AN INVESTIGATION TO DETERMINE THE RATES OF RETURN

ON AN INVESTMENT IN A DIPLOMA, MADE BY A TEACHER

EMPLOYED BY THE DEPARTMENT OF INDIAN AFFAIRS

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*Submitted in part fulfilment of the
requirements for the degree of*

MASTER OF EDUCATION

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Sociology of Education in the Faculty
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JANUARY   1980

To my father, Manika Vasar

a:8023b

Miss V M Vasar, Mr C G Persad and Mr K I Nabbi for proof-reading
the typing;

The teacher trainees, teachers and clerical employees who graciously
assisted by completing the relevant questionnaires;

Finally, my wife for her moral support.

T. VASAR

JANUARY 1980

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CHAPTER 1

1. AN INTRODUCTORY COMMENT ON INVESTMENT IN EDUCATION

1.1 THE FIELD OF STUDY OF THE INVESTIGATION

The Investigation falls within the field of study known as "economics of education". According to Blaug[1] the subject of economics of education can be divided neatly into two sections: analysis of the economic value of education and analysis of the economic aspects of educational systems. As this Investigation is concerned with determining the productivity of a particular course of study, it may be classified more precisely as belonging to the branch of economics of education dealing with the value of education.

Economics of education has been referred to as a new subject with an old history. Although certain aspects of economics of education have been discussed by economists as early as the seventeenth century, it only became established as a branch of economic studies a little more than two decades ago. Two factors are generally given as reasons for its rapid development since the mid 1950's.[2] The first is the increasing recognition that has been given to the concept "human capital". Economists are beginning to accept this form of capital as being as important a component of economic growth as physical capital. The second reason for the recent rapid development of economics of education is the increasing volume of resources that have been devoted to education. These large commitments have forced economists and educational authorities to explore various methods of ensuring efficient utilisation of resources.

1.2 EDUCATION AS AN INVESTMENT

Economic goods may be classified as either consumer goods or capital goods. Consumer goods have the capacity of satisfying human wants directly. Characteristically they are used up immediately or over a very short period of time. The most important example of consumer goods for the existence of human beings is food. Other important examples include entertainment and recreation. Capital goods satisfy human needs over a long period of time; their benefits lasting far

longer into the future than consumer goods. Often quoted examples of capital goods include factory buildings, plant and machinery. Expenditure on consumer goods is known as consumption expenditure (or simply consumption) and expenditure on capital goods as capital expenditure (or investment). It is universally accepted that capital expenditure yields future benefits, known traditionally as interest.

Education must be classed as either consumption or investment. Although it has been generally accepted that education yields its benefits over a long period of time, economists have nonetheless been reluctant to regard it as a capital good. Much of this reluctance arises from the conceptual difficulty in regarding expenditure on intangibles (education for example) as investment. Traditionally investment has been regarded as accumulation of physical plant, machinery and so on. An objective look at education, however, reveals that it may be classified as either consumption or investment. In making such a classification much will depend upon the type of education and the circumstances under which the expenditure was made. Indeed, it must be realised that a final distinction may not be possible at all. Presumably because of its intangible nature or the difficulty in distinguishing its consumption and investment components, all educational expenditure has in the past been classified as consumption. This was certainly the less controversial option and, indeed, this was the attitude towards expenditure in education adopted for the purpose of national accounting.[3] Consequently the investment proportions of education remained dormant until fairly recently. Only with the clearer definition of human capital that has emerged, is there realisation that at least certain types of education are capital expenditure undertaken with similar motives that underlie conventional investment.

The consequent change of label of certain types of educational expenditure from consumption to investment has had profound implications. One consequence has been the desire on the part of economists and educationalists to test the productivity of investment in education along the same lines as investment in physical capital. Although important differences have been noted between physical and human capital, there is sufficient common ground between them to

justify measuring the productivity of one with the estimation
techniques of the other.

1.3 PRODUCTIVITY OF EDUCATION

Woodhall[4] tells us that productivity refers to the relationship
between the inputs and outputs of any process. Although it is more
usually applied to the manufacturing process and to conventional
industry, it is perfectly possible to apply the concept to education.
In fact a treatment that is directly analogous to that accorded to
investment in physical capital is prescribed for measuring the
productivity of education.[5] Accordingly, through the human
capital approach to education, it becomes necessary to relate the
future output of activities to the inputs required to perform these
activities. This in fact amounts to a comparison of the value of the
future outputs and the value of inputs. Such a comparison must take
cognisance of the fact that some of the outputs or benefits are
expected to materialise far into the future. Thus the time stream
of the benefits or returns must be discounted to yield the true
magnitude of the "payoff".[6]

The obvious task of an investigator engaged in determining the
productivity of education is to correctly identify and measure the
inputs and outputs (or the costs and benefits) associated with a
particular type of educational investment. This is no clear-cut
task in respect of either the inputs or the outputs. However, the
problems encountered are not insurmountable. Of the two tasks,
identifying and measuring the inputs of educational investment is
comparatively easy. Identifying and measuring the outputs is a
more vexing problem because not only do benefits accrue immediately
but they also accrue in the future. In addition benefits may accrue
in both tangible and intangible form. To complicate matters even
further, we observe that the benefits of education may be enjoyed
by the "investor" as well as by others.

Meaningful comparison of the costs and benefits (inputs and outputs)
associated with education can be achieved in one of two ways. The
first method is by discounting the net future benefits of the
investment by a chosen rate of return. Fairly valid conclusions
can be arrived at by analysing the present value of the net future

benefits. The second method is by determining an internal rate of return. In principle the two methods are similar for the internal rate of return is that rate of discount which equates the costs and the net future benefits of education.

Whenever the rate of return on investment in education is calculated, a distinction is made between a private rate of return and a social rate of return. The private rate of return shows the return accruing to an individual on his human capital investment in education. The social rate of return is the rate of return earned by society on its investment in education.

1.4 INVESTMENT IN TEACHER EDUCATION

Teacher education is different from primary education or secondary education in that it has a certain vocational quality about it. This observation is not intended to deny or even minimise the importance of the other aims of teacher education. The intention is simply to show that it is definitely a form of education in which human capital accumulation takes place. Consequently, expenditure on teacher education may be regarded as an investment which yields a stream of future benefits in the form of improved earnings. As such it is a form of education which lends itself to the type of cost-benefit analysis outlined earlier.

Measuring the productivity of teacher education presupposes knowledge about the earnings of qualified teachers and matriculants. Such information will reveal the extra earnings accruing to the higher level of education. This constitutes the main economic benefit of the extra study required to become a teacher. In determining the earnings of teachers and matriculants the Investigation has restricted itself to the employees of the Department of Indian Affairs. The scope of other investigations have also been limited in this way. Psacharopoulos[7] quotes four investigations undertaken in Nigeria and Ghana, Kenya, Uganda and New Zealand which have been based on government salary scales.

For the purpose of the Investigation the costs of teacher training have been based on actual costs incurred by teacher trainees at the principal institutions for the training of Indian teachers.

1.5 THE PURPOSE OF THE INVESTIGATION

Upon matriculating a person is faced with a crucial investment decision. He has to decide whether to take up full-time employment or whether to devote additional resources to study. Committing resources to further study involves a human capital cost which is expected to yield future benefits for the student. Taking up immediate employment, on the other hand, means reaping the benefits of whatever human capital has already been accumulated.

It is hoped that the findings of the Investigation, expressed as rates of return, will aid prospective teachers in deciding whether to undertake teacher training or to join the labour force immediately in some other capacity. Secondly it is hoped to give such a person an indication of the return he may expect on his investment if he chooses teaching as a career. In addition it is hoped that the estimates made would be of value to teachers already in service. Not only are the rates of return equally applicable to them, but it is also hoped that they will be given an indication of the returns they may expect to earn from further study undertaken by them. Finally, for the authorities, the investigation hopes to present a basis upon which the productivity of different levels of education may be determined.

To place the various aspects of the Investigation in correct perspective a summary of intended estimates is given below:

1.   A rate of return, calculated separately for males and females on an investment in a three-year teaching diploma, that may be expected by an Indian teacher.

2.   A rate of return, calculated separately for males and females, on one extra year's investment involved in acquiring a teaching degree (or a degree plus a one-year teaching diploma) at a university.

3.   An indication of how social rates of return on investment in education may be calculated.

4. A rate of return, calculated separately for males
    and females, on an investment in a two-year teaching
    diploma.

5. A rate of return, calculated separately for males and
    females, on one extra year's investment involved in
    converting a two-year teaching diploma into a three-
    year diploma.

6. Rates of return on investment in further study for
    which recognition is given by the Department of Indian
    Affairs.

1.6 AN OUTLINE OF THE REMAINING CHAPTERS

Chapter 2 is devoted to an analysis of the concept "human capital".

Chapter 3 explores the cost-benefit approach of evaluating
            investment in education.

Chapter 4 assesses some important investigations undertaken in
            the field of investment in education with a view to
            developing a *modus operandi* for the main investigation.

Chapter 5 gives a background of the teaching personnel of the
            Department of Indian Affairs.

Chapter 6 involves the main investigation in which rates of
            return on an investment in a three-year teaching
            diploma are calculated.

Chapter 7 shows rates of return on investment in other levels
            of teacher education.

Chapter 8 summarises the findings of Chapter 6 and Chapter 7
            and gives an indication of how the calculated rates
            of return may be used.

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CHAPTER 2

2. HUMAN CAPITAL

2.1 AN OUTLINE OF THE CONCEPT "HUMAN CAPITAL"

2.1.1 Identifying the concept "human capital"

The concept human capital has been evident in economic thinking for many years. It will be noted later that Sir William Petty (1623 to 1687) made reference to human capital in his writings. However, the approach to the concept by the early economists lacked clarity. Reference was made to human capital in general terms and the tendency was to treat all men as capital and to regard all kinds of expenses in training and rearing human beings as capital costs.[1] The point was made, nevertheless, that man was similar to conventional capital (in the form of tangible plant, machinery and equipment) because man also "costs an expense and serves to repay that expense with a profit."[2]

In recent literature on the subject, human capital has been more clearly defined. It can now justly be said that human capital has staked its claim as a distinctive and legitimate form of capital. Human capital possesses many of the general characteristics of conventional capital. This justifies its position on an equal footing with conventional capital. However, human capital also has unique attributes. These attributes also set it apart from conventional capital, allowing the detractors of human capital to remain sceptical about it. In the past two decades the nature of human capital and its policy implications have been amplified along new lines in the research of such economists as T.W. Schultz, L.W. Hansen, G.S. Becker, H.P. Miller, H.S. Houthakker and others. As a result of the contributions of these people interest in human capital has gained new momentum.

2.1.2   The nature of human capital

With the adoption of human capital, society has begun to
realise that economic progress involves not only changes
in machinery but also in men - not only expenditure on
equipment but also on people.[3] In short, there has been
a broadening of the concept of capital. This new concept
of capital implies the traditional adding to material
capital as well as a variety of other activities. Such
"other activities" involve:

1.   Investment in education - improving skills and
     knowledge to enhance future earnings.

2.   Investment in on-the-job training - furthering the
     development of specific skills during the process of
     active employment (this is conceptually similar to
     investment in education).

3.   Investment in health - protecting and improving
     mental and physical well-being so as to acquire and
     enjoy the amenities of life.

4.   Investment in migration - moving labour into more
     productive occupations and locations to take advantage
     of changing job opportunities.

Expenditure on education, on-the-job training, health and
migration represent the major examples of investment in
human capital. The striking feature of this is that what
was previously considered to be consumption is now regarded
as capital. Previously these expenses were considered to
give immediate satisfaction only. They were not regarded
as being capable of creating future utility. It is accepted
universally that the laying of a railway line, for example,
is a capital project since it is undertaken for the purpose
of ensuring years of economic return. The argument for
regarding expenditure on education as human capital rests
on a similar proposition. Education, too, is undertaken
for the purpose of ensuring years of economic return. The

essence of the human capital approach, therefore, has been to
regard capital as including everything that yields a stream of
income over time and conversely to look upon income as the
product of capital.[4] Writing for the Encyclopaedia of
Educational Research, Hansen[5] states that by human capital
or human investment is meant the flow of activities involving
the diversion of resources from current consumption to those
designed to augment the stock of human knowledge, skill and
capabilities embodied in people as a result of resource
outlays for human investment. It is this stock of human
capital which actually produces the stream of future output
over its expected physical lifetime.

2.1.3 Human capital and economic growth

Although economists have long known that people are an
important part of the wealth of nations, they did not stress
the simple truth that people invest in themselves and that
these investments have important consequences for the economy
as well. Now that recognition has been given to human capital
as a factor in growth, the view that it is necessary for a
country to be well-endowed with natural resources if it
is to develop into a modern economy, is no longer tenable.
Schultz[6] cites the example of Japan which has demonstrated
beyond any doubt, that a rich endowment of natural resources
is not necessary in developing a modern economy. One may add
that the converse is also true. Despite the abundance of
natural resources certain countries, especially some African
states, rank amongst the poorest in the world. Schultz[7]
points out also that it is not necessary that a country be
large for it to modernise. This is evident from the success
of such countries as Denmark and Switzerland. Even though
they have no coal, iron ore, oil or even farmland that is
naturally highly productive, a very favourable economic
growth rate has been achieved by them. In each of these
cases (Japan, Denmark and Switzerland), investment in the
human element has played a significant role. Such investment
has taken on diverse forms, including development in skills;
acquisition of knowledge; and investment in research. Either

directly or indirectly these have influenced technology and
have resulted in economic growth. As further substantiation
for the existence and role of human capital Vaizey makes
reference to the dramatic post-war recovery of West Germany.[8]
Vaizey states that it was the human factor which enabled
West Germany to recover so completely and so quickly from
the destruction of Nazi Germany during the Second World War.
Schultz has expressed the view that the economists called
upon to assess the implication of these wartime losses for
recovery, overestimated the prospective retarding effect of
these losses.[9] Judgements that were made in this regard
were far off the mark because too much emphasis was given to
non-human (conventional) capital in making these assessments.
The economists entrusted with these assessments did not have
a concept of "all capital" and failed to take account of
human capital and the importance that it plays in production
in a modern economy.[10]

The significance of human capital, as a factor in economics,
is being appreciated more and more. In 1961 Schultz made
the point that although it was obvious that people acquired
useful skills and knowledge, it was not obvious that these
skills and knowledge were a form of capital; that this
capital was in substantial part a product of deliberate
investment; that it had grown at a much faster rate than
conventional capital; and that its growth may well have
been the most distinctive feature of the economic system.[11]
Today, nearly two decades later, some of these less obvious
features of human capital have become patently clear and they
have gained almost universal acceptance.

2.1.4   South African recognition of the concept human capital

In the course of a mere three hundred years South Africa has
evolved from a sparsely populated refreshment outpost into a
fully fledged, modern, capitalistic economy. The factors
usually credited for its ascendancy are its abundant natural
resources and foreign capital investment. Far too little
recognition has been given to the human capital contribution

of the various peoples who settled here and made South Africa
their home. Although little statistical evidence can be
produced to substantiate this view, one cannot help but feel
that the human capital contribution to the economy of South
Africa has been very substantial. The only statistical study
in this regard has been undertaken by R.J.O. Joubert[12] who
has shown that formal education (an important form of human
capital) has contributed 14,5% to the growth rate of the Gross
National Product of South Africa between 1960 and 1970.

Joubert's study has shown that the existence and importance
of human capital has not by-passed the attention of South
African economists and educationalists. As early as 1970
Professor Terreblanche[13] (University of Stellenbosch)
distinguished the following forms of capital formation as
being responsible for economic growth:

1. Capital widening: takes place when the additional
    labourers to a growing labour force are furnished
    with the same (tangible) capital equipment as the
    existing labour force.

2. Capital deepening: takes place when the (tangible)
    capital stock increases at a rate faster than the
    labour force with a subsequent increase in the capital-
    labour ratio.

3. Capital modernisation: (or "capital quickening") takes
    place when the capital stock is subjected to qualitative
    improvements because of technological and organisational
    progress.

4. Investment in human capital formation: takes place when
    money is spent on education, health and other services to
    improve the mental and physical capacity of the labour
    force directly.

The question of human capital investment has been given
continuing attention by Professor Trotter (University of Natal)

in various articles on the subject of investment in education
in South Africa.[14][15] In his comprehensive treatise on
education in South Africa, E.G. Malherbe[16] has devoted an
entire chapter to an analysis of education as an economic
investment. In discussing the factors contributing to
economic growth in South Africa, Malherbe refers to "human
resources"[17] as the energies, skills, talents and knowledge
of all the people of a country. Malherbe considered this to
be the most vital factor in economic growth.[18]

2.2 AN ALL-INCLUSIVE CONCEPT OF CAPITAL

2.2.1 Reasons for the non-inclusion of human capital in a general concept of capital

In developing a rationale for an all-inclusive concept of
capital (embracing both conventional capital and human
capital) two aspects need to be looked at. We know that
the concept human capital was prominent in economic thinking
from an early stage. However, it was not embodied in the
general concept of capital. The first aspect to look at,
therefore, is the reason for this non-inclusion. The second
aspect to look at is the effect of such non-inclusion on
economic theory. It is hoped that the need for an all-
inclusive concept of capital will be appreciated once the
effect of its omission is realised.

Harbison and Myers[19] are of the opinion that because
physical capital was measurable and because a capital-
output relationship was given an apparent quantitative
respectability, some modern economists virtually ignored
the human resource factor in economic development. This
view, as explained by Harbison and Myers, rests on the
premise that only that which is measurable exists and
that which cannot be measured cannot exist.[20] Economists
who hold this view are surely mistaken because such a view
does not seem consistent with the attitudes expressed in
other branches of economics. In any event it is now being
shown that human capital can be measured and on that score

alone, should be allowed to take its rightful place alongside physical (conventional) capital.

More than seven decades ago Irving Fisher established the theoretical framework for an all-inclusive concept of capital and income.[21] Fisher's theory, unfortunately, lacked the "quantitative respectability", referred to by Harbison and Myers. In fact Fisher's treatment for traditional analytic tasks was considered too abstract and mathematical by no less an authority than Alfred Marshall.[22] Marshall wanted economics to be practical and "in touch with the market place." Marshall thus rejected Fisher's notion of capital as "unrealistic".[23] There the matter rested until fairly recently. One feels certain that had economists followed the conception of capital laid down by Fisher, instead of that of Marshall, human capital would have been incorporated into the general body of capital a long time ago.

The narrower, conventional, concept of capital identifies it with material capital goods and equipment used in the production process and distinguishes it sharply from labour. Johnson[24] believes that such a view on capital derives from English classical economics which developed in response to the early stages of the Industrial Revolution. This was the stage, Johnson tells us, when a sharp distinction between capital goods and raw labour power made more sense than it does under modern industrial conditions. Moreover, the distinction between wages, profit and rent corresponded to meaningful division of society into politico-economic classes.[25] With the development of technology, the replacement of brute strength by mechanical power, and the increasing importance of skill and scientific knowledge on the part of the labour force, the traditional distinction between labour as an original factor and capital as a processed factor has become increasingly unrealistic.[26] Recognition of the fundamental difference between labour as it was known during the Industrial Revolution and labour as it is known today makes it easier to accept the concept of human capital.

The treatment of human beings as a form of capital, even if only conceptually, seems offensive to some economists. Such a treatment of human beings is regarded by them as being contrary to democratic political philosophy.[27] This attitude seems to correspond, in practice, with Shaffer's reasons why economics has little to gain and much to lose by the universal application of the capital concept of man.[28] Shaffer points out that at least a part of any direct expenditure for the improvement of man is undertaken for reasons other than the expectation of a monetary return. In fact it has no traceable effect on the future output and it satisfies wants directly.[29] Protagonists of the human capital approach are forced to concede that as yet a satisfactory empirical procedure for identifying and measuring the parts of expenditure attributable to investment and to consumption has not yet been developed. In fact a clear and consistent distinction is not possible at all. Schultz concedes that any allocation one makes, based on such clues as seem relevant, must in all honesty be labelled "arbitrary".[30] Schultz points out, however, that a similar arbitrariness characterises other areas of economic analysis as well.[31] It should be added further that meaningful conclusions can still be drawn without the need to distinguish between the consumption and investment properties of expenditure for the improvement of man.

2.2.2 Consequences of the non-inclusion of human capital in a general concept of capital

Of the traditional triumvirate of resources - land, labour and capital - only capital has been thought of as being subject to significant and appropriate social control.[32] Land is given by nature, while population and hence labour supply has been considered to be determined by forces outside the economic system. Accordingly, with society's supply of land and labour being largely beyond its control, society's ability to escape from mass poverty and to achieve wealth depends critically upon its success in accumulating capital - machinery, equipment, plant and other man-made producers'

goods. If the stock of capital can be increased sufficiently, output and living standards can rise despite growing pressures of population on the fixed supply of land.[33] The trouble with this conventional explanation of the economic growth process is that it fails to explain the growth that has occurred in several parts of the Western world in this century. The conventional inputs of labour (manhours worked) and capital (money value of physical capital) have, for example, left unexplained a great percentage of the twentieth century growth in the US economy. While the gross national product had increased by 3 percent per year, only half of this growth could be explained in conventional terms.[34] In their search for a fuller explanation of economic growth economists have turned their attention to the quality as well as the quantity of labour and physical capital. In accounting for the residual (unexplained portion of growth) economists have come to realise that capital may exist in an intangible form, as well as in the tangible, conventional form of factories and machines. Intangible capital may be embodied in people - in labour resources. This would constitute a hybrid class of production resource - a combination of labour and capital which might be called "human capital".[35]

There has always been a strange reluctance on the part of writers to treat human beings as capital. Heinrich von Thünen noted, in 1863, that, "a moral timidity seems to keep authors and everybody else from thinking about what a man costs and what capital is invested in him."[36] The consequence of the failure to treat human resources as a form of capital has relegated labour to being merely a, "capacity to do manual work requiring little knowledge and skill, a capacity with which, ...laborers are endowed about equally."[37] Further, this failure to include the acquired abilities of man that augment his economic productivity as a form of capital, as a means of production, as a product of investment, has fostered the retention of the patently wrong notion that labour is capital free and that it is only the number of manhours worked that matters.[38] In actual fact labourers have become capital through their acquisition of

skill and knowledge (education, on-the-job training) and
through their attainment of particular capacities and
situations (health, migration) that have enhanced their
economic value. Education, on-the-job training and health
and migration also cost an expense, an expense not dissimilar
to an investment. These "investments" bear a return
("interest") over the lifetime of the individual. In this
respect human capital bears a close resemblance to physical
capital. In addition, those who argue that human beings
should be viewed in a capital context defend their
proposition by noting the following:[39]

1. there are costs associated with the development and
   formation of human capital;

2. the output of skilled human resources adds incrementally
   to the national product; and

3. expenditure on human resources, which increases the
   national product, also increases national wealth.

2.2.3 Some implications of an all-inclusive concept of capital

The adoption of an all-inclusive concept of capital implies
acceptance that people can enhance their capabilities as
producers and consumers by investing in themselves. This
also means rejection of the notion that all economic
capabilities of people are given at birth; for many of
these capabilities are developed through activities that
have the attributes of an investment. By adopting a
concept of capital which includes all these propositions
Schultz says that he can offer solutions to many of the
longstanding "puzzles" in economics.[40] For example,
Schultz notes that there has been a phenomenal increase
in incomes in recent times.[41] Without an all-inclusive
concept of capital, it would seem that this increase in
incomes is out of proportion to growth in capital. The
inclusion of human capital, however, shows that the ratio
of *all* capital to income is not declining. It is true

that physical capital is declining relative to income. In the meanwhile, however, the stock of human capital has been increasing relative to income. Thus the unexplained economic growth has been arising mainly out of the increase in the stock of human capital.

The question, "What causes a difference in earnings?" can also be explained in terms of an all-inclusive concept of capital.[42] Most of the differences in earnings are a consequence of the differences in the amounts that have been invested in people. The structure of salaries and wages is primarily determined by investment in schooling, health, on-the-job training, searching for information about job opportunities and by investment in migration.

Another "puzzle" has been the observation that the inequality of personal incomes between the holders of traditional capital and workers, has been declining in recent years.[43] This redistribution of income can be explained largely in terms of the increasing investment in human capital in proportion to physical capital.

Finally, to place matters in their correct perspective, it must be stated that the tripartite classification of the factors of production - land, labour, capital - that emerged from classical economic thinking still prevails despite its limitations in analysing modern economic growth. Although this traditional concept has been subject to strong criticism, its reformulation or abandonment, in favour of a concept embracing human capital, has not been the order of the day. Schultz feels that this over-commitment on the part of economists to a partial concept of capital, restricted to material objects, is one of the major reasons for the widely held belief that economics is materialistic.[44]

2.3   THE HISTORY OF HUMAN CAPITAL

2.3.1   An introductory comment on the history of human capital

The concept human capital has a long history and it has been
applied to a wide variety of issues including health,
migration, training and education. Many well-known names
have been associated with this concept - one which regards
human beings or their skills as capital. These names include
the economists Petty, Smith, Say, Senior, List, von Thünen,
Engel and Fisher.

Throughout the course of economic history different motives
have been used for treating human beings as capital and for
valuing them in money terms. Kiker has presented the
following comprehensive list of such motives:[45]

1. to demonstrate the power of a nation;
2. to determine the economic effect of education,
    health investments, migration;
3. to propose more equitable tax schemes;
4. to determine the total cost of war;
5. to show the economic significance of an individual
    to his family and his country; and
6. to aid courts and compensation boards in making
    fair decisions in cases dealing with compensation
    for personal injury and death.

On close examination it is possible to divide the historical
references to human capital into two broad categories. The
first category comprises the contributions of those economists
who, from time to time throughout the history of economic
thought, included human beings in their concepts of capital
merely by reference. This group could be referred to as the
human capital theorists. As opposed to this group, the
second category comprises those economists whose commitment
to the concept of human capital was deeper. Members of this
group actually made estimates of human investment and human
capital. Attention is firstly given in this chapter to this
latter group.

2.3.2 Estimates of the value of human capital

2.3.2.1 Estimates using the capitalised-earnings procedure

In estimating the value of human capital, economists and statisticians have used basically two fundamental approaches; the "cost-of-production" procedure and the "capitalised-earnings" procedure.[46] The capitalised earnings procedure consisted in estimating the present value of an individual's future income stream (either net or gross of maintenance). What must have been the first reference to the social value of a person as a special kind of capital asset was made by Sir William Petty in 1687.[47] Using essentially a capitalised earnings approach, Petty is credited with having used the notion of human capital for the following purposes:[48]

1. to demonstrate the power of England;
2. to demonstrate the economics of migration;
3. to calculate the money value of life destroyed in war; and
4. to calculate the monetary loss to a nation resulting from deaths.

Petty's entire attitude to human capital was shaped by his belief in labour as being the "father of wealth".[49] Therein lay his motivation for placing a money value on labourers.

In 1853 William Farr devised the first truly scientific procedure for finding the capital or money value of a human being.[50] The basis of his calculations rested on his belief that since human beings were productive they should be regarded and taxed as capital. He advocated the substitution of the existing English income tax system by a property tax that would include property consisting of the capitalised value of earning capacity. This would mean having to determine

the stock of human capital inherent in a person.
His procedure for doing this involved calculating
the present value of an individual's net future
earnings (future earnings minus personal living
expenses); allowance being made for deaths in
accordance with life expectancy tables.[51]

Yet another attempt at estimating the stock of human
capital by the capitalised-earnings procedure was
made in 1891 by J. Shield Nicholson.[52] Nicholson
attempted to find the capital value of such things
as the wage bill, earnings of management, the
earnings of capitalists and the earnings of salaried
government officials. He estimated that the value of
the stock of "living" capital of the United Kingdom
was about five times the value of the stock of
conventional capital.[53]

In about 1900 Alfred de Foville estimated the value of
the stock of human capital in France.[54] He used the
same method applied by Petty. In 1908 another Frenchman,
A. Barriot, utilised Farr's capitalised-earnings
procedure to demonstrate what he termed as the "social
value" of man in France. Barriot defined "social value"
as the amount of his earnings that an individual restored
to society.[55] Estimates of the value of the stock of
human capital were also made in the United States by
Huebener (1914) and Edward A. Woods and Clarence B.
Metzger (1920).[56]

Apart from estimating the value of the stock of human
capital, the capitalised-earnings procedure has also
been used in evaluating the total economic losses
resulting from war.[57] For example, Sir Robert
Giffen used what was essentially Petty's method to
evaluate, in money terms, the lives destroyed in the
Franco-German War.[58] More recently J.M. Clark set
forth a modified Farr-type capitalised-net-earnings
procedure for computing the capital value of human

life destroyed in war.[59]   Other attempts at
determining the capital value of human life lost in
war have been made by Guyot (1914), Crammond (1915),
Bogart (1919) and Rossiter (1919).[60]

Kiker quotes several works which appeared in the
first quarter of the twentieth century in which the
human capital concept has been used to ascertain
monetary losses resulting from preventable illness
and death.[61]   Notable amongst these has been the
contribution of Irving Fisher who suggested that
Farr's capitalised-net-earnings approach be utilised
to estimate the savings from preventative measures in
medicine.[62]

2.3.2.2   Estimates using the cost-of-production procedure

As opposed to Petty and Farr, Ernst Engle, writing
around 1883, used the cost-of-production approach to
estimate the monetary value of human beings.[63]
Engle estimated the monetary value of an individual
to society by taking the cost of his rearing as an
indication. A point of criticism against Engle, and
indeed against the cost-of-production procedure in
general, is that there is no necessary relationship
between the cost of production of an item and its
economic value. This is as true for human beings as
it is for economic goods.

Theodor Wittstein's interest in the concept of human
capital stemmed from his desire to establish a guide
to be used as a basis to deal with claims for
compensation for loss of life. Wittstein adopted a
variation of both Farr's capitalised-earnings
procedure and Engle's cost-of-production approach to
value capital. He used the basic equation:[64]
life earnings = lifetime maintenance + education.

Fredrich Kapp used Engle's cost-of-production
procedure to estimate the capital value of an
immigrant arriving in the United States (1870).[65]
However, in estimating the capital value of
immigrants, the capitalised-earnings approach has
proved more successful than the cost-of-production
procedure. As proof of this Kiker quotes the
investigations of Charles L. Brace and Miles M.
Dawson which have used the capitalised-earnings
approach with success.[66]

2.3.3 The Contributions of the human capital theorists

Many of the human capital estimates referred to earlier had
been inspired by the writings of certain classical and neo-
classical economists on the subject of human capital. Of
those who looked upon human beings as capital, the name of
Adam Smith stands out prominently. The philosopher-economist,
Adam Smith (1723 to 1790) boldly included all the acquired and
useful abilities of all the inhabitants of a country as a part
of capital.[67] Stressing the importance of education Smith
commented as follows:[68]

> "The acquisition of such talents, by the
> maintenance of the acquirer during his
> education, study, or apprenticeship, always
> costs a real expense, which is a capital
> fixed and realized, as it were, in his
> person. Those talents, as they make a
> part of his fortune, so do they likewise
> of that of the society to which he belongs."

It must be emphasised that Adam Smith did not specifically
define the term capital. As a result there is no clear-cut
evidence of his having an all-inclusive concept of capital.
However, there can be no doubt that Adam Smith did include
the useful abilities of human beings in his category of
fixed capital. This was obvious from his writings and more
particularly from the analogy drawn by him between a man and
a machine.[69] (Refer to page 39)

Vaizey, Norris and Sheehan[70] write that the concept of human capital owes much to the neoclassical capital theory, especially as formulated by Irving Fisher.

Fisher's foundation for an all-inclusive concept of capital was laid down nearly seventy five years ago. However, his conception of capital lay neglected for many years.[71] The reason for this is that the mainstream of economic thought considered it neither appropriate nor practical to apply the concept of capital to human beings. As a result, investment in human beings was seldom incorporated into the formal core of economics; even though many economists had seen it relevant at one point or another in what they had written.[72] One such person was Alfred Marshall who admitted that an estimate of the capital value of man might be useful. In fact he discussed clearly the capitalised-net-earnings approach (consumption being deducted from earnings before capitalising) to human capital evaluation. Further, in emphasising the importance of education, Marshall expressed the view that, "the most valuable of all capital is that invested in human beings."[73] Still, Marshall disregarded Fisher's notion of human capital as "unrealistic".[74] For Marshall, human beings were incontestably capital from an abstract and mathematical point of view. However, human capital had no practical meaning for him because it was out of touch with the "market place".[75]

2.3.4 A concluding comment on the history of human capital

If the study of human capital has been neglected, an important reason for this is that economists followed the concept of capital laid down by Marshall instead of that by Fisher. In fact the concept of human capital was prominent in economic thinking and might have gained momentum had Marshall not declared it "unrealistic". In recent years the views on human capital as expressed by Fisher (in his theory of interest and capital), Petty, Farr, Engle, Wittstein and others have attracted renewed interest. Pioneering the revival of human capital has been T.W. Schultz, Professor of

Economics at the University of Chicago. In fact, the "birth"
of economics of education is attributed to his presidential
address to the Annual Meeting of the American Economic
Association in December 1960.[76]

2.4 INVESTMENT IN HUMAN CAPITAL

2.4.1 An elementary treatment of investment in education

Earlier in this chapter (refer to page 9) reference was made
to the following forms of investment in human capital:

investment in education;

investment in on-the-job training;

investment in health; and

investment in migration.

Of these four forms of human capital investment, the most
important, for the purpose of this investigation, is investment
in education. It is with this form of human capital that the
remaining chapters of this investigation are concerned.
Consequently, only an elementary treatment of investment in
education is given here.

A view on education that proved popular for several generations,
is succinctly expressed in the following illustration by
Senior (1790 to 1864) on the higher education of a "gentleman's"
son:[77]

> *"Neither the labour which the boy undergoes,
> nor the expense borne by his father, is incurred
> principally in order to obtain future profit.
> The boy works under the stimulus of immediate
> punishment. It never occurs to the father
> that... he is engaging in a speculation which is
> likely to be improfitable. To witness a son's
> daily improvement is, with all well disposed
> men... one of the sources of immediate gratification.
> The expense incurred for that purpose is as much
> repaid by immediate enjoyment as that which is
> incurred to obtain the most transitory pleasures.
> It is true that a further object may also be
> obtained but the immediate motive is ample."*

Clearly such a view is completely outdated today. With
education being free and compulsory in most progressive

countries, no longer is education the sole prerogative of a
"gentleman's" son and by no means is the purpose of education
for "immediate gratification" only. It may be said that the
"further objective" referred to by Senior has now gained more
prominence. Increasingly, the impression is gained that
people invest in themselves or in their children or the state
does it for them, quite consciously and deliberately. More
and more parents are beginning to feel that it is (as
George Eliot said in "The Mill on the Floss"), "Better (to)
spend an extra hundred or two on your son's education, than
leave it him in your will...."[78] The adoption of an all-
inclusive concept of capital has resulted in it being
extended specifically to include man and the skill and
knowledge acquired by him via his education. Since education
becomes a part of the person receiving it, it may be referred
to as human capital. Education must be a form of capital
since it renders a productive service of value to the economy.

In a broad sense schools may be likened to firms. Each is
concerned with the production of something; the latter with
goods and services and the former with "schooling".
Psacharopoulos[79] has expressed the view that higher education
is not different from any other economic activity in which raw
material (students, in this case) is processed (through
learning) and a final product (graduates) is delivered to the
market. The transformation of raw material into a final
product costs a certain amount of money which the entrepreneur
hopes to recoup by the value added to the material when it is
sold in the market. Although university graduates are not
sold like other products, they command a higher income than
secondary school graduates. This extra income can be thought
of as the value added to a man by the manufacturing process
called higher education. In spite of holding a similar view,
Schultz points out, however, that educational establishments
do not have some economic characteristics of conventional
industry. Generally, schools are not organised and
administered for profit. Their assets are not listed on stock
exchanges. As a rule, students do not pay all the costs
incurred in their schooling. Although it is true that

schooling increases the future earnings of the student, the human capital so created can nevertheless not be sold in the same way as non-human capital. Finally it must be noted that the contribution of education is multidimensional, serving at one and the same time social, political and other purposes. Firms, also, serve social and political ends. However, the predominant stress is upon the profit-making motive. These differences between the educational establishment and conventional industry need not preclude the application of economic analysis to education. Nevertheless, these differences must be taken into account by economists in their studies of education. [80]

In recent years wide recognition has been given to the investment element in education. This has followed in the wake of certain statistical discoveries about education. Blond's Encyclopaedia of Education summarises these statistical discoveries as follows: [81]

1. Rich nations appear to have more and better educated people than poor nations. The same results are found if a single nation is studied at different periods of history.

2. It is not possible to explain satisfactorily the economic growth of any nation in terms of capital accumulation and labour force growth. There is a third or residual factor which many economists have associated with education.

3. Comparisons of lifetime earnings of people with different levels of educational attainment have revealed that the rate of return on educational expenditure has in the past varied between 10% and 30%.

4. Structural changes in the economy as development proceeds cause a relative increase in the need for qualified manpower (doctors, engineers, etc.) and a relative decline in the need for less qualified manpower (unskilled manual workers, farm labourers, etc.)

2.4.2 Investment in on-the-job training

It could be argued that on-the-job training is an extension
of formal education and that a separate discussion on the
investment proportions of on-the-job training would
constitute an overlapping. However, the obviously clearer
intention to "invest", that is inherent in on-the-job
training, merits separate discussion on the topic. More so
than other forms of human capital, on-the-job training
illustrates the effect of human capital on earnings, employment
and other economic variables. [82]

On-the-job training is undertaken or prescribed for the purpose
of improving future productivity. Presumably this involves
a cost, for otherwise there would be an unlimited demand for
it. The major cost components of on-the-job training comprise
the following: [83]

Cost component No. 1 : the value placed on the time and
                        effort of trainees.

Cost component No. 2 : the cost of "teaching" provided
                        by others.

Cost component No. 3 : the cost of material and equipment.

The lower salary that an employee is sometimes forced to take
while undergoing training is a disguised form of cost
component No. 1. However, if the employee were given full
payment while still undergoing training, this would constitute
a cost to the employer and would consequently be included as
one of those belonging to cost component No. 2. Also
belonging to cost component No. 2, as a part of the cost
of "teaching", would be any wastage or loss, by damage to
machinery and materials, resulting from the inexperience of
the employees. By contrast, cost component No. 3 embraces
materials and machinery specially acquired for the purpose
of establishing a training centre.

The return to an investment in on-the-job training is
reflected in the improved future earnings stream accruing
to the employee. For the employer who has invested in
improving the ability of his workers, the return is evident
in higher productivity which may manifest itself in more
units of output, a lower accident rate, a lower staff
turnover rate and in a number of other possible ways. In
much the same way, in-service training for full-time
teachers (in the form of seminars, workshops, refresher
courses, etc.), also constitutes an investment in human
capital. The cost of such training accrues mainly to the
educational authorities concerned, for generally the teachers
themselves do not have to forego earnings and they do not
incur any direct costs. Consequently the return to such an
investment should accrue, not to the teachers but to the
educational authorities who have made the "investment". In
this instance the return manifests itself in a better
teaching service provided by the authority concerned to
its community.

2.4.3 Investment in health

Although conceptually similar to investment in education and
on-the-job training, the investment implications of spendings
on health services are more subtle. However, such implications
are not difficult to see when one examines the following
hypothesis: Illness and death involve a loss in human wealth.
A saving can be effected by preventing or postponing some of
the preventable diseases resulting in illness and death.[84]
Weisbrod points out, further, that a healthier worker is a
more productive worker - absent less from work and more
productive and more creative while on it. There can be no
doubt that improvements in health bring into being a more
effective labour force.[85]

While much of the benefit from improved health accrues to the
person affected, there are also important benefits to others
in society (external benefits of health). Such external
benefits are particularly clear where contageous diseases are

involved.[86] Thus whereas economists have traditionally regarded expenditure on public health as purely consumption, we must now accept that a large portion of such expenditure is truly investment - investment in increased longevity and lifetime labour productivity as well as increased human happiness and decreased suffering.[87] To give some idea of the advantages of such an investment for the state, Weisbrod estimated the dollar value of productivity losses resulting from polio in the United States as being at least $46 million per year. By comparison the cost of immunising everyone in the United States under the age of 35 years and then immunising the new born each year was estimated at $27 million per year.[88]

2.4.4   Investment in migration

There can be little doubt that migration also fits properly within the human capital framework. There has been general agreement, for example, that for the United States immigration was economically profitable.[89] This also raises the point that human capital in a country can also decline. Such a decline occurred during the recent past in East Germany as a consequence of the large out-migration of skilled technicians and other persons with a large amount of schooling.[90] The Grunfeld and Ben-Porath study of the per capita stock of schooling in Israel shows that there is evidence of a decline beginning in 1951 due to the inflow of poorly educated immigrants from Asia and Africa.[91]

Where an employee has to give up residence in one part of his country to take advantage of job opportunities in another part of his own country, this too would constitute investment in migration. The cost of such an investment must include not only the amount involved in removing himself physically from one place to the other, but also the "cost" associated with various kinds of inconvenience he may suffer as a result. For instance, he would have to break ties with family and friends and he would have to adjust to new circumstances. In addition he may have to forego the use of certain amenities

which may not be available in his new surroundings or he
may have to pay more for the same facilities. Admittedly,
such an investment would be difficult to calculate but its
existence cannot be denied. The return on such an
investment is often more tangible. It is usually evidenced
in improved earnings. The returns may also be non-financial;
taking the form of better working conditions, housing
facilities, the use of a company motor car and so on.

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CHAPTER 3

3. INVESTMENT IN EDUCATION : A COST-BENEFIT ANALYSIS

3.1 AN INTRODUCTORY COMMENT

3.1.1 The main approaches to investment in education

In the previous Chapter an attempt was made to show that there has been recognition and acceptance of the concept of human capital. Chapter 3 is concerned entirely with one form of human capital, namely, investment in education. Harbison and Myers[1] summarise the principal approaches in studying investment in education as follows:

1. Determining the relationship between expenditure on education and growth in income or in physical capital formation over a period of time in one country;

2. Determining the contribution of education to gross national product (G.N.P.) by the residual approach;

3. Making inter-country correlations of school enrolment ratios and G.N.P; and

4. Calculating the rate of return from expenditure on education.

The best known study of the relationship between expenditure on education and growth in income and physical capital has been undertaken by Schultz.[2] Elsewhere Schultz has also measured the total stock of "educational capital" at different points in time.[3] In the course of his investigations Schultz has developed a rationale for estimating the costs of education which various investigators have found convenient to use even in the other approaches to investment in education.

A pioneering study using the "residual" approach was made in the U.S.A. by Solow.[4] His investigation was based on the assumption that economic growth (increase in G.N.P.) was

caused by both physical capital and human capital. Solow
determined the contribution of human capital ("technical
change") by first calculating the contribution of physical
capital to G.N.P. and attributing the residual to technical
change.[5] Other important studies aimed at determining the
investment in education by the residual approach have been
undertaken by Denison[6] and Psacharopoulos.[7] Each of
these investigators has presented his respective model for
determining investment in education. Using a revised
Denison model, the Psacharopoulos model, Joubert[8] has
shown that formal education in South Africa contributed
14,5 per cent to the growth rate of the G.N.P. between
1960 and 1970.

Harbison and Myers[9] consider the work of Svennilson,
Edding and Elvin for the Organisation of Economic Co-operation
and Development (OECD) to be the major contribution in
intercountry correlations of school enrolment ratios and
gross national product. More recently Malherbe[10] has
examined the relationship between education and economic
development of 35 countries in Africa. Malherbe found a
significant positive correlation of 0,56 between the G.N.P.
per capita and the educational attainments of the population
at the secondary and tertiary levels for these 35 countries.[11]
Appendix I[12] gives the details in respect of the comparison
for each of the thirty five countries.

The approach adopted in this investigation involves,
principally, the fourth alternative mentioned above, namely,
"...calculating the rate of return from expenditure on
education." The prime concern of this Chapter, therefore,
is with analysing, evaluating and assessing investment in
education on the basis of this approach. It is hoped that
the ensuing discussion would prove to be useful in the
critical examination of actual investigations which have
been undertaken. Such an examination of some important
investigations is undertaken in Chapter 4.

