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THE UNIVERSITY OF ALBERTA

A STUDY OF THE RATE-OF-RETURN ON INVESTMENT IN
GRADUATE STUDIES IN EDUCATIONAL
ADMINISTRATION



BY
J. R. PHILIPPE DUPUIS

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
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DEPARTMENT OF EDUCATIONAL ADMINISTRATION

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UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Study of the Rate-of-Return on Investment in Graduate Studies in Educational Administration", submitted by Joseph Rosaire Philippe Dupuis in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

The purpose of this study was to evaluate the individual rate-of-return on investments in graduate studies in educational administration. Eighty-nine master's students and thirty-nine doctoral students who have been in full-time attendance in the Department of Educational Administration at the University of Alberta composed the group under study.

The actual financial net costs of the program were calculated from the individual statements provided by the subjects of the study. Foregone earnings, travelling and moving expenses, tuition fees and other spendings associated with student status were the main costs considered, along with negative costs such as: fellowships, assistantships, paid work, and the like. The average net costs for doctoral students were found to be \$8,075 for the program, while those for the master's students averaged \$4,085.

The financial marginal benefits attributed to graduate education in educational administration were calculated in two steps. Firstly, the actual marginal earnings represented by the difference between the actual salaries the graduates received the first year following graduation and the projected salaries they would have earned without having completed the program were computed.

Secondly, these marginal earnings were projected for the years following graduation up to retirement at a rate of increase of six per cent annually. Doctoral students could expect to receive, on the average \$61,221, in marginal lifetime earnings. Masters' students, on the other hand, averaged \$80,405 in expected marginal lifetime earnings.

The rate-of-return was then calculated as the ratio per unit of time of the marginal lifetime earnings to the net costs. Graduates from the doctoral program had, on the average, a rate-of-return equal to 28.07 per cent and graduates from the master's program averaged 59.63 per cent.

There were noticeable variations in costs, benefits and rates between sub-groups established for the purpose of this study. For example, master's subjects in some cases showed rates more than twice as high as doctoral subjects. Nevertheless, the rates-of-return were found to be much higher than what has been found in a review of similar studies. Furthermore, the rates-of-return were, on the whole, as high or higher than any other rates found by researchers in other areas of education.

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CHAPTER I

STATEMENT OF THE PROBLEM

Introductory Statement

The maximization of the welfare of the people of a particular society is one of the major aims of every modern state. One of the most widely used signs of progress in this area is the growth in the economy of a country. Three factors generally account for economic growth: capital, technology and labor.

For a long time economists thought that increases in the amount of capital and the number of workers were responsible for increased output. (23, pp. 360-361; 24, p. 7). But, in recent years, it has been found that increases in physical capital input and in sheer man-hour input failed to explain increases in output. (2, p. 9; 8, p. 663; 23, pp. 360-361; 24, p. 3; 25, p. 571; 15, pp. 10-12; 21, p. 8; 29, p. 24). It has now been established that these factors account for only part of economic growth. It is believed that the input of workers should be considered under two aspects: their number and the development of their skills. Skill development through formal education and on-the-job training would, along with advances in technology, account for the larger share of the unexplained growth of output. (17, p. 685; 19, p. 423, 424; 22, p. 322; 24, p. 9, 13; 26, p. 572; 28, p. 93;

31, p. 106; 4, p. 43-46).

Education would then be an important factor in economic growth. This is clearly spelled out by the Economic Council of Canada in its second annual report:

Education is a crucially important factor contributing to economic growth and to rising living standards. This has been the conclusion of a growing body of economic analysis in a number of countries. This is the conclusion also reached in our exploratory analysis of the contribution of education to the growth of the Canadian economy and to the welfare of its people. (10, p. 71).

In a technological society, skilled workers are factors for both the implementation of techniques and their development. (8, p. 665). In the first phases of industrial development, workers needed little know-how, because they were by and large performing very simple operations -- routine, repetition. As industry progressed, the less it needed unskilled labor. Many unskilled tasks are now performed by machines. (24, p. 16). Education then becomes a basic factor of economic growth as well as a consequence of it. (8, p. 665; 13, p. 19, 22).

Skilled workers participate in economic growth in different ways and to different degrees. They are more or less instrumental in the growth process according to the nature of their particular skills and the degree of their specialization in these skills.

In a free market situation the nature of the skill and the degree to which it is mastered would account for

differences in the individual's economic reward. The relative importance of a skill would call for a higher or lower reward, as would the degree of competence in the same skill. Thus, the output resulting from a kind of education or training as well as the length of the educational process or training would be marketed at different prices. This would be held true as long as education and training were associated with skill development. (12, p. 251; 32, p. 560; 16, p. 46).

Theoretically, then, education is associated with skill development, skills are associated with productivity, and productivity is related to salary. Therefore, the more education one has in a given field the higher his salary would approximately be relative to others in the same field. (6, p. 229; 32, p. 560).

However, education and productivity do not follow the laws of a perfect market and thus are not perfectly related to salaries. Prices are, to some degree, administered because of politics, snobbery, tradition, nepotism, entry restriction and other market imperfections. (1, p. 52; 6, p. 228, 229; 8, p. 661; 9, p. 128; 12, p. 251; 17, p. 686; 31, p. 109; 32, p. 548; 22, p. 38). This lack of relation is especially true of a single case. But, on the whole, one would find a positive correlation between the amount of education of a given kind and earnings. (1, p. 79, 81; 5, p. 213; 10, p. 74, 85, 86; 11, p. 308, 309; 18,

p. 963, 968, 971, 975; 19, p. 424, 428; 20, p. 138; 31, p. 108; 4, pp. 46-50).

Even if one finds that the more educated person is paid more than the less educated one, there is still a very important point to be considered: the rate of his return on the money he invested in his education. Does it pay to forego income for a certain time and invest money in further training? Society as well as individuals is faced with this question. In other words, is the return higher when the money is invested in education rather than in shares, industry, bridges, tools, highways, and other forms of wealth? In answering this question, one has to assess the total costs of education and compare them to the anticipated or realized benefits. This can be done at the individual level or for society as a whole. Furthermore, the rate of return on money invested in education should be assessed and compared to other possible alternatives for investment.

Still another approach less valuable for a study of social costs and benefits but appropriate for individual returns is the computation of the marginal lifetime earnings associated with education. Even more widely used is the marginal discounted value of these lifetime earnings.

Another level of analysis should be considered in order to obtain as accurate a picture as possible, that is, breaking down the general field of one kind of investment

into its different components and for each of them calculating the relative costs and returns. Then each component can be treated according to its relative importance within the general field under study. Education, as a general field, can be studied at various levels: kindergarten, elementary, secondary, technical, college, university, and continuing education. Even within the different levels or kinds of education one can more precisely evaluate the costs and returns of various subdivisions. For instance, university education can be broken down into undergraduate and graduate education. Graduate studies can be studied at the master's and doctoral levels. This may be done horizontally for all studies, but one can also combine this dimension with the vertical and study one kind of education at a particular level. This is illustrated in Figure 1.

In recent years such an analysis has been done by societies in order to establish their investment priorities and their manpower policies. It has been done at the individual level by economists with many of them suggesting that individuals are responding to the results of these calculations when selecting the kind and the amount of education they intend to take. (32, p. 556). One can go back to Adam Smith and see that he found it reasonable to consider the financial returns to an individual taking further education. He wrote:

Ph. D.						
Master's						
Under-graduate						
High School						
	Education	Medicine	Law	Engineering	Chemistry	Economics

FIGURE 1

TWO EDUCATIONAL DIMENSIONS: KIND AND LEVEL

When any expensive machine is erected, the extra-ordinary work to be performed by it before it is worn out, it must be expected, will replace the capital laid out upon it, with at least the ordinary profits. A man educated at the expense of much labour and time to any of those employments which require extraordinary dexterity and skill, may be compared to one of those expensive machines. The work which he learns to perform, it must be expected, over and above the usual wages of common labour, will replace to him the whole expense of his education, with at least the ordinary profits of an equally valuable capital. It must do this too, in a reasonable time, regard being had to the very uncertain duration of human life, in the same manner as to the more certain duration of the machine. (op. cit., 5, p. 168).

This is the framework for the present study. An attempt is made here to evaluate the individual returns of graduate studies in educational administration. This

is done in order to determine if it pays financially to take a master's degree or a doctorate degree in educational administration and, if it pays, how well it pays.

Statement of Sub-problems

The general problem of this study is broken down into four sub-problems and two related approaches. This will hopefully shed some light on the basic question: Does it pay the individual to take graduate work in educational administration and how well does it pay? The four sub-problems under study are:

- (1) The computation of the financial costs associated with graduate studies in educational administration.
- (2) The computation of the marginal lifetime earnings associated with graduate work in educational administration.
- (3) The discounting of the marginal lifetime earnings to their present value.
- (4) Taking the financial costs as an investment, the evaluation of their economic rate of return by comparing them to the sum of the marginal lifetime earnings.

In addition to these four sub-problems, two groups of possible investments are considered. For the purpose of this study they are related approaches or points of

comparison. The returns from investments in graduate studies in educational administration are compared to:

- (1) The returns from other forms and levels of educational investment.
- (2) The returns from investment in securities, bonds, shares and, more generally, the benefits to be expected from industrial investment.

Significance of the Problems

One can look at the problem of the financial returns from graduate studies in educational administration from at least two crucial points of view: the economic and the educational.

Economists from England, the U.S.A. and Canada have, among others, suggested that there is a lack of studies of this type. Blaug states: "Nothing but the lack of data inhibits calculation of the rate of return to each and every type of formal and informal education." (6, p. 248). Here is a clear indication for a more detailed and specific study of different kinds and levels of education. Becker also suggests the need for similar studies. He writes:

I have not tried to estimate gains to persons taking specialized programs in high school and college. Some literature is already available on the gains to various professionals, such as doctors, lawyers, engineers, or scientists, and additional comparisons can and should be made between persons with B.A., M.A., or Ph.D. degrees,

liberal arts or more specialized college majors, commercial or academic high school programs, and so on. (1, p. 157).

Wilkinson, also suggests the need for more studies in the field in writing: "Private rate-of-return or present discounted value as yet have not received the attention they deserve." (32, p. 556).

In defense of the narrowness of the scope of this study which includes only one kind of graduate work and considers graduates from only one university, one may quote Bowman:

The repetition of static studies of rate-of-return pattern in one after another setting begins to fill in a picture of the moving scene, just as multiplication of camera still shots creates a movie. (7, p. 114).

The usefulness of this kind of study can then be established in viewing it within a more general picture of education of which it is a component.

Still dealing with the economics of education, but from a more educational or administrative point of view, one can focus on the adequacy of the salaries paid to graduates in educational administration within the general framework of school board salary scales. Charles Benson¹, commenting on a study he conducted with Clifford Hooker in the Minneapolis public schools said that administrators

¹Address to Graduate Students, Department of Educational Administration, University of Alberta, March 13, 1967.

were relatively overpaid compared to the classroom teachers. The authors of the report write:

The extra value of being a principal is twice as great as the extra value attributed to the highest level of training in classroom work that is recognized (realistically) in the Minneapolis schedule: -- In computing lifetime earnings in the principalship, account was taken of the longer working year that principals have.... This appears to downgrade the role of professional teachers in undue measure. (3, p. 9).

This situation would have weakening effects for both groups of teachers and administrators, driving very able members of the first group toward a function for which they might have less aptitude simply because of the financial attraction. Analysing the same salary scales one might have concluded that administrators were not overpaid, but teachers were underpaid. The problem is: Are administrators adequately paid considering the cost of training they have been through to fill their positions?

Assumptions

This study is partly based on a questionnaire and assumptions have to be made regarding the reliability of the answers to the questionnaire.

It is assumed that the answers given to the questionnaires by the graduates represent the real figures of the individual costs and benefits.

Because much of the literature employed in this study is American in origin and based on the American

educational system, society, and economy one must make some assumptions or adaptations in applying it to the Canadian educational system, society, and economy.

There is, properly speaking, no pure social dimension in this study unless one sees the economy and education of a society as two very important expressions of that society. Assumptions then should be made at the level of these two expressions.

For the two societies, the American and the Canadian, it is assumed that they have very much in common, probably more than any other society in the world has with them. Geographically tied together by one of the longest borderlines in the world they have a great deal in common in their origin, history, culture, people, etc. Almost ninety per cent of the Canadian population lives within a hundred miles of the U.S.A. on a five thousand mile strip, making contacts easier and more pervasive.

As to the economy, we are here interested only in the relation between it and education. The assumption is made that the Canadian economy is open for even more university graduates than the American one is, (4, pp. 27-28, 56-59), that there is probably a greater need, and a greater demand for university graduates in Canada than in the U.S.A. Bertram (4, p. 50) and Hanson (13, p. 28) agree with the Economic Council of Canada (10) in its

statement that "there appear to be somewhat higher returns to education for individuals in Canada than in the United States." (10, p. 91). Also, the Canada Council in its Second Annual Review underlines very clearly the openness of the Canadian economy to more educated people in the following statement:

Very considerable scope would appear to exist in Canada to promote the growth of average per capita income by improving the educational stock of the labour force. The accumulating evidence and analysis suggest that the benefits from such improvements can be substantial for both the individuals and the economy as a whole. (10, p. 93).

For educational purposes it is assumed that the value of one year of education in the one country is, on the whole, very similar to what it is in the other. The same assumption is made by the Economic Council of Canada in its statement:

After careful consideration of these matters it has been concluded, as a working assumption for our analysis, that the average quality of education is roughly similar in the two countries -- in short, that these differences largely cancel out, and that one year of education in Canada is, on the whole, roughly the equivalent of one year of education in the United States. (10, p. 73).

Because of the nature of the technique used to establish the net benefits to education in this study it must be assumed that the projections made represent a sound probable pattern. It is therefore assumed that the projections based on past trends of the economy in

general, and on salaries paid in the field of education in particular, are reasonably accurate; and that they represent, as much as possible, what will happen in these fields as far as this study is concerned.

Delimitations of the Study

The delimitations of this study are mainly at two levels: the population studied and the scope of the elements under investigation.

Graduates from the Department of Educational Administration at the University of Alberta are the professional administrators studied here. They have to be or have been full-time students in this department. Both graduates in the field such as superintendents, principals, etc., as well as those outside actual practice of administration such as professors, consultants, teachers, etc., are included.

The economic aspect of graduate studies in educational administration is the only one considered. Excluded from the study are all costs and benefits which are not readily convertible into dollars and cents, such as: stress, family adaptation, status, cultural enrichment, enhancement of life enjoyment, and the like. Only the personal or individual benefits and costs are taken into account. Social costs and benefits are not considered. Indirect costs or spill-over benefits are ignored as are "hedging"

returns and non-market returns. In summary, only the direct earning returns to individuals on investment in graduate studies are investigated. It is clear that a study of the total individual costs and benefits may lead to fairly different results. It is also quite well understood that if the total social costs and benefits were under study the results might be quite different.

One other delimitation should be underlined. Only earnings or salaries made by the individual are taken into account. The total personal income is not within the scope of this survey, even though it is well realized that an important part of the difference between income and earnings may be related to graduate studies in educational administration.

Limitations of the Study

One obvious limitation here is the reliability of the answers given to the questionnaire. The results are limited by the value of the assumptions on which the study is based. The more realistic the assumptions are, the better are the data and their analysis. One can argue that individuals responding to questionnaires "color" their answers according to their personal biases. Nevertheless, even the data compiled by the Dominion Bureau of Statistics, on which studies of rate of return have been based -- Wilkinson (32), Podoluk (22) -- are also

subject to the same phenomenon.. Most of their figures are taken from income tax returns. The chances are that some items might be downgraded and others upgraded for obvious reasons. There is probably more chance of accuracy with data collected under cover of anonymity, for research purposes, than with data gathered from returns to a collecting governmental body.

The population used in this survey could not be taken as representative of the total population of school administrators in Canada. They represent a select group among a much larger number of people who have had no specific academic preparation for their job. It may, on the other hand, be representative of graduates in educational administration in Canada even if it is drawn from only one center for the training of administrators. The basic reason for this may be that, until a few years ago, the Department of Educational Administration of the University of Alberta, from which the sample is taken, enjoyed something of a monopoly in the field in Canada. Established ten years ago and supported by the Kellogg Foundation it made its name known throughout the country and abroad. Because of its nature and uniqueness in Canada it has drawn students from all over the country. Consequently, a great many, if not the majority of the Canadian graduates in educational administration completed

its program. The acting head of the department was able to state at the opening meeting of the 1967-68 academic year that: "If there is such a thing as an 'educational establishment' in Canada, our graduates surely are in."²

²Fred Enns. Opening Meeting, Department of Educational Administration, University of Alberta, September 9, 1967.

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CHAPTER II

CONCEPTUAL FRAMEWORK

Related Theory

Education measured as capital. Some would say that education is too valuable to be thought of and studied as capital. Many economists have felt it necessary to state their views on the subject. Those who have studied education as a process by which some "raw human material" is transformed into a more productive component of the economy have usually made it clear that their study of the economics of education was nothing but a piece in the whole picture.

Education was first formally organized to transmit sets of values which a particular society deemed necessary for its members. This is still one of the major purposes of all educational systems -- some would even say the first and most important one. This is a value judgment and it is not within the range of the objectives of the present study.

With the development of technology and the industrialization of societies a more practical aspect of education became acceptable and desirable, and the original purpose was more or less forgotten in certain parts of these societies. The need for industrialized societies

to increase their achievements and for underdeveloped societies to advance economically resulted in great emphasis on human capital, and on its accepted process of development, education. In answer to those who felt that treating education as a form of capital investment is degrading and morally wrong, and that talking about human capital is repugnant because education is for culture, values, etc., Schultz writes that education is all that plus "improving capabilities of people as they work and manage their affairs and that these improvements may increase the national income," (29, p. 572). Bowen is equally clear when writing:

One can feel strongly about the non-economic objectives of education and still acknowledge the importance of also weighing likely economic effects in arriving at policy decisions. A good case can be made (at least to economists) that this is a field in which economic issues are inevitably involved and that therefore economists must do what they can to clarify the consequences of alternative courses of action. As more and more money is spent on education, the old undocumented assertion that "we know" or "we believe" that "education pays", will prove less and less satisfactory to the private and public groups who have to pay the mounting bills. Surely the issue is not whether attempts should be made to apply the techniques of economic analysis to education, but how best to do so. (6, pp. 37-38).

For economists at least, there does not seem to be any doubt that education is an economic investment and that it aids in the development of human capital. Schultz

states:

Since education becomes a part of the person receiving it, I shall refer to it as human capital. Since it becomes an integral part of a person, it cannot be bought or sold or treated as property under our institutions. Nevertheless, it is a form of capital if it renders a productive service of value to the economy ... some and perhaps a substantial part, of the unexplained increases in national income in the United States are attributable to the formation of this kind of capital. (29, p. 571).

Eckaus is no less specific about the economic aspect of education when he says:

Education is the process by which "raw" human resources are made productive like farmland, mineral deposits, rivers have to be processed in a way or another to be made productive. (13, p. 103).

Economists also agree that, even if it is not an easy task, education can be measured economically. Becker, Strumiline, Hoselitz and Schultz have conducted evaluative studies in different parts of the world. Debauvais sees that the "stock of education of the labor force can be expressed in monetary terms." (10, p. 668). Schultz thinks that "it is meaningful to treat education as something that is measurable." (30, p. 93).

The problem is how to measure it. The practice followed with physical capital is to calculate the cost of producing the physical capital. This calculation cannot, however, be dissociated from another one; that is, the calculation of the output produced by the capital. As

a matter of fact, it is the relation between the results of both calculations that gives physical capital part of its market value. The same practice has been followed by most students of human capital. Cost-benefit analysis and rate-of-return evaluations involve these two calculations. This practice would take care of the capital consumed during the process of formation. In other words, part of the total input is consumed in producing the output and its amount may vary. Only a comparison between input and output can establish the amount. This concept is illustrated in the following figure:

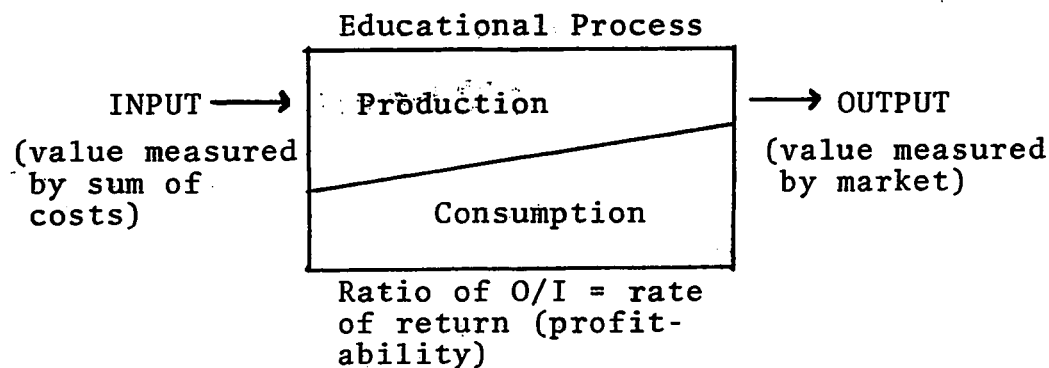


FIGURE 2

PRODUCTION OF HUMAN CAPITAL

Theoretically, all the input could be used in the process of producing a negative output, or an output having less value than the input. This would make the output hardly marketable. The combination of these two calculations

would then take care of the consumption aspect of education in isolating its real investment aspect. The sum of the costs of education would determine the value of the input and the market would establish the value of the output. The difference of both sums would represent the plus value of the initial capital acquired in the process of formation. As well, the consumption aspect of the newly formed capital would be isolated.

The market would buy only the active or reproductive part of that capital. A school board would not hire a school administrator and pay him for the enjoyment he might take in analysing the interaction between groups of teachers, but for his ability to cope with the problems this interaction may create. He would be hired and paid for what he can produce not for the enjoyment he may experience in so doing. The school board, or the market, then identifies the value of the capital produced by the training the administrator has undergone. This determines the net plus value the initial capital has acquired.

Conducting a rate-of-return study would then meet the requirements Schultz establishes to estimate human investment and take into consideration his problem of distinguishing between consumption and investment:

How can we estimate the magnitude of human investment? The practice followed in

connection with physical capital goods is to estimate the magnitude of capital formation by expenditures made to produce the capital goods. This practice would suffice also for the formation of human capital. However, for human capital ... how to distinguish between expenditures for consumption and for investment.... In principle there is an alternative method ... namely by its yield rather than by its cost. While any capability produced by human investment becomes a part of the human agent and hence cannot be sold; it is nevertheless "in touch with the market place" by affecting the wages and salaries the human agent can earn. The resulting increase in earnings is the yield on the investment. (28, p. 8).

Let us now turn more specifically to an analysis of the methods employed to measure educational capital.

Methods used to measure educational capital. This study, within its limitations and delimitations, is based on cost-benefit and rate-of-return theories as well as on theories pertaining to the calculation of lifetime earnings and discounted lifetime earnings. Moreover, one who decides to take graduate work in educational administration has been faced with a choice between investment alternatives exclusive of one another. Consideration of some basic theories on investment may be useful. The cost-benefit analysis one makes, according to some economists, has a sound investment as its goal.

The general pattern covering the situation would probably fit the following diagram:

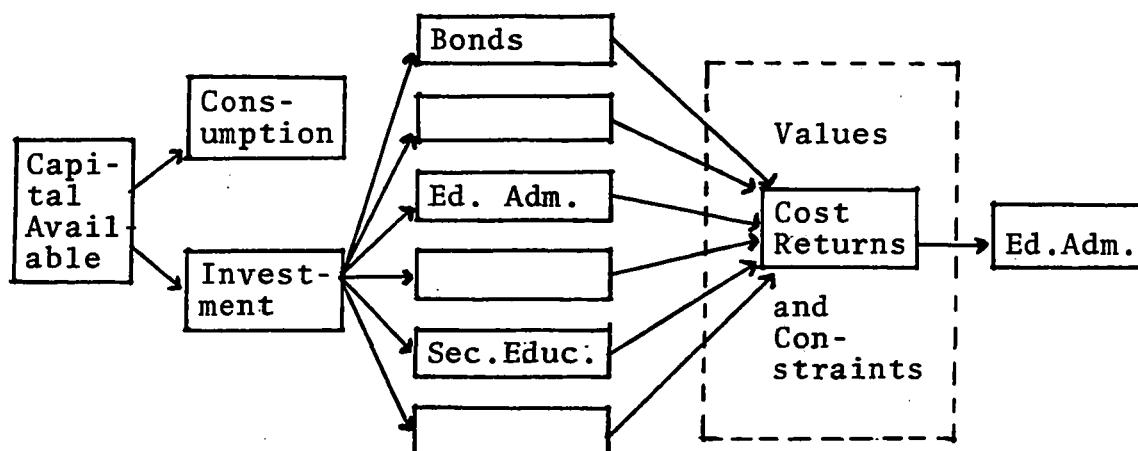


FIGURE 3

PATTERN OF DECISION-MAKING FOR INVESTMENT IN EDUCATIONAL ADMINISTRATION

A certain amount of capital is available; alternative investments, exclusive of one another, are considered the costs and returns of each of these is assessed within the limits of a personal set of values and constraints, and a decision is then made in favor of one of the alternatives. In this study, the chosen investment is graduate studies in educational administration.

(1) Investment and education. Once one has begun to study man as a form of capital, he can take most of what is said of other forms of capital and apply it to human capital. Mushkin is quite positive about this:

From the viewpoint of the individual and of society as a whole, however, education is similar to the production of physical capital goods. Both require the use over a period of

time of facilities such as buildings, materials and equipment, and labor skills. Both necessitate the sacrifice of goods and services that might otherwise have been produced. Both will yield "services" over some subsequent period. The essential capital-formation features are the same, but, of course, the conditions of "production", the time periods involved, and the resources required vary extensively. (13, p. 103).

