This paper gives a survey of the main methods of educational finance and analyzes their economic effects. These effects are examined against the background of various objectives, such as resource mobilization, equality, internal and external efficiency of education, etc.

The presentation of the study has benefitted from discussions with Messrs. C. P. van Dijk, D. Koulourianos and K. Bahr (Education Projects Department); Messrs. H. G. van der Tak, P. Eklund, S. Holm and H. H. Thias (Economics Department). The latter has also helped in the analysis of the data presented in Appendix II. Discussions during the seminar on "The Strategy of Educational Financing", organized by the International Institute of Educational Planning in Paris, in November 1970, as well as with the Agency for International Development and the World Bank, have helped to further clarify a number of issues. Miss Corazon S. Morales and Mrs. Hetherinn Hargiss typed versions of the manuscript.

Sector and Projects Studies Division
Prepared by: Daniel C. Rogers (Consultant)
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I. Introduction

Great things are expected from education. All over the world education is looked upon as being the answer to nations' most difficult problems. In developed countries, pervasive social and moral problems, as well as more limited economic ones, are expected to fall before the mace of education. In less developed countries (hereafter referred to as LDC's), critical problems of economic development and national unity are expected to be alleviated by the spread of education. Not only do the nations of the world pin great hopes on education, but they also apply a substantial and growing portion of their resources to the educational endeavor. In 1966, $118 billion was spent on formal education (see Table 1). This tremendous total constituted about 5.4 percent of the world's Gross National Product (GNP). While the totals and percentages vary widely among countries, the average proportion of GNP for each of the less developed continents was also substantial: Asia 3.0 percent, Africa 3.3 percent, and Latin America 2.7 percent. In addition to financial resources, a sizeable portion of the world's population, especially of highly educated people, is engaged in the formal schooling process. As seen in Table 1, 13 percent of all people are directly involved in this process.

While developed countries are expending massive amounts of resources on education, and have both high expectations from and great problems with their educational systems, this paper concentrates on education in LDC's. Primary emphasis is placed on LDC's for two reasons: the IBRD is, of course, mainly concerned with LDC's; more substantively, the problems of the educational systems are more severe in less developed than developed nations. In particular, LDC's have three acute problems which are typically mild or non-existent in developed countries. First, there is a proportionately much larger group to be educated in LDC's because population growth averages about 2.5 percent for the LDC's as compared to 1.1 percent for the developed world. Second, widespread and growing illiteracy exists in LDC's. Although educational systems have grown tremendously in the last decades, there are now more illiterate people in the world than there were ten or twenty years ago.

1/ Nevertheless, much of what will be said will have relevance for the developed countries as well.

2/ The dependency ratio (population under 15 and over 64 years of age divided by the population 15 - 64 years of age) in 1969 (estimated) averaged .86 for 49 countries in the developing world and .58 for 16 countries in the developed world (derived from Tables 4 and 5 of Dorothy Nortman, "Population and Family Planning Programs: A Fact-book", Reports on Population/Family Planning/December 1969/).

UNESCO estimates that in 1950 there were about 700 million illiterates 15 years of age and older, 44% of the group. However, by 1960, the figure had increased to 740 million: UNESCO, Statistical Yearbook 1968 (Paris: UNESCO, 1969).
Third, the growth of resources per person in LDC’s is not as fast absolutely, or, in most cases, proportionately as in the rest of the world. GNP per capita for the industrialized nations grew at a rate of 3.1% per annum in the period 1950-1967, whereas the LDC’s grew at only a 2.4% per annum rate. Of six regional groupings of developing countries, only the Middle East and Southern Europe grew at a rate faster than that of the industrialized nations. 1

<table>
<thead>
<tr>
<th>Area</th>
<th>Financial Summary</th>
<th>Manpower Summary</th>
<th>Financial Summary</th>
<th>Manpower Summary</th>
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<tr>
<td></td>
<td>Total Expenditure</td>
<td></td>
<td>Employment</td>
<td>Students</td>
</tr>
<tr>
<td></td>
<td>($ billions)</td>
<td></td>
<td>(thousands)</td>
<td>(millions)</td>
</tr>
<tr>
<td>Africa</td>
<td>1.7</td>
<td>3.3</td>
<td>870</td>
<td>31.0</td>
</tr>
<tr>
<td>Asia a/</td>
<td>6.6</td>
<td>3.0</td>
<td>5,291</td>
<td>157.5</td>
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<tr>
<td>Europe</td>
<td>42.6</td>
<td>6.5</td>
<td>3,896</td>
<td>79.8</td>
</tr>
<tr>
<td>Latin America</td>
<td>3.0</td>
<td>2.7</td>
<td>1,823</td>
<td>45.1</td>
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<tr>
<td>North America</td>
<td>41.1</td>
<td>5.4</td>
<td>2,671</td>
<td>59.2</td>
</tr>
<tr>
<td>Oceania</td>
<td>1.2</td>
<td>3.7</td>
<td>183</td>
<td>4.1</td>
</tr>
<tr>
<td>USSR</td>
<td>19.2</td>
<td>7.2</td>
<td>2,035 b/</td>
<td>51.4</td>
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<tr>
<td>TOTAL</td>
<td>$118.4</td>
<td>5.4</td>
<td>16,797</td>
<td>428.4</td>
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a/ Not including China (mainland), North Korea and North Vietnam.

b/ 1967


Many methods of financing education exist and others have been proposed. Each of these methods of finance has peculiar effects on the economy, on the educational system and on the people. Unfortunately, systematic research to determine the effects of the various possible methods of financing this massive enterprise is almost non-existent.

This paper first discusses the objectives for a system of educational finance. Then the ways in which education can be financed are brought together and discussed. With these as background a systematic investigation and comparison of the economic effects of the alternate methods will be presented. Finally, based on the discussion, some suggestions will be made for research and possible changes in the methods of educational finance.

1/ Empirical data on the sources of educational finance are virtually unavailable in any systematic manner. Only a few countries publish data from which they could be derived. UNESCO does not publish any statistics in this area. The only statistics that approach relevance are the breakdowns for a few countries, between public and private expenditures. Although knowing the nature of the expender is useful, it is the original source of the funds that is of primary interest.
II. Objectives of a Finance System for Education

The objectives of a system of educational finance can be divided into two categories: those that emphasize the method of finance, which we shall call "internal objectives", and those that emphasize the educational system or the economy, which we shall call "external objectives". These will be taken up in turn.

The first objective in the former category is to raise the necessary revenue. Even such a simple objective has several complex aspects. The rationale behind the decision as to what quantity is necessary is the first problem. One could merely define the necessary funds as being those called for by the budget. However, that would be utilizing circular reasoning. The budget is designed to accomplish certain things. The effects of raising the revenue must be weighed against the effects of the expenditure of the revenue. To take an extreme example, it would definitely not be a beneficial action to provide a school place for an individual if the source of finance is such that he must sacrifice his food to meet his obligation. Thus, the decision as to what constitutes the necessary revenue should be made in the context of a plan which includes the methods of finance and takes into account the effects of the financing method. It is only within a planning framework that the marginal costs and benefits of raising more funds for educational expenditure can be rationally compared.

The objective of raising the necessary revenue needs to be considered from a dynamic as well as from a static viewpoint. Therefore the income elasticity of the financing system must be of concern. In particular, it is desirable to have a financing system which is just as elastic as the need which it is designed to fill. The income elasticity is defined as the percentage change in revenue over the percentage change in income, \( \frac{\Delta R}{R} \cdot \frac{Y}{\Delta Y} \).

For education in LDC's, it is desirable to have an elastic source of finance (an income elasticity of greater than one, i.e. a revenue that grows faster than income) because expenditures on education have also typically grown faster than income. Indeed, one study found the income per capita elasticity of educational expenditures per capita to be 1.13.
for 74 LDC's and as high as 1.33 for the subgroup of Asian LDC's. [1]

A second internal objective for a system of financing education is that it has low unit cost. Ceteris paribus, the system should seek to minimize administrative costs, the complexity of the system itself, and the size of the bureaucracy. Administrative costs must be kept as low as possible because the more that is spent on gathering resources, ceteris paribus, the less there is available for the use for which the resources are gathered. Since LDC's typically do not have proportionately as much administrative know-how as developed countries, it is preferable to keep the system as simple as possible, which minimizes the pressure on the administrative structure. Some argue that it is also desirable to hold down the size of the administrative staff because any addition to the bureaucracy might reduce the efficiency of the government as a whole.

The system needs to be simple from both the administrators' and the payers' viewpoints. A system may be simple for the administrator (e.g., merely putting data cards through a computer and counting the payment) but quite complex for the payer (filling out detailed questions which require a complete set of records and extensive accounting skills). For many LDC's the problems of illiteracy, multiple languages, and lack of

[1] Daniel Blot and Michel Debeauvais, "Education Expenditure in Developing Areas: Some Statistical Aspects" in OECD, Financing of Education for Economic Growth (Paris: OECD, 1966), pp. 73-83; their findings for all areas are seen in the Table at the end of this footnote. Since they utilize data for a cross-section of countries at a given point in time, they are implicitly assuming that educational expenditures of countries will develop in a similar manner as income increases. Ideally, elasticities over time for each country would be averaged over all countries. Since such data are not available, the cross-sectional approach that Blot and Debeauvais utilize will have to suffice:

<table>
<thead>
<tr>
<th>Income per capita Elasticity of Educational Expenditures per capita (1960)</th>
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<tr>
<td>Group</td>
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<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Africa (35 countries)</td>
</tr>
<tr>
<td>Asia (19 countries)</td>
</tr>
<tr>
<td>Latin America (20 countries)</td>
</tr>
<tr>
<td>All Above (74 countries)</td>
</tr>
<tr>
<td>Industrialized (19 countries)</td>
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<tr>
<td>All (95 countries)</td>
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</table>
rudimentary bookkeeping skills on the part of the populace add complications to some financing systems which the typical developed country does not face. 1/

The "external objectives" for a method of educational finance include positive effects on resource distribution, efficiency and equity.

The effects of alternate financing methods on resource (income and wealth) distribution can be very substantial. Consequently, one objective for the method of financing education is that its effect on the demand for education, which affects the distribution of education, contributes to equality of resource distribution. The income and wealth distributions in LDC's are typically very unequal, in fact much more so than in developed countries. For example, in a group of twenty-five countries (including six LDC's) for which Lydall found data on income dispersion in an exhaustive search, the five with the most unequal distributions were all LDC's. 2/ Given that between three and six percent of the Gross National Product is typically devoted to education, the extraction of the finances to support education can have a marked effect on the distribution of resources. 3/ If the method is not progressive, the effect of the extraction will not be beneficial with respect to this goal. The method of finance affects the distribution of resources not only through the effects of the extraction of the resources but also through its effect on the distribution of education among the populace. Different methods of finance lead to different amounts of utilization of educational services. Since education affects income, this implies that the method of finance has a dynamic as well as a static effect on resource distribution.

