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THE PERVERSE EFFECTS OF PUBLIC
SUBSIDIZATION OF EDUCATION
OR
HOW EQUITABLE IS FREE EDUCATION?¹

GEORGE PSACHAROPOULOS

PROVISION OF FREE EDUCATION at all levels is one of the most cherished political goals in modern society. In practically every country in the world, education—even when not absolutely free—is heavily subsidized by the State on grounds of equality of access for all citizens to this merit good.

Yet in this paper I argue that in reality free education is likely to have the opposite effect to the one advocated by politicians, namely that it might further aggravate rather than alleviate social disparities. The main reason for this perversity is that although education (say, at the university level) is free of charge to those who eventually enroll, enrolments have to be rationed by non-price means (like competitive examinations) because the number of university places is limited (especially in less advanced countries). The non-price allocative mechanism is inequitable because it favors students from well-to-do families who can afford the substantial direct cost of private preparation for the university entrance examinations and the indirect cost of foregone earnings while the student is at school. Furthermore, the absence of tuition charges increases the ratio of aspirants to entrants and thus boosts the gap between the demand and nearly fixed supply of university places. This creates the need for further non-price restrictions to entry, increases the number of unemployed secondary school graduates and inevitably contributes to social unrest.

The hypothesis that the present public finance system in education is inequitable has already been advanced and tested, especially in the United States. The equity aspect in these studies is arrived at by comparing distributions of those enrolled in higher education by family income to the distribution of taxpayers in general by income size and the number of their children in higher education. In this paper I investigate the equity aspect with emphasis on less developed countries and by relating the degree of subsidization to the inequality of the educational pyramid.² Thus the analysis in this paper is complementary to the existing literature inasmuch as it points to another aspect of inequality, namely unequal access to “free”

¹ I would like to thank Arnold Anderson, Mary Jean Bowman, Claudio Castro, W. Lee Hansen, Mats Hultin, Athena Kottis, Walter McMahon and Peter Williams for useful comments on an earlier draft of this paper.

² Arnold Anderson makes the point that the equity aspect arises not from the degree of subsidization but from its incidence.

higher education because of a school capacity constraint at all levels and especially at the tertiary one. In other words this paper looks at a non-monetary aspect of inequality, the necessary rationing of places and unequal access to higher education in the presence of subsidies.

In what follows we document a kind of myopia from the point of view of the electorate which is demanding free education in monetary terms, yet is willing to accept unequal entry to it. Perhaps this is due to the fact that it is the more articulate, high socioeconomic-status pressure groups who get a free ride (in terms of a further boost of their real income) relative to less advantaged groups who *think* they are better off with "free" education.

In section I we look at typical educational pyramids in poor and advanced countries and discuss the possible reasons for differences in shape. Accepting the steepness of the pyramid as an exogenous constraint, the imbalance between the supply and demand of university places is established by looking at ratios of entrants to applicants in a number of countries. In view of the existing unsatisfied demand for places, we briefly discuss the likely efficiency, employment and equity effects of a free-education policy.

Section II analyzes more rigorously the sources of the private demand for education in the presence of subsidies. Indices of the effective degree of subsidisation and educational inequality are computed for 64 countries and related to their level of economic development. The main finding is that university students are very heavily subsidised in poor countries, yet it is in these countries that access to higher education is mostly restricted by a variety of apparently non-price means.

In the last section (III) we analyze the implications of the perverse relationship between public subsidisation and educational inequality, and discuss alternative policies countries could adopt in this respect. It is argued that a pragmatic policy would be a combination of discriminatory charges in higher education (i.e. payment of the full cost by students from high land ownership families) and narrowing the starting differential between university graduates and less educated labour in the public sector salary scales.

I. PYRAMIDS OF DIFFERENT SHAPES

At any moment in time, the number of students in each level of education in a given country is the result of a combination of demographic, sociological, cultural, political and economic factors. Consider for example in Figure 1 the distribution of enrolments by level of schooling in two groups of countries that differ in their degree of economic development (Highly stylised from I.B.R.D. 1974, p. 17.) The distribution referring to developed countries (DC's) is characterised by a broad base and a flat peak. By contrast, the distribution of enrolments in less developed countries (LDC's) has a narrow base and a sharp peak. The reason for the difference in shape is that advanced countries have achieved over time nearly 100 per cent enrolment

ratios at the primary level and are less keen on selection up the educational ladder. The broad base in DC's is not so much the result of minimum schooling laws, as it is the stock of highly educated parents who push their children to acquire at least as much education as themselves. Thus, schooling norms become a tradition and the social demand for education (in a non-economic sense, if you wish), perpetuates itself from generation to generation.³ Furthermore, the existence of high per capita incomes allows the satisfaction of the social demand for places at nearly all levels for those who wish to pursue their studies.⁴

By contrast, the pyramid base in less advanced countries is narrow, as, regardless of the existence of a minimum schooling law, the provision of places at the primary level is not enough to cope with rapid population growth. Also, on cultural grounds, many parents are often reluctant to send their daughters to school beyond puberty. Furthermore, on economic grounds, primary school age children represent a labour potential the farmer is unwilling to impart. Lastly, the limited amount of resources makes expansion at the tertiary level very expensive, so that LDC's have to use a variety of selection procedures to check entry to university.