3.1.2 The investment motive in education

The investment proportions of education may best be illustrated
by the following analogy drawn by Adam Smith[13] between
machines and human capital:

> *"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 labor, 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."*

Such a view on education is substantiated by those holding
the opinion that education is a process of economic production
which integrates a set of factors of production including the
services of the *primary labour unit*, the student. The product,
the *machine*, is a bundle of physical and mental skills
indissolubly associated with the primary labour unit and
employed by him throughout his working life.[14]

The views on education expressed above represent an extreme
materialistic approach. In opposition to this approach, it
must be conceded that certain types of education are not
undertaken with the specific intention of enhancing productive
output and of increasing consequent earnings. Often, the idea
of investment is furthest from one's mind when schooling is
embarked upon. For example, Walsh[15] points out that the
training children receive up to and including that in
secondary school is not primarily intended to develop
vocational skills. Rather it is the intention of parents and
the state to promote the education of citizens. The purpose
is to provide political and cultural education in the widest
sense. Although abilities which have economic significance
are developed as a part of the process of training an

intelligent electorate, these abilities are by no means the preconceived object of the training.   Their appearance is incidental to the major purpose.[16]

In spite of these loftier ideals of education, two important points need to be emphasised. Firstly, although the above types of education (referred to by Walsh) may not be under= taken in a profit-seeking manner, the development of human capital inherent in them cannot be denied. It is clear that education builds in the individual a store of knowledge, abilities and propensities which enhance his economic worth. This human capital development accrues only at a cost (either to the parents or the state) and it serves to create a reward analogous to interest created by conventional capital. The second point is that students, parents and public authorities do in fact regard certain types of education (secondary and especially post secondary education) as definite investment opportunities. They make decisions to invest in education quite deliberately, weighing up the costs involved on the one hand against the increased earnings they expect on the other.

3.1.3   The relationship between level of education and income

A basic assumption underlying investment in education is that more schooling improves the productivity of the individual and thereby compensates him for the investment of his time, effort and money. Casual observation seems to suggest that this is a reasonable assumption. Miller[17] substantiates this by quoting numerous studies which have been conducted under varying economic conditions. They simply show that persons with more schooling tend to earn more money. Blaug [18] has shown that people who remain at school beyond the statutory leaving age attain, on the average, higher life-time earnings than people of similar ability and family background who enter the labour force as soon as they can.

The experience in South Africa also suggests that higher
levels of education are accompanied by larger median incomes.
Malherbe[19] has produced figures showing this to be the
case for Whites, Coloureds and Indians in South Africa.
A detailed outline of Malherbe's median earnings for Whites,
Coloureds and Indians by level of education is given in
Appendix II.[20] Similar conclusions may be drawn from
Trotter's[21] attempt to show some characteristics of the
distribution of incomes within certain categories of
educational achievement for Whites, Coloureds and Indians
in 1960 and 1970. For example the median income of
economically active Indian males in 1970 was R868 per annum
for those with between 8 and 12 years schooling; R614 for
those with 1 to 7 years schooling; and R427 for those with
no formal schooling.[22] The relevant figures for Whites
and Coloureds are also provided, on the basis of Trotter's
calculations, in *Appendix III*.[23]

3.1.4 The necessity for cost-benefit analyses in education

In spite of agreeing that people with more schooling have
higher life-time earnings, Blaug[24] pointed out that it
was not immediately evident that the extra future earnings
outweighed costs incurred in staying on at school. As a
result of this doubt concerning the positive returns from
schooling, investigations into investment in education
need to be undertaken. Since education is an investment
in human capital, like conventional capital, it is expected
to have a return. A vital aspect of a study of the
investment in education is thus concerned with identifying
and measuring the *return* from the investment. However,
merely quantifying the return is not satisfying. To be
of any value the return must be expressed in terms of an
acceptable yardstick. The *rate of return* adequately fulfils
this role; serving as a means by which consistent comparison
can be made. As a starting point in determining the rate
of return on an investment in education, the *costs* of
education must be estimated. Such an estimate of the costs
gives us an idea of the amount of human capital created by

the investment. On the other hand, the extra benefits from
the educational investment are an indication of its returns.
Basically, therefore, investment in education may be
analysed by examining two related concepts; the *costs of
education* (the human capital build-up) and the *benefits of
education* (the human capital return). The *rate of return*
is a device showing the effectiveness of an investment and
it stands as a factor in the relationship between the costs
and the benefits of education. What, in effect, is undertaken
is a *cost-benefit analysis* of investment in education.

3.2 THE COSTS OF EDUCATION

3.2.1 The direct costs of education

There are almost as many presentations of the costs of
education (costs of schooling) as there are writers on the
subject. Generally, however, schooling costs can be divided
into *direct costs* and *opportunity costs*. The direct costs
of schooling comprise those costs incurred by pupils and
parents (in the form of books and transport for example)
as well as costs incurred by the state (in the form of
school buildings and teachers' salaries for example). The
direct costs of education are, as Sheehan[25] points out,
the "obvious financial outlays" and they are relatively
easy to calculate because, by and large, they correspond
to actual financial outlays. A fairly representative
list of the direct costs of schooling is the following
one supplied by Merrett:[26]

1. Depreciation and interest on capital equipment such as
    buildings and teaching machines. (Obviously the costs
    of maintaining and operating such equipment would also
    fall within the ambit of such a direct cost of schooling.
    So too would losses resulting from capital equipment
    becoming obsolete.)

2. <u>Salaries of teachers and auxiliary staff.</u> (Auxiliary staff includes such non-academic staff as librarians, administrators and general factotum not already included under 1. above.)

3. <u>Rent of land on which the institution is situated.</u> (Where premises are not owned by the education authority itself, this would represent an alternative cost to depreciation on buildings.)

4. <u>Materials such as textbooks and stationery.</u> (Whereas cost factors 1, 2 and 3 above are incurred by the education authorities only, cost factor 4 is incurred by both the student and the authorities.)

5. <u>Incidental costs to students such as transportation.</u> (Apart from transport a large number of other costs may be included here. However, as will be seen later, this should not be done without giving careful consideration to the circumstances under which the cost was incurred.)

It may be important to distinguish between costs incurred by individuals and costs incurred by the education authorities. Who actually bears the costs of education is a basic matter in studying the allocation of resources to education.[27] Where returns from education generally are being estimated, such an allocation is unnecessary. However, where the returns to the student or education authority specifically is required, the painstaking task of cost allocation becomes necessary. Fees collected by educational authorities from students represent an attempt by the authorities at off-setting some of their own costs. Thus when returns generally are being estimated, the full costs to the authorities should not be added to the fees paid by students. This would represent a double-counting of the amount already offset. When students calculate their direct costs of schooling, fees paid by them must naturally be included. When the direct costs to educational authorities are being ascertained fees paid by students must be deducted from their total direct costs.

Schultz[28] tells us that expenditures to operate particular
auxiliary enterprises such as providing school lunches and
room and board for students, should not be included in the
flow of costs entering an investment in education.
Mary Jean Bowman[29] refers to these as "subsistence costs"
which would have had to be borne by the student or his family
whether he were in school or not. Schultz points out that
economists do not add what a worker spends on food and
housing to his wages when they estimate labour costs of an
industry.[30] Apart from "subsistence costs" certain other
costs must also be excluded to avoid exaggerating the costs
of schooling. An example is the cost of non-educational
activities such as organised sport where such activities
are, in any event, catered for by the community for its
youth. According to Schultz, Wiles made this error in
calculating the "intellectual investment" of Britain in
1953.[31] Wiles included a "fair maintenance charge" in
estimating the cost of keeping pupils of fifteen and over
away from production. This was incorrect because living
costs entered into maintenance whether these pupils were
holding jobs or attending school except for a small difference
to the extent that somewhat better clothes and some additional
travel were required while attending school.[32]

3.2.2   The opportunity costs of education

In accounting for all the annual costs of schooling, Schultz
pursues the concept of "total factor costs" of schooling.[33]
This necessitates the inclusion of opportunity costs in
addition to the direct costs of schooling. Opportunity costs
can best be explained in the following way:[34] If an
individual chooses to undertake a course of education he
is faced with the problem of reallocating his time. He
will have to devote what would otherwise be either leisure
time or work time to his newly-chosen educational activity.
Either way this will involve a real cost to him. Leisure
is presumably a desirable thing and doing without it involves
a cost. Work is rewarded by a wage or salary payment and if
education means foregoing work it also means foregoing

earnings. The value of the work or leisure foregone is an indirect cost of education and is termed an opportunity cost. Vaizey[35] points out, likewise, that a true economic cost is the cost of acting in a different manner; for fore= going the opportunity to do X because we have chosen to do Y. Thus if the alternative to doing X is idleness, its true cost can be nil. If the alternative to building a school is building a television centre; the true cost of building a school is a television centre. For a student, the alternative to study is often work; therefore the cost of education is not only school buildings, teachers' time and so on (direct costs) but also the time of the student which could go into remunerative employment (opportunity cost).

With the inclusion of opportunity costs (described by Bowman[36] as "the value of the next-best choice") as a cost of schooling, the view that schooling for the individual is virtually free is no longer tenable. Despite the existence of free public education it is most assuredly far from free for mature students because the earnings they forego while attending school are likely to exceed all the other school costs incurred by them and for them.[37] In fact the omission of earnings foregone as a cost factor in investment in education will give exceedingly high rates of return. It is only when earnings foregone are considered that costs increase, causing the rate of return to lower to realistic proportions. One study has shown that when earnings foregone are included in the estimates of costs, the rate of return estimates are cut by about 60 per cent.[38]

It must be remembered, however, that it is only by the time that a pupil is old enough to enter high school (the senior secondary phase) that he begins to have a noticeable market value. During his early years of education the student invests little in his own education. His time and energy are all he has to offer and these are of little consequence. In any event, where education is compulsory (this is the normal case in many developed countries) there is no opportunity cost as the law forbids the employment of children of less than school leaving age.[39] Such

restraint is made effective by prosecuting defaulting
parents and employers. The Crowther Report (Report
of the Central Advisory Council for Education - England,
Vol. 1, H.M.S.O., 1959 p. 57)[40] contains an estimate
of the earnings which would have been foregone in 1958
by pupils aged 15 to 16 years if they had been compulsorily
kept at school. The earnings were estimated at £92 million.

Schultz notes that there are a number of "puzzles" related
to education for which earnings foregone offer a consistent
and unified explanation:[41]

1. In recent times there has been a shift from training
    on-the-job to learning in schools. Since foregone
    earnings, relative to the total costs of on-the-job
    training, are larger than they are to total costs of
    schooling, this may be the reason for a shift from
    training on-the-job to learning in school.

2. The average daily school attendance of children from
    farm homes was observed to be lower than that of
    children from non-farm homes. There is much work
    on farms that children can do and many farm families
    are relatively poor, which makes the value of their
    work rate comparatively high.

3. Although tuition at school is free, many talented
    children from low income homes do not avail
    themselves of additional educational opportunities.
    One of the principal reasons is undoubtedly the
    importance of the earnings foregone in these circumstances.

4. Only a small proportion of the children in most low
    income countries complete the primary grades. At a
    tender age, say beginning at age 10, children are
    required to work to piece out the meagre family income.
    The value of this work by children may be a large
    portion of the costs of their schooling.

3.3 THE BENEFITS OF EDUCATION

3.3.1 The direct benefits of education

Weisbrod[42] refers to a "benefit" of education as anything
that pushes outward the utility possibility function for
society. Included as benefits are:[43]

1. Anything which increases production possibility such
    as increased labour productivity;

2. Anything which reduces costs and thereby makes
    resources available for more productive uses,
    such as increased employment opportunities, which
    may release resources from law enforcement by
    cutting crime rates; and

3. Anything which increases welfare possibilities
    directly, such as development of public-spiritedness
    or social consciousness of one's neighbours.

From the above analysis of the benefits of education we
see that education has returns for the student directly
and for humanity generally. Weisbrod also distinguishes
five types of direct benefits of education for an individual
student:[44]

1. Financial return which accompanies additional education;
2. Financial option return;
3. Non-monetary opportunity options;
4. Opportunities for hedging against vicissitudes of
    technology; and
5. Non-market benefits.

The financial return which accompanies additional education
is the most obvious direct benefit of education for the
student. A number of investigations have been undertaken
on the assumption that there is an unmistakable positive
correlation between the level of schooling and the level
of earning. Furthermore a person with greater education

has the advantage of being in a position where he can
afford to be selective in his choice. He may eventually
make his choice on financial grounds or even on the basis
of non-monetary rewards accompanying a position. Such
non-monetary rewards may take the form of greater security,
better work conditions and convenience in terms of
travelling for example. Where an option is to be made
between two positions offering the same monetary rewards,
the person with added schooling has the opportunity of
selecting the one which offers larger non-monetary benefits.
A better educated person, it is believed, will also be
better capable of adaptation in the case of technological
change. New technology invariably requires new knowledge
and skills. People having more education are likely to be
in a position to adjust more easily than those with less
education, and to reap the returns from the education which
the new technology has made possible.[45] Apart from the
benefits realised by the individual in terms of his
employment situation, other benefits of education accrue to
him. An example is the self-satisfaction he may have from
being well informed or the pleasure he may derive from being
able to read an interesting book. The far reaching effects
of some of these benefits are difficult to visualise but
they are nonetheless real and profound.

3.3.2 Other beneficiaries of education

In addition to the benefits accruing to the student,
education benefits other people as well. If students
were the only beneficiaries of schooling, the broad
public support for education would probably wither.
But valuable as education is privately, it is even more
valuable publicly. Its benefits take diverse forms which
extend well beyond the individuals who receive it.[46]
The "other" beneficiaries of education may be divided
into three broad groups:[47]

1. Residence-related beneficiaries: those who benefit by virtue of some relationship between their place of residence and that of the subject (student).

2. Employment-related beneficiaries: those who benefit by virtue of some employment relationship with the subject.

3. Society in general: others who gain from the "spill-over" benefits of education.

As opposed to residence-related benefits and employment-related benefits, benefits to society in general are those which accrue to persons outside the school district.[48] Residence-related benefits and benefits to society in general are largely non-monetary in nature and calculating them may be impossible. The main employment-related beneficiaries are generally employers but they may also include fellow-workers and others as well. Employers may be able to calculate their benefits from the education of their employees but calculation of the benefits to this entire category of beneficiaries may also prove impossible

3.3.3 The measurable benefits of education

One should be able to appreciate, from the foregoing discussion on the benefits of education, that its nature is diverse and that consequent implications are far reaching. In fact some of the benefits of education are so far reaching that they may not be clearly identified. Consequently not all the benefits of education can be measured. An economic yardstick cannot be applied, for example, to intergenerational benefits of the fruits of literacy. It is virtually impossible to express, in monetary terms, the benefits of education accruing to humanity generally. Only the benefits of education to the student directly can be approached in monetary terms; and this too only approximately. Of all the benefits to the student directly, a price can only be attached to the "financial returns accompanying (his) additional income."

Diagrammatically represented, Figure 1 shows that the measurable returns to education are merely the "tip of the ice-berg":

Total   Returns

Returns to Humanity Generally   Direct Returns to the Student

— residence-related   — financial returns
  benefits   accompanying
                               additional education

— employment-related
  benefits   — financial option return

— benefits to society   — non-monetary opportunity
  in general   option

                             — non-market benefits
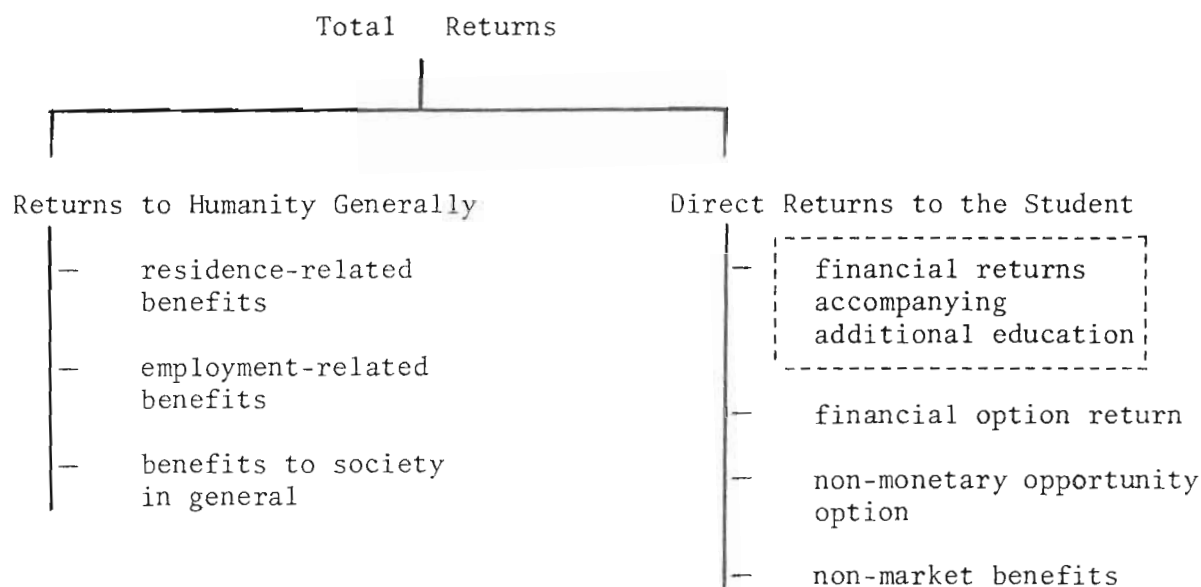
FIG. 1   BENEFITS OF (RETURNS TO) EDUCATION

Any estimation of the returns to education for the purpose of a cost-benefit investigation can give consideration only to the monetary benefits of education. The question arises at this stage: is there any point in continuing such an investigation? In other words, can meaningful conclusions be drawn from an investigation in which only some of the benefits of schooling can be considered? The answer to both questions is, "yes". These limitations need not discredit the importance of cost-benefit analyses of investment in education. A similar situation characterises all economic analyses. For example, in assessing the economic importance of an industry to a particular region measurement cannot be made of the broader social benefits arising out of the development of the industry. Consequently consideration cannot be given to these aspects in any rate-of-return estimates of capital invested in the industry concerned.

3.4 RATES OF RETURN TO EDUCATION

3.4.1 The internal rate of return

Investment in education entails costs over the duration
of the investment. We have seen that these costs accrue
to both the individual and the education authorities.
Thereafter the general position is that the investment
begins to yield a return. This return takes the form of
extra earnings resulting from the investment. In order
to estimate the value of this return on the investment, a
thorough analysis of the costs and benefits is necessary.
By analysing the costs and benefits of the investment it
is possible to make effective decisions on them. To aid
the decision-maker, a large variety of investment criteria,
based on these two elements (costs and benefits), have been
formulated. Two techniques that have figured prominently
in the investigations that have been undertaken are the
internal rate of return and the *net discounted present
value*.[49]

In the case of the internal rate of return one has a series
of outlays on and expected benefits from an investment
project stretching into the future for say n years. The
internal rate of return is that rate of discount which,
when applied to the time-stream of future net benefits
(i.e., future total benefits minus future total costs),
will equate them to zero. Let r be the internal rate of
return, let B be the gross return in a given year and C
the cost incurred in that year. Thus (B-C) measures the
net return or benefit in that year. Let the various years
be denoted by subscripts $1, 2, \ldots \ldots n$. Then the internal
rate of return is that rate of discount which equates the
expression,

$$\frac{(B_1 - C_1)}{(1 + r)} + \frac{(B_2 - C_2)}{(1 + r)^2} + \cdots \cdots \frac{(B_n - C_n)}{(1 + r)^n} ,$$

to zero. For an investment decision applied to education
the B stream would not commence for two or three years

perhaps, while the C stream would cease after a similar period.[50] The equation remains flexible by accounting for the fact that costs may occur in other than the very beginning of the income stream.

3.4.2   The net discounted (expected) present value

The net discounted present value is a variation of the internal rate of return. It is of particular use in evaluating the investments in two or more separate education projects. This criterion can be stated as follows: given the appropriate interest by which to discount, one should adopt any project for which the present value of the discounted stream of net benefits is greater than zero. If more than one project has net discounted benefits greater than zero, at the given rate of interest, adopt that project with the highest present value of net benefits.[51]

It can be expected that the net discounted present value method would use the same notations as the internal rate of return, except that one takes an assumed rate of discount, i, instead of a derived rate of return, r. The rate of discount used will depend on the type of decision being made. Where a choice is being made between two or more alternative projects in education, almost any rate of interest may be used. The project chosen will be the one that yields the highest total net present value. Sheehan suggests that a rate which reflects the cost of borrowed funds - say the rate on debentures - may be used. It would be profitable to invest in all projects as long as the net discounted present value is positive. An individual investing in his own education might use a similar rate of discount.[52]   Computationally, an equation for achieving this measure would be as follows:

$$V_o = \frac{(B_1 - C_1)}{(1 + i)} + \frac{(B_2 - C_2)}{(1 + i)^2} + \ldots\ldots \frac{(B_n - C_n)}{(1 + i)^n} \quad ,$$

where V_o is the total net expected (discounted) present value.[53]

3.4.3 The purpose of discounting in calculating the rate of return

The discussion on cost-benefit analysis has made repeated
mention of four basic elements: costs, benefits, time and the
rate of interest by which to discount the costs and benefits.
The purpose of discounting is to attach relative weights to
the cost and benefit time-profiles in order to account for
the productivity of the investment.[54] It has been pointed
out that discounting is theoretically correct and that it
can be justified on two important grounds. The first is
that the interest rate used in discounting represents the
opportunity cost of the investment fund. Thus Y dollars
invested today will yield Y + X dollars at some time in
the future due to the productivity of the investment.
Therefore reversing the process, to relate this future
income to its present value, one must discount the future
income stream to the time of making the decision (i.e.,
to the present). A second justification is that future
income is valued less than present income; the reason
being that people have a positive time preference which
makes them dislike postponing consumption.[55]

3.4.4 Private and social rates of return

Having drawn attention to the rate of return on investment
in education, a distinction must now be made between a
private rate of return and a *social* rate of return. The
private rate of return to investment in education is what
this education adds to a personal life-time income stream
expressed as a ratio of its costs to the individual. In
other words economic returns from the private point of view
is the amount added to a man's lifetime income by virtue of
his having received the increment of schooling under
examination.[56] By comparison a profitability calculation
involving total costs and earnings would result in a social
rate of return to investment in education.[57]

In calculating the total resources entering an investment in college education Schultz isolated three cost components:[58]

1. College costs: lecturers' salaries, supplies, interest and depreciation on capital;

2. Opportunity costs: income foregone while attending college; and

3. Incidental college related costs: for example tuition fees, books and transport costs.

Of these, cost components 2 and 3 are actually incurred by the individual student. Only these costs will feature in an estimation of the private rate of return. On the other hand, all costs (with the exception of tuition fees) must be considered in the calculation of a social rate of return. (The reason for omitting tuition fees was discussed earlier). On the returns side of the picture, Trotter points out that private returns consist of the future *post-tax* income streams accruing to the individual[59] while social returns are derived from *pre-tax* lifetime earnings differentials.[60]

3.5 LIMITATIONS OF INVESTMENT IN EDUCATION ANALYSIS

3.5.1 An introductory comment

If the impression has been created that rates of return resulting from a cost-benefit analysis are a hundred percent accurate and universally acceptable, then this misconception must be corrected immediately. In actual fact, cost-benefit analyses and other forms of analyses of investment in education are beset by many conceptual and statistical limitations. To most of these limitations, however, the protagonists of the various investment approaches to education have what they consider to be acceptable "explanations". The merit one sees in using a cost-benefit approach to investment in education depends, largely, upon the extent to which one is convinced by these "explanations". Obviously, the limitations of each of the various approaches to

investment in education need not be discussed here. Only
limitations relevant specifically to cost-benefit analyses
are discussed. It must be remembered that some of these
limitations are also applicable to other approaches towards
investment in education. This is because of the general
acceptance by all approaches of the concept human capital.
The main limitations of cost-benefit analyses of investment
in education may be summarised as follows:

1. It is difficult to distinguish the investment and
    consumption components of expenditure in education.

2. Only the measurable benefits of education are
    considered.

3. Treating human beings as capital seems offensive
    to some people.

4. Besides education, other factors also contribute
    to higher earnings.

5. The use of age-earnings profiles based on cross-
    sectional data is considered dangerous.

3.5.2   The investment and consumption components of expenditure
        in education

This limitation has to do with the difficulty of classifying
education into its investment and consumption components.
Investigations analysing investment in education are based
upon the assumption that education is an investment; not
entirely but, most certainly, to some extent. The
traditional practice has been to regard expenditure on
education as entirely consumption. Formal schooling was
considered to be an outright gift from society; for the
study of poetry or geometry or Latin did not directly
increase economic productivity.[61] However, for Wiles
and others holding his views, education is, ...

> *"...obviously a kind of investment, and it is*
> *tragic that it should have ever been classified*
> *as consumption by the fathers of national*
> *income accounting in the first place."* (62)

Explaining the position in another way, Vaizey[63] tells
us that goods and services can broadly be divided into
two classes; those from which consumers derive immediate
benefit, which are consumption and those which are used in
production to produce over a long term, called investment.
Education must be one or the other or both. It is private
consumption because people value it in itself and spend
money on it. They make decisions either to buy an evening
class in dancing or to buy a new sweater. It is also
public expenditure to the extent that the state decides to
spend its income on education, for example, rather than say
on health. On the other hand it is investment because
people invest in themselves or in their children or the
state does it for them, quite consciously and deliberately.[64]

In discussing this dual nature of education, Sheehan[65]
points out that sometimes education is clearly consumption
in so far as it is desired "for its own sake" or in the sense
that it is considered rewarding and intellectually stimulating
in itself. In addition, Sheehan tells us that education is
clearly an investment good in so far as it enables people to
purchase it (or participate in it) to derive a future stream
of benefits. Schultz[66] makes an extended classification of
expenditure in education. For him expenditure on education
can be placed in one of three "conceptual boxes":

1. present consumption;
2. future consumption (an investment); and
3. future producer capabilities (also an investment).

According to Schultz, no one really knows how large each "box"
is. He suspects that the third "box" is very large but he is
also aware that the other two are not empty.[67] None of this,
however, makes the allocation of expenses in education into its
consumption and investment components easier. Indeed it has

led economists like Trotter[68] to conclude that the
distinctions here are very blurred and a good deal of
what at first may seem to be the "consumption benefits"
could in fact accrue to an individual throughout his
life and could thus be regarded as returns on the original
"investment" in education after all.

The precise allocation of expenditure on education between
"consumption" and "investment" remains unresolved. Any
attempt to make such an allocation must surely be arbitrary
because the logical basis for such allocations has not yet
been formulated.[69] In most estimates of the rates of
return to schooling the standard way of dealing with the
"consumption" aspect is either to subtract a notional
consumption component from educational costs or to add
some estimate of consumption benefits to the monetary
returns. In either case the effect is to increase the
yield of the investment in education.[70] Thus if the
rate of return on an investment in education has been
calculated as x% where none of the costs were attributed
to consumption, then the return on the investment would
have been greater than x% had a portion of the costs been
ascribed to consumption. An alternative approach would be
to disregard the "consumption" component entirely; treating
all educational expenditure as investment in future earnings.
This would have the effect of understating the rate of return
on the investment. For decision-making purposes, one would
be assured in such an event of working with a minimum rate
of return.

3.5.3   The measurable benefits of education

In all investigations of this kind only the material gains
from education, expressed in money terms, have been subject
to analysis. This does not deny the existence of other, and
perhaps more important benefits of education. In fact some
economists are of the opinion that the cultural and social
advantages associated with schooling may well be worth their
cost in time, money and effort, even if the economic

advantages should cease to exist.[71] The only justification
for focusing on the economic advantages is that at present
they are the only ones capable of even approximate
measurement.

Just as it must be remembered that earnings are an incomplete
measure of the productivity of education, it must also be
remembered that schooling benefits many other persons besides
the student. It benefits the student's future children, who
receive informal education in the home; it benefits
neighbours; it benefits employers seeking a trained labour
force; and it benefits society at large by developing the
basis of an informed electorate.[72] In fact some social
benefits from education are distributed so broadly that the
nature of specific beneficiaries is obscure. For example,
literacy is not only of value to the individual possessing
it and to employers, but to the entire society and indeed
to the whole of mankind. Education is, after all, much more
than a means of raising productivity (or bringing financial
returns). It is also a means of inculcating children with
standards of socially desirable attitudes and behaviour and
introducing children to new opportunities and challenges.[73]

A cost-benefit analysis or any other economic analysis of
education can only consider some of the direct benefits of
education. The indirect or social benefits of education are
ignored completely. What are the implications of this
limitation? Should all cost-benefit analyses of education
cease on these grounds? These questions are best answered
by asking another: do economists stop computing the benefits
of an industry to a particular region because a monetary
yardstick cannot be applied to the social benefits of the
industry concerned? Cost-benefit analyses of freeways,
bridges, dams, agricultural projects and so on persist
regardless of the fact that all their benefits to society
cannot be measured. In any event when the external benefits
of education are ignored, the resulting rates of return to
investment in education are once again understated. Here,

too, for the purpose of decision-making, one can be assured
that the resulting rates of return are in fact the minimum
possible rates.

3.5.4 Treating human beings as capital

If investment in human capital has been slow to gain
acceptance on par with investment in physical capital, then
the moral issues involved must be blamed for presenting an
added stumbling block. The mere thought of investment in
human beings seems offensive to some people. Schultz[74]
puts his finger squarely on the matter when he says that
to treat human beings as wealth runs counter to deeply-held
values. Our values and beliefs inhibit us from looking upon
human beings as capital goods, except in slavery and this we
abhor. The very idea seems to reduce man to a mere material
component; to something akin to property. And for man to
look upon himself as a capital good, even if it did not
impair his freedom, may seem to debase him.[75] Consequently,
the moment it is suggested that the economic value of schooling
is under consideration, there are protests from those who
believe that placing a "price" on education is to debase it.[76]

The attitude outlined above is surely unjustified. Vaizey[77]
points out that most people some of the time think that the
pursuit of self-interest and profit is an ignoble pursuit.
In his opinion they are right to take this view, although
they preach it more often than they practise it. Economics
has been (and is) concerned with the less noble side of life -
in part, if not totally - although man is seldom more
innocently employed than while making money.[78] The treatment
of schooling as an investment in human capital need not
debase education. On the contrary the value of education
is enhanced if we have a clearer indication of what contribution
it makes to skills and how it can increase our earnings.

3.5.5   Other factors also contribute to higher earnings

Another drawback, constantly evoked by critics of investment
in education analysis, is that apart from education, other
factors also contribute to higher earnings. To use the
higher earning realised from a given level of education
as an indication of the value of that level of education,
over estimates the value of education *per se* and disregards
other factors which may have contributed to the higher
earnings. In computing the earnings return of a university
graduate, for example, the usual procedure is to take the
extra earnings over the previous level of education (under-
graduate) as an indication of his productivity. Only a
part of these extra earnings represents the true earnings
differential due to education. It can be expected that,
on average, graduates would have greater intelligence than
those who stopped their schooling at the end of high school
or at some stage before graduating. Therefore a part of the
excess earnings may be due to intelligence and not education.[79]
Only if all other things are equal (intelligence included)
can we say that the earnings differential is due to education.
Only then will we be justified in taking excess earnings as a
measure of the productivity of a given level of education.

Intelligence is only one of the factors to which an increase
in earnings may be ascribed. A short-list of the factors
responsible for possible increases in earnings includes the
following:

1. Higher intelligence of the student, including both
   psycho-motor and intellectual skills.

2. Greater individual drive and motivation.

3. Social class, family background and family connections
   of the student.

4. Other endogeneous factors such as sex, race and physical
   condition.

Okigbo[80] makes the important observation that earnings differentials also reflect the demand and supply position for particular skills at that time and as seen in the foreseeable future. The existence of differential rewards for different aptitudes and different skills is a universal phenomenon not explained fully by differences in educational level.

Failure to give consideration to these "other factors" responsible for earnings differentials would lead to a serious over-estimation of rates of return. It has been shown that earnings differentials can be adjusted downwards to the extent that a portion of the higher earnings are due to factors other than education. The difficulty with this type of adjustment is that it is basically arbitrary and that there is very little empirical evidence on the actual value of the correction factor.[81] The literature on cost-benefit studies in education suggests that there is not as yet a successful way of isolating the pure effects of education on earnings. Such studies must, at this stage, be content either to side-step the issue (thereby attributing all earnings differentials to education) or to apply an arbitrary correction factor.

3.5.6   Age-earnings profiles based on cross-sectional data

The final limitation discussed here is applicable particularly to investigations concerned with calculating rates of return to education. Criticism is levelled against the use of age-earnings profiles constructed on the basis of cross-sectional data. An age-earnings profile shows the amount that will be earned by a person each year of his working life. Generally age-earning profiles are constructed on the basis of cross-sectional data. This involves examining present earnings of persons belonging to a particular educational level to establish an average annual income for each age until retirement. Through the use of cross-sectional data future earnings are anticipated on the evidence of presently available data. This may be dangerous on account of the uncertainty which the future holds. Cross-sectional data ignores

historical background and is based on the assumption of a static future.

It is difficult to assess the precise effect of this limiting factor on the resulting rate of return on an investment in education. In the event of productivity growth in the future, it is reasonable to expect that earnings differentials, as suggested by cross-sectional data, would underestimate the rate of return.[82] It is not difficult to see that the effect on the rate of return on investment in education must vary considerably with boom, depression, and economic stagnation. The alternative to using cross-sectional data is to project future income streams. This alternative may prove more dangerous than using cross-sectional data. In any event it should be remembered that the rates of return calculated are for use in decision-making in the present. The calculated rates of return are compared with existing rates on debentures, fixed deposits and government stock in making such decisions. Rates of return calculated on the basis of cross-sectional data thus make more sense than rates based on projected future income streams. However, at the same time, a conjecture of the economy should be stated - stagnation, steady growth, cycle fluctuating about an upward trend - whatever it may be.[83]

3.5.7 A concluding note

Studies of investment in education have drawn various shades of criticism. Merrett[84] has expressed the view that the human capital concept is incapable of dealing with all the difficulties encountered in investment in education. His prescription is that research into rates of return to education should be discontinued. Merrett's views represent the attitude of the arch-critics of rates of return to education. Other critics, for example, Shaffer,[85] do not object to the concept of investment in human capital but point merely to minor difficulties encountered in practice.

Obviously much research is still needed in the rate of
return approach to education in spite of the fact that
much valuable work has already been done. Apart from
the need to define clearly certain concepts, the entire
approach needs to be tested under different circumstances.
It is hoped it can be demonstrated, by this investigation,
that in spite of several difficulties, valuable information
for decision-making can be discerned from rate-of-return
studies in education.

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CHAPTER 4

4. INVESTMENT IN EDUCATION : INVESTIGATIONS ASSOCIATED WITH RATES OF RETURN

4.1 INTRODUCTION

The rationale for rate of return investigations in education was set out in Chapter 2 and Chapter 3. The purpose of this Chapter is to show how rates of return have actually been calculated. The exact methods and techniques used vary according to the circumstances surrounding each particular investigation. Nevertheless a general *modus operandi* can be identified. Such a method of approach is clearly discernible from the investigation by Hansen into the total and private rates of return to investment in schooling.[1] Hansen's investigation is a comprehensive one, covering adequately the following major aspects of educational investment:

1. calculation of the costs of schooling,
2. evaluation of the returns to schooling, and
3. determination of rates of return.

Hansen ascribed the stimulus for undertaking his investigation to "the fragmentary treatment of both the costs of schooling and the money returns to schooling found in much of the recent literature..."[2] As can be expected, therefore, Hansen's investigation cleared much of the ground before it and thereby presented a clearer overall picture of the relationship among rates of return to different levels of schooling. For these reasons Hansen's investigation is an automatic choice as a model on which to demonstrate how rates of return to education are calculated.

Hansen's investigation, however, owes much to previous investigations undertaken. For example, Hansen owes much to the pioneering investigation of Walsh into human capital and its applications for education.[3] Although no direct evidence of this can be traced to Hansen's study, there can be no doubt that all investigations of this nature are either directly or indirectly indebted to Walsh for his contribution. His investigation provided economists with some

important conceptual tools to assist in undertaking rate of return investigations in education. However, Walsh's study had certain limitations. This was to be expected from a pioneering study.

We are also indebted to Schultz for the clarity with which he identified and defined the various cost components of an investment in education.[4][5] It is safe to say that no investigation in educational investment can possibly side-step the contribution of Schultz. Apart from giving us a detailed exposition of the costs entering schooling, Schultz is credited with having highlighted and successfully analysed the concept of "earnings foregone". By so doing Schultz showed earnings foregone as being properly a part of the investment in schooling.

Important contributions concerning the returns to different levels of schooling were made by Miller[6] and Houthakker.[7] Their techniques and methods were largely similar and tended to complement each other. For this reason their investigations have been examined together in this Chapter. Both investigations showed that people with more schooling earned higher incomes. In arriving at this conclusion both investigations used the "cross-sectional" approach to estimate life-time incomes. This "device" has proved invaluable in determining rates of return to investment in education.

Although the human capital implications of education were conceived in Europe, they were developed, amplified along new lines and applied largely in the United States. By contrast British economists and educationalists have remained largely sceptical about the investment proportions of education. It is no coincidence, therefore, that there has been a preponderance of American investigations. Nevertheless, important investigations have also been undertaken in the United Kingdom. A notable contributor to rate of return studies in Britain has been Mark Blaug, who as head of the research unit in Economics of Education at the University of London Institute of Education, has undertaken several investigations of rates of return to education in Britain. Two such investigations are examined here.[8]

To date, investigations have been undertaken in various parts of
the world including Norway, Netherlands, Germany, Israel, Greece
and Japan amongst others. Psacharopoulos[9] has reviewed the rates
of return in twenty five countries. *Appendix IV*[10] shows the
private and social rates of return of these twenty five countries.
In South Africa, studies relating to investment in education have
been made by E.G. Malherbe[11] and R.J.O. Joubert.[12] In this
Chapter, also, an examination is made of the particular method
adopted by Malherbe in arriving at his conclusions about investment
in higher education.

4.2 THE CONTRIBUTION OF WALSH

A pioneering work on the monetary value of investment in education
was presented by Walsh in 1935.[13] Although Walsh did not actually
calculate rates of return to different levels of schooling, his work,
nevertheless, provided a basis for the calculations of others.
Walsh's expressed purpose was, "...to determine whether money spent
in acquiring such training (for a professional career) is, in a strict
sense, a capital investment made in a profit-seeking, equalizing
market, in response to the same motives which lead to the creation
of factories, machinery and the like."[14] Walsh's expectations
about the competitiveness of the market for education may have been
over-optimistic but he did demonstrate that such investments were
made in a "profit-seeking" manner.

Using the data at his disposal Walsh showed the median earnings, by
age and education, for men from the ages of 18 to 70 years. Similarly,
Walsh also showed the median earnings of women by age and education.[15]
Next, Walsh calculated the "discounted value" of an average man and
woman for each educational level shown by him. *Table 4.1* gives an
indication of the method adopted by Walsh in discounting a man's
earnings and computing his value.[16]

TABLE 4.1:   EXAMPLE OF THE METHOD BY WHICH EARNINGS WERE DISCOUNTED
AND VALUE COMPUTED FOR PARTICULAR OCCUPATIONS (MEN WITH
B.A. DEGREES - BASED ON A STUDY OF MEMBERS OF ALPHA
KAPPA PSI)

Age	Survivors to mid-year	Annual earnings	Percent employed	Total actually earned during the year	Discounted to present value at 4%
(a)	(b)	(c)	(d)	(e)	(f)
22	100 000	$ 1 700	86	$ 1 462	$ 1 462
22-23	99 538	1 725	89	1 528	1 469
23-24	99 063	1 725	91	1 555	1 438
24-25	98 598	1 750	93	1 605	1 428
25-26	98 144	2 000	95	1 865	1 597
-	-	-	-	-	-
69-70	44 257	3 600	50	797	121
70-71	41 430	3 500	42	609	89
71-72	38 588	3 500	31	419	59
72-73	35 787	3 500	20	251	34
73-74	32 949	3 500	10	115	15
				TOTAL	$ 67 846

Column (a): The example represents the case of an average man whose
training ended with a university degree (B.A.). This column shows
that such a person began his earnings at the age of 22 years. He
continued to be employed until 74 years.

Column (b): In order to account for the possibility of death it was
necessary to make a downward adjustment to earnings. In accommodating
such a death factor it was assumed that 100 000 men began their
careers simultaneously. Fifty-two years later, at the age of 74
years, it was expected that of the original 100 000 people there
would only be 32 949 survivors. This column shows that after each
year the original population would have decreased by the number of
deaths occurring among members. Walsh used life-tables, drawn in
accordance with the mortality conditions in the United States in
1924, to show the number of survivors at each age.

Column (c): Using the median earnings by age and education for men, which he had compiled, Walsh was able to estimate the earnings of an average person with a degree at each stage (age) of his life.

Column (d): Yet another adjustment, similar to the one for mortality, was made to account for the incidence of unemployment. This column showed the percentage of B.A. graduates expected to be employed at each age.

Column (e): The total actually earned by an average man in a particular age-group was reflected in this column as the product of columns (b), (c) and (d). For example, the total actually earned by a 22-year-old with a degree was estimated at $1 462 during the year. This was arrived at as follows: $1 700 (basic earnings) x 1 (death factor) x 0.86 (employment factor) = $1 462. Similarly, for the 22 to 23-year-old the total actually earned was: $1725 x 0.99538 x 0.89 = $1528.

Column (f): Finally, Walsh discounted the actual earnings by 4 percent (presumably the current rate of interest) to show the present values of the expected future earnings. Column (f) totalled vertically gave the "discounted value" (present value discounted at 4%) of the average college graduate at the age of 22 years. This amount, $67 846, represented the earnings prospect which an average man could look forward to upon completing his college (university) education. It was what he and the capital invested in his education were worth to himself. It was, in fact, the capital value of his education.

Using the method described above, Walsh produced the following "discounted values" of the average person for various educational levels:[17]

TABLE 4.2:   DISCOUNTED VALUE OF THE LIFE EARNINGS ACCORDING TO
              EDUCATION

Level of education	Value
MEN	
1. Elementary School	$ 25 695
2. High School	32 837
3. B.A. or B.S. Degrees	67 846*
4. M.A.	68 878
5. Ph.D.	76 063
6. M.D.	70 527
7. LL.B. (Harvard)	208 091
WOMEN	
1. Elementary School	$ 22 806
2. High School	22 886
3. B.A. or B.S. Degrees	31 916
4. M.A.	36 547

*From Table 4.1 Column (f)

The second part of Walsh's investigation was concerned with
calculating the average cost of the various grades of education
whose capital values had been computed. The expenses considered
by Walsh in determining costs included:[18]

1.   tuition fees and the like paid to the school;

2.   board and room;

3.   equipment such as books and the like;

4.   personal expenses - clothes, recreation, travel;

5.   loss of income which would have been earned (on average)
      had the individual decided to work rather than continue
      study (this amount was reduced by an estimated average
      amount earned by students from part-time work outside
      school hours); and

6.   annual cumulative interest at 4 percent on the sum of the
      above.

By including cost components 2 and 4 above, Walsh had erroneously included "subsistence" costs (refer to page 44) which would have been incurred anyway. It will be recalled that the inclusion of such costs in the costs of schooling resulted in falsely inflating the costs of education.

The outcome of the two parts of his investigation (discounted value and cost estimates) was reflected in a benefit-cost framework. The benefit-cost framework showed the discounted value and cost value of various grades of education beyond the high school level and beyond the degree level separately. *Table 4.3* is an abridged version of the actual table shown in Walsh's investigation.[19]

TABLE 4.3:   COMPARISON OF DISCOUNTED VALUES AND COST VALUES OF SPECIAL TRAINING

Level of Education	Disc. value over elem. education	Cost value of elem. education	Disc. value over high school edu.	Cost value of high school edu.	Disc. value over B.A.	Cost value of B.A.
			MEN			
1. High sch.	$ 7142	$ 5000	-	-	-	-
2. B.A.			$35 009	$6 398	-	-
3. M.A.			36 041	9 848	$1 032	$3 450
4. Ph.D.			42 226	21 413	8 217	15 015
5. M.D.			37 690	22 143	2 681	15 747
			WOMEN			
1. B.A.			9 030	6 398		
2. M.A.					4 631	2 950

In all cases shown above discounted values exceed costs for education beyond the high school level. However, in the case of M.A., Ph.D. and M.D. degrees costs beyond the first degree level exceed discounted values. Walsh attributed this phenomenon to the fact that only monetary returns were considered. Individuals with

these degrees received special satisfaction (a large consumption component) from their studies. In addition other non-monetary benefits such as travel and vacations often accrued to them.

In conclusion it could be said that Walsh did not have a completely clear perception of the costs of schooling. This resulted in his including "subsistence" costs in the costs of schooling. In this regard Walsh could have benefited from the contribution made subsequently by Schultz. Another aspect in which Walsh's investigation could have benefited is in regard to the data at his disposal. His investigation would have been enhanced if he too, like subsequent investigators, had access to Bureau of Census Data. In spite of these drawbacks, Walsh's pioneering effort has contributed immensely towards analysing education as an investment. The concept of education as an investment in human capital was clearly inherent in his analysis of the capital value of education and he clearly showed that higher levels of education were accompanied by larger earnings. In fact it could be said that he went a bit too far; attributing all earnings differentials to education. No consideration was given to the possibility of increased earnings being the result of such other factors as those referred to on page 60 of this investigation. Walsh's explanation was that to isolate the effects of education on various groups would necessitate the elimination of all other influences; only thus could altogether satisfactory conclusions be drawn in respect of the economic value of education. No such elimination was attempted by Walsh for the simple reason that he considered it impossible to do. [20] On the evidence of available empirical research, even today, one would be inclined to concur with Walsh in this regard. All such investigations must suffer a similar drawback. Apart from making an arbitrary adjustment to accommodate the possible effect of other influences on education, little else can be done at this stage.

