poverty line, it is considered poor. If family income exceeds the "magic line," even if only by 1 cent, the family is not poor. A family's poverty line will generally equal approximately three times the number of dollars needed to purchase a minimally adequate supply of food. Poverty thresholds vary with family size, composition, and residence. In order to give the reader a feel for the dollar amounts involved, the following table presents the poverty thresholds for "standard" nonfarm families:

Poverty thresholds, 1966 [38]

Family size:	*Poverty threshold*
1	$1,758
2	2,198
3	2,642
4	3,424
5	4,121
6	4,686
7 or more	5,937

We now turn to the data.

All Poor

Table 9 presents wage-rate subsidy benefit and coverage estimates for total U.S. recipient population, for total U.S. poor recipient population, and for the poor population disaggregated by sex, race, and status in family.

TABLE 9.—WAGE-RATE SUBSIDY COST AND COVERAGE OF POOR

[In percent]

Target wage	$1.60		$2.50	
	Dollar benefit	Number recipients	Dollar benefit	Number recipients
Total	6.5	24	27.4	42
	100	100	100	100
All poor	1.5	4.5	3.9	5.5
	23.1	18.7	14.2	13.1
Poor male	.8	2.2	2.2	2.8
	12.3	9.2	8.0	6.7
Poor female	.7	2.3	1.7	2.7
	10.8	9.6	6.2	6.4
Poor white	.8	2.6	2.3	3.3
	12.3	10.8	8.4	7.9
Poor nonwhite	.7	1.9	1.6	2.2
	10.8	7.9	5.8	5.2
Poor head	1.0	2.5	2.7	3.3
	15.4	10.4	9.8	7.9
Poor nonheads	.6	2.0	1.2	2.2
	9.2	8.3	4.4	5.2

Source: Special tabulations from 1967 Survey of Economic Opportunity.

[37] For a discussion of the poverty line concept see Mollie Orshansky [23]; for critiques of and alternatives to the absolute definition of poverty see Watts [32] and [33], and Victor Fuchs [9].

[38] The full set of poverty threshold matrixes can be found in the 1967 Survey of Economic Opportunity *Codebook*, Interview Unit Segment (mimeo).

At a target wage of $1.60 the wage-rate subsidy transfers $1.5 billion to 4.5 million poor recipients. Transfers increase by 2½ times as the target wage rises to $2.50, while the number of recipients increases by about 22 percent. The rather large differences between benefit and coverage growth can be explained by considering the wage rates of the poor in relation to the target wage and changes in these values. Over the $1.60 to $2.50 range the target wage increases by 56 percent while the mean wage rate of poor recipients increases by only 22 percent (from $0.90 to $1.10). The $X-W$ differential thus increases by 100 percent. Since the wage rates of the poor seem to increase very little, the subsidy payment to them increases very much. The relatively small recipient increment for the poor mainly reflects the low wage status of this group. That is, the density of the poor in the wage distribution does not increase greatly as the wage rate rises.

Turning to the benefit and recipient percentages, it is clear that the poor do not receive a very large share of wage-rate subsidy benefits. Nor do they comprise a large share of the recipient population. The poor receive 23 percent of benefits and constitute 19 percent of recipients at the lowest target wage. These percentages both decline and tend to approach one another as the target wage rises. The low recipient share is in fact one cause of the low benefit share. As is well-known, many poor do not participate in the labor force for reasons which relate mainly to their age, family responsibility and/or disability status. In addition, many potential workers are poor because they could not obtain work at all.[39]

Turning to subgroups of the poor population we see that males would receive slightly more wage subsidy benefits than females at the lowest target wage. This differential widens as the target wage rises. At $1.60 the recipient share of poor females exceeds that of poor males. This occurrence, which is reversed as the target wage rises, probably results from the preponderance of domestics and other low-paid "female jobs" in the economy. As higher wage workers are counted, poor male recipients exceed poor female recipients.

The benefit/share relation between poor whites and poor nonwhites is quite similar to that for poor males and females. With respect to recipient shares, poor whites exceed poor nonwhites, although not nearly by as great an amount as whites exceeds nonwhites in the general population or in the labor force. This is simply another indication of the low wage position of nonwhites.

In comparing poor family heads and nonheads [40] we find the greatest differentials which exist among the subgroups considered. Head benefit share is 167 percent of nonhead at the lowest target wage and this differential rises to 223 percent at $2.50. Similarly, head recipient share is significantly greater than that of nonhead, with the differential growing as the target wage increases. It is interesting to note that when the total U.S. recipient population was considered (table 3) both the benefit and recipient shares were greater for nonheads than for heads, the reverse of the present finding.

[39] Many of these will be discouraged workers or the "hidden unemployed;" see Thomas Dernberg and Kenneth Strand [7].

[40] For the purposes of the present discussion "heads" are defined to include persons who comprise families of size 1. Consequently there is no "unrelated individual" category.

It is clear from this data that the wage-rate subsidy will not concentrate its benefits among the poor. Indeed it cannot, given its work-conditioned nature and the relatively small fraction of the poor population who are "employable" under any definition of that term. The following section attempts to take a closer look at the wage-rate subsidy recipient-working poor overlap.

Working Poor

In some ways a comparison of wage-rate subsidy recipients with the working poor is the most appropriate way to gage the usefulness of the wage-rate subsidy in transferring funds to the poor. This is so because the wage-rate subsidy is work conditioned; hence poor nonworkers could not hope to benefit. Therefore it is not fully illuminating to compare the wage-rate subsidy recipient population to a total poor population which includes the disabled, mothers of young children, persons younger than 16 years, and persons older than 65 years who are categorically ineligible for the program being analyzed in this study.

Here we consider the ratio of wage-rate subsidy recipients to all working poor and to all poor who are wage earners. The former group includes the self-employed and other nonwage workers as well as wage workers. Therefore the latter ratio is perhaps the best indicator of the wage-rate subsidy's incidence on the working poor since only hourly wage earners are eligible to be recipients. These ratios are presented in table 10. For each target wage the first column gives the ratio of wage-rate subsidy recipients to all working poor and the second the ratio with only poor wage earners in the denominator.

TABLE 10.—WAGE-RATE SUBSIDY COST AND COVERAGE OF WORKING POOR

[In percent]

Target wage	$1.60		$2.50	
	Working poor	Poor who work for wages	Working poor	Poor who work for wages
All poor	62.8	76.0	77.2	93.5
Poor male	54.9	69.3	72.4	91.4
Poor female	72.5	83.4	83.2	95.7
Poor white	55.3	71.6	71.2	92.2
Poor nonwhite	77.2	82.8	89.1	95.6
Poor head	52.2	65.3	72.2	90.3
Poor nonhead	72.4	88.9	79.0	97.1

Note: Entries in "Working poor" columns are the ratios of wage-rate subsidy recipients to all working poor (by the appropriate group at the left); entries in "Poor who work for wages" columns are ratios of same numerator to poor wage workers (by the appropriate group at the left).

Source: Special tabulations from 1967 Survey of Economic Opportunity.

As noted we consider the ratio of wage-rate subsidy recipients to one or another category of working poor. A similar comparison for dollar benefits would not seem very illuminating as 100 percent of wage-rate subsidy benefits to the poor would, by definition, go to the working poor (since one must work to receive a wage-rate subsidy). The relevant dollar transfer amounts were considered above (see table 9).

The "All poor" row in table 10 indicates that a significant portion of those poor who work would receive wage-rate subsidy benefits. An even larger percent of poor wage-earners would benefit. At the highest target wage 77 percent of all working poor and 93.5 percent of wage-earning poor would receive wage-rate subsidy benefits. Thus only about 4.5 percent of those poor who work for wages earn wages greater than $2.50 per hour. At the lowest target wage 24 percent of poor wage earners would not benefit from a wage-rate subsidy because their wage rate exceeds $1.60.

Looking at the subgroups of the poor population we see that the presumed "disadvantaged group" within each pair—females, nonwhites, and nonheads—has larger recipient ratios than does its counterpart. This reflects the fact that these groups do work for lower wages than do males, whites, and family-heads, respectively. A particularly interesting result is the relatively small differential between working poor and wage-earning poor seen for nonwhites. This suggests that relatively few poor nonwhites are engaged in any form of entrepreneurial activity.

While there are substantial differences in poor wage-earner recipient ratios at the lower target wages, these tend to become quite narrow as the target wage rises. This results from the fact that few poor in any group earn more than $2.50 per hour, but at the lower wages females, nonwhites and nonheads are disproprotionately represented. This tendency exists, but is somewhat less evident for the working poor recipient ratios.

These data suggest that the target wage would have to be set relatively high if the vast majority of the working poor are to benefit. And even then, all of the working poor will not be recipients.

VI. Wage, Hour, and Earning Effects of the Wage-Rate Subsidy

As demonstrated geometrically (see figs. II and III and related text), the wage-rate subsidy will cause market-determined values of wage rates, hours worked, and subsidy-inclusive earnings to differ from their values in a subsidyless world. Put simply, the subsidy effectively increases labor supply, which tends to bid down wage rates, which in turn causes more labor to be employed. But, because of the subsidy, postsubsidy earnings will never be less than presubsidy earnings (in a limiting case the two will be equal).

In order to estimate the magnitude of these effects a labor market model which relates demand to supply must be specified and quantitatively estimated. We have shown elsewhere that by supposing the quantities demanded and supplied of labor to depend upon the wage rate and then changing supply in the manner suggested by figure I, the effects of the wage-rate subsidy can be estimated.[41] As

[41] See Barth [2]. Basically the model is as follows:

(a) $lnH_d = lna_1 + a_2 lnW$ (demand curve).
(b) $lnH_s = lnb_1 + b_2 ln[rX + (1-r)W]$ (supply curve).
(c) $lnH_d = lnH_s$ (equilibrium condition).

Since equation (b) is nonlinear in its argument, the system (a)-(c) is solved using an iterative procedure which finds the W value that minimizes $(lnH_d - lnH_s)$. This is then used to obtain equilibrium hours.

shown in connection with the discussion of figures II and III, the magnitudes the wage-rate subsidy's effects are dependent upon the slopes, or more precisely, the elasticities of the demand and supply curves. Hence we must specify the precise quantitative nature of the demand and supply relationships; that is, the values of the demand and supply elasticities.

The elasticity of demand for labor is the relation between the percent change in amount of labor demanded and the wage rate (which relation is on the basis of theory and external evidence assumed to be negative). Thus if this elasticity is said to be, for example, minus 1, it is meant that a 10-percent increase (decrease) in the wage rate will be associated with a 10-percent decrease (increase) in the quantity of labor demanded. If the demand elasticity is −0.4, a 10-percent increase (decrease) in the wage rate will be associated with a 4-percent decrease (increase) in the quantity of labor demanded. Supply elasticity is defined similarly except that this relation is generally assumed to be positive. If the elasticity of supply is +0.1, a 10-percent increase (decrease) in the wage rate will be associated with a 1-percent increase (decrease) in the quantity of labor supplied.

The subsidy benefit estimates presented in the previous section were based on an assumption of zero elastic supply. That is, changes in wage rates were assumed to be unrelated to changes in quantity supplied of labor, which is, by definition of zero supply elasticity, fixed. Now we relax this assumption and examine a range of demand and supply elasticities which are suggested by relevant econometric literature.[42] By comparing the results for nonzero supply elasticities to those for zero, the sensitivity of estimates of wage rate, hour, and earning effects to assumptions regarding the labor market can be seen. Similarly, sensitivity can also be observed over the range of demand elasticities.

The sample population to which the analysis of subsidy effects is applied is composed of persons in the 1967 SEO file with the following characteristics: (1) male; (2) head of family with at least two adults present; (3) age between 25 and 65 years; (4) worked for wages at some time during 1966; and (5) worked for wages in week preceding survey week in 1967. There were 5,418 such sample observations. The number of persons in the total population which they represent is 10. 8 million. The variables are as described in section IV. The target wage is assumed to be $3 and the subsidy rate 50 percent. Since the sample and program parameters differ from those employed in the previous section, the results are not directly comparable. Our purpose here is simply to indicate subsidy effects on market-determined variables and the sensitivity of these effects to assumptions regarding market structure and behavior (given by the assumed elasticity values). The target wage was selected so that a substantial range of the wage distribution would be included.

The results are presented in table 11 in which each column represents a different demand elasticity: −0.4, −1.0, −2.5, and −5.0. The rows of table 11 are most simply viewed in sets of five, each set corresponding to a different supply elasticity: 0.0, +0.1, +0.2, and +0.5. Each set

[42] See Barth [1, ch. 6] for a review of relevant literature; also see [6].

contains a row for (1) the postsubsidy market equilibrium wage rate, W; (2) the postsubsidy market equilibrium annual hours (per worker), H; (3) aggregate annual subsidy benefit, S; (4) subsidy-inclusive hourly remuneration, W^s; and (5) subsidy-inclusive annual remuneration, Y^s.

TABLE 11.—WAGE-RATE SUBSIDY EFFECTS UNDER ALTERNATIVE SUPPLY-AND-DEMAND CONDITIONS

[W=postsubsidy market equilibrium wage rate ($); H=postsubsidy market equilibrium annual hours, per worker; S=aggregate annual subsidy benefit (billion dollars); W^s=subsidy-inclusive hourly remuneration; Y^s=subsidy-inclusive annual remuneration]

Supply elasticity		Demand elasticity			
		−0.4	−1.0	−1.5	−2.5
0.0	W	2.15	2.15	2.15	2.15
	H	2,424	2,424	2,424	2,424
	S	11.13	11.13	11.13	11.13
	W^s	2.58	2.58	2.58	2.58
	Y^s	6,242	6,242	6,242	6,242
+0.1	W	2.06	2.11	2.13	2.14
	H	2,464	2,466	2,467	2,467
	S	12.51	11.85	11.59	11.46
	W^s	2.53	2.56	2.57	2.57
	Y^s	6,234	6,301	6,328	6,242
+0.2	W	1.99	2.08	2.12	2.13
	H	2,498	2,506	2,511	2,512
	S	13.62	12.45	11.93	11.80
	W^s	2.50	2.54	2.56	2.57
	Y^s	6,257	6,365	6,428	6,443
+0.5	W	1.85	1.99	2.08	2.11
	H	2,574	2,613	2,634	2,643
	S	15.98	14.25	13.09	12.70
	W^s	2.43	2.50	2.54	2.56
	Y^s	6,242	6,519	6,690	6,753

The values of W and H result from the interaction of demand and supply as discussed previously (see footnote 41). S is obtained by substituting the appropriate W and H values into expression (1) and summing over all workers (see footnote 9). W^s is given by expression (2) and Y^s by expression (3a).