One could easily argue that, at any given point in time, the enrolment distributions shown in Figure 1 mainly reflect the supply side of the school system. Furthermore, the capacity of school places cannot easily change within, say ten (or even more) years as to significantly alter the shapes depicted in Figure 1. The first proposition becomes evident when one looks at the unsatisfied demand for university places around the world, especially in LDC's (see Table 1 below). The second proposition stems from the fact that, even if finance were not a constraint, (consider the oil-rich countries as an example) the time lapse between the beginning of an expansion exercise at the primary schools until it reaches the university level is considerable. And although many developing countries (especially newly independent ones in Africa) have tried a crash expansion of their tertiary level by building a number of new universities, the additional places provided have been a drop in the ocean in terms of changing the enrolment ratios because of population growth.⁵

Turning to the demand side, it might be useful to distinguish between three groups of students at the pre-university stage:

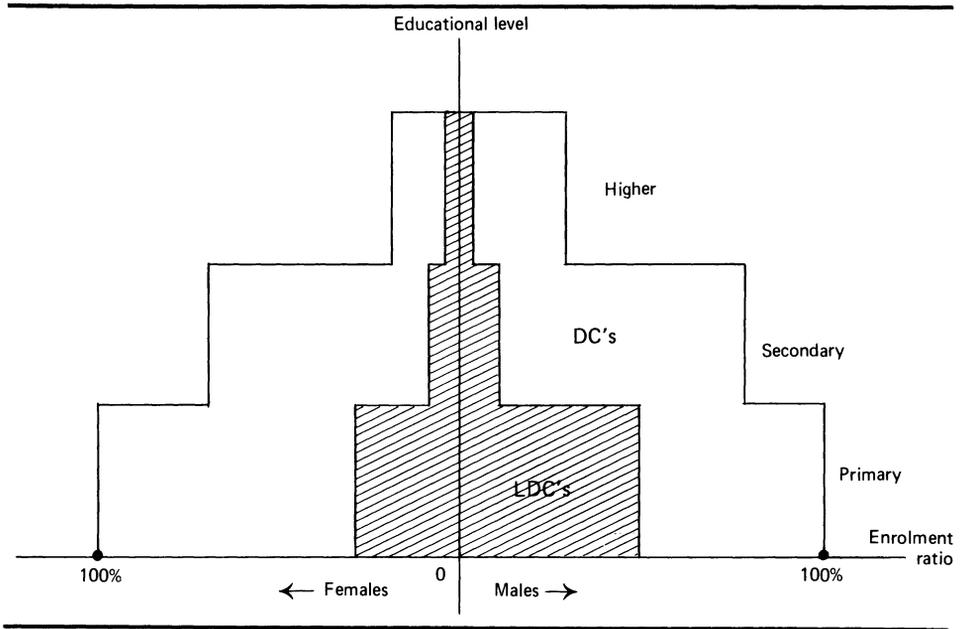
A. *Frustrated aspirants* i.e. those who have the academic talent and desire to pursue further studies but are driven out of the race for financial reasons.

³ This relationship holds even within an LDC. For example, 22 percent of students at the University of Nairobi in Kenya have parents with secondary or higher education, whereas this group represents only 2 percent of the population (Fields 1975, p. 248).

⁴ A typical example of this is the Robbins Committee (1963) philosophy for the expansion of higher education in England.

⁵ For example, between 1960 and 1970 the university enrolment ratio in the poorest country group has changed from 0.3 to 0.4 percent (I.B.R.D., 1974, p. 17, Table 2).

FIGURE 1. THE DISTRIBUTION OF ENROLMENTS BY COUNTRY TYPE



Frustrated aspirants do not even apply for university admission. Their earnings being so important to the family budget they start seeking a job at the end of secondary school.

B. *Applicants* i.e. those who have gone successfully through the school system up to the end of the secondary cycle and financially can prepare for university entry, can afford to forego earnings while studying and can bear any incidental costs related to their schooling. They express their effective demand for a university place by filling one (or even several) application(s) for admission.

C. *Entrants* i.e. those who eventually survive the selection process and enrol at the first year of the university.

The usual form of selection is tough examinations at the university entry stage. However, this apparently non-price selection for academic ability is bound to favor students from well-to-do families. For the cost of education is not only the annual tuition fees. Rather it includes the foregone earnings of the student while at school, *and* while he waits for entry, plus the cost of privately preparing for the entrance examination. These costs are by no means trivial and it is only students who can afford them that can enter the university entrance race in the first place. In Brazil, 75 percent of

all candidates for university places prepare privately. (Teixeira 1965, p. 22.)⁶ In Greece, it is quite common for someone to take the entrance examination three years in a row so as to get into a good faculty. In Kenya “one cannot simply decide to continue his education and do so. Rather, school admissions are highly competitive, the main criterion being performance on written examinations. . . . There is a great demand for education at all levels relative to the supply” (Fields 1975, pp. 246-47).

Therefore, regardless of whether education is offered free or not, a *de facto* price selection takes place which favors the rich. The fact that education is in addition provided free of charge, means that those who go over the selection hurdle are further subsidised. For example, 35 percent of students at the University of Nairobi in Kenya comes from families of high and middle level manpower, whereas these families represent only 3 percent of the population (Fields 1975, p. 248).

Measuring the imbalance. A true measure of the relationship between supply and demand for higher education in a given country would be the ratio of entrants to applicants *plus* frustrated aspirants. Of course it is very difficult if not impossible to establish the number of frustrated aspirants. An upper limit of the latter would be the number of secondary school graduates minus the number of applicants to higher education. For we do not know how many secondary school graduates would voluntarily prefer not to go into higher education because of tastes rather than lack of academic ability or financial opportunity.

Therefore, a measure that would *understate* the imbalance between demand and supply for university places would be the ratio of entrants to applicants.⁷ Table 1 shows such ratios for 13 countries. Acceptance rates are well below the 50 percent mark for most countries and it is in LDC's where the imbalance between demand and supply of university places is at its

⁶What is very eloquent in this respect is the differential success rate in good faculties between those who prepared and those who did not take preparatory courses (Teixeira, 1965).