4.3   THE CONTRIBUTION OF SCHULTZ

Schultz's investigations into the stock of human capital led to his presenting an estimate of the value of resources entering into education. Through these estimates Schultz has contributed

significantly towards a clearer evaluation of the costs of education.[21] It was obvious from the shortcomings of Walsh's treatment of this aspect that a more intensive study of the costs of education was needed. At the outset it must be said that Schultz, also, did not actually produce rates of return on the investment in education. However, on the basis of his analysis of costs entering education, calculations of the rates of return to investment in education have been undertaken by Hansen, Becker, Telser and others.

Schultz considered the resources entering into an investment in education to consist of salaries that students forego while attending school and the resources to provide and equip schools and students.[22] (For a more detailed analysis of Schultz's resource costs of schooling refer to page 44.) Schultz argued that earnings students forego were properly a part of their investment in schooling. Although this idea had earlier been expressed by others (refer to Walsh, page 74) it was left to Schultz to give a more precise account of the role of earnings foregone and its implications for economics. He set out the following arguments to substantiate his view that earnings foregone were truly a cost of schooling:[23]

1. Students study. For them this is work that creates human capital. While studying they are not enjoying leisure. Hence they may be viewed as self-employed producers of capital.

2. Assume that students were not to attend school. They would be employed producing (other) products and services of value to the economy. For this they would have been paid. The cost of going to school is the salary they forego.

3. The average earnings of young men and women of comparable age and sex who are not attending school are a measure of the students' time and effort.

4. The cost of living of students and non-students may be put aside because they apply whether young people go to school or enter the labour force.

In explaining the nature of earnings foregone,[24] Schultz found
it convenient to distinguish between elementary school and
secondary school students. The year 1949 was taken as the base
year for these estimates. He assumed that earnings foregone by
elementary school children (14 years and below) were negligible.
This was a reasonable assumption considering the state of the U.S.
economy at that time (1949). Fifty years or so earlier or even
in an under-developed country today, these children may have been
of considerable importance to the economy as workers. However, in
modern economies, with compulsory school attendance, no earnings
foregone can be assumed until the age of 15 or 16 years.

In his calculations Schultz estimated that full-time students forego
40 weeks per annum of such assumed earnings. Full credit of a year's
earnings (52 weeks) was not given because Schultz found that many
students did part-time work. Money earned in this way had to be
omitted from estimates of earnings foregone. A second adjustment
had to be made for possible unemployment had students elected to
work rather than to continue their studies. It will be recalled
that Walsh also made a downward adjustment to earnings to accommodate
the possibility of unemployment. While appreciating the need for the
second adjustment made by Schultz, one cannot help but wonder about
the necessity or even validity of an adjustment for part-time work.
What is being ascertained is an estimate of a student's "worth" had
he been otherwise employed. It is of no consequence to his "worth"
that a small portion of his time is devoted to part-time work, for
only a small portion of his self-study and recreation or leisure are
being sacrificed. The impression given by Schultz is that study is
itself a part-time occupation. Only if this were true would an
adjustment for part-time work by students be valid. In a similar
way, earnings for over-time work and week-end work, over and above
earnings of a regular job, should not enter into calculations of
earnings foregone. It may be safely assumed that every occupation
should permit its participants a reasonable amount of time for
recreation and leisure. If a person is prepared to sacrifice this
leisure in order to increase his earnings, such increased earnings
should not be considered in determining the yield on his educational
investment. The extra earnings achieved in this way are really a
yield on foregone leisure. The same reasoning would apply to
students doing part-time work.

Expressed in earning-equivalent weeks of workers in manufacturing, Schultz calculated that the 40 weeks credited to elementary school students was the equivalent of about 11 weeks' work. The 40 weeks credited to university (college) students was the equivalent of about 25 weeks' work. On the basis of the foregoing, Schultz applied his earnings ratios to particular years between 1900 and 1956 (refer to *Appendix V*)[25] *Table 4.4*[26] shows the resulting earnings foregone, calculated by Schultz, for the last two years.

TABLE 4.4:   ESTIMATE OF THE ANNUAL EARNINGS FOREGONE BY
              STUDENTS IN THE U.S.A., ADJUSTED FOR
              UNEMPLOYMENT

Year	High School Students	College or University Students
1950	$ 626	$ 1 422
1956	855	1 943

On the average, in 1950, a student in high school gave up an amount of $626 in lost earnings to be at school. For the same year the corresponding investment in earnings foregone amounted to $1 422 for a college (university) student.

It must be remembered that earnings foregone represent only a part (albeit a significant part) of the total investment in the education of a student. The cost of services provided by schools has also to be considered.[27] Schultz considered these costs to include the services of teachers, librarians, school administrators; the costs of maintaining and operating the school premises; and depreciation on equipment. As a significant departure from the treatment of costs by Walsh, Schultz excluded such costs as providing room and board for students and operating organised athletics and other non-educational activities. These were "subsistence" costs which were incurred in any event whether schooling was provided or not. School expenditures on scholarships, fellowships and other financial aids to students were also excluded because they were in the nature of transfer payments; the real costs involved in student time being fully covered by opportunity cost estimates. To find the cost of

the service provided by schools Schultz first ascertained the gross
expenditure of schools. Next "subsistence" costs and transfer
payments (referred to as "auxiliary payments" by Schultz) were
subtracted. Also subtracted from gross expenditure were capital
outlays. In this way net expenditures were arrived at. The next
step was to determine the value of property equipment to which a
depreciation of 8% was applied. By adding net expenditure and
depreciation the total cost of school services was obtained.

Appendix VI[28] and *Appendix VII*[29] show Schultz's calculation
of the costs of school services for elementary and secondary schools
and for higher education respectively. *Table 4.5*[30] and *Table 4.6*[31]
show extracts of costs for 1950 and 1956 for school education and
university education respectively.

TABLE 4.5:   ANNUAL RESOURCE COSTS OF EDUCATIONAL SERVICES
              RENDERED BY ELEMENTARY AND SECONDARY SCHOOLS
              IN THE U.S.A. (MILLIONS OF DOLLARS)

Year	EXPENDITURE (INCLUDING DEPRECIATION)		
	Public Schools	Private Schools	Total = (Secondary + Elementary)
1950	$ 5 736	$ 769	$6 505 = ($2 286 + $4 219)
1956	10 480	1 404	11 884 = ($4 031 + $7 853)

TABLE 4.6:   ANNUAL RESOURCE COSTS OF EDUCATIONAL SERVICES
              RENDERED BY COLLEGES AND UNIVERSITIES IN THE U.S.A.
              (MILLIONS OF DOLLARS)

Year	Net expenditure	Depreciation on equipment	Total expenditure
1950	$1 706	$ 422	$2 128
1956	2 788	712	3 500

Schultz concluded that since earnings foregone in elementary
education (up to 14 years) were assumed to be nil, total costs
(earnings foregone plus resource costs) for elementary education
could be read directly as $4 219 million for 1950 and $7 853
million for 1956 (Table 4.5). Schultz made no provision for
"additional expenses" (in the form of books, supplies, extra
clothing and travel) in arriving at the total costs of elementary
education, although he did in the case of high school and college
education.[32]

In spite of the fact that education was "free" in the Western World,
parents had still to bear some of these costs. In any case this was
most certainly the case in private schools which were also included
in Schultz's investigation.

The total costs of secondary school and higher education were
arrived at by considering the following cost components:[33]

1. earnings foregone,
2. cost of services provided by schools and
3. additional expenses.

Schultz used the rather dubious method of taking "additional expenses"
to be 5% of earnings foregone in the case of high school students and
10% of earnings foregone in the case of university students.
Table 4.7[34] and *Table 4.8*[35] show the total cost of secondary
school and college education respectively, as calculated by Schultz.
Since attention has been focussed here on Schultz's findings for
1950 and 1956, the figures for these years have been distinctively
marked.

TABLE 4.7:   EARNINGS FOREGONE AND OTHER RESOURCE COSTS
               REPRESENTED BY HIGH SCHOOL EDUCATION, U.S.A.,
               1900-1956

YEAR	Number of students (millions)	Earnings foregone per student ($)	Total earnings foregone ($ millions)	School costs ($ millions)	Additional expenditure ($ millions)	TOTAL ($ millions
	(a)	(b)	(c)	(d)	(e)	(f)
1900	0.7	84	59	19	3	81
1910	1.1	113	124	50	6	180
1920	2.5	275	688	215	34	937
1930	4.8	224	1 075	741	54	1 870
1940	7.1	236	1 676	1 145	84	2 905
1950	6.4	626	4 006	2 286	200	6 492
1956	7.7	855	6 584	4 031	329	10 944

Key to Table 4.7

Col. (b):   As in Table 4.4 (1950 and 1956 only)

Col. (c):   Col. (a) x Col. (b)

Col. (d):   As in Table 4.5 (1950 and 1956 only)

Col. (e):   Expenditure on books, supplies, extra clothing
            and travel, estimated at 5% of earnings foregone
            i.e., 5% of Col. (c)

Col. (f):   Col. (c) + Col. (d) + Col. (e)

TABLE 4.8:   EARNINGS FOREGONE AND OTHER RESOURCE COSTS
              REPRESENTED BY COLLEGE AND UNIVERSITY EDUCATION,
              U.S.A., 1900-1956

YEAR	Number of students (thousands)	Earnings foregone per student ($)	Total earnings foregone ($ millions)	School costs ($ millions)	Additional Expenditure ($ millions	TOTAL ($ millions)
	(a)	(b)	(c)	(d)	(e)	(f)
1900	238	192	46	40	4	90
1910	355	259	92	81	9	182
1920	598	626	374	184	37	595
1930	1 101	509	560	535	56	1 151
1940	1 494	537	802	742	80	1 624
1950	2 659	1 422	3 781	2 128	378	6 287
1956	2 996	1 943	5 821	3 500	582	9 903

Key to Table 4.8

Col. (b): As in Table 4.4 (1950 and 1956 only)

Col. (c): Col. (a) x Col. (b)

Col. (d): As in Table 4.6 (1950 and 1956 only)

Col. (e): Expenditure on books, supplies, extra clothing
           and travel, estimated at 10% of earnings foregone,
           i.e., 10% of Col. (c)

Col. (f): Col. (c) + Col. (d) + Col. (e)

Table 4.7 shows that earnings foregone while attending high school during 1950 and 1956 were 62% and 60% respectively of total costs. Similarly *Table 4.8* reveals that for the same years, earnings fore= gone by attending college were 60% and 59% respectively of total costs. Schultz attached great importance to the fact that earnings foregone comprised such a large proportion of the total cost of schooling. [36]

Schultz's estimates showed that resources entering high school and university education had increased at a faster rate than the resources entering elementary education. In addition resources entering education were increasing at a much faster rate than gross formation of physical capital. [37] For example, in 1900, the total costs of elementary education equalled 5% of gross capital (physical) formation. In 1956 it was 9%. This was also shown to be the case for high school and higher education combined. In 1900 these costs amounted to 4% of the gross capital formation. The corresponding figure for 1956 was almost 25%. From the point of view of an investment, the rate of return to education must have been relatively attractive to have induced the implied larger rate of growth of this form of human capital. Schultz concluded from this that the rate of return to education was larger than the rate of return to investment in physical capital.

4.4 THE CONTRIBUTIONS OF MILLER AND HOUTHAKKER

Working independently, Miller[38] and Houthakker[39] estimated lifetime incomes using cross-sectional data. Their procedures involved analysing incomes received by people of different ages and educational backgrounds during a single year. Because the data collected was based on variations in the payments to individuals in different age and education groups at a given time, Miller referred to these figures as "synthetic" figures. [40] These "synthetic" figures were compiled from a cross-section of the population and not on life-cycle data. According to Miller cross-sectional data had the advantage of being free from the influence of variants such as industrial depression, changes in employment opportunities, wage rates and cost of living. However, it should be added that cross-sectional data also suffer certain disadvantages. These have already been discussed in Chapter 3 (refer to pages 61-62).

The statistics produced by both Miller[41] and Houthakker[42] support the basic tenet of this investigation that persons with more schooling tend to earn more. The data presented by them showed amply that the completion of an additional level of schooling was associated with higher average incomes. These findings parallel those obtained in numerous other studies of the relationship between education and income dating back to the early part of this century. However, both Miller and Houthakker indicated that this relationship between schooling and earnings might have been a spurious one. Houthakker was perhaps the more sceptical of the two, suggesting that it was possible that the apparent effects of education on income might be completely explicable in terms of intelligence and parents' income. This would mean that the specific effect of education on earnings would be zero or even negative. Despite the absence of evidence to settle this point one way or the other, Houthakker hardly expected this extreme possibility to be the case.[43]

Table 11 in Miller's investigation showed the lifetime incomes of males by age-group and by years of schooling completed for the years 1939, 1946, 1949, 1956 and 1958. In *Table 4.9*[44] below an extract from this source is given.

TABLE 4.9:   LIFETIME INCOMES (EARNINGS) BASED ON ARITHMETIC MEANS FOR MALES FROM AGE 18 TO DEATH BY YEARS OF SCHOOL COMPLETED, U.S.A.

Years of school completed	YEAR		
	1949	1956	1958
Elementary: less than 8 years	$ 98 222	$132 736	$129 764
8 years	132 683	180 857	181 695
High school: 1 to 3 years	152 068	205 277	211 193
4 years	185 279	253 631	257 557
College : 1 to 3 years	209 282	291 581	315 504
4 years or more	296 377	405 698	435 242

Table 4.9 shows clearly that additional schooling is associated with very substantial increases in lifetime incomes. For example, on the basis of conditions in 1958 the average elementary school graduate could expect a lifetime income of $181 695 as compared to a lifetime income of $257 557 for the average high school graduate. The expected income differential associated with the extra four years of high school education therefore amounted to $76 000 or 42%. As further substantiation we see that a further four years' schooling beyond the high school level could be expected to realise an additional $177 685 in lifetime income. Similarly, increases in schooling for all three years (1949, 1956, 1958) and at all levels of schooling were accompanied by corresponding increases in earnings. In arriving at these figures, Miller was careful to make an adjustment for mortality. This was done by first making an estimate of the number, out of 100 000 children born in each of the years (1949, 1956, 1958), who would survive to each given age-group. These estimates were made from standard lifetime tables.

Houthakker compiled statistics showing mean incomes before tax and after tax by age and years of schooling completed. The mean after-tax incomes were obtained by multiplying the representative incomes for each age-education-income group by the tax rate. This was necessary, presumably, to off-set the effect of the increasing tax burden accompanying larger incomes. Houthakker also gave consideration to the mortality factor for each age-group. This was done in accordance with the mortality experience of 1949-1951 in the U.S.A. From figures produced by Houthakker it was also evident that increases in schooling were accompanied by increases in incomes.[45] In comparison with Miller, Houthakker went one step further in his investigation. He made an attempt to capitalise the stream of lifetime incomes. This was done by applying appropriate rates of discount to the expected lifetime earnings. Houthakker did this for each educational group. The result is shown in *Table 4.10*[46] below.

TABLE 4.10:   CAPITAL VALUE AT AGE 14 YEARS OF LIFETIME
INCOME BY YEARS OF SCHOOL COMPLETED

BEFORE   TAX

Years of school completed	Discount Rate (percent)			
	0	3	6	8
Elementary : 0 years	$ 64 132	$ 26 220	$ 13 014	$ 8 896
1-4 "	79 386	33 939	17 492	12 179
5-7 "	100 430	42 758	21 834	15 098
8 "	124 105	52 923	27 037	18 700
High school: 1-3 "	142 522	59 734	30 008	20 514
4 "	175 160	72 475	36 328	24 990
College : 1-3 "	198 268	78 138	36 547	23 793
4 and more	280 989	106 269	47 546	30 085

AFTER   TAX

Years of school completed	Discount Rate (percent)			
	0	3	6	8
Elementary : 0 years	$ 60 785	$ 24 944	$ 12 428	$ 8 515
1-4 "	75 021	32 189	16 638	11 730
5-7 "	93 571	40 006	20 537	14 252
8 "	115 277	49 425	25 380	17 592
High school: 1-3 "	130 933	55 260	27 945	19 188
4 "	157 940	66 055	33 466	23 149
College : 1-3 "	175 206	69 651	32 912	22 400
4 and more	238 761	91 335	41 432	26 454

In *Table 4.10* we notice that the capital value at age 14 years of
lifetime incomes are shown before and after tax for four different
rates of interest. The increment in capital value associated with
each successive level of education is nearly always positive. The
only exception is in the "College, 1-3 year" group, where at eight
percent discount (both before and after tax) lower capital values
than the preceding groups are found.

On his own admission Houthakker warned that his investigation presented "crude and limited calculations on the relation between education and income". [47] While this may be true his findings (as well as those of Miller) have not been disproved. In fact subsequent investigations have endorsed their findings. Miller and Houthakker have contributed significantly to research on investment in education in that their technique of collecting data on incomes by the cross-sectional approach have been used by other investigators in estimating the costs and benefits of schooling.

4.5 THE CONTRIBUTION OF HANSEN

In a sense, Hansen has expanded upon the work of Schultz, Miller and Houthakker. In determining the costs of education Hansen relied heavily upon the rationale and procedure set forth by Schultz. In ascertaining the benefits of education he amplified his procedure along the lines of Miller and Houthakker. Unlike the aforementioned people, however, Hansen actually produced rates of return to invest= ment in schooling. His comprehensive set of internal rates of return resulted from his dissatisfaction with, "...the fragmentary treatment of both the costs of schooling and the money returns to schooling found in much of the recent literature." [48] Hansen believed that the value of lifetime income as set forth by Miller (refer to page 86) and the present value of lifetime income as set forth by Houthakker (refer to page 87) were not relevant to ranking the direct economic returns to schooling when schooling was treated as a type of investment expenditure. Both the above methods of observing the economic returns to individuals from schooling ignored the costs of schooling. Because of this important omission the ranking of economic returns to different levels of schooling, depending upon whether one used *the value of lifetime income* or *the present value of lifetime income* or Hansen's *rate of return on investment in schooling*, were shown to be substantially different (refer to *Appendix VIII*). [49]

Hansen made it clear that his measured rates of return were money rates of return. All other costs or benefits associated with schooling were excluded from consideration. Having adopted this

stand, Hansen saw that what was required by him was data on costs
for the various levels of schooling as well as data on age-income
patterns by level of schooling. As a first step Hansen constructed
age-income profiles which showed the average incomes of males in
the different age-groups for different levels of schooling.[50]
Table 4.11[51] shows Hansen's age-income profiles which were
constructed from information provided by the 1950 Census of
Population of the U.S.A.

TABLE 4.11:   AVERAGE INCOME BY AGE AND YEARS OF SCHOOL
                COMPLETED, MALES, UNITED STATES, 1949

AGE	0	YEARS OF SCHOOL COMPLETED						
		Elementary School			High School		College	
		1-4	5-7	8	1-3	4	1-3	4+
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
14-15	$ 610	$ 350	$ 365	$ 406	-	-	-	-
16-17	526	472	514	534	$ 429	-	-	-
18-19	684	713	885	1 069	941	$ 955	-	-
20-21	944	1 009	1 216	1 535	1 652	1 744	$1 066	-
22-24	1 093	1 227	1 562	1 931	2 191	2 363	1 784	$1 926
25-34	1 337	1 603	2 027	2 540	2 837	3 246	3 444	4 122
35-44	1 605	1 842	2 457	3 029	3 449	4 055	5 014	7 085
45-54	1 812	2 073	2 650	3 247	3 725	4 689	5 639	8 116
55-64	2 000	2 045	2 478	3 010	3 496	4 548	5 162	7 655
65+	1 140	1 189	1 560	1 898	2 379	3 155	3 435	5 421

From *Table 4.11* we observe that, on average, a person who has
completed 8 years of elementary schooling would be at least 14 to 15
years old. Such a person would earn an average annual salary of $406.
A person of the same age but with only 5 to 7 years of elementary
schooling would be worth $365 a year on the labour market. Similarly
a person between the ages of 22 and 24 years possessing four years of
college (university) education would be worth $1 926 per annum. A

person with the same level of education but between the ages of 55 and 64 years was worth $7 655 per annum. After retirement (65 years and over) the average income of such a graduate dropped to $5 421 a year.

Hansen saw as his next step the need to construct *age-cost estimates*.[52] This showed the costs incurred by society (i.e., total resource costs) and by individuals (i.e., private resource costs) for each level of schooling. Hansen used exactly the same concept of total and private resource costs set forth by Schultz (refer to page 79). For Hansen, also, total resource costs included:

1. school cost incurred by society, that is, teachers' salaries, supplies, interest and depreciation on capital;
2. opportunity costs incurred by individuals, namely, income foregone during school attendance; and
3. incidental school related costs incurred by individuals, for example, books and transport.

Private resource costs included cost components 2 and 3 above plus tuition and other fees. On the basis of the above analysis of the costs of schooling, Hansen showed the costs, exclusive of opportunity costs, for elementary, high school and college education to be as follows:

TABLE 4.12:[53]   AVERAGE ANNUAL PER STUDENT COSTS, EXCLUSIVE OF OPPORTUNITY COSTS, BY AGE AND GRADE, MALES, UNITED STATES, 1949

AGE	School Level	TOTAL RESOURCE COSTS			PRIVATE RESOURCE COSTS		
		School costs	Other costs	TOTAL	Tuition and fees	Other costs	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
6-13	Elementary	$201	$ -	$201	$ -	$ -	$ -
14-17	High School	354	31	385	-	31	31
18-21	College	801	142	943	245	142	387

To show the costs, inclusive of opportunity costs (the total investment in schooling), use was made of the age-income profiles in *Table 4.11*. This provided the value of earnings foregone (opportunity costs) for each level of schooling. *Table 4.13* shows how Hansen may have calculated the total investment made by an individual in a college (university) education.

TABLE 4.13: AVERAGE PER STUDENT INVESTMENT IN A COLLEGE EDUCATION
            MADE BY AN INDIVIDUAL, MALES, UNITED STATES, 1949

YEAR	Opportunity Costs	Private Resource Costs	Total Investment
(a)	(b)	(c)	(d)
First	$ 955	$ 387	$1 342
Second	955	387	1 342
Third	1 744	387	2 131
Fourth	1 744	387	2 131
			6 946

Notes on Table 4.13:

(a) Year of study with first year commencing at 18 years.

(b) From Table 4.11, Col. (f).

(c) From Table 4.12, Col. (g).

(d) Col. (b) + Col. (c), giving the total investment by
     the individual for each year of study.

To estimate the investment in education by society data on total resource costs, private resource costs and opportunity costs were combined. *Table 4.14* shows how Hansen may have calculated the total per student investment by society in a college education. The assumption made here is that the total resource costs shown are net of any income received by colleges from students by way of tuition and other fees for example.

TABLE 4.14:   AVERAGE PER STUDENT INVESTMENT IN A COLLEGE
                EDUCATION MADE BY SOCIETY, MALES, UNITED
                STATES, 1949

YEAR	Opportunity Costs	Total Resource Costs	Private Resource Costs	Total Investment
(a)	(b)	(c)	(d)	(e)
First	$ 955	$ 943	$ 387	$2 285
Second	955	943	387	2 285
Third	1 744	943	387	3 074
Fourth	1 744	943	387	3 074
				10 718

Notes on Table 4.14:

(a) Year of study with first year commencing at 18 years.

(b) From Table 4.11, Col. (f).

(c) From Table 4.12, Col. (d).

(d) From Table 4.12, Col. (g).

(e) Col. (b) + Col. (c) + Col. (d), giving the total
     investment by society for each year of study.

On the basis of his age-income profiles and his cost estimates,
Hansen attempted to present a cost stream and a net benefit stream
for each level of schooling.[54] These were intended to show, for
each level of schooling, the flow of costs incurred during schooling
and the subsequent flow of additional income that could be attributed
to such schooling. For example, in the case of a university
graduate the cost stream for his additional qualifications over a
high school graduate would comprise school costs, school-related
costs and opportunity costs for ages 18 years to 21 years. The
net income stream for a university graduate would be the additional
earnings earned by him over his lifetime. Finally the internal rate
of return would be estimated by finding the rate of discount which
would set the present value of the cost stream to equal the present
value of the net return stream. Based on Hansen's procedure, the

following is a summary of the steps to be followed in determining the private rates of return for university graduates:

1. Find the average income of high school graduates for each age-group.

2. Find the average income of university graduates for each age-group.

3. Determine the additional lifetime earnings of university graduates over high school graduates.

4. Calculate the costs of a university education (schooling costs, school-related costs and opportunity costs) for each year of study incurred by the individual.

5. Establish a cost-net benefit stream for a university graduate over his lifetime.

6. Discount the cost-net benefit stream by a rate of interest that gives a present value of nil. Such a rate of discount is the rate of return on an investment made by an individual in a university education.

A similar procedure is followed in determining the social rate of return for college graduates. However, in ascertaining the costs of a university education consideration must be given to the costs incurred by society and not to those incurred by individuals. Although Hansen indirectly stressed the importance of using after-tax incomes in finding the private rate of return he did not specifically recommend its use as the standard procedure to be followed. Since Hansen hoped that his estimates of private rates of return would benefit the individual in deciding whether to continue or terminate schooling one would have expected him to specifically use after-tax incomes in determining private rates of return and to reserve the use of before-tax incomes for determining social rates of return only.

The calculation made by Hansen revealed the following for education in the U.S.A. for 1950:[55]

1. The rate of return on elementary education to the individual was infinity because elementary education was largely free to the student and earnings foregone were negligible. To society the rate of return was 15%.

2. An investment in high school education yielded a rate of return of 11.4% to society. For the individual it was 15.3% before tax and 14.5% after tax.

3. Rates of return to university education were smaller all-round; 10.2% on the total investment and 11.6% on the investment of the individual before tax and 10.1% for the individual after tax.

Although Hansen showed the rates of return to each successive increment of schooling, the figures quoted above are for broader increments of schooling, namely, eight years of elementary school, four years of high school and four years of university. *Appendix 1X*[56] shows the rates of return to each successive increment of schooling as well as the rates of return for broader increments of schooling.

Hansen drew attention to the following factors which had to be considered when using the findings presented by him:[57]

1. Since earnings data were not available Hansen used income data. Consequently the income profiles constructed reflected, in part, receipts from other assets.

2. Among those included in the estimates as having little schooling were some Negroes and Puerto Ricans who may have been discriminated against on the basis of race and not merely level of schooling.

3. Since those people who completed more schooling ordinarily possessed greater intelligence, as measured by intelligence scales, some part of the differential incomes received might have accrued to them anyway.

4.   All cost-estimates were regarded as investments even though some portion might better be regarded as consumption.

5.   All estimates were made on a cross-section of costs and income and thereby ignored future shifts in the relationships of the cost-income stream.

In spite of these limitations Hansen's findings are of considerable worth if only for the fact that from them preliminary conclusions about resource allocations may be drawn by individuals and education planners.[58]

4.6   THE CONTRIBUTION OF BLAUG

Research in Britain on the study of the economic aspects of education has been undertaken, principally, by two research units in London; at the University of London Institute of Education and at the London School of Economics. Research in this field has also been undertaken at some other universities, notably Brunel, Sussex and York.[59] Blaug (Head of the Research Unit in the Economics of Education, University of London Institute of Education) has presented two recent efforts at estimating rates of return to educational investment in Great Britain.[60] In contrast to the United States, the decennial census in Great Britain does not collect data on incomes so that the investigations undertaken by Blaug had to use age-education-income data which were by-products of several surveys conducted for other reasons. Because of this limitation, Blaug has warned that the results of these investigations should be treated with extreme caution.[61] In fact the object of the investigations had not been to present definite findings, but rather to illustrate some methods of calculating rates of return on educational investment.

4.6.1   The first investigation

The first investigation used evidence from a random sample of 6 500 male heads of British households, aged 20 years or more. It was the first survey in Britain to link income to education. *Table 4.15*[62] shows the relationship between the median gross incomes and terminal educational age (TEA) for three cohorts as reflected by this survey.

TABLE 4.15:　　　MEDIAN INCOMES BY PRESENT AGE AND
EDUCATION, MALES, GREAT BRITAIN,
1965

T E A	AGE			%
	20-44	45-64	65 and over	
15 or under	£ 694	£ 602	£ 309	82.4
16 - 18	960	1 203	875	13.9
19 or over	1 422	1 861	1 325	3.7
Total numbers	2 781	2 675	980	6 436

Blaug considered the data to be too crude for direct use in his own investigations. He gave the following reasons for this:[63]

1. No distinction between different types of schooling or between full-time and part-time schooling was made.

2. The age range for each cohort was too large to adequately standardize for age.

3. The results were biased downwards by omitting males between the ages of 15 and 20 years.

4. The figures were incomes and not earnings. They thus included property income which was itself positively associated with age and education.

5. The age-cohort gains were given by medians which were less than the means because the distribution was positively skewed.

6. The categories with incomes of £1 950 or more and terminal education ages of 19 or over in the original questionnaire were both open-ended.

7. The rate of non-response (15 percent) varied directly with the age and terminal education age of the heads of households.

Because of the limitations associated with the data, Blaug considered it necessary to make rather extensive adjustments to them.

After making several adjustments Blaug estimated the
earnings differentials associated with extra education
from 15 to 18 years to be as follows:[64]

TABLE 4.16:   EARNINGS DIFFERENTIALS BY PRESENT
                 AGE, MALES, GREAT BRITAIN, 1965

	AGE				
	20-24	25-34	35-44	45-54	55-64
Differential in (£)	195	392	677	737	765

These differentials were gross differentials and were the
result of extra education as well as other factors such as
social class and endowed ability. Blaug used a coefficient
(a) of 0,6 (as calculated by E.F. Denison) to obtain the
amount directly attributable to education. Using information
supplied by the Ministry of Education and the Crowther Report,
Blaug estimated the total investment cost per pupil (C),
including earnings foregone for three years of school beyond
the statutory age of 15 years, to be £1 500. Thus, on the
basis of the gross earnings differentials given above and
with C = £1 500 and a = 0,6, the social rate of return to
investment in three years of extra education beyond the
statutory age was estimated at 12.5%.[65] By the social
rate of return Blaug meant that discount rate which equated
present value of incremental earnings associated with extra
education, multiplied by a, to the present value of the total
cost of that education. Using a similar procedure Blaug
estimated the social rate of return for the 19 year-and-over
terminal education age group to be in the order of 6,5%.

To calculate the corresponding private rates of return Blaug
further estimated the after-tax earnings.[66] These were
compared with out-of-pocket costs of education including
earnings foregone. Adjusting for tax not only lowered the
earnings differentials attributed to education but also
altered them at different ages because of the progressivity
of the income tax. Blaug found that on average the tax

deduction lowered earnings differentials by 20-25 percent. Assuming a private opportunity cost of £1 000 for each year of extra secondary schooling and a similar figure for each of the three additional years of higher education, Blaug arrived at the following private rates of return:

13% to investment in education for 3 years beyond the statutory age level of 15 years and
14% to investment for a further three years in higher education.

4.6.2 The second investigation

The second investigation was based on data from a sample of 2 800 managerial, professional, technical, clerical and skilled male workers employed by one large firm in the British automobile industry and in four large British electrical engineering firms.[67] The information supplied made it possible to calculate the rates of return on investment in different and alternative types of post-secondary and higher education. The various qualifications of the subjects were ranked according to one of six levels of educational achievement which generally corresponded to the following:[68]

Level: 0 - School-leaving age
       1 - Royal Society of Arts (R.S.A.) and City and
             Guilds Institute of London (C.G.L.)
             preliminary certificates
       2 - G.C.E. "O" level
       3 - G.C.E. "A" level
       4 - Higher National Certificate and C.G.L. full
             technical certificate
       5 - University degree
       6 - University degree (honours)

Appendix X[69] shows the resulting mean annual salaries by age group and educational level.

Blaug showed the resulting age-earnings profiles for each of these six educational levels graphically.[70] On the basis of this he drew attention to the following characteristics of these six age-earnings profiles:

1. Generally those profiles with the higher-level qualifications lay above those corresponding to lower-level qualifications.

2. The distance between some profiles widened with age.

3. Some degree of interlocking of profiles, particularly for the higher age groups, were observed.

Blaug attributed this last-mentioned characteristic to three possible reasons. Firstly, it could have been caused by the relatively small number of observations. Secondly, it could have been evidence that older people managed to eventually overcome most economic disadvantages of having less education. Thirdly, it could have meant that the older individuals were educated at a time when firms were less impressed by the value of formal educational qualifications and were prepared to accept people of lower educational attainment and train them on-the-job.

To calculate the social rates of return Blaug adopted the following procedure:[71]

1. The mean net lifetime earnings stream associated with each educational level was discounted at appropriate rates of interest to obtain gross present values for each level of education.

2. The direct costs per successful candidate for each educational level were similarly discounted.

3. Net present values were obtained by subtracting discounted costs from gross discounted benefits.

4. The net present values at various discount rates for each educational level relative to level 0 were plotted graphically.

Blaug's procedure for determining the private rates of return was as follows:[72]

1. Mean lifetime earnings streams associated with each educational level were first ascertained. To these were added student's earnings and vacation earnings. Subtracted were out-of-pocket costs of education, where relevant.

2. Lifetime earnings were adjusted to take account of income tax payments by applying, to the salaries of each age-education group, a representative tax rate.

3. The tax-adjusted net lifetime earnings were then discounted at various discount rates and subtracted from the discounted stream for level 0. The method allowed automatically for foregone earnings of students.

4. Here again the net present values were plotted graphically.

Table 4.17[73] gives a summary of the social and private rates of return calculated by Blaug using the method outlined above. In each case the rates of return were to the base-level 0.

TABLE 4.17:   SOCIAL AND PRIVATE RATES OF RETURN TO
               DIFFERENT LEVELS OF EDUCATION, MALES,
               GREAT BRITAIN, 1967

Level of Education	Social (%)	Private (%)
1	5,5	5,0
2	8,5	8,0
3	7,0	8,0
4	7,5	9,5
5	6,0	8,5
6	8,0	9,5

4.7 THE CONTRIBUTION OF MALHERBE

In his comprehensive treatise on education in South Africa,
E.G. Malherbe has devoted an entire chapter to the subject of
education as an investment.[74] In it he has estimated the
contribution made by White and Non-White graduates to the economy
of South Africa. His findings have shown, for example, that as a
result of superior earning capacity a White male graduate (as
opposed to his non-graduate counterpart) contributed R2 281 per
annum to the economy. However, he showed, also, that it would
take him nine years before the cost of his higher education could
be recouped.

Using the information provided by the 1970 Census, Malherbe compiled
a list of incomes of males and females for Whites, Coloureds and
Asians (presumably mostly Indians) with certain educational
qualifications. His findings are summarised in *Table 4.18*[75] below.

TABLE 4.18:   MEDIAN INCOMES AT DIFFERENT LEVELS OF VOCATIONAL
                 AS WELL AS ACADEMIC TRAINING, SOUTH AFRICA, 1970

Educational Qualifications	Whites		Coloureds		Asians	
	male 70%	female 30%	male 63%	female 37%	male 83%	female 17%
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	R	R	R	R	R	R
B. degree	5623	2378	1721	1365	1714	1196
B. degree and diploma	5278	2583	1736	1319	1712	1226
Std X	3342	1532	1081	817	1063	797
Std X and diploma	4550	1968	1509	1036	1188	1009
Std VIII and IX	2983	1373	930	660	903	558
Std VIII and IX and diploma	3823	1797	1615	974	1442	954
Up to Std VII	2513	1170	779	430	764	330
Std VII and diploma	3511	1671	1617	1049	1168	1025

Malherbe has drawn a number of conclusions from these figures. The
most important of these, for the purpose of this investigation, is
that the acquisition of a vocational diploma (over and above a basic
level of education) is accompanied by a substantial increase in
incomes. On the average for all races shown above and for all
post-Std X diplomas the increase was calculated as ± 30%.[76] On
the basis of the information supplied in *Table 4.18*, *Table 4.19*
shows the position for Whites only to be as follows:

TABLE 4.19:   ADDITIONAL INCOMES OF WHITE DIPLOMA HOLDERS,
                SOUTH AFRICA, 1970

EDUCATIONAL LEVEL	MALES		FEMALES	
	Change in income	% change in income	Change in income	% change in income
(a)	(b)	(c)	(d)	(e)
	R		R	
B. degree and diploma	-345	-6,5	205	8,6
Std X and diploma	1208	36,1	436	28,5
Std VIII and IX and diploma	840	28,2	424	30,9
Std VII and diploma	998	39,7	501	42,8

Notes on Table 4.19:

(a)   Basic educational level plus a vocational diploma.

(b)   From Table 4.18, Col. (b), Row 2 minus Row 1.

(d)   From Table 4.18, Col. (c), Row 2 minus Row 1.

On the average, the acquisition of a diploma enhanced the income of
White males by 24.4%. Only in the case of a bachelor's degree and
a diploma were median incomes actually lower than the median income
of a bachelor's degree only. (Malherbe calculated separately that
a White university graduate with a teacher's diploma earned about 6%
more than the average graduate without a teacher's diploma).
Females, on the other hand, earned higher incomes in all instances
where additional diploma study was undertaken. On the average the
income of White females increased by 27.7% through the acquisition
of a diploma.

In the case of Coloureds the increase in incomes was even more substantial; amounting in some instances to changes in excess of 100%. Also using information from *Table 4.18*, *Table 4.20* shows the changes in incomes of Coloureds through additional study to be as follows:

TABLE 4.20:   ADDITIONAL INCOMES OF COLOURED DIPLOMA HOLDERS, SOUTH AFRICA, 1970

EDUCATIONAL LEVEL	MALES		FEMALES	
	Change in income	% change in income	Change in income	% change in income
(a)	(b)	(c)	(d)	(e)
	R		R	
B. degree and diploma	15	0,9	-46	-3,5
Std X and diploma	428	39,6	219	26,8
Std VIII and IX and diploma	685	73,7	314	47,6
Std VII and diploma	838	107,6	619	144,0

Notes on Table 4.20:
(a)   Basic educational level plus a vocational diploma.
(b)   From Table 4.18, Col. (d), Row 2 minus Row 1.
(c)   From Table 4.18, Col. (e), Row 2 minus Row 1.

In the case of Coloured males vocational diplomas resulted in an average increase in income of 55.5% while the corresponding increase for females was 53.7%.

For Asian males the average increase in income owing to diploma study (based on the information supplied by Malherbe in *Table 4.18*) was 31,4% and for females the increase was 77,7%. Details of these conclusions are reflected in *Table 4.21* below:

TABLE 4.21:   ADDITIONAL INCOMES OF ASIAN DIPLOMA
                HOLDERS, SOUTH AFRICA, 1970

EDUCATIONAL LEVEL	MALES		FEMALES	
	Change in income	% change in income	Change in income	% change in income
(a)	(b)	(c)	(d)	(e)
	R		R	
B. degree and diploma	-2	-0,1	30	2,5
Std X and diploma	125	11,8	212	26,6
Std VIII and IX and diploma	539	59,7	396	71,0
Std VII and diploma	404	52,9	695	210,6

Notes on Table 4.21:
(a)   Basic educational level plus a vocational diploma.
(b)   From Table 4.18, Col. (f), Row 2 minus Row 1.
(d)   From Table 4.18, Col. (g), Row 2 minus Row 1.

For White males the median annual income of graduates was R5 623 as opposed to R3 342 for matriculants. In the case of White females the corresponding figures were R2 378 and R1 532. However, before drawing any conclusions about these differences for the economy of the country, Malherbe considered it necessary to take two further measures. Firstly he considered the cost, to the country, of providing the university training and secondly be considered the income foregone during study for a degree.[77] Malherbe estimated that the annual cost to parents and to the State of training a university graduate was R7 000 in the case of males and R5 000 in the case of females. Unfortunately, details of how these figures were arrived at were not provided and consequently the precise

cost components considered remain unknown. In determining the
income foregone during the post-high school period, when a
university student was a non-productive unit in the country's
economy, Malherbe multiplied the average median income of
matriculants (from *Table 4.18*) by four (the average time taken
to acquire a degree). This resulted in a median income foregone
of R13 368 (R3 342 x 4) for males and R6 128 (R1 532 x 4) for
females. He thus arrived at a total amount of R20 368
(R7 000 + R13 368) as the cost of "producing" a male graduate
and an amount of R11 128 (R5 000 + R6 128) as the relevant cost
for a female graduate. To give an indication of the contribution
of such extra study to the economy, Malherbe pointed out that
since the surplus income of a male graduate over a matriculant
was R2 281 per annum (i.e., R5 623 - R3 342), it would take him
nine years (R20 368 ÷ 2281) before he could "begin to contribute
positively to the country's economy by virtue of his higher
earnings capacity as a graduate." On the same basis it would
take a female 13 years before she could make a positive contribution
to the economy.

As there were no figures available concerning the incomes of Blacks,
Malherbe confined his investigation of Non-White graduates to Asians
and Coloureds.[78] Taking into account the cost to the State and
parents as well as earnings foregone Malherbe estimated that the
total cost of "producing" a male graduate was R14 780 and R13 700
for a female graduate. In spite of the lower earnings of Non-Whites
(and consequently lower earnings foregone) these figures were found
to be relatively high. The reason for this was that the cost to
the State of university training was an estimated R10 500 as
opposed to an average of R6 000 per annum for Whites. This
difference was due mainly to the smaller numbers at Non-White
universities. Malherbe has shown that before a Non-White male
graduate began to contribute positively to the economy it would
take him 23 years. Thereafter his contribution would be R650 per
annum. A Non-White female graduate would take even longer before
beginning to contribute positively (27 years). Thereafter her
contribution was R510 per annum.

It must be appreciated that Malherbe has made no attempt to calculate
rates of return; either social or private. Consequently a Hansen-type
investigation could not be anticipated. Malherbe's intention was to
give some indication of the value of university study by pointing out
how long it would take a graduate before he/she began to contribute
positively to the economy and to show how much that contribution
would be each year. By so doing Malherbe has given us some indication
of the social value of a university degree.

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CHAPTER 5

5. TEACHERS EMPLOYED BY THE DEPARTMENT OF INDIAN AFFAIRS

Before discussing investment in teacher education for Indians,
it is important to have an understanding of Indian teachers as
a group. It is expected that such an understanding will emerge
from a discussion of the control of Indian Education; the teaching
personnel of the Department of Indian Affairs; and the training of
Indian teachers. Finally, in Chapter 5, the human capital
implications of teacher education for South African Indians are
examined.

5.1 THE CONTROL OF INDIAN EDUCATION

5.1.1 Control by the Indian Immigrant School Board

The Department of Indian Affairs assumed control of Indian
Education in 1966. The history of the Indian people in
South Africa, however, dates back to 1860. In order to see
the present system of control over Indian education in its
true perspective an assessment must be made of the control
exercised by various authorities from the earliest times.

When the indentured Indian labourers arrived in Natal in
1860, a sound educational system had not evolved among the
Whites. It was hardly surprising, therefore, that no
significant development in the education of Indians took
place for almost a decade.[1] The first schools for Indians
were started by missionaries in 1869.[2] The Christian
missionaries did not wait until the question of responsibility
and control was settled. They were already in the field and
were largely responsible for the schools of those and
subsequent years.[3]

In 1878 Act No. 20 of the Natal Government made provision for
the establishment of an Indian Immigrant School Board.[4]
The function of the Board was, *inter alia*, to administer
"...such sums of money as may be voted from time to time
by the Legislative Council for the purposes of the Education

of the children of Indian parents."[5] In the course of its
duties the Board considered applications for grants from
newly-established schools. In making such grants consideration
was given to "...regular attendance and efficient conduct of
the schools."[6]

The Board also established its own schools from the funds
available to it. These were the so-called "government
schools" for Indians. In all only three such schools were
established. By far the largest portion of the Board's funds
were utilised in aiding established schools.[7] These were
the so-called "government-aided" Indian schools. This
remained the pattern of control over Indian education until
the abolishment of the Board in 1893. At that time there
were 26 schools for Indians. Two of these were Board schools
(presumably one had already been closed down) and the remainder
were Board-aided schools.

Although many Indians had exercised their option to remain in
South Africa and to make it their home, it would seem that this
had not been realised by the Natal Government. The system of
education for Indians up to this stage was a makeshift one
intended to meet a transitory need. Nevertheless, the Indian
Immigrant School Board had played a significant role. It co-
ordinated early Indian education in Natal and it supplemented
the effort made by the missionaries. In addition it represented
the first attempt by the Government to assist Indian education
financially.