Before turning to the results it will be useful to recall a property of the zero supply elasticity assumption. Since under this assumption supply is fixed, there is no change in hours. Again because supply is fixed there is no supply-demand interaction which would result in a change in the market wage rate. Thus when supply is (assumed to be) zero elastic the pre- and post-subsidy values of market-determined wage rates and hours are equal. This is true irrespective of the demand elasticity, as can be seen in the first bloc of table 11.

Now since the presubsidy values of W and H ($2.15 and 2424, respectively) are given in the zero supply elasticity bloc, the sensitivity of the estimates to this assumption can be seen by comparing the four blocs—that is reading down the table. For the +0.1, +0.2 and +0.5 values of the supply elasticity the sensitivity of estimates to the demand elasticity can be seen by reading across the table. Given this background the results can be briefly stated.

Wage effect.—The wage-rate subsidy causes the market wage rate (W) to be bid down. All wage rates shown are less than the presubsidy value of $2.15.

Hours effect.—Hours worked increase as a result of the subsidy program (all values of H exceed 2424). This result is simply a reflection of the fact that at lower market wage rates more labor will be employed. It is unlikely that all of the increased demand for hours to be worked would be supplied by presently employed workers. Thus there would be some increase in employment as a result of the wage-rate subsidy.

Post subsidy remuneration.—In all cases workers' hourly and annual subsidy-inclusive remuneration exceed presubsidy earnings.

Aggregate subsidy benefit.—As table 11 shows there is considerable variation in the estimate of subsidy benefit over the elasticity ranges. Recall that except for administrative cost, benefit is identical to program cost. Thus the value of S in table 11 is approximately the value that would be presented to the Congress if a wage-rate subsidy was proposed. But which value of S? In practice estimates of transfer program cost—welfare reform, for example—assume that labor supply is zero elastic. This is the simplest procedure since in addition to assuming away any supply variability, the resulting estimate is invariant with respect to demand conditions.

But if the zero supply elasticity assumption is not valid a great deal of possible cost variation has been incorrectly assumed away. Unfortunately, policymakers are seldom aware of the sensitivity of program cost estimates to underlying assumptions regarding economic structure and behavior. While pleas for more research provide lame conclusions, it remains true that the present uncertainty regarding subsidy cost can only be reduced by increased quantitative research on supply and demand relations and their interaction.[43]

VII. Antipoverty Effect of the Wage-Rate Subsidy

This section inquires into the antipoverty effect of the wage-rate subsidy. Previous sections presented data which detailed the distribution of benefits among a wide variety of demographic, regional, and economic classes and data which indicated the direction and order of magnitude of the subsidy's labor-market effects. Now we define specific objectives for the wage-rate subsidy—transferring funds to the poor and removing recipients from poverty—and inquire into the efficacy of the program. Since subsidy cost is a function of the target wage and subsidy rate policy parameters (given market wage rates and annual hours), the effect on benefits of variations in these parameters will be explicitly examined. Note that for the first time the subsidy rate, r, is allowed to vary; it will take on the values of 30, 50, and 70 percent. Recall that the dollar subsidy benefit increases (linearly) with the subsidy rate.

[43] Since the analysis of subsidy effects under a backward-bending supply curve assumption depends upon somewhat more complex analysis than that reported here the results were not included in the text. Briefly, when it is assumed that the income effect dominates the substitution effect at a wage rate of about $2 (*see* Greenberg and Kosters [11] and Sherwin Rosen and Finis Welch [24] for evidence on this point) market wage rates are bid up and hours down. Subsidy cost is less than in the zero supply elasticity case.

We have defined two goals for the wage-rate subsidy; one is a specific subgoal of the other since transferring money to the poor will result in people escaping poverty. But not all recipients will receive a sufficiently large transfer to enable them to escape poverty. Thus it is worth investigating these goals separately. First we consider the transfer goal by examining the poverty-gap filling effect of the wage-rate subsidy. Then we examine the poverty escape rates which follow from different target wage-subsidy rate combinations. Both indexes of antipoverty effect are contrasted with program cost, thus providing a crude sort of benefit-cost calculation.

The Wage-Rate Subsidy and the Poverty Gap

If the total incomes of all definitionally poor [44] families are summed and then subtracted from the amount of money required to make all of these families nonpoor, the result is called the "poverty gap." Such a measure is only as valid as the poverty line concept upon which it is based and the income and earnings data used to estimate it. Nevertheless the poverty gap concept is perhaps the best single indicator of the transfers needed to eliminate poverty; that is, of the size of the poverty problem, in dollars and in the aggregate.

The wage-rate subsidy will transfer funds to workers in poor families. Using data for income year 1966 we can compare wage-rate subsidy benefits to the poverty gaps of the working poor and of four subgroups of interest.[45] The poverty gaps of families (including families of size one) with nonaged heads who worked are as follows:

1966 Poverty gap

Class:	*Billions*
Total	$5, 403
Male head	3, 568
Female head	1, 836
White head	3, 548
Nonwhite head	1, 855

Table 12–A is a 3 by 2 array of dollar benefits to poor families with at least one wage subsidy recipient. Each cell gives the benefit resulting from a particular target wage ($1.60, and $2.50) subsidy rate (30, 50, and 70 percent) combination. Thus reading across a row holds the subsidy rate constant and vice versa for reading down a column. Tables 12–B–E are similarly constructed for the subgroups noted above.

[44] The poverty line concept was defined in sec. V. The critiques and alternatives to the absolute definition of poverty cited in footnote 38 are equally relevant here.

[45] The wage-rate subsidy benefit data were calculated as described in sec. V. The poverty gap data are taken from U.S. Department of Health, Education, Welfare, Office of the Assistant Secretary for Planning and Evaluation. "Poverty Status Tabulations by Work Experience, Family Size, and Related Demographic Characteristics, 1966," mimeo. There is not a 100-percent overlap between the poverty gap and wage-rate subsidy benefit data because the former were tabulated from the Current Population Survey and the latter from the SEO. In addition, there are definitional differences. Experience with such comparisons suggests that the results are not systematically biased. The advantage of using readily available data need not be belabored.

TABLE 12.—BENEFITS TO POOR FAMILIES

[In billions of dollars]

Subsidy rate	Target wage	
	$1.60	$2.50
A. All poor:		
30 percent	$0.91	$2.36
50 percent	1.52	3.93
70 percent	2.13	5.51
B. Male head:		
30 percent	.57	1.57
50 percent	.95	2.61
70 percent	1.33	3.66
C. Female head:		
30 percent	.34	.79
50 percent	.57	1.32
70 percent	.79	1.85
D. White head:		
30 percent	.48	1.38
50 percent	.80	2.29
70 percent	1.12	3.21
E. Nonwhite head:		
30 percent	.43	.99
50 percent	.72	1.64
70 percent	1.00	2.30

Source: Special tabulations from the 1967 Survey of Economic Opportunity.

If we form the ratios, cell by cell, of program benefit to poverty gap, tables 13–A to E result. Each gives wage-rate subsidy benefit as a percent of the poverty gap for the relevant group. Since benefits increase as we move from upper left to lower right in tables 12–A to E we expect and observe the same pattern in tables 13–A to E. Put simply, by transferring enough money to the poor, poverty can be eliminated. Indeed, in most cases, for the highest benefit plan it can be more than eliminated.

Table 13–A indicates that the low benefit plan would close 16.85 percent of the poverty gap while the maximum benefit plan would close 102.04 percent. Recall that these are aggregate figures. It is not true that each family with a wage-rate subsidy program participant would have postsubsidy income equal to 102 percent of the poverty line. Some would have postsubsidy income much higher while other families would remain in poverty (but with higher incomes). Tables 13–B to E do not paint a much different picture than the aggregates in table 13–A. Most striking are the white-nonwhite differences. Presumably the relatively larger ratios for nonwhites follow from the smaller aggregate initial gap of nonwhites (because nonwhites comprise only 12 percent of the U.S. population) as well as their inferior wage position. The latter, recall, suggests higher subsidies to lower wage workers.

TABLE 13.—BENEFITS TO POOR FAMILIES AS A PERCENT OF THE POVERTY GAP

Subsidy rate	Target wage	
	$1.60	$2.50
A. All poor:		
30 percent	$16.85	$43.70
50 percent	28.15	72.78
70 percent	39.44	102.04
B. Male head:		
30 percent	15.97	43.98
50 percent	26.61	73.11
70 percent	37.25	102.52
C. Female head:		
30 percent	18.48	42.93
50 percent	30.98	71.74
70 percent	42.93	100.54
D. White head:		
30 percent	13.5	38.9
50 percent	22.5	64.5
70 percent	31.5	90.4
E. Nonwhite head:		
30 percent	23.1	53.2
50 percent	38.7	88.2
70 percent	53.8	123.7

Source: Special tabulation from 1967 Survey of Economic Opportunity and Poverty Gap Data from [31].

If the program were to be restricted to poor workers only, the data in table 12–A would give the cost of the poverty gap reduction shown in tables 13–A to E. Such a categorization is not recommended because it would create an incentive to become poor and would force a wedge between jobs and remuneration. Nevertheless, it is of some interest to recall the comparison of benefits to the poor to total benefits since this would provide a measure of transfer efficiency, given that the poor are the sole program target. This was done in table 9 of section V where the ratio of benefits accruing to all poor to benefits accruing to all recipients was given and is reproduced in the first row of table 14. This percent is invariant with respect to the subsidy rate since the latter appears in both numerator and denominator and thus cancels. The second row of table 14 gives the percent of poverty gap filled per billion dollar of cost, assuming, as we have throughout this study, that the program is universal; both poor and nonpoor low wage workers are eligible recipients. This figure, too, is invariant to the subsidy rate. It is calculated by obtaining for each target wage (assuming a subsidy rate of 50 percent), the ratio of the relevant quantity in table 13–A to the aggregate cost given in table 2 of section V.

TABLE 14

	Target wage	
	$1.60	$2.50
Benefits to poor as percent of benefits to all recipients	23.1	14.2
Percent of poverty gap filled per billion dollars of benefit	4.3	2.7

Source: Tables 2, 9, and 13–A.

The data in table 14 suggest that a great deal of wage-rate subsidy funds would have to be expended to transfer only a relatively small amount to the poor. Nevertheless, it must be recalled that this is in part a result of the program being analyzed. As noted above, some form of categorization would greatly reduce costs. Categorization itself has costs, many of the worst features of the present welfare system being examples. What we can conclude from this data is that a universal work-conditioned program would be very expensive and not terribly efficient as an antipoverty device.

The Wage-Rate Subsidy and Exit From Poverty

The previous section inquired into the amount of wage-rate subsidy dollars going to poor persons relative to the aggregate number of dollars needed to make all of them nonpoor. Now we pose a more specific question: How many persons will be removed from poverty as a result of the wage-rate subsidy?

An important goal of the wage-rate subsidy is to supplement the wages of poor persons by an amount sufficient to bring their family's income over the poverty line. Our analysis in this section will deal primarily with this goal, but some limitations and alternatives should be noted.

The poverty line is artificial and arbitrary. Moving one person from near zero income to just below the poverty line may be as socially desirable as moving another across the line. Our measure is sensitive to only the latter. In addition other effects of the wage subsidy ought to be noted. Some of these are: (1) its employment-creating effect; (2) its wage effect; (3) its relation to the aggregate inflation-unemployment tradeoff; and (4) its work incentive effect. Below we consider these.

In defense of our measure we may note that for better or worse the poverty line has become virtually institutionalized in discussions of income transfer mechanisms. Thus while the factors noted above may be as relevant, poverty exit rates are certainly central to the discussion of any program's antipoverty effect.

A "poverty outflow" index will serve here as our measure of antipoverty effect. It will be the ratio of subsidy-recipient poverty escapees to all subsidy recipients, both computed for a 1-year period (1966). Since the index relates escapees to the total recipient population, it may be viewed also as an escape rate. The number of escapees equals poor before subsidy minus poor post-subsidy. Now post-subsidy poor will be a function of both program target wage and subsidy rate. Consequently the poverty outflow index must be calculated for alternative values of both. As before target wages of $1.60 and $2.50 and subsidy rates of 30 percent, 50 percent, and 70 percent will be used. The poverty outflow index is:

$$F=\frac{P_b-P_a}{P_b} \tag{5}$$

where F = poverty outflow index
P_b = number of poor recipients, presubsidy
P_a = number of poor recipients, post-subsidy

The values of "F" are presented in table 15. In order to easily relate the poverty outflow measure to program cost the latter is given in identically constructed table 16 (note again that net of administrative expenses, benefit equals cost).

A given cell of table 15 (say 50 percent, $1.60) will give the poverty outflow paid for, as it were, by the dollar figure ($6.5 billion) given by the same cell of table 16. Thus a wage-rate subsidy program with a target wage of $2.50 and a subsidy rate of 50 percent will cause about 48 percent of presubsidy poor recipients to become nonpoor at a cost of $27.4 billion. Note that poverty outflow increases with both target wage and subsidy rate.

TABLE 15.—POVERTY OUTFLOW INDEXES

[In percent]

Subsidy rate	Target wage	
	$1.60	$2.50
30 percent	15.0	34.0
50 percent	27.1	47.8
70 percent	34.9	55.6

Source: Special tabulation from 1967 survey of economic opportunity.

TABLE 16.—SUBSIDY COST

[In billions of dollars]

Subsidy rate	Target wage	
	$1.60	$2.50
30 percent	3.9	16.4
50 percent	6.5	27.4
70 percent	9.1	38.3

Source: Special tabulation from 1967 survey of economic opportunity.

The fact that $1.60—70 percent and $2.50—30 percent subsidy plans yield virtually equal escape rates does not suggest that the same outflow can be achieved at a cost differential of $7.3 billion as between the two plans. This is because coverage is so much greater under the larger plan (by 16 million persons according to table 2). That is, only the rates are roughly equal, not the number of escapees; 34 percent of 42 million greatly exceeds 34 percent of 24 million.