For this particular study on the formation of human capital one could look at what is spent in obtaining education as a form of investment. This would follow the general laws of investment. Rivlin thinks that:

There are a great many motives for getting an education, but clearly, when people take resources away from present consumption to devote them to training and education that enable them to earn more income in the future, they are, whether they plan to or not, making an investment in themselves ... one that has many similarities to an investment in a factory or a machine. (27, p. 360).

Schultz too, makes it clear that money spent for education is a form of investment similar to an investment in physical capital. He writes:

Surely some individuals or families make decisions to invest in some kinds of education, either in themselves or in their children, with an eye to the earnings that they expect to see forthcoming from such expenditures on education. It should be possible to analyse these decisions and their consequences as one does other private decisions that give rise to physical capital formation throughout the economy. (29, p. 573).

If education is a form of investment, then it has to compete with other forms of investments and consumption. Innes and others are clear on this point. They write:

What we are suggesting is that an individual who is considering an expenditure now which will yield future income ought to consider education as one of the alternatives. (21, p. 3).

Individuals, families and governments are then forced to choose because capital is limited and what is invested in education cannot be invested in bonds, houses or highways; or spent on cars, trips, clothing, etc. Through investment then, people have to choose between immediate and future consumption. It is a matter of choice between present use of capital or of future use of the fruits this capital is expected to yield. Hirshleifer writes:

... investment is not an end in itself but rather a process for distributing consumption over time ... the attainment of an optimum through balancing consumption over time. (20, p. 329).

One of the most basic laws of investment is the principle of maximization by which the investor attempts to choose the investment which is expected to yield the most with the least risk. Prest and Turvey put it this way:

As choice involves maximization, we have to discuss what it is that decision-makers want to maximize. The formulation which, as a description, best covers most cost benefits analysis ... is as follows: the aim is to maximize the present value of all benefits less that of all costs, subject to specified constraints. (26, p. 686).

Stonier and Douglas formulate a similar idea when they write:

Now any piece of private investment will only be undertaken if it is expected that it will yield a return to the investor. Moreover, anyone who has liquid resources available for investment will usually find that there is an important alternative to investing his money in new capital equipment....

It follows that if any piece of investment is to be undertaken, not only must the investor expect to earn a money return from it, but that money return itself must be somewhat greater than the return he could obtain if he were to buy existing bonds. The return must, at the very least, equal the rate of interest. (31, p. 412-413).

Becker is no less clear in dealing with investment in education. He writes:

An informed, rational person would invest only if the expected rate of return was greater than the sum of the interest rate on riskless assets and the liquidity and risk premiums associated with the investment. (2, p. 41).

Another law of investment regulates "the amount to be invested" which "is a function of the rate of return expected." (2, p. 47). Becker has educational investment in mind when he writes this. Blaug is no less explicit when discussing the following argument:

Argument: private returns do not matter because most important benefits of education are indirect and external to the educated individual. "It is not always appreciated that even if it were true, it would still leave us with the task of explaining why people choose more or less education, or one kind of education rather than another: indirect economic benefits by definition do not determine individual choice." (5, p. 211-212).

Investment in education seems then to obey some of the fundamental laws of investment. What then would be the approach which can be regarded as the correct criterion by which a particular educational investment would be selected? Dryden emphasizes that:

In the theoretical literature the chief rivals to the claim of being the correct criterion are the internal rate-of-return (defined as the rate of interest which makes the net discounted value of the project equal to zero) and the present value criterion (defined as the net value of the project's returns when discounted to the present at a predetermined rate of interest). (12, p. 237).

This is not to say that investments in general and, in particular, investment in graduate studies in educational administration obey only the laws of financial maximization. In government investment, the highest rate of return is not necessarily the determining criterion. Political and sociological criteria are considered as well. In private investments, non-marketable effects of education surely carry weight in the decision of the investor. Blaug asserts:

... rational investment responds to certain expected monetary and psychic returns. At any rate, no one has yet produced evidence that would falsify this assumption. (5, p. 211).

Moreover, even with the most accurate possible figures of costs and benefits there will always be an element of uncertainty in any investment. Keynes recognizes that the expectations of prospective returns are based on:

... partly existing facts which we can assume to be more or less known for certain, and partly future events which can only be forecasted with more or less confidence. (op. cit., 31, p. 147).

Hirshleifer also makes a similar statement:

... ignorance and uncertainty are of the essence of certain important observable characteristics of investment decision behavior. (20, p. 330).

Keynes goes as far as making this uncertainty factor one of the attractions of investment. He writes:

If human nature felt no temptation to take a chance, no satisfaction (profit apart) in constructing a factory, a railway, a mine or a farm, there might not be much investment merely as a result of cold calculation. (op. cit., 31, p. 419).

Education is then measurable in economic terms.

A decision to complete further education is a decision which excludes other investment alternatives. A decision for an investment in education is the result of an evaluation of the costs and the returns of the possible alternatives.

(2) Cost-benefit analysis. The four different approaches used in this study -- the sub-problems -- can be regarded as a variation, an extension, or even a more or less developed application of the same principles.

The cost and benefit approach is the basis on which the rate of return is calculated. We are not using different instruments to measure the effects of education on earnings. It may even be said that the rate-of-return

approach is simply a cost-benefit analysis pushed one step further. Blaug even goes so far as to say: "Cost-benefit analysis is exactly the same thing as rate-of-return analysis." (5, p. 226). Therefore what can be said of one could be applied to the other.

Lifetime earning differentials or marginal lifetime earnings, gross or net, may be regarded as either a benefit analysis (gross), or as a cost benefit analysis (net).

In summary, if one calculates the cost of education and its returns, then one is conducting a cost-benefit analysis. Once this is done, the next step with the data is to find the rate the returns represent compared to the costs. This is a rate-of-return approach.

What does some of the literature on cost-benefit applied to education consider in constructing a working framework? This can be studied under three major headings: (a) usefulness, (b) general principles, and (c) limits and difficulties.

(a) Usefulness. Prest and Turvey in their survey stress the planning advantages of cost-benefit studies: "Cost-benefit analysis is a practical way of assessing the desirability of projects where it is important to take a wide view and a long term view." (26, p. 683). One of the prime reasons for adopting this approach is to assist

government and individuals alike in setting up a scale of priorities for the investment of their limited resources. (27, pp. 358-359; 6, pp. 111-120). Bowen sees the rate-of-return approach almost the same way:

The rate-of-return approach has many attractions, not the least of which is that educational benefits are related to educational costs in a way that holds out the hope of providing useful information concerning the adequacy of the overall level of investment in education and the extent to which economic benefits accrue directly to private individuals. (6, p. 16).

Because of the allocative advantages of cost-benefit study, the policies made to implement the investment programs have more chance of being rational and objective. Prest and Turvey underline this when they write:

An important advantage of a cost-benefit study is that it forces those responsible to quantify costs and benefits as far as possible rather than rest content with vague qualitative judgements or personal hunches. This is obviously a good thing in itself; some information is always better than none ... it has the very valuable by-product of causing questions to be asked which would otherwise not have been raised. (26, p. 730).

Wiseman, in the same vein, sees these studies as a source of unity within policy-making bodies. He writes:

... it might be thought not unreasonable to expect that "human investment" studies would reduce the importance of policy disagreements about education, or at least permit the more precise specification of the nature of such disagreements and hence facilitate their resolution. (38, p. 1).

The rate-of-return approach is seen by some economists as "the most important single determinant" (2, p. 30) of investment in education. Among other approaches it is regarded as the most effective of all for analysis of investment in education. As Bowman says:

The most embracing and refined theoretical construct applicable to economic analysis of investment in education is represented by the rate-of-return approach. Though its rigorous application is normally frustrated by inadequate data, the basic propositions and techniques are pervasive and indispensable for any rational analysis.... Rate-of-return analysis is the major tool among several in this endeavour. It provides a more precise and refined guide to direction of adjustment than any other yet available to us. (8, p. 111, 113).

The rate-of-return model is by "far more fully developed than any other" (8, p. 111) which has been used in dealing with the economics of education. The approach might be of little use in explaining decisions made by one individual, but it is a powerful instrument in forecasting or explaining decisions made by a group. (16, p. 127).

This approach may also be used as a means to determine who should bear what cost. In conducting a complete analysis, both social and individual, one could determine to some extent to whom the returns accrue: society or the individual. If there is to be a sharing of the costs it could be based on a sharing of the profits.

Bowman summarizes the advantages of the approach as most people have seen them, but adds the dynamic dimension

of communication between economists and educators. She states:

Selection of the rate-of-return models as the central theme is dictated by two considerations. First, this kind of model, which is central to analysis of all problems involving decisions with regard to the allocation of investments to one use or another, is far more fully developed than any other with which economists have approached problems in the economics of education. Second, it is the approach that most clearly illuminates the zones within which the concerns of economist and educator converge, and where better interdisciplinary communication and joint research efforts offer the greatest promise. (8, p. 111).

In summary, the rate-of-return approach is the best developed approach to the economics of education. It is used as an instrument of evaluation of alternative investments of which education is one. What are the general principles to be respected if one intends to work with that instrument?

(b) General principles. The general principles underlying a study of the rate-of-return to the individual can be grouped under two main sections: costs to be retained, and benefits to be considered.

(i) Costs. There can be two approaches to the calculation of the costs: the evaluation of the differential wealth, based on the level of wealth before and after graduate studies; and the detailed calculation of all the real costs of graduate study.

Evaluating the costs by the differential wealth

approach would involve obtaining a financial statement from a student before he enters graduate work and comparing it to a similar statement once his graduate studies were completed. This would be based on either one or the other of the following assumptions: graduate students maintain the same standard of living during their years at university as previously; the basic necessities of life are taken care of during graduate work and anything beyond this is subjective utility, not being accounted for in financial terms when calculating costs.

In a detailed calculation of the real costs, almost all studies in the field of education include such things as foregone earnings, tuition, fees, transportation, books, (15, p. 90) and any other expenses associated with study. Most researchers agree on the inclusion of all these expenses but one: foregone earnings. Vaizey takes a stand against the inclusion of these in his latest writings.

Earnings foregone -- "that is, the average income which could have been earned during the years while a person was gaining more education," (15, p. 90) -- are to be included, at the graduate level at least. Blaug is very clear about this point:

We must take account of the earnings foregone by students in calculating both the private and the social rate of return, and this, in fact, has been the standard practice. (5, pp. 226-227).

If one studies individual returns for a level of compulsory education, obviously foregone earnings cannot be included because the student cannot legally be earning money instead of studying. As soon as attendance is non-compulsory an individual has to give up a possible source of revenue to gain more education. The more one is educated, the higher is his foregone revenue. In the case of graduate work in educational administration the great majority of the students give up relatively well-paid jobs to undertake their studies. The Economic Council of Canada specifically states the importance of including foregone earnings in the costs of higher education:

The extra costs for higher education should, of course, take account not only of money expenses for such items as books, tuition, transportation -- but also of income foregone -- that is, the average income which could have been earned during the years while a person was gaining more education. (15, p. 90).

Mincer sees foregone earnings as the most important of the costs of a program of training. He writes:

The cost of training depends upon the length of the training period in two ways. First and foremost is the deferral of earnings ... second is the cost of educational services. (4, p. 284).

Vaizey, after having been in favor of including these costs as late as 1961, is the chief one along with a few followers including Harris and Burkhead, to argue against considering foregone earnings as costs of education.

(5, p. 226). His point is that in including these costs one:

... opens the gate to a flood of approximations which would take the concept of national income away from its origin as an estimation of the measurable flows of the economy.... if income foregone is added to other sectors of the economy (notably housewives, mothers, unpaid sitters-in, voluntary work of all sort). (33, p. 43).

The point is probably well taken when one has to deal with national income. Nevertheless, it seems that most economists are quite ready to say that foregone earnings is one of the most important costs -- if not the most important -- to be considered, especially in a study of the rate-of-return to individuals. In this regard, Blaug states:

But even with respect to the private yield, to ignore foregone earnings is to seriously misrepresent the nature of private decisions about education: it is foregone earnings that explain why so many able children from low-income families do not stay at school beyond the statutory age, despite the fact that the out-of-pocket costs of continuing school are minimal, particularly in this country. (U.K.). (5, p. 227).

To support his statement, he cites figures for the U.S.A. and the U.K. In the U.S.A. foregone earnings represent one-half of the costs of high school and three-quarters of the costs of college education. In the U.K., these earnings represent 34 per cent of the secondary school costs and almost 100 per cent of higher education costs. (5, p. 227).

Marginal costs are calculated after income tax is deducted. This appears to be the accepted practice (1, pp. 167-168; 18, p. 132) even if studies have shown that income tax has no influence in determining the individual choice of investment. (9, 13, p. 73). The rate of the income tax is the 1967 Canadian rate on individual income as presented in Table I. For the purposes of this study all students are considered single with regard to income tax. The point is that deductions for the family are not related to the service, the amount of education, and the increments in salary. These deductions are the result of the social welfare policies of the government. They have to be associated with transfer payments.

TABLE I
1967 RATES OF CANADIAN INCOME TAX

Taxable Income		Tax	
\$ 1,000 or less		11%	
1,000	\$ 110	+ 14% on next	\$ 1,000
2,000	250	+ 17% on next	1,000
3,000	420	+ 19% on next	1,000
4,000	610	+ 22% on next	2,000
6,000	1,050	+ 26% on next	2,000
8,000	1,570	+ 30% on next	2,000
10,000	2,170	+ 35% on next	2,000
12,000	2,870	+ 40% on next	3,000
15,000	4,070	+ 45% on next	10,000
25,000	8,570	+ 50% on next	15,000
40,000	16,070	+ 55% on next	20,000
60,000	27,070	+ 60% on next	30,000
90,000	45,070	+ 65% on next	35,000
125,000	67,820	+ 70% on next	100,000
225,000	137,820	+ 75% on next	175,000
400,000	269,070	+ 80% on remainder	

A cost which is more difficult to evaluate precisely is the differential level of consumption suggested by Eckaus. (13, p. 114). Unless one conducts a study extended over a few years covering consumption before the undertaking of graduate studies and a study again during the years of graduate work it would be rather difficult to ask people to evaluate the difference in level of consumption. Moreover, most writers agree on the influence of education in changing the individual's spending pattern. One may also use a control group to determine the difference in level of consumption.

On the other hand, if one accepts: (a) that earnings can be divided into two parts, that is, consumption and saving; (b) that the ability to save is related to the amount of the earnings; (c) that saving cannot be considered below a point where the basic necessities of life are provided for; (d) and that once this point is passed, the minimum is assured, then any amount of earnings above it is a matter of subjective utility and can be consumed or invested. The choice to invest is simply the expression of a preference for a future level of consumption over a present one, a matter of time preference in the pattern of consumption. One should not then be bothered by the possible lowering of consumption during the years of study. This would be a psychological cost of education and consequently beyond the scope of the present study.

Foregone income, fees, travelling expenses, and other expenses directly related to the undertaking of studies should be retained as costs of education, especially of graduate education, when calculating the rate-of-return for individuals. What are the benefits then which should be included in this kind of rate-of-return?

(ii) Benefits. The benefits or returns from education can be divided first into two broad classes: psychological, and financial returns. The financial returns can also be grouped under two headings: returns to the individual, and to society. The financial returns to individuals as enumerated by Weisbrod (6) are as follows: direct financial returns, financial option returns, hedging option returns, opportunity option returns, and non-market returns. Direct returns are the only returns which can be easily calculated.

The most obvious return from education, according to almost all studies on educational returns, is the increase in earnings which is associated with further education. However, a survey of medical doctors' earnings, conducted in the U.S. around 1930 (34) and Wilkinson's study on engineers' and technicians' earnings suggest that "additional education, even within occupations, does not always pay." (37, p. 569). The main source of returns is

the difference between the actual salary of a person after his graduate studies and what he would be earning, other factors being equal, had he not taken a degree. The correlation between education and earnings is almost an unquestionable fact for economists. Hanson concludes a review of the findings of some of the most important researchers in the economics of education by this short, but straightforward sentence: "Nevertheless, the evidence is pretty clear that education pays off." (19, p. 28). In any event, both kind of studies, those establishing a relation between education and earnings and the few questioning it, have in common a prime interest in differential income. Earning differentials are then regarded as basic in calculating returns to education.

The other financial returns are much less easily evaluated. (3, p. 60). Financial option returns -- "the value of the opportunity to obtain still further education" (36, p. 20) -- have an economic value, that is, it is worth something financially to have the possibility of continuing one's education. In other words, part of the financial return attributed to a higher degree should be associated with the possession of the degree required for entrance. The financial evaluation of this is a problem which has not yet been solved.

It is harder to put a price on hedging option

returns -- "The increased ability to adjust to changing job opportunities." (36, p. 23). They are mentioned by many economists as returns -- Schultz, Hanson, Becker, for instance -- but none seems to have found a formula allowing a satisfactory evaluation of them.

For those returns Weisbrod refers to as opportunity options which represent employment opportunity, one would hardly argue that they do not represent clear financial advantages. The problem is: How is the possibility of having a wider scope of possible employment evaluated financially? What is the value of possessing the requirement for better paid, more pleasant jobs? This is another return to the individual associated with education, but for which no means of evaluation has yet been found.

For the other class of returns mentioned by Weisbrod some partial figures have been suggested, (36, p. 23) but for social returns only. These non-market returns -- the financial advantage of basic reading and writing, for instance -- have a clear financial value, but they are so well spread in industrialized societies that it would be fairly hard to isolate all of them and evaluate their financial worth.

Most studies on financial returns from education have based their findings almost entirely on increases in earnings. The argument in favor of this practice -- out-

side of the difficulties mentioned earlier -- is that if one finds relatively high returns in a study based on one part of the benefits only, he can conclude that the total returns would certainly be greater, if all benefits were included in the study. Weisbrod puts it this way:

... even partial measurement may disclose benefits sufficiently sizable to indicate a profitable investment, so that consideration of the non-measured benefits would, a fortiori, support the expenditure decision. (35, p. 122).

The same reasons advocated earlier in this chapter for calculating the costs after income tax has been deducted apply to the calculation of the benefits. Therefore, the benefits have to be estimated on an after tax basis.

The rate-of-return approach has been seen as a very powerful tool to evaluate investment in education. However, one cannot help but feel that some serious limits and troubling difficulties seem to handicap the use of the approach.

(c) Limits and difficulties. In all studies consulted on the subject of rate-of-return or lifetime earnings it has been clearly indicated that the findings were partial, evaluative, and questionable in many respects. Researchers recognize that the approach is not fully developed and that much more should be done to refine even what is known. Some of the more common

objections to the rate-of-return calculation and similar instruments have been discussed, among others, by Blaug (5, p. 205-262), Bowman (7, p. 69-92), Bowen (6, pp. 13-38), Prest and Turvey (26, pp. 683-735), and Wiseman (38, pp. 1-12).

One of the most common objections to the approach is that education, ability, motivation, class, race, family, etc., are intercorrelated factors influencing earnings. This is agreed upon by most writers, but even after agreeing they generally maintain that education, if isolated as a factor, would be related to earnings. Koulourianos, in his review of the literature takes the following position vis-a-vis the problem:

In general, all the estimating methods used so far to compute the economic returns from schooling are biased in favor of formal education. Due to our inability to account, in a satisfactory way, for the contribution of qualitative variables, the question of what part of the earnings differentials must be credited to education and what to associated factors remains the great unknown of the problem. (22, p. 39).

Some writers try to isolate the "pure" educational returns in adjusting the results of their research for I.Q. and aptitude. Becker (1, pp. 61-66) and Denison (11) have worked at this. Their adjustment is based mainly on very sound assumptions; nevertheless, it leaves the field open for much more work to be done in order to reach a less arbitrary evaluation.

A second objection to the rate-of-return approach is that it assumes that "people are solely motivated by financial gains." (5, p. 212). All writers dealing with the economics of education recognize that it represents only one important dimension of the problem. Some even state this clearly as an introduction to their studies. Some have even tried to establish the relative importance of the economic factor among other factors influencing people in their career choice. Grubel's (17) study of seniors from Stanford University as well as Sanders' (op. cit., 14, p. 73) interviews of corporate executives are examples of studies which could be regarded as complementary to the rate-of-return approach. There is a matter of limitation of one's field of study which is not a denial of all other related factors, but a practical way of approaching a problem in breaking it down into more manageable components.

Earning differences are not necessarily related to productivity and consequently to education, but are often caused by market imperfections. Writers recognize this limitation, but the common thinking seems to be that in spite of these imperfections, no one has yet produced a piece of evidence showing that there is no correlation between education, productivity and earnings. Of course, this general relation may not apply to individual cases even within the same occupation, as Wilkinson (37) has

demonstrated. Market imperfections, then impose real limits to the approach. Nevertheless Blaug, among others, thinks that this difficulty is not avoided by the analysts. They are working toward a solution to what might be an over-emphasized problem. He states:

Rate-of-return analysis, despite what critics are always implying does not assume that markets are competitive. On the contrary it affords a test of the hypothesis that labour markets are competitive. (5, p. 229).

Another difficulty often mentioned is that the cross-section data quite generally used as a basis for this kind of study do not represent reality in a fluctuating economy, but a static unreal situation. If one looks at investment in education as the "use of resources which help increase our output in future periods" (7, p. 80) -- in other words, if it is a matter of spreading consumption according to individual time preference -- the approach may be misleading, especially for the last years of earnings. Secular growth of the economy, social changes and the like have such an influence that "A" with a certain amount of education will not be earning twenty years from now what "B", with a similar education and twenty years older than "A", is earning today. Morgan and David make the following comment regarding this point:

... data on earnings at a point in time are only rough indicators of future lifetime incomes. Increasing levels of ... money income, mean that current levels and differentials in income among today's older people underestimate the levels and

differences which may exist some years hence when today's young people reach those ages. The average earnings in a cross-section sample may drop between the forty-five to fifty-four age group and those fifty-five to sixty-four, but those now fifty will almost certainly have higher average earnings in five years. Similarly, those who are now thirty-five will probably have higher incomes at age fifty-five than are suggested by present cross-section estimates for incomes of persons now aged fifty-five. (25, p. 425).

Weisbrod also believes that cross-sectional data are biased. He states:

... cross-section earnings data tend to understate future productivity of today's young men; this is true because in a growing society each new cohort of people into the labor force comes with better education and knowledge. (35, p. 109).

Others see these data as being more advantageous than other kinds of data. Blaug, for one, believes that they are more appropriate as a basis for a study than genuine life-cycle data. He writes:

... cross-section data have a distinct advantage over genuine life-cycle data in that they are free from the influence of the trade cycle and implicitly provide estimates in money of constant purchasing power. Furthermore, they reflect the way in which private choices are actually made: an average person forms his expectations of the financial benefits of additional years of schooling by comparing the present earnings of different occupations requiring various amounts of education, that is, by cross-section comparisons. (5, p. 224).

Commenting on the generalized use of cross-sectional data, Koulourianos writes: "Varying rates of growth at different periods will affect the realized age-income profiles very

strongly." (22, p. 59). Alternatively, if one is discounting the differential earnings to their present value, the effect of a change in the last years of earnings would be minimal compared with the first ones. The longer the period the less the influence of the latest years. This in turn raises the objection that too much importance is attached to the first years when people with less education are already working. Economists are not in agreement regarding this problem. Wilkinson "assumes that these cross-section figures provide a reasonable approximation of the lifetime earnings expected by an individual." (37, p. 560). Becker (1, pp. 52-55) adjusts the cross-section data he uses to account for secular growth. One would be on safer ground if he used time series data rather than cross-sectional data, or adjusted the latter for secular growth. Otherwise there might be an underestimation of the returns.

Most studies using cross-sectional data employ figures published by the Dominion Bureau of Statistics or by other government agencies. These figures are compiled from income tax returns. These are misleading in some ways. They generally push the earnings downward by the understatements of the reporters. Eckstein (14, p. 61) even states that in the United States, 65.6 billion dollars was unreported, non-reported, or the like for the year 1960 on a total personal income of 400.8 billion dollars. More-

over, these income tax returns include earnings and other kinds of income which are sometimes very difficult to identify. Therefore, a cross-section approach utilizing actual salaries would avoid these two problems. Of course, it would be impossible to use data from the D.B.S. for this study because they do not present data detailed enough to be useful. Wilkinson, writing on the subject, states:

The census category "university degree" does not permit us to distinguish between persons with a three-year degree beyond Grade 12 and those with two degrees or graduate training entailing as much as twenty or more years of schooling. (37, p. 558).

Another source of problems is the indirect benefits which stem from education as opposed to the direct ones. Some writers would even go as far as to say that "... private returns do not matter because most important benefits of education are indirect and external to the educated individual." (5, pp. 211-212). On the other hand, Blaug says: "... indirect economic benefits by definition do not determine individual choice." (5, p. 211-212). Because this study deals with individual choice, the indirect benefits are not a source of problems.

Another source of difficulties would be the non-monetary returns, but they are not within the range of this study. Nevertheless it is recognized that they have a great importance in the choice individuals make when opting

for an investment in graduate studies. Grubel even ranks them before the economic aspect of a profession. (16, p. 161). A complete rate-of-return study would have to find means of evaluating these returns, otherwise educational benefits would be underestimated. (22, p. 39).

The rate-of-return approach, as well as other approaches to the economic returns of education is not a perfect tool, but as Bowen says:

It would be folly to pretend that the rate of return approach is free of troublesome difficulties or that it can be relied on to prove conclusively to a staunch unbeliever that investing resources in education makes good economic sense. But this approach does have three rather important appeals: (1) it enables us to obtain results in a form which permits comparisons of costs with benefits; (2) it permits us, in making calculations, to examine the quantitative effect on our results of alternative assumptions about such things as the proper discount rate and the effect of ability differentials on earnings differentials; and (3) as I hope ... this approach is susceptible to further refinements and does hold out the possibility that further research will remedy some of the present difficulties. (6, p. 33).