5.1.2 Control by the Natal Education Department

With the abolishment of the Indian Immigrant School Board, the
control of Indian education became the responsibility of the
Natal Education Department in 1894.[8] No significant changes
in the system of Indian education occurred initially. Out of
sheer necessity the number of schools had increased to 36 in
1909/1910. Of these only 5 were government schools and the
remainder were government-aided schools.[9] An Education
Commission, appointed in 1910, made recommendations calling
upon the owners of estates (the employers of the indentured

Indians) to provide schooling for Indian children. For the first time, it would seem, the realisation had dawned, in some quarters at least, that the Indians were very much a part of the South African community and that the education of their children was the responsibility of some person or group of persons. In spite of this recommendation, however, and in spite of Natal acquiring a new position under the Act of Union (1910), the *status quo* with regard to Indian education remained.[10] Indeed, for the next two decades from 1910 onwards Indian education showed signs of deterioration. At the root of the problem was the acute shortage of school accommodation. Out of a school-going population of 32 000 pupils in 1926 only 9 150 were at school.[11]

As a direct outcome of the Cape Town Agreement (1927) between the Governments of South Africa and India, the Natal Provincial Administration agreed "to enquire into and report upon the question of the education of Indian children in Natal."[12] The resulting Commission made far-reaching recommendations to improve educational facilities for Indians. The Natal Education Department reacted positively, although not conclusively, to these recommendations. Kuppusami and Pillay comment that,

> *"A visible rise in enrolments and the emergence of an increasing number of schools were the outcome, but the system under which education functioned made it almost impossible for it to expand speedily and effectively."* (13)

Perhaps the most distinctive feature of the 1940's and 1950's was the introduction of the platoon school system. In spite of attempts by the Department and the Indian community, the demand for school accommodation could not be adequately satisfied. Therefore, purely as an experiment, a modified system of the platoon plan was instituted at Clairwood in 1941.[14] From that stage onwards the use of the system became widespread as more and more schools adopted the plan. By 1957 there were 6 912 boys and 5 743 girls attending private platoon schools in classes ranging from substandard one to standard five.[15] It must be stressed that the system found favour with the Indian community for it had the

immediate effect of alleviating the critical shortage of
school accommodation. However, it was hoped that the
measure would be a temporary one.

The year 1961 was an auspicious one for the Indians in
South Africa. The machinery was set in motion whereby
the Indian people were to acquire South African citizenship.
The consequent development of this was the creation of a
separate Government department (the Department of Indian
Affairs) to attend to the needs of the Indian people. The
Indian Education Act No. 61 of 1965 empowered the Department
of Indian Affairs to assume control of the education of
Indians. Eventually in 1966 the control of Indian education
moved into a new phase and passed out of the control of the
Natal Education Department.

5.1.3 Control in the Transvaal and the Cape Province

Indians from Natal began to enter the Transvaal (known at the
time as the South African Republic) since 1881. [16] Initially no
provision was made for the education of the Indian child by
the government of the South African Republic. As in the case
of Natal, early education in the Transvaal owed much to
missionary venture. The early mission schools, which were
unaided by the government, provided schooling for Whites,
Coloureds and Indians. [17] After the South African Republic
became a British Colony in 1902, moves were made towards
providing separate schools for Whites, Africans and other
races. Separate government schools were established for
Coloureds and grants were made to mission schools accommodat=
ing Coloured children. Indian children were permitted to
attend these schools. [18] In 1907 General Smuts was
appointed Minister of Education in the Transvaal. Smuts
drafted a new education act which altered the form of
control of education in the Transvaal. As a result of this
act control was exercised by the Education Department via
newly-created School Boards. Each School Board (to which
only Whites could be elected) also controlled the education
of Indian pupils in the area for which it was responsible. [19]

Moves were made to establish purely Indian schools in the
Transvaal in 1912. By 1921 three such schools had been
established. Overall control of these schools was still
the function of the Transvaal Education Department.[20]
In 1928 Kalilas Kichlu, a noted educationalist sent to
South Africa by the government of India, condemned the
sectarian nature of these schools and recommended their
discontinuance. The Transvaal Provincial Administration
accepted Kichlu's recommendation and within two years the
content of the education of Indians in the Transvaal was
identical to that imparted at White and Coloured schools.[21]
In spite of the development of separate Indian schools,
the practice of Indians attending Coloured schools persisted.
As recently as 1960, when there were 32 Indian schools in the
Transvaal, a small number of Indian children were still
attending Coloured schools.[22] Even after the assumption of
control over Indian education in the Transvaal by the
Department of Indian Affairs (1967), a number of Indian
children were still attending Coloured schools.[23]

As early as the mid 1870's Indians began to settle in the
Cape Province; especially around Port Elizabeth. By 1913
there were an estimated 2 000 Indians in the Cape Province.
From the beginning Indian children attended Coloured schools.
It was not until 1941 that the first government-recognised
Indian school was established.[24] Until the take-over of
Indian education by the Department of Indian Affairs, Indian
education was subjected to the same form of control that had
been applicable to Coloured education over the years. Even
in 1978 with only 4 Indian schools[25] in the Cape Province,
a large number of children attend schools of the Department
of Coloured Affairs.[26]

5.1.4   Control by the Department of Indian Affairs

Before the creation of the Union of South Africa in 1910,
each of the different provinces had its own legislation with
regard to Indians within its borders. After 1910, as a
result of legislation passed, certain matters concerning
Indians became the direct responsibility of the Central

Government. The Department of Interior and the Department
of Social Welfare and Pensions, for example, each had
divisions attending to relevant matters regarding Indians.[27]
The education of Indians, however, remained the responsibility
of the respective provincial administrations. On 2 August 1961,
the then Prime Minister of the Republic of South Africa,
Dr the Honourable H F Verwoerd announced the simultaneous
dissolution of the Asiatic Affairs Division of the Department
of Interior and creation of the Department of Indian Affairs.
The stated aim of the newly created Department was to give
special attention,

> "...to the economic and social development...
> as an independent community... of the Indian
> group in the Republic." (28)

From this stage onwards the scope of the Department of Indian
Affairs continued to broaden as more and more matters regarding
Indians came under its control. The Indian Education Act
(No 61 of 1965) made provision for the establishment of a
Division of Education under the jurisdiction of the Department
of Indian Affairs. The Division of Education assumed control
over Indian education in stages, commencing in 1966. The
education of Indians in Natal, which had previously been
controlled provincially by the Natal Education Department,
was officially drawn into the ambit of the Department of
Indian Affair's Division of Education on 1 April 1966.
Control over the education of Indians in the Transvaal
(previously under the auspices of the Transvaal Education
Department) and in the Cape Province (previously under the
auspices of the Cape Provincial Department) was assumed on
1 April 1967 and 1 April 1970 respectively.[29]

The Division of Education is headed by a Director of Education.
Until 1976 the Director was responsible to the Secretary and
the Minister of Indian Affairs. As from 2 January 1976 all
powers held by the Minister of Indian Affairs in terms of the
Indian Education Act were transferred to the Executive Committee
of the South African Indian Council (S.A.I.C.).[30] According
to a report in "The Star" of 2 January 1976,[31] for
administrative purposes, certain powers were being redelegated

to the Director and other officials of the Department of Education.
The Chairman of the S.A.I.C. was quoted as saying that the take-over
would not result in any major changes in control, as the S.A.I.C.
Executive Committee was taking over only those powers previously held
by the Minister, and the greater part of the control would still be in
the hands of the Director. *Figure 2*, adapted from "Stepping into the
Future,"[32] gives a detailed outline of the control of Indian education
by the Department of Indian Affairs.
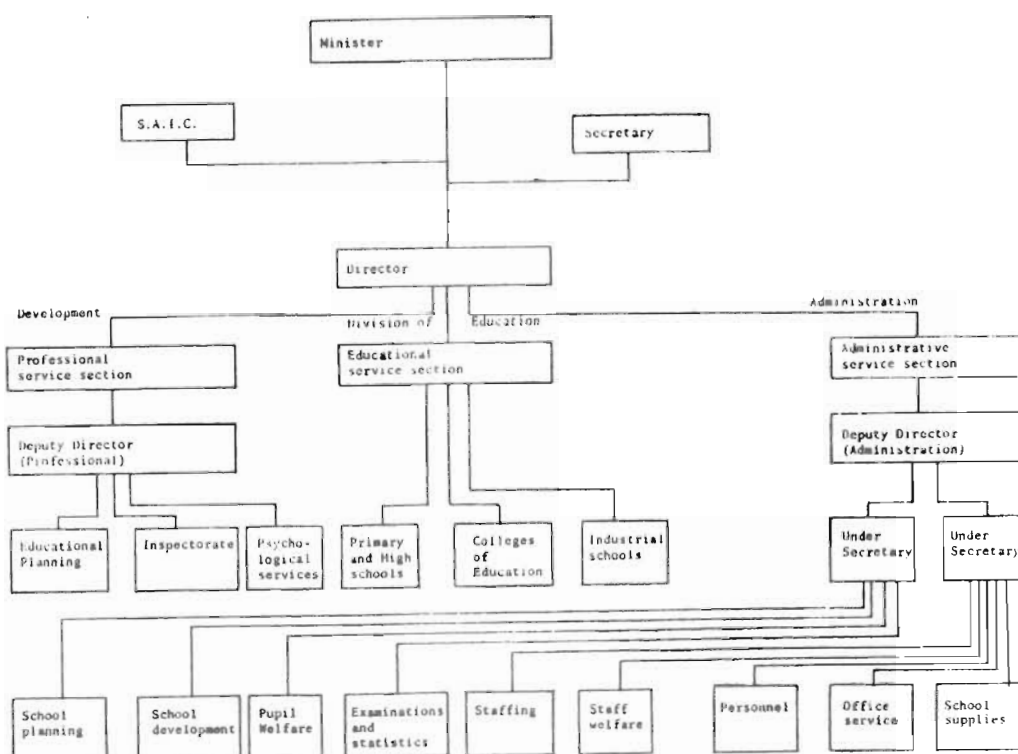
Fig. 2   Organisation Chart - Indian Education

5.2 TEACHING PERSONNEL OF THE DEPARTMENT OF INDIAN AFFAIRS

5.2.1 Indian teachers and pupils in the Republic of South Africa

For all intents and purposes any investigation concerned with the pupils and teachers of the Department of Indian Affairs can be considered to be an investigation of the Indian pupils and teachers of the Republic of South Africa. Apart from the 205 136 pupils[33] attending schools of the Department of Indian Affairs (1978) only a small number of Indian pupils are known to attend other schools. An agreement exists between the Department of Indian Affairs and the Department of Coloured Affairs whereby, at centres where there are no Indian schools, Indian pupils may attend Coloured schools and at centres where there are no Coloured schools, Coloured pupils may attend Indian schools.[34] In 1974, 3 844 Indian children attended Coloured schools in the Cape Province and the Transvaal. This represented a mere 2,1% of the school population of the Department of Indian Affairs for 1974.[35] Unfortunately the number of Indian pupils at Coloured schools at present (1978) is not known.[36] Since 1974 schools have been built for Indians in the Cape Province. However, with the greater increase in the school population the percentage of Indian pupils attending Coloured schools is estimated as fractionally higher than 2,1%. According to the Minister of Indian Affairs (Hansard 5 col. 446; Hansard 17 Col. 1170),[37] in 1977 there were three schools in the Cape Province catering exclusively for Indian pupils, and attended by 2 126 children. The estimated number of Indian pupils in the Cape was 6 330 (a projection based on the 1970 census) and those not attending Indian schools attended schools under the Administration of Coloured Affairs.[38] As a percentage of the 1977 Indian school-going population this group represented 2,15%; an estimated increase of 0,05% over the 1974 figure.

In 1978 some 1 151 Coloured children attended Indian schools (568 in the Transvaal; 356 in Natal; 227 in the Cape Province). This represented a mere 0,56% of the total school population of the Department of Indian Affairs for 1978. Apart from a further minor adjustment that may have to be made for Indian

pupils attending private schools, one may take the figure
of 205 000 as a close approximation of the number of Indian
school pupils in the Republic of South Africa in 1978.

Similar conclusions may be drawn about the number of Indian
teachers in the Republic of South Africa. In 1978, 7 553
teachers were employed by the Department of Indian Affairs.[39]
To this figure must be added the small number of Indian
teachers known to be employed, temporarily, by the Department
of Coloured Affairs. In addition, from the figure of 7 553
mentioned above must be deducted the 29 White teachers and 23
Coloured teachers employed in schools of the Department of
Indian Affairs.[40]

5.2.2 Provincial distribution of teachers and pupils of the Department of Indian Affairs

Of the 7 553 teachers employed by the Department of Indian
Affairs the majority (85,4%) were engaged in schools in Natal.
Only 14,6% of the teaching force of the Department was employed
in the Transvaal and the Cape Province. A detailed distribution
of teachers among the provinces is shown in *Table 5.1*[41] below:

TABLE 5.1:   PROVINCIAL DISTRIBUTION OF TEACHERS EMPLOYED
              BY THE DEPARTMENT OF INDIAN AFFAIRS - 1978

PROVINCE	Secondary Schools	Primary Schools	Special Schools	TOTAL	%
NATAL	2 201	4 185	63	6 449	85,4
TRANSVAAL	394	592	4	990	13,1
CAPE	49	65	-	114	1,5
TOTAL	2 644	4 842	67	7 553	100,0

As could be expected the largest proportion of pupils of the
Department was also to be found in Natal (86,3%). A detailed
distribution of the pupils among the provinces is given in
Table 5.2[42] below:

TABLE 5.2:   PROVINCIAL DISTRIBUTION OF PUPILS OF THE
DEPARTMENT OF INDIAN AFFAIRS   -   1978

PROVINCE	Secondary Schools	Primary Schools	Special Schools	TOTAL	%	Ratio to Teachers
NATAL	65 566	110 159	1 278	177 003	86,3	1:27,4
TRANSVAAL	9 837	15 333	152	25 322	12,3	1:25,6
CAPE	1 044	1 767	-	2 811	1,4	1:24,7
TOTAL	76 447	127 259	1 430	205 136	100,0	

A more comprehensive classification of the pupils of the
Department of Indian Affairs is given in *Appendix XI*. [43]

5.2.3 Classification of the teaching personnel

The classification of the teaching personnel of the Department
of Indian Affairs has a vital bearing on this investigation.
Two possible classifications are outlined here; both are
significant. The first of these has to do with teachers'
qualifications. In this regard *Table 5.3* [44] shows the
classification of Indian teachers into four distinct groups
according to qualifications.

TABLE 5.3:   TEACHERS EMPLOYED BY THE DEPARTMENT OF INDIAN
AFFAIRS ACCORDiNG TO QUALIFICATIONS HELD - 1978

QUALIFICATIONS	Secondary Schools	Primary Schools	Special Schools	TOTAL
Degrees with professional qualifications	908	454	19	1 381
Degrees without professional qualifications	15	14	-	29
Non-graduate with professional qualifications	1 581	3 989	40	5 610
Non-graduate without professional qualifications	140	385	8	533
TOTAL	2 644	4 842	67	7 553

Since this investigation is concerned particularly with
evaluating the investment made by teachers holding three-year
diplomas, the group with which it is most concerned is the
one classified as, "Non-graduate with professional qualifications."
Not all members of this group hold three-year diplomas but a
further narrowing down has been delayed until later in the
investigation. (Refer to page 163). It must be mentioned,
however, that the investigation has important implications
for members of the other groups as well. Here again, further
elaboration has been left to a later stage. The second
classification has to do with positions held by teachers.
The overall situation is adequately reflected in *Table 5.4*. [45]

TABLE 5.4:   TEACHERS EMPLOYED BY THE DEPARTMENT OF INDIAN
               AFFAIRS ACCORDING TO POSITION HELD -   1978

POSITION	Secondary Schools	Primary Schools	Special Schools	TOTAL
Principal	79	292	7	378
Deputy Principal	49	117	-	166
Head of Department	122	217	5	344
Senior Teacher	416	497	8	921
Teacher	*	*	47	5 744
TOTAL			67	7 553

* A separate calculation has not been made.

In theory a teacher in possession of a three-year teaching
diploma may aspire to any of the abovementioned positions.
However, the posts of Principal, Deputy Principal and Head
of Department in Secondary Schools are accessible only to
persons with higher qualifications. Usually the higher
qualification is a university degree.[46]

The object of this dual classification has been to show
that the prime subjects of this investigation cannot be
defined with clear-cut precision. They are a sub-set of
the group designated as being "non-graduate with professional
qualifications" and in addition they may be principals,
deputy principals, heads of department, senior teachers
or teachers. Further, they may be engaged in secondary
schools, primary schools or special schools in either
Natal, Transvaal or the Cape Province.

5.3 THE TRAINING OF INDIAN TEACHERS

5.3.1 A brief history of the training of Indian teachers

As in the case of school education the initiative for the
training of Indian teachers was taken by the Christian
Missionaries. To widen the scope of their activities more

teachers had to be found. It was not surprising that the
missionaries turned towards the Indian community as a source
of manpower. The first school for the training of Indian
teachers was started in Durban by Rev. Ralph Stott.[47]
This institution actually served a dual purpose; operating
as a school for younger pupils during a day session and as
a teacher-training centre for older pupils during an evening
session. The first teacher at this dual-purpose institution
was Munshi Henry Nundoo, an Indian from Benares. Some of the
teachers trained by Nundoo became teachers in other schools
established by Rev. Stott. However, many other teachers
trained by him were drawn away from teaching by more lucrative
opportunities.[48]

Suggestions to the Indian Immigrant School Board in 1884 to
establish a training institution for Indian teachers were
turned down as being premature.[49] In the meantime the
increasing demand for school accommodation and the critical
shortage of teachers persisted. The Natal Education Department
introduced examinations for the Junior and Senior Indian
Teachers' Certificate in 1900 but no provision was made for
the training of teachers. This prompted Canon A H Smith to
open the St. Aidan's Training College in 1904.[50] The entire
cost of the building was borne by the St. Aidan's Mission but
the Natal Government provided an annual grant of R400. The
College, which was staffed by lecturers from India, provided
both full-time teacher training and continuation classes for
unqualified teachers.[51] Although the College could not
alleviate the shortage of qualified teachers, it nevertheless
served a very pressing need.[52] Unfortunately, its activities
were reduced virtually to a standstill with the outbreak of
World War I in 1914. Several teachers and potential teachers
volunteered for the front and the lecturers who had staffed
the College returned to India. To overcome the problem the
Natal Education Department instituted week-end classes at
three centres for pupil-teachers and unqualified teachers
but the arrangement proved largely ineffective. What was
really needed was a residential college of education but the
Natal Administration could not, under the prevailing circum=
stances, contemplate such a step.[53]

As a result of a supreme effort on the part of the Indian
community, Sastri College was opened in 1930 as a combined
high school and training college.[54] In 1936 a separate
section of the Natal University College was created enabling
Indians and other non-whites to acquire degrees.[55]
University classes were inaugurated at Sastri College with
Mabel Palmer as organiser.[56] Until 1951, when the Spring=
field Training College was established, Sastri College and
the Natal University were mainly responsible for improving
the quality of Indian teachers. In the Transvaal, Indian
teachers were allowed to attend the training institution
established at Vrededorp in 1919 for Coloured trainees.[57]
This institution was later renamed the Eurafrican Training
Centre and Indians continued to attend it until a training
course was introduced separately for Indian teacher trainees
in 1954 at the Johannesburg High School.[58] In 1955 the
Johannesburg Training College was opened at Fordsburg to
concentrate solely on teacher education for Indians.[59]

The principal institutions now responsible for the training
of Indian teachers are Springfield College of Education (known
previously as Springfield Training College); Transvaal College
of Education (known previously as Johannesburg Training College)
and the University of Durban-Westville (known previously as
University College, Durban). All three institutions were in
existence prior to the establishment of the Department of
Indian Affairs and were each controlled by different authorities.
In October 1964 the Central Government decided to co-ordinate
all education for South African Indians under the jurisdiction
of the Department of Indian Affairs. Accordingly, a scheme
for the training of additional teachers was submitted to the
Minister of Indian Affairs and approved by him.[60] Amongst
other things, the new scheme made provision for a bursary fund
to assist teacher trainees and for the introduction of special
courses. This latter measure was achieved by co-ordinating the
efforts of the two Colleges of Education and by gaining the
assistance of the Council of the University College.[61]

5.3.2   Institutions for the training of Indian teachers

5.3.2.1 Springfield College of Education

In 1951 teacher training was transferred from Sastri College
to the Springfield Training College as it was then known.
Classes commenced with 125 students on 20 August 1951.[62]
Initially students could enrol for one of two courses: those
with a Junior Certificate (Std 8) could enrol for a two-year
professional certificate and those with a Matriculation
Certificate could enrol for a one-year course of professional
training. As early as 1952 changes in the nature and duration
of courses were implemented. In addition, entrance requirements
were also gradually made more stringent.[63]

An important mile-stone was reached in 1966 when the College
came under the control of the Department of Indian Affairs.
Renamed the Springfield College of Education, it continued
to grow in size and stature. The present (1979) enrolment
of the College is 844. *Table 5.5* gives details of the 1979
enrolment of the College.

TABLE 5.5:   ENROLMENT AT THE SPRINGFIELD COLLEGE
              OF EDUCATION - 1979

YEAR OF STUDY	Males	Females	TOTAL
First	123	191	314
Second	97	154	251
Third	88	191	279
TOTAL	308	536	844

Source   Department of Indian Affairs: *Pupil Statistics as at*
         (Division of Education)   *6 March 1979*, p. 24

All courses offered by the College are of three years'
duration and the minimum entrance requirement is the Senior
Certificate. A more detailed description of the minimun
entrance requirements to the College is given later in the
investigation. (Refer to page 208). A student may enrol for

one of three diplomas offered by the College:

1. The Junior Primary Diploma;
2. The Senior Primary Diploma; and
3. The Junior Secondary Diploma.

Students taking the Senior Primary Diploma may do so under one of two departments; Humanities or Science. Students taking the Junior Secondary Diploma may specialise in one of four directions: Humanities; Commerce; Industrial Arts; or Science.[64] *Appendix XII*[65] gives, in detail, the number of students enrolled for each of the above diplomas.

To give an indication of the role played by the Springfield College of Education, *Table 5.6*[66][67] shows the number of teachers who have graduated from the College since 1970. The percentage contribution to the teaching force for each year (in comparison with other teacher training centres) is also given.

TABLE 5.6:   DIPLOMAS AWARDED BY THE SPRINGFIELD
               COLLEGE OF EDUCATION - 1970 TO 1978

YEAR	No of diplomas awarded	Percentage contribution
1970	234	49,5
1971	194	52,7
1972	186	51,2
1973	149	42,7
1974	179	48,3
1975	93	43,9
1976	120	52,6
1977	149	59,1
1978*	226	60,3

* Information for 1978 supplied on request by the Department of Indian Affairs

The above figures show that the Springfield College of Education has been the most important institution for the training of Indian teachers for the last decade.

5.3.2.2 Transvaal College of Education

The first institution exclusively for the training of Indian
teachers in the Transvaal was the Johannesburg Training
College opened in Fordsburg in 1955. The College commenced
with 114 students who were prepared for primary as well as
secondary work. [68] When the Department of Indian Affairs
assumed control of school education and teacher education in
Natal in 1966, it also took control of teacher education in
the Transvaal. Control over school education in the Transvaal
was only assumed a year later in 1967. [69]

The Transvaal College of Education (the new name given to the
College in 1966) operates along similar lines as the Spring=
field College of Education. It offers the same courses and
it has similar objectives which may be summarised as follows:

1. To train teachers for work in the junior primary and
    senior primary phases of education;

2. To train teachers for work in the junior secondary
    phase of education; and

3. To raise the educational standards of the student
    teachers themselves.

At present (1979) the enrolment of the College is 245.
Table 5.7 gives details of the 1979 enrolment of the College.

TABLE 5.7:   ENROLMENT AT THE TRANSVAAL COLLEGE
               OF EDUCATION - 1979

YEAR OF STUDY	Males	Females	TOTAL
First	62	39	101
Second	37	23	60
Third	55	29	84
TOTAL	154	91	245

Source Department of Indian Affairs: *Pupil Statistics as at*
        (Division of Education)   *6 March 1979,* p. 24

(For details about the number of students enrolled for each
course refer to *Appendix XII*)

The Transvaal College of Education has played a vital role
in providing the teaching requirements of Indian schools in
the Transvaal. *Table 5.8*[70][71] shows the number of teachers
who have graduated from the College since 1970. The correspond=
ing percentage contribution to the teaching force for each
year, in comparison with other teacher training centres, is
given as well.

TABLE 5.8:   DIPLOMAS AWARDED BY THE TRANSVAAL
               COLLEGE OF EDUCATION - 1970 TO 1978

YEAR	No of diplomas awarded	Percentage contribution
1970	72	15,2
1971	64	17,4
1972	81	22,3
1973	75	21,5
1974	84	22,6
1975	53	24,5
1976	54	23,7
1977	27	10,7
1978*	31	8,3

* Information for 1978 supplied on request by the Department
  of Indian Affairs

For many years applications for admission to the College from
the Transvaal have been insufficient. In 1973, 1974 and 1975
the College was able to recruit all its students from the
Transvaal itself. However, again in 1976 and 1977 the
Director of Indian Education reported unsatisfactory response
from the Transvaal. Consequently students from Natal were
once again enrolled at the Transvaal College of Education.[72]

5.3.2.3 University of Durban-Westville

The University College Durban was established in terms of the
Extension of University Education Act No 45 of 1959. Classes
commenced in 1961 on temporary premises at Salisbury Island
in the Durban Harbour.[73] Up to 1964 there were only two
faculties; Arts and Science. Initially the Department of
Education (together with the Departments of Commerce and Law)
fell under the control of the Faculty of Arts. In 1965 a

a separate Faculty of Education was created.[74] Enrolment
for teaching courses commenced in 1961 with 6 students taking
undergraduate diplomas. This quickly rose to 100 students in
1962. Post-graduate diplomas were first offered in 1963 when
9 students enrolled. Here too numbers have steadily increased
over the years.[75]

At present the Faculty of Education of the University of
Durban-Westville (the University acquired this new name with
autonomy in 1971) offers courses to cater for the training of
teachers in all spheres of school education for Indians. A
list of the teaching diplomas and degrees offered by the
University is shown in *Table 5.9.*[76] Also shown are the
respective durations and minimum entrance requirements for
the various degrees/diplomas.

TABLE 5.9:   DEGREES AND DIPLOMAS OFFERED BY THE FACULTY OF
               EDUCATION OF THE UNIVERSITY OF DURBAN-WESTVILLE

Degree/Diploma	Duration	Minimum entrance requirements
University Higher Diploma in Education (Graduate)	1 year	Approved bachelor's degree
University Diploma in Education (Junior Secondary)	3 years	Senior Certificate
University Diploma in Education (Senior Primary)	3 years	Senior Certificate
Bachelor of Paedagogics	4 years	Senior Certificate with exemption
Diploma in Special Education	2 years*	Approved teaching diploma
Diploma in School Counselling	2 years*	Approved teaching diploma
Diploma for Teachers of Deaf and Hard of Hearing	2 years*	Approved teaching diploma
Diploma in teaching of Physiotherapy	2 years*	Approved teaching diploma
Diploma in Resource Centre Management	2 years*	Approved teaching diploma
Bachelor of Education	2 years*	Bachelor's degree plus teaching diploma
Master of Education	5 years (max.)*	Bachelor of Education Degree

* Offered part-time only

The 1979 enrolment for full-time courses in the Faculty of
Education numbered 732. *Table 5.10* gives further details
of enrolment for 1979.

TABLE 5.10:   ENROLMENT AT THE UNIVERSITY OF DURBAN-
WESTVILLE (FACULTY OF EDUCATION) FOR
FULL-TIME DEGREES AND DIPLOMAS - 1979

YEAR OF STUDY	Males	Females	TOTAL
First	113	87	200
Second	109	114	223
Third	112	97	209
Fourth (B.Paed. only)	36	15	51
One-year course (UHDE)	31	18	49
TOTAL	401	331	732

Source   Department of Indian : *Pupil Statistics as at*
          Affairs (Division of   *6 March 1979*, p. 26
          Education)

(For details about the number of students enrolled for each
course refer to *Appendix XII*)

Since 1970 the University has awarded 767 first diplomas and
degrees in education. *Table 5.11*[77][78] shows the number of
teaching degrees and diplomas awarded to full-time students
since 1970 and the percentage contribution made towards the
total supply of new teachers for each year.

TABLE 5.11:   DEGREES AND DIPLOMAS AWARDED BY THE FACULTY
                OF EDUCATION OF THE UNIVERSITY OF DURBAN-
                WESTVILLE TO FULL-TIME STUDENTS - 1970 TO 1978

YEAR	Degrees/Diplomas Awarded			Percentage contribution
	Degrees	Diplomas	Total	
1970	-	134	134	28,3
1971	-	59	59	16,0
1972	-	62	62	17,1
1973	-	89	89	25,5
1974	-	108	108	29,1
1975	15	52	67	31,6
1976	12	42	54	23,7
1977	10	66	76	30,2
1978*	23	95	118	31,4

* Information for 1978 supplied on request by the Department of Indian Affairs.

The most important contribution of the Faculty of Education is in connection with graduate teachers. In 1974, of the 108 diplomas awarded, 24 were Post-Graduate Secondary Teachers' Diploma. In 1975, for the first time, the Bachelor of Paedagogics degree was awarded to 15 students. In addition, of the 52 diplomas awarded, 17 were University Higher Diplomas in Education (Graduate).

5.3.2.4 M.L. Sultan Technikon

The M.L. Sultan Technical College (now known as the M.L. Sultan Technikon) has also played an important role in the training of Indian teachers, albeit to a lesser extent than the institutions already mentioned. The College entered the sphere of tertiary education in 1966 with the gradual passing of control of secondary vocational education to the Department of Indian Affairs. The new status of the M.L. Sultan Technical College was affirmed under the Indians' Advanced Technical Education Act No 12 of 1968. [79]

Enrolment for teacher education commenced in 1966 with 23
teacher trainees. Amongst various diplomas offered by the
College were the following four teaching courses:[80]

1. Education Diploma in Commerce;
2. Education Diploma in Home Economics;
3. Specialist Course for Physical Education Teachers; and
4. Specialist Course for Industrial Arts Teachers.

The first two courses mentioned above were of three years'
duration and the minimum entrance requirement in each case
was the Senior Certificate. The remaining two courses were
of one year's duration but these courses were available only
to students in possession of a two-year teaching diploma.
Table 5.12[81][82] shows the number of students who have
acquired teaching diplomas at the M.L. Sultan College since
1970. The comparative contribution to the teaching force
made by the College for each year is also given.

TABLE 5.12: DIPLOMAS AWARDED BY THE M.L. SULTAN TECHNICAL
COLLEGE (DIVISION OF EDUCATION) - 1970 TO 1973

YEAR	No of diplomas awarded	Percentage contribution
1970	33	7,0
1971	51	13,9
1972	34	9,4
1973	42	10,3

The M.L. Sultan teacher training division has had a limited
existence. At the end of 1973 teacher education was dis=
continued. Staff and students were incorporated into the
Springfield College of Education.[83]

5.4 THE HUMAN CAPITAL IMPLICATIONS OF TEACHER EDUCATION FOR SOUTH AFRICAN INDIANS

The credibility of this investigation rests upon acceptance of the
human capital concept. It must be realised that the traditional
concept of investment as tangible plant, machinery and equipment
is too narrow and restrictive. The concept of capital must be
broadened to include intangible human capital as well.

Education was shown to be an important form of human capital. (Refer to Chapter 2). Like all forms of education, teacher education is also an investment in human capital. Teacher education must be a form of capital since it renders a productive service which is of value to the economy. Since education becomes a part of the person receiving it, it must be human capital. More so than other forms of education (notably pre-primary, primary and secondary), teacher education is undertaken to develop vocational skills. Once this is recognised and accepted it is not difficult to see that teacher education is an investment; undertaken to improve productivity and to secure higher earnings.

The argument that education is undertaken to promote cultural enlightenment in its widest sense, is not in conflict with the vocational implications of teacher education. In actual fact these seemingly opposite goals of education complement each other. No form of education (indeed, no form of economic activity) can be completely devoid of its cultural undertones. In any event it is not desirable that education should be impoverished in this way. Even in the apprenticeship of tradesmen (no other form of education is more vocationally orientated) cultural ideals are transmitted in the course of education. This is both inevitable and necessary. We do not perform our vocation (whether it be teaching or trading or whatever) in a vacuum. We integrate with a community and with society at large. Any cultural attributes acquired in the course of teacher education are therefore, in a sense, vocational as well. They help us to perform our tasks as teachers more effectively.

The Indian community of South Africa has always regarded education as an investment in the economic well-being of its youth. Evidence of this attitude has been displayed in the constant efforts on the part of the Indian community to improve educational facilities. This was particularly applicable during the 1940's when, "...it had become the general practice... for the Indian community to erect its own (school) buildings."[84] Sastri College, built in 1930 out of funds collected mainly from Indian businessmen,[85] stands as a monument to the effort by the Indian community to further the education of its own people. This may well be the reason for resistance from certain areas of the Indian community to suggestions that Sastri College be absorbed as a part of the M.L. Sultan Technikon.

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CHAPTER 6

6. PRIVATE AND SOCIAL RATES OF RETURN ON AN INVESTMENT IN A THREE-YEAR TEACHING DIPLOMA

6.1 INTRODUCTION

6.1.1 The aims of the main investigation

In this Chapter, which contains the main part of the investigation, a *private* rate of return and a *social* rate of return are calculated separately for males and females. In both instances, the rate of return is on an investment in a three-year teaching diploma made by an employee of the Department of Indian Affairs. The private rate of return, which is the return that accrues to the individual teacher as a result of his personal investment, is expected to assist a prospective teacher in deciding whether or not to pursue a career in teaching. Such a rate of return would indicate to the individual what economic benefit he or she could expect by investing in the extra study needed to acquire a teaching diploma. On the other hand, the social rate of return is expected to show the return that society may expect to earn from its investment in teacher education. It is hoped that such a rate of return would give the educational authorities an indication of the effectiveness of the resources allocated to this particular branch of education.

6.1.2 An outline of the procedure followed

In Chapter 4 an assessment was made of several important investigations in the field of educational investment. Although some of these investigations did not themselves produce actual rates of return, they did, nevertheless, make important contributions towards the procedure eventually used in calculating rates of return to investment in education. In fact the method of calculating rates of return used by Hansen[1] may well be regarded as the combination of the

efforts of several investigators.   Subsequent investigations, notably those of Blaug,[2] have endorsed the basic strategy adopted by Hansen.   The general approach applied by Hansen and Blaug in their respective investigations is used, with minor deviations, in this investigation as well.   These deviations have been necessary because of the particular circumstances of the investigation.

The following steps are taken in calculating the private rate of return on an investment in a teaching diploma made by an employee of the Department of Indian Affairs:

Step 1:   The *direct costs* of the investment are first determined.   These costs include actual payments made by an individual (or by his parent) on such items as books and fees.   Direct costs are determined separately for each year over the duration of the entire course (three years).

Step 2:   The *opportunity costs* of the investment are also established for each year over the three-year duration of the course of study.   Opportunity costs relate to the earnings that a student foregoes by deciding to study for the diploma rather than taking up immediate employment.

Step 3:   By combining the direct costs and the opportunity costs of the investment the *total private resource costs* are obtained.

Step 4:   As opposed to the costs of the investment the *net earnings benefits,* accruing as a result of the extra study, are determined next.   This involves establishing two life-income profiles - one representing the higher level of education (that of the teacher holding a diploma) and the other representing the base level of education (that of the matriculant clerk).

Step 5: The private rate of return is eventually calculated by constructing a *cost-net benefit-stream* and then discounting this "stream" to the present time. Basically the cost-net benefit-stream is the net result of combining the costs and net benefits of the investment over its entire duration.

In calculating the social rate of return much the same procedure is followed as in the case of the private rate of return. However, in addition to the *direct costs* and *opportunity costs* of the individual, consideration is also given to the costs incurred by the Department of Indian Affairs in providing teacher training facilities. These three cost factors combined give the *total social resource costs* of the investment. The *net earnings benefits* used to calculate the social rate of return, must use incomes gross of income tax. Since income tax is a benefit to the State and consequently to society, pre-tax earnings contain the benefits of both the State and the individual. The post-tax part of the income (pre-tax income less the tax), which is the benefit accruing to the individual is also a benefit to society since the individual is also a part of society. Finally the *cost-net benefit-stream* is constructed by combining the total social resource costs and the net earnings benefits over the duration of the entire investment.

6.2 A PRELIMINARY INVESTIGATION

It was considered necessary to undertake a preliminary investigation before embarking on the main investigation. There were two important reasons for this decision. A basic tenet of the investigation is that higher levels of education are accompanied by higher average earnings. Malherbe[3] showed this phenomenon to be generally true for Whites, Coloureds and Indians in South Africa. Thus, firstly, the preliminary investigation was conducted to establish whether this relationship between education and earnings also existed in the particular circumstances of the investigation. The second reason for the preliminary investigation was to test the effectiveness of two important questionnaires needed for the investigation.

In examining the relationship between level of education and level of earnings, the method used was similar to that used by Malherbe. Malherbe showed an average income for each level of education without giving consideration to age as a factor.[4] The earnings of 107 clerical employees and 277 teachers of the Department of Indian Affairs were estimated for the purpose of the preliminary investigation. *Table 6.1* gives details of the 107 clerical employees of the Division of Education used in the preliminary investigation.

TABLE 6.1: CLERKS OF THE DIVISION OF EDUCATION USED IN THE PRELIMINARY INVESTIGATION

MALES	
Position held	Number
Chief Clerk	1
Principal Clerk	8
Senior Clerk	18
Grade I Clerk	28
Grade II Clerk	41
	96
FEMALES	
Position held	Number
Senior Typist	1
Assistant Clerk Senior	-
Telephonist	2
Typist	5
Assistant Clerk	3
	11

The 277 teachers used in the preliminary investigation were drawn from thirteen schools of different type and size. *Table 6.2* shows details of the schools involved in the preliminary investigation.

TABLE 6.2:   TEACHERS OF THE DIVISION OF EDUCATION USED IN THE
              PRELIMINARY INVESTIGATION AND DETAILS OF THE SCHOOLS
              FROM WHICH THEY WERE DRAWN

NAME OF SCHOOL	Grade	Pupil enrolment	Male	Female	TOTAL
Apollo	SI	999	30	13	43
Clare Hills	SI	939	20	12	32
Phoenix	SI	*	22	13	35
Orient	SII	423	16	4	20
Alencôn	PI	923	10	14	24
Evergreen	PI	804	10	13	23
Parlock	PI	740	9	6	15
Phoenix No 1	PI	*	7	5	12
Phoenix Pioneer	PI	786	11	4	15
Resmount	PI	632	11	8	19
Willow Park	PI	804	11	5	16
Puntan's Hill	PI	301	5	3	8
Umhlatuzana	PII	447	6	9	15
TOTAL	-	-	168	109	277

*Enrolment not confirmed as at 1.4.1979.[5]

The returns from teachers were analysed into five post-matriculation
categories designated Category B, Category C, Category D, Category E
and Category F. The returns which did not belong to either of these
categories were excluded from the preliminary investigation. *Table 6.3*
shows the resulting classification.

TABLE 6.3:   TEACHERS USED IN THE PRELIMINARY INVESTIGATION
ACCORDING TO FIVE CHOSEN CATEGORIES

CATEGORY	Males	Females	TOTAL
B	20	18	38
C	60	62	122
D	41	7	48
E	27	6	33
F	11	-	11
Unclassified	9	16	25
TOTAL	168	109	277

In terms of the regulations of the Department of Indian Affairs
each category denotes a number of years of approved study after
the standard 10 level.[6]   For example Category B (M + 2) means
two years of approved study after matriculation; Category C (M + 3)
means three years of approved study after matriculation, etc. Each
of the above categories contained a cross-section of the teaching
personnel of the thirteen schools used. Included in each category
were teachers, senior teachers, heads of department, deputy
principals and principals.

The educational level of clerks was taken as matriculation (M).
Although some clerks might have held higher qualifications the
minimum qualification for their appointment and further progress
was standard 10. Two basic sources of information were used in
estimating the earnings of clerks. Firstly, use was made of the
existing salary scales of Indian civil servants. Secondly, use
was made of information supplied voluntarily by clerks, in response
to the research questionnaire shown in *Appendix XIII*. In addition
it was necessary to make the following further assumptions:-

1.   Grade II Clerks (males) and Assistant Clerks, Typists and
     Telephonists (females) were credited with a salary notch
     for each completed year of service over and above their
     respective starting salaries.

2. All clerks holding promotion posts (Grade I Clerks, Senior Clerks, Principal Clerks and Chief Clerks in the case of males and Senior Typists and Assistant Clerks Senior in the case of females) were assumed to have attained the maximum salaries of their preceding posts upon attaining their current promotion posts. Thereafter a salary notch, appropriate to the post held, was allowed for each completed year the post was held.

3. In all grades of clerical positions, for males and females, the maximum salary applicable to the post held was not exceeded.

In estimating the earnings of teachers (with educational levels of M + 2; M + 3; M + 4 etc.) use was made of the existing salary scales applicable to the different teaching posts and different categories of Indian teachers.[7] Here too, use was made of further information supplied voluntarily in response to the research questionnaire shown in *Appendix XIV*. As in the case of clerks, it was also necessary to make certain assumptions in estimating the earnings of teachers.

1. Teachers (both males and females) were credited with a salary notch, appropriate to their category, for each completed year of service over and above their respective starting salaries.

2. Senior teachers (a post which no longer exists) were treated as ordinary teachers but they were given an additional salary notch appropriate to their category. In effect, therefore, the maximum salary of a senior teacher was assumed to be one notch higher than the maximum salary of an ordinary teacher.

3. Teachers holding promotion posts were all assumed to have attained the maximum salary of their preceding post levels upon attaining their current promotion posts. Thereafter a notch, appropriate to their post level and category, was allowed for each completed year the post was held.

4. For all post levels, in the case of males and females, the maximum salary applicable to the post level and category held was not exceeded.

Appendix XV shows the estimated earnings of individuals belonging to the following educational levels:

Matriculants   (M)   -   clerks
Category   B   (M + 2)   -   teachers
Category   C   (M + 3)   -   teachers
Category   D   (M + 4)   -   teachers
Category   E   (M + 5)   -   teachers
Category   F   (M + 6)   -   teachers

Earnings of teachers belonging to category G were not estimated as no returns were received from teachers belonging to this category. Earnings of female teachers belonging to category F were also not estimated for the same reason. Using the information in *Appendix XV*, an *average salary* was estimated for each educational level. *Table 6.4* shows the averages for males and females.

TABLE 6.4:   THE AVERAGE EARNINGS OF MALES AND FEMALES BELONGING
                TO DIFFERENT EDUCATIONAL LEVELS, ESTIMATED FOR THE
                PURPOSE OF THE PRELIMINARY INVESTIGATION (NUMBER OF
                RETURNS GIVEN IN BRACKETS)

| Educational level | Average expected annual earnings | |
	Males	Females
M + 6	(11) R10 800	(0) R *
M + 5	(27) 9 372	(6) R7 125
M + 4	(41) 8 105	(7) 6 051
M + 3	(60) 6 110	(62) 4 859
M + 2	(20) 5 402	(18) 4 150
M	(96) 4 009	(11) 2 600

*No estimate made

Table 6.4 shows clearly that in the case of employees of the Department of Indian Affairs higher levels of education are accompanied by higher average earnings. The phenomenon shown by Malherbe[8] for White, Coloureds and Indians generally, that people with more education earn more, is true in this investigation as well.

6.3 THE COSTS OF THE TEACHING DIPLOMA

6.3.1 The direct costs

6.3.1.1 The sample chosen to determine direct costs

A survey involving students of Springfield College of
Education, Transvaal College of Education and University of
Durban-Westville (Faculty of Education) was undertaken to
ascertain the costs involved in attending a teacher training
institution for three years. A sample of 575 students,
comprising approximately one-third of the combined 1979
enrolment[9] was gathered from these three institutions.
Caution was taken to ensure that there was fair representation
for each of these institutions. In addition, the sample
selected contained a representative number of first year,
second year and third year students. Finally male students
and female students were proportionately represented in the
sample. In addition to this sample a further sample,
comprising fourth year students of the University of Durban-
Westville (Faculty of Education), was gathered. Out of a
population of 100[10] fourth year students, 72 students
responded to the research questionnaire. A combination of
the two samples is given in *Table 6.5* and *Table 6.6* for
males and females respectively.