The maximum outflow among the chosen plans, 55.6 percent, would cost $38.3 billion. The least costly plan, $1.60—30 percent, would cost $3.9 billion and result in an escape rate of 15 percent. Relative to other plans, this one does not cost much because it does not do very much.

The reader may wish to contrast subsidy cost with percent of poverty gap filled (table 13–A). We would simply note that the relative rankings are the same except for the "tie" plans noted above, that is, $1.60—70 percent and $2.50—30 percent. Most significant, perhaps, is the fact that as plans become more generous, the gap-filling/escape rate differentials grow. Thus sole reliance on movements

across the arbitrary poverty line gives an increasingly understated estimate of wage-rate subsidy effect on poverty status as plans become more generous. Such a finding provides further reason for avoiding sole reliance on poverty outflow in evaluating income transfer programs.

Other Wage-Rate Subsidy Effects

The poverty-gap filling and poverty outflow measures examined above are perhaps the most obvious indexes of how well a transfer program might perform. They have the added virtue of being readily quantifiable. However, those two measures have a serious defect: they are static. That is, the wage-rate subsidy itself may affect the labor market in such a way as to change the initial conditions upon which the transfer-effect measures were based. This section will indicate what some of these effects are and, where possible, their likely direction and/or magnitude.

Employment effect.—Some families are poor because some or all of their potential earners do not work, work few hours, and/or work for low wages. If the wage-rate subsidy should have a positive employment-manhours effect, the first two of these labor-market related causes of poverty would be mitigated. In addition to its income transfer function the wage-rate subsidy will have induced an increase in earned income via increased labor market activity. Thus, any evaluation must consider the likely employment effect of the wage-rate subsidy.

In section VI we saw that the wage-rate subsidy has a positive manhours-employment effect. For the male family-head group studied the effect was sizable, although it varied depending on the structure of the labor market. For the general population we expect highly inelastic supply, but probably some positive wage sensitivity. Thus the wage-rate subsidy would increase manhours-employment. In a sense, such a conclusion serves to augment the values of the poverty-gap filling and poverty outflow measures since it suggests that the employment effect will raise the values of these indexes after the program goes into effect (holding constant wage rates).

Wage effect.—If the wage-rate subsidy causes market wages to be bid down, it will cause program costs to be raised. For a given budget constraint, then, smaller poverty outflows will be effected. The analysis of section VI showed that if the supply curve is positively sloped, wage rates will be bid down.[46] Subsidy-inclusive earnings will of course rise, but the Government will pay a larger share of the benefits. Any firm conclusion here must wait upon an analysis of the dynamics of the adjustment. However, we can conclude that, ceterus paribus, subsidy costs will grow as a result of the subsidy. To the extent that this cost escalation meets a budget constraint, poverty-gap filling and poverty outflow goals may be lowered.

Inflation effect.—It can be shown that many income transfer programs will effect the inflation-unemployment tradeoff, or Phillips

[46] Since general wage levels grow over time the wage-rate subsidy induced bidding down of particular wage rates may be more than, just, or less than balanced by general wage level movements as a function of supply and demand elasticities, level of the target wage and density of the wage distribution in the neighborhood of the target wage.

curve, via their affects on wage aspirations, unemployment frustration factors, and job vacancy rates.[47] The more inward the Phillips curve (or lower the "natural" rate of unemployment) the less need for transfer programs and the smaller they can be. Now if a transfer program has the effect of shifting out the Phillips curve it will in many ways be self-defeating since real incomes will grow less and contractionary monetary and fiscal policies may result. The unemployment caused by the latter is perhaps the most important cause of poverty among employables.

Since wage-rate subsidies increase employment without increasing market wages they are likely to be, on net, job-vacancy filling. Since no income or wage guarantee is supplied the frustrations of unemployment are not lessened and wage demands would still tend to fall as the duration of unemployment lengthened. Since total remuneration is increased, voluntary quits may decrease and job matches made more lasting. This would tend to lower the equilibrium vacancy rate which in turn implies an inward shift of the Phillips curve.

On the other hand, the higher wage-rate subsidy-inclusive wage may raise initial wage aspirations which would tend to shift out the Phillips curve. On net, however, the wage-rate subsidy is likely to improve the inflation-unemployment tradeoff. This conclusion would suggest that the quantitative measures discussed previously in this section understate the case for the wage-rate subsidy.

Work incentive effect.—The work incentive issue has been central to all recent discussion of questions regarding income redistribution, the "war on poverty," and welfare reform policies. Whether any given form of income transfer has proincentive effects depends principally on the labor-leisure preferences of recipients, the precise type of plan and how it integrates with other existing transfers, and the nature of the preplan world relative to its successor (for example, is the preplan tax rate higher than that in the plan).

The static work incentive effects of the wage-rate subsidy have been qualitatively analyzed and the results can be restated here. Kesselman compared the wage-rate subsidy to a negative income tax and concluded that "* * * the wage [-rate] subsidy offers less static disincentive to work than the income subsidy (for example, negative income tax) plans yet developed" [18, p. 276]. Barth and Greenberg argued that a wage-rate subsidy ought not to be, nor is it likely to be, the sole component of an income-transfer system [3]. After studying the static incentive effects of a mixed wage-rate subsidy-public assistance program they concluded that under a reasonable set of assumptions the work incentive advantage of the "pure" wage-rate subsidy could be neutralized. Garfinkel investigated the differential human investment incentives contained in wage-rate subsidy and negative income tax plans. Since the wage-rate subsidy raises the opportunity cost of off-the-job investment and the negative income tax does not, Garfinkel concludes: "This differential investment disincentive could easily outweigh the static work disincentive advantages of the pure wage-rate subsidy system in terms of productivity" [10, p. 15].

[47] For a basic statement of the theory see Charles Holt [13]; for a specific application of the theory to a similar problem (public employment) see Barth and Edward M. Gramlich [4].

All of these analyses are static and each presents a caveat regarding possible differences in the results of a dynamic analysis. In addition, the conclusions are qualitative and thus difficult to balance against some of the points made previously in this section. Nevertheless, it does seem fair to conclude that the wage-rate subsidy, even when combined with other transfers,[48] would be the most pro-incentive of the transfer schemes usually considered. The possibly negative off-the-job investment effect may or may not detract from the desirability of the wage-rate subsidy depending on one's view of the relative productivities of off- versus on-the-job training.

In the wage subsidy formulation examined in this study the subsidy rate, r, can be viewed as a tax rate internal to the plan. Now the higher the tax rate, the smaller the amount of any wage increase which will accrue to the worker. On this count plans with r=30 percent dominate those with r=50 percent and similarly as r is increased. While we are not in a position to evaluate the quantitative significance of this effect, plans with higher subsidy rates are, ceterus paribus, inferior to lower r-value plans.[49] Thus there may be a work disincentive cost to moving down any of the columns of table 12–A. This would result mainly from a differential substitution effect.[50] More generous plans would also engender leisure-inducing income effects (over some range); thus raising the target wage could have work incentive costs.

Concluding Note

It seems quite clear that a universal wage-rate subsidy would be an inefficient transfer mechanism. The plans analyzed here filled between 4.3 percent and 2.7 percent of the poverty gap per billion dollars expended. Between 23 percent and 14 percent of total benefits would accrue to poor persons. A plan which would cost $6.5 billion would fill 28 percent of the working poor poverty gap and result in 27 percent of presubsidy poor recipients escaping poverty.

On the criteria of employment effect, inflationary impact, and work incentive effect the wage-rate subsidy fares rather well. Since the presumptive direction of any wage effect is negative, and reduced wages raise program costs, the grade on this criterion is low. Of course, the positive employment effect is really the other side of the wage effect coin. But since these two effects are likely to be borne by different persons and families they must be considered separately.

Thus, insofar as labor market efficiency is concerned the wage-rate subsidy seems a sound program (ignoring thorny questions of administrative feasability). As a transfer program it seems inefficient. If one's values point toward work-conditioned programs, the latter may be the price of the former.

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[48] For a clever example see Kesselman [19].

[49] Interestingly, preliminary results from the Office of Economic Opportunity-sponsored New Jersey Graduated Work Incentive Experiment, have shown no differential earnings or hours response to tax rate differentials. How applicable this response pattern to a nonwork conditioned transfer is to a wage-rate subsidy is, of course, questionable. See Watts [34].

[50] It should be noted that, for constant wage rates, plans with higher subsidy rates will have a stronger work incentive effect since the price of leisure, subsidy-inclusive remuneration, varies positively with the subsidy rate. Thus the direction of the work incentive effect depends on whether wage rates, as in the text, or hours, are being varied.

VIII. Summary and Conclusion

This study examined a subsidy program which has been suggested as a possible component of an antipoverty strategy. While various forms of subsidy to employers have been tried, a wage-rate subsidy with the worker as intended recipient has not. Consequently and necessarily, our analysis is based upon theoretical insights and survey data which provide, at best, proxies for what we would ideally want to observe and measure. Nevertheless studies such as this can facilitate intelligent policy planning by forecasting a range of potential effects of and benefit distributions for the program under consideration.

The wage-rate subsidy examined here would pay a subsidy equal to some fraction (called the subsidy rate) of the difference between a socially determined target wage and the market-determined wage rate. The base of the subsidy is the hourly wage rate. All hours worked for which the target wage exceeds the market wage rate are eligible to be subsidized. Eligibility for the program is universal; no special categories of recipients save for age are defined. Finally, the program is work conditioned; if no labor is supplied, no wage-rate subsidy is paid.

Estimates of dollar benefits (shown to be equal to transfer cost) to all recipients and numerous population subgroups were presented for target wages of $1.60 and $2.50 and subsidy rate of 50 percent. For total United States, benefits of $6.5 billion and $27.4 billion would accrue to 24 million and 42 million recipients respectively at the two target wages.

A principal conclusion was that while the wage subsidy may aid the "target group" to some extent, benefits tend not to be concentrated where transfer policy might desire. A typical example is that nonheads in nonpoor families comprise a large recipient group. An exception is that a disproportionate share of benefits would go to the South, a region which seems to be the target of interregional income redistribution policy.

Analysis of the wage-rate subsidy's effects on market-determined variables showed that wage rates would be bid down and hours worked increased. In all cases examined subsidy-inclusive per hour and per annum remuneration of recipients increased. Perhaps the most striking result of this analysis was the sensitivity of estimates of program effects and cost to assumptions regarding labor market structure and behavior. A clear-cut conclusion is that policymakers ignore the implications of their assumptions at their, and the taxpayer's, peril.

By examining both the percent of working-poor poverty gap closed and the poverty exit rate associated with various target wage-subsidy rate combinations, measures of transfer efficiency were approximated. A universal wage-rate subsidy is not an efficient antipoverty weapon since only between one-fourth and one-seventh of benefits accrue to the poor (for the programs we examined). It was noted that the very nature of such a program—its universality—preordains its low antipoverty efficiency. Thus, if all poor persons comprise the target group, a wage-rate subsidy clearly will not be an optimal policy tool. Moreover, any work-conditioned program excludes many persons simply because many of the poor cannot work.

If only certain classes of workers with wage rates less than the target wage were eligible, cost would be lower and benefits could be pinpointed. But it must be emphasized that categorization is not without its costs. The canon of "equal pay for equal work" would have to be violated. Unknown effects on the social structure could result from the creation of a "class" of subsidized workers. These problems seem to be inherent in work-conditioned transfers and, indeed, characterize the present public assistance system, the distaste for which motivated the discussion of alternative antipoverty devices.

On the other hand, the wage-rate subsidy appears to be a relatively efficient labor-market device since it tends to be employment-creating. In addition, the wage-rate subsidy is likely to be noninflationary in a Phillips curve sense. Finally, relative to most other suggested antipoverty devices, the wage-rate subsidy has the most desirable static work incentive effects. While these may be neutralized when the wage-rate subsidy is integrated with other transfers, clever schemes can still capitalize on the program's work incentive advantage.

The conclusion then would seem to be that there is a clear tradeoff between transfer efficiency and labor-market efficiency. The universal wage-rate subsidy appears to have desirable labor-market effects but is inefficient at tranferring funds to the poor. A final point, which may be as philosophical as it is economic, is that while a wage-rate subsidy would to some extent get at the symptoms of labor-market related causes of poverty, it would not, indeed could not, attack the causes of poverty. The phenomenon of "low wagedness" is too complex to go into here. But we should note that a wage-rate subsidy could, by appearing to shore up the earnings of certain workers, reduce the incentive to study the cause of and to initiate policies to reduce "low wagedness."

Future research might begin by examining, both theoretically and empirically, how this conflict between transfer efficiency and labor market efficiency can be resolved. Other related areas which could profit from additional research may be mentioned. Since many poor persons cannot work and since a wage-rate subsidy does not adjust for family size related poverty lines, the wage-rate subsidy probably should be considered only in conjunction with other transfers. How would the wage-rate subsidy best integrate with other income-conditioned cash and in-kind transfers? The present study defined a wage-rate subsidy so that it could be analyzed, not implemented. The thorny questions of administration must be answered before the wage-rate subsidy goes any farther than it has here. We examined one particular formula. Presumably other formulas may be developed and investigated. In this study we have assumed 100-percent participation in the program. A socioeconomic analysis of the reasons for and likely magnitude of less than full participation would be quite valuable. The question of the impact of wage-rate subsidy on the wage structure and any consequential effects was ignored here. This would seem a particularly interesting topic.

This study has compared the pre- and post-subsidy worlds and ignored the transition from one to the other. Technically this analytic method is called comparative statics. A dynamic analysis of subsidy effects would provide insight into how soon different groups benefit,

and could yield information on the crucial question of whether the wage-rate subsidy would cause displacement of workers just above the target wage by those just below. An analysis of the wage bill subsidy which permitted direct comparison to our results would surely be a contribution to policymaking in the area of wage-related transfer programs. Finally, data are needed which permit the investigator to employ conceptually meaningful economic concepts in conjunction with appropriate demographic information. Some sort of marriage of establishment and household data would help provide such a data source.