Note on Education and Training

In the literature consulted, education and training are generally taken together as a whole or as interchangeable when the "returns to education" are studied. It may be appropriate to make a distinction between these two terms, one which may well explain the findings of some studies -- such as those of Walsh (34) and Wilkinson

(37) -- which have raised doubts on returns to investment in education. Webster's Dictionary gives a broader sense to education than training, but the distinction given there is not sufficient for our purpose. Training in Webster includes "teaching, drill or discipline by which powers of mind or body are developed." Education would be all that plus the moral or ethical development the process may imply. For our purpose education would be as general as Webster's definition but training would have a much more limited sense, that is, a development of a very narrow range of the powers of mind and/or body through teaching, drill or discipline. Education would then be the process of developing a broader scope of potentialities. It would be looked upon as a humanistic process of betterment of the individual, a discipline aiming at developing the subject as a whole. Training would be the process of developing specifically one human potentiality without regard to others. It would be associated with techniques, or special skills. The following example may clarify this point. A four-year program in arts and sciences could fit the definition of education better than four years of study in electrical engineering, the latter fitting better the description of training, as understood here. One of the main points here is that education gives more flexibility for adaptation into a changing world, and training gives a more readily

marketable knowledge in a specialized field but the latter does not provide for as much possibility of adaptation in the event of change in the market pattern of demands. This point is illustrated in Time.

... next weeks' scientific discovery can make last weeks' textbooks obsolete. Even future vocational demands are unpredictable; not long after Los Angeles vocational schools developed a program to train key-punch operators, new machines came along to make the key-punch -- and the operator -- superfluous. (32, p. 70).

Money invested in training in this case would have, to say the least, a very low return, if any at all. Of course, one has to study in depth a narrow field and become a specialist in it if he wants to fit into a technological society. The point is: When and how should this be done? The sooner specialization is undertaken, the greater the danger of missing the needed general development. When this specialization is taken it can be divorced from other aspects of life and other disciplines, and consequently can be a kind of trap for the future technocrat. This is clearly underlined in the following quotation:

Once in his specialty, the student is isolated from his fellows by what Robert Oppenheimer calls 'a thinning of common knowledge', thus silencing the age-old conversation among scholars that is the soul of humane learning.... And businessmen, as Barzun¹ acknowledges, remain 'true believers' in the liberal arts tradition and support it because 'they really prefer general intelligence, literacy and adaptability' to special skills that grow quickly obsolete. (23, p. 4).

¹Jacques Barzun, Provost of Columbia.

Nevertheless, it is not within the scope of this study to establish if graduate studies in educational administration are more education than training or vice versa, but one should bear it in mind.

Definition of Terms

For the purpose of this study the following terms will be used as defined below.

Cost. "What is given up to obtain education."
(8, p. 112).

Benefit. What is gained from obtaining education.

Rate-of-return. Ratio per unit of time of the marginal lifetime earnings associated with education against the net costs of this same education.

Internal Rate-of-Return. "... rate at which the present value of the extra lifetime earnings from extra education equals the cost of staying at school." (4, p. 167).

External Rate-of-Return. "rate of return used for comparative purposes." (7, p. 28).

Discounted cash flow - Present value. "the value of the net returns when discounted to the present at a predetermined rate of interest." (5, p. 209).

Salary, wages and earnings. Money received for labor or services, excluding money received from property, investment, etc.

Income. Money received for labor or services, property, investments, etc.

Marginal Earnings. Part of the earnings associated with educational increments.

Foregone Earnings. Earnings not received because one took further university education instead of working; or, what "they could earn if they were not going to school ... (what is) received by working people of the same age and education." (22, p. 46-47).

Diminishing Returns. Economic phenomenon which makes any new or additional investment in a project, return less than past investments.

Theory and Hypotheses for this Study

The sum of money represented by the cost of education to the individual at the master's and doctoral levels in educational administration at the University of Alberta is looked upon as an investment. Any sound investment is the result of a decision to choose among mutually exclusive alternatives with the intent to maximize profits. Investment in graduate studies in this case is then expected to support the first four of the hypotheses listed below.

Because of the substantial aid received by graduate students in educational administration in the form of fellowships, assistantships, leaves of absence with pay, scholarships and the like, the law of diminishing returns

will be distorted. This would support the first part of the fifth hypothesis. Nevertheless, because of administered prices, a market imperfection, the returns which might have been otherwise infinite will tend to be closer to figures given in other studies. A market imperfection would then be a corrective device for the distortion of the law of diminishing returns. This would support part two of hypothesis five.

The five hypotheses to be tested then are as follows:

- (1) The marginal lifetime earnings discounted at a rate equal to the rate of interest paid on the market will be equal to or greater than the cost of education.
- (2) The rate-of-return of the investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or greater than other forms of educational investment.
- (3) The rate-of-return of the investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or greater than the industrial rate-of-return.
- (4) The rate-of-return of the investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or

greater than the cost of borrowing money on the market.

- (5) The rate-of-return and the marginal lifetime earnings will be substantially higher than the figures which have been advanced by other studies of the economics of education. Nevertheless, they will not be so much above as to approach infinite returns; rather, they will be close to previously found figures.

greater than the cost of borrowing money on the market.

- (5) The rate-of-return and the marginal lifetime earnings will be substantially higher than the figures which have been advanced by other studies of the economics of education. Nevertheless, they will not be so much above as to approach infinite returns; rather, they will be close to previously found figures.

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CHAPTER III

INSTRUMENTATION AND DATA COLLECTION

Instruments

The data of this study were collected from two sources: graduate students from the Department of Educational Administration at the University of Alberta; and journals and papers dealing with economics, finance and business. A questionnaire was used for the collection of the data coming from the first source.

A first draft of the questionnaire¹, was administered to forty-three graduate students in educational administration at the University of Alberta. Their numerous critiques assisted considerably in drafting the final form. Most of the corrections dealt with the wording of some questions marked as "not clear" by the respondents or for which they had to ask for explanations in order to be able to answer them. The major change was the deletion of that part of the questionnaire concerned with "differential wealth" -- an attempt to establish the difference between the subjects' wealth before and after graduate studies. It was thought that, on the average, the costs calculated in using the "differential wealth" approach would be approximately identical to the detailed

¹Copy of the questionnaire in appendix.

calculation of these. The other and most desired asset of the approach was its apparent simplicity: the difference between wealth before and after graduate study. In one single operation the net cost of graduate studies would have been calculated. From the pilot experiment both expected assets were found to involve very complicated problems. From the data collected it was clear that in order to achieve any degree of accuracy in the estimate of the costs, numerous corrections would have been needed for inflation, market fluctuations, plus value of real estates, inheritance, investment revenues, and other elements influencing the net value of the assets of a student. For the purposes of this study then, a decision was made not to pursue the analysis in this way.

The questionnaire is then composed of four parts from A to D. Part A deals with general information: age of the respondent, his status before and after graduate studies, and the pattern he followed for his graduate work in educational administration. Part B covers the costs involved in graduate work. Five main items are considered: salary foregone, fees, travelling and moving expenses, housing expenses, and other expenses. It is constructed in such a way as to enable the respondents to distinguish between gross costs and marginal costs. Only the latter are of interest in this study as they are the sole ones related to the status of students. Part C

evaluates the sources of revenues of the student. It is a complement to Part B. Replies to Part C assist in calculating foregone income, in supplying information regarding: leaves of absence, scholarships, assistance-ships, wife's income, personal income, and other sources of financing available during periods of graduate studies. Part D includes some questions which do not readily fit into other sections of the questionnaire, questions for example which assist in computing marginal lifetime earnings.

All questions are factual. They ask for descriptive answers. They are designed in such a way as to include what previous studies in the field have described as direct personal costs of a financial nature attributed to education, as well as direct financial benefits to the individual. Some of the costs on which writers do not agree, such as foregone income, either are or are not covered by a question on the basis of previous discussion of costs in this study. This applies also to sources of revenue which students may have when undertaking graduate work.

Sample and Sampling Techniques

The sample is taken from the Department of Educational Administration of the University of Alberta. Only master's and doctoral students are considered. Students who have

withdrawn from the course for illness or other reasons are excluded. Diploma students are also excluded, as are part-time students at the master's level.

Among the master's and doctoral students, only those who have been in residence in 1962-63, 1963-64, 1964-65, 1965-66, 1966-67, and 1967-68 are studied. They represent one hundred and fourteen students at the master's level, and forty-seven at the doctoral level. Students who were in the department before 1962-63 are not included because of the difficulty of evaluating costs which were incurred from almost seven years ago to nearly twelve years ago. Their inclusion would likely be a source of vagueness and bias for the evaluation of the costs. There is probably no problem of this kind for at least the last three years. Many have just graduated a year or so ago, and a large number are still at university. For the year 1962-63 and the two following years there might be more imprecise evaluation.

For students of 1967-68, presently in their training program, one might object that their evaluation does not represent actual figures. The master's students, when answering the questionnaire in late February, were close enough to the end of their program to give accurate evaluations. The same applies to the doctorate students in the last year of the program. For the first-year doctorate students the problem is recognized and they are excluded.

The sample is then composed as follows:

TABLE II

GRADUATE STUDENTS IN EDUCATIONAL ADMINISTRATION AT
THE UNIVERSITY OF ALBERTA, 1962-63 TO 1967-68, (FOR
THE PURPOSE OF THIS STUDY)¹

	Master's	Ph. D. (last year)	
1967-68	27	16	
1966-67	24	7	
1965-66	24	8	
1964-65	21	6	
1963-64	7	10	
1962-63	11	0	
Total	114	47	161

¹Students who have completed the Master's and the Ph. D. programs in three consecutive years are considered for the purpose of this study, as having taken the three year Ph. D. program.

At a very early stage of the analysis of the data it became obvious that some of the graduate's questionnaires had to be deleted from this study because of the strong bias their answers would have introduced into the sample. They are those people coming to the Department of Educational Administration from foreign countries such as Australia (7 students), England (3 students), Thailand (1 student), Trinidad (1 student), and Nigeria (1 student). The economy, the school system, and other social factors

are such that inclusion of data from graduates working in these countries would have distorted the replies by the great majority of the sample. Australia,² for example has a system of education in which personal academic achievement is rewarded in quite a different way, if at all, than it is in Canada. Promotions and salaries are related much more to seniority and professional achievement than to the holding of a university degree. Educators there do not have the free employment situation which we have in Canada. The relationship between further education and salaries is so different in that society, in the field with which we are concerned, that figures were meaningless when compared to the rest of the sample. This was mentioned by most of the Australians who answered the questionnaire.

These reasons for dropping Australian subjects were even more obvious when the answers from English, West Indian, Thai, and Nigerian graduates were analysed. There were nevertheless, cases where foreign students were retained in the study. If, for instance, an Australian remained in Canada following graduation, he was included in the analysis. Adjustments were made to give him a salary comparable to that of a Canadian with the same function, an equivalent degree, and the same teaching experience. This has been done in two cases. For those foreigners who had

²The consideration on Australia have been read and found accurate by two Australian superintendents of schools.

worked in Canada before beginning their course there was no problem. Canadians who left Canada following graduation were deleted from the study for the same reason foreigners were. In two instances Canadians abroad were included in the sample because they were working with the Canadian Department of External Affairs, were in fact on Canadian salary scales, and technically employed and paid by the board of education they worked for when last in Canada.

Another group of four students at the Masters' level in 1967-68 had to be excluded from the study. They are planning to pursue doctoral degrees in September 1968. For the purpose of this study they are then assimilated with those taking their Ph. D. in the three-year pattern.

The sample was then composed as follows:

TABLE III

GRADUATE STUDENTS IN EDUCATIONAL ADMINISTRATION
AT THE UNIVERSITY OF ALBERTA, 1962-63 TO 1967-68,
AFTER SELECTION²

	Master's	Ph. D. (last year)
1967-68	21 (4 continuing, 2 Englishmen)	13 (3 Australians)
1966-67	20 (2 Australians, 1 Thai, 1 West Indian)	7
1965-66	22 (1 Australian, 1 Nigerian)	8
1964-65	21	6
1963-64	6 (1 Australian)	10
1962-63	10 (1 Englishman)	0
Total	100	44
		144

²Numbers in parenthesis indicate subjects who were deleted from the study.

Data Collection

There are two main sources of data: one concerned mainly with costs, the other, with comparative returns. The first source is exploited through the appended questionnaire which has been sent to sampled students. The second one is the publications dealing with return to investments in various fields. The publications of the Dominion Bureau of Statistics as well as various journals, reviews and papers dealing with economics and finance are the sources of these comparative data.

Doctor G. L. Mowat sent a letter³ to all the graduate students in educational administration at the University of Alberta who have been attending during the period 1962-1966 and to those in attendance in 1967-68. He requested them to cooperate and assist in the research. They were assured that, due to the confidential nature of the information they would provide, the returned material would be treated in such a way as to preserve complete anonymity. Included with the letter were a form to be completed⁴, and stamped and addressed envelope provided for the return of the completed form. There were 161 letters sent. One hundred and fifty-four were returned, leaving seven people for whom the correct address could

³Copy of this letter in Appendix.

⁴Copy of this form in Appendix.

not be found. Of these 154 replies, 148 agreed to collaborate. Six people were deleted: one refused collaboration; one had been mistaken for a former student; three had been in the department before the date limit set for the study; and one had dropped the course due to illness.

A few weeks after the first letter was sent, the questionnaire was forwarded to those who had agreed to collaborate. Enclosed with the questionnaire were a letter of introduction and directions⁵, an information sheet⁶, and a stamped and addressed envelope for return mailing. There were 131 returns received in the next few weeks.

A follow-up letter⁷ was then sent to the 17 for whom no completed questionnaires had been received by the end of March, 1968. This last letter resulted in eleven more replies which are used in the analysis of the data. Finally, there were three replies received too late to be included in the analysis and two persons did not send a properly completed questionnaire. Therefore, the total number of collaborators is 142. This can be summarized by the following table.

⁵Copy of this letter in Appendix.

⁶Copy of this information sheet in Appendix.

⁷Copy of this letter in Appendix.

TABLE IV
DATA COLLECTION: EVOLUTION OF THE PROCESS

Original Sample	161
No Correct Address	7
Mistaken Student	5
Refusal of Collaboration	1
Accepted Collaboration	148
Questionnaire Sent	148
Questionnaire return: first	131
Questionnaire return: after following up letter	11
Questionnaire return: too late for inclusion	4
Questionnaire not Returned	2

The final sample used in the analysis of the data, after the selection process described in Sample and Sample Techniques above, comprises 127 persons, 128 subjects. These 128⁸ subjects are spread over the six-year period between Master's and Ph. D. programs as shown in Table V.

The 128 subjects were holding different positions in their respective educational systems before they came to university to pursue graduate studies. Table VI

⁸It is to be noted that this number 128 does not coincide with the number of people included in the study 127, one less in the latter. This is because one person is included twice -- one time as a Master's student, one time as a Ph. D. student -- in the analysis. That person has been a student for both degrees in this department with a three years period of time in between both attendances. It is also to be noted that these 128 subjects represent 142 collaborators less foreign students.

TABLE V
GRADUATE STUDENTS IN EDUCATIONAL ADMINISTRATION AT THE
UNIVERSITY OF ALBERTA, 1962-63 TO 1967-68
FINAL INCLUSION

	Master's	Ph. D. (last year)
1967 - 68	22	13
1966 - 67	18	8
1965 - 66	17	4
1964 - 65	18	8
1963 - 64	7	6
1962 - 63	7	0
Total	89	39 = 128

enumerates the number of them for each of the positions held, with a distinction being made between Master's and doctorate students. The great majority of the Master's students came from three main positions: teachers (31), principals (27), and assistant principals (19). More than half of the doctoral students came from principalships (16) and assistant principalships (5).

Following graduation, students were employed as shown in Table VII. All but four students accepted employment as administrators following completion of the Master's degree. Almost half of the group became principals. All Ph. D. graduates accepted positions as administrators or as lecturers of educational administration. The latter group represents almost half the sample at the Ph. D. level.

TABLE VI
POSITION HELD BEFORE GRADUATE STUDIES

	Master's	Doctorate	Total
Assistant Principal	20	5	25
Assistant Superintendent	1		1
College Dean	1	3	4
Department Head	1	1	2
Executive Assistant		2	2
Guidance Counselor		2	2
Inspector		1	1
Principal	29	16	45
Regional Assistant Director	1		1
Superintendent	1	1	2
Supervisor of Curriculum	1		1
Teacher	34	3	37
Teacher's College Lecturer		3	3
University Lecturer		1	1
University Professor		1	1
Total	89	39	128

TABLE VII
POSITION HELD AFTER GRADUATE STUDIES

	Master's	Doctorate	Total
Assistant Principal	19		19
Assistant Superintendent	2		2
Assistant Supervisor	1		1
College Dean		4	4
Department Head	2		2
Executive Assistant	1	4	5
Government Department	2	5	7
Principal	35	3	38
Regional Assistant Director	1		1
Superintendent	14	5	19
Supervisor of Curriculum	4		4
Teacher	4		4
University Lecturer	3		3
University Professor	1	18	19
Total	89	39	128

For the purpose of this study, students are grouped into four categories at the Ph. D. level and also four categories at the Master's level. The groups for the Ph. D. students and graduates are as follows in Table VIII.

TABLE VIII
GROUPS OF GRADUATES AT THE PH. D. LEVEL

Groups	Number of Subjects
University Professors	18
Government Employees	10
Deans and Principals	7
Association Executives	4
Total	39

The group representing the university professors is quite homogeneous, and need not be subdivided. Grouping together the remainder of the Ph. D. sample would have, from the point of view of numbers, created two well-balanced groups; but the following considerations precluded the adoption of that approach. These twenty-one graduates represent nine different positions in different systems, with the largest group including only four people; moreover, there is a wide range in the salaries of these people. Therefore, from the point of view of similarity in functions, costs and salaries, three groups represent

these twenty-one graduates: government employees (10), deans and principals (7), and association executives (4). This last group is very small but it seems that it cannot be merged with any other group without seriously biasing the other group. This is due to the relatively high salaries these four graduates command.

The Master's graduates are grouped as described in Table IX. The principals' group includes principals alone. In the assistant principals' group, two members are really department heads. In terms of function and salary, however, they are closer to this group than any other one. The superintendents' group includes two assistant superintendents and five supervisors of instruction.

TABLE IX
GROUPS OF GRADUATES AT THE MASTER'S LEVEL

Groups	Number of Subjects
Principals	35
Assistant Principals	21
Superintendents	21
Others	12
Total	89

The functions and salaries of the latter are also closer to this group than to the others. The remaining twelve graduates are employed in six different types of positions.

Four of these are government employees in one capacity or another, four are university lecturers, and four are teachers. The decision to include the four teachers in this last group is prompted by their limited number, (to compose a group of four when all other groups number at least twenty would have made group comparisons difficult.) Therefore, they are included in this last group to which they are closer financially.

CHAPTER IV

ANALYSIS OF DATA, GENERAL PROCEDURE

The analysis of the data can be divided into three parts: analysis of costs, analysis of benefits, and relationship between costs and benefits.

Analysis of Costs

The total costs: foregone earnings and direct costs associated with education; and the different sources of revenue of the students are calculated. The revenues are subtracted from the costs to arrive at the net costs. This calculation can be described by the following inclusive formula:

$$NC = \sum (FE - (A+W+WW) + (T-TR) + (M-MR) + (F-FR) + (B-BR) + (C-CR) + (O-OR))$$

or

$$NC = \sum (FE+T+M+F+B+C+O) - (A+W+WW+R)$$

or $NC = \sum (FE+E) - (Re+R)$

where NC = net costs, FE = foregone earnings, A = assistantships, fellowships and the like, W = paid personal work, WW = paid wife's work, T = transportation, R = reimbursement, M = moving, F = fees, B = books and the like, C = clerical work, O = other expenses, E = expenses, and Re = revenue.

This way of calculating the costs isolates normal

consumption from total expenses. Normal consumption means here the sum required to cover food, lodging, clothing and the like which one has to pay for at university or elsewhere. These are not related to the fact that one is a student, but to living, regardless of one's status; student or worker. In view of the fact that this study is concerned with the returns on investment, the real investment, does not equal the total costs. The real investment would be only that part of the total costs which is directly caused by the fact that one is a student. Hansen acknowledges this fact even though he does not provide for it in his work. He says:

... all cost elements were considered as investment even though some portions might better be regarded as consumption. To the extent that any of the cost is considered as consumption, the investment costs are overstated. (5, p. 133).

The items included in the calculation of the net costs are chosen on the basis of the discussion pertaining to the costs in Chapter II. In the treatment of the data, all revenues and foregone earnings figures are considered after income tax deduction unless these were income tax free. From the revenue represented by a wife's work, expenses are deducted which she incurred due to her work: travelling, baby-sitting, clothes, etc. For practical reasons, travelling and moving expenses are considered together: most subjects in the pilot study found it

impossible to provide actual appropriate figures for these costs separately. Also, all costs representing sums spent on books, reprints, thesis writing, data collection, clerical work are analyzed together. This is done because of the similarities in the nature of these costs and their direct relation to what could be called instructional material, or course work and assignments. It is to be noted that under housing, only the marginal costs are included in the analysis. The question, B4, dealing with this item clearly stated that the study was considering the difference between the cost of housing before graduate studies and during the undertaking of these. Under the item fellowship or assistantship are entered resources coming from the Department of Educational Administration, the University of Alberta, provincial governments, associations, companies and other groups or individuals providing financial support to the student. Also included under this item are the graduate teaching assistantships, graduate research assistantships and graduate service assistantships. These involve personal work on the part of the student, but as they are within his specialty, they can be regarded as part of his training program. These assistantships, unlike scholarships and fellowships, are partly taxable. In practical terms they are free from income tax because only half the sum -- generally the total amount varies from \$1,800 to \$3,000

a year -- is taxable and all income tax contributors are exempted from paying income tax on the first \$1,000 of their earnings. Thus, at the maximum there is only \$500 remaining on which income tax need be paid. Once the tuition fees and charitable donations without receipt (\$100 for everyone) are deducted from this amount, nothing remains to be taxed. As far as this study is concerned, then, income tax on these assistantships can be ignored.

Analysis of Benefits

The differential earnings are dealt with in two steps: the sum of the marginal benefits, and the discounted present value of these.

Marginal benefits are equal to the difference between the salary one receives with his master's or doctorate and what he would receive without such a degree.

Marginal benefits are computed for the years between the graduation year and the year one reaches sixty-five, the age generally considered for retirement. This equals the marginal lifetime earnings. The formula for the sum of marginal lifetime earnings would then be as follows:

$$MLE = \sum^N (EWD - EOD)$$

where MLE = marginal lifetime earnings, N = number of years, EWD = earnings with the degree, EOD = earnings without the degree.

This first presentation of the analysis of the

benefits can be expanded in a more detailed form. Earnings from the year of graduation to the year of retirement are calculated as follows: the actual figures are provided by the questionnaire for all subjects for the first year after the residence requirements; for the period covering the subject's career to the age of retirement, earnings are projected by adding 6 per cent a year to the last year for which there are data available.

Five per cent a year represents the average increase in salary due to inflation and productivity, each accounting for approximately 2 or 3 per cent a year, among working people in general. The 1965 figure shows 5.2 per cent increase over 1964. (2, p. 23). The percentage increase in average annual income declared for tax purposes from 1948 to 1962 is approximately 2.3 per cent. (3, p. 88). For the same period, teachers and professors have made a gain of 4.3 per cent a year. (3, p. 88). 2.3 per cent is then close to half the 5 per cent increase a year. The figure for teachers and professors is well above this and confirm Wilkinson's (6, p. 570) findings that salaries of teachers have increased at a much faster rate than some other professions in the last few years. A figure of 6 per cent then, is employed in this study.

It is not at all certain that this accelerated rate of increase in teachers' salaries will be maintained in the future. There are signs that some kind of saturation

has been reached in the "catching-up" process and that increases might come closer to the average increase of all salaried people. The Quebec Government, for example, has taken a strong stand in setting a provincial salary scale in order to "regulate" salaries. The Saskatchewan government has announced a plan for closer control over university finance early in 1968. Also the Minister of Education of Alberta stated in early 1968, that teachers will have to be more realistic in their demands for increased salaries and accept that their increments must obey the possibilities of the economy. Ontario, in the same period, was planning provincial control over teachers' salaries. Some of these plans may be looked upon as bargaining positions; but, nevertheless, the trend seems to be toward increases in teachers salaries which are closer to the national norm.

Salaries of teachers and professors are dealt with here because most graduates in educational administration are either professors or educational administrators. Salaries for the latter are generally based on teachers' salary scales.

One could summarize the process of determining the earnings of graduates from the time of graduation to the age of retirement by using the following chart:

<u>1963-1968</u>	<u>65 years of age</u>
graduation	retirement
actual figures provided by questionnaires	projected figures based on an increase of 6 % a year

FIGURE 4
COMPUTATION OF SALARIES

The second step is to discount the marginal earnings to their present value at different, chosen rates. Generally, the rates used in similar studies are those one could expect guaranteed investments such as government bonds, banks, trusts, etc., to return. The rate of interest charged on loans available on the market for an individual project is also considered.

Marginal lifetime earnings are then discounted at 5 per cent which "is the rate on long-term Government of Canada bonds." (6, p. 561). Also, they are discounted at 6 per cent which represents the rate-of-return one can receive for his investments with trust companies. They are also discounted at 8 per cent, a rate equal to the interest charged by a bank on a personal loan. Finally the rate of 10 per cent is applied as it has been in some other studies. (6). This last rate is especially useful in the evaluation of the internal rate-of-return.

The formula for the discounted lifetime earnings

would then be as follows:

$$DMLE = \sum_{t=1}^N AME \left(\frac{100}{100+R} \right)^t + \dots + AME \left(\frac{100}{100+R} \right)^N$$

or

$$DMLE = \sum_{t=1}^N \left(\frac{AME \times 100}{100 + R} \right)^t + \dots + \left(\frac{AME \times 100}{100 + R} \right)^N$$

or

$$DMLE = \sum_{t=1}^N \frac{AME}{(1+R)^t} + \dots + \frac{AME}{(1+R)^N}$$

where DMLE = discounted marginal earnings, N = number of years to discount, AME = annual marginal earnings, and R = rate of discount.