The method for financing education will certainly have implications for the efficiency of the educational system. Therefore, another objective is that the positive effects on both internal and external efficiency of education be as great as possible. Internal efficiency is the production of a given amount of education at the lowest cost, that is, it is a micro view of the education industry. To achieve internal efficiency,

1/ See for example Joseph Crockett, "Common Obstacles to Effective Tax Administration in Latin America" in Joint Tax Program of the Organization of American States, the Inter-American Development Bank, and the Economic Commission for Latin America, Problems of Tax Administration in Latin America (Baltimore: The Johns Hopkins Press, 1965), for a discussion of the need for simplicity of the tax structure in LDC's.


it is necessary to have incentives. Such incentives do not have to be built into the financing system at the stage when resources which are to be used in education are extracted from the public. While that is one possibility, the incentives could also come at a later stage. For example, in a system of finance through central government general taxation, incentives might be built in at the stage of disbursement from the central government to the local authority in charge of the schools. While such incentives are beyond the scope of this paper, we shall discuss below some ways in which the financing method might influence internal efficiency.

External efficiency has two aspects. The first is the match of the manpower needs of the economy with the education received by the students in terms of type (agricultural, vocational, scholastic, etc.) and nature (rote ability, creative ability, mechanical ability, etc.). The second is the effect of the educational system's physical and financial resource utilization on the rest of the economy. For the matching of the manpower needs and the educational system, incentives which are different from those required for internal efficiency are required, and these too may be furnished through the financing system.

Moving to the second aspect of external efficiency, the growth of the economy would be fostered by the ideal educational financing system. The method of finance of education will most certainly have effects on the amount and type of investment that will be made in the economy. The various finance methods have effects on the entire range of consumer and producer choices, including decisions on how much to consume, how much to invest absolutely and proportionately, the items included in the investment portfolio, and even how much to work.

One question is crucial in the assessment of the effect of a method of educational finance on economic growth. That question is, what would the resources have been used for if they had not gone into education? For example, if a tax is the source of educational finance and the bulk of such taxes replaces consumption of imported consumer goods it is one thing. But if the taxes are paid with resources which would otherwise have been invested in improving farms, it is quite another. Looking at the same question from a more macro perspective, if the Government expenditure that goes into education does so at the expense of military procurements rather than the construction of infrastructure, it will have a markedly different effect on the growth of the economy. 2/

The above-mentioned distributional effects will also influence investment. Unfortunately, equality of resource distribution and investment for economic growth are conflicting objectives. 2/ There is much evidence

1/ Of course, if the military situation is such that the regime invites aggression by putting the resources into education, the long-run effects on growth could be reversed.

which supports the proposition that those with greater income invest a greater proportion of their income, thus implying that the more unequal the income distribution the more total investment will be made. 1/

The financing system can also have effects on the social conscience of the people which in turn can affect the growth of the economy. An equitable system might have the effect of contributing to a sense of support for the government and willingness to work for common goals. An inequitable system might lead to an attitude of every man for himself which might in turn be quite detrimental to the growth of LDC's because they are typically in need of cooperative efforts of many sorts if they are to grow.

No single method of finance will be able to achieve each of these objectives optimally. The next section will present various methods of financing education and lay the groundwork for the detailed discussion of their economic effects in Section IV.

1/ For an interesting discussion questioning this view see Noel McGinn and Russell Davis, Build a Mill, Build a City, Build a School: Industrialization, Urbanization, and Education in Ciudad Guayana, Venezuela (Cambridge, Mass.: Massachusetts Institute of Technology Press, 1969).
III Methods of Financing Education

In order to help set the rather mixed bag of financing sources into perspective, a taxonomy of these sources is presented below. At the outset it will be necessary to clarify just what universe is being considered and how it is being treated.

The taxonomy will be concerned with the totality of education: all levels of education and all types of expenditure (capital, recurrent, and opportunity costs). Formal education in institutions which are primarily educational in purpose will be considered the principal type of education; elementary schools, secondary schools, colleges, universities, teacher training schools, training institutes, and so forth are in this category. Other types of education include on-the-job training, education in the military, and some forms of private education (for example, small-scale and ad hoc activities for teaching such things as language, literacy, music, and art). Since these other types of education are often very important in LDC's, they will be considered wherever possible; however, the possibility of doing this is much greater in theoretical than statistical discussions due to the extreme sparseness of data.

The ultimate sources of the financial resources and the methods by which they are extracted from those sources are considered here. That is, if the source is the general public and the method of extraction is a tax, it is not of concern whether the resources are funneled directly to an educational institution or filtered through three or four layers of government first.

Finally, an attempt will be made to characterize the progressivity and the income elasticity of each source. Progressive, neutral, and regressive taxes or sources of finance are ones in which the proportion of individuals' income extracted increases, remains constant, or decreases, respectively, as the level of income rises. Thus, these terms refer to the rate structure. As used here, a tax is elastic, neutral, or inelastic if the tax yield increases proportionately more than, the same, or proportionately less than, respectively, national income. 1/

Both of these are extremely difficult areas in which to draw conclusions from either an empirical or a theoretical vantage. Data are very limited and the theoretical basis for empirical studies of the incidence of various taxes and payments is still moot, as the literature shows. 2/

1/ See Appendix I for a brief numerical presentation showing the differences between these two sets of concepts.

Also, most sources of finance are not inherently progressive, regressive, elastic, inelastic or neutral. The progressivity of a source of finance frequently varies markedly through the range of income levels (for example, regressive for the range 0 - 1000, progressive for the range 1001 - 3000, and neutral for the range 3001 and over), often depending on the particular intervals chosen. In addition, intercountry differences in the progressivity and elasticity of various sources are substantial, also making it hard to generalize. Therefore a single statement of "progressive" or "elastic" sometimes can be misleading. On the other hand, sources of finance often do have a tradition of being structured in a specific manner, in which case generalizations can be usefully made.

Like the private methods of finance, all of the public methods of raising resources are dependent on the general population. Tax revenue is derived from levies which are imposed upon the public either directly or indirectly through businesses. The latter are owned by the public either directly or through their intermediary, the government. Thus, in the final analysis the public is the source of all educational finance, an extremely simple point but one which is all too often ignored.

The sources of finance are first divided into public and private. One characteristic distinguishing these two types is that private finance sources, unlike public ones, are generally tied to the consumption of education. That is, the individual or family finances the education only if a member of the family is in the educational system, whereas when the source is public, resources are gathered without regard to school attendance. Public sources are either general or earmarked. The former extract revenue for government to spend on all its activities, including education. The revenues generated by the latter are used solely in education.

The sources of finance will now be discussed in terms of the progressivity and elasticity in the order shown in Table 2. Income taxes are highly income-elastic because they tend to be progressive and the tax base grows over time, both of which lead to a greater-than-proportional increase of revenue as income grows. Some wealth taxes are typically progressive, like inheritance and full wealth taxes, and others are not. Wealth taxes are probably elastic in that the capital output ratio is thought by many to increase with development, and capital and wealth are closely related. 1/ Land taxes, however, are typically inelastic due to the difficulty of reassessment, especially for rural land. Business taxes are probably of greater-than-unitary elasticity in LDC's. With development, the base for these taxes increases. Profit taxes are usually progressive in their rate structure. Value added and sales taxes are most often regressive in structure so any elasticity they may have is based on the growth of the tax base relative to the growth of the economy as a whole.

1/ Richard Thorn, "The Evolution of Public Finances during Economic Development", The Manchester School (January 1967). Some of the discussion which follows also draws on this article.
Table 2: Taxonomy of Sources of Educational Finance

I. Public Sources
   A. General Revenue
      1. General Taxes
         a. Income and Wealth
            1) Capital gains
            2) Earnings
            3) Income
            4) Land
            5) Property
            6) Net worth
         b. Business
            1) Excess profits
            2) Profits
            3) Value added
            4) Sales
      2. Customs Duties
      3. Fees, Licenses, etc.
   B. Earmarked Revenue
      1. Lottery
      2. Earmarked taxes (e.g., property tax in the United States)
      3. Loans
      4. Other (e.g., labor)

II. Private Sources
   A. Fees
   B. Donations
   C. Loans
      1. Private Sector
      2. Public Sector
   D. Labor
Taxes on the foreign sector vary as to their progressivity and historically have a declining base. Taxes on foreign businesses, like other businesses, are progressive. Custom duties embrace both export and import taxes, including the profits of marketing boards, and are seldom progressive. Fees and license revenue are typically minor and are most likely slightly elastic due to a somewhat regressive structure and expanding base.

When contemplating any of these general sources in terms of financing education, it must be remembered that funds are fungible, that is, it is almost impossible to tie the source to the use made of it. These resources go into a common pool which is tapped for all governmental needs. Therefore, the progressivity and elasticity of the total set of general public sources is the most meaningful item to look at when trying to evaluate the effects of the utilization of these sources of finance. Overall, general public sources in LDC's are probably regressive and slightly elastic.

Earmarked revenue is only slightly different from general revenue from an analytical viewpoint. Earmarked revenue has the great virtue of being an expenditure on education which is easily quantifiable as to its source; general revenue for educational finance, being allotted to education from a common treasury, is difficult if not impossible to pin down to a specific source. Profits of lotteries are sometimes earmarked for education. Lotteries are regressive and one can only guess as to their elasticity, the latter depending more on national quirks than economics. Any general tax can be wholly or partially earmarked for education. When this is done, the taxes are equal in progressivity and elasticity to the same taxes when they are not earmarked. Exceptions to this rule could exist if, for example, there were a systematic difference by income level between earmarked and non-earmarked taxes as to individuals being honest about the extent of liability and paying the tax.

Loans in the public sector for the financing of education form a somewhat ambiguous category. The immediate source is the business sector (broadly defined so as to include the investment activities of individuals). However, the long-run source depends on the financing of the repayment of the loans -- whether it is from general government revenue, earmarked government revenue, or other sources.

The final category in the public half of the dichotomy is "other". This includes labor and subsistence activities which are prescribed by the government for the furtherance of education. Direct labor is regressive, even though the value of the time of richer people is typically higher, due to the higher proportion of the income of poorer people that is attributable to their labor. Its elasticity is dependent on the national milieu regarding its use. Similarly, such items as the provision of board or lodging for a teacher, which is sometimes done on a rotating basis throughout a village, are regressive.
Private sources of resources for education are found in both public and private institutions. As pointed out above, the factor which differentiates them from those classified under the public rubric is that their commitment to education is directly related to the consumption of education by the individual.

Fees would appear to be a regressive method of finance. However, the scant evidence from budget surveys on expenditures for education (fees and other direct costs) by income class suggests that a greater proportion of income is spent on education as income increases (see Appendix II Table 1 and the discussion thereof). These results can be misleading because in most cases not all of society is represented in the surveys so that the results are partially caused by what might be thought of as the most regressive possible effect of a tax -- exclusion of those with lower incomes from participation.

Donations may be from either domestic or foreign, individual or corporate sources. Foreign donations often play a more significant role in the educational system of LDC's than in those of developed countries. Domestic donations are in all likelihood a progressive source of finance in that those with low incomes probably do not make them. Donations are likely to be income elastic since more people are able to contribute as income increases.