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ALTERNATIVE TAX SUBSIDIES FOR THE TRAINING AND EMPLOYMENT OF THE UNEMPLOYED

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SUMMARY OF PAPER

This paper deals with a major aspect of public finance which has recently received considerable attention on Federal and State legislative fronts; namely, the use of tax incentives for the accomplishment of social and desirable goals. Specifically, attention is centered on the use of tax credits against Federal income taxes in order to encourage the private business sector to hire and train unemployed, unskilled members of the labor force.

Much of the interest in the use of tax credits in this poverty problem area stems from the belief that the problems of training and employing the poor must ultimately be solved in the private sector, as opposed to federally run and regulated manpower programs. To this end considerable attention has recently been given by the Congress toward the use of income tax credits as a means for encouraging private industry to invest in poverty areas, as well as to hire and train the unskilled and untrained poor in the labor force. The administration has also expressed recent interest in the use of poverty-oriented tax credits for the employment and training of the economically disadvantaged.

This paper looks at several of these recent legislative proposals, pointing out some of their problems with regard to administration, effectiveness, and cost. Poverty-oriented legislation of the late Senator Robert Kennedy, and Senators Harris and Pearson are discussed as well as a recent proposal by the administration in this area which involved both employment and investment poverty-oriented tax credits. The recently passed WIN tax credit is discussed, and particular attention is given to a 1971 bill by Senator Jacob Javits regarding a general employment tax credit.

In addition, a study is made of the possible effects of general wage-training tax credit subsidies upon the employment in the private sector of the unskilled, unemployed poor. The tax subsidies considered involve both a wage credit and a training credit for any employer in the private sector who hires and trains disadvantaged individuals under such general tax credit programs. Results are shown for various wage-training tax credit combinations, with the credit rate varying in intervals of 10 percent, from 20 to 40 percent of the wage costs of those hired under an employment-training program, and the training tax rate ranging in the intervals from 70 to 100 percent of the training costs incurred by the employers. Depending upon the size of the

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credits, estimates of additional jobs for the hard-core unemployed created under these programs would vary from 70,000 to 700,000. Corresponding program costs to the Federal Government of these various wage-training credit packages would range to over $2.3 billion in forgone tax revenue in 1 year of program operation, again depending upon the size of the various credits. Estimates are also provided as to expected reductions in costs of certain Federal and State welfare programs which would result under the tax credit programs, such as in aid for dependent children, food subsidy programs for the poor, and general assistance payments.

The results provide some quantitative economic insight into the effects and costs of tax incentives in an area where the literature is often only qualitative. They indicate that these tax incentives could be used to accomplish at least the short-run employment and training of the hard-core and that the degree of program effectiveness and cost could be controlled.

The final section of the paper deals with the concept of a general employment-training tax credit program in view of oft-sited comments and criticisms. Pros and cons of the tax credit manpower subsidy vis-a-vis the more common direct subsidy also are discussed in light of the findings of this study. The paper is concluded with a brief analysis of possible areas of related research and legislative needs.

Among the more serious domestic issues which confront this country are the widespread existence of poverty and the often associated problem of unemployment. In 1969, which economically was a good year, slightly less than 5 million families in the United States were known to be living on incomes below the poverty level. In 1970, when the unemployment rate averaged nearly 5 percent, the number of poor families had increased to over 5.2 million, reversing a 10-year decline in the annual number of poor families in the United States.[1] This amounted to 10 percent of all families in the United States. The incidence of poverty was particularly high among Negro families—29 percent as compared to 8 percent for white families in 1970. There were 25.5 million poor people in the United States in 1970, 20.5 million of whom were in families, with the remaining 5 million being unrelated individuals 14 years and older.[2] Of these 25.5 million, 17.5 million were white, 13.4 million of whom lived in families. Of the 8 million nonwhite poor, over 7 million lived in families.

Unemployment among all people in 1970 averaged 4.1 million;[3] in 1971 the average unemployment was nearly 5 million. However,

[1] U.S. Department of Commerce, Bureau of the Census, "Poverty in the United States: 1959-68," Curren. Population Reports, Series P-60, No. 68 (Washington, D.C.: U.S. Government Printing Office, Dec. 31t 1969), p. 27.

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[2] The term "family" refers to two or more persons related by blood, marriage, or adoption, and who are residing together. All such persons are considered as members of the same family. The term "unrelated individuals" refers to persons 14 years old and over who are not living with any relatives. An unrelated individual may constitute a one-person household by himself, he may be part of a household including one or more other families or unrelated individuals, or he may reside in group quarters such as a rooming house.

[3] U.S. Department of Labor, Bureau of Labor Statistics, "Employment and Unemployment in 1970," Special Labor Force Report 129, p. A-7.

unemployment figures are a static concept representing at any particular time the size of the pool of unemployed. Since most of the unemployed are only temporarily unemployed, annual data of those who experienced periods of unemployment are generally three to four times larger than unemployment as an annual average. Thus in 1970, approximately 14.6 million members of the labor force were unemployed at least one time during the year and actively seeking work.[4] The period without work in over 50 percent of the unemployed cases was relatively short (less than 5 weeks). Presumably, unemployment for many of these was due largely to voluntary job changes, some delay in finding work upon entry or reentry into the labor force, and expected seasonal layoffs.

An aspect of manpower subsidy which has received considerable attention from the Congress over the past few years is the use of the Federal tax structure in order to subsidize the employment and (in most cases) the training of the unemployed poor in the labor force. These proposals in one form or another suggest the use of income tax credits as a subsidy to those in the private sector who would hire and train the unskilled and unemployed, or who would invest in poverty areas with the resulting secondary effect of increased employment in these designated areas.[5]

Virtually all of the tax subsidy proposals to date have been oriented toward the low-income unemployed and underemployed, since among these individuals unemployment and underemployment is considerably in excess of levels experienced by the nonpoor. This is brought out in a recent survey [6] in which poor heads of households accounted for nearly 17 percent of unemployed heads even though poor heads were but 10 percent of all heads. Among those seeking work but not finding any during the entire year, the poor accounted for over 60 percent. Periods of unemployment are much longer among the poor, with jobs more difficult for them to obtain, and steady employment often the exception rather than the rule. In 1970, of household heads holding full-time jobs who worked less than one-half of the year, over 25 percent were poor. Of those working less than 13 weeks, over 37 percent were poor. The employment situation is even more serious among workers at part-time jobs,[7] where 35 percent of heads working less than one-half of the year are poor as are over 40 percent of those working less than 13 weeks.[8]

Job instability and accompanying unemployment is particularly characteristic of the low-income, unskilled members of the labor force. For those who are unemployed for an extended portion of the year, many move in and out of work two or more times during this

[4] U.S. Department of Labor, "Manpower Report of the President" (1972, preliminary figures).

[5] Although such proposals generally have been designed toward the economically disadvantaged members of the labor force, Senator Javits has recently introduced legislation which would permit a tax credit against Federal taxes for any employer who increased his employment regardless of the income levels of the employees. This bill is discussed further in the section on "Employment and Training Oriented Tax Credit Proposals."

[6] U.S. Department of Commerce, Bureau of the Census, "Characteristics of the Low-Income Population, 1970," Current Population Reports, Series P–60, No. 81 (Washington, D.C.: U.S. Government Printing Office, November 1971).

[7] A person is classified as having worked at part-time jobs during the year if he worked at jobs which provided less than 35 hours of work per week in a majority of the weeks in which he worked during the year. He is classified as having worked at full-time jobs if he worked 35 hours or more per week during a majority of the weeks in which he worked.

[8] Current Population Reports (No. 81), op. cit., pp. 73, 75, 77.

period. In the report by the President's Commission on Income Maintenance Programs [9] it was reported that over 80 percent of all family heads work 50 to 52 weeks, whereas only 40 percent of poor family heads manage the same work experience. Further, the proportion of those who hold more than one job is highest among the lowest income earners and lowest among the highest income earners. Michael Priore concluded in a study of the urban poor [10] that high unemployment rates observed in urban ghettos were a result of a rapid job turnover, indicating the jobs to be of low quality requiring little or no education and training; hence, the unattractiveness of the jobs and the relatively rapid job turnover.

The basic premise behind manpower subsidy programs aimed at reducing unemployment, particularly among low-income individuals, is that most of these people do not need a stronger work incentive; rather, they need additional skills and employment opportunities with possibilities of higher earnings and job stability in order to obtain a decent living standard.[11] Manpower programs such as JOBS, manpower development and training, Job Corps, and the recently revised work Incentive Program (WIN) were established on the belief that if the productivity of disadvantaged individuals could be increased through institutional and on-the-job training, major barriers to steady, productive employment would be removed. By providing the economically disadvantaged members of the labor force with potentially remunerative skills, a major cause of continuous poverty might thereby be circumvented.

In this paper, attention is directed to the effects of various wage-training tax credit subsidies on the employment in the private sector of the unskilled, unemployed poor. The tax subsidies considered involve both a wage credit and a training credit for employers who would hire and train disadvantaged individuals under a general tax credit program. Results are shown for various wage-training credit combinations, with the wage credit rate varying in intervals of 10 percent, from 20 to 40 percent of the wage costs of those hired under the employment-training program, and the training credit rate varying in like intervals from 70 to 100 percent of their training costs. Depending upon the size of the credits, estimates of additional jobs created under these programs would range from 70,000 to 700,000.[12] Corresponding program costs to the Federal Government would range to over $2.3 billion in forgone tax revenue in 1 year. Estimates are also provided as to expected reductions in costs of certain Federal and State welfare programs which would result under these tax credit programs, such as in Aid for Dependent Children and General Assistance.

Much of the interest in the use of tax credits in the poverty-employment problem area stems from the belief that the problems of training and employing the poor must ultimately be solved in the private sector. Several reasons are often cited by proponents of tax credits as to why

[9] The President's Commission on Income Maintenance Programs: Background Papers (Washington D.C.: U.S. Government Printing Office, 1970).
[10] M. Priore, "On-the-Job Training of Disadvantaged Workers," Public-Private Manpower Policies, ed. by A. R. Weber, F. H. Cassell, and W. L. Ginsburg (Madison: Industrial Relations Research Association, 1969), pp. 101–29.
[11] For example, see U.S. Department of Labor, "Manpower Report of the President" (1970), p. 119.
[12] Based upon 1970 data.

a tax credit would prove superior in terms of cost and effectiveness to the direct forms of Government subsidy in the employment and training of the unskilled and unemployed poor members of the labor force.

First, the tax credit places the decisionmaking process directly in the private sector with the individual firm. Decisions such as in what employment areas there are labor shortages and what forms of job training are preferable can best be made by the employer under a tax credit program instead of by agencies of the Federal Government, as is often the case under direct subsidy manpower programs.

Second, the direct subsidy manpower programs have become large in number with little interprogram coordination; thus, overlapping of responsibility and clientele coverage is frequently experienced. Supporters of the use of tax credits for the employment (and training) of the unemployed poor, claim that a tax credit program would allow for the abolishment of several related job training programs as well as at least partial elimination of direct Government intervention and associated administrative machinery.

Third, the concept of indirect subsidy of manpower training has fairly wide support in the private sector. According to a report by the Planning Research Corp., almost all business executives who were interviewed in the study preferred the use of tax incentives over the use of direct Government subsidy of manpower programs in the private sector.[13] Basically, the executives favored the possibility of reduced Government intervention, under an employment-training tax subsidy program relative to that of directly subsidized programs.

The results and analysis presented here should provide some initial insight into the effectiveness and costs of tax subsidy programs of the employment-training nature, as well as provide a worthwhile basis for comparison with direct subsidy programs of similar scope. Before proceeding, a presentation of some of the recent tax credit proposals in this area seems appropriate in order to place the ensuing discussion in a better perspective.

Employment and Training Oriented Tax Credit Proposals [14]

The proposals for using tax credits for the solution of employment and poverty programs are many and varied.[15] These proposals exemplify the tendency by legislators to make frequent use of the tax system in the form of subsidies in order to attack admittedly urgent domestic concerns, but often without sufficient attention to costs,

[13] In a recent article on the use of tax incentives for training the disadvantaged, Daniel Holland suggests that the business community seems "sharply divided on this point," with perhaps a slight favoritism for the tax incentive for reasons cited above.
See Daniel M. Holland, "An Evaluation of Tax Incentives for On-the-Job Training of the Disadvantaged," The Bell Journal of Economics and Management Service, II (Spring 1971), 318-320.

[14] Tax credits of various types are in use at both the Federal and State levels. The most common form of the income tax credit at the State level (outside of the withholding credit) is the use of personal State income tax credits to minimize the regressivity of sales and property taxes. At the Federal level, major income tax credits are withholding credits, credits for taxes of foreign countries, credits on retirement income, and the investment tax credit.

[15] For a presentation of additional tax incentive proposals for on-the-job training, see Holland, op. cit., pp. 304-306. Receiving particular attention in this treatise is the proposal by the Advisory Panel on Private Enterprise in its report to the National Advisory Commission on Civil Disorders. Briefly, this proposal would have given a tax credit to those firms which hired and trained those classified as hard-core unemployed. The proposal was for a credit of 75 percent of wages paid the hard-core unemployed in the first 6 months, 50 percent of wages in the second 6 months of their employment under this program, and a 25 percent credit for wages paid these individuals in the second year. The credit was to be limited by a scale dependent upon the number of hard-core unemployed hired as a percent of the firm's employees.

effectiveness, and administrative problems. Several of the problems are discussed within the context of these proposals, with particular attention given to a recent proposal by Senator Javits [16] for a general employment tax credit.

The Kennedy bill.—In 1967 Senator Robert Kennedy introduced legislation [17] intended to relieve problems of unemployment in areas of the country designated as poor. Businesses which invested in such areas would qualify for a 7-percent investment tax credit on plant facilities and a 10-percent tax credit on equipment. There was a further incentive in that all such investments would have their useful lives shortened by one-third for purposes of depreciation. For compensation paid to low income employees, an additional deduction of 25 percent of the wage bill would have been permitted. Since the main intention of S. 2088 was for large businesses to invest in poverty areas and thereby provide jobs, the benefits of the proposal were restricted to businesses which would have provided at least 50 new jobs.