The two following formulas are then used in analysing the benefits:

$$(1) \quad MLE = \sum_{t=1}^N (EWD - EOD), \text{ and}$$

$$(2) \quad DMLE = \sum_{t=1}^N \frac{AME}{(1+R)^t} + \dots + \frac{AME}{(1+R)^N}$$

Relations Between Benefits and Costs

Two different comparisons are made between benefits and costs: the rate-of-return and the internal rate-of-return. The latter is not part of the study but its evaluation is fairly simple and it could clarify other findings, e.g., discounted, marginal lifetime earnings.

The rate-of-return is calculated in finding the ratio of the marginal lifetime earnings to the net costs, per unit of time. The formula would be as follows:

$$RR = \frac{\sum_{N=1}^N \frac{(AME)}{NC_1} + \dots + \frac{(AME)}{NC_N}}{N}$$

or

$$RR = \frac{(\sum_{N=1}^N AME_1 + \dots + AME_N)}{NC}, \text{ because NC is a constant.}$$

or

$$RR = \frac{\frac{(MLE)}{NC}}{N}, \text{ because } \sum_{N=1}^N (AME_1 + \dots + AME_N) = MLE$$

or

$$RR = \frac{MLE}{(NC) N}$$

The internal rate of return is "that rate which makes the estimated future gain in earnings equal to the present cost of obtaining education." (1, p. 128). The calculation of this should lead to the following equation:

$$\frac{DMLE}{NC} = 1$$

or

$$DMLE = NC$$

NC is a known quantity in this equation, DMLE is the part of the equation where the internal rate-of-return is to be found. In other words: Which rate of discount would make the discounted marginal lifetime earnings equal to

the net costs? The internal rate-of-return is, then, a point on a spectrum of possible rates of discount. It should be noted here that the internal rate-of-return and the rate of discount can be the same when the latter is such as to make the marginal lifetime earnings equal to the costs.

The relationship between the costs and benefits is then established by using the following formula:

$$RR = \frac{MLE}{(NC)N},$$

and by discounting the marginal lifetime earnings so that:

$$NC = DMLE.$$

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CHAPTER V

ANALYSIS OF THE DATA

Costs

The inclusive formula for the calculation of the net costs is as follows: $NC = \sum [FE - (A+W+WW)] + (T-TR) + (M-MR) + (F-FR) + (B-BR) + (C-CR) + (O-OR)$, or in a more practical way: $NC = (FE+T+M+F+B+C+O) - (A+W+WW+R)$. This can be summarized by: $NC = (FE+E) - (Re+R)$. In practical terms this means that the net costs are equal to the gross costs minus the revenues.

The costs for doctoral graduates and masters' graduates are analysed separately.

Costs at the Doctoral Level

The thirty-nine people included in the study who have been in the Department of Educational Administration have invested an average of \$8,075 in completing the Ph. D. program. They have foregone \$18,508 in earnings. Their fees represented \$315, their moving and travelling expenses \$620, and their costs of housing \$825 more than it would have been, had they not undertaken doctoral studies. Clerical work, books, thesis and other similar costs were \$852. On the average gross costs totalled \$21,120. Many of these students received assistantships, fellowships and other similar stipends while some of them were on leave

of absence and were paid part of their salary, The amount received by the first group averaged \$7,002 for the duration of the program, while the latter amounted to \$2,091. The students had two other sources of revenue: their part-time work, and their wives' work. On the average, the first one amounted to \$761 while the other source came to \$2,391. The total revenue of these doctoral students for the duration of the program was then, \$13,045. Subtracting these revenues from the gross costs results in a figure of \$8,075. This is, on the average, the amount of the net costs for doctoral students in educational administration at the University of Alberta. In other words, these students have invested \$8,075 in their Ph. D. program.

These thirty-nine students have been grouped in Chapter III of this study according to criteria described there. If instead of looking at the whole group, one studies each one of the sub-groups the figures vary significantly. Gross costs for example, range from \$16,685 to \$22,640, while revenues range from \$10,652 to \$14,633. The net costs then fluctuate from a low of \$6,003 to a high of \$10,391. Table X, page 91 presents a breakdown of the gross costs and revenues for each of the sub-groups, as well as the total group averages.

One can take each of the items included in the calculation of the net costs and compare them for the different sub-groups, and to the averages of the group as

a whole. Salary foregone ranges from \$14,348 to \$19,932 while the group average is \$18,505. There is a range of \$142 for tuition fees with a low of \$241 and a high of \$383. The group average in this case is \$315. Travelling and moving expenses are presented in a block. The average cost for this item for sub-group 4 (executive assistants) is \$200, and \$830 for sub-group 2 (government employees), while all students have a mean of \$620. The extra expenses incurred for housing due to the undertaking of graduate studies have a range of \$358. The marginal cost of housing is \$1,015 for sub-group 4, and \$657 for sub-group 3, while the group average is \$825. Some students have undertaken expensive surveys for their thesis; others were fortunate enough to study some problems for which the spending could be kept at a relatively low level. This is shown in the item called "others" which includes expenses related to books, clerical work, thesis survey, writing, printing, binding, and the like. For this item, the group average is \$852. Sub-group 2 has a low of \$641 and sub-group 3 a high of \$980. All these differences explain the wide range of \$5,955, which exists for the total costs between the different sub-groups. This \$5,955 represents 28.24 per cent of the average total costs of the group which amounts to \$21,120. Figure 5, page 92 shows the differences among sub-groups as well as the mean for the thirty-nine subjects included in the analysis.

TABLE X

COSTS OF GRADUATE STUDIES IN EDUCATIONAL ADMINISTRATION
AT THE DOCTORAL LEVEL - IN DOLLARS

	Group 1	Group 2	Group 3	Group 4	Average
Number of Graduates	18	10	7	4	39
Salary Foregone	+19360	+19932	+14384	+18472	+18508
Fees	383	263	241	268	315
Moving- Travelling	660	830	459	200	620
Housing	766	974	657	1015	825
Others	903	641	980	931	852
Leave	-1093	-3672	-5879	-3807	-2891
Fellowship	8339	6797	3971	6800	7002
Work	1407	100	151	700	761
Wife's Work	3794	1680	651	900	2391
Gross Costs	+22071	+22640	+16685	+20886	+21120
Revenues	-14633	-12249	-10652	-12207	-13045
Net Costs	7438	10391	6033	8679	8075

The amounts of revenue which doctoral students enjoyed vary considerably. For the complete program, leave of absence with pay varies from a low of \$1,093, for sub-group 1, to a high of \$5,879 for sub-group 3, and the average for the groups is \$2,891. There is a range of \$4,368 for fellowships, scholarships, bursaries, and the like between the sub-group 3 average of \$3,971 and the sub-group 1 average of \$8,339. The group averages

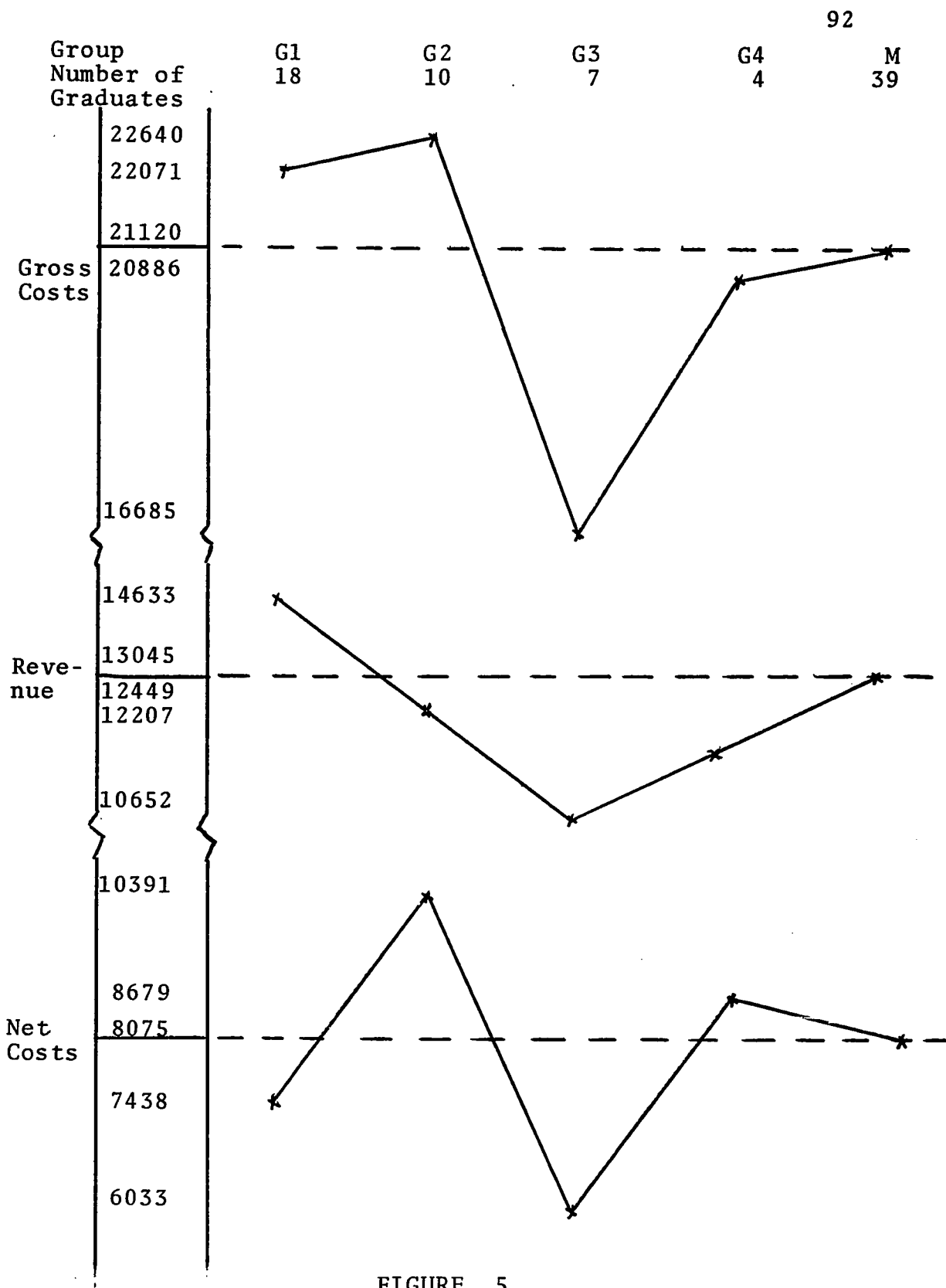


FIGURE 5

SUMMARY OF THE COSTS OF GRADUATE STUDIES IN EDUCATIONAL
ADMINISTRATION AT THE DOCTORAL LEVEL - IN DOLLARS

\$7,002 for this item. The student's own employment is ten times more important, as far as the amount of money is concerned, for sub-group 1 than it is for sub-group 2. The average for this group is \$761. A last source of revenue comes from the employment of student's wives. The sum of money it represents varies from \$651 for government employees, to \$3,794 for university professors, with a group average of \$2,391. These discrepancies explain the \$3,981 of difference in revenues between sub-group 3 and sub-group 1. Figure 5, page 92 shows these differences in revenues as well as differences between gross costs and net costs.

Costs at the Master's Level

The eighty-nine subjects under analysis at the master's level have invested an average of \$4,085 in their education. They have foregone \$7,209 in earnings and paid \$201 for fees on the average. Their moving and travelling expenses averaged \$420; at the same time, their mean marginal cost for housing was \$546. They had to pay \$480 for clerical work, books, thesis and the like. On the average, the gross costs amounted to \$8,856. These students received assistantships, fellowships and other similar stipends which amounted to an average of \$2,239. Some of these students were on leave of absence receiving part of their salaries which amounted to a mean

of \$1,406. Master's students had two other sources of revenue: their part-time work, which accounted for \$242; and their wives' work, which amounted to \$884. For the duration of the program then, the total revenue of these students was \$4,771. Subtracting these revenues from the gross costs, \$8,856, gives \$4,085 which is the average amount of the net costs for master's students in educational administration at the University of Alberta.

The eighty-nine master's students have been grouped in this study into four sub-groups according to criteria described previously. Figures vary significantly if these sub-groups are studied. Gross costs, for example, present a range from \$7,689 to \$10,440, while the revenues range from \$3,560 to \$5,425. Thus, the net costs fluctuate from a low of \$2,961 to a high of \$5,425. Table XI on page 96 presents a breakdown of the gross costs and revenues for each of the four sub-groups, as well as the total group averages.

Each of the items included in the calculation of the net costs can be compared for the different sub-groups and to the average of the group as a whole. There is a range of \$1,686 for foregone salary, with a low of \$6,109 in sub-group 2, and a high of \$7,797 in sub-group 1. The group average is \$7,209. Tuition fees range from \$138 to \$242 while the group mean is \$201. Travelling and moving expenses are presented in a block. The average cost for

this item is \$248 for sub-group 4, and \$518 for sub-group 3, while all students have an average of \$420. The extra expenses incurred for housing due to the undertaking of the program have a range of \$231. The marginal cost of housing is \$417 at the lowest and \$648 at the highest, while the total group average is \$546. The differences in costs of books, clerical work, writing of thesis and associated expenses results in a range of \$230, with a high of \$595 and a low of \$365. All these differences explain the significant range of \$2,751 which exists between the various sub-groups for gross costs. This figure represents 31.06 per cent of the average total costs of the group which are: \$8,856. Figure 6 on page 97 shows these differences between the four sub-groups.

Turning to the sources of revenue, leaves of absence with pay range from \$929 for assistant principals in sub-group 2, to \$1,836 for the principals in sub-group 1 while the total group mean is \$1,406. Assistantships, fellowships, grants and the like range from \$1,817 in sub-group 4, to \$2,407 in sub-group 3 with the group standing at \$2,239. Personal paid work gives nothing to the superintendents in sub-group 3, but averages \$392 for the principals in sub-group 1. There is a group mean of \$242. Finally, some students' wives' worked and their earnings show an average of \$229 for sub-group 4, while,

TABLE XI
COSTS OF GRADUATE STUDIES IN EDUCATIONAL ADMINISTRATION
AT THE MASTER'S LEVEL - IN DOLLARS

	Group 1	Group 2	Group 3	Group 4	Average
Number of Graduates	35	21	21	12	89
Salary Foregone	+7788	+6109	+7797	+6657	+7209
Fees	200	198	242	138	201
Moving- Travelling	480	321	518	248	420
Housing	501	595	648	417	546
Others	471	466	595	365	480
Leave	-1836	-929	-1112	-1499	-1406
Fellowship	2276	2250	2407	1817	2239
Work	392	363		15	242
Wife's Work	921	1186	895	229	884
Gross Costs	+10440	+7689	+9780	+7825	+8856
Revenues	-5425	-4728	-4414	-3560	-4771
Net Costs	5015	2961	5366	4265	4085

at the same time, sub-group 2 has an average of \$1,186. For this last item the group average is \$884. Total revenues during the program vary from \$3,560 to \$5,425, a range of \$1,865 which represents 39.30 per cent of the average revenue of \$4,771 for the total group.

The variations in each of the items analysed result in a range of \$2,405 between the lowest net costs of \$2,961 and the highest net costs of \$5,366. This range

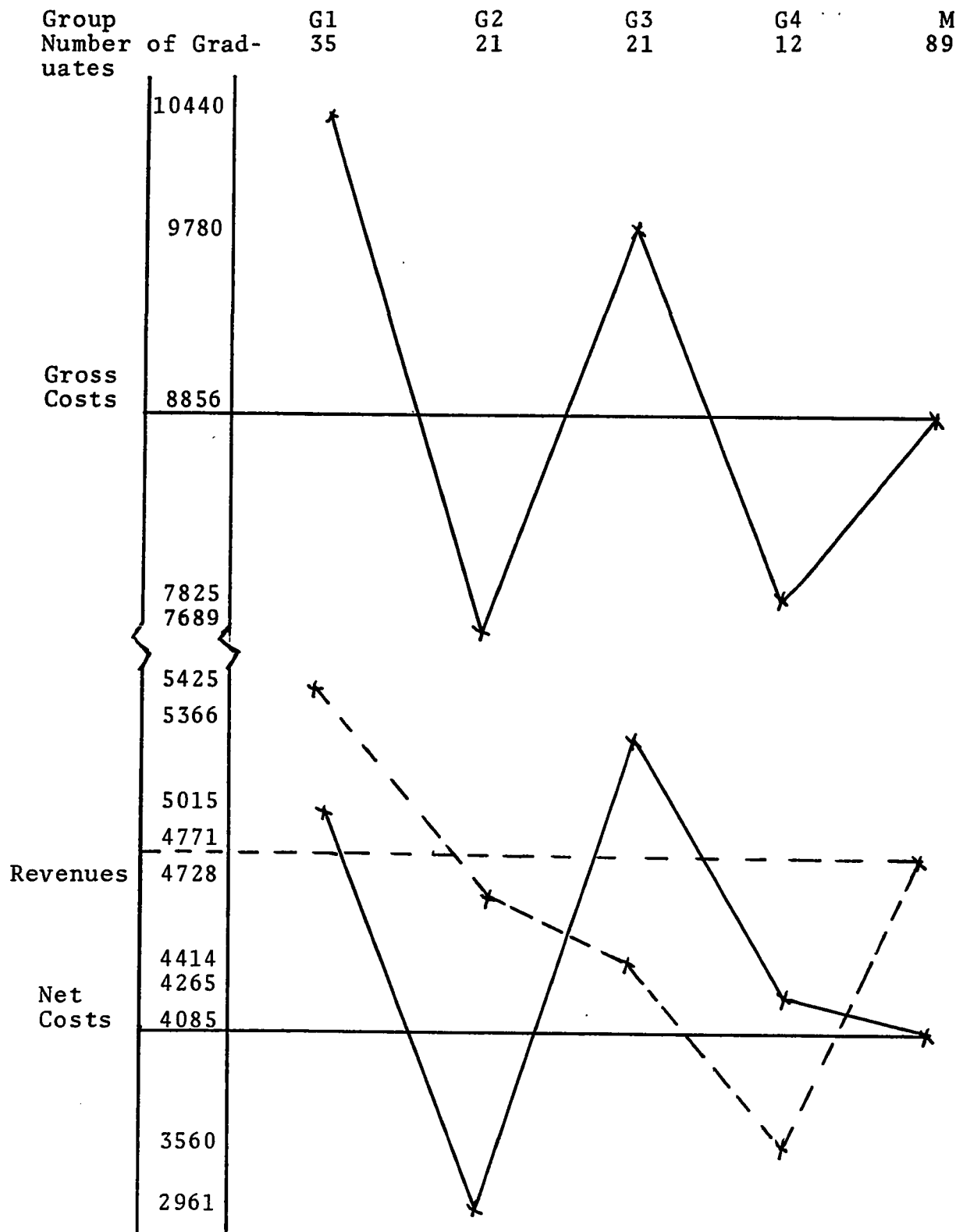


FIGURE 6

SUMMARY OF THE COSTS OF GRADUATE STUDIES IN EDUCATIONAL
ADMINISTRATION AT THE MASTER'S LEVEL - IN DOLLARS

accounts for 58.86 per cent of the net costs of \$4,085. Figure 6 on page 97 illustrates this situation.

Benefits

The financial benefits associated with graduate studies in educational administration are equal to the net streams of revenues. One stream is a projection of salary without the degree and the other, a projection of salary with the degree. The first is based on the salary before entering the program and the latter, on the salary following the program. The formula for the marginal lifetime earnings is:

$$MLE = EWD - EOD$$

Once the net stream of revenue is found the next step is to discount the marginal earnings to their present value. The formula for the discounted marginal lifetime earnings is as follows:

$$DMLE = \sum_{t=1}^N \frac{(AME)}{100+R_1} + \dots + \frac{(AME)}{100+R_N}$$

Master's and doctoral graduates are studied separately for each of these approaches.

Benefits at the Doctoral Level

The questionnaires returned by the subjects of this study give the actual salaries for one year before the program and, at the most, for five years after the residence requirements are fulfilled. Foregone salary for the period

of studies are also provided by the same means. Taking the three or four years for which salary figures -- before the completion of the course -- are available in the completed questionnaire one can project with some accuracy the probable salary for the year following completion of the residence requirements if the respondent had not been a student and remained in his work. Table XII on page 100 presents, where possible, the evolution of the salary pattern for the doctoral students from the year prior to their undertaking of the program, up to five years following the completion of the program.

Table XII gives figures for the thirty-nine graduates as a group, as well as for four sub-groups which have been formed for the purpose of this study in Chapter III. The average Ph. D. student was earning \$8,063 a year before undertaking the program. The last year of the program he forwent \$8,887 and would have earned \$9,171 the year following the program, had he not completed it. The first year following the residence requirement, he received \$10,132 in salary. The second year the twenty-six subjects for whom data were available earned an average of \$10,867, and the third year eighteen subjects earned an average of \$11,503. For the fourth year, only thirteen subjects were able to provide data, and, for the fifth year, only seven out of an original

TABLE XII
SALARIES FOR DOCTORAL STUDENTS: FROM THE YEAR BEFORE THE PROGRAM TO FIVE
YEARS AFTER IT - IN DOLLARS

	Group 1	Group 2	Group 3	Group 4	Average
	N	N	N	N	N
Year Before	7835 18	8701 10	7490 7	8506 4	8063 39
Last Year ¹	8632 18	9623 10	8040 7	9521 4	8887 39
First Year A ₂	8967 18	9841 10	8320 7	9846 4	9171 39
First Year	9751 18	11103 10	9100 7	10978 4	10132 39
Second Year	10187 11	11347 5	10037 7	13605 3	10867 26
Third Year	10756 7	10130 1	10953 7	14740 3	11503 18
Fourth Year	11582 5	11330 1	11994 6	15780 1	12091 13
Fifth Year	12343 2	11690 1	12081 4		12103 7

¹ Last Year, stands for the last year of the program and the salary indicated is based on the evaluation of the probable earnings the graduates would have made that year if they had been working not studying.

² First Year A, figures here represent the probable salary the graduates would have been making without having been through the program.

sample of thirty-nine were able to do so. The mean salaries for these two years are probably very poor indicators of the real mean for the whole group. Nevertheless, for the fourth year they were \$12,091, and for the fifth they were \$12,103.

Table XII gives a breakdown of the group of thirty-nine into four sub-groups, and for each of them, shows the pattern of the after-taxation yearly salary streams from the year before the undertaking of the program until five years after its completion. Marked differences exist between the sub-groups. Of special interest here are the differences at the level of "first year after A" and "first year". For the first, sub-group 3, representing principals and deans, there is a low of \$8,320 while for sub-group 4, representing association executives, there is a high of \$9,846. For the first year after completion of the residence requirements, sub-group 3 is again the lowest with \$9,100, while sub-group 2, government employees, has a high of \$11,103. Two years following the completion of the program, sub-group 4 is \$3,000 higher than sub-group 1.

These figures, and the trend for each sub-group are more easily seen in Figure 7 on page 102. One trend is clear; as soon as the number of members in a sub-group, or for the group in general, decreases, the previous trend is no longer evident. Figure 7 presents two streams above

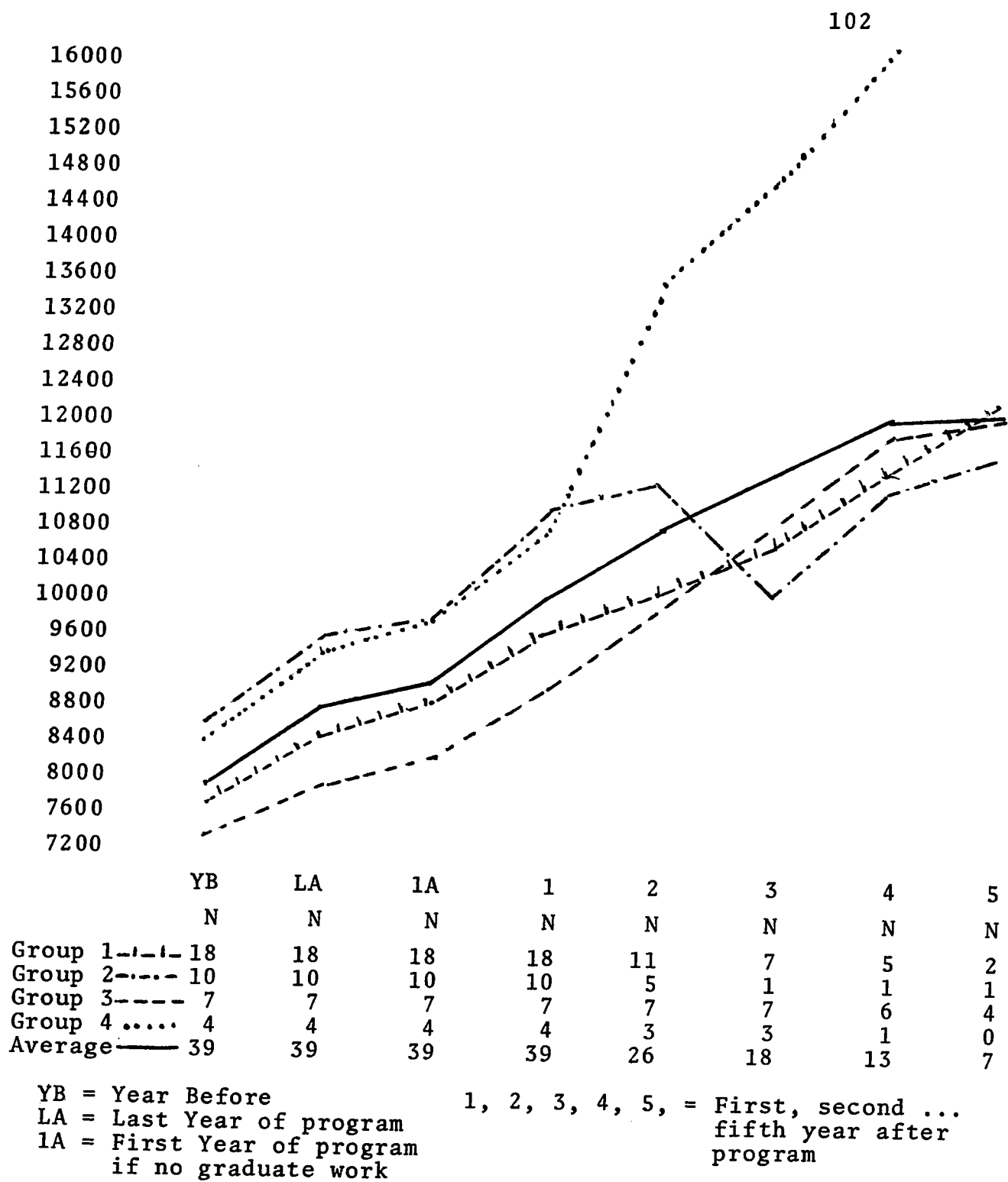


FIGURE 7

SALARIES FOR DOCTORAL STUDENTS FOR THE YEARS FROM: BEFORE
 THE PROGRAM TO FIVE YEARS AFTER - IN DOLLARS

the average, those for government employees and, in particular for association executives. Unfortunately, the data for sub-group 2 is halved after one year and its salary stream drops. Sub-groups 1 and 3 present a more regular pattern, especially sub-group 3. It is interesting to note that these two sub-groups have data available for a longer period of time and proportionally more subjects than any other sub-groups. On the average, the pattern of increases seems to be fairly regular for the group as a whole, even with only thirteen members left out of the original thirty-nine, up to four years following the completion of the residence requirements.