TABLE 6.5:   SAMPLE TO DETERMINE THE DIRECT COSTS OF AN
                INVESTMENT IN TEACHER TRAINING - MALE STUDENTS

NAME OF INSTITUTION	First Year	Second Year	Third Year	Fourth Year	TOTAL	% Sample
Springfield College	41	33	32	-	106	34%
Transvaal College	21	12	16	-	49	32%
University of Durban-Westville	38	36	37	42	153	38%
TOTAL	100	81	85	42	308	
Percentage Sample	34%	33%	33%	63%	36%	

TABLE 6.6:   SAMPLE TO DETERMINE THE DIRECT COSTS OF AN
                INVESTMENT IN TEACHER TRAINING - FEMALE STUDENTS

NAME OF INSTITUTION	First Year	Second Year	Third Year	Fourth Year	TOTAL	% Sample
Springfield College	56	53	64	-	173	32%
Transvaal College	12	8	10	-	30	33%
University of Durban-Westville	38	36	32	30	136	41%
TOTAL	106	97	106	30	339	
Percentage Sample	33%	33%	33%	91%	35%	

The research questionnaire, distributed at random and
answered voluntarily, was administered personally by
the investigator to students of the Springfield College
and University of Durban-Westville. Assistance was sought
in administering the questionnaire to students of the
Transvaal College of Education.

6.3.1.2 <u>Subsistence costs</u>

The questionnaire administered to student teachers (refer to *Appendix XVI*) was designed to extract information pertaining to two groups of costs. The first group comprised *compulsory costs* and the second group comprised what was described by Schultz[11] and Bowman[12] as *"subsistence costs"*. Both these costs are necessary costs and are in fact actually incurred by students or their parents on their behalf. Compulsory costs (such as fees and books) are incurred specifically because of attendance at a teacher training institution. Subsistence costs (such as transport, clothing and board and lodge) would have been incurred by students in any case; even if they had decided to take up employment immediately upon matriculating. Whereas compulsory costs must be included in the costs of a teaching diploma, subsistence costs must not be included. Only if attendance at a teacher training institution necessitated extra costs on transport, clothing and board and lodge could such "extra" costs be justifiably included in the costs of acquiring a diploma.

In order to identify such extra costs, if any, a control group was also asked to estimate its expenses on transport, clothing and board and lodge. The control group was drawn from clerical employees of the Department of Indian Affairs. To reduce the number of interfering factors to a minimum, only single persons under the age of 26 years were included in the control group. Responses in this regard were made in the questionnaire shown in *Appendix XIII*. *Table 6.7* shows the average expenses of 112 male members of the control group and 308 male students.

TABLE 6.7:   AVERAGE MONTHLY SUBSISTENCE COSTS OF
              CLERKS AND TEACHER TRAINEES - MALES

EXPENSES	CONTROL GROUP (Clerks)	STUDENTS			
		First Year	Second Year	Third Year	Fourth Year
Transport	R12	R17	R18	R17	R21
Clothing	32	20	20	24	15
Board and Lodge	85	59	59	59	59
TOTAL	129	96	97	100	95

Table 6.8 shows the corresponding costs of 42 females
belonging to the control group and 339 female students.
In determining the subsistence costs of female members
of the control group both full-time and part-time assistant
clerks were approached.

TABLE 6.8:   AVERAGE MONTHLY SUBSISTENCE COSTS OF CLERKS AND
              TEACHER TRAINEES - FEMALES

EXPENSES	CONTROL GROUP (Clerks)	STUDENTS			
		First Year	Second Year	Third Year	Fourth Year
Transport	R12	R17	R18	R17	R21
Clothing	36	25	22	23	14
Board and Lodge	57	54	54	54	54
TOTAL	105	96	94	94	89

Since there was no reason why the transport costs of males
and females should be different the responses of males and
females were combined in arriving at the average transport
costs for the control group and for students. However,
since the practice teaching commitment of first year,

second year, third year and fourth year students varied it
was necessary to calculate the average transport cost for
each year of study separately. For the same reason expenses
on clothing were calculated separately for students of
different years of study. In addition average clothing
costs were also calculated separately for males and females.
While expenditure on board and lodge was calculated separately
for males and females, it was considered unnecessary to show
these costs separately for students in different years of
study. The average figures for board and lodge expenses of
students were arrived at by combining the actual expenses in
the case of students who were boarding and an estimated value
for board and lodge in the case of students living with their
families.

An examination of *Table 6.7* and *Table 6.8* shows that the
control group incurred higher expenses on clothing and board
and lodge than students in the case of both males and females.
This meant that no "extra" costs for clothing and board and
lodge could be assumed in calculating the costs of a diploma.
However, first year and third year students spent an average
of R5,00 per month more on transport than the control group.
For second year students the extra amount spent on transport
was R6,00 per month while for fourth year students it was
R9,00 per month. A part of the higher transport costs of
students could possibly be attributed to their practice
teaching requirements. In conclusion it can be said that
only "extra" costs for transport could be permitted as a
cost of acquiring a diploma. All remaining costs were in
fact subsistence costs.

6.3.1.3 Compulsory costs

Expenses incurred on textbooks, stationery and software for
the production of teaching aids were calculated separately
for males and females to account for the different curricula
followed by males and females. Such expenses had also to be
shown separately for each year of study. *Table 6.9* shows
the expenses incurred on textbooks, stationery and study aids
as revealed by the survey.

TABLE 6.9:   AVERAGE YEARLY EXPENSES ON TEXTBOOKS,
             STATIONERY AND STUDY AIDS INCURRED BY
             TEACHER TRAINEES

YEAR OF STUDY	Males	Females
First	R159	R150
Second	151	152
Third	141	143
Fourth	128	106

Apart from the expenses shown in *Table 6.9* the only other
compulsory cost incurred by students taking a teaching
diploma was in connection with fees. The fees charged by
each of the different teacher training institutions were
as follows:

	Registration	Tuition	Sports	Total
Springfield College*	R10,00	R 60,00	R 6,50	R 76,50
Transvaal College*	10,00	60,00	6,50	76,50
University of Durban-Westville[13]	20,00	270,00	20,00	310,00

*Information obtained through personal inquiry.

Fees of the University of Durban-Westville were substantially
higher than those of the Colleges. The reason was that fees
of the Colleges were subsidised by the Department of Indian
Affairs while fees of the University were not.

Weighted according to the 1979 enrolment for first year,
second year, third year and fourth year students of each
of the three institutions, *Table 6.10* shows the following
average amounts spent on fees for each year of study:

TABLE 6.10:   AVERAGE ANNUAL AMOUNT SPENT
ON FEES BY TEACHER TRAINEES

YEAR OF STUDY	AVERAGE FEES
First year	R152
Second year	174
Third year	162
Fourth year	310

6.3.1.4 A summary of the direct costs

The direct costs incurred by students of teacher training
institutions comprised expenditure on books, fees and "extra"
transport costs. *Table 6.11* and *Table 6.12* show the details
of direct costs of male and female students respectively.

TABLE 6.11:   DIRECT COSTS OF TEACHER TRAINEES - MALES

YEAR OF STUDY	Books	Fees	Extra Transport	TOTAL
	(1)	(2)	(3)	(4)
First year	R159	R152	R50	R361
Second year	151	174	60	385
Third year	141	162	50	353
Fourth year	128	310	90	528

TABLE 6.12:   DIRECT COSTS OF TEACHER TRAINEES - FEMALES

YEAR OF STUDY	Books	Fees	Extra Transport	TOTAL
	(1)	(2)	(3)	(4)
First year	R150	R152	R50	R352
Second year	152	174	60	386
Third year	143	162	50	355
Fourth year	106	310	90	506

In determining the annual amount spent on "extra" transport
it was assumed that students incurred such costs over an
academic year comprising ten calendar months.

6.3.2 The opportunity costs

The opportunity costs of the investment in teacher education accrue in the form of earnings foregone over three years. As opposed to the direct costs of the investment, which are actual costs, opportunity costs are hypothetical amounts representing the earnings that accrue to the base level of education for the first three years. In this investigation the estimated earnings of clerks employed by the Department of Indian Affairs have been used in determining opportunity costs. The salaries earned by the clerks during the first three years of employment were taken as the opportunity cost of going to a teacher training institution. For males opportunity costs for the three years were as follows:

First year - R2 520
Second year - R2 670
Third year - R2 820

For females the opportunity costs were:

First year - R1 842
Second year - R1 956
Third year - R2 070

In arriving at the above figures the existing salary scales of Grade II Clerks (males) and Assistant Clerks (females) were used since these were the starting posts of newly-employed clerks. It was assumed that both males and females would receive their normal annual increment but that no promotion would be received for the first three years of employment.

6.3.3 Total private resource costs

The direct costs of an investment in a teaching diploma plus the opportunity costs of the investment (i.e., the total resource costs) incurred by an individual are shown in *Table 6.13* and *Table 6.14* for males and females respectively.

TABLE 6.13:   TOTAL PRIVATE RESOURCE COSTS OF TEACHER TRAINEES
              -   MALES

YEAR OF STUDY (1)	Direct costs (2)	Opportunity costs (3)	Total resource costs (4)
First	R361	R2 520	R2 881
Second	385	2 670	3 055
Third	353	2 820	3 173

Note: Column (2) taken from Table 6.11

TABLE 6.14:   TOTAL PRIVATE RESOURCE COSTS OF TEACHER TRAINEES
              -   FEMALES

YEAR OF STUDY (1)	Direct costs (2)	Opportunity costs (3)	Total resource costs (4)
First	R352	R1 842	R2 194
Second	386	1 956	2 342
Third	355	2 070	2 425

Note: Column (2) taken from Table 6.12

From *Table 6.13* and *Table 6.14* we may conclude that in the
first year of study males invest an amount of R2 881 towards
their diplomas.   For females the investment in the first year
is R2 194.   In the second year males invest R3 055 and females
R2 342.   In the final year of study the respective investments
of males and females are R3 173 and R2 425.   Opportunity costs
comprise the larger cost component of the investment in each
year.   In the first year opportunity costs represent 87,5% of
the investment of males and 84,0% of the investment made by
females.   In the second year opportunity costs are 87,4% and
83,5% of the respective investments while in the third year
the opportunity costs of males and females are 88,9% and 85,4%
respectively of total resource costs.   If opportunity costs

were ignored the total costs of the investment would be considerably reduced so that the rate of return would be falsely inflated.

6.4 THE NET EARNINGS BENEFITS OF THE TEACHING DIPLOMA

6.4.1 Introduction

The net earnings benefits of the teaching diploma are in fact the increased earnings realised as a result of the further study undertaken. Such benefits are expected to accrue over the entire working life of the "investor". To determine the extent of the benefit it is necessary to construct a life-earnings profile for the base level of education (standard 10) and a life-earnings profile for the higher level of education (three-year teaching diploma). The difference between the two profiles will show the net earnings benefits produced by the higher level of education for a person over his entire career. A life-earnings profile is actually an age-earnings profile since it shows the earnings of an individual at different ages in his life.

Age-earnings profiles or life-earnings profiles have been constructed by various investigators from cross-sectional data about the earnings of persons belonging to a particular level of education. The implications of gathering data on earnings by this method have already been discussed (refer to pages 61-62). In this investigation the use of cross-sectional data involved gathering information about earnings from a cross-section of matriculants and from a cross-section of teachers holding a three-year diploma. On the basis of such information it was possible to show the average earnings of matriculants at each age-level and the average earnings of the teachers at each age-level as well. In other words, on the basis of cross-sectional data, it was possible to show the age-earnings profiles of matriculants and teachers possessing the three-year diploma.

6.4.2 <u>The earnings data of matriculants</u>

6.4.2.1 <u>The source of the sample</u>

Since the minimum entrance requirement to a teacher training institution is the Senior Certificate,[14] the base level of education in an investigation to determine rates of return on an investment in teaching is standard 10. At the outset it was stated that this investigation would be confined to the employees of the Department of Indian Affairs. Thus the life-time earnings of matriculants were determined by assessing the earning capacities of those employees of the Department engaged in the various grades of clerical positions. The highest of these posts is that of Chief Clerk. An employee of the Department with a standard 10 certificate, may reach such a position after a series of promotions through the ranks commencing as a Grade II Clerk. In the case of females, the highest posts to which they may aspire are those of Senior Typist or Assistant Clerk Senior. The various clerical positions that may be held are given below in order of seniority:

MALES	FEMALES
Chief Clerk	Senior Typist
Principal Clerk	Assistant Clerk Senior
Senior Clerk	Telephonist
Grade I Clerk	Typist
Grade II Clerk	Assistant Clerk

Employees of the Department of Indian Affairs holding the various clerical positions mentioned above fall under the eventual control of the Secretary and Minister of Indian Affairs.[15] Immediately under the control of the Secretary there are various sub-divisions.[16][17] One such sub-division is the Division of Education. At the head of the Division of Education is a Director of Education who has control over Indian Education in South Africa. Other matters concerning Indians (apart from education) are controlled by the Secretary of Indian Affairs via Regional Representatives in each of the Provinces of Natal, Transvaal and Cape Province. In Natal the head office of the Regional Representative is situated in Durban. Branches are situated at Chatsworth,

Verulam and Pietermaritzburg. Apart from the Division of
Education and the Offices of the Regional Representatives
one further sub-division exists, namely, the Efficiency
Division. This Division is under the control of a Chief
Work Study Officer whose office is based in Durban.

6.4.2.2 The sample chosen to construct the age-earnings profile of matriculants

In order to obtain the cross-sectional data needed to construct
the age-earnings profile of matriculants, employees in each of
the sub-divisions and branches mentioned above were approached
to complete a research questionnaire (refer to *Appendix XIII*).
The sample gathered therefore consisted of employees of the
Department of Indian Affairs, holding various clerical positions,
who voluntarily responded to the research questionnaire.
Table 6.15 shows details of the sample gathered from each
division and branch mentioned above.

TABLE 6.15:   SAMPLE CHOSEN TO DETERMINE THE AGE-
EARNINGS PROFILE OF MATRICULANTS

MALES	
Position held	Number
Chief Clerk	3
Principal Clerk	19
Senior Clerk	47
Grade I Clerk	78
Grade II Clerk	153
TOTAL	300
FEMALES	
Position held	Number
Senior Typist	2
Assistant Clerk Senior	1
Telephonist	2
Typist	8
Assistant Clerk	77
TOTAL	90

6.4.3   The earnings data of teachers holding three-year diplomas

6.4.3.1   The source of the sample

In gathering a sample to provide the cross-sectional data
needed to construct the age-earnings profile of teachers
holding a three-year diploma, consideration had first to
be given to such matters as the type of school in which
these teachers may be found; the posts occupied by them
and the category occupied by such teachers.

Types of schools: Basically two types of schools can be
identified; primary schools and secondary schools. Primary
schools cater for the junior primary phase (Class I, Class II,
Std. I) and senior primary phase (Std. II, Std. III, Std IV) of
education while secondary schools cater for the junior
secondary phase (Std. V, Std. VI, Std. VII) and senior
secondary phase (Std. VIII, Std. IX, Std. X) of education. [18]
However, it is not uncommon to find a certain amount of
overlap between the two types of schools. The overlap
must be seen as a continuation of the tradition which
existed prior to the introduction of differentiation in
Indian education in 1973. [19] In its ideal form different=
iation should see the existence of separate institutions
for each phase of education. The Department of Indian Affairs
has already taken steps in this direction.

Both primary schools and secondary schools are further
classified on the basis of pupil enrolment. [20] Secondary
schools may be classified as either SI or SII schools; the
distinguishing feature being that SI schools have an enrolment
of 600 pupils or more. Similarly, primary schools may be
designated P I, P II, P III, P IV on the basis of pupil
enrolment. A notable feature of such a classification of
primary schools is that pupils accommodated in platoon
classes are not considered in classifying a school; the
reasoning being that such classes are a temporary measure and
that a school should not be graded on transitory figures.

Apart from pupil enrolment an important distinction from one grade of school to another is the structure and composition of the teaching personnel. For example, the full permissible complement of an SI school according to the staff rationing formula[21] of the Department comprises a principal, a deputy principal, between 3 and 6 heads of department and a prescribed number of teachers (usually between 20 and 50) depending upon the exact pupil enrolment and the courses of study offered by the school. By contrast the smallest primary school (P IV) may consist of a principal and one or two teachers. *Table 6.16* shows the approximate structure of each of the different types of schools of the Department.

TABLE 6.16: APPROXIMATE STRUCTURE OF EACH OF THE DIFFERENT TYPES OF SCHOOLS OF THE DEPARTMENT OF INDIAN AFFAIRS

Type of School	Enrolment	Teaching personnel			
		Principals	Deputy Principals	Heads of Department	Teachers
S I	600+	1	1	3-6	21-50
S II	-600	1	0	1-3	3-20
P I	600+	1	1	2-5	17-33
P II	250-599	1	0	1-2	7-17
P III	50-249	1	0	0	2-7
P IV	-50	1	0	0	1-2

Posts occupied: The highest post to which a teacher may aspire is that of principal of a large high school (S I). Such a post is usually attained after a series of promotions through the ranks commencing with the post of Teacher. Hierarchically the following post levels have been approved by the Department.[22]

Post level	Type of Post
1	Teacher
2	Principal P IV
3	Head of Department (Primary)
	Principal P III
4	Deputy Principal (Primary)
	Head of Department (Secondary)
5	Principal P II
	Deputy Principal (Secondary)
6	Principal P I
	Principal S II
7	Principal S I

Salary categorisation: The principle of differentiated salary scales according to recognised qualifications is applicable to each of the post levels mentioned above.[23] What this in effect means is that, everything else being equal, where the same type of post or post level is held by two different people, a higher salary will be received by the one with a higher level of education. The salary categories, in ascending order, together with the qualifications with which they are usually associated, are as follows:[24]

Category Za
Lower than Std. 10.

Category aa
Std. 8 plus a two-year teaching diploma.

Category A (M + 1)
Std. 10 plus a one-year teaching diploma.

Category B (M + 2)
Std. 10 plus a two-year teaching diploma.

Category C (M + 3)
Std. 10 plus a three-year teaching diploma, OR
A bachelor's degree plus a low level of professional qualification.

Category D (M + 4)
A bachelor's degree plus a university higher diploma in education
OR
Std. 10 plus a three-year teaching diploma plus approved credit towards a bachelor's degree.

Categories E, F and G
Teachers entering the profession for the first time usually commence with category C or category D. Thereafter a teacher may improve his category by undertaking study towards approved diplomas or degrees. However, credit is not allowed for more than two diplomas and category G may only be reached if the teacher possesses an approved master's degree. (25)

Post levels 1 to 6 are accessible to teachers belonging to
category C (e.g., teachers holding a three-year diploma).
However, not all types of posts are accessible to members
of this group. All secondary school posts are inaccessible
to teachers belonging to category C so that teachers with a
three-year diploma may occupy the following posts only:

Post level	Type of Post
1	Teacher
2	Principal P IV
3	Principal P III
	Head of Department (Primary)
4	Deputy Principal (Primary)
5	Principal P II
6	Principal P I

6.4.3.2 The sample chosen to construct the age-earnings profile of teachers holding a three-year diploma

For the purpose of the investigation in general (as opposed
to the main investigation only) it was decided to extract a
sample comprising teachers of all categories and holding
different post levels from about one-third of the schools of
the Department of Indian Affairs. Out of a total of 380
schools,[26] 128 schools (+ 34%) were approached with the
request that all qualified teachers complete the relevant
research questionnaire. (Refer to *Appendix XIV*). In choosing
the 128 schools consideration was given to different types of
schools. Fair representation had to be given to S I, S II,
P I, P II, P III, and P IV schools because of the different
staff structure relevant to each. It was considered unfair
merely to choose an equal number of each type of school. A
more effective criterion for choosing the exact number of
each type of school was on the basis of the total number of
children enrolled in each type of school. For example, 56 648
pupils were accommodated in S I schools.[27] This figure
represented 28.2% of the total school population of 200 906
pupils. Accordingly 28.2% of the sample schools had to be
S I schools. This meant that 36 out of the 128 schools
approached had to be S I schools (i.e., 28.2% of 128).
Table 6.17 shows the basis upon which the number of each
type of school was decided.

TABLE 6.17:   THE NUMBER OF EACH TYPE OF SCHOOL SELECTED
                FOR THE SAMPLE

Grade	Number of Schools			Total	Pupils enrolled (+)	% pupils	Schools selected (+)
	Natal	Tvl.	Cape				
S I	50	7	1	58	56 648	28.2	36
S II	11	11	2	24	8 916	4.4	6
P I	108	14	2	124	91 497	45.5	58
P II	70	6	-	76	31 966	15.9	20
P III	64	15	-	79	11 174	5.6	7
P IV	10	9	-	19	705	0.4	1
TOTAL	313	62	5	380	200 906	100.0	128

As there were no environmental factors which dictated that
particular schools should be included in the sample, the
schools actually approached for assistance were those which
were most conveniently situated. Approximately 3 000
questionnaires were distributed to teachers in the sample
schools. 2 535 teachers responded to the questionnaire.
Appendix XVII gives details of the sample schools and shows
in addition the number of returns received from each school
In *Table 6.18* below the number of returns received for each
category is shown.

TABLE 6.18:   SAMPLE OF TEACHERS ACCORDING TO CATEGORY

Category	Males	Females	TOTAL
Za	6	42	48
aa	58	161	219
A	50	40	90
B	237	136	373
C	540	469	1 009
D	371	70	441
E	231	39	270
F	76	7	83
G	2	0	2
TOTAL	1 571	964	2 535

For the purpose of the main investigation (the rates of return on an investment in a three-year diploma), of special significance are the 1 009 teachers belonging to category "C". This group comprised males (540) and females (469) from primary schools and secondary schools occupying all post levels accessible to teachers of category C.

6.4.4 The age-earnings profiles of clerks (standard 10) and teachers (category C)

Both clerks and teachers responding to the questionnaires were classified into age-cohorts of five-year and ten-year intervals. *Table 6.19* shows the number of matriculants belonging to the selected age-cohorts.

TABLE 6.19:   SAMPLE OF MATRICULANTS ACCORDING TO
SELECTED AGE-GROUPS

Age-group	Males	Females	TOTAL
0-20	59	30	89
21-25	107	30	137
26-30	54	9	63
31-35	39	9	48
36-40	19	-	19
41-50	10	-	10
51-60	5	-	5
Unclassified*	7	12	19
TOTAL	300	90	390

*Not all returns could be classified because of incomplete
information.

Table 6.20 shows the number of teachers (category C)
belonging to the selected age-cohorts.

TABLE 6.20:   SAMPLE OF TEACHERS (CATEGORY C) ACCORDING
TO SELECTED AGE-GROUPS

Age-group	Males	Females	Total
0-25	126	202	328
26-30	179	179	358
31-35	111	51	162
36-40	55	16	71
41-50	46	13	59
51-60	20	-	20
Unclassified*	3	8	11
TOTAL	540	469	1 009

*Not all returns could be classified because of incomplete
information.

In the case of both matriculants and teachers the number of
responses in the over-60 year age-group was so small that
they were not considered.

In estimating the salaries of each individual (matriculants and teachers) the same criteria were used as in the case of the Preliminary Investigation. (Refer to page 147). In addition to the basic salary thus estimated two other sources of income were recognised. In accordance with the regulations of the Department of Indian Affairs each married male was credited with an annual vacation savings bonus of R200 per annum. Single men and women and married women were credited with a vacation savings bonus of R100 per annum.[28] Also added to the basic salary was an amount totalling 5% of the basic salary in the case of females and an amount totalling 7% of the basic salary in the case of males.[29] These amounts represented the employer's contribution towards the Government Service Pension Fund of which employees of the Department are members. It was decided to add the pension benefits immediately rather than contend with an uncertain lump-sum upon retirement. Since private rates of return are calculated on post-tax earnings a tax deduction, according to the requirements of the Receiver of Revenue, had to be made for each individual. *Appendix XVIII* shows the estimated earnings of matriculants (Group 2) and teachers (Group 1) after giving consideration to the foregoing factors.

To give a clearer indication of how the post-tax earnings were arrived at, the column headings of *Appendix XVIII* are reproduced below. A supporting explanation follows thereafter.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Basic salary	Vac. bonus	Emp. pension	Pre-tax earnings	Non-tax. pension	Taxable earnings	Tax code	Tax deduct.	Post-tax earnings

Column (1) - Basic salary: This amount was estimated on the basis of existing salary scales and from further information supplied by respondents to the research questionnaires.

Column (2) - Vacation savings bonus: This amount was calculated at 10% of the basic salary subject to a maximum of R200 in the case of married men and R100 in the case of all other recipients.

Column (3) - Employer's pension contribution: This was calculated at 7% of the basic salary in the case of males and 5% of the basic salary in the case of females as stipulated by the Public Service Commission and implemented by the Department.

Column (4) - Pre-tax earnings: This amount was obtained by adding together the basic salary (1), the vacation savings bonus (2) and the employer's pension contribution (3) to give the gross annual earnings benefits accruing to employees.

Column (5) - Non-taxable pension: This amount represents the combined contribution on a Rand for Rand basis, of the employer and the employee towards the Government Service Pension Fund. The figure was obtained by doubling the amount calculated as the employer's pension contribution (i.e., Column (3) x 2).

Column (6) - Taxable earnings: This amount was obtained by subtracting the non-taxable pension contributions of employer and employee from the gross annual earnings benefits (i.e., Column 4 less Column 5).

Column (7) - Tax code: This code, similar to the code used by the Receiver of Revenue, [30] was used to indicate the particular tax tables that had to be applied. Separate tax tables were applied for single persons, married women and married men. In the case of married men the tax code also showed the number of dependent children.

Column (8) - Tax deduction: This amount was calculated on the basis of the taxable earnings (Column 6) and according to the tax tables suggested by the tax code (Column 7).

Column (9) – Post-tax earnings: The tax deduction (Column 8) was subtracted from the gross annual earnings benefits (Column 4) to give the annual earnings benefits, net of income tax.

Actual calculation of the pre-tax earnings and the post-tax earnings was done on computer (N.C.R. Century 300, using Cobol language) by Durban Computers (Pty) Ltd. In the case of clerks (Group 2) the information given to the programmer was basic salary, sex, age, marital status and number of dependent children. In the case of teachers the information supplied was basic salary, category, sex, age, marital status and number of dependent children. In addition details regarding the Government Service Pension Fund and the Vacation Savings Bonus Scheme, applicable to both groups, were also supplied. The tax calculations were done, as authorised by the Secretary of Inland Revenue,[31] on the basis of the statutory rates of tax rather than in accordance with the prescribed tax deduction tables (I.R.P. 10).

Table 6.21 shows the average post-tax earnings of matriculants (Group 2 in *Appendix XVIII*) and teachers (Group 1, Category C in *Appendix XVIII*) for each of the selected age-cohorts.

TABLE 6.21:   AVERAGE POST-TAX EARNINGS OF MATRICULANTS
              (CLERKS) AND TEACHERS (CATEGORY C) FOR
              SELECTED AGE-GROUPS

| Age-group | Average post-tax earnings | | | |
| | Males | | Females | |
	Clerks	Teachers	Clerks	Teachers
0-20	R2 766	R -	R2 071	R -
21-25	3 227	4 686	2 454	3 737
26-30	4 403	6 308	2 873	5 059
31-35	5 251	6 958	3 012	5 628
36-40	5 721	7 161	*	5 691
41-50	9 131	7 597	*	5 971
51-60	7 073	8 720	*	*

*No estimate made as there were no returns

Although the earnings of male clerks and teachers in the
over-60 year group were not estimated (because of the small
number of returns in the sample) one could safely assume
that the average amount earned would not be smaller than
the average amount earned by the 51 to 60-year group. Thus
annual averages of R7 073 (clerks) and R8 720 (teachers)
were assumed for this latter age-group. A similar assumption
was made for female teachers in the 51 to 60-year group. In
estimating the earnings of female clerks in the 36 to 40-year,
41 to 50-year and 51 to 60-year groups it was assumed that the
nine members of the 31 to 35-year group would all remain in
service. Their earnings were then projected until the age
of retirement. The following average post-tax earnings could
thus be expected:

36 to 40 years   -   R3 269
41 to 50 years   -   R3 324
51 to 60 years   -   R3 324

The corresponding pre-tax earnings would be:

36 to 40 years   -   R3 485
41 to 50 years   -   R3 548
51 to 60 years   -   R3 548

Graphic representation of the post-tax earnings of matriculants
(clerks) and teachers (category C) is given in *Figure 3* and
Figure 4 for males and females respectively.
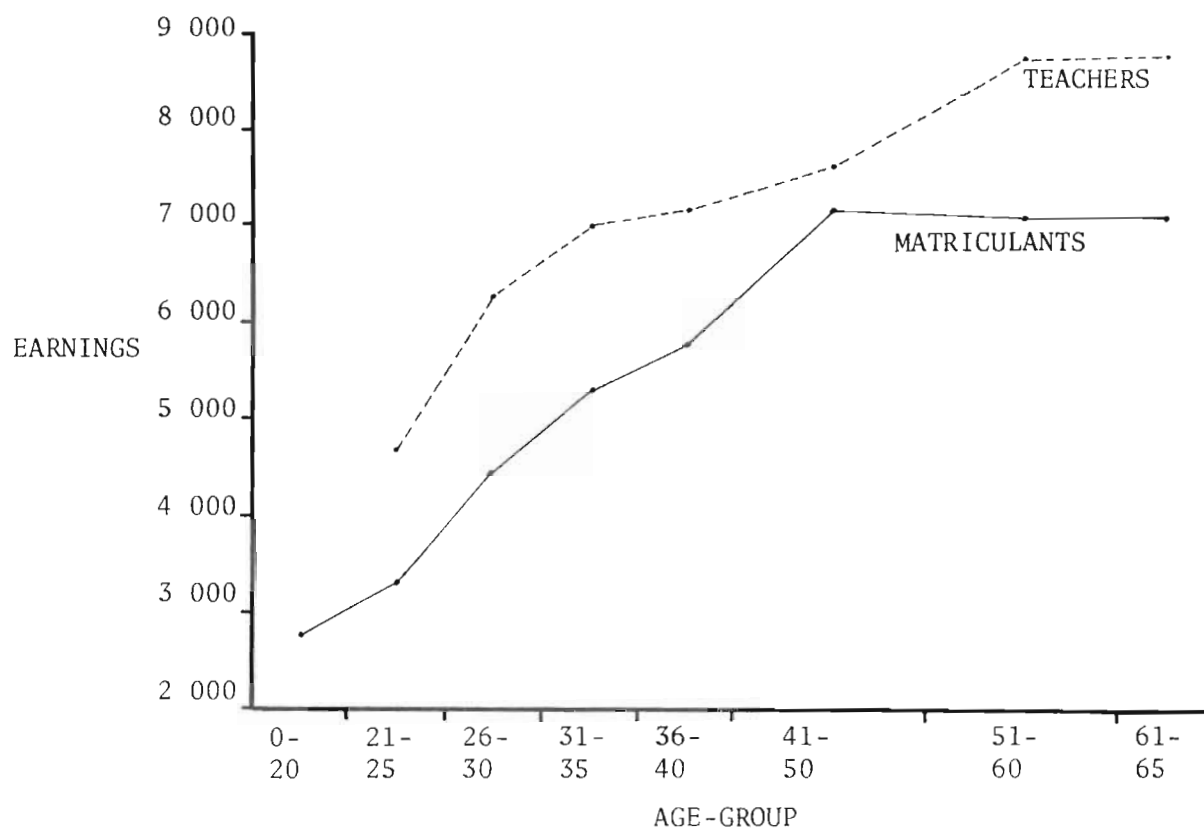
FIG. 3   AVERAGE POST-TAX EARNINGS OF MATRICULANTS AND
         TEACHERS (MALES)
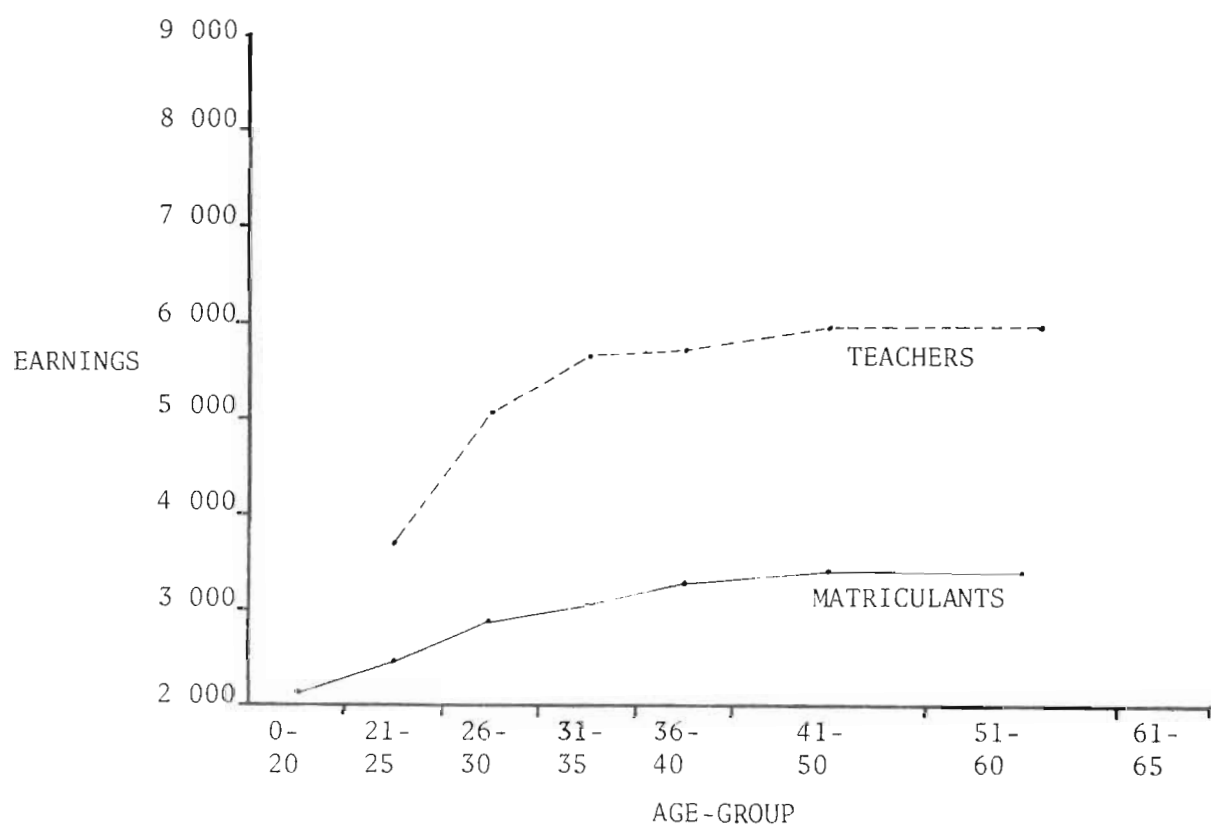
FIG. 4   AVERAGE POST-TAX EARNINGS OF MATRICULANTS AND
         TEACHERS (FEMALES)

The detailed age-earnings profiles of matriculants (clerks) and teachers
(category C) are given in *Table 6.22*

TABLE 6.22: AGE-EARNINGS PROFILES (POST-TAX) OF MATRICULANTS (CLERKS)
AND TEACHERS (CATEGORY C)

Age	Males		Females	
	Clerks	Teachers	Clerks	Teachers
	R	R	R	R
18 years	2 766	-	2 071	-
19 "	2 766	-	2 071	-
20 "	2 766	-	2 071	-
21 "	3 227	4 686	2 454	3 737
22 "	3 227	4 686	2 454	3 737
23 "	3 227	4 686	2 454	3 737
24 "	3 227	4 686	2 454	3 737
25 "	3 227	4 686	2 454	3 737
26 "	4 403	6 308	2 873	5 059
27 "	4 403	6 308	2 873	5 059
28 "	4 403	6 308	2 873	5 059
29 "	4 403	6 308	2 873	5 059
30 "	4 403	6 308	2 873	5 059
31 "	5 251	6 958	3 012	5 628
32 "	5 251	6 958	3 012	5 628
33 "	5 251	6 958	3 012	5 628
34 "	5 251	6 958	3 012	5 628
35 "	5 251	6 958	3 012	5 628
36 "	5 721	7 161	3 269	5 691
37 "	5 721	7 161	3 269	5 691
38 "	5 721	7 161	3 269	5 691
39 "	5 721	7 161	3 269	5 691
40 "	5 721	7 161	3 269	5 691
41 "	7 131	7 597	3 324	5 971
42 "	7 131	7 597	3 324	5 971
43 "	7 131	7 597	3 324	5 971
44 "	7 131	7 597	3 324	5 971
45 "	7 131	7 597	3 324	5 971
46 "	7 131	7 597	3 324	5 971
47 "	7 131	7 597	3 324	5 971
48 "	7 131	7 597	3 324	5 971
49 "	7 131	7 597	3 324	5 971
50 "	7 131	7 597	3 324	5 971
51 "	7 073	8 720	3 324	5 971
52 "	7 073	8 720	3 324	5 971
53 "	7 073	8 720	3 324	5 971
54 "	7 073	8 720	3 324	5 971
55 "	7 073	8 720	3 324	5 971
56 "	7 073	8 720	3 324	5 971
57 "	7 073	8 720	3 324	5 971
58 "	7 073	8 720	3 324	5 971
59 "	7 073	8 720	3 324	5 971
60 "	7 073	8 720	3 324	5 971
61 "	7 073	8 720	-	-
62 "	7 073	8 720	-	-
63 "	7 073	8 720	-	-
64 "	7 073	8 720	-	-
65 "	7 073	8 720	-	-

6.5 THE PRIVATE RATE OF RETURN ON THE INVESTMENT IN THE TEACHING DIPLOMA

6.5.1 The cost-net benefit-stream of teachers (category C)

The net benefits accruing to teachers for each year of investment
were determined by subtracting the earnings of clerks from the
earnings of teachers, as reflected in their respective earnings
profiles, for each age. During the first three years of the investment
while the teacher was enrolled at a teacher training institution, there
were no benefits; only costs. Benefits only accrued from the fourth year
of the investment. By combining the costs of the teaching diploma
with the net benefits into a series of annual outlays and accruals,
a cost-net benefit-stream was arrived at.

Earnings received by clerks during the first three years of the
investment were in actual fact negative benefits accruing to teachers.
By taking earnings foregone as a cost component of the investment,
due consideration has been given to the negative benefits of the
investment.

6.5.2 Determination of the private rate of return

Once the cost-net benefit-stream of the investment was established,
all that remained was to find the rate of discount which reduced the
cost-net benefit-stream to zero. Such a rate of discount was the
rate of return on the investment in the diploma.

By applying Sheehan's internal rate of return formula[32] to the
cost-net benefit-stream of males (refer to page 51) i.e.,

$$V_o = \frac{(B_1 - C_1)}{(1 + r)} + \frac{(B_2 - C_2)}{(1 + r)^2} + \ldots \ldots \frac{(B_n - C_n)}{(1 + r)^n} \quad,$$

we see that at a rate of discount of 14% (i.e., $r = 0,14$) the present
value of the cost-net benefit-stream is R441,90 (i.e., $V_o = +R441,90$).
At a rate of discount of 15%, $V_o = -R88,80$. We may conclude that the
rate of return on an investment made by a male in a three-year
teaching diploma lies between the "border" rates of 14% and 15%.

A similar application of Sheehan's formula to the cost-net benefit-stream of females reveals a present value of R81,60 (i.e., V_O = +R81,60) at a discount of 20%. At a discount of 21% a present value of -R246,00 results. Our conclusion from this is that the rate of return on an investment by a female in a three-year teaching diploma must lie between the "border" rates of 20% and 21%.

Table 6.23 and *Table 6.24* show the cost-net benefit-streams of males and females respectively. Each "stream" has been discounted by the two appropriate "border" rates.

TABLE 6.23: THE PRESENT VALUE OF THE COST-NET BENEFIT-STREAM (POST-
TAX) OF TEACHERS POSSESSING A THREE-YEAR DIPLOMA - MALES

Year of invest.	Cost-net benefit-stream	Present value at 14%		Present value at 15%	
		Pres. value of R1	Pres. value of "stream"	Pres. value of R1	Pres. value of "stream"
1	2 881	.8772	2 527.2	.8696	2 505.3
2	3 055	.7695	2 350.8	.7561	2 309.9
3	3 173	.6750	2 141.8	.6575	2 086.2
4	1 459	.5921	863.9	.5718	834.3
5	1 459	.5194	757.8	.4972	725.4
6	1 459	.4556	664.7	.4323	630.7
7	1 459	.3996	583.0	.3759	548.4
8	1 459	.3506	511.5	.3269	476.9
9	1 905	.3076	586.0	.2843	541.6
10	1 905	.2697	513.8	.2472	470.9
11	1 905	.2366	450.7	.2149	409.4
12	1 905	.2076	395.5	.1869	356.0
13	1 905	.1821	346.9	.1625	309.6
14	1 707	.1597	272.6	.1413	241.2
15	1 707	.1401	239.2	.1229	209.8
16	1 707	.1229	209.8	.1069	182.5
17	1 707	.1078	184.0	.0929	158.6
18	1 707	.0946	161.5	.0808	137.9
19	1 440	.0829	119.4	.0703	101.2
20	1 440	.0728	104.8	.0611	88.0
21	1 440	.0638	91.9	.0531	76.5
22	1 440	.0560	80.6	.0462	66.5
23	1 440	.0491	70.7	.0402	57.9
24	466	.0431	20.0	.0349	16.3
25	466	.0378	17.6	.0304	14.2
26	466	.0331	15.4	.0264	12.3
27	466	.0291	13.6	.0230	10.7
28	466	.0255	11.9	.0200	9.3
29	466	.0224	10.4	.0174	8.1
30	466	.0196	9.1	.0151	7.0
31	466	.0172	8.0	.0131	6.1
32	466	.0151	7.4	.0114	5.3
33	466	.0132	6.2	.0099	4.6
34	1 647	.0116	19.1	.0086	14.1
35	1 647	.0102	16.8	.0075	12.4
36	1 647	.0089	14.7	.0065	10.7
37	1 647	.0078	12.8	.0057	9.4
38	1 647	.0069	11.4	.0049	8.1
39	1 647	.0060	9.9	.0043	7.1
40	1 647	.0053	8.7	.0037	6.1
41	1 647	.0046	7.6	.0032	5.3
42	1 647	.0041	6.8	.0028	4.6
43	1 647	.0036	5.9	.0025	4.1
44	1 647	.0031	5.1	.0021	3.5
45	1 647	.0027	4.4	.0019	3.1
46	1 647	.0024	4.0	.0016	2.6
47	1 647	.0021	3.5	.0014	2.3
48	1 647	.0019	3.1	.0012	2.0
TOTAL			+R441.9		-R88.8

TABLE 6.24: THE PRESENT VALUE OF THE COST-NET BENEFIT-STREAM (POST-TAX)
OF TEACHERS POSSESSING A THREE-YEAR DIPLOMA - FEMALES

Year of invest.	Cost-net benefit-stream	Present value at 20%		Present value at 21%	
		Pres. value of R1	Pres. value of "stream"	Pres. value of R1	Pres. value of "stream"
1	2 194	.8333	1 828.3	.8264	1 813.1
2	2 342	.6944	1 626.3	.6830	1 599.6
3	2 425	.5787	1 403.3	.5645	1 368.9
4	1 283	.4823	618.8	.4665	598.5
5	1 283	.4019	515.6	.3855	494.6
6	1 283	.3349	429.7	.3186	408.8
7	1 283	.2791	358.1	.2633	337.8
8	1 283	.2326	298.4	.2176	279.2
9	2 186	.1938	423.6	.1799	393.3
10	2 186	.1615	353.0	.1486	324.8
11	2 186	.1346	294.2	.1228	268.4
12	2 186	.1122	245.3	.1015	221.9
13	2 186	.0935	204.4	.0839	183.4
14	2 616	.0779	203.8	.0693	181.3
15	2 616	.0649	169.8	.0573	149.9
16	2 616	.0541	141.5	.0474	124.0
17	2 616	.0451	118.0	.0391	102.3
18	2 616	.0376	98.4	.0323	84.5
19	2 422	.0313	75.8	.0267	64.7
20	2 422	.0261	63.2	.0221	53.5
21	2 422	.0217	52.6	.0183	44.3
22	2 422	.0181	43.8	.0151	36.6
23	2 422	.0151	36.6	.0125	30.3
24	2 647	.0126	33.4	.0103	27.3
25	2 647	.0105	27.8	.0085	22.5
26	2 647	.0087	23.0	.0070	18.5
27	2 647	.0073	19.3	.0058	15.4
28	2 647	.0061	16.1	.0048	12.7
29	2 647	.0051	13.5	.0040	10.6
30	2 647	.0042	11.1	.0033	8.7
31	2 647	.0035	9.3	.0027	7.1
32	2 647	.0029	7.7	.0022	5.8
33	2 647	.0024	6.4	.0019	5.0
34	2 647	.0020	5.3	.0015	4.0
35	2 647	.0017	4.5	.0013	3.4
36	2 647	.0014	3.7	.0010	2.6
37	2 647	.0012	3.2	.0009	2.4
38	2 647	.0010	2.6	.0007	1.9
39	2 647	.0008	2.1	.0006	1.6
40	2 647	.0007	1.9	.0005	1.3
41	2 647	.0006	1.6	.0004	1.1
42	2 647	.0005	1.3	.0003	0.8
43	2 647	.0004	1.1	.00027	0.7
TOTAL			+R81.6		-R246.0

The "border" rates of discount (i.e., 14% and 15% in the case of males and 20% and 21% in the case of females) were arrived at by a process of trial-and-error. Thereafter the actual rates of return were arrived at by the following method of interpolation:[33]

MALES

Step 1:

Rate	Present Value
14%	+R441,90
r	0
15%	-R 88,80

Step 2:

$$\frac{r - 14\%}{15\% - 14\%} = \frac{0 - R441,90}{-R88,80 - R441,90}$$

$$r - 14\% = \frac{-R441,90}{-R530,70}$$

$$r = 14\% + 0.8327$$

$$= \underline{14.8\%} \text{ (approximately)}$$

FEMALES

Step 1:

Rate	Present Value
20%	+R81,60
r	0
21%	-R246,00

Step 2:

$$\frac{r - 20\%}{21\% - 20\%} = \frac{0 - R81,60}{R246,00 - R81,60}$$

$$r - 20\% = \frac{-R81,60}{-R327,60}$$

$$r = 20\% + 0.2491$$

$$= \underline{20.3\%} \text{ (approximately)}$$

6.6 THE SOCIAL RATE OF RETURN ON THE INVESTMENT IN THE TEACHING DIPLOMA

When an individual evaluates education as an investment he does so
from his personal point of view; in terms of the costs incurred by
him and in terms of the benefits that accrue to him personally.
However, apart from the costs incurred by the individual, very
substantial costs are incurred by the State on education. The State
incurs these costs on behalf of society via its various educational
authorities. In the same way that returns accrue to the investment
of the individual, society's investment also yields a return. Like
the individual, society is also concerned about the effectiveness of
its investments in different branches of education. The social rate
of return can be used by educational authorities to gauge how
effectively resources in education are being utilised.