Country type	Educational level	Early sixties	Late sixties
30 DC's	Primary	50%	46%
	Secondary	25%	26%
	Higher	13%	17%
16 LDC's	Primary	47%	42%
	Secondary	28%	31%
	Higher	12%	16%

Based on Unesco (1970). Figures are means within country groups and do not add up to 100 because of administration expenses and expenses on “other types” of education.

⁷Even this is not an easy statistic to get. Could it be because of its embarrassing nature? Note that a value of it less than unity is inconsistent with the constitutional provision of free education.

TABLE 1. UNIVERSITY ENTRANTS AS A PERCENTAGE OF APPLICANTS

Country	Entrance ratio
Brazil	23.4
Chile	42.2
England	61.0
France ^(a)	49.8
Greece	24.8
India ^(b)	33.8
Iran	15.0
Israel	72.0
Japan	23.6
New Zealand	63.0
Pakistan	40.3
Senegal ^(a)	43.0
Vietnam	32.9

Notes: (a) Refers to Baccalaureat passes.
 (b) Refers to applications rather than applicants.

Source: Brazil from Teixeira (1965), p. 23.
 Chile from Orellana and Grassau (1965), p. 67.
 England from Lauwerys (1965), p. 531.
 France from Legrand (1969), p. 131.
 Greece from Academy of Athens (1975), p. 46.
 India from Saiyidain and Gupta (1965), p. 199.
 Iran from ILO (1973), p. 66.
 Israel from Norman (1976), p. 239.
 Japan from Hidaka (1965), p. 254.
 New Zealand from Parkyn (1965), p. 292.
 Pakistan from Wong (1969), p. 363.
 Senegal from Bowles (1965), p. 343.
 Vietnam from Wong (1969), p. 363.

highest. Furthermore, the ratio of entrants to applicants is dropping over time in many countries. For example this ratio dropped from 35 to 24 percent within 10 years in Japan (Hidaka 1965, p. 254), from 60 to 34 percent within a decade in India (Saiyidain and Gupta 1965, p. 199) and from 50 to 35 percent within ten years in Brazil (Teixeira 1965, p. 25). Even if the ratio of entrants to applicants stayed constant, the absolute difference between demand and supply could increase. For example, although the entrance ratio in Israel has increased from 70 to 72 percent in twelve years, the difference between the number of applicants and the number of entrants increased from 1,000 in 1960 to over 4,000 in 1972 (Norman 1976, p. 239). In Greece, the gap between the demand and supply of university places increased from 46,000 to 55,000 between 1974 and 1975.⁸

The political goal of free education. Now in the presence of an effective capacity constraint on the expansion of the school system, politicians

⁸ At the time this article goes to press it is reported that for academic year 1976-77 there are 78,136 candidates competing for 13,000 university places. This represents a gap of over 65,000 places or an entrance ratio of 16.6 percent (See Athens daily *Eleftherotypia*, August 23, 1976, p. 2).

throughout the world pledge free education for all school levels and all citizens.⁹ What are the likely effects of this indiscriminate subsidization? My thesis in this paper is that although educational subsidies towards higher education are beneficial to the politician in terms of votes and popularity, they have severe adverse efficiency, equity and employment effects. That is, such subsidies are likely to score a minus entry on all three measured components of social welfare. Furthermore, this adverse relationship is also perverse, in the sense that it gets worse over time and also is stronger in countries that need to pay most attention to the efficiency, equity and employment aspects of their policies, namely the LDC's.

The adverse efficiency effect comes from the fact that educational subsidies towards higher education mean increased investment at the educational level that exhibits the lowest profitability. It has been well documented that in practically every country, and especially in LDC's, primary education is a more profitable investment than higher education. For example, at the world scale the social rate of return to primary education is of the order of 25 percent whereas the corresponding rate for higher education is 11 percent (Psacharopoulos 1976, Table 6). Thus, efficient allocation of resources would mean increased spending at the primary relative to the higher level. A look at the evidence, however, shows that the opposite trend dominates throughout the world, higher education commanding over time an increased share of the educational budget in most countries.¹⁰

Elsewhere, we have estimated that the efficiency loss because of a persistent allocation bias towards the tertiary level is sometimes equivalent (on an annual basis) to the size of the educational budget itself. (Dougherty and Psacharopoulos 1976). And countries like Chile, Nigeria, Singapore, Taiwan and Thailand could gain as much as 50 percent per year of the resources they devote to education in general by reshuffling their educational budgets toward increased expenditure at the primary level.

⁹ This pledge is often found in the country's Constitution. For example, article 16 of the Greek Constitution says: "All Greeks have the right to free education at all levels."

¹⁰ For example, consider the evolution of the distribution of the educational budget by educational level:

<i>Country</i>	<i>Illiterates</i>	<i>Primary</i>	<i>Secondary</i>	<i>Higher</i>
Argentina	4%	4%	6%	3%
Venezuela	4%	7%	10%	2%
India	1%	3%	7%	3%
Ceylon	7%	n.a.	12%	2%
Malaya	10%	20%	30%	16%
Syria	4%	n.a.	12%	4%
Iran	10%	8%	13%	3%

Based on Psacharopoulos (1975), p. 156.

The low unemployment rate among illiterates and primary school graduates relative to secondary school graduates may be due to the fact that in LDC's most of the former are in agriculture where they are not counted as unemployed by the same definition used for secondary school graduates who are mainly employed in the urban sector.