The next step in computing the benefits resulting from graduate education is to project the net streams of salaries for the remainder of the subjects' careers. The net stream of revenues or the marginal lifetime earnings is calculated by the following formula:

$$MLE = \sum^N EWD - EOD$$

This formula would be adequate if both streams of actual salaries were available. Because of the limited data, however, the net stream has to be projected. The base year used for projection is the first year after residence. This is done at a rate of 6 per cent a year, as indicated previously. The above formula then becomes:

$$MLE = \sum^N ME + (ME \times 1.06) + \dots + (ME \times 1.06^N)$$

Therefore, the marginal lifetime earnings for doctoral students are as indicated in Table XIII.

TABLE XIII

PROJECTED MARGINAL LIFETIME EARNINGS OF DOCTORAL GRADUATES, BASED ON MARGINAL EARNINGS OF THE FIRST YEAR AFTER RESIDENCE - IN DOLLARS

Group	ME ₁	Years ₂	MLE ₃
1	784	28	53,726
2	1,262	26	74,655
3	780	25	42,794
4	1,132	30	89,494
Average	961	27	61,221

¹ Marginal earnings first year after residence.

² Number of years until retirement.

³ Marginal lifetime earnings.

Marginal lifetime earnings equal \$61,221 for the thirty-nine Ph. D. subjects under study. School principals and deans composing group 3, have a low of \$42,794, and association executives a high of \$89,494.

The \$61,221 which an average doctoral graduate is expected to earn due to his graduate work will be available to him over a period of twenty-seven years. The amount he will receive the twenty-seventh year will have its full value at the end of that twenty-seventh year and the same can be said of the amount for the twenty-sixth

year -- the second year and the first year. The present value of these marginal lifetime earnings is equal to the marginal lifetime earnings discounted at an accepted rate. For the purpose of this study the rates of discount have been set at 5 per cent, 6 per cent, 8 per cent and 10 per cent. The general formula is as follows:

$$DMLE = \sum_{t=1}^N \frac{AME}{(1+R)^t} + \dots + \frac{AME}{(1+R)^N}$$

The present value of the marginal lifetime earnings for doctoral students is then as shown in Table XIV.

TABLE XIV

DISCOUNTED MARGINAL LIFETIME EARNINGS FOR DOCTORAL
GRADUATES - PRESENT VALUE IN DOLLARS

Group	MLE ₁	DMLE ₂			
		Rate: 5 %	6 %	8 %	10 %
1	53,726	25,260	21,952	16,932	13,412
2	74,655	37,386	32,812	25,745	20,677
3	42,794	22,108	19,500	15,432	12,482
4	89,494	39,467	33,960	25,752	20,124
Average	61,221	29,710	25,947	20,185	16,099

¹ MLE = Marginal lifetime earnings.

² DMLE = Discounted marginal lifetime earnings.

Benefits at the Master's Level

As for the doctoral students the marginal earnings associated with the undertaking of the master's program

in educational administration are calculated from the differences in salary earned before the program and after it, once the necessary adjustments are made. Actual figures for the year after the residence requirements have been met are supplied by the answers to the questionnaires. For that same year one can project the probable salary the graduates would have earned if they had not completed the program. This is done by adding to the foregone earnings the normal increments an individual would have received if he had remained in the same position instead of undertaking the master's program. Table XV on page 107, tabulates the evolution of the salary pattern of master's students from the year before they undertook the program up to six years after, where figures are available.

Table XV gives figures for the eighty-nine graduates as a group as well as for the four sub-groups formed earlier in this study. The average master's student was earning \$6,657 the year before he undertook the program, he forwent \$7,209 during his residence and would have made \$7,632 the following year if he had not undertaken the program. The first year after he took the course he made \$8,458 in salary. The sixty-seven students, for whom data were available, averaged \$9,194 the second year, and forty-eight of them made \$9,659 the third year. For the three following years, data are available for only twenty-eight, eleven and

TABLE XV
SALARIES FOR MASTER'S STUDENTS, FROM THE YEAR BEFORE THE PROGRAM TO
SIX YEARS AFTER IT - IN DOLLARS

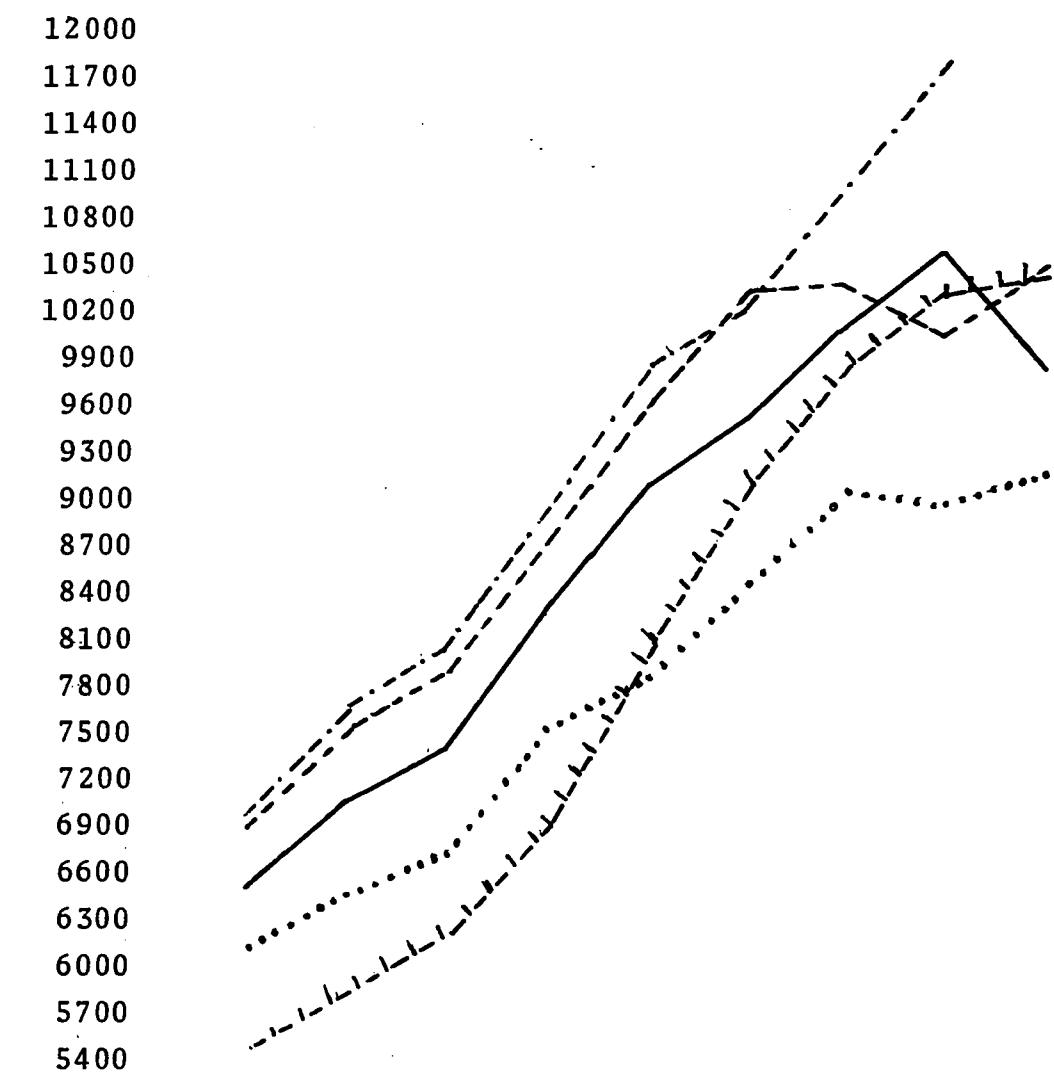
	Group 1	N	Group 2	N	Group 3	N	Group 4	N	Average	N
Year Before	7084	35	5722	21	7105	21	6294	12	6657	89
Foregone	7778	35	6109	21	7797	21	6657	12	7209	89
First Year After A(1)	8096	35	6410	21	8134	21	6856	12	7632	89
First Year After	8961	35	7106	21	9148	21	7677	12	8458	89
Second Year	9814	21	8252	18	9976	18	8048	10	9194	67
Third Year	10436	13	8927	16	10432	11	8665	8	9659	48
Fourth Year	10501	6	10020	8	11167	8	9246	6	10292	28
Fifth Year	9919	2	10160	2	11923	5	9155	2	10751	11
Sixth Year	10610	1	10550	2			9317	2	10091	5

¹ First Year After A, figures here represent the probable salary the graduates would have been making without having been through the program.

five graduates, respectively. Mean salaries for these years are probably very poor indicators of the group average.

The after-taxation salaries of the four sub-groups for the six years following residence requirements exhibit marked differences between one another. Of interest too, are the differences between the "first year after" and the "first year after A". Sub-group 2 has a low of \$7,106 for the first year after the program, while sub-group 3 has a high of \$9,148. For the second year, sub-group 4 has the lowest salary, \$8,048, and sub-group 3 the highest, \$9,976. The third year, with data available for approximately half the subjects, sub-group 1 reaches \$10,436 and sub-group 4 shows a low of \$8,665.

All the figures included in Table XV are reported in Figure 8, page 109. The trend for each sub-group and for the group as a whole can be seen. One trend common to all sub-groups, with the possible exception of group 2, is the flattening of the slope as there are fewer subjects for whom data are available. Sub-group 2, the vice-principals, starts in the lowest position, well below the group average and almost reaches second place after six years. It is interesting to note that this sub-group has more data available for a greater proportion of its members than any other. Sub-group 3, school superintendents, starts above all the others and finishes well ahead after



	YB	F	1A	1	2	3	4	5	6
	N	N	N	N	N	N	N	N	N
Group 1	35	35	35	35	21	13	6	2	1
Group 2	21	21	21	21	18	16	8	2	2
Group 3	21	21	21	21	18	11	8	5	0
Group 4	12	12	12	12	10	8	6	2	2
Average	89	89	89	89	67	48	28	11	5

YB = Year Before
 F = Foregone
 1A = First year after
 program, if no
 graduate work.

1, 2, 3, 4, 5, 6, = First,
 second ... sixth year after
 program.

FIGURE 8

SALARIES FOR MASTER'S STUDENTS FOR YEARS: FROM BEFORE
 THE PROGRAM TO SIX YEARS AFTER - IN DOLLARS

six years. If more data were available for sub-group 1, school principals, for the fourth, fifth and sixth years it seems that they would achieve a much more regular, rising slope for these years. The group average on the whole does not seem to suffer as much as the sub-group averages from the lack of data for the last years. It is only for the sixth year, where the same was reduced to five subjects out of eighty-nine, that a clear decline in the slope is perceptible.

Because of the limited data available, salaries for future years have to be projected from some base year. Marginal earnings, which are to be studied next, also have to be projected from the first annual marginal earnings. The net stream of revenue or marginal lifetime earnings equals the sum of the annual differences to the age of retirement. The formula is as follows:

$$MLE = \sum_{N} EWD - EOD$$

Because of the need for projection the formula becomes:

$$MLE = \sum_{N} ME + (ME \times 1.06) + \dots + (ME \times 1.06^N).$$

The computation of the sum of the net streams of earnings results in the figures shown in Table XVI, page 111.

The average master's student can therefore expect to earn \$80,405 in net benefits because of the program he undertook. The range of these marginal earnings extends from \$76,444, for sub-group 2, to \$85,989 for sub-group 3.

The difference is \$9,545.

The present value of these marginal lifetime earnings is equal to their value at "maturity" discounted at ratios of 5 per cent, 6 per cent, 8 per cent and 10 per cent as accepted for this study. The formula is:

$$DMLE = \sum_{t=1}^N \frac{AME}{(1+R)^t} + \dots + \frac{AME}{(1+R)^N}.$$

TABLE XVI

PROJECTED MARGINAL LIFETIME EARNINGS OF MASTER'S GRADUATES, BASED ON MARGINAL EARNINGS OF THE FIRST YEAR AFTER RESIDENCE - IN DOLLARS

Group	ME ₁	Years ₂	MLE ₃
1	865	32	78,620
2	686	35	76,444
3	1,014	31	85,989
4	821	33	79,919
Average	826	33	80,405

¹ Marginal earnings first year after residence.

² Number of years until retirement.

³ Marginal lifetime earnings.

The present value of the marginal lifetime earnings for master's graduates is then as shown in Table XVII.

TABLE XVII

DISCOUNTED MARGINAL LIFETIME EARNINGS FOR MASTER'S
GRADUATES - PRESENT VALUE IN DOLLARS

Group	MLE ₁	DMLE ₂			
		Rate: 5 %	6 %	8 %	10 %
1	78,620	32,490	27,680	20,638	15,916
2	76,444	28,607	24,010	17,457	13,207
3	85,989	36,713	31,434	23,636	18,348
4	79,919	31,960	27,093	20,031	15,348
Average	80,405	32,155	27,258	20,153	15,442

¹ MLE = Marginal lifetime earnings.

² DMLE = Discounted marginal lifetime earnings.

Costs-Benefits Relationships

The purpose of this study is to determine the rate-of-return of investments in graduate studies in educational administration which is the ratio of the benefits to the costs. This is done for the master's and the doctoral graduates separately. A second relationship between benefits and costs is the internal rate of return. It is also dealt with separately for master's and doctoral graduates.

Cost-benefits at the Ph. D. level. The rate-of-return on investment -- the costs -- in graduate studies is equal to the ratio of the benefits -- the marginal lifetime earnings -- to the investment per unit of time. The

formula is as follows:

$$RR = \frac{MLE}{(NC) N}$$

The rates-of-return for all Ph. D. subjects and for the four sub-groups is then as shown in Table XVIII.

TABLE XVIII

PRIVATE RATE-OF-RETURN ON INVESTMENT IN EDUCATIONAL
ADMINISTRATION AT THE DOCTORAL LEVEL

Group	NC ₁	MLE ₂	Years ₃	RR ₄
1	7,438	53,726	28	25.79
2	10,391	74,655	26	27.62
3	6,033	42,794	25	28.36
4	8,679	89,494	30	34.37
Average	8,075	61,221	27	28.07

¹ NC = Net costs, in dollars.

² MLE = Marginal lifetime earnings, in dollars.

³ Years = Years from the end of the program until retirement.

⁴ RR = Rate-of-return, in per cent.

On the average, the rate-of-return to investment in a doctoral program is 28.07 per cent for the thirty-nine subjects under study. It fluctuates from 25.79 per cent for university professors, sub-group 1, to 34.37 per cent for association executives, sub-group 4. Deans and principals, sub-group 3, average 28.36 per cent while

government employees, sub-group 2, have a mean of 27.62 per cent.

The internal rate-of-return at the same level is evaluated by analysing part of Table X and part of Table XIV. Table XIX contains the essential elements of these two tables which are needed for this purpose.

TABLE XIX
NET COSTS AND DISCOUNTED MARGINAL LIFETIME EARNINGS AT
THE DOCTORAL LEVEL - IN DOLLARS

Group	N.C. ₁	DMLE ₂			
		Rate: 5 %	6 %	8 %	10 %
1	7,438	25,260	21,952	16,932	13,412
2	10,391	37,386	32,812	25,745	20,677
3	6,033	22,108	19,500	15,432	12,482
4	8,679	39,467	33,960	25,752	20,124
Average	8,075	29,710	25,947	20,185	16,099

¹ N.C. = Net costs.

² DMLE = Discounted marginal lifetime earnings.

All sub-groups and the groups as a whole are well above 10 per cent and likely 2 to 6 per cent above this figure.

Cost-benefits at the Master's level. The rate-of-return for master's graduate equals:

$$\frac{MLE}{(NC) N}$$

For the eighty-nine subjects involved in the analysis at

this level the rates-of-return for the group as a whole as well as for the four sub-groups are shown in Table XX.

TABLE XX

PRIVATE RATE-OF-RETURN ON INVESTMENT IN EDUCATIONAL
ADMINISTRATION AT THE MASTER'S LEVEL

Group	NC ₁	MLE ₂	Years ₃	RR ₄
1	5,015	78,620	32	48.99
2	2,961	76,444	35	73.75
3	5,366	85,989	31	51.69
4	4,265	79,919	33	56.78
Average	4,085	80,405	33	59.63

¹ NC = Net costs, in dollars.

² MLE = Marginal lifetime earnings, in dollars.

³ Years = Years from the end of the program until retirement.

⁴ RR = Rate-of-return, in per cent.

The rate-of-return at this level is 59.63 per cent for the group as a whole. It ranges from 48.99 per cent for group 1, representing the principals, to 73.75 per cent for group 3, including the assistant principals.

The internal rate-of-return for the same subjects can be evaluated if one combines part of Table XI and part of Table XVII together. Table XXI contains the essential elements of these two tables which are needed

for this purpose.

TABLE XXI

NET COSTS AND DISCOUNTED MARGINAL LIFETIME EARNINGS
AT THE MASTER'S LEVEL IN DOLLARS

Group	N.C. ₁	DMLE ₂				
		Rate:	5 %	6 %	8 %	10 %
1	5,015		32,490	27,680	20,638	15,916
2	2,961		28,607	24,010	17,457	13,207
3	5,366		36,713	31,434	23,636	18,347
4	4,265		31,960	27,093	20,031	15,348
Average	4,085		32,155	27,258	20,153	15,442

¹ NC = Net costs.

² DMLE = Discounted marginal lifetime earnings.

The group as a whole and every sub-group have an internal rate-of-return which seems to be well above 10 per cent.

Adjusted Data

Adjustment of costs. In the computing of the net costs, the earnings of the student's wife were subtracted from the foregone income. The rationale behind this was that part of the foregone earnings were supplemented by assistantships, fellowships, and the like, and the money earned by a wife covered part of these foregone earnings as well. It might be argued that the fact a wife worked

was independent of her husband's status as a student. On the other hand, the questionnaire states: "If your wife had to work ...". Therefore it was considered necessary to include the wife's net salary in the calculation of the net costs. Nevertheless, for comparative purposes, the net costs are calculated below without the wife's earnings. Also, the rate-of-return one can expect with that adjustment of the net costs is determined. Table XXII gives these adjusted data for doctoral students.

TABLE XXII

PRIVATE RATE-OF-RETURN WITH NET COSTS ADJUSTED FOR
WIFE'S WORK FOR DOCTORAL GRADUATES

Group	NC ₁	WW ₂	ANC ₃	MLE ₄	Y ₅	ARR ₆	RR ₇
1	7,438	3,794	11,233	53,726	28	17.08	25.79
2	10,391	1,680	12,071	74,655	26	23.78	27.62
3	6,033	651	6,684	42,794	25	25.61	28.36
4	8,679	900	9,579	89,494	30	31.14	34.37
Average	8,075	2,391	10,466	61,221	27	21.66	28.07

¹ NC = Net costs with original data, in dollars.

² WW = Wife's work, in dollars.

³ ANC = Adjusted net costs, in dollars.

⁴ MLE = Marginal lifetime earnings, in dollars.

⁵ Y = Years to go until retirement.

⁶ ARR = Rate-of-return based on adjusted net costs, in per cent.

⁷ RR = Rate-of-return on net costs, in per cent.

As expected, sub-group 1, for which a wife's work represents the most important asset, has a drop in rate-of-return twice as significant as any other sub-group; there is a difference of 8.71 per cent in this sub-group's rate-of-return compared to less than 4 per cent for each of the other groups. The rate-of-return for the thirty-nine subjects involved at this level drops from 28.07 per cent to 21.66 per cent, following correction of the data.

The same calculations at the master's level give the results shown in Table XXIII.

TABLE XXIII

PRIVATE RATE-OF-RETURN WITH NET COSTS ADJUSTED FOR
WIFE'S WORK FOR MASTER'S GRADUATES

Group	NC ₁	WW ₂	ANC ₃	MLE ₄	Y ₅	ARR ₆	RR ₇
1	5,015	921	5,936	78,620	32	41.39	48.89
2	2,961	1,186	4,147	76,444	35	52.66	73.75
3	5,366	895	6,161	85,989	31	45.02	51.69
4	4,265	229	4,494	79,919	33	53.89	56.78
Aver- age	4,085	884	4,969	80,405	33	49.04	59.63

¹ NC = Net costs with original data, in dollars.

² WW = Wife's work, in dollars.

³ ANC = Adjusted net costs, in dollars.

⁴ MLE = Marginal lifetime earnings, in dollars.

⁵ Y = Years to go to retirement.

⁶ ARR = Rate-of-return based on adjusted net costs, in per cent.

⁷ RR = Rate-of-return based on net costs, in per cent.

Sub-group 2 records the sharpest drop of all sub-groups -- 21.09 per cent -- roughly three times as much as any other group. This is to be expected if one considers that a wife's earnings represent more, absolutely and relatively, for this sub-group than for any other. The average return for the group as a whole shows a drop of 10.59 per cent when net costs are calculated without taking into account the wife's work.

Adjustment of benefits. The net marginal earnings in this study are based on the marginal earnings of the first year after the residence requirements have been fulfilled. The marginal earnings for that first year are calculated from the difference between the actual salary for that year and the projected salary the same person would have made that year had he not undertaken the program, other factors being equal.

Table XII, Table XV, Figure 7 and Figure 8 show that the increments employed to arrive at the projected salary for that first year are not as high as the difference between salary foregone and the salary for the year before the program. The reason for these differences is that in establishing foregone salaries, everyone who said, in answering the questionnaire, that he would have had a better paid position if he had remained in his school system instead of taking graduate work, or that he would have probably had a

higher salary, was given the increments he was sure he would have had or thought he would probably have had. It was thought that these are above average raises due to promotion and would not likely be repeated the following year. Moreover, because both kinds of promotions, the assured ones and the probable ones, were granted for the purpose of this study, it may well be that foregone earnings are somewhat higher than they actually would have been. Therefore, a more modest increase, the following year, would probably be quite reasonable and, on the average, would likely represent the actual figures for the projected salaries for that first year following residence. Nevertheless, for comparative purposes, the increments given in calculating the foregone earnings are added to these earnings to establish these hypothetical salaries for the first year after the program. These figures are likely very liberal and not as close to reality as the one used in the first analysis.

If one took the adjusted benefits these corrections result in, and the adjusted costs which have been calculated earlier, one would arrive at rates-of-return based on a very liberal evaluation of the costs and a very conservative forecasting of the benefits. These corrected costs and benefits and the rates-of-return their ratio represents are presented in Table XXIV for the doctoral students.

TABLE XXIV

PRIVATE RATE-OF-RETURN WITH NET COSTS ADJUSTED FOR
WIFE'S WORK AND BENEFITS ADJUSTED FOR SALARY
INCREASES - DOCTORAL GRADUATES

Group	A' ₁	AA' ₂	A ₃	AME ₄	AMLE ₅	Y ₆	AARR ₇	RR ₈
1	8,967	9,030	9,751	721	49,066	28	15.60	25.79
2	9,841	10,084	11,103	1,019	60,280	26	19.20	27.62
3	8,320	8,315	9,100	785	43,069	25	25.76	28.36
4	9,846	10,028	10,978	950	75,105	30	26.14	34.37
Average	9,171	9,309	10,132	823	52,430	27	18.61	28.07

¹ A' = Salary for the first year after residence if no program, in dollars.

² AA' = Adjusted A' for salary increase, in dollars.

³ A = Salary after residence, in dollars.

⁴ AME = Adjusted marginal earnings, in dollars.

⁵ AMLE = Adjusted marginal lifetime earnings, in dollars.

⁶ Y = Years to go to retirement.

⁷ AARR = Rate-of-return adjusted for wife's work and salary increase, in per cent.

⁸ RR = Rate-of-return not adjusted, in per cent.

The rates-of-return fluctuate from 15.60 per cent for sub-group 1, to 26.14 per cent for sub-group 4, instead of from 25.79 per cent to 34.37 per cent for the same sub-groups, respectively, without any adjustment. If the changes in rate-of-return due to adjusted costs -- wife's work -- are isolated, then it can be seen that corrected

benefits have little relative impact on the total change. The comparison of the rates-of-return in Table XXII with those in Table XXIV show that the net effect of changes in benefits results in a drop in the rate of 1.48 per cent for sub-group 1, of 4.58 per cent for sub-group 2, of 5 per cent for sub-group 4, of 3.05 per cent for the average, and a rise of 0.15 per cent for sub-group 3.

