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DISTRIBUTIONAL EQUITY IN STUDENT SUBSIDIES FOR HIGHER EDUCATION IN CALIFORNIA: 1967-1977

by Frederick Thompson and Larry R. Jones

In a recent article in the *Journal of Human Resources* Joseph McGuire reexamined the study of costs and benefits of higher education conducted over a decade ago by Lee Hansen and Burton Weisbrod [10, 7]. After adjusting and updating data gathered in California since Hansen and Weisbrod made their analysis, McGuire concluded that:

> "...the subsidy granted to students in each segment of public higher education in California was, both on the average and in the aggregate, larger for students from below-average-income families than that granted to students from families with above-average incomes". [10,p.343]

This conclusion implies that Hansen and Weisbrod's findings were in error and, therefore, that the substantial influence their work has exerted on higher education financing policies in California has been misguided [10, p. 343]. The implication of McGuire's argument is that "budgetary policies for institutions of higher education" followed in California since Hansen and Weisbrod ought to be reversed [10, p. 343]. In fact, McGuire did not attempt to show that Hansen and Weisbrod inaccurately depicted the distribution of public subsidies characteristic of higher education finance in California during the mid-1960's. His analysis also omitted consideration of the distributional consequences of post Hansen and Weisbrod modifications in higher education finance.

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Analysis of the changes in higher education financing that have occurred over the past decade in California provide evidence sufficient to challenge the implications of McGuire's findings. Moreover, our investigation indicates that McGuire's conclusions and findings are based upon data of poor quality and questionable assumptions. We would respectfully submit that McGuire's argument ought not to be interpreted as an unbiased examination of the distributionl consequences of public financing of higher education. Rather, it appears to be special pleading on behalf of one of the segments of public higher education in California.[1]

McGuire's Analysis

McGuire replicated and adjusted the methodology employed by Hansen and Weisbrod, which was itself based upon data provided in an earlier work by Sanders and Palmer [14]. Where Hansen and Weisbrod found that the income levels of families with students attending higher education institutions in California were above the mean family income for the state, McGuire found the opposite. As his source of information, McGuire used the 1971 *Student Resources Survey* administered by the California State Scholarship and Loan Commission [3].

The 1971 *Student Resources Survey* (SRS) employed by McGuire is superficially similar to the instrument employed by Sanders and Palmer; Sanders acted as an advisor to the SRS effort. However, the SRS questionnaires which gathered data on family income were completed solely by students rather than by students and by parents, as had been the case with the Sanders and Palmer survey. Sanders and Palmer found that, for various reasons, students underestimated their actual family incomes by approximately 30%.

The inaccuracy of student responses to family income questions has been substantiated by numerous institutional financial aid offices and also by the College Scholarship Service in its development of Financial Need Analysis methodology, a process which requires verification from Internal Revenue Service income tax data. It is highly probable that underestimation characterized student responses to SRS questionnaires. The impact of this underestimation alone would seriously weaken McGuire's findings. It should be noted that McGuire's student-reported family income figures are approximately 30% lower than those of Sanders and Palmer, adjusting for inflation [14].

The 1971 *Student Resources Survey* was also characterized by sample bias. Questionnaires were distributed to students in registration packets. Students applying for financial aid were more likely to respond to the questionnaire than students who were not submitting financial aid applications. The bias suggested here is explained by the fact that students from families with lower incomes were more apt to apply for financial aid than students from higher income families. It

[1] A recent study conducted for the California Legislature should be mentioned in this context [1]. *Unequal Access to Postsecondary Education* found participation in higher education in California to be even more skewed by income than was indicated by Hansen and Weisbrod. There are several problems associated with the use of this study, the most important of which is that its sample was drawn from the Los Angeles area rather than from the entire state. The significance of this study is that while it differs methodologically from both Hansen and Weisbrod's and McGuire's efforts, its findings completely contradict those of McGuire.

is doubtful that sample bias materially altered SRS results from the independent colleges, and from the Community Colleges. In the period sampled by the 1971 SRS, the independent colleges typically required all students to complete aid applications, and in the Community Colleges relatively little financial aid was available. The degree of bias in the State College sample is unclear. While the impact of this factor in the State Colleges is difficult to estimate, the University of California sample appears to have been highly biased by self-selection of respondents.