The adverse employment effect of the subsidy relates to the fact that the passage from secondary to higher education is one of the most serious bottlenecks in LDC'S. We have documented this fact above by means of the entrance ratios (Table 1). Now, if we relate this to the rate of unemployment by educational level, we see that this statistic is at its highest for the secondary level.¹¹

Although association does not imply causation, one can reasonably speculate that the educational subsidy towards higher education has raised expectations of university entry. (After all, it is "free" according to the Constitution.) Thus, the frustrated aspirants and the applicants who fail, join the ranks of the unemployed. That is, their level of education (mostly of the secondary-general type) prohibits them from readily accepting a manual job at a low salary as it has raised their expectations regarding university entry and a much higher salary later in life (ILO, 1971). On the other hand the effective capacity constraint prohibits them from entering higher education. Therefore, secondary school graduates in these countries are faced with a Scylla and Charybdis situation.¹²

Regarding the equity effect of the subsidy, it is at first sight counter-intuitive that its effect could be adverse: subsidies are usually advocated on equity grounds. "More education" always sounds nice, so why not subsidize it? This statement is correct, provided the increment of education is of the right kind. As we have shown elsewhere, giving primary education to 10 percent of Mexican illiterates would *reduce* a measure of income inequality (the variance of the logarithm of earnings in this case) by 5 percent. On the contrary, giving higher education to 5 percent of those without would *increase* income dispersion by 2 percent. (Marin and Psacharopoulos 1976, Table 1). Therefore, on equity grounds, it seems that expansion of the lower levels of education is more equitable than expansion of the higher levels.

Another way of assessing the equity of a higher education subsidy is by means of studies of the Hansen-and -Weisbrod (1969) type which compare distributions of taxpayers by income size and the number of children in higher education. The general conclusion of these studies seems to be that a redistribution takes place from low income to high income families.¹³

¹¹ Compare the unemployment rate by educational level in the following countries:

<i>Faculty</i>	<i>Took preparatory courses</i>	<i>Did not take preparatory courses</i>
Medicine	11%	3%
Architecture	35%	7%
Engineering	26%	19%

¹² In an effort to isolate the employment effect of a policy of reshuffling Iran's educational budget towards primary education, I found it to be equivalent to 1 percent of its annual rate of growth (Psacharopoulos 1976b, Table 8).

¹³ For the controversy regarding this conclusion in the United States see Pechman (1970), Hartman

A less rigorous yet very intuitive way of assessing the adverse effect of the subsidy is by looking at the social background of students in higher education. Several examples have been mentioned above in this respect. But let us here add Busch's (1975) finding that whereas in countries like the United States and England the relative chances of access to higher education of someone coming from a high level manpower parent (relative to someone whose parent is a manual worker) is 2 : 1, the corresponding chance in Italy is 18 : 1 and in Spain 25 : 1.

Still another way of evaluating the effect of the subsidy is by looking at the selectivity of the educational system, on the theory that the more selective the system, the more it will favor students from high income families. This is the subject of the next section to which we now turn.

II. THE RELATIONSHIP BETWEEN PUBLIC SUBSIDIZATION, EDUCATIONAL INEQUALITY AND ECONOMIC DEVELOPMENT

In this section I develop an index showing the public subsidization of higher education and try to relate it to an index of inequality in the distribution of enrolments within countries and also within DC and LDC country groups. The question we try to answer is: given the exogenous supply constraint on the expansion of the educational system (as reflected by the shape of the pyramid), what is the likely effect of the provision of free education at the university level? In view of the imbalance between demand and supply for university places, do different countries act to reduce the imbalance? What is the relative policy performance of LDC's versus DC's in this respect?

Before doing so, however, let us ask what the determinants of the private demand for education are. The available theories in this respect could be classified under "sociological" or "economic" headings. For example, one sociological explanation of the demand for higher education is that the student and/or his family are very keen that he eventually gets a "prestige job" or that he "succeeds in life". On the other hand, the typical economic explanation of the demand for higher education is that the student acts as if he were comparing the costs of education to the benefits derived from it. If the benefits exceed the costs then he "buys" higher education as an "investment good". Of course sociological and economic theories are not incompatible and overlap to a great extent; most prestigious occupations carry high incomes as well. Therefore, in what follows we shall concentrate on the economic explanation without loss of generality.

The cost of education can be divided into two parts: the direct cost (C_3) and the earnings foregone (Y_2) while at school. The direct cost is

(1970), Hight and Pollock (1973) and Miklius (1975). For applications to LDC's establishing the regressivity of the existing public finance system see Jallade (1974) and Fields (1975).

what the student pays as tuition or fees in order to enroll in the tertiary level, plus any incidental expenses. If education were not subsidized, C_3 would equal the true social cost of a university place. The foregone earnings part is measured by what secondary school graduates earn in the market. The benefits of education are usually measured by the difference in earnings of someone with higher education (Y_3) and another one with secondary education (Y_2).

Let us first consider a situation where higher education is not subsidized. Assuming a four-year university cycle, the costs and benefits could be summarised in the unsubsidized private rate of return to higher education which is approximately given by the formula¹⁴

$$(1) \quad r_u = \frac{Y_3 - Y_2}{4(C_3 + Y_2)}$$

Now the individual will compare r_u to his best alternative. If r_u is, say, 15 percent and the best return he could get in another investment venture is $r^* = 10$ percent, then he will apply for admission to higher education. The higher the discrepancy between r_u and the alternative rate, the higher the demand for higher education.

Next, let us consider a situation where higher education is fully subsidized by the State. Since C_3 is equal to zero in this case, the subsidized rate of return to higher education is given by the formula¹⁵

$$(2) \quad r_s = \frac{Y_3 - Y_2}{4 Y_2}$$

Since $r_s > r_u$, it is obvious that such subsidization will generate an *extra* demand for university places, above the existing one because r_u was already higher than the discount rate r^* .