 Loans to finance direct costs, indirect costs, or both are differentiated here as to the source of the financial resources. Some loans for educational purposes are entirely within the private sector, that is, individuals borrowing from other individuals or businesses such as banks. Utilization of such loan finance is presumably regressive since the same amount is required to finance education regardless of the individual's income. Loans would probably be an elastic source of finance in that more people might be willing to take out loans when the general income level is increasing due to the optimism such increases would generate. On the other hand, increased income might lessen the necessity for loans and therefore act to reduce their elasticity. Other loans transfer funds from the public sector to individuals or institutions in the private sector. This latter type of loan is somewhat ambiguous in its role as the original commitment of funds is financed by the public sources but, since they are repaid, the charge on the public treasury is ultimately cancelled out. The progressivity and elasticity of this form is the same as those of public loans in the first instance and the same as those of private loans as they are paid off. Finally, voluntary labor is a source of resources quite similar in its role to labor that is commandeered for education.

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1/ Although the cost of a year of schooling may vary greatly among schools in a country even if there is a centralized public financing method, this generalization holds. The fact that there are many qualities and hence prices for a particular type of good is not unusual and does not affect regressivity.
IV. The Economic Effects of Various Methods of Educational Finance

In this section, the effects of the various methods of financing education (as classified in Table 2) and the objectives for such a system will be specified in detail. In general, major differences in effects among methods of finance will be stressed. Thus, not every financing variant will be discussed under each category of economic effects.

A. The Demand for Education

The first topic is the effect of methods of finance on the demand for education. The objective to which this relates is that of quality of resource distribution. Since the effect of financing on demand is varied and complex, it is discussed separately from resource distribution.

A few things can be said about the group of financing methods as a whole. First, taking the size of the educational system as a given, any financing method has a negative effect on demand. With a public source of finance for the direct costs of education, it is the decrease in income due to earnings foregone while attending school that would create an incentive, which many would heed, to work instead of attending school. This effect is seen in all those countries which have no direct costs affixed to school attendance but nevertheless have substantial wastage on grounds other than academic or physical. If the source of finance of direct costs is private, the negative influence on demand is increased in that all costs are then tied to school attendance. However, a decrease in the amount demanded could be artificially prevented if school attendance were legally required and enforced.

Secondly, the more regressive the financing method, the less demand there will be for education. Since in every country the actual income distribution is such that many more people are in the lower income classes than in the higher ones, a regressive source means that the burden is greatest on the largest groups. This in turn suppresses the amount demanded more than would be the case if the same total were collected through a progressive source.

While it is usually true that the more regressive the financing method the lower will be the demand for education, this may not hold for the higher levels of education. If the system is such that a much larger-than-proportionate number of individuals from the higher income brackets qualifies for higher levels of education due to monetary or verbal advantages, as is universally the case, the rule would be reversed. A progressive revenue source in such a case would decrease the resources of the families

---

1/ The only exceptions to this would occur if all costs of education (including foregone earnings) were met through a general public source or through a donor whose own demand was not affected thereby.
of those who are qualified and make it more difficult for them to afford the education.

The next general point is that the greater the extent that the financing is tied to the consumption of education, the lower will be the amount of education demanded. If education is financed in a manner wherein the individual must contribute his share whether or not he undertakes education, there is no direct (or indirect, if foregone earnings are also financed) marginal cost of attendance. Thus education is treated like a free good and the amount demanded will be large relative to a situation in which there is a marginal cost of attending.

A hypothetical example illustrating the alternatives is pictured by Figure 1 in which $D_2$ represents the aggregate demand curve of families with one child of school age and incomes of $400 when the finance of education is tied to consumption. Attendance of a child requires payment for the educational services by the family. Here $Q_2$ per cent of the cohort would demand education at a price of $30. (Note that only at a negative price would 100% of the cohort demand education.) On the other hand, when education is financed through some general levy not tied to consumption, all of the community must pay the levy, including those who have no desire to continue education at any price (for example, childless couples and unmarried adults). Thus the levy can be something less than the cost per pupil, say $25. This creates a lower after-tax income and a lower aggregate demand curve, $D_1$, representing the same set of tastes, but referring to disposable incomes of $375 instead of $400. However, the direct cost of education has dropped to zero, yielding a much greater aggregate demand, $Q_1$. In effect, education has become a free good. This exercise could be repeated for each income family size category with similar results, thereby demonstrating the general principle that as the extent of the finance which is directly related to attendance is increased, the amount of education demanded will diminish.

Finally, the comparative effects of the financing methods on demand depend to a significant degree on the nature of the educational system and the economy. It depends, for example, on the cost of education relative to the incomes of various segments of the population, on the absolute income level of the country, on the level of schooling being considered, on the progressivity of the tax structure, and on the mix of public and private schools. Often some of these factors are put into the background and the generalizations are made despite the possibility that

1/ If the demand for education were sufficiently price inelastic and/or the income elasticity were sufficiently great, the results could be reversed. However, it would require quite extreme values to accomplish this result.

2/ This is a simple price-quantity relationship. As the price decreases, the amount demanded increases. That is, it is a movement along a given demand curve rather than a movement of the demand curve.
Figure 1

Hypothetical Demand Curves for Primary Education: Financing Tied or Not Tied to Consumption

D_1: Income = $400; marginal cost ("fees") = 0; income after "tax" = $375; "tax" = $25

D_2: Income = $400; "tax" = 0; income after "tax" = $400; marginal cost ("fees") = $30.
a particular extreme circumstance for one of these factors may lead to a
correction of the generalization. At other times, when one of these
factors is crucial to any distinction, it will be explicitly brought into
the analysis. 1/ 

The differences in effect on demand among the methods of financing
education which are tied to its consumption will be discussed first; direct
work, fees and fees combined with loans to cover them and other costs. Due
to the typically large differences in costs in LDC's among the levels of
education, each level will be discussed separately, beginning with primary
education.

Financing primary education through direct labor would theoretically
lead to the greatest demand. This method's first advantage is that it is
intrinsically pay-as-you-go. Neither the student nor his family has to save
any amount beforehand. In countries where a great number of families live
at the subsistence level, this is indeed an advantage. Of course, fees can be
and in some places are collected periodically throughout the school year
rather than in one lump payment. Therefore, the advantage for work is in the
necessity of its being pay-as-you-go as compared to fees which only have the
possibility. To be successful, a system of direct work must assure a source
of employment sufficient to meet the costs. The fact that this method is so
little used is evidence that it is not a simple task to develop a pay-through-
labor system in LDC's. Employment of any type is difficult to generate. 2/
To generate it for primary school age children is especially difficult. 3/
However, the labor need not be that of the primary school children. It might
be possible to utilize the labor of the adult members of a family to finance
the education. The effect on demand of financing education with adult labor
would depend critically on the nature of the labor relative to the other work
of the adults -- its economic value per unit of time, its timing (the part of
the day, week and year), and its social prestige -- the more attractive the
labor, the greater the willingness to undertake it and hence the greater the
demand.

A loan program can affect the demand by postponing the day of
reckoning. However, the fact that the actual financing is only postponed
rather than explicitly provided for is the weakness of this form of financ-
ing in terms of demand generation. In a subsistence economy, the typical

1/ Perhaps the ideal procedure would be to create an n-dimensional matrix
and analyze the effect on demand of each financing method for each com-
bination of all other factors. However, such a procedure suffers from
three drawbacks: first, it would be extremely time-consuming and tedious;
second, the results would be very difficult to interpret; and third,
the data do not exist with which to operationalize such a matrix.


3/ One proposal to help alleviate this part of the problem is to begin
education at a somewhat older age than is the average in LDC's. This
has been proposed by, among others, Julius Nyerere in his Education for
individual hesitates to try something new and unknown \(^1\) and a loan program for financing education would be unfamiliar even though borrowing is widespread in most LDC's. \(^2\) Nevertheless, loans should have the effect of making more people able to take advantage of education in that temporary liquidity problems could be ameliorated and payment could be spread over many years. However, the psychological problems with loans make the net effect on demand an unknown quantity.

The third type of finance which is tied to consumption is that which is most often adopted, fees. Fees in some cases can actually increase demand. The inauguration of a fee supported school where no school existed before can lead to the individuals realizing their unfulfilled demand, demand which was not seen earlier due to the good not being offered. Relative to the other two methods of consumption-tied finance, however, this would theoretically lead to the least demand since it requires payment directly, without any system for easing the problem of generating the resources.

For secondary education, the relative effects on demand of these financing methods are somewhat different. First, it must be mentioned that the nature of primary school and the method by which it was financed will have a major effect on the size and nature of the pool of individuals who will be eligible for secondary school. The lower the demand at the primary level due to the method of finance or any other reason, the more likely the pool of eligibles for secondary school will be heavily weighted with representatives from the upper income and educational classes of society. Such individuals and their families will react differently to alternate methods of financing secondary education than those from lower classes.

The direct cost of education in LDC's is often very large relative to the average income per capita. For example, a survey of Latin American and African countries in 1960 found that the annual recurrent costs alone of primary school ranged from $5 to $70 per student with an average of $30 per student when per capita income for many of the countries was well below $100. Secondary education was almost ten times the cost of primary

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\(^1\) See Theodore W. Schultz, *Transforming Traditional Agriculture* (New Haven: Yale University Press, 1964), who suggests that this is rational position for someone living at the subsistence level to take since any failure can be literally fatal.

\(^2\) For example, 42 per cent of 5,399 spending units surveyed in Ceylon had incurred debts within the previous twelve months. Those in the urban sector had fewer but on average larger loans than others; Central Bank of Ceylon, Department of Economic Research, *Survey of Ceylon's Consumer Finances 1963* (Colombo: Government Printer, 1964).
education and higher education was two to four times the cost of secondary
education. 1/

Because of the great expense involved, probably no country in
the world limits attendance at secondary school to those who are able and
willing to finance the entire cost. Direct labor as the sole means of
finance is probably completely impractical. However, direct labor could
be utilized to cover part of the costs and such a system would undoubtedly
lead to a greater total demand than would otherwise be seen. Loans become
a more viable method at the secondary level in terms of a positive effect
on demand. The rewards from education in terms of employment at a relatively
high wage are more visible and indeed more probable from the vantage point of
secondary school students in an LDC. 2/ Thus the fear of committing future
income should be somewhat diminished at this stage. In addition, given the
relatively great expense, the necessity of finding a source of finance in
a situation of educational cost being tied to attendance also makes loans
more attractive. Finally, a program consisting of financing solely through
fees would yield the lowest demand.

For vocational education of all sorts - teacher education, technical
education, etc. - the situation is similar to that of academic secondary
schooling. Here, however, the financial rewards of schooling should be even
more evident so that all of the financing methods which are alternatives to
general taxation support should have even larger positive effects on demand.
But, as shown by several investigators, vocational education does not enjoy
great prestige in most LDC's, and deservedly so from the private point of
view. 3/ In some cases this ill-repute is due to educational programs being

1/ Netherlands Economic Institute, "Financial Aspects of the Educational
Expansion in Developing Regions: Some Quantitative Estimates", in OECD,
Of twenty Latin American countries, three had average incomes per capita
of less than $100 in 1961 (the median income per capita for the group
was $250); of thirty-five African countries, twenty were below $100
(the median was $83); and of nineteen Asian countries, nine were below
$100 (the median was $100) -- derived from Blot and Debeauvais, op. cit.,
pp. 82-83.

2/ Primary school graduate unemployment is already growing rapidly in Africa,
the continent with the lowest level of education; see, for example,
Archibald Callaway, "Unemployment Among School Leavers in An African City",
in George Bereday and Joseph Lauwerys (eds.), Educational Planning: The
World Yearbook of Education 1967 (New York: Harcourt, Brace and World,
1967) and Lewis Brownstein "Mass Primary Education in Kenya: A Problem
in Social and Political Development" (unpublished doctoral dissertation,
Johns Hopkins, 1969). Unemployment of secondary and even higher education
graduates is now seen in many LDC's.