A second area where we disagree with McGuire relates to his assertion that his estimate of the relative wealth of students' families is more valid than Hansen and Weisbrod's estimate. McGuire states that, "the family group wherein the head is between 35 and 60 years of age is the most appropriate universe with which to compare the income of students' parents..." [10, p. 343]. While there appears to be valid room for disagreement over the most appropriate base for comparison, it seems to us that the decision to use one comparison method or the other is more political/value oriented than scientific.[2]

Neither McGuire nor Hansen and Weisbrod can claim to have accurately estimated the relative wealth of students' parents. Both use family income in given year as a proxy for wealth. This is a satisfactory measure for average net present worth, a reasonable synonym for wealth, for the population of the state as a whole. However, due to individual and occupational differences in age-income profiles, it is an imperfect proxy for the net worth of students' parents.

To correct for this factor, McGuire chose to compare the incomes of students' families with the incomes of families headed by mature wage earners. In effect, he tried to eliminate the bias inherent in the use of student family income data by comparing them with similarly biased data, on the supposition that the two biases would be in the same direction and would cancel each other out.

The possible difficulty with McGuire's approach arises from the fact that the variance in family income for this particular age group (35 to 60 years of age) greatly understates the variance in family net-worth. This is so because these are the peak earnings years for skilled, semi-skilled, and unskilled workers. Futhermore, these families are particularly likely to benefit from contributions to family income made by family members other than the head of the family - including sons and daughters who might otherwise be enrolled in college. The key question

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[2] We are inclined to agree with Joseph Pechman's observation on higher education benefit and cost distribution:

> The traditional way of looking at the burdens and benefits of higher education is to distribute the net benefits received by students by the income classes of parents (taxpayers). This sweeps the problem created by the intergenerational nature of the benefit transfer under the rug. It seems to me that a more useful way of looking at the problem is to acknowledge that the benefits of public higher education are received by one generation while the costs are paid by another and that there is no way of merging the benefits and costs in one distribution to evaluate the equity of the system. [12]

Equity issues are frequently highly resistent to the learned ratiocinations of economists. Clearly, most people, including the majority of political decision makers continue to believe that the wealth of students' families is the key to distributional equity. Consequently, the perceived utility of the information provided by Hansen and Weisbrod and McGuire cannot be denied.

that arises here, therefore, is whether or not, from the standpoint of net-worth and independent of differences in annual family income, students' families represented a distinct sub-population of the whole.

Fortunately, it can be shown that Hansen and Weisbrod had access to information which strongly suggested that the net worth of students' parents was on average greater than that of other families with similar incomes. Sanders and Palmer [14] has found significantly higher correlations between assessed housing values and college attendance rates than they had between family income and college attendance. Since the value of owner-occupied housing has been shown to be a significantly better predictor of lifetime earnings than annual earnings [11 13], this finding supports the notion that students' parents did represent a relatively wealthier sub-set of the population and that this difference between their wealth and the wealth of the population was at least partially independent of differences in annual income. Consequently, there is apparently no justification for McGuire's assertion that through his choice of a comparison population he has obtained a more accurate estimate of the relative wealth of students' families than was achieved in estimates made by Hansen and Weisbrod.

Post Hansen-Weisbrod Changes

The weaknesses of the 1971 SRS are known and generally acknowledged by those responsible for its administration. As a result, any assessment of the relative wealth of students' families using these SRS data are subject to serious criticism. Similarly, there is evidence sufficient to question McGuire's choice of a comparison group. There is little need to belabor these points. Instead, the dramatic changes in postsecondary education financing made over the last decade in California should be examined in order to gain a better perspective on the distributional equity issue. Many of the changes which appear to have rendered the system more equitable can be attributed in part to the conclusions drawn by Hansen and Weisbrod on the distribution of benefits and costs of higher education. The most important of these changes are (a) redirection of state expenditures supporting institutional operations so that, at the margin, state support per student is more equal across the public segments of California higher education than was the case a decade earlier, (b) promotion of price discrimination to permit the capture of a larger part of student surpluses, and (c) increased federal and state student financial aid, especially need-based aid.