We may formalize these relationships within a simple behavioral model where the demand for university places is a positive function of the difference between the private rate of return to education and the alternative rate of interest:

$$D_3 = f(r_{\text{private}} - r^*).$$

For reasons presented earlier, the supply of places at the university level in most countries can be considered as virtually fixed, thus

$$S_3 = \bar{S}_3.$$

¹⁴ For expository simplicity I abstract here from many refinements like differential taxation rates, ability, finite life horizon, economic growth and concave age-earnings profiles. These refinements do not affect the points made below.

¹⁵ For simplicity, I again abstract from any remaining incidental costs that would have to be borne by the student.

We have also given evidence above that in practically all countries there exists an excess demand for university places,

$$\Delta = D_3 - \bar{S}_3,$$

and this is consistent with the fact that in most countries $r_{\text{private}} > r^*$. Namely, given the supply constraint, the market for places is not cleared and the prevailing private rate of return is higher than the discount rate. Given this framework, consider the situation within a given country that changes its policy from no subsidization (or mild subsidization, if you wish) to one of free education.

The unsatisfied demand for places in the unsubsidized case (u subscript) was

$$\Delta_u = f(r_u - r^*) - \bar{S}_3,$$

whereas after subsidization the unsatisfied demand is

$$\Delta_s = f(r_s - r^*) - \bar{S}_3.$$

Given the fact that r^* and S_3 are constants, the *additional* unsatisfied demand *created by the Governmental policy of free education is*

$$(3) \quad \Delta \Delta = \Delta_s - \Delta_u = f(r_s - r_u).$$

Substituting (1) and (2) into (3) we find

$$(4) \quad \Delta \Delta = f \left[r_u \left(\frac{C_3}{Y_2} \right) \right]$$

i.e. the excess demand generated by free education is a positive function of:

- (a) The unsubsidized rate of return (r_u) which is determined by the labour market conditions affecting relative earnings (Y_2 and Y_3) and the direct social cost of schooling (C_3), and
- (b) The ratio of direct costs to foregone earnings (C_3/Y_2).

What equation (4) says is that for any given market conditions that produce an unsubsidized rate of return (r_u), the degree of effective subsidization is proportional to it by a $\left(\frac{C_3}{Y_2}\right)$ factor. In what follows we shall call this ratio the "subsidization index". That is, the higher the direct social costs of education relative to foregone earnings, the higher the effective Government subsidy when higher education is provided free of charge. Or, consider two countries exhibiting the same unsubsidized rate of return to higher education. Then the one in which the C_3/Y_2 ratio is higher would effectively subsidize more heavily its university system (if it adopted a policy of free education)¹⁶ and thus create a higher excess demand for places relative to the other country.

To put it yet another way, part of the observed unsatisfied demand for university places is due to factors beyond Government control, like the shape of the educational pyramid and the market conditions for graduates that produce the structure of relative wages (Y_2 and Y_3), while another part is due to the Governmental policy of providing higher education free of charge. It is our purpose here to isolate as much as possible these two determinants of the demand for higher education. The market wage structure is sufficient in most cases to generate an imbalance between the demand and supply of university places. The question then is what is the impact of, say, free education *on top* of the demand generated by labour market conditions.

Sometimes the demand for higher education in LDC's is rationalized in terms of the probability of entry into the high pay modern sector (Edwards and Todaro 1973). However, this is tantamount to the high earnings stake of university graduates relative to non-graduates in the urban sector. For example, in Morocco a university graduate from the competitive engineering faculty earns three times as much as a secondary school graduate (Psacharopoulos 1976a, Table 2). In Iran, university graduates employed on a contractual (rather than permanent) basis by the public sector earn nearly three times as much as secondary school graduates (Psacharopoulos and Williams 1973, Table 2). And in countries like Nigeria and Ghana the earnings ratio of university to secondary school graduates is nearly 5. In developed countries this ratio centres around 1.5 (Psacharopoulos 1973, Table F. 2).

Looking back at formulas (1) and (2), we note that the unsubsidized rate of return (r_u) roughly corresponds to the social rate of return as conventionally calculated. Also the subsidised rate of return (r_s) roughly corresponds to the private rate of return as found in most empirical studies. Therefore, the difference between the two rates would give an indication of the degree of subsidization within a given country. Existing evidence shows that in most countries even if higher education were not subsidized (and the private returns were approximately equal to the social ones) there would continue to exist an unsatisfied demand for university places because the social rate of return exceeds any plausible value of an alternative rate of return. The fact that education is subsidized simply means that the demand for higher education is reinforced. For example, consider the case of Mexico where both the private and social rates of return to university education are of the order of 29 and 23 percent respectively. Obviously, public subsidies to higher education could be reduced without making higher studies a pri-

¹⁶ Note that this is really an upper bound of the degree of subsidization, as it refers to a case where education is provided at zero direct cost to the student. Otherwise we could call it the degree of "potential" subsidization. But, of course, this distinction is trivial, as in most countries education is virtually free.

IS FREE EDUCATION EQUITABLE?

TABLE 2. SUMMARY STATISTICS BY COUNTRY TYPE

<i>Variable</i>	<i>LDC's</i>	<i>DC's</i>	<i>All</i>
Effective subsidization of higher education ($\overline{\text{SUBINDEX}}$)	6.74	.80	4.70
Enrollment dispersion ($\overline{\text{EDINEQ}}$)	1.04	.66	.91
Correlation ($\overline{\text{SUBINDEX}}$, $\overline{\text{EDINEQ}}$)	.57*	-.04	
Direct cost of higher education per student year, in \$ ($\overline{C_3}$)	1252	1735	1418
Per capita income, in \$ (\overline{YP})	313	2200	962
Number of countries in the sample	42	22	64

Source: See Appendix Table.