3/ See Philip Foster, "The Vocational School Fallacy in Development Planning"
in C. Arnold Anderson and Mary Jean Bowman (eds.), Education and Economic
Development (Chicago: Aldine, 1965).
ill conceived, poorly carried out, or both. 1/ In other cases it is the total economic and educational systems which prevent success.

For vocational education in particular, direct labor programs should be more effective as a financing source, in that saleable skills should be created by the schools. Similarly, fees should be a somewhat better method of finance in terms of generating demand because parents should be able to see the benefits to their children (and themselves through their children) more clearly and therefore be more willing to directly finance the education. Unfortunately, in practice, neither the skill development nor the financial benefit is typically the result of vocational education.

The trend identified in the discussion as it moved from the lowest to the higher levels of education persists in higher education. First, the population eligible in terms of educational qualifications is normally even more restricted at the higher education level. Thus the socio-economic class effect becomes stronger. 2/ At this level loans would undoubtedly have a sizable positive effect on demand relative to other methods of consumption-tied finance. The financial rewards derived from higher education in LDC's are usually quite substantial and fairly immediate. In addition, the student eligible for higher education is already highly educated relative to the norm. For all these reasons, hesitancy in accepting a loan would be sharply reduced. Direct labor as a method of finance is more difficult in the sense that the recurrent cost alone of higher education is generally greater than the per capita national income in LDC's, in some cases many times as much, but the student in higher education often already has skills which are in short supply and therefore can command a relatively high wage. Of course, direct labor can only finance a part of foregone earnings if education takes up any of the normal work-time. The balancing of these two points suggests that traditional higher education could not be totally financed by direct labor in most cases, but that some type of sandwich course arrangement (alternately working for a period and attending courses for a period) would be a feasible method of increasing demand. 3/ Finally, at this level, financing through fees alone would narrowly limit the demand to those from the highest income families.

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1/ For an example of such an unsuccessful program see Frank Taylor "An Analysis of the Efficiency of the Investment in Industrial Technical Education at the Secondary Level in the Northeast of Brazil" (unpublished manuscript, 1970).


3/ Whether sandwich courses should be classified as a financing method through direct labor or fees is either a semantic or an accounting question, depending on how the earnings from the labor are treated and one's preference in wording.
The effect on demand of financing education through sources which are not tied to the consumption of education is primarily determined by the progressivity of the source. In general, as has been demonstrated, the more progressive the source, the greater the demand will be. Since the progressivity of each of the sources was brought out in Section III, that discussion need not be repeated here. However, a distinction can be made between the general and the earmarked revenue sources. Since education is a very popular service in LDC's, the support for taxation of this type may be greater than for general taxation. Thus, the demand for education as reflected in the resources the public devotes to it, that is, the effective demand, could easily be greater if financed through a source which is specified as being in support of education. 1/

Indeed, the Government might find earmarked taxes a means of increasing the amount of resources distributed by the Government. That is, a shift of education from being supported by general taxes to being supported by a new earmarked tax might allow the Government to increase the total taxation, a step which if attempted under other circumstances might not be politically viable. Such additional taxation could be utilized to increase the size of the educational effort above that which would normally accrue or merely finance the normal growth of the system. 2/

B. Equity and Distribution

The effect of the method of educational finance on equity and the distribution of resources will be discussed in terms of various classifications of society: residence (urban-rural), income and educational class, ethnicity, occupation, family size and academic ability. The effects of the extraction of the funds for education and of the consumption of the education will be separately discussed. Of course, it is the sum of these two factors which determines the net distributional effect of each method of financing education. The equity discussions will in general concentrate on horizontal equity (equal treatment of people with equal means) rather than on vertical equity (equal relative burden on people in the various income groups), which has already been discussed implicitly in terms of the progressivity of the financing source. The discussion of the financing method's effects on demand and their implications for distribution will not be repeated here.

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1/ Many countries have added taxes on businesses, the funds from which are earmarked for vocational education.

2/ See Per Eklund, *Taxation and Earmarking in Developing Countries* (Economics Department Working Paper No. 43, Revised, IBRD, July 11, 1970) for an extensive study of earmarked taxes.
First, we investigate the relationship between place of residence and the distributional effects of educational finance. Considering first public sources of finance, income and wealth taxes undoubtedly bear more heavily on urban than rural populations in LDC's. This, like many of the differences in incidence we will discuss, is due to the greater concentration of non-monetary activities in the rural than the urban sectors of the economies. The majority of monetary GNP is typically generated in the urban areas. Rural dwellers often have neither cash sources of income nor substantial visible capital which could be easily taxed. The ownership of property is sometimes communal rather than individual, making even this base a difficult one to tap. Business taxes also fall on urban dwellers more heavily than on rural. This is especially true of taxes on profits, since the greatest portion of the business community is located in urban areas. Sales taxes are less biased toward urban areas, but they nevertheless fall more on urban than rural dwellers, since they only are levied on monetary purchases which constitute a smaller portion of income in the rural sector. Custom duties' effect is dependent upon the mix of items taxed. Export duties are usually only levied on raw materials, therefore bearing down heavily on the rural sector. On the other hand, import duties are generally felt more strongly by urbanites as they are often luxury items which the typical rural dweller cannot afford in any case. Moving into private sources of finance, it can be said that they probably affect the rural sector more strongly than the urban one. Fixed school fees, for example, represent a larger portion of the income of the rural dwellers than the urban dweller.

The incidence by economic class is nothing more than the progressivity of the source and this has already been discussed. The incidence by occupation is also for the most part a question of the progressivity of the source due to the high correlation between occupational status and economic status. However, the match is not perfect and there are occupational characteristics which do affect the incidence. People with occupations which are in the non-monetary sector are more heavily drained by sales, value added, and customs taxes than income, wealth, and profits taxes. Those with occupations for which employment is concentrated in the government or in large firms and wage earners as opposed to self-employed individuals are more vulnerable to earnings taxes than others, due to their greater visibility.

In addition to the correlations between economic status and ethnicity and occupation and ethnicity, which are often quite high, there are other characteristics of specific ethnic groups which make minor contributions to lead to the incidence of certain financing sources being higher for them than for others. Contrasting purchasing and living patterns could account for some differences. For example, due to their great reliance on non-market goods and services, the Masai of Kenya and Tanzania would feel a much lower incidence of sales taxes than individuals with the same income and wealth who were members of most other tribes. Similarly, various ethnic groups often concentrate their efforts on different crops due to geographic or other reasons and these alternate crops have divergent amounts of duties placed upon them.
The greatest horizontal equity differentials for alternate methods of financing education are within the last two categories, family size and academic ability. All public sources incorporate a lighter burden for larger as compared to smaller families than do private sources, the extent being directly proportionate to the number of school age children. 1/ The degree of progressivity of the source has something of a special meaning in the context of family size. Progressivity is usually computed on the basis of family income or wealth, counting all families as equal units. If progressivity were calculated on a per person basis (counting children as either partial or full units), the progressivity of various financing methods would be altered for various families. Since family size is inversely related to income, education and social class, regressive sources of revenue become more regressive and progressive sources less progressive when calculated on a per family member basis. 2/ The differential effect of alternative methods of financing education on individuals of different academic ability is seen only with regard to the greater probability of high-talent individuals attracting donations (scholarships, fellowships, bursaries, and loans at low or no interest) to support their education. The probability of such gifts is directly related to ability. 3/

The effect of alternate financing methods on the distribution of education is complementary to the effect of the financing burden on the incidence of education, that is, as the burden for a group increases, the share that group receives increases. We are not considering here the effect of the generating method on the total amount of resources which can be generated but, rather, the effect of a method, given a set revenue, on how education is distributed. Urbanites are favored in all cases in that per pupil costs of education are typically lower in urban than in

1/ This is actually an overstatement in that, on average, as family size increases, a smaller proportion of the children attend school, ceteris paribus.


3/ For evidence of this effect in the United States, see Edward Denison, "An Aspect of Inequality of Opportunity", *Journal of Political Economy* (September/October 1970) and James Davis, *Stipends and Spouses* (Chicago: University of Chicago Press, 1962), p. 204. In many countries, including most LDC's, higher levels of education are heavily or completely subsidized for all those who have demonstrated sufficient ability.
rural areas due to the differences in population density. Public sources of educational finance typically favor urbanites substantially over rural dwellers in the distribution of educational opportunity. This is a result of the concentration of wealth and political power and the density of population in the urban areas relative to the rural areas. Because of the higher levels of economic well-being in urban areas, all private sources of finance also favor the urban areas in the amount of education provided. Even the loan method would probably favor urban dwellers over rural ones in that the former would more readily accept loans than the latter, due to their greater sophistication in economic transactions. However, of the various private methods of finance, a loan program would give urbanites the least advantage.

Other than the effect described of the relationship between the burden of a finance source and the distribution of education, the main effect of occupation is in terms of the type of locality in which the occupation is normally practiced. That is, rural occupations (such as farming and extension work) would lead to lower consumption of education, ceteris paribus, than urban oriented occupations (such as street cleaning or factory work).

The distribution of education among ethnic groups is often quite unequal in LDC's. This is partially a result of the differences in occupation, place of residence and economic status -- the effects of each of which have already been discussed -- and partially a result of cultural differences which lead to different purchasing patterns and hence vulnerability to taxes.

Next to economic status the characteristic which has the greatest effect on the distribution of education is academic ability. The public-private dichotomy in financing is particularly strong in its influence here. In countries where schooling at the primary level is universal and publicly financed, ability becomes the key variable determining the distribution of higher levels of education. However, ability in this context refers to revealed ability to succeed in school tasks. Inherent ability differs from revealed ability to the extent that childhood stimuli and types of ability differ. Due to the greater stimuli, especially of the types that lead to success in school, that children of better educated and wealthier parents on average receive, the effect of ability as a potential counteracting element to economic status is blunted. Where early education is privately financed, ability is an even earlier screening device. When the sacrifice necessary to continue the child's education is great and perhaps a choice must be made between two children, parents are more likely to support a child who is succeeding than one who is failing.

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1/ This is partially compensated for by the greater cost of land and other inputs in urban areas.
C. Resource Pool

When considering the effect of alternative methods of financing education on the pool of resources available for education, both short-run and long-run effects are relevant. In the short-run, two types of effects can be identified and dealt with separately. The first are effects on the nature of the resource pool given an assumed overall level of support, that is, holding the size of the pool constant. Second are the effects on the size of the resource pool itself. In the long-run, there can be consequences resulting from deferred payments for education or alteration in supplies or demand of labor.

The financing method will have several effects on the mixture of resources utilized in education. Whether financing is through public or private sources can affect the type of individual attracted into the education industry as teacher or administrator. Public sources typically imply greater rigidity and bureaucracy than private sources. Public sources also imply greater security of position. Each of these factors has its correlates in positive and negative attributes of people who are attracted by them. Within the public source category, general sources usually imply less riskiness of job than do specified revenues.