Among other things, the Kennedy bill exemplifies a major problem characteristic of many of the tax subsidy proposals designed for specific groups or areas of the country; namely, a problem of program administration. An argument frequently cited in support of the tax subsidy approach to such domestic economic concerns is that the tax subsidy represents a simpler approach than direct subsidy. Since the administrative framework is already established in the Internal Revenue Service, there is no need of yet another agency in an already sprawling bureaucracy of independent agencies, which are often guilty of duplication of effort, and thereby are administratively costly. Because of the attempt to limit the subsidy to specific economic behavior in selected areas of the country designated as poor, a proposal such as S. 2088 would likely prove to be quite difficult to administer, by the IRS or anyone else. Regardless of the definition of what constitutes a poverty area, there would be tremendous administrative complications involved with actually determining whether an area qualifies for an entire subsidy or only part depending upon degrees of poverty and length of qualification. Problems would arise with businesses which operate in and out of these select areas, such as trucking companies, railways, and bus lines; problems consisting of distribution of tax subsidy benefits among these transient companies and of additional bookkeeping costs incurred by them. Selective tax subsidies such as in S. 2088 would discriminate against established businesses in the designated area, placing such firms at a competitive disadvantage. Problems of dealing with poverty and unemployment pockets in areas not covered by the selective subsidy plan would obviously arise, requiring either greater program selectivity (and greater administrative costs) or generalization of subsidy coverage accompanied by increases in program costs.

This is not to say that employment-poverty tax subsidies such as S. 2088 which are selective in regional coverage are not administratively feasible. But it should be made clear that the complexity of such programs would not only increase administrative costs—and pro-

[16] S. 2632, 92d Cong., first sess., 1971.
[17] S. 2088, 90th Cong., first sess., 1967.

gram enforcement—but would also negate most of the aforementioned arguments in support of the tax subsidy over the direct subsidy approach.

Harris-Pearson bill.—Senators Pearson from Kansas and Harris from Oklahoma proposed legislation [18] in the 91st Congress which would extend tax credits to businesses for investment in job-producing real and personal property. The bill provided for a 7-percent tax credit for investments in real property and a 14-percent tax credit for investment in personal property, providing such property were located in certain designated rural areas. The amount of the credit was limited by the taxpayer's tax liability, but generous carryback and carryforward provisions were permitted. Although cosponsored by 37 Senators, the bill died in the Senate Finance Committee.

The Harris-Pearson bill would have faced administrative problems similar to those outlined under the Kennedy bill. In addition, the Harris-Pearson bill brings out a point which is often overlooked in many tax credit, employment programs; namely, the use of capital-tied subsidies for the purpose of stimulating demand for additional labor. The basic theory underlying such subsidies is that the increased demand for capital stock results in increased employment in the capital producing industries and provides jobs in areas where the additional capital is employed. In areas of the country where a determined capital shortage and labor surplus exists, capital-tied subsidies may prove more desirable for job creating purposes, providing administrative problems of such regional incentives could be overcome. But in general, capital-tied incentives increase the substitution of capital for labor as a productive factor, and to this extent such subsidies act counter to stated program purposes. In addition, capital-tied subsidies would discriminate against labor intensive firms, placing at a competitive disadvantage those very businesses intensive in the productive factor for which the tax subsidy is theoretically designed. Also worthy of mention is the fact that capital-tied subsidy programs similar to the Harris-Pearson bill and the Stevens' amendment [19] have no provisions which would guarantee the training and upgrading of the low-productive, unskilled unemployed who would be hired under these programs.[20]

In the context of the aforesaid employment subsidies and their associated shortcomings, a recent study and associated proposal by several Federal agencies under the direction of the Treasury Department is of particular interest. This proposal attempted to combine the ideas vested in earlier tax subsidy programs and further reflects the widespread interest in the use of tax subsidies in the domestic problem areas of poverty and unemployment.

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[18] S. 15, 91st Cong., first sess., 1969.

[19] U.S. Congress, House, Tax Reform Act of 1969, Amendment No. 380 to H.R. 13270, 91st Cong., 1st sess., 1969.

Proposed by Senator Stevens of Alaska, this amendment was passed by the Senate as part of the 1969 Tax Reform Act. The proposal allowed for a 7-percent investment tax credit on new investment in designated poverty areas. The amount of the credit which would be claimed was limited to $15,000 per new hire in these designated areas. Like the Kennedy bill, this proposal tied the investment tax credit to employment in poverty areas. As did most selective tax credit proposals, this one would have proved complex from an administrative standpoint. The amendment was scuttled by the Joint Conference Committee and was not part of the final version of the Tax Reform Act.

[20] More is said about the importance and significance of this point in the discussion on Senator Javits' recent bill (S. 2632) concerning an employment tax credit.

Treasury proposal.—In his message [21] to the Congress on April 21, 1969, President Nixon urged the use of part of the revenues resulting from the repeal of the investment tax credit at that time for tax credits to encourage investment in poverty areas and for the hiring and training of the hard-core unemployed.

The Treasury Department was authorized to study this tax credit program and to subsequently present a working proposal of the same. The proposal submitted consisted of two parts: an employment-investment credit and an employment training credit. The employment investment credit consisted of a 50-percent credit on tax liability based on investment in depreciable assets and limited to $5,000 per disadvantaged individual hired. The investment had to take place in designated poverty areas, and the individuals hired had to meet specific qualifications in order to be considered disadvantaged. An incremental feature was built into the program requiring increases in the number of disadvantaged individuals hired each year in order for the participating firm to qualify for the full extent of the credit.

The employment training credit consisted of a 40-percent tax credit against wage and training costs of disadvantaged individuals who were hired and trained under this program. The amount of this credit was limited in that it could not exceed $100 per week, nor could it exceed a 52-week training period. There were also allowances in the form of tax credits for job upgrading of those individuals qualified under this program who were currently employed.

The final report recommended that a pilot, or test, program be conducted in 24 selected SMSA's which had a current labor force of 5.2 million and unemployment of 150,000. The pilot program would last 2 years, followed by a thorough cost-benefit evaluation. The total estimated cost of the pilot program was between $40 and $70 million.

The pilot project was to be initiated by Presidential order and funded primarily out of the budget of the Department of Labor. For various reasons, the proposal was dropped in March 1970.

The WIN tax credit.—The Work Incentive Program (WIN) is a training and employment program authorized by the 1967 amendments to the Social Security Act which services only recipients of Aid to Families With Dependent Children (AFDC). WIN is administered jointly by the Department of Health, Education, and Welfare, and the Department of Labor. Operating through State welfare agencies, HEW refers AFDC recipients to WIN for enrollment and provides child care, medical, and other social services as needed. Through State employment security agencies, the Department of Labor provides the necessary manpower services to enable recipients to become self-sustaining jobholders.[22]

There were nearly 267,000 enrollments in WIN from its beginning in 1968 through April 1971. Under the budget request for fiscal 1972, an additional 187,000 slots were authorized for first-time enrollees in WIN. Through fiscal 1971, WIN had placed 44,100 people in regular

[21] U.S. President, 1968 (Nixon), "Message from the President of the United States Regarding Tax Reform," Tax Reform Proposals, Committee Print, House Committee on Ways and Means, 91st Cong. (Washington, D.C.: U.S. Government Printing Office, 1969), pp. 1-4.

[22] U.S. Department of Labor, "The Work Incentive Program," second annual report of the Department of Labor to the Congress on training and employment under title IV of the Social Security Act, June 1971, p. 1.

jobs, although 42 percent of the enrollees as of that time were still in the program. Of those who have terminated from the WIN program through April 1971, only 20 percent successfully completed WIN and were employed. An additional 20 percent quit the program without stated cause, while the remaining 60 percent of the terminations resulted from causes considered "good," such as illness, family care problems, and pregnancy.[23]

Included in the Revenue Act of 1971 was an addition to the Internal Revenue Code [24] which provides for an income tax credit for certain wage expenses incurred under the WIN program by participating firms. Specifically, the credit allowed is 20 percent of wages paid during the first 12 months of employment to an employee certified under the WIN program. In order for the employer to receive the credit, he must retain a WIN program employee for at least 1 year after the completion of 12 months of employment unless the employee leaves his employment voluntarily or is terminated due to misconduct as determined under the State unemployment compensation law.

The WIN tax credit is of interest not only because it is the first of its kind to become part of the Internal Revenue Code, but it also represents a tax subsidy supplementing a direct subsidy manpower program. For this reason, the WIN tax credit seems an inefficient approach toward providing an additional subsidy under the WIN program. WIN currently operates in conjunction with the National Alliance of Businessmen—Job Opportunities in the Business Sector (NAB—JOBS) Program for the purpose of providing both on-the-job training and employment for its enrollees. Where necessary, the WIN program subsidizes part or all of the training costs incurred by private employers in the training of WIN enrollees. Since the administrative machinery currently exists for the provision of subsidies under contractual agreement to the private sector, it is inefficient to add the additional administrative complexities of a partial, selective tax subsidy to the WIN program. Either the entire program should be conducted under direct subsidy contract between the administrative agencies and the private sector, or the program should be abandoned in its present construct and replaced, perhaps along with other manpower programs, with a total tax subsidy manpower program.[25]

Javits' bill (I).—In 1968, Senator Jacob Javits of New York proposed legislation [26] in which tax credits would have been granted to private employers for hiring individuals who were classified as economically disadvantaged. The bill allowed for a tax credit of 75 percent of the disadvantaged employee's compensation during the first 6 months of employment. After this initial period, the amount of the subsidy would decrease to 50 percent of compensation during the following 6 months and 25 percent for the following year. The bill was intended for those individuals who were disadvantaged, unemployed, and not participating in any other Federal job training program. It was never reported out of the Senate Labor and Public Welfare Committee.

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[23] *Ibid.*, pp. 11, 14, 20.
[24] Sec. 40 added to the Internal Revenue Code of 1954 by sec. 601(a) of Public Law 92-178.
[25] In addition, the WIN credit becomes a pure subsidy for those services which would have been rendered by the private sector under the WIN Program without the additional subsidy.
[26] S. 3249, 90th Cong., 2nd sess., 1968.

Javits' bill (II).—Recently Senator Javits, with the support of 12 other members of the Senate, introduced a bill [27] which would permit a tax credit for the creation of additional jobs in the private sector. Under this bill, any employer whose employees work more man-days during taxable years beginning in 1972 or 1973 than in the immediately preceding taxable year would be eligible for a tax credit in the amount of $4 per additional man-day. The credit would be available to all employers with no restrictions on the total amount of the credit which would be available, except for special regulations to deal with mergers and new businesses.

Estimates provided by the Joint Economic Committee as to the cost and success of the employment credit show the bill resulting in approximately 500,000 additional jobs in the first year of operation with a cost to the Treasury of $1.8 billion.[28] Of the $1.8 billion, $0.5 billion could be directly attributed to program success as measured by additional employment, with the remaining $1.3 billion going toward the pure subsidization of employers who would have increased employment regardless of S. 2632.

If one takes into account growth in the labor force coupled with an actual achievement of a 5-percent level of unemployment as anticipated by the administration, cost estimates of the employment credit would rise to between $2.7 billion and $3.0 billion. In addition, there are a large number of "discouraged workers" who have left the labor force, individuals who want work but are not actively seeking a job simply because they believe such a search would be in vain.[29] One would expect a portion of these individuals to reenter the labor force with a falling unemployment level, and to the extent they find employment (whether or not as a result of the employment credit), this would add to the direct subsidy costs of the program.

In view of a $25.5 billion deficit structured toward lowering unemployment to the 5-percent level, S. 2632 would add considerably to the immediate financial burdens of the Government. Undoubtedly, the employment credit as specified in S. 2632 would stimulate some additional demand for labor, but in so doing it would provide a rather sizable and unnecessary subsidy to the private sector responding to the "pump-priming" effects of a full-employment, but deficit, budget.[30]

Because of the ceiling on the credit and the requirement that employers participating in the employment credit program pay the Federal minimum wage, S. 2632 may prove ineffective toward those who need the intended benefits most; namely the hard-core unemployed. As can be seen from table 1, a large percent of the working poor were earning below the Federal minimum wage during the period 1966–67, with well over half earning less than $1 per hour.

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[27] S. 2632, loc. cit.

[28] Congressional Record, Oct. 1, 1971, p. S15612.

[29] This number of "discouraged workers" has risen substantially in the past few months, from 600,000 in early 1970 to about 750,000 as of mid-1971.
U.S. Department of Labor, Monthly Labor Review, XCIV, No. 10 (Oct. 1971).

[30] Senator Brooke has suggested a partial alleviation of this problem of unnecessary subsidization by structuring the employment tax credit on a sliding scale, directly related to levels of unemployment. This would create tremendous administrative problems as well as introduce elements of uncertainty which would prove self-defeating to the overall intent of the employment credit.
See Congressional Record, op cit., p. S15613.

TABLE 1.—PERCENT DISTRIBUTION OF WORKING POOR[1] BY HOURLY WAGE PAID[2]

Hourly wage	Percentage distribution	Cumulative percentage
Up to $1	56.4	56.4
$1 to $1.60	29.7	86.1
$1.60 to $2	3.5	89.6
$2 to $3	8.1	97.7
$3 and over	2.3	100.0
Total	100.0	

[1] Age 14 years and older.
[2] Office of Economic Opportunity, Survey of Economic Opportunity, special tabulations.

Although no data exist showing a later distribution comparable to that in table 1, one would not expect a significant upward shift in the distribution of the productive potential among the untrained, unskilled hard-core poor who represent the marginal members of the labor force.[31]

By requiring the payment of the Federal minimum wage, the size of the subsidy would have to be proportionately larger for the lower productive individuals to be hired. Thus, an individual whose current productive value is measured at $1 per hour would not be hired full-time at $1.60 per hour unless a daily subsidy of $4.80 were provided. In view of table 1, S. 2632 would fail to reach many of the hard-core unemployed.