Note: * = Statistically significant at the 1% level.

vately unprofitable investment opportunity. The same logic applies as well to Ghana and Venezuela (Psacharopoulos 1973, p. 62).

Working with rates of return, however, has two drawbacks. First, the existing evidence is limited to only a few countries and my purpose here is to test statistically the hypothesis about which kind of country subsidizes its educational system most. Second, the existing rates of return for different countries are computed on the basis of very different adjustments. Therefore, the relationship I am interested in might be masked by differences in the way the rates are computed. In view of all this we shall attempt to measure the degree of subsidization by the ratio of the direct social cost of higher education to foregone earnings.

Data on the direct social cost of higher education are more or less readily available. However, data on Y_2 , the foregone earnings component, do not exist for nearly as many countries as is the case with C_3 . Thus, in order to expand the statistical base, I substitute the country's per capita income (YP) for Y_2 . For the countries for which we have actual data on Y_2 , this is a very good approximation.¹⁷

Using Unesco's data on the direct recurrent cost of higher education, the subsidization index

$$\text{SUBINDEX} = C_3/YP$$

is estimated for 64 countries in the Appendix table. Although its value varies a lot from country to country, less advanced countries exhibit much higher subsidization than advanced countries.¹⁸ The summary provided in Table 2 shows that the effective degree of subsidization in developed countries is very small as compared to the degree of subsidization in less advanced countries. What matters for our purposes is not so much the absolute but the difference in relative size of the index between the two kinds of countries.

¹⁷ Even if the correspondence is not exact, the correlation between the foregone earnings of secondary school graduates and per capita income is very high. Compare Tables 5.2 and F.2 in Psacharopoulos (1973).

¹⁸ One reason for the wide fluctuation of the index within country groups is that some countries have expanded their tertiary system at a high cost while others have done so at the expense of quality.

According to the evidence, poor countries' subsidies per student in higher education are six times as high (relative to per capita income) as subsidies per student in advanced countries.

The reason such a dramatic difference exists in the degree of subsidization between country types is that although foregone earnings in LDC's are much less than foregone earnings in DC's, the cost of university education is nearly as high in LDC's as in DC's. Thus, the effective subsidy, i.e. the coverage of the direct cost of education, represents a high premium in LDC's when expressed as a proportion of the opportunity cost of attending university.

A measure of educational inequality. How is the extra demand for university places generated by the Government to be met? Earlier I gave reasons why it will simply *not* be met because of the effective capacity constraint of the school system. The effect of the subsidy, at least in the short run, will be to increase the pressure in the system, e.g. by increasing the ratio of applicants to entrants, thus increasing the inequality of access between those who would like to enroll in higher education and those who eventually manage to enroll.

A simple measure that would capture the degree of existing educational inequality in a given country is the dispersion of enrolments by school level. Let us call the coefficient of variation of student enrolment within a given country the degree of educational inequality

$$EDINEQ = \sqrt{\frac{\sum_i (S_i - \bar{S})^2}{3}} / \bar{S}$$

where S_i is the number of students enrolled at school level i , the latter running over primary, secondary and higher education. The flatter the educational pyramid, the lower the coefficient of variation of enrolments, thus the more educational equality of access would exist in a given country.¹⁹

Using again Unesco data I estimated educational inequality indices for the 64 countries of the sample. As shown in the Appendix Table, the degree of educational inequality is much sharper in less advanced countries. According to the summary Table 2, the degree of enrolment dispersion in LDC's is about double that in DC's.

What is of particular interest is that not only high subsidization coincides with high educational inequality, but that this perverse relationship is stronger within the LDC group. In fact, the correlation coefficients between

¹⁹Note that SUBINDEX refers only to the higher level, whereas EDINEQ to all educational levels. This is the correct procedure since selection to deter entry into the higher level starts at a very early stage in the educational ladder. Mary Jean Bowman raises several objections regarding this index, mainly the fact that it does not take into account the number of students who are actually subsidized in each country and that fast demographic growth in some countries produces biases by flattening the pyramid base. She suggests two alternative simple measures of educational inequality: $S_3/(S_1 + S_2)$ or S_3/S_2 .

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TABLE 3. SUBSIDIZATION AS A FUNCTION OF EDUCATIONAL INEQUALITY AND PER CAPITA INCOME

<i>Sample</i>	<i>Constant term</i>	<i>EDINEQ</i>	<i>YP</i>	<i>R</i> ²
All countries	-12.86	19.38 (3.5)		.333
	7.42		-.0030 (.0009)	.145
LDC's	-26.40	31.98 (7.3)		.322
	12.16		-.0173 (.006)	.190
DC's	.93	-.20 (1.04)		.002
	.86		-.00003 (.00013)	.002

Source: Based on Appendix Table.
SUBINDEX is the dependent variable in all cases.
Numbers in parentheses are standard errors.

the two indices in Table 2 show that this relationship is purely an LDC phenomenon, the correlation between SUBINDEX and EDINEQ being virtually non-existent within the advanced countries group.

Once an association between two variables is established, the next question is: What is the direction of causation? Is it SUBINDEX which affects EDINEQ or the other way round? One could formulate two hypotheses in this respect:

Hypothesis No. 1: Given the supply constraint on the expansion of the educational system, different countries try to equalize opportunity by subsidizing higher education. Accepting EDINEQ as the exogenous variable, one would expect the result of a rational policy in this respect to yield a negative b coefficient in a regression of the type

$$\text{SUBINDEX} = a + b \text{EDINEQ.}$$

But as shown in Table 3, the opposite is the case. The more unequal the distribution of enrolments, the heavier education is subsidized. Note also that we are not picking up a spurious relationship between educational inequality and the degree of economic development. As shown in Table 3, per capita income has half the explanatory power of educational inequality in accounting for variations in the subsidization index.