The source could also have an effect on the capital and materials entering into education. Because of differences in competitiveness and time horizons, public sources would more likely be invested in more expensive and permanent buildings and equipment than funds from private sources of finance. Thus, for a given budget, private sources may support a greater quantity of education, as defined by numbers of students, and public sources a great quality, as defined by expenditure per student. The reasons for this are important enough to discuss in some detail.

In LDC's education is a service which has several attributes which make it complicated for economic analysis. It is usually provided mainly by public authorities; it has a great deal of appeal in terms of the status its consumption bestows on the student and his parents; its demand is to a degree derived in that some of the desire for it is predicated on its ability to increase the earnings potential of the consumer; and its output is extremely difficult to evaluate in economic terms. Given the hopes that parents put on education in terms of prestige and future earnings (in which, given the extended family system prevalent in almost all LDC's, parents share), there is a strong tendency not to criticize the system's quality, the main exception being that criticism will arise if the earnings expectations are not met. Given this, and noting that public expenditures are typically under much less pressure to be economically processed than those which face the test of competition in the market, expenditures on education which are supported by direct private methods are likely to have stronger cost conscientiousness applied to them. For example, instead of having students riot when asked to sleep two in a room (as those who were completely financed by government in Kenya and Ghana did), one might expect student initiative for cost-saving
changes if the costs were financed from private sources. LDC's are notorious (especially African countries) for having education, and in particular higher education, which is more expensive than that provided in developed countries, not only relatively, but absolutely. 1/ Within the private finance category, financing through fees with loans is likely to create more pressure for low-cost education than financing through fees alone. This results from the different mix of students that the two systems would bring into education. Fees with loans would bring in more students from poor families than would fees without loans. Such students are more likely to be acutely aware of the costs to themselves of their education than those from rich families.

The final short run effect on the nature of the resource pool would be on the students. Here there is an effect on the economy at large as well as the educational sector itself. The effects of the various financing methods on the mix of students of various backgrounds has already been discussed above. However, we have not yet discussed the psychological and cultural effects on the students themselves. President Nyerere of Tanzania suggests that education:

must encourage the development of a proud, independent and free citizenry which relies upon itself for its own development, and which knows the advantages and the problems of cooperation. It must ensure that the educated know themselves to be an integral part of the nation and recognize the responsibility to give greater service the greater the opportunities they have had. 2/

Nyerere is arguing for a system of finance which incorporates a great deal of, if not complete, support through the labor of students, in particular in cooperative undertakings. However, it could be asserted that all methods of private finance will have an effect on students in the direction desired by President Nyerere. Even direct parental payment of education costs would undoubtedly lead to some such pressure on students.

The effect on the economy at large would be in terms of the labor resources likely to be made available during the period of education. In a privately financed program of education, great pressure would be put on students to undertake productive labor during vacation periods and on a part-time basis. Indeed, in a country which utilized a private financing source for education, there would be some likelihood that an alteration of the school year would also be launched in order to ease the process of

1/ See, for example, W. Arthur Lewis, "Education and Economic Development", Economic and Social Studies (June 1961) or Netherlands Economic Institute, op. cit.

2/ Nyerere, op. cit., p. 25.
students working to support their expensive "habit" of education. For example, vacations might be staggered so as to permit students to permanently fill certain work slots in the economic system. 1/ Such a program might, as a side effect, also conserve on other resources going into education. In addition, it would make the choice between work and education a clearer one for the community and the individual. At present, it often appears that education is a free good except for foregone earnings, and an individual would therefore be foolish to turn it down in favor of work. If the education were privately financed or financed through a direct government grant to cover tuition costs, the potential benefits of education relative to its costs could and would be more rationally compared to the benefits and costs of other alternatives such as work, apprenticeships and on-the-job training, the choice of any of which would increase the supply of labor in the economy.

The short-run effects on the size of the resource pool can also be substantial. Taking the demand for education of each individual in a society as given, it has been shown that under certain assumptions the resources devoted to education will be greater under a program of mixed private and public financing than under either one taken alone. 2/ The logic behind this result is that some people will be forced to support public education at a higher level than they prefer because of the power to tax they have vested in government. Those who wanted to spend more than the privately-supported level are still able to do so. Thus, the total expenditure is greater than would be found in a purely publicly-supported system (those desiring heavy educational consumption would be thwarted) or a purely private one (those wishing to spend little on education would not be forced to spend more). That is a description of the resources under a private fee system and/or a public system. If a loan system were added, the resource pool would be increased even more in that those who desired more education but did not have the ability to finance it directly and could not borrow it because of imperfect capital markets would be able to borrow and, therefore, would also increase their consumption. Finally, the resource pool might be larger if education were financed from earmarked public funds rather than general funds. This would occur if the public demand for education were very strong, so that such specified revenue for education as lotteries or higher levels of earmarked taxes would be supported at times when sources utilized for general government expenses would be unsupported. 3/

1/ See Department of Economics, University College Nairobi, "The Use of the University: A Proposal" (Nairobi: Mimeo. 1968) for a rationale and description of such a system.

2/ William Craig Stubblebine, "Institutional Elements in the Financing of Education", The Southern Economic Journal (July 1965 Supplement). He assumes a society in which decisions are made by simple majority within a fixed fiscal system, all people are welfare maximizers, and all people are equally endowed with capital and income. His results probably hold when many of his assumptions are relaxed.

3/ That this can work in the opposite direction is seen by the recent wave of education-supporting bond issues and tax bill increases which have been voted down in the United States; see, for example, U.S. News and World Report (December 9, 1968, p.11).
Only those long run effects of alternative financing methods which would not be included in a simple summation of the specified short run effects are discussed here. First, working to finance the costs of education would affect the supply of labor. The direction of the effect would depend on whether the total time spent in study were increased more or less than the time spent working during their period of education. The supply of labor would be decreased to the extent that the private financing, especially through loans, caused a brain drain. Loan finance would undoubtedly lead to a marked brain drain which could only be relieved if some ironclad systems were developed (such as bonding which was internationally accepted as binding or a system of international restrictions on student movements) to assure that students did not evade their responsibilities. Even fees without loans would lead to a greater proportion of the students, at the higher levels especially, taking their education abroad. A certain proportion of these are bound to find foreign climes to their liking and migrate permanently.

Secondly, if the increased responsibility for their own education which is associated with private methods of finance successfully makes better students and citizens, private finance can lead to more productive laborers in the long-run. Indeed, many feel that education which is interspersed with work experience will bear better fruit in that students will be able to more soundly approach the theoretical parts of their studies after they have been exposed to practical problems of work. That such a mixture can be effective at all educational levels is indicated by the learn-by-doing system of education at the primary level and the mandatory summer field experience in, for example, various university engineering courses.

Thirdly, given that expenditure on education leads to an increase in human capital, the supply of capital would be increased through any program of private or mixed private and public educational finance. As long as the proportion of private expenditure that comes at the expense of consumption is more than the proportion of educational expenditures which could be classified as human capital, this proposition holds. When education is financed by loans, the increase in capital is probably even stronger in that the loan repayments come out of private earnings and go into the government coffers. This second thesis does not hold if educated individuals have a higher propensity to invest in capital out of marginal income than does the government (a position which is not easily refuted due to lack of facts on either side of the issue).

Some argue that in LDC's private educational expenditure comes at the expense of physical investment and argue against the extension of educational opportunity on this basis. While there undoubtedly is some truth to this allegation, the general proposition asserted above is not nullified by it. See Edward Denison, The Sources of Economic Growth in the United States and the Alternatives before Us (New York: Committee for Economic Development, 1962), p. 78.
Finally, the method of finance can have an independent long-run effect on the size of the resource pool available for education. In particular a loan program for educational finance will increase the resource pool, assuming that repayments are allocated to education and the level of current support is not affected. The effects of such programs are not substantial at first but can build up to important proportions after a number of years. The timing and the overall size depend on the specifics of the particular program. In a study of a loan program for university students in Kenya, it was shown that under certain assumptions the entire recurrent cost of the university could be met by loan repayments within fifteen years of the institution of the program. 1/

D. Quality of Education

The first difficulty in any attempt to discuss the effect of the method of educational finance on educational quality is that no agreed-upon definition of educational quality exists. As one scholar, Harold Clark, put it, "There are almost as many definitions of quality in education as there are persons discussing the problem". 2/ The most common indices utilized for measuring educational quality are expenditures per pupil, measures of rates of student progression through courses of study, and objective tests of pupil achievement. Expenditure per pupil is a measure of inputs rather than outputs. Measures of student progression (percentage who drop out, percentage who graduate, and average length of time to completion) are deficient as measures of quality since they depend in part on the level of performance required for progression through the system. Objective tests, while having grave problems in design and execution, are the sole remaining option.

An ideal type of quality measure would be a set of quantifiable objectives for the educational system combined with instruments to test the standings of students at the beginning and end of an educational cycle. While many countries do employ testing in their schools to an extensive degree, the area of the testing is typically narrow in terms of the many objectives for education that are hoped for. It is also extremely difficult

1/ Daniel C. Rogers, "Student Loan Programs and the Returns to Investment in Higher Levels of Education in Kenya", Economic Development and Cultural Change (Forthcoming). This result was found for several alternatives: full cost repayment on either a ten or twenty-year repayment program at seven percent interest or a ten-year repayment program at zero interest (a seven-and-a-half percent default rate assumed in all cases). The revenue generated from lifetime repayment programs (fixed amount and percentage of earnings) was also calculated.

to make comparisons across cultures. 1/ Another type of quality measure looks to the performance of the students in the economy and society. This also is extremely difficult to put into practice, although attempts have been made to do so. 2/ These types of measures are quite disparate and none is very satisfactory. We specify a definition of quality similar to Clark's: efficiently accomplishing whatever ends aimed for. However, the definition is only stated for clarity of exposition; it is not operational in that no measuring instruments are supplied. 3/ For purposes of the following discussion, it is assumed that some definition of quality has been satisfactorily specified.

The effect of the finance method on the uniformity of quality is considered first. The dispersion of quality can be measured in terms of variance of means of students across schools and variance among students within schools. Public sources of finance should imply less variance of means across schools and more variance within schools than private financing sources. Few governments maintain a policy of treating various of their citizens unequally. Therefore schools in all areas should be similar in their resources and their students. Similarly, each school should enroll a complete cross-section of each age cohort. In actuality, however, publicly financed schools often encompass a wide disparity of quality across schools, and public authorities often finance schools for special purposes which have homogeneous student bodies. 4/ For the most part, inter-school variability of publicly-financed education can be explained by local finance and control of the schools. With local control, differences in wealth and population among localities are reflected in the quality of the public schools. Nevertheless, the generalization of greater variance across and less variance within privately-financed schools probably holds.


2/ Studies of numbers of Nobel Laureates, Who's Who, etc., by school.

3/ If the objective is clearly defined and narrow enough it is possible to specify a quantifiable measuring instrument. For example, if the objective was turning out the number of degree holders in various fields that the manpower plan called for, the quality of the system could be measured by the percentage of the required number of degrees granted in each year.