For the master's graduates, Table XXV presents the results of the same type of corrections which have been discussed above for doctoral graduates.

TABLE XXV

PRIVATE RATE-OF-RETURN WITH NET COSTS ADJUSTED FOR WIFE'S WORK AND BENEFITS ADJUSTED FOR SALARY INCREASE - MASTER'S GRADUATES

Group	A' ₁	AA' ₂	A ₃	AME ₄	AMLE ₅	Y ₆	AARR ₇	RR ₈
1	8,096	8,472	8,961	489	44,445	32	23.39	48.89
2	6,410	6,496	7,106	610	67,975	35	46.83	73.75
3	8,134	8,489	9,148	659	55,884	31	29.26	51.69
4	6,856	7,020	7,677	657	63,954	33	43.12	56.78
Average	7,632	7,761	8,458	697	67,848	33	41.37	59.63

¹ A' = Salary for the first year after residence if no program, in dollars.

² AA' = Adjusted A' for salary increase, in dollars.

³ A = Salary after residence, in dollars.

⁴ AME = Adjusted marginal earnings, in dollars.

⁵ AMLE = Adjusted marginal lifetime earnings, in dollars.

⁶ Y = Years to go to retirement.

⁷ AARR = Rate-of-return adjusted for wife's salary and salary increase, in per cent.

⁸ RR = Rate-of-return not adjusted, in per cent.

The rates-of-return, based on adjusted costs and benefits, range from 23.39 per cent for sub-group 1, to 46.83 per cent for sub-group 2. Comparatively, the range for the same sub-groups is from 48.89 per cent to 73.75 per cent without adjusted data. If the corrections for the costs are isolated -- this is done in finding the difference in rates from Tables XXVI and XXV -- the influence of the adjusted salaries on the final rates-of-return is determined. This procedure demonstrates that changes in salary account for 7.67 per cent in the drop of the rate for the group, as a whole. The rate of sub-group 1 is the most affected, dropping 18 per cent, while sub-group 2 is the least affected, showing a drop of only 5.83 per cent. Therefore, the adjusted benefits have, relatively, a somewhat milder influence on the rates of return than the adjusted costs for the group in general.

Adjustments in costs and benefits result in differences in marginal lifetime earnings, and consequently influence discounted marginal lifetime earnings. Moreover, the internal rate-of-return would be affected if these corrected costs and benefits were to be considered. Table XXVI shows the adjusted net costs and the discounted marginal lifetime earnings, after adjustments, for doctoral students.

TABLE XXVI
ADJUSTED NET COSTS AND DISCOUNTED MARGINAL LIFETIME
EARNINGS AFTER ADJUSTMENT AT THE DOCTORAL LEVEL -
IN DOLLARS

Group	ANC ₁	ADMLE ₂			
		Rate: 5 %	6 %	8 %	10 %
1	11,232	23,230	20,188	15,571	12,334
2	12,071	30,187	26,494	20,788	16,696
3	6,684	22,250	19,625	15,532	12,562
4	9,579	33,122	28,500	21,612	16,889
Aver- age	10,466	25,444	22,221	17,286	13,787

¹ ANC = Adjusted net costs.

² ADMLE = Discounted marginal lifetime earnings after adjustments.

As expected, the internal rates-of-return are significantly lower than with the original data. Net costs are increased here and marginal lifetime earnings are decreased. Naturally, the rate-of-return which would make the latter equal to the first has to be lower. The internal rate-of-return would be above, but close to 10 per cent for sub-group 1; it would be well above 10 per cent for sub-group 2, sub-group 3, and sub-group 4. For the group as a whole it would be above 10 per cent by probably 2 or 3 per cent.

The same computations for master's graduates result in the figures shown in Table XXVII.

TABLE XXVII
ADJUSTED NET COSTS AND DISCOUNTED MARGINAL LIFETIME
EARNINGS AFTER ADJUSTMENT AT THE MASTER'S LEVEL -
IN DOLLARS

Group	ANC ₁	ADMLE ₂			
		Rate: 5 %	6 %	8 %	10%
1	5,936	18,367	15,648	11,667	8,998
2	4,147	25,438	21,350	15,523	11,743
3	6,161	23,860	20,429	15,360	11,924
4	4,494	25,576	21,681	16,030	12,283
Aver- age	4,969	27,133	23,001	17,006	13,030

¹ ANC = Adjusted net costs.

² ADMLE = Discounted marginal lifetime earnings after adjustments.

The internal rate-of-return for the group as a whole, for sub-group 2 and sub-group 4 is well above 10 per cent. For sub-group 1, school principals, and superintendents, sub-group 3, it would stand above 10 per cent, probably by 2 to 4 per cent.

Adjustment for constant dollars. A final adjustment is made here to correct for inflation. Part of the raises in salaries are lost due to inflation. Consequently, the real increments are relatively lower when current dollars are converted into constant dollars.

For example, from 1926 to 1968 inflation devaluated

the Canadian dollar approximately 2 1/2 per cent a year, on the average. In the case of this study it has been accepted that the projected earnings would increase at 6 per cent a year until retirement. In constant dollars, the net increment would then be 3 1/2 per cent per year if the economy of this country follows the pattern established during the last forty years and if teachers' salaries are kept within the framework of evolution described earlier in this research.

This last adjustment has the very real advantage of producing data which are more readily comparable to results of other research for which the data have been converted into constant dollars. This adjustment would also make comparison between the results of the present study and others, using cross-sectional data, more meaningful. By the mere fact that cross-sectional data are used in some studies, the inflation factor is isolated and the data are in constant dollars of the year studied.

The marginal lifetime earnings corrected for inflation have a direct influence on the rate-of-return. Table XXVIII presents, for doctoral students, the marginal lifetime earnings in constant dollars and the rate-of-return they generate. The same table includes the data in current dollars.

TABLE XXVIII

PRIVATE RATE-OF-RETURN WITH MARGINAL LIFETIME EARNINGS
IN CONSTANT DOLLARS - DOCTORAL LEVEL

Group	NC ₁	ME ₂	MLE ₃	RR ₄	MLECD ₅	RRCD ₆
1	7,438	784	53,726	25.79	36,292	17.43
2	10,391	1,262	74,655	27.62	52,137	19.30
3	6,033	780	42,794	28.36	30,381	20.14
4	8,679	1,132	89,494	34.37	58,437	22.44
Average	8,075	961	61,221	28.07	42,053	19.29

¹ NC = Net costs, in dollars.

² ME = Marginal earnings, in dollars.

³ MLE = Marginal lifetime earnings, in current dollars.

⁴ RR = Rate-of-return, in per cent.

⁵ MLECD = Marginal lifetime earnings in constant dollars.

⁶ RRCD = Rate-of-return based on constant dollar data, in per cent.

Marginal lifetime earnings are noticeably lower when the correction is made to convert the current dollars into constant dollars. They range from \$30,381 to \$58,437 instead of from \$42,794 to \$89,494. Consequently, rates-of return calculated with data in constant dollars are clearly lower than when calculated with data in current dollars. They range from 17.43 per cent to 22.44 per cent instead of from 25.79 per cent to 34.37 per cent.

Table XXIX presents the results of the same procedures for the master's students.

TABLE XXIX

PRIVATE RATE-OF-RETURN WITH MARGINAL LIFETIME EARNINGS
IN CONSTANT DOLLARS - MASTER'S LEVEL

Group	NC ₁	ME ₂	MLE ₃	RR ₄	MLECD ₅	RRCD ₆
1	5,015	865	78,620	48.89	49,594	30.90
2	2,961	686	76,444	73.75	45,738	44.13
3	5,366	1,014	85,989	51.69	55,192	33.18
4	4,265	821	79,919	58.78	49,540	35.20
Average	4,085	826	80,405	59.63	49,842	36.97

¹ NC = Net costs, in dollars.

² ME = Marginal earnings, in dollars.

³ MLE = Marginal lifetime earnings, in current dollars.

⁴ RR = Rate-of-return, in per cent.

⁵ MLECD = Marginal lifetime earnings, in constant dollars.

⁶ RRCD = Rate-of-return based on constant dollar data, in per cent.

Marginal lifetime earnings, when converted into constant dollars range from \$45,738 to \$55,192 instead of from \$76,444 to \$85,989 when current dollars are the basis of the calculation. Consequently, master's students have a lower rate-of-return when constant dollars are used. The rate-of-return then ranges from 30.90 per cent to 44.13 per cent instead of from 48.89 per cent to 73.75 per cent when current dollars are used as the basis for the calculations.

The discounted marginal lifetime earnings, when

converted into constant dollars, are as presented in Table XXX for the doctorate subjects.

TABLE XXX

NET COSTS AND DISCOUNTED MARGINAL LIFETIME EARNINGS
AT THE DOCTORAL LEVEL - IN CONSTANT DOLLARS

Group	NC ₁	DMLECD ₂			
		Rate: 5 %	6 %	8 %	10 %
1	7,438	17,939	15,820	12,555	10,216
2	10,391	27,177	24,157	19,427	15,971
3	6,033	16,260	14,511	11,749	9,710
4	8,679	27,382	23,962	18,774	15,126
Average	8,075	21,346	18,899	15,098	12,347

¹ NC = Net costs.

² DMLECD = Discounted marginal lifetime earnings,
in constant dollars.

The internal rate-of-return seems to be well above the rates of discount used in the calculation of the discounted marginal lifetime earnings in constant dollars. It is only with a rate of discount equal to 10 per cent that the discounted marginal earnings result in figures which are relatively close to the net costs.

Calculations for the master's subjects with the same kind of data result in the figures shown in Table XXXI.

TABLE XXXI

NET COSTS AND DISCOUNTED MARGINAL EARNINGS AT THE
MASTER'S LEVEL - IN CONSTANT DOLLARS

Group	NC ₁	DMLECD ₂			
		Rate: 5 %	6 %	8 %	10 %
1	5,015	22,023	19,126	14,798	11,812
2	2,961	18,728	16,083	12,221	9,627
3	5,366	25,177	21,948	17,088	13,702
4	4,265	21,414	18,527	14,247	11,321
Average	4,085	21,544	18,640	14,334	11,390

¹ NC = Net costs.
² DMLECD = Discounted marginal lifetime earnings, in constant dollars.

Discounted marginal earnings based on constant dollars are much higher than the net costs, even when the rate is as high as 10 per cent. Therefore, the internal rate-of-return of master's students would be well above 10 per cent, if constant dollars are used in the calculations.

Costs have been adjusted, benefits have been corrected, and current dollars have been converted into constant dollars. The first two of these have been jointly applied to the data. The results of this two-fold correction can be corrected in order to take into account the constant dollar conversion. Data corrected for costs and adjusted benefits for which provision is

made in order to have constant dollars would show different results than if current dollars were used. Table XXXII presents adjusted costs, corrected benefits in constant dollars, and the rates-of-return these would generate for doctoral subjects.

TABLE XXXII

PRIVATE RATE-OF-RETURN WITH ADJUSTED COSTS AND BENEFITS,
PH. D. LEVEL - IN CONSTANT DOLLARS

Group	ANC ₁	Y ₂	AMLECD ₃	RRCD ₄
1	11,232	28	33,376	10.61
2	12,071	26	42,098	13.41
3	6,684	25	30,576	18.30
4	9,579	30	49,042	17.07
Average	10,466	27	36,014	12.74

¹ANC = Adjusted net costs, in dollars.

²Y = Years to retirement.

³AMLECD = Adjusted marginal lifetime earnings, in constant dollars.

⁴RRCD = Rate-of-return based on constant dollars, in per cent.

The same calculations for the master's subjects give the results shown in Table XXXIII.

TABLE XXXIII

PRIVATE RATE-OF-RETURN WITH ADJUSTED COSTS AND BENEFITS,
MASTER'S LEVEL - - IN CONSTANT DOLLARS - - -

Group	ANC_1	Y_2	$AMLECD_3$	$RRED_4$
1	5,936	32	28,037	14.76
2	4,147	35	40,672	28.02
3	6,161	31	35,869	18.78
4	4,494	33	39,645	26.73
Average	4,969	33	42,058	25.65

¹ ANC = Adjusted net costs, in dollars.

² Y = Years to retirement.

³ $AMLECD$ = Adjusted marginal lifetime earnings, in constant dollars.

⁴ $RRED$ = Rate-of-return based on constant dollars, in per cent.

The next step is to calculate the discounted marginal lifetime earnings based on corrected data, and constant dollars. Table XXXIV presents the corrected marginal lifetime earnings discounted to their present value in constant dollars at the doctoral level.

The internal rate-of-return for the group as whole is slightly above 10 per cent but within a fraction of one per cent. For sub-group 1, school principals, it is slightly above 8 per cent. Sub-group 2 has an internal rate above 10 per cent, very probably just below 11 per cent. Sub-group 3, and sub-group 4 have internal rates higher than 10 per cent, probably somewhere between 2 and

4 per cent above this figure.

TABLE XXXIV
ADJUSTED NET COSTS AND DISCOUNTED MARGINAL LIFETIME
EARNINGS AFTER ADJUSTMENT IN CONSTANT DOLLARS -
PH. D.

Group	ANC ₁	ADMLECD ₂			
		Rate: 5 %	6 %	8 %	10 %
1	11,232	16,497	14,549	11,547	9,395
2	12,071	21,944	19,505	15,686	12,896
3	6,684	16,365	14,604	11,825	9,773
4	9,579	22,980	20,110	15,755	12,694
Average	10,466	18,281	16,185	12,930	10,574

¹ ANC = Adjusted net costs.

² ADMLECD = Adjusted discounted marginal lifetime earnings in constant dollars.

The same calculations for master's students give the results shown in Table XXXV.

The internal rate-of-return of master's students is well above 10 per cent for the group as a whole, as for all sub-groups with the exception of sub-group 1, for which it is slightly above the rate of 10 per cent. For the latter sub-group it is probably between 10 and 11 per cent.

TABLE XXXV
 ADJUSTED NET COSTS AND DISCOUNTED MARGINAL LIFETIME
 EARNINGS AFTER ADJUSTMENT IN CONSTANT DOLLARS -
 MASTER'S

Group	ANC ₁	ADMLECD			
		Rate: 5 %	6 %	8 %	10 %
1	5,936	12,450	10,812	8,367	6,678
2	4,147	16,653	14,301	10,867	8,561
3	6,161	16,363	14,264	11,105	8,905
4	4,494	17,136	14,826	11,401	9,060
Average	4,969	18,180	15,729	12,095	9,611

¹ ANC = Adjusted net costs.

² ADMLECD = Adjusted discounted marginal lifetime earnings in constant dollars.

CHAPTER VI

RATES-OF-RETURN IN OTHER FIELDS OF EDUCATION AND SOME OTHER KINDS OF INVESTMENT

In sub-dividing the problem of this study, two related approaches or points of comparison were indicated as part of the process of data analysis. It was previously stated that the returns from investments in graduate studies in educational administration would be compared to:

- (a) the returns from other forms and levels of educational investment; and to
- (b) the returns from investment in securities, bonds, shares, and, more generally, the benefits to be expected from industrial investments.

To do so, data from studies on returns to educational investment are gathered, then some studies in investments in different fields of the economy are presented and, finally, in the conclusion, comparisons are made between these two and the results of the analysis of the data for investments in educational administration.

Rates-of-Return on Investment in Education

Individual. Generally the individual returns to elementary education are not dealt with for the simple

reason that the costs are almost nil and the returns tend toward the infinite (4, p. 136). In countries such as Canada, where secondary education, or part of it is compulsory, the same phenomenon occurs. Therefore, research here deal largely with part of secondary education and college or university education.

Lee Hansen (4) has made a very comprehensive study of the individual returns to investment in education for 1949. One can gather data from his research which can be compared to the findings of the present study. Figure 9 presents a selection of his findings regarding the marginal returns.

Figure 10 shows the same for cumulative returns.

Becker (1) calculated the returns on investment in high school and college education for selected years from 1939 to 1961. His findings are as follows:

TABLE XXXVI

PRIVATE RATE-OF-RETURN FROM COLLEGE AND HIGH SCHOOL
EDUCATION FOR SELECTED YEARS SINCE 1939

	College Graduates	High School Graduates
1939	14.5 %	16 %
1949	13+	20
1956	12.4	25
1958	14.8	28
1959)	Slightly higher than in 1958	
1961)		

Figures from Becker (1, p. 128)

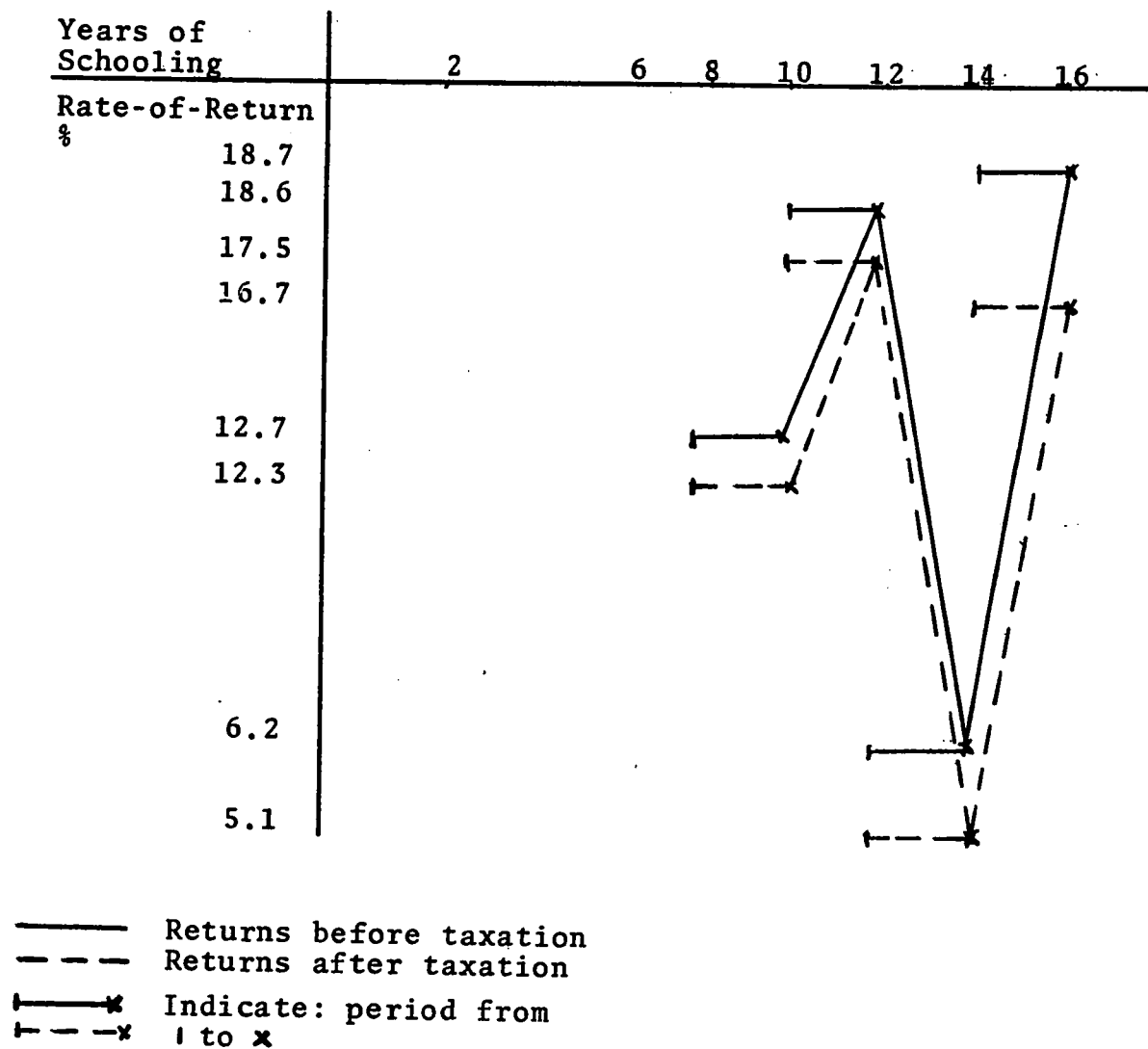


FIGURE 9

MARGINAL INTERNAL RATES-OF-RETURN TO PRIVATE
RESOURCES IN SCHOOLING, U.S.A., MALES, 1949

[Figures from Hansen (4, p. 136)]

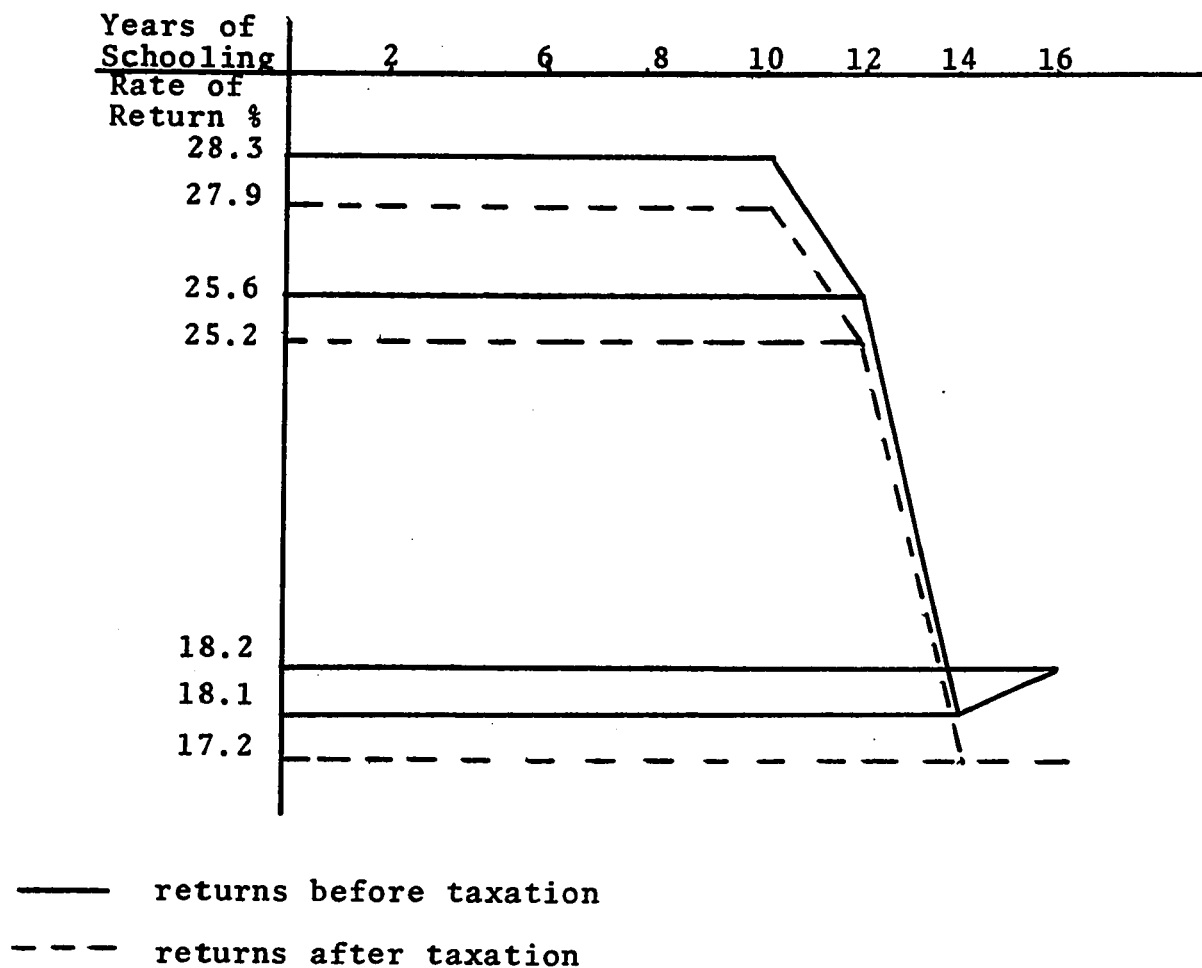


FIGURE 10
 CUMULATIVE INTERNAL RATE OF RETURN TO PRIVATE RESOURCE
 INVESTED IN SCHOOLING, U.S.A., MALES, 1949

[Figures from Hansen (4, p. 136)]

Podoluk (5) conducted a fairly extensive analysis of the relationship between education and earnings. She found that for the year ending May 31, 1961, the individual returns on investment in education were as follows:¹ for four to five years of high school they equal 16.3 per cent; for a university degree, they reach 19.7 per cent; and from the completion of elementary school to completion of university, the returns are 17.1 per cent.

Carroll and Ihnen (2) have found that a post secondary technical education of four years duration brings 23.9 to 25.9 per cent return to the individual.

The findings related to the individual rate-of-return are summarized in Table XXXVII.

Social. Schultz (7), Becker (1), Hansen (4) and Carroll (2) are some of the most current researchers in the field of the rate-of-return on social investment in education. Hansen presents the most detailed study for a single year, 1949. His findings are summarized in Figure 11.

¹J. R. Podoluk discussed the effects of income tax on the rate-of-return on page 51 but she does not specify if she uses after or before income tax figures in her calculations. It is assumed that she used before income tax data for her data come from the 1961 Census of Canada.

TABLE XXXVII
RATE-OF-RETURN TO INDIVIDUAL INVESTMENT
EDUCATION¹

Study	Marginal		Cumulative		Year
	BIT	AIT	BIT	AIT	
<u>Hansen</u>					
8 - 10	12.7	12.3	28.3	27.9	1949
10 - 12	18.6	17.5	25.6	25.2	1949
12 - 14	6.2	5.1	18.1	17.2	1949
14 - 16	18.7	16.7	18.2	17.2	1949
<u>Becker</u>					
High School		16			1939
		20			1949
		25			1956
		28			1958
College		14.5			1939
		13 +			1949
		12.4			1956
		14.8			1958
<u>Podoluk</u>					
High School	16.3				1961
College	19.7				1961
Elementary - University Degree		17.1			1961
<u>Carroll and Ihnen</u>					
Post-Secondary					
4 years	25.9	(2)			1964
	23.9	(3)			1964

¹ BIT = Before income tax deduction; AIT = After income tax deduction. - indicates from to, 8 - 10 = from completion of grade 8 to completion of grade 10. Figures from: Hansen (4, p. 136), Becker (1, p. 128), Podoluk (5, pp. 61, 62), and Carroll and Ihnen (2, pp. 868-71).