Thus we document a non-rational policy from the point of view of LDC's, as in the presence of a highly selective educational system, they boost inequality of access via heavy subsidization of university students.

Hypothesis No. 2: Different countries decide politically to provide free education at the higher level. But since they cannot financially afford to satisfy the generated demand for places, they tacitly maintain unequal

TABLE 4. EDUCATIONAL INEQUALITY AS A FUNCTION OF THE DEGREE OF SUBSIDIZATION AND THE LEVEL OF ECONOMIC DEVELOPMENT

<i>Sample</i>	<i>Constant term</i>	<i>SUBINDEX</i>	<i>DC dummy</i>	<i>R²</i>
All countries	.83	.017 (.003)		.333
	.97	.010 (.002)	-.32 (.04)	.709
LDC's	.97	.010 (.002)		.322
DC's	.67	-.009 (.050)		.002

Source: Based on Appendix Table.
 EDINEQ is the dependent variable in all cases.
 DC dummy has a value of 1.0 if the country belongs to the DC group and 0 otherwise.

access to the school system. This theory predicts that in a regression of the type

$$EDINEQ = a + b \text{ SUBINDEX},$$

the b coefficient would be positive. As shown in Table 4, this is in fact the case, especially in LDCs. Note also, that adding the degree of economic development as an independent variable has the expected negative sign, in the sense that countries who can afford the financial cost expand their educational system more readily and thus exhibit less educational inequality.

Thus we conclude this section by having documented a myopia from the point of view of the electorate who demand higher education subsidies, only to be denied by unequal entry opportunities, especially in LDCs.²⁰

III. SOME POLICY ALTERNATIVES

Regardless of the direction of causation, in the previous section we have documented the fact that Governments, acting in the name of equality of opportunity, actually generate extra demand for university places when pledging free education. This relationship is found in its most extreme form in less advanced countries, where higher effective subsidies coincide with very steep educational pyramids. Because the supply of places cannot increase or, at least, not as fast as the free education law might require, a non-price restriction mechanism has to operate. The usual mechanism is that of selection via competitive examinations, not only at the university entrance stage, but also well down the educational ladder. This selection clearly favors students from well-to-do families.

Thus, the provision of free education, especially at the higher level in poor countries, is associated with three adverse side effects: first, it is inequitable, as the apparently non-price selection mechanism favours the higher

²⁰ For those who doubt the existence of an "electorate" in LDC's, this may be simply viewed as the demand of some subgroup of the population which is dominant.

income groups in the population. Second, it is inefficient, as resources are devoted to the educational level that exhibits the lowest monetary profitability. And third, it generates unemployment among secondary school graduates who on the one hand cannot enter higher education because of the effective supply constraint, and on the other hand are not willing to accept lower status jobs because the free education policy and the possibility of eventually receiving high graduate wages have raised their expectations in life.

It is my belief that this situation cannot continue for ever. Although an illusion prevents the electorate from realizing that what appears to be nice and equitable (i.e. free education) is in fact very inequitable, it is the finance factor and social unrest that will eventually oblige governments to change their educational policy.

Per capita incomes in poor countries virtually stagnate while university costs follow World trends.²¹ Thus provision of higher education to the point of satisfying the demand for places will be impossible on simple financial grounds. Even advanced countries have recently been obliged to cut the real resources they devote to higher education by not increasing student subsidies *pari passu* with inflation. This inevitably leads to turmoil, not only in the higher education student body but among the unemployed secondary school graduates as well.

In view of all this, the usual solution suggested in the literature is to make the student and his family pay the cost of his education.²² However, this is easier said than done. Politically, such a solution is clearly unacceptable as it would mean loss of votes. Furthermore, if an indiscriminate increase in fees were introduced, some students from poor families who hitherto managed to survive the selection process, would be excluded from higher education on cost grounds. So, let us dismiss this solution as non-pragmatic.

Another solution suggested in the literature is the institution of loans. It looks both fair and efficient for those who will have higher incomes later in life, but today cannot afford the lump sum cost of their education, to be encouraged to borrow. Although loans seem a good proposition when applied in advanced countries like Sweden, they become a dubious one in the context of LDC's.²³ Besides the administrative difficulties involved,²⁴ the private returns of higher education in poor countries are so high that it is unlikely the introduction of a loan scheme would appreciably reduce the

²¹ For the economics of a new university in Ghana, see Andoh (1968).

²² See Psacharopoulos (1972), Edwards and Todaro (1973), Blaug (1973) and Fields (1975).

²³ Mats Hultin reminds me that the loan system has some discriminatory effects, as, for example, in Sweden there is hesitation among low-income groups to allow their children to borrow money, while such hesitation does not exist among high income groups.

²⁴ In the 15 years of the existence of the loans programme in Kenya, fewer than 300 loans have been given (Rogers 1972). For a description of loan schemes in other LDC's see Rogers (1971) and Williams (1974).

number of aspirants. For example in Kenya, the institution of a loan scheme according to which the costs of education are to be repaid by a 6 percent charge of earnings each year of the working life would reduce the private rate of return to the highest level of education from 22 to 18 percent (Roger 1972, Table 3).