4/ Guy Hunter asserts that "the best secondary schools are usually in or near towns...", Modernizing Peasant Societies: A Comparative Study in Asia and Africa (New York: Oxford University Press, 1969) p. 249. Alliance High School near Nairobi and the Bronx High School of Science in New York are two examples of well-known, extremely high quality public schools.
Private sources of finance would likely lead to a greater variance in the resources per school and greater uniformity of students within particular schools since parents have different means at their disposal and different demands for education. On the other hand, private finance would lead to greater variance in student quality at the higher levels of education if the size of the system were taken as a given. This would result from the truncation of the pool of eligible students, due to the inability of poorer families to finance the education of their children. The group of students with the best records in the lower levels of education would undoubtedly have a wider range of inherent ability since some of the highest ability children from poor families would never have entered the competition.

A system of mixed private and public finance can have the greatest variance of all. Privately financed schools in such a system could siphon off the most affluent of the potential student body, thereby reducing the political support of these wealthier families for the financing of the public schools. Their support would fall for two reasons: the expense of private schools would be a drain on their resources and their children would not be directly affected by the quality of the public schools. Thus, a bi-modal distribution of quality could be created with one of the peaks being at a lower level of quality than the peak frequency in an exclusively privately-financed system (see Figure 2). On the other hand, in such a system, the privately-financed schools could be themselves bi-modal. Such is the case in Kenya, for example, where high-quality private schools exist side by side with privately-financed schools which take students who could not obtain places in the public schools because of their grades. These latter schools are typically poorly financed which, when combined with low ability students, almost assures a low quality education. 1/

The effects on the mean quality of education are also of interest. As was discussed in the previous section, there can be an effect on the type of materials and capital acquired which, in turn, could imply different levels of quality for a given amount of support. In addition and more importantly, one might expect a higher quality educational system from either a private or a mixed public-private educational system than from a public system of finance due to the greater probability of competition in the former system. 2/ It is possible but not easy to create a competitive atmosphere in a publicly financed undertaking. Many have suggested means by which

1/ The private schools referred to include not only the non-profit Harambee schools but also many profit-making schools.

2/ Increasing competition in a system which does not approach pure competition is not necessarily a move towards optimization. However, it is our judgment that in the case of education it would be a positive step.
competition might be brought into publicly financed education in the United States and the United Kingdom, for example, but these suggestions have only been translated into action to a very limited extent. (This topic will be discussed further below under the heading of internal educational efficiency.)

The stimulus of competition is important for the quality of any good or service. This is true of competition within the public sector, the private sector and between the two. For example, many would point to the competition from private mail companies as one strong factor in pushing the public mail system in the United States towards what little progress it has achieved in increasing quality. 1/ Competition between government units such as cities can lead to better ways of providing services, and competition between firms can lead to better mousetraps. Thus, a system which increases the competition between schools (competition already exists to a certain degree in the form, for example, of student and faculty recruitment and of several textbooks being produced for each of various courses) could lead to greater mean quality.

In addition to the distribution of overall quality, some effects of the financing system can be expected on quality in terms of meeting specific objectives. Two such objectives are the creation of skills which will contribute to economic development and the furthering of the process of political socialization. The effect of the financing system on the quality of the former has already been referred to in discussing the competitiveness of the system and the composition and attitudes of the student body. The latter consists of fostering the attributes which characterize national states -- citizenship, common mores, and unity. Many have claimed that the primary justification for a public system of education is its integrating effect on the people of the country. This has been argued time and time again by commentators in the United States and the United Kingdom, for example, as well as in the less developed world. 2/ The arguments for public support are typically in terms of maximizing the distribution of education rather than the quality of the socialization achieved, although it is recognized that the distribution itself can have an effect on the quality. That is, heterogeneous student bodies lead to a better appreciation and understanding of political and social problems than do homogeneous ones, as these topics by their nature require a hearing of the ideas of as many segments of society as possible. There is no particular reason to believe that privately financed education would be less successful than publicly financed education in producing socialization other than the distributional factor, which is undoubtedly a major one.

1/ A paragovernmental postal system has just been created in the United States. Private services are proscribed from many activities thereby limiting the possible competition.

E. External Efficiency

Maximizing the external efficiency of education in LDC's is possibly the most important task facing educational planners. The external efficiency of education is determined by the match of the manpower needs of the economy with the education given to students coming out of the educational system and by the effects of the educational system on the economy in general. External efficiency is affected by decisions on the mix between general and specific education, the mix of students at the different levels of education, the mix of specific subjects studied by the mass of students, including the content of the subjects, and other factors affecting the economic system.

The method and source of finance does not have much direct effect on the specificity of education; rather this is primarily a result of the particular model on which the educational system is patterned. However, the more diverse the sources of finance, the greater the probability that a variety of degrees of specificity of education will coexist. In a British type educational system, for example, specialization comes much earlier than it does in a system like that of the United States. With diverse means of finance, individuals with background in both educational approaches might be developed due either to some students being educated abroad or some schools having the freedom to choose a model other than the one dominant in the country. One sees mixed educational systems in many countries which have received both bilateral and multilateral aid.

One avenue by which the method of finance can have great effects on the external efficiency of education is in utilizing different methods for different levels of education with the objective of attaining the best mix of student output. For example, if there is an oversupply of secondary school graduates, the method of finance could be made such as to reduce the demand for that type of education, say, by introducing full cost fees in place of tuition free, tax supported schools.

The financing method also has great potential for affecting the occupational mix of students. Privately financed schools must cater to the educational demands of the students but public sources of finance allow control over the type of places made available in the school systems. While such control is subject to the political approval of the citizenry, it is an important avenue which policy makers can utilize to improve external efficiency.

External efficiency also can be promoted by manipulating the availability and extent of various sources of finance. For example, if fees are charged to finance or help finance education, the level of fee charged for particular courses of study could be inversely related to the needs of the economy for students with the various backgrounds. Similarly, if scholarships or loans are utilized to finance the charges for education, the quantitative extent of their availability and the terms on which they are dispersed could be manipulated to encourage the mix of course enrollments which would lead to the greatest external efficiency. For example,
scholarships for agronomy or loan funds for veterinary medicine would make these courses of study more attractive than others lacking such financing. Several organizations created to manage student loans for higher education in Latin America use manpower requirements as one of the main criteria for the award of the loans. 1/

While the scope for such actions is greatest at the higher education level, it is important to realize that earlier stages of education need to be acted upon also if this method is to be maximally effective. In Tanzania, for example, government actions aimed at maximizing external efficiency through control of the number of places and the availability of finance for different courses of study at the higher education level have been impeded by a lack of suitably trained science candidates coming from the secondary schools. 2/

The match of the quality of student output with the needs of the economy for quality is also a factor affecting the external efficiency of the educational system. Just as with quantity objectives, efficiency can be promoted by turning out individuals who have the levels of quality that best fit into the economic and social structure. The financing of education can be geared to aid this goal by avoiding both overeducation and undereducation. For example, charging full cost on a current basis would certainly discourage the production of medical doctors relative to the production of medical technicians.

1/ "So as to benefit the nation as well as the individual, ICETEX (Instituto Colombiano de Credito Educativo y Estudios Tecnicos en el Exterior) has established a system of priorities which grants loans first to students pursuing training for which there is an evident need in Colombia." ICETEX, Board of Directors, A Tool for the Overall Development of Colombia (Bogota: Prensa Nacional, 1966), p. 21; "The fundamental criteria for granting educational credits by the FCE (Fundacion de Credito Educativo), is at present, based on intellectual capacity, the lack or inadequacy of economic resources of the concerned parties, and the importance of their respective disciplines for the country's development programs." Altagracia Perez Pena, "Report on the Financial Situation of Higher Education in the Dominican Republic and the Present and Future Role of the Educational Credit", II Congreso Panamericano de Instituciones de Credito Educativo (November 23-26, 1969, Caracas, Venezuela).

The type of education supplied can also be more radically affected by the method of finance. A proposal by Ivan Illych, for example, would give each youth an education voucher good for an amount equal to the current total government expenditures on education at all levels divided by the population in the cohort. Not only does this proposal have drastic implications for the equalization of education opportunity, but it would also allow education to be purchased at any time during a lifetime. This would undoubtedly radically change the type of education supplied. One would expect more adult and teenage education and more vocational education, all coming at times of life when the schooling might be more meaningful due to other experiences, especially work experiences, which the individual could bring into the classroom with him. To the extent that education "purchased" under such a program were more meaningful in its contribution to productivity, this would contribute to external efficiency. While this is more a matter of the distribution of the finances going into education than the method of generating those finances, only a public source could be distributed in this manner.

A second reallocation possibility is increasing the supply of adult education relative to that of formal, continuous education. Such a change can be accomplished by the diversion of funds from one type of education to the other. The practicability and effect on external efficiency of this type of change is being determined in about a dozen countries in large pilot projects sponsored by the United Nations Development Program under the direction of UNESCO.

F. Internal Efficiency

The encouragement of internal efficiency within education is another extremely important concern for LDC's. Given the general scarcity of resources in LDC's, it is essential that the utmost be done to conserve and utilize effectively those resources which are allocated to the educational sector. Although many suggestions for improving internal efficiency in education in both developed and less developed countries have been presented in the literature, they do not usually pertain to the source of the financing of education. Nevertheless, the source of finance can and does play a role in determining the level of internal efficiency in education.


2/ The first three projects are in Algeria, Mali, and Iran, and are due to be completed in 1970 and 1971. The UN is contributing $3.8 million and the three countries $9 million. For further description of these see "Three Projects in Functional Literacy", UNESCO Chronicle (March 1966). Other projects were begun after these three.
The most pervasive potential effects of the financing source on internal efficiency of education are indirect, acting through influence on the incentive system within the education sector. Suggestions about new financing methods which act upon the incentive system in education abound. Incentives to administrators, teachers, and students have all been proposed as methods of increasing internal efficiency.1/ These incentive systems typically affect the distribution rather than the collection of educational resources. However, it is possible for one source of finance to fit more easily into these systems than another. For example, the civil service tradition in most countries of equal pay for equal jobs is definitely an inhibiting factor vis-a-vis the institution of a program of paying teachers on the basis of the performance of their students. Evidence from the United States indicates that large school systems have not found merit pay feasible as often as small ones.2/

Thus, direct private finance of education, which implies relatively little administrative burden, might make the institution of "merit pay" systems a more practical possibility.

A second area of possible influence of the finance method on internal efficiency is in the extent of resource utilization. The practice of having long vacations during which the physical facilities of schools are not utilized to their normal degree is one example. Another is the short length of the school day in many countries. These periods in which buildings are idle and staff is underutilized have major effects on the overall efficiency of education. Here, too, it is possible that a financing method in which the costs of education are directly visible to the financers might encourage the financers to press for institutional changes leading to fuller utilization of the educational resources.

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1/ Incentives to administrators are implicit or explicit in various programs of utilizing vouchers good only for education and given to parents to be used wherever they think best (see footnote 1, p. 32 for sources). Incentives to teachers have often been suggested and have been labelled "merit pay" systems by some. For descriptions of such systems see Virgil Rogers (ed.), Do We Want "Merit" Salary Schedules? Report of the Second Annual Workshop on Merit Rating in Teachers' Salary Schedules (Syracuse: Syracuse University Press, 1960), or Stayner Brighton and Cecil Hannan, Merit Pay Programs for Teachers, A Handbook (San Francisco; Feardon, 1962). Incentives for students are being experimented with in the United States with some success, utilizing, depending on the age group, such awards for good performance as free periods, money, and cigarettes.