But a more serious problem with S. 2632, as well as with the aforementioned 1968 proposal of Senator Javits, is the fact that there are no provisions for increasing the productive potential of those hired under the program. Again, this would tend to discriminate against the low-productive unemployed. The removal of the subsidy (employment credit) would affect adversely the low-productive marginal workers first and foremost. Since job instability and high unemployment rates are particularly characteristic of this group, the absence of the subsidy after the 1 year period would place these individuals without special job training in virtually the same employability situation as they were prior to the temporary wage-bill subsidy. An employer might pay a productive factor a current wage in excess of the expected value of current productivity if he expected discounted future returns in excess of discounted future costs of that factor. Such would be the case with a firm which employed a highly specialized employee with training which was of a nature particular to the firm involved. With limited job mobility because of the highly specialized nature of his job, the employee could be expected to remain with the firm for some period in the future. By paying a higher current wage than the current productive value, the firm expects a future return from the factor in excess of the future factor costs. But unskilled and untrained members of the labor force are seen to be characterized by job instability, having low productivity and low productive potential. These individuals would not be expected to command a current wage greater than the current market value of their productivity.

[31] Increased application of the minimum wage does not, of course, increase the productive value of individuals covered in this table, as is measured by their hourly wage. The effect of the minimum wage for those with productive potential below this wage level is to construct barriers to their employment, either adding to their over-representation in the unemployed pool or their dropping from the labor force entirely.

Most poor people in the labor force have had limited formal education. (Only 26 percent of the poor family heads and unrelated individuals in 1970 completed high school.) With limited formal education, coupled with the fact they are poor, unskilled, and unemployed, these people would require training both basic and general in nature, as opposed to highly skilled professionalized training. This general training would be useful in many firms and areas besides the one providing it. For example, an individual trained as an electrician in a steel firm might very well find his skills valued equally in an aircraft firm. The more general the training, the less likely any given firm could expect to retain the individual indefinitely. Most on-the-job training presumably increases the marginal productivity of workers in the firm providing the training, but the general training would also increase their marginal productivity in other firms as well. Since in a competitive labor market the wage rates paid by any firm are determined by marginal productivities in other firms, any increase in productivity due to training would need to be matched by wage increases by the firm providing that training. The firm which provided the training could recapture training costs assuming that the value of the marginal product exceeded all wage costs. But for cases of generalized training, such as the training expected for many of the low-skilled unemployed, wage rates must rise by the same amount as marginal products, disallowing any return above wage costs for application toward the cost of training.

Thus, the profit maximizing firm is not likely to provide generalized training of the kind anticipated for the poor, unskilled worker unless either the worker bears training costs while training, or some outside form of subsidy compensates the firm for training costs incurred.[32]

The Javits' proposals lack any such training subsidy which would be essential for an employment tax subsidy program to be worthwhile and successful from a long-run viewpoint. In addition, the employment tax credit as envisioned in S. 2632 is far too general in view of current budgetary policy and would provide unnecessary tax subsidies to employers without reaching many of the hard-core, long-term unemployed.

An Employment-Training Tax Credit Program

The intent of an employment-training tax credit program of the type considered here (regardless of its detailed and legal construct) is to employ and train the economically disadvantaged members of the labor force who are both unskilled and unemployed. A program of this nature would reach those who have been unemployed the longest and who are unable to maintain steady employment even in periods of relatively low unemployment in the economy. The credit would be available to all employers to partially offset wage and training costs incurred through the employment and training of the disadvantaged; no investment credit provisions are considered. A tax subsidy plan structured similar to the one analyzed here would

[32] For a theoretical discussion of general vs. specific job training in the context of expectations and hiring practices of the firm, see G. S. Becker, Human Capital, National Bureau of Economic Research, General Series No. 80 (New York: National Bureau of Economic Research and Columbia University Press, 1964), chapter 2.

circumvent many of the aforementioned problems inherent in the above proposals.[33]

The results presented in this section are based upon a neoclassical production model which incorporates the effects of tax credits into the profit maximizing conditions of firms in the private sector. The tax credit model employed is a comparative equilibrium model into which subsidies in the form of tax credits as a function of wages and the costs of training the economically disadvantaged are introduced, thereby altering relative short run equilibria in the various productive factor markets. By lowering the per unit cost of a particularly designated pool of low productive labor, the tax subsidy alters the view of firms toward such low productive factors, thereby resulting in increased demand for such factors vis-a-vis precredit levels. Prohibiting the hiring of these individuals are the training costs involved plus minimum wage requirements which would be imposed under any federally subsidized program of this type. In order for the tax credit subsidy to stimulate demand for such labor, it must be sufficiently large to cover training and wage costs in excess of the expected productive value of those hired. Any profit maximizing firm is assumed to be able to differentiate the productive capabilities of laborers and would reflect this by a propensity to hire the most employable and most productive of the current program eligibles.[34] Thus, an employment-training tax credit would increase the employment of the low productive labor until the marginal productivity of the last labor unit hired equaled required wage and training costs to the participating firm.

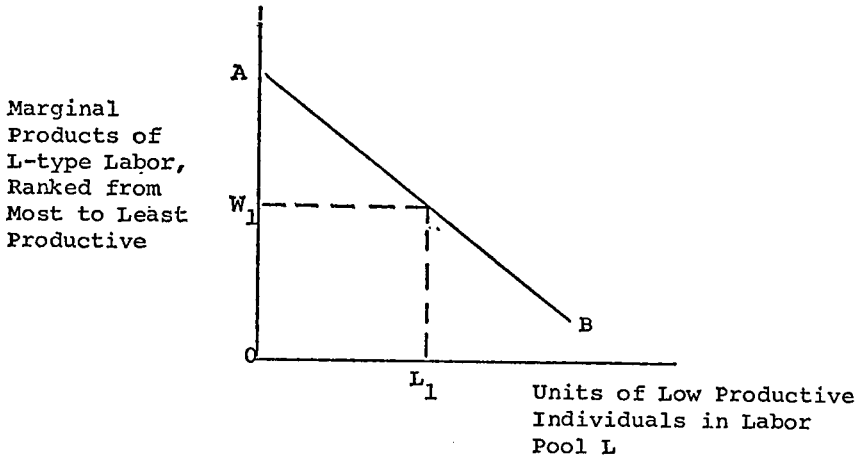
In Chart 1, line AB denotes the rate of change in the marginal productivity of those in the labor force who would comprise the clientele of the employment-training tax credit program. Individuals in labor pool L are ranked from most to least productive, the order in which they theoretically would be employed. Now, if the costs of employing and training individuals in this labor pool exceed the level at point A in Chart 1, profit maximizing firms would not hire any of these laborers since their expected per unit productive value would fall short of per unit employment and training costs. But if a subsidy in the form of a tax credit were introduced such that per unit costs were lowered to point W_1, then laborers from the designated pool L would be hired by employers up to level L_1. At L_1, the expected productive value of laborer L_1 equals expected employment-training costs. To increase the employment of labor from pool L, it then would be necessary to increase the tax subsidy in order to lower effective per unit cost below W_1.

In order to obtain estimates of firms' productivity expectations of those who would be hired under the tax credit training program,

[33] This is of particular interest in the context of these subsidy studies inasmuch as "hidden expenditures" of the Federal Government in the form of tax subsidies are often made without sufficient attention to the extent of subsidy, or its effectiveness in view of stated program goals.

[34] One would expect this to be the case; consequently, any employment tied tax credit is not likely to stimulate demand for the hardcore among the unemployed unless the credit is strictly earmarked for such individuals, or the subsidy covers virtually all costs involved to the firm. Garth Mangum, in his study of the Manpower Development Training Act, several times mentions this "creaming" propensity in conjunction with recruiting for the MDTA programs by the various employment services. Since the services obviously reflect the wishes of the employers involved, one would reasonably anticipate this occurring under a tax credit program fashioned similar to MDTA in clientele and goals. G. L. Mangum, "MDTA: Foundation of Federal Manpower Policy" (Baltimore, Md.: Johns Hopkins Press, 1968), pp. 2, 21–22, 53–54, 89–92.

Chart 1



selected hourly wage data were compiled of the working poor from the Survey of Economic Opportunity.[35] These per unit wage data were ranked from highest to lowest and weighted by appropriate sample weights, providing several distributions of the productive value of the employable poor. Among the estimates made, the one was selected which evidence suggested to be most representative of the productive potential of the expected clientele of an employment-training credit program as described previously. A linear least-squares regression line was then fitted to this particular wage distribution as a measure of their marginal value products.

In order to provide cost estimates of the tax subsidy to the Federal Government, it was necessary to specify the expected size of the low productive labor pool which would consist of individuals considered eligible for the program. This in turn involved a closer look at those who might be expected to comprise the clientele of said program.

The type of program being considered would provide some form of basic job training for those in the labor force who lack skills to obtain stable employment. Their productive potential is low; consequently, what wage they command is also low. Upgrading of those currently employed or temporarily unemployed who have some basic job training (generally classified as semiskilled) is not under consideration. Such services are likely to be provided under programs such as the Manpower Development Training Program or by private industrial initiative seeking to upgrade the productive potential of those currently employed. Inclusion of upgrading provisions into a credit pro-

[35] The Survey of Economic Opportunity (SEO) under the auspices of the Office of Economic Opportunity and conducted by the Bureau of the Census is a comprehensive survey of income, work, and demographic characteristics of the U.S. population, similar to the Current Population Surveys (CPS) but oriented more toward examining the poverty components of the populace. The purpose of the SEO is to enlarge the scope of the CPS and to obtain detailed information about poverty not available from standard CPS poverty surveys.

gram have been considered in certain government studies but are independent of the type of employment-training credit program being considered herein. The "hardcore" of the unemployed would be less qualified than those the employer would normally hire, generally requiring extensive training, counseling, and other individual services.[36]

Those poor who earn the relatively higher hourly wages, and thereby are relatively more productive, are going to be the first employed and the last discharged among the poor in any given economic location because of their greater abilities reflected in the job market by their hourly wage. Technically, those with greater productive capabilities in specified job areas would be eligible for participation in the credit program by the fact that they were poor and temporarily unemployed members of the labor force. From a practical viewpoint, the likelihood of their participation in such a program is lessened by the nature and intent of the program. The credit would be available for the employment and provision of basic job training skills for the hardcore unemployed. A person previously trained for a job requiring specific skills and specific vocational preparation is not likely to retrain and learn the basics of a new job unless he believes that his current skills are outmoded and/or out of demand on a more or less permanent basis. For such people, longrun economic gains from retraining must be greater than costs involved by training and working temporarily at a new job for a lower wage. The young and those anticipating prolonged periods of unemployment might be expected to retrain, and thereby would be considered potential clientele of the credit program. The relatively old and those anticipating brief periods of unemployment would not be expected to be involved in the credit program.

For these reasons, there may be those with a recent record of relatively high hourly earnings who would decide to participate in the employment-training credit program. But firms participating in the credit program and providing the basic specific vocational training would not value the productivity potential of these individuals as high as had the specific job market for which they had been trained. Because of the admitted necessity of training, the participating firms would expect a lower productive performance than previously recorded and would not value the current productive potential of the individual, with regard to the new job, necessarily above any other of the credit program clientele with similar general educational development.[37]

Included then among the expected clientele of this credit program [38] would be the full-time, poor unemployed members of the labor force, the low-productive part-time employed (particularly those with prolonged periods of unemployment during the year), and those unemployed poor who need to be trained and retrained due to outmoded skills.

But such individuals would not entirely comprise the pool of labor of those for whom an employment-training subsidy would

[36] The clientele of such a program would be similar to that of the JOBS Program, which is a direct subsidy program for employing and training the hardcore poor.
[37] Similar in institutional and previous related job experience.
[38] Estimated eligible clientele in 1970 for this particular subsidy program is about 2.8 million.

be intended. Many people who are neither working nor seeking work want and need jobs. There are a large number of men and women below retirement age who are out of the labor force due to frustration and discouragement over the inability to find jobs, Similarly, there exist many young people in slum areas who have dropped out of school and who are neither working nor seeking work because they believe that no work is available for them. Many people are out of the labor force because limited education and training have led them to believe that they lack the experience necessary to obtain work. A number of older people both need and wish to continue in paid employment. Finally, illness and disability prevent many people from working in physically demanding occupations and sometimes keep them from working at all. Long-term disabilities tend to discourage people from even looking for work.

Not all of the above people would benefit from the proposed tax credit program. Among those who have dropped from the labor force and who would be likely beneficiaries of such a program are those lacking the necessary schooling, training, and skills to obtain work, and those believing that there are no jobs available for them. Consequently, these should be included in the prospective labor pool for the credit program.

Employment-training tax credit packages of various size were tested in the credit model [39] for the all-nonfarm industrial sector. The percentage of wages paid to those hired under the credit program which could be claimed as a tax credit against Federal tax obligations was varied from 10 to 40 percent. The rate of the training part of the tax credit was allowed to vary correspondingly by intervals of 10 percent from 70 to 100 percent of training costs. Because the training part of the credit program would involve costs above the wage payment which would normally be due the productive units hired under the program, the Government should anticipate paying for most, if not all, of the training costs. Table 2 [40] shows the expected effectiveness of the alternative employment-training credit packages and estimated direct costs of the tax subsidy to the Federal Government.

As is evidenced in table 2, constant increases in the wage credit rate or the training credit rate result in relatively steady increases in the effectiveness of the tax credits upon the employment of disadvantaged labor Constant percent increases in the wage credit are more effective than equal percent increases in the training credit due to the relative importance of wages to the total costs which participating firms would incur. For the most part, a 10-percent increase (decrease) in the wage credit is offset in its effect by a corresponding 15-percent decrease (increase) in the training credit rate. The cost figures are tax credit claims of participating firms, based upon wage and training cost estimates and retention rates of those who would be hired under the credit program. Administrative costs are not included in these figures.

[39] Cf. Chart 1.

[40] These results reflect not only productivity expectations by firms of those hired but include adjustments for both program retention of trainees and increased productivity expectation of enrollees due to training.

TABLE 2.—EFFECTS AND COSTS OF ALTERNATIVE EMPLOYMENT-TRAINING TAX CREDITS FOR DISADVANTAGED LABOR

Wage credit [1] (percent) (1)	Training credit [2] (percent) (2)	Percent effective [3] (3)	Direct cost [4] (millions) (4)
30	70	2.50	$165.9
20	90	5.00	345.5
30	80	7.42	537.6
40	70	9.49	714.3
20	100	9.88	748.5
30	90	12.34	968.4
40	80	14.42	1,169.8
30	100	17.27	1,455.9
40	90	19.35	1,682.5
40	100	25.09	2,339.9

[1] Credit as percent of wages paid during year. Federal minimum wage assumed with appropriate wage adjustments upon completion of training program.
[2] Credit as a percent of estimated training costs.
[3] Manpower employed as percent of estimated eligible manpower available.
[4] Size of tax subsidy necessary to stimulate effective demand as shown in col. 3.