The costs to society of an investment in a three-year teaching diploma
for Indians include both the costs incurred by the individual and the
costs incurred by the Department of Indian Affairs. The Department of
Indian Affairs has calculated its per pupil cost for teacher education
as R1 613,73 per annum.[34] A detailed analysis of the nature of these
costs falls outside the scope of this investigation. However, use was
made of the official per pupil cost for teacher education to
demonstrate how the social rate of return could be calculated.

Table 6.25 and *Table 6.26* show the costs to society of an investment
in the training of male and female Indian teachers respectively for
a three-year diploma.

TABLE 6.25:   TOTAL SOCIAL RESOURCE COSTS OF TEACHER EDUCATION - MALES

Year of study	Individual costs*	State costs	Total costs
First	R2 881	R1 614	R4 495
Second	3 055	1 614	4 669
Third	3 173	1 614	4 787

*From Table 6.13

TABLE 6.26:   TOTAL SOCIAL RESOURCE COSTS OF TEACHER   EDUCATION -
              FEMALES

Year of study	Individual costs*	State costs	Total costs
First	R2 194	R1 614	R3 808
Second	2 342	1 614	3 956
Third	2 425	1 614	4 039

*From Table 6.14

The return on society's investment in a three-year teaching diploma
includes the returns to both the individual and the State. Returns
to the individual accrue in the form of increased earnings. Returns
to the State accrue in the form of the increased income tax resulting
from the individual's higher earnings. Consequently, in calculating
the social rate of return, the age-income profiles for the base level
of education (matriculation) and the higher level of education
(teaching diploma) were established on the basis of pre-tax earnings
rather than post-tax earnings.

Table 6.27 shows the average pre-tax earnings of matriculants (Group 2
in *Appendix XVIII*) and teachers with a three-year diploma (Group 1,
Category "C" in *Appendix XVIII*) for each of the selected age-cohorts.

TABLE 6.27:   AVERAGE PRE-TAX EARNINGS OF MATRICULANTS (CLERKS) AND
              TEACHERS (CATEGORY C) FOR SELECTED AGE-GROUPS

Age-group	Average pre-tax earnings			
	Males		Females	
	Clerks	Teachers	Clerks	Teachers
0-20	R2 928	R –	R2 165	R –
21-25	3 408	5 023	2 579	4 058
26-30	4 595	6 736	3 037	5 684
31-35	5 467	7 377	3 208	6 369
36-40	5 919	7 496	3 485*	6 485
41-50	7 452	7 963	3 548*	6 825
51-60	7 339	9 421	3 548*	6 825
61-65	7 339	9 421	–	–

* Projected incomes

Once again the earnings of males in the 61 to 65-year group and
females in the 51 to 60-year group were assumed to be the same
as for their respective preceding age-groups. In other instances,
where data was not sufficient to estimate earnings, projected
earnings were used (refer to page 171).

Table 6.28 shows the detailed age-earnings profiles of matriculants
and teachers (category C) used in determining the social rate of
return.

TABLE 6.28: AGE-EARNINGS PROFILES (PRE-TAX) OF MATRICULANTS
(CLERKS) AND TEACHERS (CATEGORY C)

Age	Males		Females	
	Clerks	Teachers	Clerks	Teachers
	R	R	R	R
18 years	2 928	-	2 165	-
19 "	2 928	-	2 165	-
20 "	2 928	-	2 165	-
21 "	3 408	5 023	2 579	4 058
22 "	3 408	5 023	2 579	4 058
23 "	3 408	5 023	2 579	4 058
24 "	3 408	5 023	2 579	4 058
25 "	3 408	5 023	2 579	4 058
26 "	4 595	6 736	3 037	5 684
27 "	4 595	6 736	3 037	5 684
28 "	4 595	6 736	3 037	5 684
29 "	4 595	6 736	3 037	5 684
30 "	4 595	6 736	3 037	5 684
31 "	5 467	7 377	3 208	6 369
32 "	5 467	7 377	3 208	6 369
33 "	5 467	7 377	3 208	6 369
34 "	5 467	7 377	3 208	6 369
35 "	5 467	7 377	3 208	6 369
36 "	5 919	7 496	3 485	6 485
37 "	5 919	7 496	3 485	6 485
38 "	5 919	7 496	3 485	6 485
39 "	5 919	7 496	3 485	6 485
40 "	5 919	7 496	3 485	6 485
41 "	7 452	7 963	3 548	6 825
42 "	7 452	7 963	3 548	6 825
43 "	7 452	7 963	3 548	6 825
44 "	7 452	7 963	3 548	6 825
45 "	7 452	7 963	3 548	6 825
46 "	7 452	7 963	3 548	6 825
47 "	7 452	7 963	3 548	6 825
48 "	7 452	7 963	3 548	6 825
49 "	7 452	7 963	3 548	6 825
50 "	7 452	7 963	3 548	6 825
51 "	7 339	9 421	3 548	6 825
52 "	7 339	9 421	3 548	6 825
53 "	7 339	9 421	3 548	6 825
54 "	7 339	9 421	3 548	6 825
55 "	7 339	9 421	3 548	6 825
56 "	7 339	9 421	3 548	6 825
57 "	7 339	9 421	3 548	6 825
58 "	7 339	9 421	3 548	6 825
59 "	7 339	9 421	3 548	6 825
60 "	7 339	9 421	3 548	6 825
61 "	7 339	9 421	-	-
62 "	7 339	9 421	-	-
63 "	7 339	9 421	-	-
64 "	7 339	9 421	-	-
65 "	7 339	9 421	-	-

A combination of the total social resource costs (refer to *Table 6.25*) and the net benefits of the investment for males (deduced from *Table 6.28*) is reflected as a cost-net benefit-stream in *Table 6.29*. Also shown in *Table 6.29* are the present values of the cost-net benefit-stream at each of the two "border" rates of discount.

TABLE 6.29: THE PRESENT VALUE OF THE COST-NET BENEFIT-STREAM (PRE-
TAX) OF TEACHERS POSSESSING A THREE-YEAR DIPLOMA - MALES

Year of invest.	Cost-net benefit-stream	Present value at 10%		Present value at 11%	
		Pres. value of R1	Pres. value of "stream"	Pres. value of R1	Pres. value of "stream"
1	4 495	.9091	4 086.4	.9009	4 049.5
2	4 669	.8264	3 858.5	.8116	3 789.4
3	4 787	.7513	3 596.5	.7312	3 500.3
4	1 615	.6830	1 103.0	.6587	1 063.8
5	1 615	.6209	1 002.8	.5935	958.5
6	1 615	.5645	911.7	.5346	863.4
7	1 615	.5132	828.8	.4817	777.9
8	1 615	.4665	753.4	.4339	700.7
9	2 141	.4241	908.0	.3909	836.9
10	2 141	.3855	825.4	.3522	754.1
11	2 141	.3505	750.4	.3173	679.3
12	2 141	.3186	682.1	.2858	611.9
13	2 141	.2897	620.2	.2575	551.3
14	1 910	.2633	502.9	.2320	443.1
15	1 910	.2394	457.3	.2090	399.2
16	1 910	.2176	415.6	.1883	359.7
17	1 910	.1978	377.8	.1696	323.9
18	1 910	.1799	343.6	.1528	291.8
19	1 577	.1635	257.8	.1377	217.2
20	1 577	.1486	234.3	.1240	195.5
21	1 577	.1351	213.1	.1117	176.2
22	1 577	.1228	193.7	.1007	158.8
23	1 577	.1117	176.2	.0907	143.0
24	511	.1015	51.9	.0817	41.7
25	511	.0923	47.2	.0736	37.6
26	511	.0839	42.9	.0663	33.9
27	511	.0763	39.0	.0597	30.5
28	511	.0693	35.4	.0538	27.5
29	511	.0630	32.2	.0485	24.8
30	511	.0573	29.3	.0437	22.3
31	511	.0521	26.6	.0394	20.1
32	511	.0474	24.2	.0355	18.1
33	511	.0431	22.0	.0319	16.3
34	2 082	.0391	81.4	.0288	60.0
35	2 082	.0356	74.1	.0259	53.9
36	2 082	.0323	67.2	.0234	48.7
37	2 082	.0294	61.2	.0210	43.7
38	2 082	.0267	55.6	.0190	39.6
39	2 082	.0243	50.6	.0171	35.6
40	2 082	.0221	46.0	.0154	32.1
41	2 082	.0201	41.8	.0139	28.9
42	2 082	.0183	38.1	.0125	26.0
43	2 082	.0166	34.6	.0112	23.3
44	2 082	.0151	31.4	.0101	21.0
45	2 082	.0137	28.5	.0091	18.9
46	2 082	.0125	26.0	.0082	17.1
47	2 082	.0113	23.5	.0074	15.4
48	2 082	.0103	21.4	.0067	13.9
	TOTAL		+R1 048.8		-R82.1

The corresponding cost-net benefit-stream of females, discounted at each of two "border" rates is shown in *Table 6.30* below.

TABLE 6.30: THE PRESENT VALUE OF THE COST-NET BENEFIT-STREAM (PRE-TAX) OF TEACHERS POSSESSING A THREE-YEAR DIPLOMA - FEMALES

Year of invest.	Cost-net benefit-stream	Present value at 15%		Present value at 16%	
		Pres. value of R1	Pres. value of "stream"	Pres. value of R1	Pres. value of "stream"
1	3 808	.8696	3 311.4	.8621	3 282.9
2	3 956	.7561	2 991.1	.7432	2 940.1
3	4 039	.6575	2 655.6	.6407	2 587.8
4	1 479	.5718	845.7	.5523	816.9
5	1 479	.4972	735.4	.4761	704.2
6	1 479	.4323	639.4	.4104	607.0
7	1 479	.3759	556.0	.3538	523.3
8	1 479	.3269	483.5	.3050	451.1
9	2 647	.2843	752.5	.2630	696.2
10	2 647	.2472	654.3	.2267	600.1
11	2 647	.2149	568.8	.1954	517.2
12	2 647	.1869	494.7	.1685	446.0
13	2 647	.1625	430.1	.1452	384.3
14	3 161	.1413	446.6	.1252	395.8
15	3 161	.1229	388.5	.1079	341.1
16	3 161	.1069	337.9	.0930	294.0
17	3 161	.0929	293.7	.0802	253.5
18	3 161	.0808	255.4	.0691	218.4
19	3 000	.0703	210.9	.0596	178.8
20	3 000	.0611	183.3	.0514	154.2
21	3 000	.0531	159.3	.0443	132.9
22	3 000	.0462	138.6	.0382	114.6
23	3 000	.0402	120.6	.0329	98.7
24	3 277	.0349	114.4	.0284	93.1
25	3 277	.0304	99.6	.0245	80.3
26	3 277	.0264	86.5	.0211	69.1
27	3 277	.0230	75.4	.0182	59.6
28	3 277	.0200	65.5	.0157	51.4
29	5 277	.0174	57.0	.0135	44.2
30	3 277	.0151	49.5	.0116	38.0
31	3 277	.0131	42.9	.0100	32.8
32	3 277	.0114	37.4	.0087	28.5
33	3 277	.0099	32.4	.0075	24.6
34	3 277	.0086	28.2	.0064	21.0
35	3 277	.0075	24.6	.0055	18.0
36	3 277	.0065	21.3	.0048	15.7
37	3 277	.0057	18.7	.0041	13.4
38	3 277	.0049	16.1	.0036	11.8
39	3 277	.0043	14.1	.0031	10.2
40	3 277	.0037	12.1	.0026	8.5
41	3 277	.0032	10.5	.0023	7.5
42	3 277	.0028	9.2	.0020	6.6
43	3 277	.0025	8.2	.0017	5.6
TOTAL			+R560.7		-R242.6

For males the social rate of return on an investment in a three-year teaching diploma was between 10% and 11%. Using the method of interpolation described earlier (refer to page 178) the exact social rate of return was calculated as 10,9%. For females, the social rate of return on an investment in a three-year diploma in teaching was calculated in a similar way to be 15,7%

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CHAPTER 7

7. PRIVATE RATES OF RETURN TO OTHER LEVELS OF TEACHER EDUCATION

7.1 PURPOSE AND METHOD

For teachers of the Department of Indian Affairs the various levels
of teacher education are indicated by each of the following
categories: Za, aa, A, B, C, D, E, F and G.[1] Teachers belonging
to category B, for example, have an educational level of matriculation
plus two years' full-time study (i.e., M + 2).[2] Usually such
teachers are in possession of the Senior Certificate (standard 10)
and a two-year teaching diploma.

Up to 1969 teacher trainees had the option of enrolling for a two-
year diploma or a three-year diploma. Thereafter, however, the two-
year diploma course was discontinued. A three-year diploma became
compulsory for all teacher trainees enrolling in 1970.[3] Since 1974
teachers belonging to category B have been given the opportunity of
undertaking further study to convert to a three-year diploma.[4]
Such study may be undertaken with the Springfield College of Education
on a part-time basis over two years. This course of study has been
generally known as the "M + 3 External" course.[5] One purpose of
Chapter 7 is to calculate the private rate of return on an investment
in a two-year diploma and then to determine the extent to which the
investment may be improved by undertaking further study to acquire
category C.

Another purpose of Chapter 7 is to show the private rates of return
for successive levels of teacher education beyond category C, i.e.,
for category D, category E and category F. Because of the small
number of returns from teachers belonging to category G, in response
to the research questionnaire (refer to *Appendix XIV*), it was
impossible to calculate a rate of return for this category. For the
same reason a rate of return for females belonging to category F
could not be determined.

For the purpose of Chapter 7 it was assumed that each successive
level of teacher education (i.e., each successive category) was
acquired through one year's full-time study. In actual practice
full-time study may have been the exception rather than the rule.
Although part-time study is undertaken over two years, earnings
are not foregone. What is foregone, however, is free-time or
leisure time. Measuring leisure may seem to be a matter of guess-
work. However, Sheehan tells us that measuring *whatever* is foregone
(earnings or leisure) by the wage appropriate to the category of
labour involved would provide a rough approximation. [6] Thus the
opportunity costs of full-time study (i.e., earnings foregone for
one year) and the opportunity costs of part-time study (i.e., leisure
foregone for two years) could be assumed to be approximately the same.

The average annual post-tax earnings of teachers belonging to
categories B, D, E and F are shown in *Table 7.1* below. These
averages have been extracted from *Appendix XVIII*. Only in the case
of the 61 to 65-year group (males) and the 51 to 60-year group
(females) have earnings been assumed.

TABLE 7.1:   AVERAGE POST-TAX EARNINGS OF TEACHERS BELONGING TO
              CATEGORIES B, D, E AND F FOR SELECTED AGE-GROUPS

Age-group	Average post-tax earnings - males			
	B	D	E	F
	R	R	R	R
0-25	3 019	5 552	-	-
26-30	5 247	7 193	7 912	8 956
31-35	5 730	7 972	8 417	9 055
36-40	5 759	8 089	8 833	10 217
41-50	6 092	9 294	9 774	11 080
51-60	6 330	10 396	11 710	12 921
61-65*	6 330	10 396	11 710	12 921

Age-group	Average post-tax earnings - females			
	B	D	E	F
	R	R	R	R
0-25	2 140	4 347	-	-
26-30	4 219	5 602	6 178	-
31-35	4 203	6 304	7 306	-
36-40	4 283	6 412	7 914	-
41-50	4 279	6 974	7 914	-
51-60*	4 279	6 974	7 914	-

*Earnings for these age-groups have been assumed.

Age-earnings profiles of teachers belonging to category B, compiled
on the basis of information contained in *Table 7.1*, are given in
Appendix XIX and *Appendix XX* for males and females respectively.

7.2 PRIVATE RATE OF RETURN ON AN INVESTMENT IN A TWO-YEAR DIPLOMA (CATEGORY B)

7.2.1 Introduction

Since the conversion from category B to category C may take place at any age from about 30 years to 65 years, the resulting improvement in the investment would vary according to the age at which the extra study was undertaken. To give a clearer indication of the improvement that may be expected, rates of return have been calculated for category B with conversion to category C at 30 years of age; 40 years of age and 50 years of age.

7.2.2 Determination of the rate of return on an investment in a two-year diploma

Information from 369 teachers belonging to category B was used in the estimates. *Table 7.2* gives details of these respondents to the research questionnaire.

TABLE 7.2:   SAMPLE OF TEACHERS (CATEGORY B) ACCORDING TO SELECTED AGE-GROUPS

Age-group	Males	Females	Total
0-25	7	4	11
26-30	9	21	30
31-35	61	53	114
36-40	71	36	107
41-50	60	19	79
51-60	28	0	28
61-65	0	-	0
Total	236	133	369

The direct costs and opportunity costs of the investment in category B were assumed to be the costs of the first two years of teacher trainees. These figures, extracted from

Table 6.13 and *Table 6.14* were as follows:

	Males	Females
First year	R2 881	R2 194
Second year	3 055	2 342

A comparison of the earnings-profiles of matriculants and
teachers (category B) was made to determine the net-earnings
benefits of teachers. In the case of males the total net
benefits were found to be negative. The rate of discount
which equated the resulting cost-net benefit-stream (refer
to *Appendix XXI*) to zero was found to be -2,2%. This, in
fact, meant that the investment in two years' study for a
teaching diploma resulted in a negative rate of return.
For females, however, the rate of return on an investment
in a two-year diploma was calculated as 10,8%. The cost-
net benefit-stream from which this figure was derived is
shown in *Appendix XXII*.

7.2.3   Rate of return on an investment in a two-year diploma with
        conversion to category C at ages 30 years, 40 years and 50
        years

The direct costs and opportunity costs (earnings foregone
for one year) of full-time students in the third year of
study at a teacher training institution were calculated as
R3 173 for males (from *Table 6.13*) and R2 425 for females
(from *Tables 6.14*). It was assumed that these amounts would
adequately represent the direct costs and opportunity costs
(leisure foregone for two years) of teachers undertaking the
necessary part-time study to acquire category C.

A male completing such study at the age of 30 years would
incur a cost of R3 173 in the thirteenth year of his investment.
A male completing the course at the age of 40 years would
incur this cost in the twenty-third year of his investment
while for the male teacher who was 50 years old the cost
would be incurred in the thirty-third year of his investment.
The corresponding cost of a female teacher undertaking such
study was R2 425.

Since the study was undertaken on a part-time basis, earnings would have continued. Consequently, net benefits would have continued to accrue to the original investment. To a certain extent these net benefits would have off-set a portion of the costs of the further investment.

Table 7.3 and *Table 7.4* show the cost-net benefit-streams (males and females respectively) who were regraded as a result of two years' part-time study from category B to category C. The cost-net benefit-streams are shown for regrading at the age of 30 years, 40 years and 50 years.

TABLE 7.3: COST-NET BENEFIT-STREAM OF TEACHERS REGRADED FROM
CATEGORY B TO CATEGORY C AT AGES 30, 40 AND 50 YEARS - MALES

Year of invest.	Cost-net benefit-stream			
	Category B	Category C with regrading at....		
		age 30	age 40	age 50
1	2 881	2 881	2 881	2 881
2	3 055	3 055	3 055	3 055
3	253	253	253	253
4	- 208	- 208	- 208	- 208
5	- 208	- 208	- 208	- 208
6	- 208	- 208	- 208	- 208
7	- 208	- 208	- 208	- 208
8	- 208	- 208	- 208	- 208
9	844	844	844	844
10	844	844	844	844
11	844	844	844	844
12	844	844	844	844
13	844	- 2 329	844	844
14	479	1 707	479	479
15	479	1 707	479	479
16	479	1 707	479	479
17	479	1 707	479	479
18	479	1 707	479	479
19	38	1 440	38	38
20	38	1 440	38	38
21	38	1 440	38	38
22	38	1 440	38	38
23	38	1 440	- 3 135	38
24	- 1 039	466	466	- 1 039
25	- 1 039	466	466	- 1 039
26	- 1 039	466	466	- 1 039
27	- 1 039	466	466	- 1 039
28	- 1 039	466	466	- 1 039
29	- 1 039	466	466	- 1 039
30	- 1 039	466	466	- 1 039
31	- 1 039	466	466	- 1 039
32	- 1 039	466	466	- 1 039
33	- 1 039	466	466	- 4 212
34	- 743	1 647	1 647	1 647
35	- 743	1 647	1 647	1 647
36	- 743	1 647	1 647	1 647
37	- 743	1 647	1 647	1 647
38	- 743	1 647	1 647	1 647
39	- 743	1 647	1 647	1 647
40	- 743	1 647	1 647	1 647
41	- 743	1 647	1 647	1 647
42	- 743	1 647	1 647	1 647
43	- 743	1 647	1 647	1 647
44	- 743	1 647	1 647	1 647
45	- 743	1 647	1 647	1 647
46	- 743	1 647	1 647	1 647
47	- 743	1 647	1 647	1 647
48	- 743	1 647	1 647	1 647

TABLE 7.4: COST-NET BENEFIT-STREAM OF TEACHERS REGRADED FROM CATEGORY
B TO CATEGORY C AT AGES 30, 40 AND 50 YEARS - FEMALES

Year of invest.	Category B	Cost-net benefit-stream		
		Category C with regrading at...		
		age 30	age 40	age 50
1	2 194	2 194	2 194	2 194
2	2 342	2 342	2 342	2 342
3	69	69	69	69
4	- 314	- 314	- 314	- 314
5	- 314	- 314	- 314	- 314
6	- 314	- 314	- 314	- 314
7	- 314	- 314	- 314	- 314
8	- 314	- 314	- 314	- 314
9	1 346	1 346	1 346	1 346
10	1 346	1 346	1 346	1 346
11	1 346	1 346	1 346	1 346
12	1 346	1 346	1 346	1 346
13	1 346	- 1 079	1 346	1 346
14	1 191	2 616	1 191	1 191
15	1 191	2 616	1 191	1 191
16	1 191	2 616	1 191	1 191
17	1 191	2 616	1 191	1 191
18	1 191	2 616	1 191	1 191
19	1 014	2 422	1 014	1 014
20	1 014	2 422	1 014	1 014
21	1 014	2 422	1 014	1 014
22	1 014	2 422	1 014	1 014
23	1 014	2 422	- 1 411	1 014
24	955	2 647	2 647	955
25	955	2 647	2 647	955
26	955	2 647	2 647	955
27	955	2 647	2 647	955
28	955	2 647	2 647	955
29	955	2 647	2 647	955
30	955	2 647	2 647	955
31	955	2 647	2 647	955
32	955	2 647	2 647	955
33	955	2 647	2 647	- 1 470
34	955	2 647	2 647	2 647
35	955	2 647	2 647	2 647
36	955	2 647	2 647	2 647
37	955	2 647	2 647	2 647
38	955	2 647	2 647	2 647
39	955	2 647	2 647	2 647
40	955	2 647	2 647	2 647
41	955	2 647	2 647	2 647
42	955	2 647	2 647	2 647
43	955	2 647	2 647	2 647

In all cases cited above, the cost-net benefit-streams changed after the year in which the extra study was completed. Up to that stage the cost-net benefits were identical to that of a teacher belonging to category B. After the extra study was completed, net benefits belonging to teachers in category C accrued to the investment.

The rates of discount which reduced the various cost-net benefit-streams to zero (i.e., the rates of return on the various investments) are summarised below:

Investment in category B with conversion to category C at ...

30 years		40 years		50 years	
male	female	male	female	male	female
8,5%	14,1%	5,8%	12,2%	3,0%	11,2%

7.3   PRIVATE RATE OF RETURN ON AN INVESTMENT IN ACQUIRING CATEGORY D

7.3.1   Introduction

The quickest way in which a teacher may reach category D is by study at a university for a teaching degree or for an approved bachelor's degree plus a one-year teaching diploma. Teachers in service who are already on category C may reach category D through part-time study (usually over two years). In either case one year's costs have been assumed. *Table 7.5* shows the costs of fourth year B.Paed. students and U.H.D.E. students of the University of Durban-Westville.

TABLE 7.5:   TOTAL PRIVATE RESOURCE COSTS OF TEACHER TRAINEES
             IN THEIR FOURTH YEAR OF STUDY AT A UNIVERSITY

Costs	Males	Females
Direct costs:		
Books	128	106
Fees	310	310
Extra transport	90	90
Opportunity costs	3 960	3 240
	R4 488	R3 746

The information on direct costs was extracted from *Table 6.11*
and *Table 6.12*. The first year's earnings of teachers
belonging to category C were used to estimate the opportunity
costs of teachers undertaking study to acquire category D.

7.3.2 Determination of the rate of return on an investment in acquiring category D

Information from 444 teachers belonging to category D was
used in the estimates. *Table 7.6* gives details of respondents
to the research questionnaire in this category.

TABLE 7.6:   SAMPLE OF TEACHERS (CATEGORY D) ACCORDING
             TO SELECTED AGE-GROUPS

Age-group	Males	Females	Total
0-25	22	27	49
26-30	76	22	98
31-35	95	12	107
36-40	61	7	68
41-50	77	6	83
51-60	39	0	39
61-65	0	-	0
Total	370	74	444

The age-earnings profiles of teachers in category D are
shown in *Appendix XIX* and *Appendix XX*. The net earnings
benefits of these teachers were determined by comparing
their earnings-profiles with those of teachers in category C.
In *Appendix XXI* and *Appendix XXII* their net benefits and
costs are shown in the form of a cost-net benefit-stream
for males and females respectively.

In the case of males the investment needed to reach
category D was found to yield a rate of return of 20,4%.
For females the rate of return on the investment was
calculated as 16,7%.

7.4 THE PRIVATE RATE OF RETURN ON AN INVESTMENT IN ACQUIRING CATEGORY E

The direct costs of the investment needed to reach category E were
assumed to be the same as for fourth year university students.
Opportunity costs, however, were based on the first year's earnings
of teachers belonging to category D.

Details of the sample used in estimating the rate of return on the
investment needed to reach category E are given in *Table 7.7*.

TABLE 7.7: SAMPLE OF TEACHERS (CATEGORY E)
ACCORDING TO SELECTED AGE-GROUPS

Age-group	Males	Females	Total
26-30	38	14	52
31-35	57	11	68
36-40	56	9	65
41-50	55	0	55
51-60	16	0	16
61-65	0	–	0
Total	222	34	256

Appendix XIX and *Appendix XX* show the earnings-profiles of teachers belonging to category E. A combination of the costs and net benefits of the investment, in the form of a cost-net benefit-stream, is shown in *Appendix XXI* (for males) and *Appendix XXII* (for females).

The resulting rates of return on the investment were calculated as 10,4% for males and 16,4% for females.

7.5 THE PRIVATE RATE OF RETURN ON AN INVESTMENT IN ACQUIRING CATEGORY F

The procedure for determining the costs (direct costs and opportunity costs) of the investment was the same as for category D and category E.

In the case of category F, a rate of return was calculated for males only. *Table 7.8* shows details of the sample of teachers used for this purpose.

TABLE 7.8:   SAMPLE OF TEACHERS (CATEGORY F)
ACCORDING TO SELECTED AGE-GROUPS - MALES

Age-group	Total
26-30	5
31-35	25
36-40	17
41-50	22
51-60	6
61-65	0
Total	75

Appendix XIX shows the earnings-profile of teachers belonging to category F. In *Appendix XXI* the cost-net benefit-stream of the investment is shown.

Investment in study undertaken to reach category F resulted in a rate of return of 15,4% for males.

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CHAPTER 8

8. CONCLUDING OBSERVATIONS OF THE INVESTIGATION

8.1 LIMITATIONS OF THE INVESTIGATION

The main limitations of a cost-benefit approach to investment in education have been discussed in Chapter 3. Attention is given here to the limitations which are peculiar to this particular Investigation. In assessing the findings of the Investigation the following shortcomings should be borne in mind:

1. The earnings used in the Investigation are *estimated* earnings and not *actual* earnings. It is the opinion of the investigator that had actual earnings been asked for, the number of respondents would have been smaller. The investigator is also confident that the method of estimating earnings is sufficiently reliable and that the calculated rates of return on the various investments in teacher education are very close approximations. Out of a total sample of 2142 teachers used in the investigation only 443 or 20,7% held promotion posts (including the post of senior teacher). In estimating earnings a margin of error was expected only in the case of this 20,7% of the sample of teachers.

2. Only certain minor allowances have been omitted in estimating the earnings of teachers. The allowance payable to acting principals[1] has been omitted. The allowance due to principals of schools conducting platoon classes[2] was also excluded from the estimated earnings. Finally, in estimating their earnings teachers of special classes, who were entitled to an extra salary notch,[3] were treated as ordinary teachers. The omission of these allowances was considered to have a negligible effect on the calculated rates of return.

3. In making the deduction for income tax, consideration was given to taxable earnings, marital status and number of dependent children. Other tax dependants were not considered.

4. It was assumed, in calculating the costs of teacher trainees,
    that all students passed their respective courses of study
    within the minimum specified period. No consideration was
    given to the fact that failure would effectively increase
    the costs of teacher training. This factor was expected to
    have a small downward effect on the calculated rates of return.

5. A more effective basis for comparison could have been gained
    by examining the earnings of a larger spectrum of matriculants.
    Restricting the investigation to employees of the Department of
    Indian Affairs has been a limiting factor in the Investigation.

8.2 FINDINGS AND RECOMMENDATIONS

The investigation has substantiated the veiw that higher levels of
education are accompanied by higher earnings. It was found in the
case of every age-cohort used in the investigation that teachers
with higher qualifications consistently earned more than their
counterparts with lower qualifications. The position is summarised
graphically in *Figure 5* and *Figure 6*.
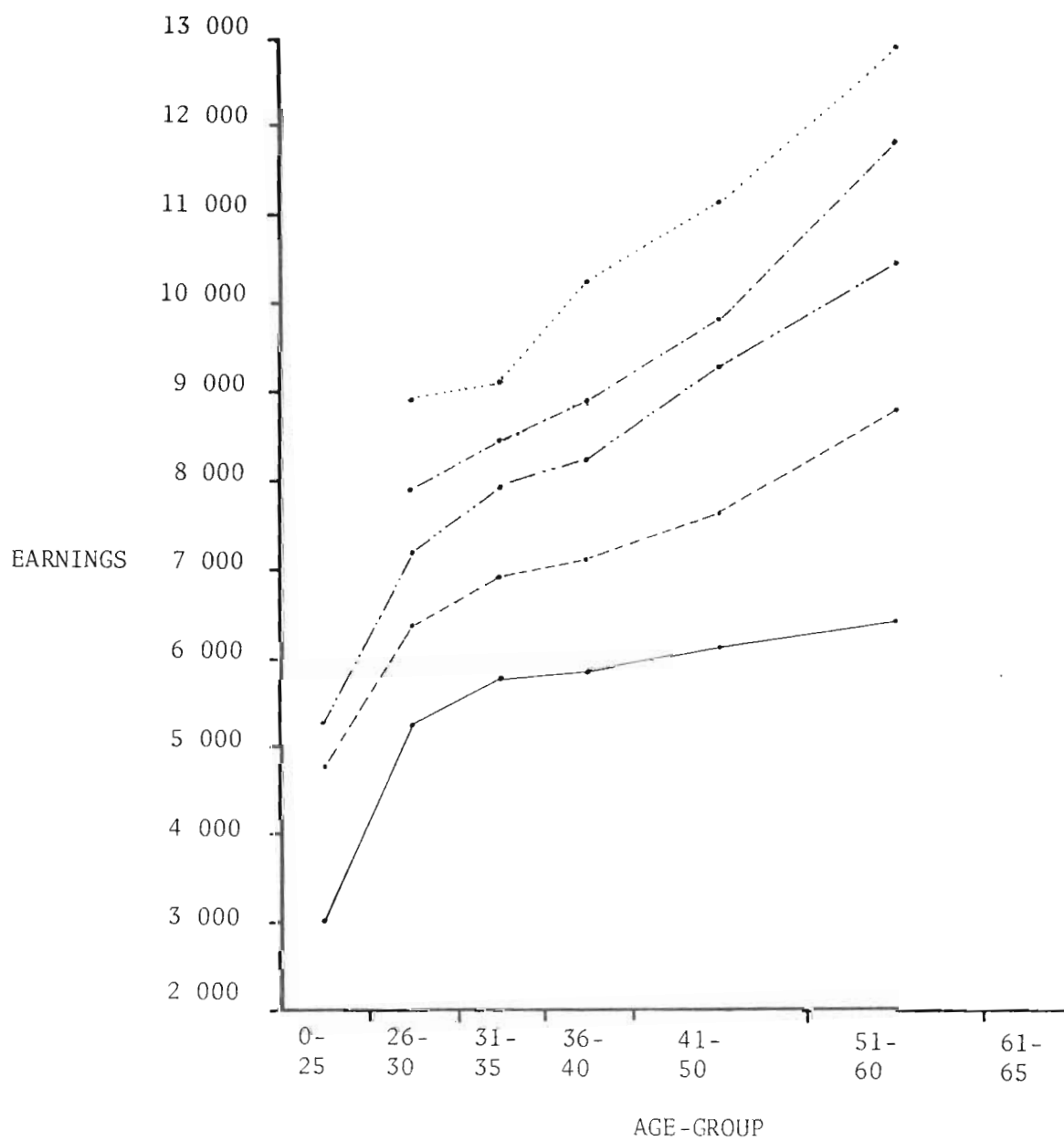
FIG. 5: AGE-EARNINGS PROFILES FOR DIFFERENT LEVELS OF TEACHER
EDUCATION - MALES
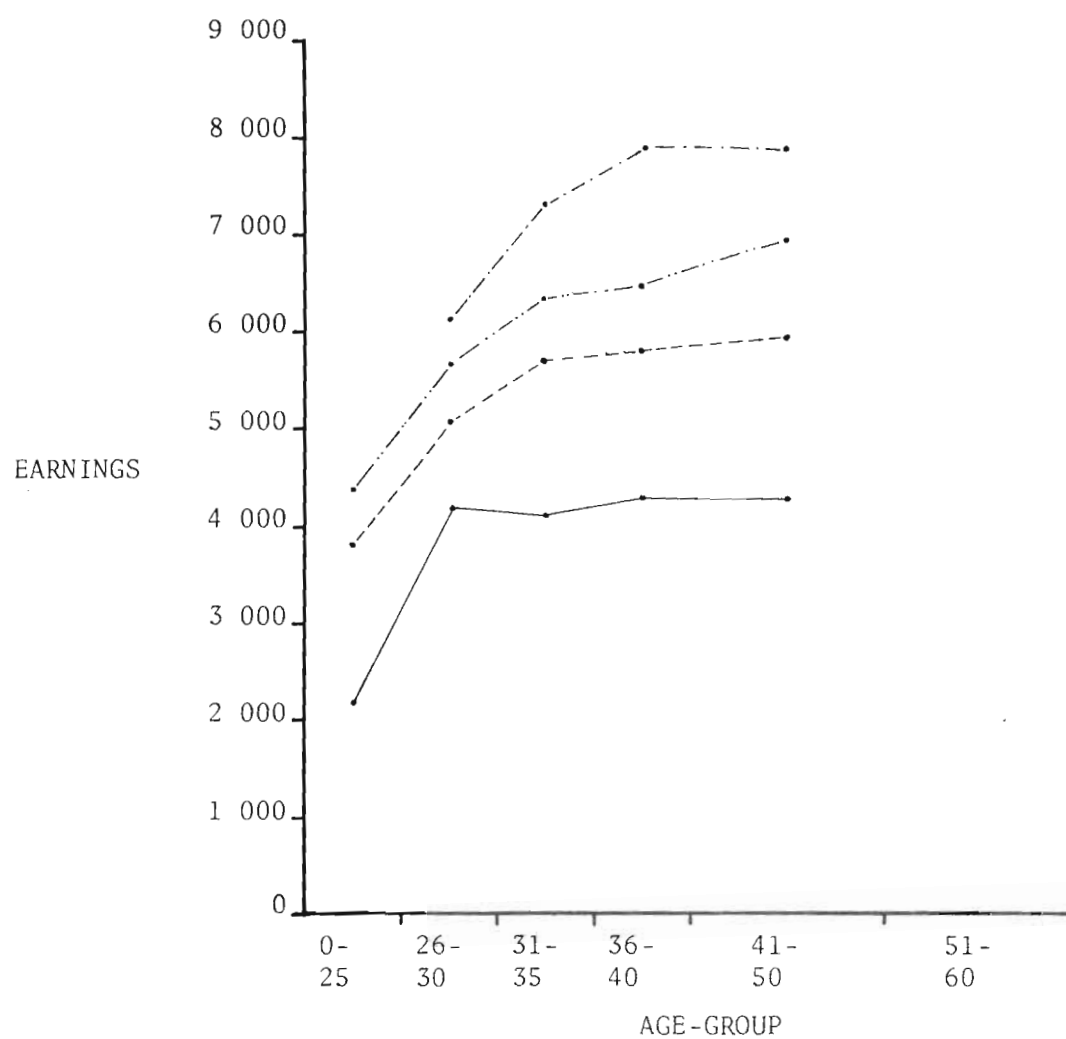
Key:

_____	CATEGORY B
_ _ _ _ _ _ _	CATEGORY C
_.._.._.._.._	CATEGORY D
_.._.._.._.._	CATEGORY E

FIG. 6: AGE-EARNINGS PROFILES FOR DIFFERENT LEVELS OF TEACHER
EDUCATION - FEMALES

Figure 5 and *Figure 6* show clearly that profiles associated with
the higher-level qualifications lie above those corresponding to
the lower-level qualifications. In addition the distance between
the profiles widens with age.

An investment in a two-year teaching diploma (category B) was found
to yield a rate of return of -2,2% for males and 10,8% for females.
While the investment in two years' study (over and above standard 10)
has been satisfactory for females, for males the findings have been
disturbing. A negative rate of return for males was expected in view
of the poor earnings of teachers (category B) in comparison with the
earnings of matriculants. One reason for the low earnings has been
the poor possibilities of promotion to higher post levels for this
category of teachers. In the 41 to 50-year old group of teachers
for example, only 13 out of 60 members of the sample held promotion
posts (i.e., either principal, deputy principal or head of department).
By comparison, all 10 members of the sample of clerks in the same age-
group held posts of senior clerk or higher.

The investigation has shown that through extra study needed to attain
the next category (category C), the overall position of the two-year
investment could be improved significantly. The extent of the
improvement depended upon the age at which the extra study was
completed. For a male making the conversion from a two-year diploma
to category C at age of 30 years, the improvement in the investment
was 10,7%. Conversion at the age of 40 years resulted in an
improvement of 8,0% while conversion at the age of 50 years resulted
in a 5,2% improvement in the investment. For females the improvement
in the investment for conversion at age thirty years, forty years and
fifty years was 3,3%, 1,4% and 0,4% respectively. On the basis of
these figures, a male teacher especially, belonging to category B, would
be well advised to undertake the study needed to reach category C at
as early an age as possible. For females the benefits of such study
were much smaller. If undertaken, study would be for non-economic
considerations rather than for the prospect of large financial gain.

In comparison with conventional investment opportunities, investment
in a three-year teaching diploma (category C) proved to be satisfactory.
The investment yielded 14,8% for males and 20,3% for females. It

should be noted, however, that with the ever-increasing improvement
in the qualifications of Indian teachers, these rates of return
could only decline in future years. The Investigation has revealed
that of the promotion posts accessible to male teachers in category
C, 63,6% were in fact occupied by teachers in possession of higher
levels of qualification. In the case of females 25,0% of the
promotion posts were held by teachers in possession of higher
levels of qualification. The overall yield on an investment in a
three-year diploma would also be seriously affected should the
course be discontinued in favour of a four-year teaching diploma.
Teachers belonging to category C (especially males) could easily
become victims of the fate that befell teachers holding a two-year
diploma when the course was discontinued in 1971. A safeguard
against the investment in a three-year diploma becoming impoverished,
by the manner mentioned above, would be to invest in higher levels of
teacher education.

The Investigation has shown that higher levels of teacher education
(beyond category C) paid handsomely. This point was illustrated from
the rates of return calculated for three successive levels of teacher
education (i.e., category D, category E and category F). In calculat=
ing the rates of return for each of these levels of education, the
previous level of education was used as a base in each case. The
resultant rates of return for males and females are summarised in
Table 8.1 below.

TABLE 8.1:   PRIVATE RATES OF RETURN TO INVESTMENT IN LEVELS
               OF TEACHER EDUCATION BEYOND CATEGORY C

Level of education	Rate of Return	
	Males	Females
Category D	20,4%	16,7%
Category E	10,4%	16,4%
Category F	15,4%	*

*No calculation made

It should be noted that the above rates of return are for teachers
being regraded at the earliest possible stages in their careers.
Regrading at later stages would result in correspondingly lower
rates of return. This was clearly demonstrated in the case of
conversion from category B to category C at the age of 30, 40
and 50 years respectively.

It has been shown that society can expect a rate of return of 10,9%
in the case of males and 15,7% in the case of females for its
investment in a three-year teaching diploma. On the basis of these
findings, educational authorities can be assured that resources
devoted to teacher education are being effectively utilised.
Similar calculations by the authorities for other levels of education
(notably high school education, technical education and university
education) would reveal the areas in which resources are being most
effectively utilised.

8.3 GENERAL COMMENTS

1. Only the economic benefits of education have been considered
   in the Investigation. No attempt has been made to estimate the
   other possible benefits of teacher education. Such "other"
   benefits may in themselves be worthwhile even if the economic
   benefits were completely absent.

2. Bursaries received by teacher trainees from the Department of
   Indian Affairs were excluded from the determination of the
   costs of teacher education. One reason for the exclusion was
   that not all students were provided with a bursary. Another
   reason was that such a bursary imposed an obligation on
   students to serve the Department for a certain minimum period.[4]

3. The minimum entrance requirements applied by teacher training
   institutions[5] for Indians have meant that not all matriculants
   could avail themselves of the investment in teacher education.
   In addition only a small percentage of matriculants meeting the
   minimum entrance requirements have gained admission to teacher
   training institutions in recent years. In 1979, for example,
   only 611 students were enrolled out of approximately 1 200
   applicants.[6] This high demand for teacher education must be

seen in the light of the current economic position of the
country. With the expected improvement in the economy of
the country a normal demand for admission to teacher training
institutions can be expected. In any event the calculated
rates of return are specifically for the benefit of would-be
investors who expect to gain admission to teacher training
institutions and for teachers who are already in service.

4. Finally the effect of a possible change in the salary
   structure of the employees of the Department of Indian Affairs
   should be examined. A change in the salary structure will
   most definitely affect the calculated rates of return of
   the Investigation. However, so long as the salary structure
   adheres to the principle of rewarding teachers holding higher
   qualifications with higher salaries, the calculated rates of
   return would not change materially. The conclusions drawn from
   the Investigation would remain unaltered.