While substantial income-related differences in student retention and completion rates remain, the changes noted above have significantly increased participation in postsecondary education and have greatly increased the range of educational choices open to students from lower income families.[3]

Redirection of State Appropriations for Institutional Operations

Most studies of the distributional consequences of public support for institutional operations equate the subsidy to students and their families with state and

[3] At the same time, the increased proportion of revenues generated by the individual income tax has brought about a substantial shift in the incidence of state and local taxes in California since Hansen and Weisbrod published their conclusions. This has been the trend in most states. The transition from a regressive to a moderately progressive tax structure has been more rapid in California than in most states during the last decade [8].

local expenditure per-student. This ignores the multiple purposes of colleges and universities and the benefits distributed to non-students which result from services performed by these institutions. A better measure of the subsidy to students would be marginal or incremental state and local expenditure per student. The University of California reports that between 1967 and 1975, incremental state support per-student averaged $890 in current dollars, approximately one-third of the amount received during the mid-1960's [16]. The California State University and Colleges have estimated "average marginal" state support to have been $1,280 for 1975, a reduction from an amount slightly over $2,000 in the mid-1960's [4]. Marginal state support for the Community Colleges increased from $256 in the mid-1960's to $1,060 in 1975 [6]. At the margin, this represents nearly a doubling of support for Community Colleges in constant dollars. While students attending the University of California and the California State University and Colleges may have received a substantially larger public subsidy during the mid-1960's than did students attending Community Colleges, it appears that this is no longer the case.

As a consequence of changes in marginal support rates, total state support of Community College operations increased from $71 million in 1967 to $515 million in 1976-77. As a proportion of total state higher education expenditures, state support for Community College operations increased from 15% to 28% while state support for the University of California and the California State Universities and Colleges decreased from 50% to 38% and 35% to 34% respectively [4, 6, 16].

The distributional consequences of these changes are likely of far greater magnitude than these figures would suggest. This is so because total state aid to a Community College district is a function of the size of the tax base and the rate of student participation. Both of these variables are negatively correlated with family income. Consequently, cross-sectional analysis of community college districts indicates that differences in average per-capita income explains roughly 25% of the variance in total state support per district ($r^2 = -.249$) [6]. Since neither total expenditure per capita nor the local tax rates are correlated with income ($r^2 = -.005$ and $r^2 = .04$ respectively), it can be inferred that so long as the state revenue structure is progressive, the distributional consequences of state community college support are, on average, highly progressive.

Price Discrimination Enabling the Capture of a Larger Proportion of Student Surpluses

The price elasticity of demand for educational services is thought to be a function of both student family income and student ability [2]. The public higher education market in California is segmented along both dimensions, both admission standards and price are highest at the University of California and lowest (open admission and zero tuition) in the California Community Colleges.

The structure of this market existed long before the work of Hansen and Weisbrod. However, the opportunities presented for price discrimination by this structure had not been exploited prior to the early 1970's. Increased price discrimination resulting from student tuition fee increases at the University of California and the California State University and Colleges has permitted the expan-

sion of educational services by shifting a larger share of the total burden of institutional support to high achievement students from families with higher incomes.[4] Cross-sectional analysis shows a high correlation between income-per-capita and transition rates from high school to the University of California ($r^2 = .700$), a moderate correlation for CSUC ($r^2 = .202$) and no relationship for the Community Colleges ($r^2 = -.020$) [6].

It might be concluded that the price discrimination opportunities presented by market segmentation have been under-exploited. Not only could one argue for further differentiated increases in student fees at the University of California and the State University and Colleges, but it might also be recognized that there are a large number of academic programs which face highly inelastic demand schedules - graduate business, law, medicine for example - and could charge higher prices without causing a reduction in student participation.