2/ Brighton and Hannan, op. cit.
A third area in which there are possibilities of increasing internal efficiency is in taking advantage of economies of scale. 1/ The method and source of finance can influence the degree to which such economies are taken advantage of in two ways. First, the directness of the financing to the interests of the students and their parents, which has been mentioned several times, may have an influence on their willingness to apply pressure on behalf of efficiency. Second, if more than one type of finance exists, implying the possibility of more than one school of a given level in a given community, inefficient fragmentation of the school population may result. 2/ This is one of the few arguments for a centralized, unitary system of financing of education that we have found so far.

In order to achieve a high level of internal efficiency, it is necessary to practice planning. Planning on a national scale can help insure consistency in the actions taken which affect the resources allotted to the educational system. Similarly, planning at lower levels can markedly influence the degree of internal efficiency of the educational units involved. A centralized, unitary educational system allows for the greatest ease in planning. Of course, there is nothing which prohibits a unitary system from drawing on several sources for its finance. Indeed, this is just what, for example, the Commission on National Education for Pakistan recommended in its Report to the President. 3/

1/ On theoretical grounds one might expect a u-shaped curve between cost per pupil and number of pupils in a school or school system. That such a pattern can be found has been shown empirically in the United States and is accepted in LDC's as well. For United States evidence see John Riew, "Economies of Scale in High School Operation", Review of Economics and Statistics (August 1966), and Walter Hettich, "Equalization, Grants, Minimum Standards and Unit Cost Differences in Education", Yale Economic Essays (Spring 1968). Professor S.A. Aluko says, for example, "The larger the school, up to a point, the cheaper the cost of education per pupil" from "Public Finance and Education in Nigeria" Public Finance (1966), p. 296, and Hans Thias and Martin Carnoy show that "In terms of per pupil expenditure, the economies of scale in the 120-130 range [students per primary school] are considerable ..." Cost Benefit Analysis in Education: A Case Study on Kenya, EC-173 (Washington, D.C.: IBRD, 1969) p. 44.

2/ Professor S.A. Aluko asserts that "In Nigeria, the existence of rival missions has led to the existence of two or three primary schools in a locality or village where there should be one .... the cost of primary education is increased, as non-viable and partially full schools are maintained..." p. 295, op. cit.

Any system that cuts wastage contributes positively to the internal efficiency of education. Since three or four years of schooling are typically required to establish permanent literacy, high dropout rates during the first years of education imply a complete loss of resources. One would expect that a system of financing through fee payment would have the highest rate of wastage, ceteris paribus. The inclusion of a loan program would decrease the wastage and a system of finance that was not tied to the consumption of education would have the least wastage, other things, especially quality of education and effort of students, being equal. However, it has already been argued that student effort, for one, would be higher under a system of finance which had a direct connection with the consumption of education. Therefore, other things probably would not be equal.
V. Conclusions and Recommendations

The crucial problem for educational finance in LDC's is how best to generate the resources for education which are required to meet the politically potent social demand for education. Behind the phrase "how best to" are the potentials for utilizing the financing method for achieving efficiency and distributional objectives. The main conclusion of this study is that any method of finance which does not either require an increase in general taxation or draw public resources away from other development tasks is desirable. In particular, fees, fees combined with loans, and earmarked taxes are all methods of financing education worthy of careful consideration.

For higher levels of education, a system of tuition at full or partial cost level in combination with a program of loans to students has the best set of economic effects in the context of most LDC's. From the point of view of equity and income distribution, this prevents the anomalous situation of peasants earning a few hundred dollars per year being taxed to support young men and women at a university at the cost of a few thousand dollars per year. With such a system of finance, no one would be prevented from consuming higher levels of education on strictly economic grounds, except if the overall educational system were such that those with less means tended to be screened out of the system before reaching the level where loans were available. It is also equitable in that it ties the payment for education to the direct recipients of its benefits. When education is supported by taxes, for example income taxes, all individuals participate in paying for the education of the few regardless of whether or not they have been able to take advantage of educational opportunities.

A fee-loan combination can contribute to the internal efficiency of education in that a large group is formed -- the students -- with a vested interest in seeing that costs be kept as low as possible. It can also lead to increased internal efficiency in the sense of an improvement in the educational quality realized with a given amount of resources. This can result from attitudinal changes in students who face the responsibility of repaying a sizeable loan.

A loan program can be an instrument for affecting external efficiency as well. Loan funds might be specified as to their allowed use in terms of school or type of course. More funds could be made available for those courses of study deemed most needed by the economy. This has an advantage over merely limiting the number of places in each course of study according to perceived manpower needs in that those with the ability and willingness to pay for a specific course of study are not absolutely barred from pursuing it. Thus, the market is given more room for approaching an optimum position. At the same time, the market is allowed to act in a way which would alleviate the seeming paradox of increased demand for schooling and increased unemployment of school leavers. One of the main causes of this seemingly irrational combination is that the full cost of the education is not being met by the student -- the state is heavily or completely subsidizing the education. The real mystery is why the state does not stop
such inequitable practices. 1/

The only possible economic objection to compelling students to contribute to the support of their education would be based on the assertion that the proportion of physical capital investment from the earnings of those with high levels of education is significantly greater than the proportion of marginal future tax dollars that the general taxpayer would invest. Thus, it might be argued, such a financing system would lead to lower investment in physical capital. Whether or not this is a valid argument has never been shown empirically.

The Kenyan and Taiwanese experiences, to take two examples, demonstrate that a straight full-cost tuition scheme for financing education is possible. In both of these countries the private school system coexists with a free or low-cost public system at most levels. In Taiwan, the private senior secondary school (grades 10-12), junior college, and college/university systems are mostly profit-making. Nevertheless in 1968 they enrolled 33%, 72%, and 52%, respectively, of the total enrollments of those levels and were growing faster than the public schools. 2/ In Kenya, fees account for 27% and 42% of the total recurrent primary and secondary school costs, respectively (1968/69). 3/ Almost half (46%) of the secondary school enrollment is in non-profit private schools ("Harambee" schools) and another 6% is in aided schools. These examples demonstrate that fees can be the backbone of the financing method for education on a broad basis.

It has been asserted that the difficulty with fees as a method of finance is that it reinforces elites by making education more difficult to attain for those from the lower economic groups. This is absolutely correct. Therefore, we would not recommend the establishment of fees unless it were coordinated with a program to ameliorate the negative effects on the distribution of education. At the primary school level variable fees inversely related to income could succeed in extracting resources without cutting off the bottom part of the income distribution from educational opportunity. A variation of this is utilized in Kenya and Tanzania, for example, where a fund is set aside so that fees can be waived for those unable to pay them.

1/ There is no question but that the institution of tuition where none existed before is a politically unpopular action. On the other hand, a sensible propaganda campaign pointing out the distributional effects of such an action should be able to generate widespread support.


The experiences of Taiwan, Kenya, and Tanzania, for example, could be fruitfully studied in order to ascertain the effects of these financing methods on the economy, the educational system, and the people. In particular, a study of the effects of these programs on the distribution of education would be most useful to other countries contemplating such finance methods. The experiences of Latin American countries can be especially helpful here. While loans for secondary students are not now under discussion, twelve Latin American countries and the Organization of American States have loan programs for students in higher education. The oldest of these, the Colombian Institute of Educational Credit and Foreign Technical Studies (ICETEX) was legislated into existence in 1950 and made its first loans in 1953. Some of these institutions are quite new and relatively small like El Fondo de Prestamos a Estudiantes in Honduras -- "Educredito" -- which made only 17 loans in 1968. Others, like ICETEX, are well established and have made loans to a significant proportion of all those who have achieved higher education (26 percent as of 1969).

These institutions, who had their Third Congress in August 1970, could be fertile ground for a thorough review of the economic effects of credit as an educational financing method. ICETEX has undertaken some such analysis and the apparent effects on the distribution of education among income classes and the external efficiency of the higher education system seem to be particularly good. For example, in the four-year period of 1960-63, 44 percent of all graduates had studied in the scientific and technological fields while in the previous forty years the percentage had been only 29.

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1/ For descriptions of all but one of these, see: Organization of American States. El Credito Educativo en America (Washington, D.C.: O.A.S., 1970). The countries are Argentina, Chile, Colombia, Costa Rica, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, the Dominican Republic and Venezuela.


4/ Derived from Board of Directors, Colombian Institute for Advanced Training Abroad, op. cit., p. 39.
Consequently, one activity the IBRD might profitably undertake would be to sponsor a research project which would include visits to each of these institutes in order to gather as much economic data about their experience as possible. In particular, information should be extracted on the impact of the programs on aggregate educational expenditure and the government budgets, repayment records, the effect on the distribution of students in the various possible courses of study, and the distribution of students in terms of their family income level.

Such information would be invaluable if the IBRD were ever approached with a proposal for a loan to finance the inauguration of a large-scale revolving student loan program. Such a program could be self-perpetuating in that the repayments would finance future students. Also, it has been the experience of ICETEX and others that private persons, foundations and businesses find it an attractive vehicle through which to channel donations for student loans and scholarships.

One of the most important types of data for analyzing or assessing the economic impact of alternate methods of financing education that is not now available is how the marginal resources utilized for education would be distributed if education were expanded or cut back. This is crucial for determining the impact on income distribution, on the distribution of education, on the growth effect of education, and even on the external efficiency of education. It is, therefore, proposed that a study be formulated with the objective of determining this information in some sample country or countries. There are several possible ways of generating this information, none of which is particularly easy to accomplish.

First, one could find two areas which are similar in the distribution of family income or farm size and quality, but have different average educational expenditures. The differences in family investments and expenditures could then be found and they could be attributed to the differences in educational finance. A problem with this approach is that some social scientists hypothesise that a greater desire for education is manifested in an effort to increase personal income in order to pay for it. That is, one's needs determines one's income. If this were the case, matching two groups by their income level would be picking dissimilar rather than similar sets of individuals. Perhaps, then, size of farm of a given quality would be better than income as a sampling criterion. Secondly, one could compare the earnings and expenditure patterns of families of students who are financed in different ways -- for example, students on bursaries versus those who are not. Thirdly, the earnings and expenditures of similar families that have different numbers of children of school age could be compared. Other such experiments could be devised.

On a macro level, sectoral shares of GNP or GDP over time in a given country could be studied to see if any obvious relationship between the shares of education and other items in GNP is evident. The share of
education in GNP has been growing markedly in many countries during the last decade. However, since the growth seldom amounts to more than a couple of percentage points, it is difficult to isolate the effects of the growth of education expenditure from the effects of other structural and cyclical changes in the economy. Nevertheless, it is possible that a trend could be seen in government expenditure because education typically is mainly public and constitutes a much larger proportion of government expenditures (often about five times as great) than of GNP.

Whatever the results of such investigations proved to be, our knowledge about the economic impact of financing education would be significantly improved. The controversy of what educational expenditures replace in a budget would enter a phase in which more than pure speculation, intuition, or theorizing could be brought to bear.
APPENDIX I
Progressivity and Elasticity

There is often a match between taxes being progressive and elastic on the one hand or regressive and inelastic on the other. However, it is possible for a tax to be at the same time both regressive and elastic. For example, Chart I shows a regressive tax: as income increases, the percent of each individual's income that is taxed away decreases. Chart II, A and B, show two possible ways in which aggregate income could double over time. In the case of a change from I to IIA, the tax yield increases by less than a factor of two while the change to IIB yields an increase of greater than a factor of two. Thus, the regressive tax can be either inelastic (as shown by IIA) or elastic (as shown by IIB).