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SUMMARY

Economists have shown that the conventional definition of capital as
physical plant, machinery and factory buildings is too narrow and
restrictive in accounting fully for economic growth. This has led
to the recognition of *human capital* as being equally important as a
component of economic growth.

Economists and educationalists have thus realised that expenditure on
education (an important form of human capital) is not merely *consumption*
but also *capital*. Previously, expenditure on education was considered
to give immediate satisfaction only. However, expenditure on education
is also capable of creating future utility. As in the case of other
forms of capital, investment in education is also undertaken to ensure
years of economic return. This has resulted in a desire to test the
productivity of educational investment along the same lines as investment
in physical capital. Although important differences have been noted
between physical capital and human capital, there is sufficient common
ground between them to justify measuring the productivity of one with
the estimation techniques of the other.

Since education is an investment, it must have a return analogous to
interest on conventional capital. A recognised method of determining
the interest on an investment in education is by means of a *cost-benefit
analysis*. Such a method of measuring the productivity of educational
investment is based on the finding that people with higher qualifications
earn higher incomes.

A *modus operandi* for determining the rate of return on an investment by
an Indian teacher in a three-year diploma has been established after a
thorough analysis of several investigations in the field of educational
investment. On this basis, the investigation has revealed a *private*
rate of return of 14,8% for males and 20,3% for females. In addition,
use was made of available data to determine the rate of return of such
an investment to society. A *social* rate of return of 10,9% and 15,7%
was estimated for males and females respectively.

The investigation has also calculated rates of return to *other levels*
of teacher education. The investment in a two-year diploma (now

discontinued) was found to yield a return of -2,2% for males and 10,8% for females. Further, an attempt has been made to show the extent to which a person holding such a diploma may improve his investment through further study. Finally, the investigation has revealed handsome returns for investment in levels of teacher education beyond the three-year diploma.

The approach used in determining rates of return to investment in education generally, is not without its *limitations*. In addition, the investigation has had to contend with limitations of its own. The results must therefore be seen within the context of these limitations.

APPENDIX I: CORRELATION BETWEEN ECONOMIC AND EDUCATIONAL
              CONDITIONS OF COUNTRIES IN AFRICA

Country	Population (millions)	G.N.P. R million	Per Capita G.N.P.	Per 1000 of Population in Secondary and Tertiary Education
Un. Arab Republic	37,0	13 191	356,5	48,6
South Africa	24,9	14 498	582,2	35,4
Tunisia	5,6	1 100	196,4	30,9
Morocco	16,3	2 888	177,2	23,8
Algeria	15,8	3 125	197,8	19,4
Botswana	0,6	65	108,3	18,0
Cameroon	6,2	837	135,0	16,1
Kenya	12,4	1 377	111,0	15,5
Ivory Coast	6,0	1 406	234,3	15,4
Malagasy	7,9	685	86,7	15,4
Guinea	4,2	314	74,8	15,1
Sudan	16,9	1 290	76,3	14,7
Angola	5,7	1 109	194,6	13,6
Togo	2,1	184	87,6	13,5
Mali	5,4	396	73,3	13,1
Lesotho	1,1	67	60,9	13,0
Zaire	24,2	1 383	57,1	12,9
Benin	2,9	189	65,2	11,0
Zambia	4,8	1 222	254,6	10,7
Sierra Leone	3,0	399	133,0	10,6
Somalia	2,9	152	52,4	10,3
Ghana	9,0	1 472	163,6	8,9
Libya	2,2	3 305	1 502,3	8,6
Rhodesia	6,1	1 727	283,1	7,4
Ethiopia	26,0	1 557	59,9	6,0
Nigeria	79,8	3 842	48,1	5,1
Uganda	10,0	1 016	101,6	5,1
Senegal	4,2	709	168,8	4,4
Malawi	4,8	302	62,9	3,4
Burundi	3,6	138	38,3	3,2
Chad	3,8	166	43,7	2,6
Tanzania	15,0	876	65,1	2,6
Niger	4,5	234	52,0	2,2
Upper Volta	5,9	216	36,6	2,1
Mozambique	8,5	1 504	176,9	1,6

Source   MALHERBE, E.G.   :   *Education in South Africa Volume 2 1923-1975*, Juta, Cape Town, 1977 p. 610

APPENDIX II: MEDIAN ANNUAL INCOMES AT DIFFERENT EDUCATIONAL LEVELS
OF ECONOMICALLY ACTIVE MALES IN 1960 AND 1970

Educational level	Whites		Asians		Coloureds	
	Census Years		Census Years		Census Years	
	1960	1970	1960	1970	1960	1970
	R	R	R	R	R	R
No schooling	735	852	286	427	190	244
Up to Std V	1 433	1 933	435	614	291	439
Stds VI and VII	2 074	2 513	541	764	533	779
Std VIII	2 305	2 944	694	897	645	918
Std X	2 724	3 342	932	1 063	905	1 081
Bachelor's degree	3 973	5 566	1 923	1 713	2 191	1 724
Master's degree	4 264	6 218	2 056	1 740	-	1 700
Doctorate	5 587	7 630	1 948	1 839	-	1 753

Note: In order to make a significant comparison between the incomes of
1960 and 1970, the incomes of 1960 were stepped up according to
the value of the rand in 1970 - as determined by the consumer
price index which was about 30% higher in 1970 than in 1960.

Source   MALHERBE, E.G.: *Education in South Africa, Volume 2 (1923-1975)*,
Juta, Cape Town, 1977 p. 632

APPENDIX III: CHARACTERISTICS OF INCOME DISTRIBUTIONS FOR ECONOMICALLY ACTIVE MALES BY LEVEL OF EDUCATION, 1960 AND 1970

Years of Education	Year	Whites	Coloureds	Indians
		Median R	Median R	Median R
0 1-7 8-12 Degree	1960	566 1 103 1 728 3 394	147 224 427 1 740	220 335 447 1 594
0 1-7 8-12 Degree	1970	852 1 933 2 923 5 697	244 439 861 -	427 614 868 -

Source   TROTTER, G.J.: *Education and Income Distribution,*
The South African Journal of Economics,
Vol. 45, No. 4, December 1977 p. 353

APPENDIX IV: RATE OF RETURN TO INVESTMENT IN HIGHER EDUCATION
BY COUNTRY

Country	Year	Rate of return (percentage)	
		Private	Social
United States	1959	9.6	n.a.
Canada	1961	19.7	n.a.
Mexico	1963	29.0	23.0
Venezuela	1957	n.a.	23.0
Colombia	1965	n.a.	8.0
Chile	1959	n.a.	12.2
Brazil	1962	38.1	14.5
Great Britain	1966	12.0	8.2
Norway	1966	4.5	5.4
Sweden	1967	10.3	9.2
Denmark	1964	10.0	7.8
Netherlands	1965	10.5	5.5
Belgium	1967	n.a.	8.7
Germany	1964	n.a.	4.9
Greece	1964	n.a.	8.0
Israel	1958	n.a.	6.6
India	1960	14.3	12.7
Malaysia	1967	n.a.	10.7
Japan	1961	10.0	6.0
Philippines	1966	12.5	11.0
W. Nigeria	1967	n.a.	17.0
Ghana	1967	n.a.	16.5
Kenya	1968	27.4	8.8
Uganda	1965	n.a.	12.0
New Zealand	1966	14.7	13.2

Source   PSACHAROPOULOS, G.:   *The Economic Returns to Higher Education in Twenty-Five Countries*, Higher Education, Vol. 1, No. 2, p. 147

APPENDIX V: ANNUAL EARNINGS FOREGONE BY STUDENTS, ADJUSTED
             FOR UNEMPLOYMENT, 1900-1956, IN CURRENT PRICES

Year	High School	College or University
1900	$ 84	$ 192
1910	113	259
1920	275	626
1930	224	509
1940	236	537
1950	626	1 422
1956	855	1 943

Source   SCHULTZ, T.W.:   *Capital Formation by Education,*
                           Journal of Political Economy, LXVIII,
                           December 1960 p. 575

APPENDIX VI: ANNUAL RESOURCE COSTS OF EDUCATIONAL SERVICES RENDERED
               BY ELEMENTARY AND SECONDARY SCHOOLS IN THE UNITED STATES,
               1900-1956, IN CURRENT PRICES (MILLIONS OF DOLLARS)

Year	Elementary	Secondary	Total
1900	233	19	252
1910	450	50	500
1920	967	215	1 182
1930	1 947	741	2 688
1940	1 810	1 145	2 955
1950	4 219	2 286	6 505
1956	7 853	4 031	11 884

Source   SCHULTZ, T.W.:   *Capital Formation by Education*,
                          Journal of Political Economy, LXVIII,
                          December 1960 p. 578

APPENDIX VII: ANNUAL RESOURCE COSTS OF EDUCATIONAL SERVICES
                RENDERED BY COLLEGES AND UNIVERSITIES IN THE
                UNITED STATES, 1900-1956, IN CURRENT PRICES
                (MILLIONS OF DOLLARS)

Year	Total
1900	40
1910	81
1920	184
1930	535
1940	742
1950	2 128
1956	3 500

Source   SCHULTZ, T.W.:   *Capital Formation by Education*,
                          Journal of Political Economy, LXVIII,
                          December 1960 p. 579

APPENDIX VIII: ALTERNATIVE METHODS OF COMPARING VALUE OF PRIVATE
ECONOMIC RETURNS TO INVESTMENT IN SCHOOLING, AS
VIEWED AT AGE FOURTEEN, UNITED STATES, MALES, 1949
(AFTER TAX)

Schooling from completion of grade 8 to completion of	Addition-al life-time income	Present Value of Additional Income at				Internal Rate of Return (Per Cent)
		3 Per Cent	6 Per Cent	8 Per Cent	10 Per Cent	
2 years high school	$ 14,143	$ 5,081	$ 1,956	$ 996	$ 436	12.3
4 years high school	38,287	13,580	5,362	2,929	1,547	14.5
2 years college	52,485	17,000	5,364	2,084	336	9.4
4 years college	109,993	36,575	12,824	6,170	2,611	11.5

Source   HANSEN, W.L.:   *Total and Private Rates of Return to Investment in Schooling,* Journal of Political Economy, 1964, p. 138

APPENDIX IX: INTERNAL RATES OF RETURN TO TOTAL RESOURCE INVESTMENT
IN SCHOOLING AND TO PRIVATE RESOURCE INVESTMENT IN
SCHOOLING (AFTER TAX), UNITED STATES, MALES, 1949

TOTAL ROURCE INVESTMENT

	From:		(1)	(2)	(3)	(4)	(5)	(6)	(7)
To:	Age		6	8	12	14	16	18	20
		Grade	1	3	7	9	11	13	15
(1)	7	2	8.9	....	....	....	....	....	....
(2)	11	6	12.0	14.5	....	....	....	....	....
(3)	13	8	15.0	18.5	29.2	....	....	....	....
(4)	15	10	13.7	15.9	16.3	9.5	....	....	....
(5)	17	12	13.6	15.4	15.3	11.4	13.7		
(6)	19	14	11.3	12.1	11.1	8.2	8.2	5.4	
(7)	21	16	12.1	12.7	12.1	10.5	10.9	10.2	15.6

PRIVATE RESOURCE INVESTMENT (AFTER TAX)

	From:		(1)	(2)	(3)	(4)	(5)	(6)	(7)
To:	Age		6	8	12	14	16	18	20
		Grade	1	3	7	9	11	13	15
(1)	7	2	*	....	....	....	....	....	....
(2)	11	6	*	*	....	....	....	....	....
(3)	13	8	*	*	*	....	....	....	....
(4)	15	10	27.9	33.0	24.8	12.3	....	....	....
(5)	17	12	25.2	28.2	22.2	14.5	17.5		
(6)	19	14	17.2	17.5	13.7	9.4	8.5	5.1	
(7)	21	16	17.2	17.3	14.4	11.5	11.4	10.1	16.7

*Infinity

Source HANSEN, W.L.: *Total and Private Rates of Return to Investment in Schooling*, Journal of Political Economy, 1964, pp. 134-136

APPENDIX X: MEAN ANNUAL SALARY BY AGE AND EDUCATIONAL LEVEL,
MALES, GREAT BRITAIN, 1967

Age	Educational level						
	0	1	2	3	4	5	6
	£	£	£	£	£	£	£
15	286	-	-	-	-	-	-
16	257	(308)	-	(308)	(308)	-	-
17	696	362	360	(360)	(360)	-	-
18	468	468	482	395	(435)	-	-
19	547	562	651	497	(540)	-	-
20	774	654	666	533	(650)	-	-
21	798	759	805	824	637	702	-
22	748	-	930	707	863	828	850
23	902	885	785	896	841	991	1 081
24	934	742	903	972	1 059	980	1 217
25-29	967	923	1 055	1 011	1 107	1 180	1 249
30-34	1 073	948	1 285	1 232	1 294	1 392	1 760
35-39	1 166	2 136	1 374	1 343	1 511	1 773	2 198
40-44	1 181	1 616	1 738	1 483	1 592	1 856	2 246
45-49	1 226	1 452	1 444	1 603	1 791	2 184	2 709
50-54	1 239	1 590	1 565	1 604	1 347	2 218	2 702
55-59	1 260	1 640	1 486	1 784	1 934	2 165	1 722
60-64	1 230	1 184	2 034	1 363	1 556	2 185	2 150

Note: Bracketed figures were estimated on apprenticeship rates

Source   BLAUG, M.: *Private and Social Returns on Investment in
Education: Some Results for Great Briatin*,
Journal of Human Resources, 2: No. 3, September
1967 p. 338

APPENDIX XI: PUPIL ENROLMENT OF THE DEPARTMENT OF INDIAN AFFAIRS AS AT
7 MARCH 1978

(i) Natal

Class or standard	State schools	State-aided schools	Special schools	Total
Special classes	1 031	97	4	1 132
Unclassified			146	146
Class (i)	12 554	7 133	17	19 704
Class (ii)	12 999	6 790	31	19 820
Std 1	11 552	6 086	40	17 678
Std 2	11 356	6 016	28	17 400
Std 3	12 444	5 699	48	18 191
Std 4	12 538	4 809	19	17 366
Std 5	11 581	3 694	27	15 302
Std 6	12 900	1 025	18	13 943
Std 7	12 488	403	19	12 910
Std 8	10 535	251	14	10 800
Std 9	8 137	197	7	8 341
Std 10	4 095	169	6	4 270
Total	134 210	42 369	424	177 003

APPENDIX XI CONTINUED

(ii) Transvaal

Class or standard	State schools	State-aided schools	Special schools	Total
Special classes	110	Nil		110
Unclassified			42	42
Class (i)	3 007			3 007
Class (ii)	2 702			2 702
Std 1	2 546			2 546
Std 2	2 444			2 444
Std 3	2 359			2 359
Std 4	2 275			2 275
Std 5	2 176			2 176
Std 6	1 856			1 856
Std 7	1 834			1 834
Std 8	1 868			1 868
Std 9	1 295			1 295
Std 10	808			808
Total	25 280	-	42	25 322

APPENDIX XI CONTINUED

(iii) Cape Province

Class or standard	State schools	State-aided schools	Special schools	Total
		Nil	Nil	
Class (i)	346			346
Class (ii)	363			363
Std 1	259			259
Std 2	278			278
Std 3	288			288
Std 4	233			233
Std 5	250			250
Std 6	247			247
Std 7	243			243
Std 8	182			182
Std 9	95			95
Std 10	27			27
Total	2 811			2 811

Source   DEPARTMENT OF INDIAN AFFAIRS: *Report, 1 July 1977 to 30 June 1978* pp. 60-62

APPENDIX XII: FULL-TIME ENROLMENT AT THE SPRINGFIELD COLLEGE OF EDUCATION,
TRANSVAAL COLLEGE OF EDUCATION AND UNIVERSITY OF DURBAN-
WESTVILLE (FACULTY OF EDUCATION) - 1979

(i) Springfield College of Education

Course	Males	Females	Total
Junior Primary Education Diploma:			
First year	-	101	101
Second year	-	85	85
Third year	-	103	103
Senior Primary Education Diploma:			
First year	31	20	51
Second year	25	11	36
Third year	37	28	65
Junior Secondary Education Diploma:			
First year	92	70	162
Second year	72	58	130
Third year	51	60	111
Total	308	536	844

APPENDIX XII CONTINUED

(ii) Transvaal College of Education

Course	Males	Females	Total
Junior Primary Education Diploma:			
First year	–	21	21
Second year	–	11	11
Third year	–	11	11
Senior Primary Education Diploma:			
First year	62	18	80
Second year	37	12	49
Third year	55	18	73
Junior Secondary Education Diploma:			
First year	–	–	–
Second year	–	–	–
Third year	–	–	–
Total	154	91	245

APPENDIX XII CONTINUED

(iii) University of Durban-Westville (Faculty of Education)

Course	Males	Females	Total
Senior Primary Education Diploma:			
First year	10	16	26
Second year	16	19	35
Third year	11	23	34
Junior Secondary Education Diploma:			
First year	43	18	61
Second year	36	35	71
Third year	53	32	85
University Higher Diploma in Education:			
One-year course	31	18	49
Bachelor of Paedagogics:			
First year	60	53	113
Second year	57	60	117
Third year	48	42	90
Fourth year	36	15	51
Total	401	331	732

Source   DEPARTMENT OF INDIAN AFFAIRS : *Pupil Statistics as at 6 March
         (DIVISION OF EDUCATION)   1979*, pp. 24-26

APPENDIX XIII: RESEARCH QUESTIONNAIRE ADDRESSED TO CLERKS OF
THE DEPARTMENT OF INDIAN AFFAIRS

RESEARCH WITH THE UNIVERSITY OF DURBAN-WESTVILLE

EMPLOYEES OF THE DEPARTMENT OF INDIAN AFFAIRS:

Dear Sir/Madam

The information you are asked to supply is intended for use in research
towards a Masters Degree in Education. As the researcher is interested
in group characteristics only, you are at liberty to withhold your name
so long as your reference number is disclosed. In any event, the
researcher offers his assurance that the information supplied will
be treated strictly in confidence and will be used solely for research
purposes.

Thank you for your assistance and cooperation.

T. Vasar

KINDLY MARK WITH A CROSS (X) WHERE APPLICABLE

SECTION A

1. Name: _____

2. Reference Number: .... ☐☐☐☐☐☐☐

3. Sex: .... M ☐   F ☐

4. Date of Birth: .... ☐☐ 19 ☐☐

5. Date of Appointment: .... ☐☐ 19 ☐☐

6. Years of Service (in completed years) ....

7. Position held: Clerk Grade II ....
   Clerk Grade I ....
   Senior Clerk ....
   Principal Clerk ....
   Chief Clerk ....
   Other (specify) _____

8. No. of years for which the above post has been held _____

9. Marital status: .... M ☐   S ☐

10. If married, number of dependent children: _____

SECTION B *(To be completed only by unmarried men and women)*

11. Approximate monthly travelling cost to and from work: R _____

12. Approximate monthly expenditure on clothing for work: R _____

13. Estimate the monthly cost of your board and lodge: R _____

APPENDIX XIV: RESEARCH QUESTIONNAIRE ADDRESSED TO TEACHERS

OF THE DEPARTMENT OF INDIAN AFFAIRS

RESEARCH WITH THE UNIVERSITY OF DURBAN-WESTVILLE

TEACHERS, HEADS OF DEPARTMENT, DEPUTY PRINCIPALS AND PRINCIPALS OF THE DEPARTMENT OF INDIAN AFFAIRS

Dear Colleague

The information you are asked to supply is intended for use in research towards a Masters Degree in Education. The researcher offers his assurance that the information provided will be treated strictly in confidence and that it will be used solely for academic purposes. As the researcher is interested in group characteristics only, you are at liberty to withhold your name so long as your reference number is disclosed.

Your assistance and cooperation in completing this questionnaire is greatly appreciated.

T. Vasar

KINDLY MARK WITH A CROSS (X) WHERE APPLICABLE)

1. Name: ....

2. Reference number: ....

3. Sex: .... M☐ F☐

4. Date of Birth: .... ☐☐ ☐☐ 1 9 ☐☐

5. Category: ....

6. The year in which you acquired the above category: ...

7. Qualification - Professional: ......

Academic (Highest): ..

8. Date of appointment: .... ☐☐ ☐☐ 1 9 ☐☐

9. Years of service (in completed years): ....

10. Position held - Principal ....
                    Deputy Principal ....
                    Head of Department ....
                    Senior Teacher ....
                    Teacher ....

11. The year in which you acquired your present position: 1 9 ☐☐

12. Marital status: .... M☐ S☐

13. If married, number of dependent children: ....

14. Name of school at which you are presently engaged:

APPENDIX XV: EARNINGS OF MALES AND FEMALES BELONGING TO DIFFERENT
EDUCATIONAL LEVELS, ESTIMATED FOR THE PURPOSE OF THE
PRELIMINARY INVESTIGATION

MALES

R		R		R

Teachers - Category F (M + 6)

	R		R		R
1.	14 400	2.	13 200	3.	12 600
4.	11 400	5.	11 400	6.	10 800
7.	10 800	8.	8 550	9.	8 550
10.	8 550	11.	8 550		

Average = R10 800

Teachers - Category E (M + 5)

	R		R		R
1.	12 600	2.	12 600	3.	11 400
4.	10 800	5.	10 800	6.	10 200
7.	10 200	8.	10 200	9.	10 200
10.	9 600	11.	9 600	12.	9 600
13.	9 600	14.	8 550	15.	8 550
16.	8 550	17.	8 550	18.	8 550
19.	8 100	20.	8 100	21.	8 100
22.	8 100	23.	8 100	24.	8 100
25.	8 100	26.	8 100	27.	8 100

Average = R9 372

Teachers - Category D (M + 4)

	R		R		R
1.	12 000	2.	10 200	3.	10 200
4.	9 600	5.	9 600	6.	9 600
7.	9 600	8.	9 000	9.	9 000
10.	9 000	11.	9 000	12.	8 550
13.	8 100	14.	8 100	15.	8 100
16.	8 100	17.	7 650	18.	7 650
19.	7 650	20.	7 650	21.	7 650
22.	7 650	23.	7 650	24.	7 650
25.	7 650	26.	7 650	27.	7 650
28.	7 650	29.	7 650	30.	7 650
31.	7 650	32.	7 650	33.	7 650
34.	7 650	35.	7 650	36.	7 650
37.	6 750	38.	6 750	39.	6 750
40.	6 300	41.	5 040		

Average = R8 105

APPENDIX XV CONTINUED

	R			R			R

Teachers - Category C (M + 3)

1.	8 100	2.	8 100	3.	7 200
4.	7 200	5.	7 200	6.	6 750
7.	6 750	8.	6 750	9.	6 750
10.	6 750	11.	6 750	12.	6 750
13.	6 750	14.	6 750	15.	6 750
16.	6 750	17.	6 750	18.	6 750
19.	6 750	20.	6 750	21.	6 750
22.	6 750	23.	6 750	24.	6 750
25.	6 750	26.	6 750	27.	6 750
28.	6 750	29.	6 750	30.	6 750
31.	6 750	32.	6 750	33.	6 300
34.	6 300	35.	6 300	36.	5 850
37.	5 850	38.	5 850	39.	5 850
40.	5 850	41.	5 850	42.	5 400
43.	5 400	44.	5 400	45.	5 400
46.	5 400	47.	5 400	48.	5 040
49.	5 040	50.	5 040	51.	5 040
52.	4 680	53.	4 680	54.	4 680
55.	4 680	56.	4 680	57.	4 320
58.	4 320	59.	3 960	60.	3 960

Average = R6 110

Teachers - Category B (M + 2)

1.	6 750	2.	6 750	3.	5 850
4.	5 400	5.	5 400	6.	5 400
7.	5 400	8.	5 400	9.	5 400
10.	5 400	11.	5 400	12.	5 400
13.	5 400	14.	5 400	15.	5 400
16.	5 400	17.	5 400	18.	5 400
19.	5 400	20.	2 280		

Average = R5 402

APPENDIX XV CONTINUED

	R		R		R

Clerks - Standard 10

1.	9 480	2.	7 200	3.	7 200
4.	6 900	5.	6 900	6.	6 900
7.	6 900	8.	6 600	9.	6 600
10.	5 790	11.	5 790	12.	5 580
13.	5 370	14.	5 370	15.	5 370
16.	5 370	17.	5 160	18.	5 160
19.	5 160	20.	5 160	21.	4 960
22.	4 960	23.	4 960	24.	4 740
25.	4 530	26.	4 320	27.	4 320
28.	4 320	29.	4 320	30.	4 320
31.	4 320	32.	4 320	33.	4 320
34.	4 320	35.	4 320	36.	4 320
37.	4 320	38.	4 320	39.	4 110
40.	4 110	41.	4 110	42.	4 110
43.	4 110	44.	4 110	45.	3 900
46.	3 900	47.	3 900	48.	3 720
49.	3 720	50.	3 720	51.	3 540
52.	3 540	53.	3 540	54.	3 540
55.	3 540	56.	3 540	57.	3 360
58.	3 180	59.	3 180	60.	3 180
61.	3 180	62.	3 180	63.	3 000
64.	3 000	65.	3 000	66.	3 000
67.	3 000	68.	3 000	69.	3 000
70.	3 000	71.	3 000	72.	3 000
73.	2 820	74.	2 820	75.	2 670
76.	2 670	77.	2 670	78.	2 670
79.	2 670	80.	2 670	81.	2 670
82.	2 670	83.	2 670	84.	2 670
85.	2 520	86.	2 520	87.	2 520
88.	2 520	89.	2 520	90.	2 520
91.	2 520	92.	2 520	93.	2 520
94.	2 520	95.	2 520	96.	2 520

Average = R4 009

FEMALES

Teachers - Category E (M + 5)

1.	9 000	2.	9 000	3.	7 200
4.	6 300	5.	5 850	6.	5 400

Average = R7 125

APPENDIX XV CONTINUED

Teachers - Category D (M + 4)

1.	9 600	2.	6 750	3.	6 750
4.	6 300	5.	5 040	6.	3 960
7.	3 960				

Average = R6 051

Teachers - Category C (M + 3)

1.	7 200	2.	6 750	3.	6 750
4.	6 750	5.	6 750	6.	5 850
7.	5 850	8.	5 850	9.	5 850
10.	5 850	11.	5 850	12.	5 850
13.	5 850	14.	5 850	15.	5 850
16.	5 850	17.	5 850	18.	5 850
19.	5 850	20.	5 850	21.	5 400
22.	5 400	23.	5 400	24.	5 400
25.	5 400	26.	5 400	27.	5 040
28.	5 040	29.	5 040	30.	5 040
31.	5 040	32.	5 040	33.	4 680
34.	4 680	35.	4 680	36.	4 680
37.	4 680	38.	4 680	39.	4 680
40.	4 680	41.	4 680	42.	4 680
43.	4 320	44.	4 320	45.	4 320
46.	3 600	47.	3 600	48.	3 600
49.	3 600	50.	3 600	51.	3 240
52.	3 240	53.	3 240	54.	3 240
55.	3 240	56.	3 240	57.	3 240
58.	3 240	59.	3 240	60.	3 240
61.	3 240	62.	3 240		

Average = R4 859

Teachers - Category B (M + 2)

1.	4 680	2.	4 320	3.	4 320
4.	4 320	5.	4 320	6.	4 320
7.	4 320	8.	4 320	9.	4 320
10.	4 320	11.	4 320	12.	4 320
13.	4 320	14.	4 320	15.	4 320
16.	4 320	17.	3 240	18.	1 980

Average = R4 150

Clerks - Standard 10

1.	4 110	2.	3 360	3.	3 000
4.	2 670	5.	2 520	6.	2 370
7.	2 220	8.	2 220	9.	2 220
10.	2 070	11.	1 842		

Average = R2 600

APPENDIX XVI: RESEARCH QUESTIONNAIRE ADDRESSED TO TEACHER TRAINEES

RESEARCH WITH THE UNIVERSITY OF DURBAN-WESTVILLE

TEACHER TRAINEES AT UNIVERSITIES AND COLLEGES OF EDUCATION:

Dear Student

The information you are asked to supply is intended for use in research towards a Masters Degree in Education. The researcher offers his assurance that the information provided will be treated strictly in confidence and that it will be used solely for research purposes. Your assistance and cooperation is greatly appreciated.

T. Vasar

| KINDLY MARK WITH A CROSS (X) WHERE APPLICABLE |
---

1. Name: ....

2. Date of Birth: .... [ ][ ][ ][1][9][ ][ ]

3. Sex: .... [M] [ ]   [F] [ ]

4. Institution of study:..

5. Name of the course for which enrolled: ....

6. Duration of the above course: ....

7. Year of study: ....

First	
Second	
Third	
(B.Paed. and U.H.D.E. only) Fourth	

8. Estimate the value of textbooks, stationery and other study aids used by you for the year .   R _____ p.a.

9. Mode of transport to and from College ....

| Private Transport | |
| Public Transport | |

10. Approximate monthly travelling costs to and from College. (Including travelling costs during practice teaching). ....   R_____ p.m.

11. Approximate monthly expenditure on clothing for college use. (Including clothing purchased for practice teaching) ....   R_____ p.m.

12. Do you live in residence, do you board privately or do you live with your family? ....

Residence	
Board	
With Family	

13. If you live in residence what is your approximate monthly hostel and laundry cost? ....   R _____ p.m.

14. If you board privately, what is the monthly cost of your board and lodge? ....   R _____ p.m.

15. If you live with your family, estimate a monthly board and lodge cost incurred by your parents/guardian on your behalf ....   R _____ p.m.

APPENDIX XVII: SCHOOLS OF THE DEPARTMENT OF INDIAN
                  AFFAIRS USED IN THE INVESTIGATION

Name of school	Grade	Roll	Questionnaires returned		
			Males	Females	Total
Apollo	SI	999	30	13	43
Asoka	SI	1 163	35	15	50
Avoca	SI	778	21	11	32
Brindhaven	SI	966	20	7	27
Buffelsdale	SI	1 245	21	5	26
Burnwood	SI	1 096	32	13	45
Centenary	SI	1 007	33	12	45
Chatsworth	SI	1 099	21	14	35
Clairwood	SI	1 407	22	2	24
Clare Hills	SI	939	20	12	32
Crossmoor	SI	1 019	24	12	36
Drakensberg	SI	646	14	2	16
Dundee	SI	567	12	0	12
Durban Indian Girls'	SI	1 140	2	24	26
Esther Payne Smith	SI	986	28	6	34
Gandhi Desai	SI	1 083	8	0	8
Glenover	SI	1 029	29	9	38
Lakehaven	SI	1 182	21	10	31
Meadowlands	SI	1 101	16	3	19
Merebank	SI	1 038	30	11	41
Montarena	SI	997	22	3	25
Mount Edgecombe	SI	861	21	7	28
Phoenix No. 1	SI	*	22	13	35
Phoenix No. 2	SI	*	17	8	25
Phoenix No. 5	SI	*	11	4	15
Protea	SI	1 157	29	11	40
P.R.Pather	SI	1 093	23	9	32
Raisthorpe	SI	1 236	29	2	31
Reservoir Hills	SI	886	19	16	35
Risecliff	SI	1 214	29	9	38
Sastri College	SI	835	13	0	13
Southlands	SI	1 026	12	6	18
Tongaat	SI	1 141	31	8	39
Verulam	SI	804	11	3	14
Westcliff	SI	934	23	9	32
Woodlands	SI	1 202	23	8	31
Barberton	SII	200	4	1	5
East London	SII	377	8	4	12
M.L. Sultan Glencoe	SII	468	10	2	12
Orient Islamic	SII	423	16	4	20
Valencia	SII	293	8	0	8
Woolhope	SII	1 011	13	6	19
Alençon	PI	923	10	14	24
Alipore Road	PI	749	13	9	22
Anjuman Islam	PI	652	10	4	14
Astra	PI	752	9	9	18
Baijoo and Maharaj	PI	731	8	6	14

APPENDIX XVII CONTINUED

Name of school	Grade	Roll	Questionnaires returned		
			Males	Females	Total
Belvedere	PI	748	8	6	14
Clayhaven	PI	960	6	9	15
Coedmore	PI	636	10	7	17
Collegevale	PI	761	17	9	26
Columbia	PI	638	13	9	22
Crescentridge	PI	865	7	9	16
Crestview	PI	825	12	12	24
Crossmead	PI	763	7	8	15
Dawnridge	PI	923	13	13	26
Deccan Road	PI	1 258	15	18	33
Durban Heights	PI	666	8	3	11
Durwest	PI	619	10	7	17
Erica	PI	652	13	11	24
Evergreen	PI	804	10	13	23
Excelsior	PI	656	8	10	18
Fairhaven	PI	746	15	8	23
Falcon Park	PI	827	8	6	14
Glenview	PI	752	15	8	23
Greenvale	PI	603	11	8	19
Highlands	PI	693	15	9	24
Junagarth Road	PI	758	14	10	24
Lotus	PI	742	13	9	22
Merebank	PI	699	10	5	15
M.L. Sultan St. Mary's	PI	687	8	7	15
Moorlands	PI	1 213	8	6	14
Moorton Heights	PI	768	11	10	21
M. Padavatan	PI	785	10	2	12
Mountain Rise	PI	790	11	10	21
Newhaven	PI	731	8	5	13
Nizam Road	PI	951	11	16	27
Ocean View	PI	719	12	6	18
Orient Islamic	PI	604	8	9	17
Parlock	PI	740	9	6	15
Parsee Rustomjee	PI	710	12	12	24
Phoenix No. 1	PI	*	7	5	12
Phoenix No. 6	PI	*	4	8	12
Phoenix No. 8	PI	*	7	6	13
Phoenix Pioneer	PI	786	10	4	14
Resmount	PI	632	11	8	19
Rose Heights	PI	898	11	13	24
St. Aidan's	PI	898	6	2	8
St. Aidan's No. 3	PI	828	0	16	16
Settlers	PI	1 044	13	6	19
Seven Hills	PI	712	10	10	20
Silverglen No. 3	PI	438	10	12	22
S.M. Jhavary	PI	775	11	18	29
Southern Cross	PI	658	11	8	19
Springfield Gardens	PI	880	7	7	14
Springfield Model	PI	869	14	15	29
Summerfield	PI	759	7	8	15
Sunnyvale	PI	1 085	15	6	21

APPENDIX XVII CONTINUED

Name of school	Grade	Roll	Questionnaires returned		
			Males	Females	Total
Victoria	PI	724	18	6	24
Willow Park	PI	804	11	5	16
Woodgrove	PI	778	11	4	15
Ahmedia	PII	590	5	8	13
Arya Samaj	PII	301	2	7	9
Clairwood Boys'	PII	552	8	6	14
Clairwood Girls'	PII	445	0	7	7
Clare Estate	PII	399	6	3	9
Clareville	PII	528	7	5	12
Dr Mackan Mistry	PII	404	8	5	13
Durban South	PII	548	6	5	11
Hindu Tamil	PII	450	4	9	13
Islamia	PII	397	2	4	6
Juma Musjid	PII	414	0	14	14
M.L. Sultan Avoca	PII	491	5	7	12
P.P. Chetty	PII	250	4	5	9
Puntan's Hill	PII	301	5	3	8
Springfield Hindu	PII	596	9	5	14
Surat Hindoo	PII	419	2	8	10
T.P.A.	PII	630	10	10	20
Umgeni	PII	449	8	4	12
Umhlatuzana	PII	447	6	9	15
William A. Campbell	PII	485	8	4	12
Dr A.D. Lazarus	PIII	159	5	1	6
Greenwood Park	PIII	295	5	1	6
Gujerati Verdic	PIII	227	4	2	6
Hillview	PIII	146	3	2	5
Nizamia Muslim	PIII	253	4	4	8
Sanathan Sabha	PIII	109	2	3	5
Shri Vishnu	PIII	222	0	4	4

*New schools - role not confirmed as at 1.4.79.

Source (grade, roll): DEPARTMENT OF INDIAN AFFAIRS : *Circular Minute, AE*
(DIVISION OF EDUCATION) *of 1979*

APPENDIX XVIII: EARNINGS OF MALE AND FEMALE EMPLOYEES OF THE DEPARTMENT OF INDIAN AFFAIRS BELONGING TO DIFFERENT EDUCATIONAL LEVELS

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RESEARCH WITH THE UNIVERSITY OF DURBAN WESTVILLE

ESTIMATED EARNINGS

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	B	00-25	3600	100	252	3952	504	3448	SO	290	3662
				2880	100	202	3182	404	2778	SO	204	2978
				2880	100	202	3182	404	2778	SO	204	2978
				2880	100	202	3182	404	2778	SO	204	2978
				2880	100	202	3182	404	2778	SO	204	2978
				2880	100	202	3182	404	2778	SO	204	2978
				2280	200	160	2640	320	2320	MO	57	2583

AVERAGE PRE-TAX EARNING = 3215   AVERAGE POST-TAX EARNING = 3019

1	M	B	26-30	5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	MO	345	5633
				3600	200	252	4052	504	3548	M1	105	3947
				2880	200	202	3282	404	2878	M2	12	3270

AVERAGE PRE-TAX EARNING = 5464   AVERAGE POST-TAX EARNING = 5247

1	M	B	31-35	5850	200	410	6460	820	5640	M3	195	6265
				5850	200	410	6460	820	5640	M1	330	6130
				5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	B	31-35	5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352

AVERAGE PRE-TAX EARNING = 5984   AVERAGE POST-TAX EARNING = 5730

GROUP	SEX	CATEGORY	AGE	BASIC SALARY	VACATION BONUS	EMPLOYERS PENSION	PRE-TAX EARNINGS	NON-TAX PENSION	TAXABLE EARNINGS	TAX CODE	TAX DEDUCTION	POST-TAX EARNINGS
1	M	B	36-40	5850	200	410	6460	820	5640	M4	118	6342
				5850	200	410	6460	820	5640	M3	195	6265

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
	M	B	36-40	5850	200	410	6460	820	5640	M1	330	6130
				5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)×2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	B	36-40	5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				3240	200	227	3667	454	3213	M0	127	3540

AVERAGE PRE-TAX EARNING = 5963   AVERAGE POST-TAX EARNING = 5759

1	M	B	41-50	7200	200	504	7904	1008	6896	M5	193	7711
				7200	200	504	7904	1008	6896	M5	193	7711
				6750	200	473	7423	946	6477	M5	135	7288
				6750	200	473	7423	946	6477	M5	135	7288
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M0	511	6912
				6300	200	441	6941	882	6059	M4	171	6770
				6300	200	441	6941	882	6059	M3	240	6701
				5850	200	410	6460	820	5640	M4	118	6342
				5850	200	410	6460	820	5640	M3	195	6265
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5400	200	378	5978	756	5222	M6	00	5978
				5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M5	31	5947

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	B	41-50	5400	200	378	5978	756	5222	M5	31	5947
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	100	378	5878	756	5122	S0	526	5352
				3240	200	227	3667	454	3213	M4	00	3667

AVERAGE PRE-TAX EARNING = 6283   AVERAGE POST-TAX EARNING = 6092

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	B	51-60	7200	200	504	7904	1008	6896	M1	493	7411
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)x2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	B	51-60	6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6300	200	441	6941	882	6059	M4	171	6770
				5850	200	410	6460	820	5640	M2	264	6196
				5400	200	378	5978	756	5222	M6	00	5978
				5400	200	378	5978	756	5222	M4	81	5897
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633

AVERAGE PRE-TAX EARNING = 6614   AVERAGE POST-TAX EARNING = 6330

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	00-25	6750	200	473	7423	946	6477	M1	437	6986
				6300	200	441	6941	882	6059	M1	381	6560
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5040	200	353	5593	706	4887	M1	242	5351
				5040	200	353	5593	706	4887	M0	306	5287
				5040	200	353	5593	706	4887	M0	306	5287
				5040	200	353	5593	706	4887	M0	306	5287
				5040	200	353	5593	706	4887	M0	306	5287
				5040	100	353	5493	706	4787	S0	475	5018
				5040	100	353	5493	706	4787	S0	475	5018
				5040	100	353	5493	706	4787	S0	475	5018
				5040	100	353	5493	706	4787	S0	475	5018
				5040	100	353	5493	706	4787	S0	475	5018
				5040	100	353	5493	706	4787	S0	475	5018
				4680	200	328	5208	656	4552	M1	209	4999
				4680	200	328	5208	656	4552	M1	209	4999
				4680	200	328	5208	656	4552	M1	209	4999
				4680	200	328	5208	656	4552	M1	209	4999
				4680	200	328	5208	656	4552	M0	269	4939
				4680	200	328	5208	656	4552	M0	269	4939
				4680	200	328	5208	656	4552	M0	269	4939
				4680	200	328	5208	656	4552	M0	269	4939
				4680	200	328	5208	656	4552	M0	269	4939
				4680	200	328	5208	656	4552	M0	269	4939
				4680	100	328	5108	656	4452	S0	427	4681
				4680	100	328	5108	656	4452	S0	427	4681
				4680	100	328	5108	656	4452	S0	427	4681

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	00-25	4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	MO	236	4586
				4320	200	302	4822	604	4218	MO	236	4586
				4320	200	302	4822	604	4218	MO	236	4586
				4320	200	302	4822	604	4218	MO	236	4586
				4320	200	302	4822	604	4218	MO	236	4586
				4320	200	302	4822	604	4218	MO	236	4586
				4320	200	302	4822	604	4218	MO	236	4586
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				3960	200	277	4437	554	3883	M1	132	4305
				3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	00-25	3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235
				3960	200	277	4437	554	3883	MO	202	4235
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003
				3960	100	277	4337	554	3783	SO	334	4003

AVERAGE PRE-TAX EARNING = 5023   AVERAGE POST-TAX EARNING = 4686

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M	C	26-30	7200	200	504	7904	1008	6896	M3	339	7565
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	100	504	7804	1008	6796	SO	831	6973
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	26-30	6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912

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GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	26-30	6750	200	473	7423	946	6477	MO	511	6912
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6750	100	473	7323	946	6377	SO	750	6573
				6300	200	441	6941	882	6059	M3	240	6701
				6300	200	441	6941	882	6059	M2	315	6626
				6300	200	441	6941	882	6059	M2	315	6626
				6300	200	441	6941	882	6059	M2	315	6626
				6300	200	441	6941	882	6059	M2	315	6626
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	MO	454	6487
				6300	200	441	6941	882	6059	MO	454	6487
				6300	200	441	6941	882	6059	MO	454	6487
				6300	200	441	6941	882	6059	MO	454	6487
				6300	200	441	6941	882	6059	MO	454	6487
				6300	100	441	6841	882	5959	SO	669	6172
				6300	100	441	6841	882	5959	SO	669	6172
				6300	100	441	6841	882	5959	SO	669	6172
				6300	100	441	6841	882	5959	SO	669	6172
				6300	100	441	6841	882	5959	SO	669	6172
				6300	100	441	6841	882	5959	SO	669	6172
				5850	200	410	6460	820	5640	M4	118	6342
				5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M2	264	6196

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	26-30	5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	200	410	6460	820	5640	MO	398	6062
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5850	100	410	6360	820	5540	SO	597	5763
				5400	200	378	5978	756	5222	M3	137	5841
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M2	218	5760
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	M1	279	5699
				5400	200	378	5978	756	5222	MO	345	5633

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	26-30	5400	200	378	5978	756	5222	MO	345	5633
				5400	200	378	5978	756	5222	MO	345	5633
				5400	200	378	5978	756	5222	MO	345	5633
				5400	100	378	5878	756	5122	SO	526	5352
				5400	100	378	5878	756	5122	SO	526	5352
				5400	100	378	5878	756	5122	SO	526	5352
				5400	100	378	5878	756	5122	SO	526	5352
				5400	100	378	5878	756	5122	SO	526	5352
				5400	100	378	5878	756	5122	SO	526	5352
				5040	200	353	5593	706	4887	M1	242	5351
				5040	200	353	5593	706	4887	M1	242	5351
				5040	200	353	5593	706	4887	M1	242	5351
				5040	200	353	5593	706	4887	MO	306	5287
				5040	100	353	5493	706	4787	SO	475	5018
				5040	100	353	5493	706	4787	SO	475	5018
				5040	100	353	5493	706	4787	SO	475	5018
				4680	200	328	5208	656	4552	M2	138	5070
				4680	200	328	5208	656	4552	M1	209	4999
				4680	200	328	5208	656	4552	MO	269	4939
				4680	200	328	5208	656	4552	MO	269	4939
				4680	100	328	5108	656	4452	SO	427	4681
				4680	100	328	5108	656	4452	SO	427	4681
				4320	100	302	4722	604	4118	SO	379	4343
				4320	100	302	4722	604	4118	SO	379	4343
				3960	200	277	4437	554	3883	M1	132	4305