What I consider to be a more pragmatic solution is to link the educational subsidy to the ability of the student's family to pay. Given the fact that the direct income tax system in LDC's is not highly developed, the criterion of the ability to pay should be ownership of land.²⁵ Property registers exist virtually everywhere and they are clearly more reliable indicators of the family's financial status than taxable income. For example, 73 percent of students at the University of Nairobi in Kenya are not only landowners, but 38 percent of them have 25 or more acres of land (Fields 1975, p. 248).

It should be politically acceptable that students from rich families pay the full direct social cost of their education. The money thus raised could be used not so much to further expand the higher education system, but rather to flatten the pyramid base. This is desirable not only on equity and efficiency grounds, but also on literacy grounds. While an increased amount of resources is devoted to higher education over time around the World, improvement in literacy is very slow. Based on Unesco (1970) data I estimate that the mean level of illiteracy in 11 poor countries has decreased from 60 to 51 percent between 1955 and 1965.

One could also go a little beyond this, in the sense of using the proceeds to subsidize not only the direct cost part but also the foregone earnings of students from poor families. For example, in India foregone earnings represent 50 percent of the true cost of study (Psacharopoulos 1973; Table 8.1). Therefore, true equality of opportunity would not only be the provision of "free" education (i.e. not direct fees) but also finance of the indirect cost of education for students who deserve it.

Although the proposed scheme would help in redressing the equity balance, I have no illusions that it will substantially reduce the demand for university places. For that purpose, one would have to supplement it with another scheme that would operate on the other source of the demand for university entry; namely the relative wages of graduates to non-graduates. As mentioned earlier, university graduate wages in poor countries are today three times those of secondary school graduates. Although part of this gap must be due to productivity differences between the two kinds of labor, another part must be due to the public sector salary scales.

The public sector today employs the majority of graduates in LDC's and DC's alike. Given its non-profit maximizing behaviour and its size relative to the market, one could reasonably expect that graduate wages are well above the market clearing level. Thus a policy of reducing at least

²⁵ Or property in general, or a combination of income and value of property.

starting graduate salaries in the civil service would be an instrument for dampening the demand for places in higher education, as this is tantamount to reducing the graduation stake. (Psacharopoulos and Williams 1973.)

Institution of these measures, although not solving the problem altogether, would certainly be a move in the right direction regarding the equity, efficiency and employment effects of educational policies.

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APPENDIX TABLE

EFFECTIVE SUBSIDIZATION OF HIGHER EDUCATION AND EDUCATIONAL INEQUALITY
BY COUNTRY TYPE CIRCA 1970

<i>Country (1)</i>	<i>Subsidization index SUBINDEX (2)</i>	<i>Educational inequality EDINEQ (3)</i>
<i>Less than \$1,000 per capita income</i>		
Algeria	5.43	1.16
Cameroon	19.67	1.23
Ethiopia	22.25	1.14
Ghana	10.77	1.29
Ivory Coast	11.20	1.15
Kenya	19.13	1.21
Mauritius	1.85	.94
Morocco	6.43	.99
Nigeria	18.67	1.22
Senegal	1.13	1.11
Sierra Leone	32.79	1.07
Sudan	16.02	1.10
Tanzania	35.65	1.31
Tunisia	3.30	1.15
Uganda	18.37	1.28
Jamaica	11.73	1.19
Mexico	.89	1.07
Nicaragua	.76	1.05
Panama	1.12	.92
Boliva	2.57	1.12
Chile	2.05	1.09
Colombia	.99	1.01
Dominican Republic	1.35	1.10
Ecuador	.70	1.00
Guyana	2.27	.82
Paraguay	1.37	1.14
Afghanistan	10.56	1.03
Burma	1.85	1.05
Cyprus	1.78	.72
Hong Kong	1.67	.84
India	1.66	1.07
Indonesia	.36	1.11
Iran	2.34	.92
Iraq	3.31	.93
Jordan	1.77	.90
Korea	.89	.84
Lebanon	1.29	.79
Malaysia	3.84	.86
Pakistan	.60	.70
Thailand	1.82	1.19
Portugal	.20	.85
Spain	.48	.78

APPENDIX TABLE (con't)

<i>Country (1)</i>	<i>Subsidization index SUBINDEX (2)</i>	<i>Educational inequality EDINEQ (3)</i>
<i>More than \$1,000 per capita income</i>		
Canada	.77	.64
Puerto Rico	1.03	.61
U.S.A.	.53	.46
Argentina	.39	.84
Venezuela	1.69	.88
Israel	.82	.84
Japan	1.22	.51
Singapore	.66	.79
Australia	.75	.75
Belgium	2.01	.57
Denmark	.93	.65
England	1.23	.63
Finland	.57	.60
France	.39	.56
Germany	.63	.71
Greece	.28	.65
Iceland	.11	.63
Ireland	.71	.78
Italy	.37	.55
Netherlands	1.93	.54
Norway	.39	.58
New Zealand	.15	.69

Source: Col. 2: SUBINDEX = C_3/YP

where C_3 is the direct social cost of higher education per student year in \$ and YP the country's per capita income. C_3 in local currency from Unesco (1973), Table 5.4, except for Norway, Denmark, Belgium and Nigeria from Psacharopoulos (1973), p. 177.

Exchange rate from Unesco (1973), Table 1.3, except for Thailand, Kenya and Mexico from Psacharopoulos (1973), p. 176 and Pakistan from IBRD (1971), Table 1.7.

Col. 3: $EDINEQ = \left[\sqrt{\frac{\sum_i (S_i - \bar{S})^2}{3}} \right] / \bar{S}$

where S_i is the number of students enrolled in educational level i and \bar{S} the average number of students. Subscript i runs over primary, secondary and higher education.

S_i from Unesco (1973), Tables 3.2, 3.3 and 4.1, except Canada from Psacharopoulos (1973), p. 194.