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APPENDIX II

Education Elasticities

The family income elasticity of education can be estimated in two ways. First, household expenditure survey data can be utilized. The elasticity, \( b \), in an equation such as \( \log E = a + b \log Y \) (where \( E \) is educational expenditure and \( Y \) is income) can be estimated through a regression. Table I shows the results of such analyses for a number of countries, all those for which sufficient data could be found. As indicated, the coverage of "educational expenditure" varies as do the dates of the surveys and the size and nature of the samples.

Second, the value of \( b \) in an equation of the following sort could be estimated through a regression: \( \log P_i = a + b \log Y \) (where \( P \) is the proportion of children in an income group who are in school; \( Y \) is median income of an income group; and \( i \) is an age group -- for example 6-12 or 6-16). This has not been undertaken as the data are not, to our knowledge, available. Indeed, this approach to the problem has not been suggested elsewhere. 1/ The data could be generated through a sample survey of households with a questionnaire of only a half dozen or so questions.

The former method, which we call the expenditure approach, determines the responsiveness of educational expenditures to increases in family income. An elasticity of greater than one implies that as family income increases, a more than proportionate increase in expenditures on education is made. It is impossible to determine whether this increase in expenditures is a result of more intensive (more expensive schools, more books, etc.) or more extensive (more years per child) expenditure by the higher income groups. On the other hand, the second approach, which we call the cohort approach, is an income elasticity explicitly for the extensiveness of education. It encompasses foregone earnings to a greater extent than does the expenditure approach in the sense that foregone earnings may be a prime determinant of school attendance but do not show up on household expenditure surveys. 2/

The family income elasticity of education is a useful datum for assessing the economic effects of education. Assuming that educational investment has a positive rate of return and that at least some of the private resources expended on education are substituting for consumption expenditures, an elasticity of greater than 1.0 implies that education is a factor contributing to an increase in income inequality. Indeed, even if the elasticity is below 1.0, it may be furthering inequality, the effect depending on the proportion of the expenditures that come at the expense of consumption,

1/ Discussions with Professor Barry Chiswick led to the development of this approach.

2/ Foregone earnings do enter into household survey data, but they affect the independent variable, income, rather than the dependent variable, educational expenditure.
the value of the elasticity, and the rate of return on educational investment relative to the rate of return on other investments. Similarly, the educational investment's effects on economic growth are dependent on the same factors.

It would be most interesting to compare the prices of education and relate them to the income elasticities that we have calculated. While we have not been able to accumulate sufficient information about these countries' educational prices in the years the surveys were undertaken to make these comparisons, one would expect that the higher the price, the greater would be the elasticity, as for most goods and services. If the elasticity differed markedly for countries with different price levels, it would be much easier to predict the impact of various possible financing reforms. For example, if a given increment in price implied a large increment in elasticity, to introduce fees as a method of financing education would be expected to greatly contribute to income distribution inequality. Therefore, in such a situation, it would be essential to concurrently introduce a sizeable scholarship and/or loan system.

Alternate family income elasticities and their effects on educational expenditure are depicted in Figure I. A greater family income elasticity implies a greater demand, given the distribution of income. We have calculated family income elasticities for rural areas for two countries, Spain and Mexico, and utilized elasticities already calculated by the analysts in Tunisia (Table II). In all three cases, the rural elasticity is much lower than the elasticity for the country as a whole and in the former two cases significantly less than 1.0. While the relative values of the intercepts differ for the two coverages in Spain and Mexico, in both cases the result implies a higher urban than rural expenditure.

Table III summarizes the relationship between costs (prices) and educational demand and income elasticity and educational expenditure. Finally, Figure II demonstrates arguments about price elasticity and demand.

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1/ Specifying the price level for education is not simple, even if substantial data are available. Presumably a weighted average of fees and other costs at each level of education could be developed for this purpose. The problems of comparing prices among countries with widely varying degrees of public subsidization of education still remain.
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Figure I - Income Elasticity of Demand for Education
Figure II - Price Elasticities of Household Demand for Education

Assume: 1. \( Pr > Pu \): as a result of more boarding in rural areas, fewer opportunities for economies of scale and more opportunities for productive work than in the cities where open unemployment is high.

2. Price elasticity is higher in urban \((Du_1)\) than rural areas \((Dr)\): in rural areas education is considered a necessity due to the lack of other things to put hopes into.

3. Incomes are higher in urban areas: therefore demand curve starts at a higher price.

Therefore: \( Qu > Qr \). Even if elasticity assumption was reversed \((Du_2)\) the result might be unchanged as seen by \( Qu_2 \) versus \( Qr \).
Table I

Income Elasticities of Household Educational Expenditures

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
<th>Sample Local Coverage</th>
<th>Sample Size</th>
<th>Actual Mean Income</th>
<th>Education Expenditure Coverage</th>
<th>Number of Income Classes</th>
<th>Income Elasticity&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Coefficient Significant at:</th>
<th>R&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Burma</td>
<td>1958</td>
<td>Rangoon All</td>
<td>3550</td>
<td>Yes</td>
<td>Mainly school fees and textbooks</td>
<td>7</td>
<td>1.38</td>
<td>.01</td>
<td>.84</td>
</tr>
<tr>
<td>2. China</td>
<td>1954/5</td>
<td>All Wage and Salary Workers</td>
<td>1992</td>
<td>Yes</td>
<td>Children (7) Adv. Study (7) Total</td>
<td>0.89</td>
<td>0.92</td>
<td>.05</td>
<td>.76</td>
</tr>
<tr>
<td>3. Japan</td>
<td>1968</td>
<td>All All</td>
<td>5,525</td>
<td>Yes</td>
<td>Education</td>
<td>16</td>
<td>1.02</td>
<td>.01</td>
<td>.97</td>
</tr>
<tr>
<td>4. Jordan</td>
<td>1968</td>
<td>Amman Civil Servants</td>
<td>178</td>
<td>No</td>
<td>Private School Fees</td>
<td>8</td>
<td>1.35</td>
<td>.01</td>
<td>.97</td>
</tr>
<tr>
<td>5. Kenya</td>
<td>1963</td>
<td>Nairobi¹ Mid. Inc. 300</td>
<td>Yes</td>
<td>Sch. Fees 26</td>
<td>Mainly Sch. Fees</td>
<td>1.10&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.112&lt;sup&gt;2&lt;/sup&gt;</td>
<td>No</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>1963</td>
<td>Nairobi² Mid &amp; Low Inc.-300?</td>
<td>Yes</td>
<td>Sch. Fees 11</td>
<td></td>
<td>1.76&lt;sup&gt;3&lt;/sup&gt;</td>
<td>?</td>
<td>?</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>1963</td>
<td>Rural All Central Province</td>
<td>814</td>
<td>Yes</td>
<td>Sch. Fees</td>
<td>136</td>
<td>1.10&lt;sup&gt;4&lt;/sup&gt;</td>
<td>5%</td>
<td>.60</td>
</tr>
<tr>
<td>6. Mexico</td>
<td>1963</td>
<td>All All</td>
<td>7,249</td>
<td>Fees, textbooks-16 and special ed.</td>
<td></td>
<td>1.08</td>
<td>.01</td>
<td>.95</td>
<td></td>
</tr>
<tr>
<td>7. Panama</td>
<td>1952/3</td>
<td>Panama City All</td>
<td>449</td>
<td>Yes</td>
<td>Education fees, books &amp; equip.</td>
<td>11</td>
<td>1.47</td>
<td>.01</td>
<td>.96</td>
</tr>
<tr>
<td>8. Pakistan</td>
<td>1955/6</td>
<td>Dacca Industrial 1000</td>
<td>Yes</td>
<td>&quot;Education&quot; 9</td>
<td></td>
<td>?</td>
<td>.96</td>
<td>.10</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narayanganj Workers 126</td>
<td>Yes</td>
<td>&quot;Education&quot; 12</td>
<td></td>
<td>2.55</td>
<td>.05</td>
<td>.69</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Income Elasticity
<sup>2</sup> Significant at .01
<sup>3</sup> Significant at .05
<sup>4</sup> Significant at .10
<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>Year</th>
<th>Region</th>
<th>All</th>
<th>Yes</th>
<th>Expenditure</th>
<th>Estimation</th>
<th>Income</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Puerto Rico</td>
<td>1952</td>
<td>All</td>
<td>All</td>
<td>3,000</td>
<td>Yes</td>
<td>Educ.</td>
<td>2.43</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fees, eqpt.</td>
<td>.01</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&amp; books</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Spain</td>
<td>1964/5</td>
<td>All</td>
<td>All</td>
<td>20,062</td>
<td>Yes</td>
<td>Fees,</td>
<td>1.17</td>
<td>.01</td>
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<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Sudan</td>
<td>1963</td>
<td>All</td>
<td>All</td>
<td>572</td>
<td>Yes</td>
<td>reading</td>
<td>6</td>
<td>.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>materials,</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>school fees</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&amp; sch. eqpt.</td>
<td>10</td>
<td>.68</td>
</tr>
<tr>
<td>12</td>
<td>Tunisia</td>
<td>1965</td>
<td>All</td>
<td>All</td>
<td>7,147</td>
<td>No</td>
<td>school</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>materials</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1. Estimated by regression equation of the form \( \log E = a + b \log Y \) where \( E \) is expenditure on education, \( Y \) is family income and \( b \) is the elasticity.

2. Family size was also an independent variable. Taken from B. Massell and J. Heyer.

3. Taken from C. Howe, as reported by B. Massell and J. Heyer.

4. Expenditure elasticity, family size and degree of subsistence activities also used as independent variables. Taken from B. Massell.

5. Elasticity calculated from mean expenditures and mean educational expenditures across 50 provinces.

6. Income per family member elasticity of educational expenditures per family member.
Table II
Rural Total Income Elasticities of Education

<table>
<thead>
<tr>
<th>Country</th>
<th>Coverage</th>
<th>Elasticity</th>
<th>Significant at</th>
<th>Intercept</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>Total</td>
<td>1.16</td>
<td>.01</td>
<td>-1.48</td>
<td>.51</td>
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<tr>
<td></td>
<td>Rural</td>
<td>0.52</td>
<td>.01</td>
<td>0.79</td>
<td>.16</td>
</tr>
<tr>
<td>Mexico</td>
<td>Total</td>
<td>1.08</td>
<td>.01</td>
<td>0.36</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>0.54 ((&lt; 2,500))</td>
<td>.01</td>
<td>0.02</td>
<td>.57</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Big cities</td>
<td>1.28</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>.99</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

Sources: See Table I.

Table III
Educational Expenditure by Cost and Income Elasticity

| Cost  | Elasticity | High       | Low
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>(2, 3)?</td>
<td>(4) least</td>
<td>(less expend.)</td>
</tr>
<tr>
<td>Low</td>
<td>(1) most</td>
<td>(2, 3)?</td>
<td>(more expend.)</td>
</tr>
<tr>
<td></td>
<td>(more expend.)</td>
<td>(less expend.)</td>
<td></td>
</tr>
</tbody>
</table>