A comparison of columns (3) and (4) of table 2 reveals that the employment-training tax credit becomes less and less effective per dollar cost as the rate of the particular credits is increased. In order to increase the effectiveness of the credit program, it becomes necessary to increase the rate of the tax credit allowed against wages and training costs. This results in increased costs per individual hired under any given wage-training credit combination. Consequently, absolute changes in total direct costs increase, and the per dollar tax expenditure in the form of a tax credit becomes less effective in terms of hard-core unemployed being hired and trained.

Table 3 shows the expected distribution by major industrial class of new hires for any of the employment-training credit combinations in the credit program. The employment-training credit would be most effective in those industries which are labor intensive and lend themselves easily to on-the-job training, such as in manufacturing, services, retail trade, and construction. The predominant response would be in the manufacturing sector which, by any measure, is the largest industrial classification. These results do not reflect such things as discrimination in hiring practices and the effects of labor unions [41] which might very well alter the distribution shown in table 3. Thus, in contract construction where there is strong trade union influence, the effect of these unions might be to depress the hiring of individuals under an employment-training tax credit program.

TABLE 3.—*Distribution of new hires under employment-training tax credit programs by major industrial classification* [1]

Industry:	*New hires as percent of total*
Manufacturing	35.5
Services	20.0
Retail trade	16.9
Contract construction	7.2
Wholesale trade	6.0
Other	14.4

[1] Derived from application of credit model for major industrial classifications.

[41] A select study on the JOBS program indicated that generally unions were not opposed to the JOBS program, but neither had they openly supported it. In the case of the craft unions, there was open opposition to the program.
Systems Development Corp., "Evaluation of the JOBS Program in Nine Cities" (unpublished final report prepared for the U.S. Department of Labor, Washington, D.C., September 1969), p. 53.

Expenditure Reductions in Government Programs Affecting the Hard-Core Unemployed

These are many Federal-State programs oriented toward assisting the poor and the unemployed. Since an employment-training tax incentive program would result in additional employment and income for those hired under the program, some would no longer be eligible for certain Federal and State income maintenance Benefits such as unemployment compensation are generally self-funding and do not involve direct Federal expenditure. Others such as general assistance payments are funded almost entirely by State and local governments. The net cost of a tax incentive program to the Federal Government would be lessened by savings to those poverty related programs which were funded (either entirely or partially) by the Federal Government. Several of these related programs are discussed briefly in the following paragraphs, with estimates given (where possible) of revenue saving which would have occurred to these Federal and State-local financed funds had selected employment training tax incentives existed in 1970, having the effects as predicted in table 2 above.

Aid to Families With Dependent Children (AFDC).—The AFDC program was established under the Social Security Act during the depression. The program was initially designed to aid the children of prematurely deceased or disabled workers. But statistics of recent history of the program show that the program primarily supports unmarried, deserted, divorced, or separated mothers and their children.[42] Between 1963 and late 1971, the number of AFDC recipients rose by 166 percent, from 3.9 million to 10.4 million. Correspondingly, the AFDC annual outlay rose from $1.4 to $5.7 billion over this same period.[43]

In 1970 approximately $4.1 billion was expended for AFDC from Federal and State funds. Of this, over $2.1 billion were Federal expenditures. The average payment to an AFDC family amounted to about $2,200.

Not all people hired under an employment-training tax incentive program would be recipients of public assistance; on the contrary, the majority would not be expected to be public assistance recipients.[44] Cumulative data on the JOBS program indicate that 16 percent of the participants were public assistance recipients at the time of enrollment. Of these it is estimated that 90 percent were recipients under the AFDC program and the remainder were general assistance recipients.[45]

Table 4 shows the estimated savings of Federal and State-local expenditures under the AFDC program for selected employment-training tax incentive combinations, based upon estimated reductions of AFDC claimants under these programs.

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[42] For example, recent figures showed that in only 18.2 percent of the AFDC families was the father living at home. In 5 percent of the AFDC families, the father lived at home and was unemployed. In over 14 percent of AFDC families the mother was unemployed, seeking work.

[43] Combined Federal and State expenditures. "Manpower Report of the President" (1970), op. cit., pp. 148–49; Division of Statistics, Department of Health, Education, and Welfare.

[44] See the characteristics of individuals participating in various Federal manpower programs. "Manpower Report of the President" (1971), pp. 303–11.

[45] "The President's Commission on Income Maintenance Programs: Background Papers," op. cit., pp. 235, 258; U.S. Department of Health, Education, and Welfare, Welfare in Review, IX, No. 1 (January-February, 1971); U.S. Department of Labor, Office of Manpower Management Data Systems, special tables on the characteristics of persons hired through the JOBS program.

Medical assistance (vendor) payments.—Medical assistance payments are payments to vendors of medical services for public assistance recipients. Prior to 1966, this combined Federal-State program (previously administered at the State level) consisted of individual funds federally matched for each State and for each facet of the public assistance program. In 1966 the Medicaid program was initiated, providing for the unification of all medical vendor payments under State programs and uniform coverage for recipients. The medicaid program not only combines medical vendor payments into a more uniform program for public assistance recipients, but increases the amount and extent of coverage.

TABLE 4.—ESTIMATED REDUCTIONS IN FEDERAL AND STATE-LOCAL EXPENDITURES FOR AFDC PROGRAM UNDER SELECTED EMPLOYMENT-TRAINING TAX CREDIT PROGRAMS[1]

[Dollar amounts in millions]

Wage-training credit[2] (percent)	Estimated AFDC reductions	
	Federal expenditures	State-local expenditures
30–70	$11.8	$10.5
20–90	23.7	21.0
30–80	35.1	31.0
40–70	44.9	39.8
20–100	46.8	41.5
30–90	58.4	51.8
40–80	68.3	60.5
30–100	81.8	72.5
40–90	91.6	81.3
40–100	118.8	105.3

[1] Sources: The President's Commission on Income Maintenance Programs: Background Papers, loc. cit.; Welfare in Review, loc. cit.; U.S. Department of Labor, Manpower Report of the President, loc. cit.; U.S. Department of Health, Education, and Welfare, Division of Statistics; table 2.

[2] First figure is wage tax credit as percent of wages paid; second figure is training tax credit as percent of training costs.

Expenditures by all governments for the medicaid program in 1970 were close to $6 billion.[46] Expenditures by all governments for medicaid payments to AFDC recipients in 1970 were over $2.2 billion. The average vendor payment per AFDC recipient in 1970 was $170. Table 5 shows the estimated reduction in expenditure by all governments on medical vendor payments to AFDC recipients hired under the various employment-training tax credit programs. The corresponding reduction in Federal expenditures would be approximately 50 percent of total Government expenses for medical payments.

Commodity distribution program and food stamp program.—The commodity distribution program donates food acquired through price-support and surplus removal purchases to States for distribution to designated poor families, and is the older of the two-family food distribution programs administered by the Department of Agriculture.

The food stamp program was established in 1961 by Executive order as a pilot program and was authorized by legislation in 1964. Administered by the Department of Agriculture, the food stamp program issues stamps to eligible families at a certain rate of purchase discount. The extent of the benefit, and thereby eligibility criterion, is dependent upon family size and income.

[46] "The President's Commission on Income Maintenance Programs: Background Papers", op. cit., p. 323.

TABLE 5.—ESTIMATED REDUCTIONS IN EXPENDITURES BY GOVERNMENTS ON MEDICAL VENDOR PAYMENTS AND COMMODITY DISTRIBUTION—FOOD STAMP PROGRAM COST, UNDER VARIOUS EMPLOYMENT-TRAINING TAX CREDIT PROGRAMS[1]

[Dollar amounts in millions]

Wage-training credit (percent)	Estimated reductions[2]	Estimated cost[3]
30–70	$2.0	$3.9
20–90	3.9	7.8
30–80	5.9	11.6
40–70	7.5	14.8
20–100	7.8	15.4
30–90	9.8	19.2
40–80	11.4	22.5
30–100	13.7	26.9
40–90	15.3	30.1
40–100	19.9	39.1

[1] Welfare in Review, loc. cit.; U.S. Department of Health, Education, and Welfare, Division of Social Statistics; U.S. Department of Agriculture, Division of Food and Nutrition Service; table 2.
[2] Estimated reductions in medical vendor payments to AFDC recipients.
[3] Estimated cost reductions in commodity distribution—food stamp program.

The cost of these two programs to the Federal Government in 1970 was about $830 million.[47] This amounted to a cost of $32.50 per poor person. The employment-training tax incentive program as has been considered herein would remove most participating families from eligibility for commodity distribution and Food Stamp Program Benefits. Table 5 shows the estimated reductions in Federal expenditures for this program under selected employment-training tax incentives.

Other related welfare programs.—The previous discussion of decreased expenditures on certain welfare programs does not exhaust the list of those programs which might be affected by employment-training tax incentives. Some of the other federally funded programs which would benefit from the tax incentive program are child welfare, non-food assistance to poverty area schools, low-cost housing and urban development, school lunch—school milk programs, and reduction in crime costs. Other State-local funded welfare programs would also be favorably affected by an employment-training tax incentive program beyond those already mentioned. Significant among these is State contributions for General Assistance payments.

General Assistance is provided by State and local governments, without Federal aid, to needy individuals who do not qualify under any other public assistance program. Two-thirds of the people covered are physically or mentally disabled and would not be considered eligibles for an employment-training tax subsidy program. Of those who would comprise the clientele of expected enrollees in this program, only 10 percent of public assistance recipients would be under general assistance.

Table 6 shows expected reductions in General Assistance payments which would have occurred in 1970 as a result of the selected employment-training tax subsidies listed. Also shown are estimated reductions in unemployment compensation payments made as a result of the corresponding tax subsidy plans.

[47] U.S. Department of Agriculture, Division of Food and Nutrition Service.

Conclusion and Evaluation

Because of the hypothetical nature of a tax credit program such as the one presented herein, it is perhaps best to evaluate the results and the proposal itself in the context of certain statements commonly cited about the use of tax credits.[48]

From a strictly economic standpoint, the results do indicate that Federal income tax credits could be used effectively toward inducing the private sector to employ and train the hard-core unemployed. The degree of effectiveness depends upon the size of the credits offered with respect to wage and training costs. This in turn depends upon the extent of revenue loss (or tax expenditure) which the Federal Government is willing to make, as is also true of any direct subsidy program.

TABLE 6.—OTHER ESTIMATED EXPENDITURE REDUCTIONS UNDER SELECTED EMPLOYMENT-TRAINING TAX SUBSIDIES

[Dollar amounts in millions]

Wage-training credit (percent)	Estimated reductions	
	General assistance payments [1]	Unemployment compensation payments [1]
30-70	1.5	$9.4
20-90	2.9	18.8
30-80	4.4	27.9
40-70	5.6	35.7
20-100	5.8	37.2
30-90	7.2	46.4
40-80	8.5	54.2
30-100	10.1	65.0
40-90	11.4	72.8
40-100	14.7	94.4

[1] Welfare in Review, loc. cit.; Committee for Economic Development, "Improving the Public Welfare System," a statement by the research and policy committee (New York, April 1970); table 2.

[2] Irene Lurie, "The Distribution of Transfer Payments Among Households," The President's Commission on Income Maintenance Programs: Technical Papers (Washington, D.C.: U.S. Government Printing Office, 1970), pp. 143-57; U.S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review, XCIV, No. 5 (May 1971), table 10; table 2.

A reason commonly cited for the use of tax incentives in order to accomplish certain socially desirable goals is that they would lower the administrative costs as compared to direct subsidy programs with the same goals. Because of the indirect nature of the Government subsidy, the properly designed tax incentive would require much less expansion of administrative machinery and proliferation of Government agencies than has typically been the case with other more direct forms of government support. Consequently, with lower administrative costs the same goals could be accomplished by means of the tax credit program for less government expense than by a direct subsidy program.

Whether a tax incentive program would prove a more efficient means of administering an employment-training program for the hard-core unemployed than a direct subsidy program depends upon the controls built into such a program. If the placement services

[48] For example, see D. Holland, loc. cit.

normally conducted by various Federal and State government agencies are primarily replaced by individual recruiting on behalf of participating firms, administrative costs of a tax incentive program would be less. But such administrative procedure would lend support to a common criticism of a tax incentive program of this type; namely, that tax incentives would be hidden from public scrutiny and review. Since the incentive program would likely be exempt from frequent evaluation of its effectiveness, it is possible the program could remain in existence regardless of its efficacy or need. Thus, periodic program evaluation by governmental units would be necessary in the administration of a tax incentive program. If governmental employment and placement services were not used in a tax credit program, the administrative burden would fall upon the Internal Revenue Service in increased auditing of returns in order to avoid credits claimed which were not due. Although increased auditing duties by the IRS would involve increased costs, administrative costs may be lower by the avoidance of duplication of effort, which is not uncommon when several agencies are involved in a common service.

Records of the JOBS program show that actual operational and administrative costs to the Government have averaged about $3,500 per trainee.[49] In comparison, table 7 shows the expected costs per trainee to the Government (net of administrative costs) of the employment-training credits combinations as shown throughout the previous tables. As can be seen from table 7, the employment-training tax incentive would cost less if total administrative costs would be kept below $500-$1,000 per trainee, depending upon the size of credit program being considered.[50] But, because of the difference in the nature of funding and timing of the two programs, no additional cost comparisons are justifiable, even though clientele characteristics of both programs would be quite similar.

TABLE 7.—PER TRAINEE COSTS OF EMPLOYMENT-TRAINING TAX CREDITS BY SELECTED TAX CREDIT PROGRAMS [1]

Wage-training credit (percent)	Estimated per trainee cost [2]
30–70	$2,350
20–90	2,450
30–80	2,570
40–70	2,670
20–100	2,690
30–90	2,780
40–80	2,875
30–100	2,990
40–90	3,080
40–100	3,300

[1] Determined from table 2.
[2] Administrative costs not included.