² Based on data adjusted for growth.

³ Based on data not adjusted for growth.

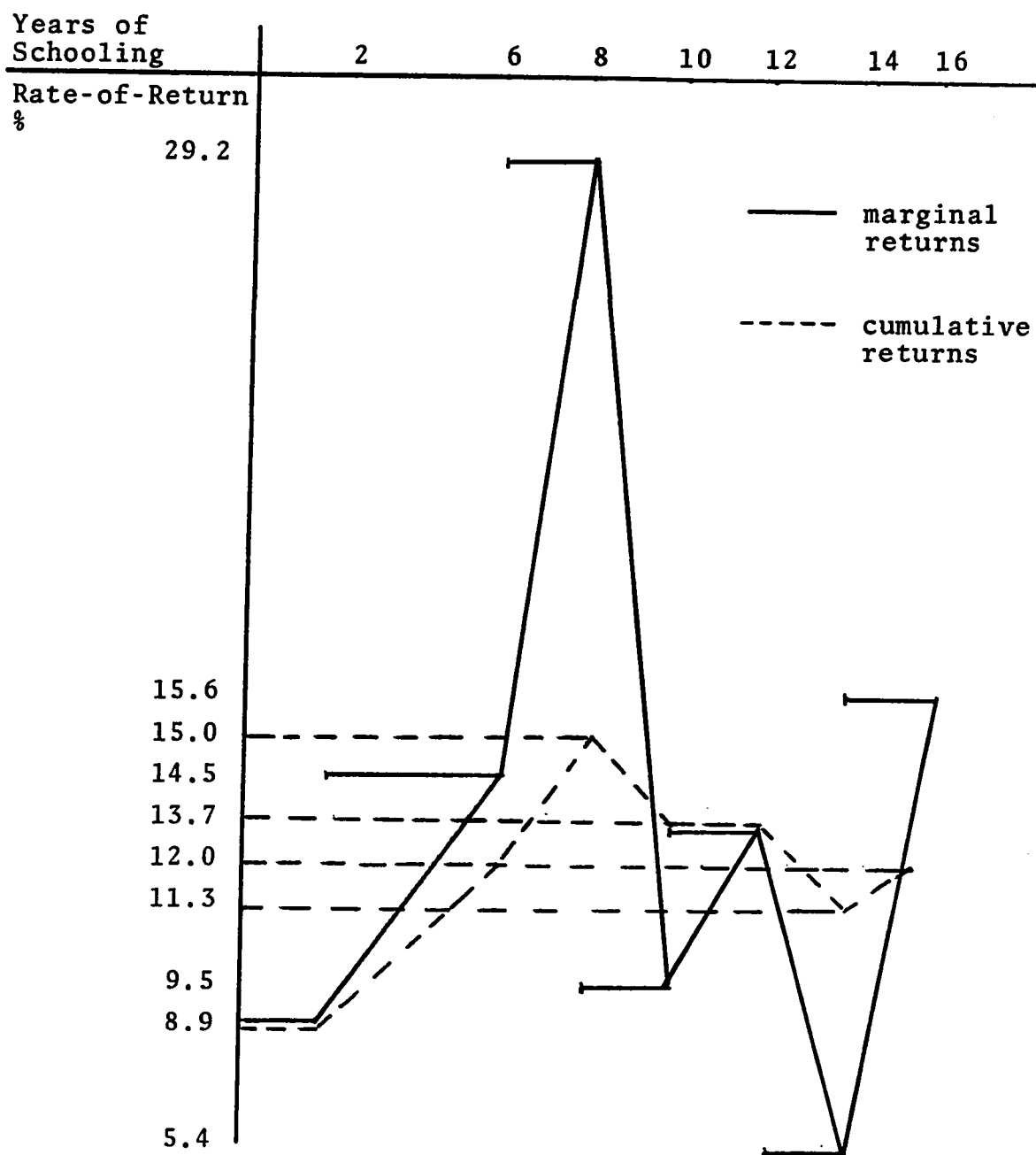


FIGURE 11

INTERNAL RATE-OF-RETURN TO TOTAL RESOURCE INVESTMENT IN
SCHOOLING, U.S.A., MALES, 1949

[Figures from Hansen (4, p. 134)]

Carroll and Ihnen present a study in depth of post-secondary technical education in Gaston technical school. For the four-year program they found that the rate-of-return varies from 11.7 per cent to 20.1 per cent, depending upon the treatment of the data.

Schultz and Becker have completed less detailed calculations but, longitudinally they are of particular interest. Schultz gives 14.3 per cent as the return to high school education for the period 1939-50. Becker finds that 9 per cent is the return for college students for the period 1940-50.

The four groups of findings can be summarized in a comprehensive table as in Table XXXVIII.

Rates-of-Return on Other Kinds of Investments

Fisher and Lorie (3), in what Rudd describes as "The most recent comprehensive studies of common stocks" (6), have surveyed the rates-of-return on investments in common stocks from 1926 to 1960, inclusively. Their problem was:

How much gain or loss an individual investor might have realized if he had bought all New York Stock Exchange common stock at five different dates and held them for varying lengths of time during the thirty-five years from 1926 through 1960.
(3, p. 1)

The rate-of-return under such conditions would have been 6.9 per cent before income tax deduction and 6.5 per cent

TABLE XXXVIII
MARGINAL RATE-OF-RETURN ON INVESTMENT IN EDUCATION¹

Study	% of Rate- of Return	Year
<u>Schultz</u> , 4 years high school	14.3	1939-50
<u>Becker</u> , College, White males	9	1940-50
Elementary	35	1958
High School	10	1958
College	11	1958
<u>Hansen</u> , Elementary 2 years	8.9	1949
Elementary 6 years	14.5	1949
Elementary 8 years	29.2	1949
High School 2 years	9.5	1949
High School 4 years	13.7	1949
College 2 years	5.4	1949
College 4 years	15.6	1949
<u>Carroll and Ihnen</u>		
Post-secondary		
Technical 4 years	16.5 ²	1964
	11.7 ³	1964
	20.1 ^{2,4}	1964
	16.7 ^{3,5}	1964

¹ Figures from Schultz (7, p. 62), Becker (1, p. 128), Hansen (4, p. 134) and Carroll and Ihnen (2, pp. 868-871).

² Based on data adjusted for growth.

³ Based on data not adjusted for growth.

⁴ Based on data adjusted for leisure time.

⁵ Based on data not adjusted for leisure time.

after income tax deduction if the investor were in the \$10,000 per annum income class in 1960. Under the same conditions but for the period 1955 to 1960, the returns would have been 10.9 per cent and 9.6 per cent, respectively. If the dividends had been reinvested as soon as they were paid, all factors being equal, the rate-of-return would have been the same for the period 1955-60; but for 1926-60, it would have been 9.0 per cent and 8.2 per cent before and after tax, respectively.

Fisher and Lorie also give figures for other kinds of investments for the same period on a before-tax basis. Savings in commercial banks, mutual savings, banks, and savings and loan associations "never earned as much as 6 per cent per annum ... and for most of the period 1926-60 earned less than 4 per cent." (3, op. cit., p. 8). For mortgage loans the yields varied from 4 per cent to 6 per cent and averaged about 5 per cent a year for the period 1920-47 (3, op. cit., p. 8). During the period 1926-60 the yields on municipal and U.S. Government bonds averaged less than 4 per cent (3, op. cit., p. 8). Corporate bond returns varied between 5 and 8 per cent from 1900 to 1958 (3, op. cit., p. 8). In American manufacturing industries the rate-of-return, after income tax, fluctuated from 5.43 per cent to 10.43 per cent during the years 1939-1957. It averaged 7.5 per cent for that period (8, pp. 34-35). Therefore, on the U.S. markets,

returns to investments varied, for the periods mentioned, from approximately 4 per cent a year to approximately 11 per cent a year depending upon where the money had been invested. These statistics can be summarized as follows in Table XXXIX.

TABLE XXXIX

RATE-OF-RETURN ON INVESTMENTS IN THE U.S., IN
PER CENT A YEAR¹

Field of Investments	Before Taxation	After Taxation
(a) New York Stock Exchange, 1926-60	9	8.2
(a) New York Stock Exchange, 1955-60	10.9	9.6
(b) New York Stock Exchange, 1926-60	6.9	6.5
(b) New York Stock Exchange, 1955-60	10.9	9.6
Saving Institutions, 1926-60	-4 (c)	
Mortgage Loans, 1920-47	5	
Municipal and U.S. Bonds, 1926-50	-4 (c)	
Corporate Bonds, 1900-58	5 to 8	
Manufacturing Industries, 1939-57		7.5
(a) With reinvestment of dividends, including capital appreciation.		
(b) Without reinvestment of dividends, including capital appreciation.		
(c) - indicates: less than but close to.		
¹ All figures are from Fisher and Lorie (3, pp. 4, 5, 8), except those for manufacturing industries which are from Stigler (8, pp. 34,35).		

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CHAPTER VII

SUMMARY, CONCLUSIONS, COMMENTS AND IMPLICATIONS

Summary

The problem. Skilled workers are factors in both the implementation of techniques and their development. They participate in economic growth in different ways and in varying degrees. They are more or less instrumental in the growth process according to the nature of their particular skills and the degree of their specialization in these skills. In a free market situation the nature of the skill and the degree to which it is mastered would account for differences in the individual's economic reward.

If one associates education with skill development, the output resulting from a specific type of education and its length would be marketed at different prices. Then the return on the money invested in education could be calculated as well as the marginal lifetime earnings associated with a specific type of education and a defined amount of the same. In recent years some calculations of this kind have been done for both individual and social returns. These calculations are looked upon as a means to rationalize the allocation of scarce resources.

This study was an attempt to evaluate the individual return on investments in graduate studies in educational administration.

Sub-problems. The general problem of this study was sub-divided into four sub-problems and two related approaches. They were:

(a) Sub-problems:

- (1) The computation of the financial costs associated with graduate studies in educational administration.
- (2) The computation of the marginal lifetime earnings associated with graduate work in educational administration.
- (3) The discounting of the marginal lifetime earnings to their present value.
- (4) The evaluation of the rate-of-return the marginal lifetime earnings represent when compared to educational costs.

(b) Related approaches:

- (1) The returns from other educational investments.
- (2) The returns from industrial investment.

Significance of the problem. Economists from England, the U.S.A., and Canada have suggested that there is a lack of studies of this type. Educationists, in

particular administrators, indicated the need for such studies. The results of such studies can be valuable in establishing salary scales for personnel within school systems.

Assumptions. The answers given to the questionnaire used in the study were assumed to represent real individual costs and benefits. It was assumed that the literature consulted was applicable to the economy of Canada and to its education and society. The hypothetical data were assumed to approximate the real data.

Delimitations. The population under study was composed of graduate students from the Department of Educational Administration at the University of Alberta. Only full-time students were included. Solely the economic aspect of graduate studies was considered; only the costs and benefits pertinent to the individual were retained. Salary or earnings are taken into account, not the total income.

Limitations. The results were limited by the value of the assumptions on which the study was based. The sample could not be taken as representative of Canadian educational administrators in general and one could not make inferences regarding the latter on the basis of the study. It might be, if one was prepared to accept some

assumptions, representative of graduates in educational administration in Canada.

Related theory. Education was first formally organized to transmit sets of values which a particular society deemed necessary for its members. The need for industrialized societies to continually improve and for underdeveloped societies to advance economically resulted in great emphasis on human capital, and on its accepted process of development, education. Studied in this way education can be valued economically. It is a process in which input as well as output can be expressed in monetary terms. The sum of the costs of education would determine the value of the input and the market would establish the value of the out-put. The difference of both sums would represent the plus value of the initial capital acquired in the process of formation as well as isolating the consumption aspect of the newly formed capital. This would be done by conducting a cost-benefit analysis or a rate-of-return study.

The input in education can be looked upon as an investment and the output as the return. A certain amount of capital is available, alternative investments, exclusive of one another, are considered, the costs and returns of each of them are assessed within the limits of a personal set of values and constraints, then a

decision is made for one of the alternatives. In this study, the chosen investment is graduate studies in educational administration.

Money spent on education is a form of investment similar to an investment in physical capital. It has to compete with alternate investments and consumption. It obeys such general laws of investment, as: the maximization of profits, the least risk, the relation between amount invested, the risk involved, the profit expected, etc. The correct criteria for an individual choice of investment seem to be the internal-rate-of-return and the discounted value of the project's returns. Of course, non-monetary factors are crucial in the decision of the investor. They may even outweigh the above-mentioned factors.

The advantages of cost-benefit analysis are many. They assist in establishing a scale of priorities for the investment of limited resources. Because of their allocative advantages the policies made to implement investment programs have a greater likelihood of being rational and objective. They are a source of unity within policy-making bodies. Cost-benefit analysis is generally regarded as the most important and most effective single determinant of investments. It is far more fully developed than any other approach. Also this analytical approach has the dynamic dimension of establishing

communication between economists and educators.

The costs to be retained in an individual's cost-benefit analysis in education are: foregone income, fees, travelling expenses, and other expenses directly related to the undertaking of studies. The returns to be considered in such a study are the economic returns directly enjoyed by the individual and associated with education. Indirect costs, total costs, hedging benefits, spill-over benefits, non-market costs and benefits, and many others associated with education are not generally included in a study of an individual's costs and returns either because the individual is not directly concerned with them or because of the difficulties in putting a price on them.

The cost-benefit approach is not free from difficulties and limitations. It has been clearly indicated that its findings are partial, evaluative and questionable in many respects. Some say that education, ability, motivation, class, race, family, etc., are intercorrelated factors influencing earnings. The cost-benefit approach assumes that people are solely motivated by financial gains. Earnings differentials are not necessarily related to productivity and consequently to education, but are often caused by market imperfections. Cross-sectional data generally employed as a basis for this kind of study do not represent real life in a fluctuating economy, but a

static unreal situation. Indirect benefits are more important than direct ones. These criticisms and others are not discarded by students of the cost-benefit approach. They recognize them and try to cope with them either in limiting their study or in providing corrective devices within their instruments, or methods of analysis.

Definition of terms. The following terms have been defined for the purpose of this study: cost, benefit, rate-of-return, internal rate-of-return, external rate-of-return, discounted cash flow, salary, income, marginal earnings, foregone earnings, and diminishing returns.

Hypotheses. The five hypotheses to be tested were as follows:

- (1) The marginal lifetime earnings discounted at a rate equal to the rate of interest paid on the market will be equal to or greater than the cost of education.
- (2) The rate-of-return of investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or greater than other forms of educational investment.
- (3) The rate-of-return of the investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or

greater than the industrial rate-of-return.

- (4) The rate-of-return of the investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or greater than the cost of borrowing money on the market.
- (5) The rate-of-return and the marginal life-time earnings will be substantially higher than the figures which have been advanced by other studies of the economics of education. Nevertheless, they will not be so much above as to approach infinite ~~returns~~ rather, they will be close to previously found figures.

Instruments. The selection of the items included in the questionnaire was based on what previous studies have described as direct personal costs of a financial nature attributed to education. Statements related to sources of income and salaries were also part of the instrument. All the questions were factual and ask for descriptive answers. The questionnaire was first administered in a pilot study including forty-three graduate students in educational administration. Their critiques assisted in the re-wording of the questions and resulted in the deletion of one section of the questionnaire.

Sample. Once the foreign students were deleted the original sample of 161 students was reduced to 144, including 100 master's and 44 doctoral students and graduates. They were full-time students in the Department of Educational Administration at the University of Alberta from 1962-63 to 1967-68.

Data collection. A request for collaboration in the study was first sent to the 161 sampled subjects. This request brought 1 refusal, 7 unknown addresses, 5 mistaken students and 148 acceptances. Of the 148 questionnaires sent, 131 completed ones were returned in the next few weeks. A follow-up letter resulted in 11 more completed questionnaires. Once foreign students were excluded, the total number of subjects studied was 128, including 89 master's and 39 doctoral students and graduates.

Analysis of data. The total costs: foregone earnings and direct costs associated with education, and the different sources of revenue of the students were calculated. The revenues were subtracted from the costs to give the net costs. The formula was as follows:

$$NC = (FE + E) - (Re + R)$$

The benefits equaled the marginal lifetime earnings associated with a master's or a doctorate degree. Marginal benefits were computed for the years between the graduation

year and the year one is sixty-five. The computing formula was as follows:

$$MLE = \sum^N (EWD - EOD).$$

A second step was to discount the marginal earnings to their present value at different chosen rates -- 5 per cent, 6 per cent, 8 per cent, and 10 per cent. The formula was as follows:

$$DMLE = \sum^N \frac{AME}{(1+R)^1} + \dots + \frac{AME}{(1+R)^N}.$$

Two different comparisons were made between benefits and costs: the rate-of-return, and the internal rate-of-return.

The rate-of-return equaled the ratio of the marginal lifetime earnings to the net costs per unit of time:

$$RR = \frac{MLE}{(NC) N}.$$

The internal rate-of-return led to the following equation:

$$DMLE = NC.$$

Conclusions

The basic question asked at the beginning of this dissertation was: "Does it pay the individual to take graduate work in educational administration and how well does it pay?" The task was then divided into four main sub-problems and two related approaches. Five hypotheses

had to be tested to answer the original question.

Hypothesis 1. The marginal lifetime earnings discounted at a rate equal to the rate of interest paid on the market will be equal to or greater than the cost of education.

Common shares on the New York Stock Exchange yielded 6.5 per cent, after income tax deduction, from 1926 to 1960 and averaged 9.6 per cent, after taxation, from 1955 to 1960. Saving institutions paid less than 4 per cent, on the average, from 1926 to 1960. Municipal and U.S. bonds averaged the same for the same period. Mortgage loans yielded 5 per cent for 1920 to 1947, and corporate bonds averaged between 5 to 8 per cent from 1900 to 1958. (Table XXXIX). Long-term Canadian Government bonds yielded 5 to 5 1/2 per cent on the average.

(a) Doctoral Students. Discounted marginal lifetime earnings at the doctoral level are summarized in Table XIX. It is shown there that the group and all sub-groups have rates-of-return, which would make the marginal lifetime earnings equal to the costs, above 10 per cent. Because all the rates of interest paid on the market are equal to or below 9.6 per cent, Hypothesis 1 is found to be supported at the doctorate level. A correction has been made in the analysis of the data to convert current dollars into constant dollars. It was

found that a rate-of-discount above 10 per cent would be necessary to make the marginal lifetime earnings in constant dollars equal to the net costs. The hypothesis is therefore fully supported, even with constant dollars.

In the analysis of the data, the benefits as well as the costs have been corrected. If both corrections are taken into account at the doctoral level, the internal rates-of-return are all above 10 per cent. (Table XXVI). Therefore, the hypothesis would be substantiated even if the adjusted data are considered to be closer to reality than the original data. When constant dollars were used with corrected costs and benefits the group as a whole and three of the four sub-groups had internal rates-of-return above 10 per cent. Sub-group 1 showed a rate slightly above 8 per cent which would be somewhat below some rates of interest paid on the market. Therefore, Hypothesis 1 would in general be supported.

(b) Master's Students. Marginal lifetime earnings have been discounted at 5, 6, 8 and 10 per cent and the results of these computations are given in Table XXI. It shows that the internal rates-of-return for all the sub-groups, as well as for the group as a whole, are well above 10 per cent. Therefore Hypothesis 1 is supported at the master's level. When the marginal lifetime earnings were converted into constant dollars before discountings, the internal rates-of-return were still well above

the rates of interest paid on the market. Therefore, the hypothesis is still fully supported.

Adjusted costs and benefits have been analysed, and the marginal lifetime earnings have been discounted. The results of these computations are gathered in Table XXVII. It shows that the internal rate-of-return for all sub-groups and the group in general is above 10 per cent. Therefore, all these sub-groups, and the group as a whole need a rate of discount higher than the rate of interest paid on the market to make marginal lifetime earnings equal to the costs. Therefore, Hypothesis 1 is substantiated if adjusted data are used. When adjusted data were converted into constant dollars, the internal rates-of-return were still above 10 per cent. Therefore, Hypothesis 1 is fully supported.

Hypothesis 2. The rate-of-return of the investment measured as the ratio of the marginal earnings to the costs per unit of time will be equal to or greater than other forms of educational investment.

Some marginal rates-of-return to individual investment in education are presented in Table XXXVII. These rates fluctuate from 5.1 per cent for two years of high school to 28 per cent for the completion of high school. College education results in a return of 19.7 per cent, the average return for four years of post secondary technical

schooling is 23.9 per cent.

Table XXXVIII shows social returns to investment in education at different levels. Figures range from a low of 4.5 per cent for two years of college, to a high of 35 per cent for completion of elementary school. The rates for college education vary from 5.4 per cent to 16.5 per cent.

(a) Doctoral Students. The rate-of-return for the doctoral students under study attains a high of 34.37 per cent for association executives and a low of 25.79 per cent for university professors (Table XVIII). Therefore all rates-of-returns, to individuals at the doctoral level are higher than previously found rates-of-return, with the exception of the social returns to elementary education and of individual returns to secondary education in some cases. Consequently Hypothesis 2 is generally substantiated at the doctoral level.

In constant dollars the rates-of-return fluctuated from 17.43 per cent to 22.44 per cent. Therefore, completion of elementary school would yield a higher rate-of-return than what was found in this study for Ph. D. subjects. Four years of technical training and college education would have, in some cases, higher rates-of-return as well. Consequently, if the benefits are converted into constant dollars, the hypothesis is not fully supported in all cases.

With adjusted costs at the same level, the rates-of-return fluctuate from 17.08 per cent to 31.14 per cent (Table XXII). This adjustment still maintains these returns above most social and individual returns. As a matter of fact, only social returns to elementary education, and individual returns to some high school education and post-secondary technical education are higher in some cases, than what has been found in this study for doctoral students with corrected costs.

Benefits as well as costs have been corrected. With both corrections, the rate-of-return for the group averages 18.61 per cent and for the sub-groups ranges from 15.60 per cent to 26.14 per cent.

The rates-of-return based on corrected costs, or on both corrected costs and benefits, are then higher than most individual and social returns found in other studies. Returns to elementary education are the only ones which are clearly higher. College education, four years post-secondary technical training, and to some extent, high school education have higher returns than educational administration in some areas. Hypothesis 2 is then supported to a large extent, even with adjusted costs and benefits, at the doctoral level.

When both costs and benefits were adjusted and provision was made for constant dollars, the rates were from 10.61 per cent to 18.30 per cent. These rates were

below most cumulative returns, and below some high school returns and some post secondary returns to individuals, but above others. Moreover, a few post-secondary, elementary and secondary social returns were above 18.30 per cent, but most of them were below or approximately to the rates based on constant dollars. Therefore, the hypothesis is not fully supported.

(b) Master's Students. The rate-of-return for the eighty-nine master's students under study is 59.63 per cent. When they are divided into sub-groups it ranges from 48.99 per cent to 73.75 per cent (Table XX). This places these returns well above the findings of all studies consulted on the subject at all levels of education. Hypothesis 2 is then fully substantiated at the master's level.

When provision was made for conversion into constant dollars, the rates were still higher than in other studies consulted, with the exception of returns to elementary education and this is the case only with sub-groups 1 and 3. Therefore, the hypothesis is largely supported, even if the rates are based on constant dollars.

Adjustment of the costs brings the rate-of-return to investment at the master's level to a range of 41.39 - 53.89 per cent (Table XXIII). With adjusted benefits added to adjusted costs, the rate-of-returns becomes 41.37 per cent for the group, and the sub-groups average 23.39

per cent to 46.83 per cent (Table XXV).

Returns based on adjusted costs are still significantly higher than what previous studies have found for any level of education. Returns based on adjusted costs and benefits are higher than all returns previously calculated with the exception of returns for sub-group 1 which fall below individual returns for high school education and four years of post-secondary technical education; and for sub-groups 1 and 3 which are lower than social returns to elementary education.

Hypothesis 2 is then clearly supported by the findings of this study at the master's level even if the rate-of-return is calculated with corrected costs. If the rates are based on corrected costs and benefits, the hypothesis is still largely supported.

When corrected data were converted into constant dollars, the rates-of-return were from 14.76 per cent to 28.02 per cent. This still placed the returns to master's subjects above most of those found in the literature consulted. Only in a few cases did elementary education present higher social returns. Also, in two cases high school and post-secondary education had higher returns. The hypothesis is therefore largely supported.

Hypothesis 3. The rate-of-return on the investment measured as the ratio of the marginal earnings to the

costs per unit of time will be equal to or greater than the industrial rate-of-return.

The rate-of-return in manufacturing industries in the United States was 7.5 per cent after taxation for the period from 1939 to 1957 (Table XXXIX).

(a) Doctoral Students. The average rate-of-return for the thirty-nine doctoral students is 28.07 per cent and the lowest rate, for university professors, is 25.79 per cent (Table XVIII). Therefore, the hypothesis is clearly supported.

When the rates were calculated from data adjusted for constant dollars they ranged from 17.43 per cent to 22.44 per cent (Table XXVIII), these figures still support the hypothesis.

With a rate-of-return calculated on adjusted costs the group averages 21.66 per cent. Sub-group 1 is the lowest with a rate-of-return of 17.08 per cent (Table XXII). If the rate is calculated by using corrected costs and benefits, then it becomes 18.61 per cent for the group and 15.60 per cent for the lowest rate, university professors (Table XXIV). Even with adjusted costs and benefits the rate-of-return for doctoral students is higher than the rate-of-return in manufacturing industries. Hypothesis 3 is therefore clearly supported.

When corrected costs and benefits in constant dollars were used in the calculations, the lowest rate-

of-return, 10.61 per cent, was still well above the average returns to manufacturing industries. Therefore, the hypothesis is supported.