Increase in Need-based Student Aid

To complement the effects of increases in tuitions and fees upon the distribution of higher education benefits, State funding of need-based student aid has been increased from a few million dollars in the mid-1960's to over $80 million in 1976-77. It appears that this amount has been sufficient to provide universal tuition relief on a family-income contingent basis. In addition, the Federal government and institutional resources (public and private) provided approximately $265 million in need-based financial aid in 1976-77 [7, pp. 927-928]. In this context we refer to need-based aid as financial assistance that is targeted at students whose demand for higher education is most elastic; students of greater than average ability from families with low to moderate incomes, students of average ability from low income families, and specific racial and ethnic groups. The success of need-based student aid programs is most evident when the performance of the first of the groups mentioned above is examined. In 1967, it was reported that 44% of the high school seniors in California from lower income families had no immediate plans to attend a four-year institution. However, by 1976 this figure had dropped to 9%, as shown in Table 1.

Table 1
Planned Postsecondary Activities of High School Graduates
Eligible to Attend the University of California[5, 6]

Income Group	University of California	California State University and Colleges	Other Four Year Institutions (Independent and Out-of-State)	No Immediate Plans to Attend Four-year Institution
1966				
High	37%	14%	23%	24%
Medium	25	24	15	37
Low	23	20	11	44
Total Eligible High School Graduates	29%	19%	19%	33%
1976				
High	51%	16%	20%	12%
Medium	N.A.	N.A.	N.A.	N.A.
Low	24	10	57	9
Total Eligible High School Graduates	38%	19%	25%	17%

[4] At the same time, State policy has pressured the University of California to increase its entrance requirements. However, this pressure has been neither consistent nor particularly successful.

Summary

An understanding of the distribution of higher education subsidies is presently quite important. Decision makers in state capitals throughout the U.S. are faced with the dilemma of how to respond to changes in student demographics. State finance decision makers have several options, among which may be contrasted those measures adopted in pursuit of clearly defined distributional objectives, measures which have made financing systems more equitable and institutions more competitive, or measures which protect public institutions from competition with other public colleges and universities and private institutions. For example, attempts to cut financial assistance to students attending private institutions in order to reduce alleged public segment "excess capacity" may be seen to fall into this latter category. Efforts to reduce tuition in high quality public institutions or to reduce resources destined for open access institutions may also be perceived in this light. Such efforts will work to the disadvantage of students and the general public by reducing both the opportunity for choice and the range of educational diversity presently available to a student population whose preferences are shifting as the mean age of the population increases.

In affirmation of the worth of policies designed to increase both vertical and horizontal efficiency in the distribution of public expenditures on higher education, California is an example to other states. McGuire's conclusions would invalidate this example. By implication, they would also attribute responsibility for implementation of ill-conceived policies to Hansen and Weisbrod and to others who have attempted to increase subsidies for students from lower-wealth families.

During the past decade, California has employed a number of instruments designed to shift a greater portion of the burden of support for higher education to higher income groups, to students' parents and to the public at large, and to

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[5] *Sourcess Financial Assistance Programs* [5], Table I-2, p. I-9; Table I-3, I-10, Table B-3, Appendix; and *Unequal Access to College* [1], Table 18, p. 20.

[6] Note that the proportion of the high school graduating class reported eligible to attend the University was roughly the same, 19 and 20 percent, in both study periods. Also, note the great increase in the proportion of University of California eligible high school seniors from lower income families planning to enter private colleges and the slight shift in intentions of upper income students away from community colleges and the private institutions. The latter change implies a slight shift in the incidence of higher education support away from higher income families to the public. However, if one accepts the marginal support and price discrimination arguments made above, the effects of this latter shift are more than offset by the effects of the former. Of course, those who see any such shift as undesirable might conclude that tuitions/fees at the University of California and the State University and Colleges should be increased, further increasing the vertical efficiency (to use Weisbrod's term) of state support for public higher education. It might be observed that such a policy would have the secondary consequence of increasing the pressures on the public segments to give greater attention to non-price competition as a means of retaining and attracting students.

increase the level of subsidies targeted to students from lower income families as well as to other population groups deemed to have special needs. We believe that these policies have accomplished their purpose. Consequently, if Hansen and Weisbrod's study were to be replicated today, it is likely that many of their key findings would be reversed. This conclusion is directly contrary to the inferences drawn by McGuire.

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