[49] "The President's Commission on Income Maintenance Programs: Background Papers," op. cit., p. 393.
[50] Estimates by Planning Research Corp. of the administrative costs of enrollees in on-the-job training under the MDTA program average between $500 and $600 annually.

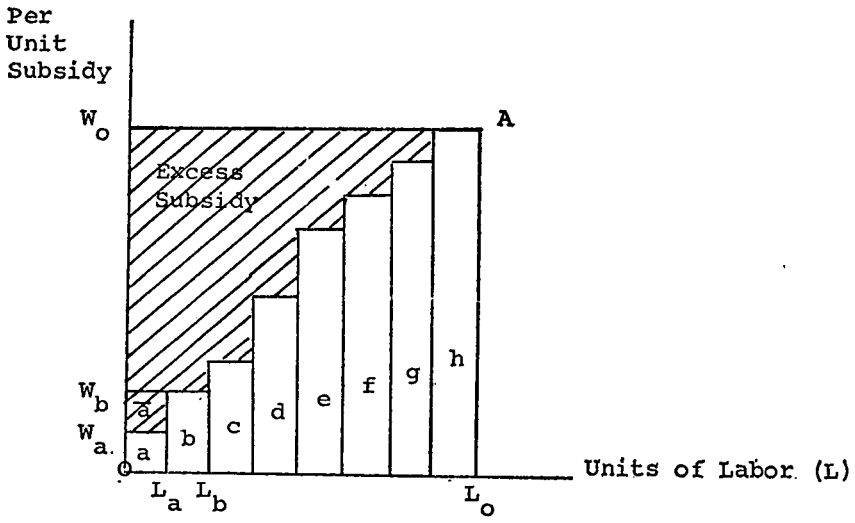
There are certain other administrative matters which deserve brief consideration. The problem of labor displacement must be considered before an employment-training tax subsidy program could be implemented. From the viewpoint of employment only, a generalized program such as the one considered here is of little success if the labor hired under the program simply displaces an equal number of those currently employed. This is an administrative (and legal) problem, yet one which requires solution if the program is ultimately to prove successful. One feasible solution is the "incremental" approach. Set forth in the Treasury proposal,[51] the incremental approach ties qualification for the credit to incremental increases in both the number employed and the number of qualified individuals hired under the program. Such an approach does not entirely solve the displacement problem since proper consideration must still be given as to what constitutes normal discharging of an employee and what constitutes displacement because of the credit program. But, without becoming entangled in a myriad of legal and administrative details, it is sufficient to expose the problem of displacement to which the incremental approach provides a possible solution.

Another related administrative problem which deserves attention is that of duplication of effort. A hypothetical employment-training credit program possibly would replace certain direct subsidy programs which currently exist; such as JOBS, the Job Corps, the current WIN program, and perhaps part of the MDTA program. As previously mentioned, duplication of effort and bureaucratic entanglements lead only to higher per trainee administrative costs. Thus, an employment-training tax credit program should avoid not only duplication of clientele coverage with other programs, but should also attempt to make full use of necessary administrative machinery which currently exists, such as employee placement centers.

A further criticism of tax incentive programs of the type considered is that they would result in uncontrollable revenue losses, placing undue strains upon the Federal Government's budgetary position. Although a tax incentive program would not encompass the rigid financial controls as does a direct subsidy program, it can be seen from table 2 that operational costs can be controlled by regulating the size of the credits allowed. But, as is evidenced in table 7, the per unit subsidy would have to grow progressively larger for marginal increases in program coverage. Thus, any tax subsidy program which allows a certain percentage tax credit against labor cost in order to increase the employment of such labor is bound to result in an excess subsidy to the employer by the Government. That this is the case can be seen with the aid of chart 2.

[51] See section on "Employment and Training Oriented Tax Credit Proposals."

Chart 2



Suppose it were desired to construct a tax subsidy, employment-training program which would result in the demand by the private sector of L_o of the pool L of eligible labor under the program. If a per unit (of L) subsidy were offered of W_a, then L_a of L would be employed under the tax subsidy program with a total subsidy cost shown by the area "a" in chart 2. In order to increase employment of L to L_b, it would require the per unit subsidy to be raised to W_b, with total cost of the subsidy indicated by the area ($a + \bar{a} + b$). But W_b is needed only to increase program coverage from L_a to L_b; a subsidy of W_a is sufficient to create employment of La of L type labor. Thus a per unit subsidy of W_b would mean an excess subsidy to employers of "$\bar{a}$". By analogous reasoning, a program which offered a per unit tax subsidy of W_o in order to insure program coverage (per unit of time) of L_o would result in oversubsidizing firms by an amount shown in the shaded area of chart 2. The section [$a + b + \ldots + h$] is the subsidy which would be necessary in order to accomplish the stated program coverage of L_o of L; the remaining area in the rectangle OL_oAW_o represents a "wastage" of Government funds. For this reason, the tax credit approach as a form of manpower subsidy is theoretically inefficient vis-a-vis the direct contractual approach. But as previously mentioned, contractual approaches often have proven burdensome to program participants, thus adding to administrative costs.

In this context of program cost control, the results and the corresponding cost estimates of the various incentive packages are based strictly upon economic considerations. An indeterminable number of firms may decide for basically reasons of social concern to hire individuals under the provisions of an employment-training tax

subsidy. There is no a priori way of determing the amount of this noneconomic favorable reaction on the part of firms to an employment-training tax incentive. However, such reaction is likely to be less than if the concept of Government encouragement of employment and training of the hardcore were new.

A final criticism of tax incentive programs which should be mentioned is that the credit cannot be used by all firms. A firm with insufficient or no tax liability would be unable to use the tax credit. This is a valid criticism of any tax incentive program which can be at least partially alleviated by allowing generous carry-forward and carry-back provisions such as those provided under the investment tax credit.

Throughout this paper the basic underlying assumption has been that a need exists for the employment and training of the economically disadvantaged. In view of this and the widespread interest in satisfying this need through tax subsidy programs, the primary intent has been to shed some light as to just how large of a tax subsidy would be involved and what would be expected short-run costs and effectiveness of these various tax credits. But eventually the short run becomes the long run, thus requiring that short-run results and implications be modified in order to include possible long-run effects. In the case of the employment-training credit, particular attention is directed as to what might be expected when the tax credit subsidy ends.

Removing the wage tax credit [52] is certain to have a depressing effect upon the demand for that labor group whose employment had been previously subsidized by the Federal Government. But to argue that this negates the effectiveness of the credit program is erroneous, if such a program has provisions for training and upgrading the productive potential of the enrollee. Regardless of the demand for the labor which participated in the employment-training credit program, those who have completed the training program have become skilled in a job in which they were previously unskilled. Presumably, the per unit productivity of these trainees has increased because of the training and job experience, thereby making them more competitive in the labor market relative to their position prior to the credit program. Hopefully, the economy has grown sufficiently in order to accommodate these individuals in the labor market without resulting in the displacement of others. But this becomes the problem of monetary and fiscal policy with respect to unemployment in general. Like the direct subsidy counterparts, the intent of the employment-training credit program is to subsidize only temporarily any particular individual participating in the program. The credit program would be a permanent part of the tax structure but certainly not a permanent subsidy for any given group of employees. The program would train an individual for a particular job, increase his productivity accordingly, and provide short-term job experience. Its success after that is contingent upon economic growth and labor demand in general. Regional and national deficiencies in labor demand are certainly serious problems which may very well result in the newly trained

[52] The training tax credit is assumed to cease upon the completion of training.

losing their jobs as a result of "negative creaming" [53] in any particular job category. But because of the credit program, the participant is no longer in the same position relative to the labor force that he was prior to training; his competitive position has improved.

The philosophical foundation of an employment-training credit program is that these individuals are not permanently and gainfully employed because they lack the necessary skills, not because there is deficiency in demand for such skilled labor. The fact that after the employment-training period has ended some of these individuals are again unemployed is certainly a relevant issue, but in a broader sense. The problem becomes one of classical unemployment, insufficient growth, and insufficient demand for trained labor.[54]

As to the funding of a program such as an employment-training tax credit, this could be accomplished by deficit financing, increased taxation, program replacement, self-financing, or any combination thereof.

A program such as an employment-training tax credit would not enter into the budget decisionmaking process as do similar, directly funded Federal programs. Being a tax expenditure, the credit program would not even appear in the budget of the Federal Government. What loss of revenue there was from the program would naturally increase a deficit (or decrease a surplus) accordingly. But the decision to initiate an employment-training tax credit should be based upon an evaluation of the social-private benefits and costs involved in the program. To the extent that an employment-training tax credit program leads to a budgetary deficit, one could argue it is being financed by Federal borrowing; but, no more so than any other tax of direct expenditure program.

The same can be said of a budget which is partially financed by increased taxation. To the extent that an employment-training credit program is financed by increased taxation, it is being funded by those taxpayers upon whom the tax falls in order to subsidize profitable firms who employ and train low productive members of the labor force.

If an employment-training tax credit program replaces other federally funded manpower programs, the credit program would be funded by expenditures which had previously been diverted toward these other manpower programs. But, like the funding which would occur through taxation or deficit financing, this transfer would be neither direct nor obvious. The cancellation of directly funded programs would release funds which would compensate for any increases in the budget deficit (or decreases in the budget surplus) brought about by the implementation of an employment-training tax subsidy. In this sense, the credit program could be considered financed by program replacement, although not appearing as such anywhere in the budget.

Finally, it is quite conceivable that an employment-training tax credit program would be at least partially self-funding, as well as

[53] Negative creaming would involve dismissing the least productive individual in any given area or job category first.

[54] A case can perhaps be made for slowly withdrawing the wage credit, instead of abruptly doing so, in order to guarantee additional job experience for the trainee after the short-term training and employment period. This is a long-run consideration which was not encompassed in this presentation but which is worthy of attention in any actual employment-training credit proposal.

funded by program replacement. Self-funding would occur through increased tax revenues resulting from the increased production and employment over the long run of those hired under the employment-training credit. In this sense, these individuals and businesses which participated in the program would be funding it (at least partially) through increases in their personal and business tax liabilities.

Summary

This paper has attempted to deal with a major aspect of public finance which has recently received considerable attention on Federal and State legislative fronts; namely, the use of tax subsidies for the accomplishment of socially and economically desirable goals. Specifically, attention was centered on the use of tax credits against Federal income taxes in order to encourage the private business sector to hire and train unemployed, unskilled members of the poor labor force. The results showed that these tax incentives could be used to accomplish at least the shortrun employment and training of the hard core, and that from a strict economic standpoint the degree of effectiveness and the program cost could be controlled. It was not possible to ascertain from the results whether the tax credit would prove more cost effective than direct subsidy methods; this would be contingent upon many things, such as program design and administrative complications. But because of these, a stronger argument can be made for the generalized use of tax credits rather than attempt to construct complicated tax subsidy programs with the intent of attaining highly specialized program impact. Such complications undoubtedly would increase per unit administrative costs and thereby decrease the attractiveness of the credit approach.

The results also provided some quantitative economic insight into the effects and costs of tax incentives in an area where the discussion and literature is often only qualititative and speculative. There has been considerable interest at various levels of Government over the use of tax credits for attacking the massive domestic problems of poverty by eliminating, at least partially, the related causes of unemployment and unskilled labor. Businessmen from all sectors of industry have also expressed interest in the use of tax credits in these and other areas of social concern. Thus to this end these results are perhaps useful. But beyond that, they point to needs of further research of the use of tax incentives in both this and related areas.

Tax incentives of the nature considered here need not be limited in use to the Federal tax system. Although most social problems such as poverty, educational deficiencies, and pollution are widespread throughout the United States, they are frequently regional when it comes to priorities and solutions. Air pollution in the Four Corners Region of the United States is probably of little concern, but certainly abject poverty, high unemployment rates, and limited educational opportunities are. An employment-training investment tax credit may prove quite effective in eliminating unemployment and resulting conditions of poverty in Cleveland, Ohio, but prove of little success in the hills of Appalachia. On the other hand, an investment tax credit might be a most successful means of attacking poverty in the title V regions.

Consequently, where selective tax incentives may be too administratively burdensome, costly, and perhaps regionally ineffective for Federal administration, their enactment at the State level may prove quite desirable. Such programs could be enacted and administered at the State level through the State tax system, but partially or totally funded through Federal aid to States with such socially desirable programs.

As can be imagined, consideration of the use of tax subsidies in major areas of social concern opens the door to innumerable possibilities. This, of course, accounts for the large and growing number of bills submitted in the Congress involving the use of tax credits. Since each should not be accepted or rejected a priori, an equal number of specific areas of research exist. But tax subsidies because of their nature of hidden costs have a legislative and political appeal which can result in a tax expenditure spree on hot social issues without proper attention to these hidden costs and relative effectiveness of the subsidies. Congress should not simply ask if a tax credit program will pay for itself in the long run. Obviously, a person who is employed, has job stability, contributes to production, and adds to the tax base will prove less costly than if he remains on public assistance for the next 10 to 20 years.[55]

What is of particular importance is which program is going to accomplish stated goals for the least cost. Thus in the context of employment and training tax subsidies, these results may suggest a limited trial program in order to empirically examine the conditions and construct of a successful tax subsidy program in this area. It may be found through such a test that because of complications in program construction which would result from attention to regional needs, administrative costs would prove such an approach infeasible on a national level. Or, it may be established that a combined investment-employment-training tax subsidy program would be desirable for augmenting the nationwide assault on the problems of unemployment and poverty.

The arguments for and against the use of tax credits in this area of social concern are many on both sides. These findings do not settle these arguments, but from a purely economic framework they hopefully put the entire concept of the tax subsidy in the area of employment and training in a clearer perspective.

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[55] Long-range predictions often made from economic models as to the outstanding success in terms of longrun costs and benefits of various tax subsidies should be viewed with the realization that even if everything goes as planned for the longrun, those same successes may have been reached through a different program with a smaller subsidy or direct expenditure. Thus, a program which has a longrun benefit-cost ratio of 100 to 1 should be regarded not only in light of longrun assumptions behind the results, but also in the critical context of whether an alternative approach under the same longrun assumptions might not result in a higher ratio.

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