(b) Master's Students. The average rate-of-return for the eighty-nine students included in the analysis at the master's level is 59.63 per cent. Assistant-principals have a high of 73.75 per cent and superintendents a low of 51.69 per cent (Table XX). Therefore Hypothesis 3 is very strongly supported.

When constant dollars were used in the calculation of the rates, the results were still much higher than the rate-of-return to manufacturing industries. Therefore, the hypothesis is supported.

Rates-of-return calculated with adjusted costs drop to a group average of 49.04 per cent. Sub-groups range from 41.39 per cent to 53.89 per cent (Table XXIII). Correcting the benefits as well as the costs leads to a rate of 41.37 per cent for the group. The lowest rate is 23.39 per cent and the highest rate 46.83 per cent. When the corrected data were converted into constant dollars, the rate fluctuated from 14.76 per cent to 28.02 per cent. Hypothesis 3 is then substantiated for master's students, even if corrected data and constant dollars are used.

Hypothesis 4. The rate-of-return of the investment measured as the ratio of the marginal earnings to the

costs per unit of time will be equal to or greater than the cost of borrowing money on the market.

The rate of interest charged by chartered banks at the end of 1967 was approximately 8 per cent. The lowest rate-of-return to investment in graduate studies in educational administration was found to be 10.61 per cent, with adjusted data in constant dollars for university professors at the doctoral level. As this latter rate is above 8 per cent, Hypothesis 4 is substantiated for both master's and doctoral students.

Hypothesis 5. The rate-of-return and the marginal lifetime earnings will be substantially higher than the figures which have been advanced by other studies of the economics of education. Nevertheless, they will not be so much above as to approach infinite returns; rather, they will be close to previously found figures.

This hypothesis is really an extension of Hypothesis 2 and the same figures and tables are used to test it.

(a) Doctoral Students. All rates-of-return at the doctoral level, when they are calculated from non-corrected data, are much higher than any rate of return found in other studies consulted, with two exceptions. Elementary education shows a social rate-of-return higher than that found for doctoral students. For high school education in one instance, the returns are 28 per cent.

This contradicts the present hypothesis but the rate is not much more than the rate-of-return of the two sub-groups which show a rate inferior to 28 per cent. The next highest rate-of-return to individuals is 23.9 per cent, and is for four years of post-secondary technical education. It is lower than the lowest return -- 25.79 per cent for sub-group 1. Therefore all rates-of-return at the doctoral level are either well above previously found figures; or above but close to them; or, in a few cases, below but close to them. Therefore Hypothesis 5 is generally substantiated at the doctoral level.

When constant dollars were used in the analysis, the hypothesis was not fully supported. In most cases, however, it is substantiated.

Corrected costs and benefits lower the rates-of-return significantly, but they still remain either among or above the highest rates found in other studies. Therefore Hypothesis 5 is not clearly supported with adjusted costs and benefits, even though it is substantiated in many respects for most sub-groups and for the group as a whole.

Where corrected costs and benefits have been converted into constant dollars, the rates-of-return were from 10.61 per cent to 18.30 per cent. These rates are below some returns to most levels and kinds of education, but still above many of them. The hypothesis would then

be substantiated to a large extent.

(b) Master's Students. All rates-of-return at the master's level are well above any other findings consulted for this study. Moreover they are so much above, that part two of Hypothesis 5 is probably not substantiated. The returns to investments at the master's level are not approaching infinite returns, but neither are they close to what previous studies found. Almost the same conclusions apply to the returns based on adjusted costs. If both costs and benefits are adjusted, some sub-groups show lower returns than a few previous studies; but, as a group, master's students still have higher returns than any other studies have indicated. They are so high that in comparison to most other returns they hardly support part two of Hypothesis 5.

With data converted into constant dollars, the rates-of-return were found to be much closer to some of the highest rates found in the studies consulted. Three sub-groups, 1, 3 and 4, had rates equal to or slightly lower than rates-of-return for elementary education. Therefore, the hypothesis would be closer to being entirely substantiated with constant dollars as a basis for calculation.

Comments

Returns to investments in educational administration

are relatively very high. The returns for master's students are much above any returns found in previous studies consulted for this thesis.

Some returns from other studies would have to be lowered if comparisons are to be fair, because they were calculated before income tax deductions, while all returns for this study were calculated after income tax deductions. This would result in an even greater margin of difference between the present findings and previous ones.

The objection may well be raised, that the very high rates-of-return are due largely to other factors apart from the master's and doctoral programs. It is granted that a large part of the benefits attributed here to education are related to the function of the former students in their educational milieu. But what part? It should be noted before any attempt is made to determine what part, that the benefits may be related to the positions. But would the graduates occupy these positions without their master's or Ph. D. degrees? This question cannot be answered with certitude, because in most cases the present situation does not require the holding of a degree in educational administration as a prerequisite for the occupation of administrative positions. Nevertheless, there are some cases where such a degree is almost a prerequisite, for example, a university professor needs a

doctorate, applicants to many local superintendencies must be holders of a master's degree and Ph. D. holders are given preference. In the government services master's degrees are almost a prerequisite for some functions, at least any younger applicant would not have as much advantage, if any, over older ones were it not for his degree. Moreover, the mere fact that these people saw fit to undertake the program before applying for the position they took after residence indicates, it seems, that they valued it as an asset in obtaining the appointment.

One cannot consider the increments given to degree holders in salary scales as representing marginal earnings because of the mere fact that they do not represent a real evaluation of these marginal earnings. They would be equal to the marginal earnings due to further education if the latter were not instrumental in assisting the graduates to obtain more highly paid positions. Moreover, salary scales present some tremendous differences in increments related to the holding of degrees, the increments vary from approximately \$300 per annum in some British Columbia school districts to over \$2,000 a year according to the salary scale offered as a bargaining position by the Government of Quebec.

It is recognized that as far as ability is not taken into account in this study, the rates-of-return are

largely weighted in favor of education. Nevertheless it is felt that the rates-of-return have been underestimated in this study because of the conservative evaluation of the benefits, and the very liberal evaluation of the costs on which the rates-of-return are calculated.

Costs and benefits have been adjusted previously but it was mentioned that the way they were corrected probably did not represent the real situation. Not only is it felt that the way the corrections were made was unnecessary, but it is felt that the costs should have been kept as in the original analysis, and that the benefits should have been upgraded. The correction should have been such then as to increase the benefits and, in the same way, to increase the rates-of-return. It is thought that making the marginal lifetime earnings equal to the marginal earnings of the first year projected at a 6 per cent rate of increase a year underestimates the net streams of revenue. Of course, there is not enough data, in general, to proceed otherwise. Nevertheless, even with limited data there are clear indications that the actual salaries, for the years after the first year, would be higher in many cases than the projected figures used in the analysis. This point is particularly evident at the master's degree level in general, and for subgroups 3 and 4 of the doctoral level. Table XL on page 173 presents the projected salaries and the actual earnings

for the four years following the residence requirements. Table XLI on page 174 completes the preceding table, it gives the actual differences between projected salaries and real ones as well as the number of subjects for whom data was available. Therefore, the rate-of-return based on actual salaries rather than on projected ones may be higher than what was found in this study.

One of the factors associated with what was just discussed above may be the way in which increments in salaries are attributed in school systems, and for which an average rate does not account. Are increases in salaries, especially at the time of bargaining, equally distributed among teachers? Are they allocated to some groups or segments of the teaching profession? Some would definitely say that, within the union-like framework in which salary negotiations are conducted, the majority has to be satisfied first. This would make less qualified teachers more powerful and would make them the major beneficiaries both absolutely and relatively. On the other hand, teachers' associations, and school authorities in general, have at heart the improvement of the academic standards of the teachers. Therefore, they would logically reward those with higher degrees in such a way as to financially interest teachers in taking more education. Nevertheless, one must remember that the disposable income represents a greater

TABLE XL
PROJECTED AND ACTUAL SALARIES FOR SOME YEARS AFTER THE
RESIDENCE REQUIREMENTS - IN DOLLARS

	1st Year		2nd Year		3rd Year		4th Year	
	P ₁	A ₂	P	A	P	A	P	A
<u>Doctorate</u>								
Group 1	--	9,751	10,336	10,187	10,956	10,756	11,613	11,582
2	--	11,103	11,769	11,347	12,475	10,130	13,223	11,330
3	--	9,100	9,646	10,037	10,224	10,953	10,838	11,974
4	--	10,978	11,636	13,605	12,334	14,740	13,074	15,780
Average	--	10,132	10,739	10,867	11,384	11,503	12,067	12,091
<u>Master's</u>								
Group 1	--	8,961	9,498	9,814	10,068	10,436	10,672	10,501
2	--	7,106	7,532	8,252	7,983	8,927	8,463	10,020
3	--	9,148	9,696	9,976	10,278	10,432	10,895	11,167
4	--	7,677	8,137	8,048	8,625	8,665	9,143	9,246
Average	--	8,458	8,956	9,194	9,503	9,659	10,073	10,292
1 P = Projected salaries								
2 A = Actual salaries								

TABLE XLI

DIFFERENCES BETWEEN THE PROJECTED EARNINGS AND THE
ACTUAL EARNINGS FOR SOME YEARS FOLLOWING THE
RESIDENCE REQUIREMENTS - IN DOLLARS ABOVE
OR BELOW THE PROJECTED EARNINGS

Doctoral N	Group 1 18	Group 2 10	Group 3 7	Group 4 4	Average 39
Second Year N	-149 11	-422 5	+391 7	+1,969 3	+128 26
Third Year N	-200 7	-2,345 1	+729 7	+2,406 3	+119 18
Fourth Year N	-31 5	-1,893 1	+1,156 5	+2,706 1	+24 13
Master's N	35	21	21	12	89
Second Year N	+316 21	+720 18	+280 18	-89 10	+229 67
Third Year N	+368 13	+944 16	+154 11	+40 8	+156 48
Fourth Year N	-171 6	+1,557 8	+372 8	+103 6	+219 28

proportion of the gross increments in the low echelons of a salary scale. It is not clear, then, who obtains the most in the final analysis. This would probably be a useful subject for study.

Implications for Further Studies

From the analysis of the data of the present study it is obvious that much more must be done in the field of the rate-of-return to investments in education in general, and in the more specific field of graduate studies. Certainly, the latter area could be studied much more deeply, broadly, and inclusively, both for the individual and society before adequate enough knowledge is obtained to result in an optimum allocation of scarce resources. These further studies can be grouped under two inclusive headings: individual and social.

Individual. The sample used in this study could be administered a follow-up questionnaire in possibly five years, or ten years from now to determine the actual financial benefits the graduates will realize. One could add to the sample the graduates of the department from 1967-68 to the time the study is conducted. The results could be compared to the figures projected in the present study. This can be looked upon as a vertical extension of what has been done here. A horizontal approach would be the replication of this survey to other fields of

graduate studies, both in faculties of education and in other faculties. Then comparisons could be made between the rate-of-return on investment in graduate studies in elementary education, secondary education, medicine, law, commerce, economics, engineering, etc.

The scope of the study could be widened in conducting a study of the total rate-of-return to the individual, including financial benefits such as financial option returns, hedging option returns, opportunity option returns and others.

The depth of the approach could also be carried even further by incorporating into a questionnaire devices to measure the attitudes of the subjects toward the financial aspects of their profession, something similar to Grubel's (1, pp. 161-163) study at Stanford University for instance, and correlate these attitudes with the returns.

It has been noted at the end of Chapter II that the differences between education and training may be responsible for differences in the rate-of-return to investment in schooling. It would be useful to devise means to isolate the two aspects of a program, rate their relative importance in different programs and establish the relationship between these ratings and the financial returns.

Social. Individual costs and returns to graduate studies are only part of a larger framework. A calculation of the total social costs and returns may well produce quite different figures. In the Canadian setting, for example, the tuition fees do not represent the total costs of operating a department. Society in financial terms contributes a great deal more than does the student. The financial benefits to the individual are only a small part of the total profit a society receives from graduate studies. One could evaluate, for example, the effects of having better educated managers in a given system. The efficiency of the workers, the level of production, the quality of the marketed product, etc. could be examined as areas which are possibly affected.

Studies could establish the relative returns to society of its investment at different levels and in kinds of training and education. Such studies may assist in grading priorities in the investment policies of governments.

The field for further studies is surely wide enough as to provide researchers with problems of choice rather than problems of finding topics for study.

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A P P E N D I X

FACULTY OF EDUCATION
DEPARTMENT OF EDUCATIONAL
ADMINISTRATION



THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA

Dear Graduate:

I am writing to request your cooperation and assistance in completing a research study I am interested in and which is conducted by one of our doctoral students, Philippe Dupuis. I am Philippe's advisor.

The research is concerned with the rate-of-return of the individual's investment in graduate studies. In other words, does it pay to take a degree in educational administration, and if so how much? To do so we need your help especially for evaluating the actual costs of graduate education. A questionnaire designed for this purpose will be sent to all graduate students who have been full time in this department and who are willing to collaborate. This questionnaire is short, it can be completed in about 15 minutes. You will be asked to state the cost of your graduate studies as well as your sources of revenue at that time. It is realized that some of this may be regarded as personal information. You can be assured that the way the data will be handled and treated will safeguard complete anonymity. All signs of identification will be removed from the returned questionnaire before the latter is read, and Philippe Dupuis will be the only person opening and reading these returns.

Having done graduate work yourself, in the same department, you realize how important it is to collect answers from all sampled persons for research to be of any value. This is why I am taking it upon myself to ask you personally to collaborate with Philippe in this interesting study.

Would you please fill in the enclosed form at your earliest convenience and return it in the already addressed and stamped envelope which is enclosed.

Thank you for your cooperation in this matter.

Sincerely yours,

G.L. Mowat
Professor

GLM/ed
Encl.

P.S. We think that you would be interested in the results of this study and intend to forward to you a summary of our findings.

RATE-OF-RETURN ON INVESTMENT IN GRADUATE STUDIES

A survey conducted under the guidance of G. L. Mowat,
Professor, Department of Educational Administration,
University of Alberta.

Dear Sir:

I am willing to collaborate in the survey as
described by G. L. Mowat _____.

I cannot collaborate in the above survey.

_____.

Signature _____

Please enclose this form in the stamped and addressed
envelope provided.

G.L.M.



Dear Graduate:

Thank you for your positive reply to Dr. Mowat's request regarding cooperation in the study I am conducting on investment in graduate studies in educational administration.

Following are some suggestions which will be useful in answering the enclosed questionnaire.

- (1) The questionnaire is divided into four parts: A to D. It is spread over 9 pages. It would have been possible to include all the questions in less than five pages, but the present form will facilitate your reply.
- (2) An information sheet is enclosed, it can be helpful for answering Sections B(1), B(2), C(1), and C(2).
- (3) You are asked to answer all questions. Some questions are clearly not applicable to your case, for these latter put "NA" (non applicable) as an answer.
- (4) Once you have answered all questions put your completed questionnaire in the stamped and addressed envelope enclosed.
- (5) Would you please fill in the enclosed questionnaire at your earliest convenience, within the next two or three days if possible?

Thank you again for your cooperation in this matter. As promised the findings of this study will be forwarded to you as soon as possible.

Sincerely yours,
Philippe Dupuis
Philippe Dupuis

PD'bb
Encls.

INFORMATION SHEET

- (A) Some of the questions are presented with the following setting:

Master's program in 1 year of residence. *Master's program in 2 years of residence.*
 Master's \$ _____ or Master's I \$ _____
 Master's II \$ _____
 Ph. D. I \$ _____
 Ph. D. II \$ _____
Ph. D. program in 2 years of residence *Ph. D. program in 3 years of residence.*
 Ph. D. III \$ _____

→ Use the pattern you followed when you took your graduate studies.

- (B) Fees, (question B(2)). Following are the fees charged at the University of Alberta, Edmonton, for:

	Master's 1 year <u>program</u>	Ph. D. 2 years and <u>3 years program</u>
1962 - 63	\$258	a year
1963 - 64	\$335	a year
1964 - 65	\$335	a year
1965 - 66	\$400	a year
1966 - 67	\$400	a year
1967 - 68	\$400	a year

- (C) "Work" in question C(7) excludes G.T.A., G.S.A., and G.R.A.

IT IS APPRECIATED THAT SOME OF YOUR ANSWERS WILL BE ONLY APPROXIMATIONS.

**RATE-OF-RETURN ON INVESTMENT IN
GRADUATE STUDIES**

**INDIVIDUAL STATEMENTS ON THE FINANCIAL ASPECT OF
GRADUATE STUDIES IN EDUCATIONAL ADMINISTRATION
AT THE UNIVERSITY OF ALBERTA, 1962-1967**

A. GENERAL INFORMATION:

(1) What is your age at present time? _____ years.

(2) What was your age when:

(a) You took your Master's?

starting? _____ convocation? _____

year _____ year _____

(b) You took your Ph. D.?

starting? _____ convocation? _____

year _____ year _____

(3) What was your job just before you took your:

Master's? _____

Annual Salary: _____

Ph. D.? _____

Annual Salary: _____

(4) What was your job just after you took your:

Master's? _____

September/196____ Annual Salary \$ _____

Ph. D.? _____

September/196____ Annual Salary \$ _____

(5) What is your present job? _____

Annual Salary \$ _____

(6) What will probably be your job in September, 1968?

Annual Salary \$ _____

(7) Where did you take your Master's? _____

(8) Where did you take your Ph. D.? _____

- (9) Which of the following patterns did you follow for your graduate studies: (Please check).

Master's as a part time student _____

Master's in 1 year residence _____

Master's in 2 years residence _____

Ph. D. in 2 years residence _____

Ph. D. in 3 years residence _____

- (10) Is your degree, Master's or Ph. D., a prerequisite for holding the job you hold at present time?

Master's: Yes _____, No _____.

Ph. D.: Yes _____, No _____.

B. COST OF GRADUATE WORK:

(1) Salary Forgone.

- (a) What was your last annual salary before undertaking graduate studies:

before Master's? \$ _____ annually.

before Ph. D.? \$ _____ annually.

- (b) What would have been your annual salary, staying in the same place with the same job, instead of taking graduate studies:

Master's \$ _____ or Master's I \$ _____

Master's II \$ _____

Ph. D. I \$ _____ or Ph. D. I \$ _____

Ph. D. II \$ _____ Ph. D. II \$ _____

Ph. D. III \$ _____

- (c) Do you think that, during the years you were studying, you would have had a better paid job than what you had the year you left to take graduate studies?

No _____, Probably _____, Yes _____

If probably or yes what would have been your annual salary:

Master's \$ _____ or Master's I \$ _____
Master's II \$ _____
Ph. D. I \$ _____ or Ph. D. II \$ _____
Ph. D. II \$ _____ Ph. D. III \$ _____
Ph. D. III \$ _____

(2) Fees.

(a) How much were the tuition fees annually:

Master's \$ _____ or Master's I \$ _____
Master's II \$ _____
Ph. D. I \$ _____ or Ph. D. I \$ _____
Ph. D. II \$ _____ Ph. D. II \$ _____
Ph. D. III \$ _____

(b) Did you pay them entirely yourself?

Yes _____ No _____

If no how much did you pay yourself?

Master's: \$ _____

Ph. D. \$ _____

(3) Travelling and moving expenses.

(a) Coming to university for the Master's program:

How much did it cost you for moving and travelling, family included if applicable? \$ _____

How much did you have to pay by yourself?

\$ _____

(b) Going back to work after the Master's program:

How much did it cost you for moving and travelling, family included if applicable? \$ _____

How much did you have to pay by yourself:

\$ _____

(c) Coming to university for the Ph. D. program:

How much did it cost you for moving and travelling,
family included if applicable? \$ _____

How much did you have to pay by yourself:

\$ _____

(d) Going back to work after the Ph.D. program:

How much did it cost you for moving and travelling,
family included if applicable? \$ _____

How much did you have to pay by yourself?

\$ _____

(4) Housing Expenses.

(a) How much more (or less) did it cost you for
housing compared to what it cost you before
being at university:

More _____ or less _____ Master's \$ _____ a month,
or \$ _____ a year.

More _____ or less _____ Ph. D. \$ _____ a month,
or \$ _____ a year.

(b) If you had to sell your house before leaving
home how much did you lose?

Master's: \$ _____, Ph.D.: \$ _____

or gain?

Master's: \$ _____, Ph.D.: \$ _____

(c) If you sold your furniture before leaving home
how much did you lose?

Master's: \$ _____, Ph.D.: \$ _____

or gain?

Master's: \$ _____, Ph.D.: \$ _____

- (d) If you bought furniture when you were attending university and had to sell them after, how much did you lose?

Master's: \$_____, Ph.D.: \$_____

or gain?

Master's: \$_____, Ph.D.: \$_____

(5) Other Expenses.

- (a) How much did you spend on books, journals, reprints, outlines of courses and other similar material related to your:

Master's: \$_____, Ph.D.: \$_____

- (b) How much did your thesis cost you in typing, printing, binding and so on:

Master's: \$_____, Ph.D.: \$_____

- (c) What was the sum of the expenses like typing (except for the thesis), paper, xerox, and so on:

Master's: \$_____, Ph.D.: \$_____

- (d) If you had any other expenses caused by the fact you were a student, how much did it amount to:

Master's: \$_____, Ph.D.: \$_____

Would you like to specify the nature of these other expenses?_____

C. SOURCE OF REVENUE:

(1) If you were on leave of absence with pay how much were you receiving a year?

(a) Master's \$_____ Tax free, yes____, no____

or

Master's I \$_____ Tax free, yes____, no____

Master's II \$_____ Tax free, yes____, no____

(b) Ph. D. I \$_____ Tax free, yes____, no____

Ph. D. II \$_____ Tax free, yes____, no____

or

Ph. D. I \$_____ Tax free, yes____, no____

Ph. D. II \$_____ Tax free, yes____, no____

Ph. D. III \$_____ Tax free, yes____, no____

(c) How much did you have to pay back?

Master's: \$_____ Ph.D.: \$_____

(2) If you were receiving fellowship, scholarship, G.T.A., G.S.A., etc., what was the annual sum?

(a) Master's \$_____ or Master's I \$_____

Master's II \$_____

(b) Ph. D. I \$_____ or Ph. D. I \$_____

Ph. D. II \$_____ Ph. D. II \$_____

Ph. D. III \$_____

(3) If you had to borrow money to be able to go through your program, how much did you borrow for the:

Master's? \$_____, _____% interest

Ph. D.? \$_____, _____% interest

- (4) If your wife had to work, how much did she make a year:

for ____ year(s) -- During the Master's? \$ _____

for ____ year(s) -- During the Ph. D.? \$ _____

- (5) How much was left of her salary after deducting from her salary the income tax and the extra expenses due to her work, e.g. clothes, travelling, baby-sitting, and so on:

During the Master's? \$ _____ a year for ____ year(s).

During the Ph. D.? \$ _____ a year for ____ year(s).

- (6) How much of your previously saved money did you have to spend:

At the Master's? \$ _____

At the Ph. D.? \$ _____

- (7) If you had to work yourself during your graduate studies, how much did you earn a year?

For ____ year(s) at the Master's \$ _____,
Income tax free, yes _____, no _____.

For ____ year(s) at the Ph. D. \$ _____,
Income tax free, yes _____, No _____.

- (8) (a) Did you have any other source of revenue from which you took money for these years? How much did you use?

At the Master's \$ _____

At the Ph. D.? \$ _____

- (b) Would you specify these other sources of revenue?

D. REVIEW:

1. (a) What was your annual salary for the following years: (If you were working, not studying).

1963 - 64? \$ _____
 1964 - 65? \$ _____
 1965 - 66? \$ _____
 1966 - 67? \$ _____

- (b) What is your annual salary for: (If you are working, not studying).

1967 - 68? \$ _____

- (c) What will probably be your salary for:

1968 - 69? \$ _____

- (d) How much a year is your degree accountable for in your salary for:

	<u>Master's</u>	<u>Ph. D.</u>
1963 - 64?	\$ _____	\$ _____
1964 - 65?	\$ _____	\$ _____
1965 - 66?	\$ _____	\$ _____
1966 - 67?	\$ _____	\$ _____
1967 - 68?	\$ _____	\$ _____
1968 - 69?	\$ _____	\$ _____

2. Would you please send me the salary scale used by your employer and on which your salary is figured?

(a) I am including the salary scale. _____

(b) I am not including the salary scale but you can get one in applying to:

(c) For the category I am in the salary scale provides for increments of \$ _____ a year for (how many) _____ years. I still have _____ years to go before reaching the maximum in my category.

(d) My salary is not based on a salary scale, it is evaluated as follows:

with the following annual increments: _____

with the maximum reached after _____ years
of service.

3. How many years of experience in education do you
have, including 1967 - 68?

_____ years

P. Dupuis,
Department of Educational Administration,
University of Alberta,
Edmonton, Alberta.

I am interested in knowing the results of this survey.
Would you please send them to me at the following address:

Name: _____

Address: _____



Note:

This sheet will be only used as a checking instrument for the returns of the questionnaires and for forwarding the results of the survey. It will be removed from the questionnaire before the latter is read, giving all answers complete anonymity. The undersigned will be the only person opening the returned letters and reading them. Thanks for your very useful cooperation.

Yours sincerely,

Philippe Dupuis

PD'bb



Dear Graduate:

A few months ago at Dr. Mowat's request you accepted to collaborate in the study I am conducting on investment in educational administration.

Following your positive reply a questionnaire was sent to you a few weeks ago. You are among the few I have not yet received the filled questionnaire from. It is very important for the study that all sampled people be included in the analysis of the data. As soon as your answered questionnaire arrives the analysis can start. Until then it is held back. From experience it takes at the most fifteen to twenty minutes to complete the questionnaire.

Would you then be kind enough to fill the questionnaire in the next few days and send it back at your earliest convenience.

Thank you again for your cooperation in this matter. As promised the findings will be forwarded to you as soon as possible.

Sincerely yours,

Philippe Dupuis

PD'bb

P.S. It may happen that you have sent everything in the last few days. If it is the case, please disregard this follow up letter.

P.D.