AVERAGE PRE-TAX EARNING = 6736   AVERAGE POST-TAX EARNING = 6308

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	C	31-35	7200	200	504	7904	1008	6896	M4	262	7642
				7200	200	504	7904	1008	6896	M4	262	7642
				7200	200	504	7904	1008	6896	M3	339	7565
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	MO	572	7332
				7200	200	504	7904	1008	6896	MO	572	7332
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)x2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	31-35	6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	31-35	6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	200	473	7423	946	6477	MO	511	6912
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6300	200	441	6941	882	6059	M2	315	6626
				6300	200	441	6941	882	6059	M2	315	6626
				5850	200	410	6460	820	5640	M2	264	6196
				5850	200	410	6460	820	5640	M1	330	6130
				5850	200	410	6460	820	5640	M1	330	6130
				5400	200	378	5978	756	5222	MO	345	5633
				4320	200	302	4822	604	4218	M2	111	4711

AVERAGE PRE-TAX EARNING = 7377   AVERAGE POST-TAX EARNING = 6958

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	36-40	8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M0	704	8163
				7200	200	504	7904	1008	6896	M4	262	7642
				7200	200	504	7904	1008	6896	M4	262	7642
				7200	200	504	7904	1008	6896	M4	262	7642
				7200	200	504	7904	1008	6896	M3	339	7565
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M0	572	7332
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX-PENSION (3)×2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	36-40	6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M0	511	6912
				6750	200	473	7423	946	6477	M0	511	6912
				6300	200	441	6941	882	6059	M1	381	6560
				4680	200	328	5208	656	4552	M2	138	5070

AVERAGE PRE-TAX EARNING = 7496   AVERAGE POST-TAX EARNING = 7161

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX-PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	C	41-50	10800	200	756	11756	1512	10244	M3	845	10911
				9000	200	630	9830	1260	8570	M3	564	9266
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8100	200	567	8867	1134	7733	M5	286	8581
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				7650	200	536	8386	1072	7314	M0	633	7753
				7200	200	504	7904	1008	6896	M9	00	7904
				7200	200	504	7904	1008	6896	M6	116	7788
				7200	200	504	7904	1008	6896	M4	262	7642
				7200	200	504	7904	1008	6896	M3	339	7565
				7200	200	504	7904	1008	6896	M3	339	7565
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	100	504	7804	1008	6796	S0	831	6973
				6750	200	473	7423	946	6477	M5	135	7288
				6750	200	473	7423	946	6477	M5	135	7288
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M4	216	7207
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	41-50	6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M3	288	7135
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	100	473	7323	946	6377	S0	750	6573

AVERAGE PRE-TAX EARNING = 7963   AVERAGE POST-TAX EARNING = 7597

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	C	51-60	10800	200	756	11756	1512	10244	M3	845	10711
				10800	200	756	11756	1512	10244	M1	1089	10667
				10800	200	756	11756	1512	10244	M0	1213	10543
				10800	200	756	11756	1512	10244	M0	1213	10543
				9000	200	630	9830	1260	8570	M4	474	9356
				9000	200	630	9830	1260	8570	M0	856	8974
				9000	200	630	9830	1260	8570	M0	856	8974
				8550	200	599	9349	1198	8151	M0	775	8574
				8550	200	599	9349	1198	8151	M0	775	8574
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	200	567	8867	1134	7733	M0	704	8163
				7650	200	536	8386	1072	7314	M2	476	7910
				7200	200	504	7904	1008	6896	M0	572	7332
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986

AVERAGE PRE-TAX EARNING = 9421   AVERAGE POST-TAX EARNING = 8720

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	00-25	6750	100	473	7323	946	6377	S0	750	6573
				6300	200	441	6941	882	6059	M2	315	6626
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M0	454	6487
				6300	100	441	6841	882	5959	S0	669	6172
				5850	200	410	6460	820	5640	M1	330	6130
				5850	100	410	6360	820	5540	S0	597	5763
				5850	100	410	6360	820	5540	S0	597	5763
				5850	100	410	6360	820	5540	S0	597	5763
				5850	100	410	6360	820	5540	S0	597	5763
				5400	200	378	5978	756	5222	M0	345	5633
				5400	200	378	5978	756	5222	M0	345	5633
				5040	200	353	5593	706	4887	M0	306	5287
				5040	200	353	5593	706	4887	M0	306	5287
				5040	100	353	5493	706	4787	S0	475	5018
				5040	100	353	5493	706	4787	S0	475	5018
				4680	200	328	5208	656	4552	M1	209	4999
				4680	100	328	5108	656	4452	S0	427	4681
				4680	100	328	5108	656	4452	S0	427	4681
				4680	100	328	5108	656	4452	S0	427	4681
				4680	100	328	5108	656	4452	S0	427	4681
				4680	200	328	5208	656	4552	M0	269	4939

AVERAGE PRE-TAX EARNING = 5994   AVERAGE POST-TAX EARNING = 5552

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M	D	26-30	9000	200	630	9830	1260	8570	M2	661	9169
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	100	567	8767	1134	7633	S0	1013	7754
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	26-30	7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M2	420	7484
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M0	572	7332
				7200	100	504	7804	1008	6796	S0	831	6973
				7200	100	504	7804	1008	6796	S0	831	6973
				7200	100	504	7804	1008	6796	S0	831	6973
				7200	100	504	7804	1008	6796	S0	831	6973
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M1	437	6986
				6750	200	473	7423	946	6477	M0	511	6912
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M1	381	6560
				6300	200	441	6941	882	6059	M0	454	6487
				6300	200	441	6941	882	6059	M0	454	6487
				6300	100	441	6841	882	5959	S0	669	6172
				6300	100	441	6841	882	5959	S0	669	6172
				6300	100	441	6841	882	5959	S0	669	6172

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	26-30	6300	100	441	6841	882	5959	S0	669	6172
				6300	100	441	6841	882	5959	S0	669	6172
				5400	200	378	5978	756	5222	M0	345	5633
				5400	100	378	5878	756	5122	S0	526	5352
				5400	100	378	5878	756	5122	S0	526	5352
				5040	100	353	5493	706	4787	S0	475	5018
				4680	100	328	5108	656	4452	S0	427	4681

AVERAGE PRE-TAX EARNING = 7769   AVERAGE POST-TAX EARNING = 7193

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	D	31-35	9000	200	630	9830	1260	8570	M4	474	9356
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M1	754	9076
				9000	200	630	9830	1260	8570	M0	856	8974
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	100	567	8767	1134	7633	S0	1013	7754
				7650	200	536	8386	1072	7314	M5	238	8148
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	31-35	7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	31-35	7650	200	536	8386	1072	7314	MO	633	7753
				7650	100	536	8286	1072	7214	SO	922	7364
				7650	100	536	8286	1072	7214	SO	922	7364
				7650	100	536	8286	1072	7214	SO	922	7364
				7650	100	536	8286	1072	7214	SO	922	7364
				7650	100	536	8286	1072	7214	SO	922	7364
				7650	100	536	8286	1072	7214	SO	922	7364
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	MO	572	7332

AVERAGE PRE-TAX EARNING = 8505   AVERAGE POST-TAX EARNING = 7972

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	D	36-40	9000	200	630	9830	1260	8570	M5	389	9441
				9000	200	630	9830	1260	8570	M3	564	9266
				9000	200	630	9830	1260	8570	M3	564	9266
				9000	200	630	9830	1260	8570	M3	564	9266
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				8550	200	599	9349	1198	8151	M2	596	8753
				8100	200	567	8867	1134	7733	M5	286	8581
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	MO	704	8163
				8100	200	567	8867	1134	7733	MO	704	8163
				8100	100	567	8767	1134	7633	SO	1013	7754
				7650	200	536	8386	1072	7314	M5	238	8148
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	36-40	7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364
				6300	100	441	6841	882	5959	S0	669	6172

AVERAGE PRE-TAX EARNING = 8597   AVERAGE POST-TAX EARNING = 8089

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M	D	41-50	13200	200	924	14324	1848	12476	M3	1336	12988
				12600	200	882	13682	1764	11918	M5	923	12759
				12600	200	882	13682	1764	11918	M2	1354	12328
				12000	200	840	13040	1680	11360	M4	938	12102
				12000	200	840	13040	1680	11360	M4	938	12102
				12000	200	840	13040	1680	11360	M3	1075	11965
				11400	200	798	12398	1596	10802	M3	953	11445
				10800	200	756	11756	1512	10244	M3	845	10911
				10800	100	756	11656	1512	10144	S0	1669	9987
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				9600	200	672	10472	1344	9128	M5	463	10009

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	41-50	9600	200	672	10472	1344	9128	M5	463	10009
				9600	200	672	10472	1344	9128	M4	553	9919
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M1	858	9614
				9600	200	672	10472	1344	9128	M1	858	9614
				9000	200	630	9830	1260	8570	M5	389	9441
				9000	200	630	9830	1260	8570	M4	474	9356
				9000	200	630	9830	1260	8570	M3	564	9266
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M1	754	9076
				9000	200	630	9830	1260	8570	M0	856	8974
				9000	100	630	9730	1260	8470	S0	1213	8517
				9000	100	630	9730	1260	8470	S0	1213	8517
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8100	200	567	8867	1134	7733	M5	286	8581
				8100	200	567	8867	1134	7733	M5	286	8581
				8100	200	567	8867	1134	7733	M5	286	8581
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M1	614	8253
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	M3	391	7995

				(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
GROUP	SEX	CATEGORY	AGE									
1	M	D	41-50	7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M3	391	7995
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	100	536	8286	1072	7214	S0	922	7364
				7650	100	536	8286	1072	7214	S0	922	7364

AVERAGE PRE-TAX EARNING =   9949   AVERAGE POST-TAX EARNING =   9294

1	M	D	51-60	13200	200	924	14324	1848	12476	M3	1336	12988
				13200	200	924	14324	1848	12476	M1	1649	12675
				13200	200	924	14324	1848	12476	M0	1807	12517
				13200	200	924	14324	1848	12476	M0	1807	12517
				12600	200	882	13682	1764	11918	M3	1200	12482
				12000	200	840	13040	1680	11360	M4	938	12102
				12000	200	840	13040	1680	11360	M3	1075	11965
				12000	200	840	13040	1680	11360	M2	1220	11820
				12000	200	840	13040	1680	11360	M1	1352	11688
				12000	200	840	13040	1680	11360	M0	1495	11545
				12000	200	840	13040	1680	11360	M0	1495	11545
				12000	200	840	13040	1680	11360	M0	1495	11545
				12000	200	840	13040	1680	11360	M0	1495	11545
				10800	200	756	11756	1512	10244	M4	729	11027
				10200	200	714	11114	1428	9686	M5	541	10573
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M1	967	10147
				10200	200	714	11114	1428	9686	M1	967	10147
				10200	200	714	11114	1428	9686	M1	967	10147
				10200	200	714	11114	1428	9686	M0	1086	10028
				10200	200	714	11114	1428	9686	M0	1086	10028
				9600	200	672	10472	1344	9128	M7	301	10171
				9600	200	672	10472	1344	9128	M4	553	9919
				9600	200	672	10472	1344	9128	M4	553	9919
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M1	858	9614
				9600	200	672	10472	1344	9128	M1	858	9614
				9600	200	672	10472	1344	9128	M1	858	9614
				9600	200	672	10472	1344	9128	M0		

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	D	51-60	9600	200	672	10472	1344	9128	MO	964	9508
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	200	630	9830	1260	8570	M2	661	9169
				9000	100	630	9730	1260	8470	SO	1213	8517
				8100	200	567	8867	1134	7733	M6	215	8652
				8100	200	567	8867	1134	7733	M1	614	8253
				7650	200	536	8386	1072	7314	M4	312	8074
				7650	200	536	8386	1072	7314	MO	633	7753

AVERAGE PRE-TAX EARNING = 11367   AVERAGE POST-TAX EARNING = 10396

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	E	26-30	9600	200	672	10472	1344	9128	M2	756	9716
				8550	200	599	9349	1198	8151	M0	775	8574
				8550	100	599	9249	1198	8051	S0	1112	8137
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	100	567	8767	1134	7633	S0	1013	7754
				7650	200	536	8386	1072	7314	M2	476	7910
				7650	200	536	8386	1072	7314	M1	553	7833
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	200	536	8386	1072	7314	M0	633	7753
				7650	100	536	8286	1072	7214	S0	922	7364
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	200	504	7904	1008	6896	M1	493	7411
				7200	100	504	7804	1008	6796	S0	831	6973
				7200	100	504	7804	1008	6796	S0	831	6973
				6750	200	473	7423	946	6477	M2	365	7058
				6750	200	473	7423	946	6477	M1	437	6986
				6750	100	473	7323	946	6377	S0	750	6573
				6750	100	473	7323	946	6377	S0	750	6573
				5850	200	410	6460	820	5640	M0	398	6062

AVERAGE PRE-TAX EARNING = 8536   AVERAGE POST-TAX EARNING = 7912

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	E	31-35	9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M1	858	9614
				9600	100	672	10372	1344	9028	S0	1358	9014
				8550	200	599	9349	1198	8151	M3	503	8846

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	E	31-35	8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	100	599	9249	1198	8051	S0	1112	8137
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	200	567	8867	1134	7733	M0	704	8163
				8100	100	567	8767	1134	7633	S0	1013	7754
				8100	100	567	8767	1134	7633	S0	1013	7754
				8100	100	567	8767	1134	7633	S0	1013	7754

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	E	31-35	8100	100	567	8767	1134	7633	S0	1013	7754
				8100	100	567	8767	1134	7633	S0	1013	7754
				7200	200	504	7904	1008	6896	M1	493	7411
				5850	200	410	6460	820	5640	M1	330	6130

AVERAGE PRE-TAX EARNING = 9029   AVERAGE POST-TAX EARNING = 8417

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M	E	36-40	10800	200	756	11756	1512	10244	M3	845	10911
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M1	967	10147
				10200	100	714	11014	1428	9586	S0	1507	9507
				9600	200	672	10472	1344	9128	M4	553	9919
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				8550	200	599	9349	1198	8151	M5	337	9012
				8550	200	599	9349	1198	8151	M4	418	8931
				8550	200	599	9349	1198	8151	M4	418	8931
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	100	599	9249	1198	8051	S0	1112	8137
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M4	363	8504
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	E	36-40	8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	200	567	8867	1134	7733	M0	704	8163

AVERAGE PRE-TAX EARNING = 9428   AVERAGE POST-TAX EARNING = 8833

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	M	E	41-50	13200	200	924	14324	1848	12476	M2	1501	12823
				13200	200	924	14324	1848	12476	M1	1649	12675
				12600	200	882	13682	1764	11918	M6	800	12882
				12000	200	840	13040	1680	11360	M3	1075	11965
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M1	1089	10667
				10200	200	714	11114	1428	9686	M5	541	10573
				10200	200	714	11114	1428	9686	M4	635	10479
				10200	200	714	11114	1428	9686	M4	635	10479
				10200	200	714	11114	1428	9686	M4	635	10479
				10200	200	714	11114	1428	9686	M4	635	10479
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M1	967	10147
				9600	200	672	10472	1344	9128	M5	463	10009
				9600	200	672	10472	1344	9128	M4	553	9919
				9600	200	672	10472	1344	9128	M4	553	9919
				9600	200	672	10472	1344	9128	M3	648	9824

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	E	41-50	9600	200	672	10472	1344	9128	M3	648	9824
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9600	200	672	10472	1344	9128	M2	756	9716
				9000	200	630	9830	1260	8570	M4	474	9356
				8550	200	599	9349	1198	8151	M4	418	8931
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M2	596	8753
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M3	447	8420
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M2	535	8332
				8100	200	567	8867	1134	7733	M1	614	8253
				8100	100	567	8767	1134	7633	S0	1013	7754

AVERAGE PRE-TAX EARNING = 10479   AVERAGE POST-TAX EARNING = 9774

1	M	E	51-60	13800	200	966	14966	1932	13034	M4	1317	13649
				13800	200	966	14966	1932	13034	M0	1977	12989
				12600	200	882	13682	1764	11918	M4	1057	12625
				12600	200	882	13682	1764	11918	M2	1354	12328
				12600	200	882	13682	1764	11918	M2	1354	12328
				12600	200	882	13682	1764	11918	M2	1354	12328
				12600	200	882	13682	1764	11918	M1	1498	12184
				12600	200	882	13682	1764	11918	M1	1498	12184
				12600	200	882	13682	1764	11918	M0	1645	12037
				11400	200	798	12398	1596	10802	M4	830	11568
				10800	200	756	11756	1512	10244	M4	729	11027
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M1	1089	10667
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M0	1086	10028

AVERAGE PRE-TAX EARNING =

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	F	26-30	10200	200	714	11114	1428	9686	M2	860	10254
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M1	683	8666
				8110	200	568	8878	1136	7742	M1	615	8263

AVERAGE PRE-TAX EARNING = 9608   AVERAGE POST-TAX EARNING = 8956

1	M	F	31-35	10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M0	1086	10028
				10200	200	714	11114	1428	9686	M0	1086	10028
				10200	100	714	11014	1428	9586	S0	1507	9507
				9000	200	630	9830	1260	8570	M2	661	9149
				9000	200	630	9830	1260	8570	M2	661	9169
				8550	200	599	9349	1198	8151	M5	337	9012
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M2	596	8753
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M0	775	8574
				8550	200	599	9349	1198	8151	M0	775	8574
				7650	200	536	8386	1072	7314	M0	633	7753

AVERAGE PRE-TAX EARNING = 9769   AVERAGE POST-TAX EARNING = 9055

1	M	F	36-40	11400	200	798	12398	1596	10802	M4	830	11568
				11400	200	798	12398	1596	10802	M3	953	11445
				11400	200	798	12398	1596	10802	M1	1217	11181
				10800	200	756	11756	1512	10244	M3	845	10911
				10800	200	756	11756	1512	10244	M3	845	10911
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M0	1213	10543
				10200	200	714	11114	1428	9686	M2	860	10254
				10200	200	714	11114	1428	9686	M2	860	10254

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	M	F	36-40	10200	200	714	11114	1428	9686	M2	860	10254
				9000	200	630	9830	1260	8570	M2	661	9169
				8550	200	599	9349	1198	8151	M4	418	8931
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M1	683	8666
				8550	200	599	9349	1198	8151	M0	775	8574

AVERAGE PRE-TAX EARNING = 11076   AVERAGE POST-TAX EARNING = 10217

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M	F	41-50	14400	200	1008	15608	2016	13592	M4	1459	14149
				13200	200	924	14324	1848	12476	M4	1182	13142
				13200	200	924	14324	1848	12476	M3	1336	12988
				13200	200	924	14324	1848	12476	M2	1501	12823
				13200	200	924	14324	1848	12476	M0	1807	12517
				12600	200	882	13682	1764	11918	M4	1057	12625
				12600	200	882	13682	1764	11918	M4	1057	12625
				11400	200	798	12398	1596	10802	M3	953	11445
				11400	200	798	12398	1596	10802	M1	1217	11181
				10800	200	756	11756	1512	10244	M4	729	11027
				10800	200	756	11756	1512	10244	M3	845	10911
				10800	200	756	11756	1512	10244	M3	845	10911
				10800	200	756	11756	1512	10244	M3	845	10911
				10800	200	756	11756	1512	10244	M2	970	10786
				10800	200	756	11756	1512	10244	M1	1089	10667
				10200	200	714	11114	1428	9686	M3	743	10371
				10200	200	714	11114	1428	9686	M3	743	10371
				8550	200	599	9349	1198	8151	M4	418	8931
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846
				8550	200	599	9349	1198	8151	M3	503	8846

AVERAGE PRE-TAX EARNING = 12026   AVERAGE POST-TAX EARNING = 11080

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	M	F	51-60	14400	200	1008	15608	2016	13592	M4	1459	14149
				14400	200	1008	15608	2016	13592	M2	1815	13793
				13200	200	924	14324	1848	12476	M3	1336	12988
				13200	200	924	14324	1848	12476	M3	1336	12988
				13200	200	924	14324	1848	12476	M2	1501	12823
				10800	200	756	11756	1512	10244	M2	970	10786

AVERAGE PRE-TAX EARNING = 14324   AVERAGE POST-TAX EARNING = 12921

RESEARCH WITH THE UNIVERSITY OF DURBAN WESTVILLE

ESTIMATED EARNINGS

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	B	00-25	2160	100	108	2368	216	2152	MW	84	2284
				1980	100	99	2179	198	1981	MW	67	2112
				1980	100	99	2179	198	1981	SO	98	2081
				1980	100	99	2179	198	1981	SO	98	2081

AVERAGE PRE-TAX EARNING = 2226   AVERAGE POST-TAX EARNING = 2140

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	F	B	26-30	4680	100	234	5014	468	4546	MW	482	4532
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				3600	100	180	3880	360	3520	MW	272	3608

AVERAGE PRE-TAX EARNING = 4618   AVERAGE POST-TAX EARNING = 4219

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	F	B	31-35	4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	SO	441	4573
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	B	31-35	4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				3600	100	180	3880	360	3520	MW	272	3608
				3240	100	162	3502	324	3178	MW	215	3287
				2880	100	144	3124	288	2836	MW	165	2959

AVERAGE PRE-TAX EARNING = 4600   AVERAGE POST-TAX EARNING = 4203

| 1 | F | B | 36-40 | 5850 | 100 | 293 | 6243 | 586 | 5657 | MW | 776 | 5467 |

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	B	36-40	4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				3960	100	198	4258	396	3862	MW	335	3923

AVERAGE PRE-TAX EARNING =   4702   AVERAGE POST-TAX EARNING =   4283

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	B	41-50	4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	B	41-50	4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	SO	392	4244

AVERAGE PRE-TAX EARNING = 4696   AVERAGE POST-TAX EARNING = 4279

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	00-25	5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	00-25	4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	00-25	3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	00-25	3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	MW	215	3287
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	00-25	3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248
				3240	100	162	3502	324	3178	SO	254	3248

AVERAGE PRE-TAX EARNING = 4058   AVERAGE POST-TAX EARNING = 3737

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	F	C	26-30	7200	100	360	7660	720	6940	MW	1086	6574
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6300	100	315	6715	630	6085	MW	898	5817
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	26-30	5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	26-30	5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5400	100	270	5770	540	5230	SO	544	5226
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	26-30	5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	MW	482	4532
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	MW	405	4231
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	26-30	4320	100	216	4636	432	4204	SO	392	4244
				3960	100	198	4258	396	3862	MW	335	3923
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	MW	272	3608
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3600	100	180	3880	360	3520	SO	299	3581
				3240	100	162	3502	324	3178	MW	215	3287

AVERAGE PRE-TAX EARNING = 5684   AVERAGE POST-TAX EARNING = 5059

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	C	31-35	7200	100	360	7660	720	6940	MW	1086	6574
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	SO	776	6412
				6750	100	338	7188	676	6512	SO	776	6412
				6750	100	338	7188	676	6512	SO	776	6412
				6750	100	338	7188	676	6512	SO	776	6412
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	SO	693	6022
				6300	100	315	6715	630	6085	SO	693	6022
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	SO	617	5626

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	31-35	5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5400	100	270	5770	540	5230	MW	654	5116
				4680	100	234	5014	468	4546	MW	482	4532
				3240	100	162	3502	324	3178	MW	215	3287

AVERAGE PRE-TAX EARNING = 6369   AVERAGE POST-TAX EARNING = 5628

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	C	36-40	7650	100	383	8133	766	7367	MW	1180	6953
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	SO	776	6412
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	SO	693	6022
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	SO	617	5626
				5040	100	252	5392	504	4888	MW	565	4827

AVERAGE PRE-TAX EARNING = 6485   AVERAGE POST-TAX EARNING = 5691

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	C	41-50	7650	100	383	8133	766	7367	MW	1180	6953
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	SO	776	6412
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	C	41-50	5850	100	293	6243	586	5657	S0	617	5626
				5850	100	293	6243	586	5657	S0	617	5626
				5850	100	293	6243	586	5657	S0	617	5626

AVERAGE PRE-TAX EARNING = 6825   AVERAGE POST-TAX EARNING = 5971

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	D	00-25	5850	100	293	6243	586	5657	MW	776	5467
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	MW	565	4827
				5040	100	252	5392	504	4888	SO	489	4903
				5040	100	252	5392	504	4888	SO	489	4903
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				4320	100	216	4636	432	4204	SO	392	4244
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	MW	335	3923
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914
				3960	100	198	4258	396	3862	SO	344	3914

AVERAGE PRE-TAX EARNING = 4780   AVERAGE POST-TAX EARNING = 4347

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	F	D	26-30	8550	100	428	9078	856	8222	MW	1368	7710
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	SO	776	6412
				6750	100	338	7188	676	6512	SO	776	6412
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	MW	898	5817
				6300	100	315	6715	630	6085	SO	693	6022
				6300	100	315	6715	630	6085	SO	693	6022
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116
				5400	100	270	5770	540	5230	MW	654	5116

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	D	26-30	5040	100	252	5392	504	4888	SO	489	4903
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				4680	100	234	5014	468	4546	SO	441	4573
				3960	100	198	4258	396	3862	SO	344	3914

AVERAGE PRE-TAX EARNING = 6354   AVERAGE POST-TAX EARNING = 5602

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	D	31-35	8550	100	428	9078	856	8222	MW	1368	7710
				8550	100	428	9078	856	8222	MW	1368	7710
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	SO	776	6412
				4320	100	216	4636	432	4204	SO	392	4244

AVERAGE PRE-TAX EARNING = 7290   AVERAGE POST-TAX EARNING = 6304

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	D	36-40	7650	100	383	8133	766	7367	MW	1180	6953
				7650	100	383	8133	766	7367	MW	1180	6953
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196

AVERAGE PRE-TAX EARNING = 7458   AVERAGE POST-TAX EARNING = 6412

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	D	41-50	9600	100	480	10180	960	9220	MW	1588	8592
				9000	100	450	9550	900	8650	MW	1463	8087
				7200	100	360	7660	720	6940	MW	1086	6574
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196
				6750	100	338	7188	676	6512	MW	992	6196

AVERAGE PRE-TAX EARNING = 8159   AVERAGE POST-TAX EARNING = 6974

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
1	F	E	26-30	8550	100	428	9078	856	8222	SO	1153	7925
				7650	100	383	8133	766	7367	MW	1180	6953
				7200	100	360	7660	720	6940	MW	1086	6574
				7200	100	360	7660	720	6940	MW	1086	6574
				7200	100	360	7660	720	6940	MW	1086	6574
				7200	100	360	7660	720	6940	MW	1086	6574
				7200	100	360	7660	720	6940	MW	1086	6574
				6300	100	315	6715	630	6085	MW	898	5817
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	MW	776	5467
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5850	100	293	6243	586	5657	SO	617	5626
				5400	100	270	5770	540	5230	MW	654	5116

AVERAGE PRE-TAX EARNING = 7087   AVERAGE POST-TAX EARNING = 6178

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	E	31-35	9000	100	450	9550	900	8650	SO	1257	8293
				9000	100	450	9550	900	8650	SO	1257	8293
				8550	100	428	9078	856	8222	MW	1368	7710
				8550	100	428	9078	856	8222	MW	1368	7710
				8100	100	405	8605	810	7795	SO	1050	7555
				7650	100	383	8133	766	7367	MW	1180	6953
				7650	100	383	8133	766	7367	MW	1180	6953
				7650	100	383	8133	766	7367	MW	1180	6953
				7200	100	360	7660	720	6940	MW	1086	6574
				7200	100	360	7660	720	6940	MW	1086	6574
				7200	100	360	7660	720	6940	SO	862	6798

AVERAGE PRE-TAX EARNING = 8476   AVERAGE POST-TAX EARNING = 7306

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
1	F	E	36-40	10800	100	540	11440	1080	10360	MW	1839	9601
				9600	100	480	10180	960	9220	MW	1588	8592
				9000	100	450	9550	900	8650	MW	1463	8087
				9000	100	450	9550	900	8650	MW	1463	8087
				9000	100	450	9550	900	8650	MW	1463	8087
				9000	100	450	9550	900	8650	MW	1463	8087
				9000	100	450	9550	900	8650	SO	1257	8293
				7200	100	360	7660	720	6940	MW	1086	6574
				6300	100	315	6715	630	6085	MW	898	5817

AVERAGE PRE-TAX EARNING = 9305   AVERAGE POST-TAX EARNING = 7914

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ESTIMATED EARNINGS

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		00-20	3000	200	210	3410	420	2990	MO	109	3301
				3000	200	210	3410	420	2990	MO	109	3301
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920
				2670	200	187	3057	374	2683	MO	84	2973
				2670	200	187	3057	374	2683	MO	84	2973
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		00-20	2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2·48
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648
				2520	100	176	2796	352	2444	S0	148	2648

AVERAGE PRE-TAX EARNING = 2928   AVERAGE POST-TAX EARNING = 2766

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX. PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
2	M		21-25	4320	100	302	4722	604	4118	S0	379	4343
				4320	100	302	4722	604	4118	S0	379	4343
				4110	200	288	4598	576	4022	M1	143	4455
				3900	200	273	4373	546	3827	M1	128	4245
				3720	200	260	4180	520	3660	M2	67	4113
				3720	200	260	4180	520	3660	M0	180	4000
				3720	200	260	4180	520	3660	M0	180	4000
				3720	200	260	4180	520	3660	M0	180	4000
				3720	200	260	4180	520	3660	M0	180	4000
				3720	100	260	4080	520	3560	S0	304	3776
				3720	100	260	4080	520	3560	S0	304	3776
				3720	100	260	4080	520	3560	S0	304	3776
				3720	100	260	4080	520	3560	S0	304	3776
				3720	100	260	4080	520	3560	S0	304	3776
				3540	200	248	3988	496	3492	M2	55	3933
				3540	200	248	3988	496	3492	M2	55	3933
				3540	200	248	3988	496	3492	M1	101	3887
				3540	200	248	3988	496	3492	M1	101	3887
				3540	100	248	3888	496	3392	S0	282	3606
				3540	100	248	3888	496	3392	S0	282	3606
				3540	100	248	3888	496	3392	S0	282	3606
				3540	100	248	3888	496	3392	S0	282	3606
				3360	200	235	3795	470	3325	M1	88	3707
				3360	200	235	3795	470	3325	M0	136	3659
				3360	200	235	3795	470	3325	M0	136	3659
				3360	100	235	3695	470	3225	S0	260	3435

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		21-25	3180	200	223	3603	446	3157	MO	122	3481
				3180	200	223	3603	446	3157	MO	122	3481
				3180	200	223	3603	446	3157	MO	122	3481
				3180	200	223	3603	446	3157	MO	122	3481
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3180	100	223	3503	446	3057	SO	238	3265
				3000	200	210	3410	420	2990	M1	62	3348
				3000	200	210	3410	420	2990	M1	62	3348
				3000	200	210	3410	420	2990	M1	62	3348
				3000	200	210	3410	420	2990	M1	62	3348
				3000	200	210	3410	420	2990	MO	109	3301
				3000	200	210	3410	420	2990	MO	109	3301
				3000	200	210	3410	420	2990	MO	109	3301
				3000	200	210	3410	420	2990	MO	109	3301
				3000	200	210	3410	420	2990	MO	109	3301
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				3000	100	210	3310	420	2890	SO	217	3093
				2820	200	197	3217	394	2823	M1	50	3167
				2820	200	197	3217	394	2823	MO	95	3122
				2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		21-25	2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920
				2820	100	197	3117	394	2723	SO	197	2920
				2670	200	187	3057	374	2683	MO	84	2973
				2670	200	187	3057	374	2683	MO	84	2973
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2670	100	187	2957	374	2583	SO	180	2777
				2520	200	176	2896	352	2544	M1	31	2865
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648
				2520	100	176	2796	352	2444	SO	148	2648

AVERAGE PRE-TAX EARNING = 3408   AVERAGE POST-TAX EARNING = 3227

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2	M		26-30	5370	200	376	5946	752	5194	MO	342	5604
				5160	100	361	5621	722	4899	SO	491	5130
				4950	200	347	5497	694	4803	MO	297	5200
				4950	200	347	5497	694	4803	MO	297	5200
				4950	100	347	5397	694	4703	SO	463	4934
				4740	200	332	5272	664	4608	M1	215	5057
				4530	200	317	5047	634	4413	M4	21	5026
				4530	100	317	4947	634	4313	SO	407	4540
				4320	200	302	4822	604	4218	M3	57	4765
				4320	200	302	4822	604	4218	M3	57	

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		26-30	4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M0	236	4586
				4320	200	302	4822	604	4218	M0	236	4586
				4320	200	302	4822	604	4218	M0	236	4586
				4320	200	302	4822	604	4218	M0	236	4586
				4320	200	302	4822	604	4218	M0	236	4586
				4320	200	302	4822	604	4218	M0	236	4586
				4320	200	302	4822	604	4218	M0	236	4586
				4110	200	288	4598	576	4022	M2	95	4503
				4110	200	288	4598	576	4022	M2	95	4503
				4110	200	288	4598	576	4022	M1	143	4455
				4110	200	288	4598	576	4022	M1	143	4455
				4110	200	288	4598	576	4022	M1	143	4455
				4110	200	288	4598	576	4022	M0	216	4382
				4110	100	288	4498	576	3922	S0	352	4146
				3900	200	273	4373	546	3827	M0	197	4176
				3720	200	260	4180	520	3660	M2	67	4113
				3720	200	260	4180	520	3660	M2	67	4113
				3720	200	260	4180	520	3660	M1	114	4066
				3720	200	260	4180	520	3660	M1	114	4066
				3720	200	260	4180	520	3660	M1	114	4066
				3720	200	260	4180	520	3660	M1	114	4066
				3720	200	260	4180	520	3660	M0	180	4000
				3720	200	260	4180	520	3660	M0	180	4000
				3720	100	260	4080	520	3560	S0	304	3776
				3540	200	248	3988	496	3492	M1	101	3887
				3540	200	248	3988	496	3492	M1	101	3887
				3540	200	248	3988	496	3492	M1	101	3887
				3540	200	248	3988	496	3492	M0	149	3839
				3540	100	248	3888	496	3392	S0	282	3606
				3540	100	248	3888	496	3392	S0	282	3606
				3540	100	248	3888	496	3392	S0	282	3606
				3540	100	248	3888	496	3392	S0	282	3606
				2670	100	187	2957	374	2583	S0	180	2777

AVERAGE PRE-TAX EARNING =   4595   AVERAGE POST-TAX EARNING =   4403

| 2 | M | | 31-35 | 6900 | 300 | | | | | | | |

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		31-35	6900	200	483	7583	966	6617	M3	305	7278
				6600	200	462	7262	924	6338	M3	271	6991
				6600	200	462	7262	924	6338	M1	418	6844
				6600	100	462	7162	924	6238	S0	723	6439
				6000	200	420	6620	840	5780	M2	281	6339
				5790	200	405	6395	810	5585	M3	189	6206
				5790	200	405	6395	810	5585	M2	258	6137
				5790	200	405	6395	810	5585	M0	391	6004
				5580	200	391	6171	782	5389	M2	236	5935
				5370	200	376	5946	752	5194	M3	135	5811
				5370	200	376	5946	752	5194	M2	215	5731
				5370	200	376	5946	752	5194	M2	215	5731
				5160	200	361	5721	722	4999	M2	194	5527
				5160	200	361	5721	722	4999	M0	318	5403
				5160	200	361	5721	722	4999	M0	318	5403
				4960	100	347	5407	694	4713	S0	464	4943
				4740	200	332	5272	664	4608	M3	86	5186
				4530	200	317	5047	634	4413	M3	71	4976
				4530	200	317	5047	634	4413	M2	127	4920
				4530	200	317	5047	634	4413	M2	127	4920
				4530	200	317	5047	634	4413	M1	195	4852
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M2	111	4711
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	200	302	4822	604	4218	M1	176	4646
				4320	100	302	4722	604	4118	S0	379	4343
				4320	100	302	4722	604	4118	S0	379	4343
				4320	100	302	4722	604	4118	S0	379	4343
				4110	200	288	4598	576	4022	M3	43	4555
				3900	200	273	4373	546	3827	M1	128	4245
				3540	200	248	3988	496	3492	M3	06	3982
				3540	200	248	3988	496	3492	M3	06	3982
				3540	200	248	3988	496	3492	M2	55	3933

AVERAGE PRE-TAX EARNING = 5467   AVERAGE POST-TAX EARNING = 5251

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
2	M		36-40	9480	200	664	10344	1328	9016	M2	737	9607
				6600	200	462	7262	924	6338	M3	271	6991
				6300	200	441	6941	882	6059	M1	381	6560
				6000	200	420	6620	840	5780	M3	210	6410
				5790	200	405	6395	810	5585	M3	189	6206
				5790	200	405	6395	810	5585	M3	189	6206

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	M		36-40	5580	200	391	6171	782	5389	M3	167	6004
				5580	200	391	6171	782	5389	M2	236	5935
				5580	100	391	6071	782	5289	S0	554	5517
				5370	200	376	5946	752	5194	M2	215	5731
				5160	200	361	5721	722	4999	M4	62	5659
				5160	200	361	5721	722	4999	M4	62	5659
				5160	200	361	5721	722	4999	M2	194	5527
				4320	200	302	4822	604	4218	M4	08	4814
				4320	200	302	4822	604	4218	M4	08	4814
				4110	200	288	4598	576	4022	M2	95	4503
				3900	200	273	4373	546	3827	M4	00	4373
				3900	200	273	4373	546	3827	M3	29	4344
				3540	200	248	3988	496	3492	M0	149	3839

AVERAGE PRE-TAX EARNING = 5919   AVERAGE POST-TAX EARNING = 5721

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2	M		41-50	9060	200	634	9894	1268	8626	M4	481	9413
				8220	200	575	8995	1150	7845	M4	377	8618
				8220	200	575	8995	1150	7845	M2	551	8444
				7500	200	525	8225	1050	7175	M4	296	7929
				7200	200	504	7904	1008	6896	M3	339	7565
				6600	200	462	7262	924	6338	M3	271	6991
				5790	200	405	6395	810	5585	M4	113	6282
				5160	200	361	5721	722	4999	M3	117	5604
				5160	100	361	5621	722	4899	S0	491	5130
				4960	200	347	5507	694	4813	M2	176	5331

AVERAGE PRE-TAX EARNING = 7452   AVERAGE POST-TAX EARNING = 7131

GROUP	SEX	CATEGORY	AGE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2	M		51-60	8220	200	575	8995	1150	7845	M3	462	8533
				7500	200	525	8225	1050	7175	M4	296	7929
				7200	200	504	7904	1008	6896	M3	339	7565
				6900	200	483	7583	966	6617	M4	232	7351
				3540	200	248	3988	496	3492	M4	00	3988

AVERAGE PRE-TAX EARNING = 7339   AVERAGE POST-TAX EARNING = 7073

ESTIMATED EARNINGS

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX. PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	F		00-20	2520	100	126	2746	252	2494	MW	121	2625
				2370	100	119	2589	238	2351	SO	138	2451
				2220	100	111	2431	222	2209	MW	89	2342
				2220	100	111	2431	222	2209	SO	122	2309
				2220	100	111	2431	222	2209	SO	122	2309
				2220	100	111	2431	222	2209	SO	122	2309
				2070	100	104	2274	208	2066	SO	107	2167
				2070	100	104	2274	208	2066	SO	107	2167
				2070	100	104	2274	208	2066	SO	107	2167
				1956	100	98	2154	196	1958	SO	95	2059
				1956	100	98	2154	196	1958	SO	95	2059
				1956	100	98	2154	196	1958	SO	95	2059
				1842	100	92	2034	184	1850	MW	56	1978
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949
				1842	100	92	2034	184	1850	SO	85	1949

AVERAGE PRE-TAX EARNING = 2165   AVERAGE POST-TAX EARNING = 2071

2	F		21-25	3360	100	168	3628	336	3292	MW	233	3395
				3000	100	150	3250	300	2950	MW	181	3069
				3000	100	150	3250	300	2950	MW	181	3069
				2670	100	134	2904	268	2636	MW	138	2766
				2670	100	134	2904	268	2636	SO	186	2718
				2520	100	126	2746	252	2494	MW	121	2625
				2520	100	126	2746	252	2494	MW	121	2625
				2520	100	126	2746	252	2494	MW	121	2625

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS (1)+(2)+(3)	(5) NON-TAX, PENSION (3)X2	(6) TAXABLE EARNINGS (4)-(5)	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS (4)-(8)
2	F		21-25	2520	100	126	2746	252	2494	MW	121	2625
				2520	100	126	2746	252	2494	SO	169	2577
				2520	100	126	2746	252	2494	SO	169	2577
				2520	100	126	2746	252	2494	SO	169	2577
				2520	100	126	2746	252	2494	SO	169	2577
				2370	100	119	2589	238	2351	MW	104	2485
				2370	100	119	2589	238	2351	MW	104	2485
				2370	100	119	2589	238	2351	MW	104	2485
				2370	100	119	2589	238	2351	MW	104	2485
				2370	100	119	2589	238	2351	SO	138	2451
				2220	100	111	2431	222	2209	SO	122	2309
				2220	100	111	2431	222	2209	SO	122	2309
				2070	100	104	2274	208	2066	SO	107	2167
				2070	100	104	2274	208	2066	SO	107	2167
				2070	100	104	2274	208	2066	SO	107	2167
				1956	100	98	2154	196	1958	MW	65	2089
				1956	100	98	2154	196	1958	MW	65	2089
				1956	100	98	2154	196	1958	SO	95	2059
				1956	100	98	2154	196	1958	SO	95	2059
				1956	100	98	2154	196	1958	SO	95	2059
				1842	100	92	2034	184	1850	MW	56	1978
				1842	100	92	2034	184	1850	SO	85	1949

AVERAGE PRE-TAX EARNING = 2579   AVERAGE POST-TAX EARNING = 2454

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
2	F		26-30	3900	100	195	4195	390	3805	MW	324	3871
				3180	100	159	3439	318	3121	MW	206	3233
				2820	100	141	3061	282	2779	MW	157	2904
				2670	100	134	2904	268	2636	MW	138	2766
				2670	100	134	2904	268	2636	MW	138	2766
				2670	100	134	2904	268	2636	SO	186	2718
				2520	100	126	2746	252	2494	MW	121	2625
				2370	100	119	2589	238	2351	MW	104	2485
				2370	100	119	2589	238	2351	MW	104	2485

AVERAGE PRE-TAX EARNING = 3037   AVERAGE POST-TAX EARNING = 2873

GROUP	SEX	CATEGORY	AGE	(1) BASIC SALARY	(2) VACATION BONUS	(3) EMPLOYERS PENSION	(4) PRE-TAX EARNINGS	(5) NON-TAX PENSION	(6) TAXABLE EARNINGS	(7) TAX CODE	(8) TAX DEDUCTION	(9) POST-TAX EARNINGS
2	F		31-35	4110	100	206	4416	412	4004	SO	363	4053
				3180	100	159	3439	318	3121	MW	206	3233
				3180	100	159	3439	318	3121	MW	206	3233
				3180	100	159	3439	318	3121	SO	246	3193
				3180	100	159	3439	318	3121	SO	246	3193
				3000	100	150	3250	300	2950	MW	181	3069
				2520	100	126	2746	252	2494	MW	121	2625
				2220	100	111	2431	222	2209	MW	89	2342
				2070	100	104	2274	208	2066	SO	107	2167

AVERAGE PRE-TAX EARNING = 3208   AVERAGE POST-TAX EARNING = 3012

APPENDIX XIX: AGE-EARNINGS PROFILES (POST-TAX) OF TEACHERS
                  BELONGING TO CATEGORIES B, D, E AND F - MALES

AGE	CATEGORY			
	B	D	E	F
	R	R	R	R
20 years	3 019	-	-	-
21 "	3 019	-	-	-
22 "	3 019	5 552	-	-
23 "	3 019	5 552	5 776	-
24 "	3 019	5 552	5 776	6 167
25 "	3 019	5 552	5 776	6 167
26 "	5 247	7 193	7 912	8 956
27 "	5 247	7 193	7 912	8 956
28 "	5 247	7 193	7 912	8 956
29 "	5 247	7 193	7 912	8 956
30 "	5 247	7 193	7 912	8 956
31 "	5 730	7 972	8 417	9 055
32 "	5 730	7 972	8 417	9 055
33 "	5 730	7 972	8 417	9 055
34 "	5 730	7 972	8 417	9 055
35 "	5 730	7 972	8 417	9 055
36 "	5 759	8 089	8 833	10 217
37 "	5 759	8 089	8 833	10 217
38 "	5 759	8 089	8 833	10 217
39 "	5 759	8 089	8 833	10 217
40 "	5 759	8 089	8 833	10 217
41 "	6 092	9 294	9 774	11 080
42 "	6 092	9 294	9 774	11 080
43 "	6 092	9 294	9 774	11 080
44 "	6 092	9 294	9 774	11 080
45 "	6 092	9 294	9 774	11 080
46 "	6 092	9 294	9 774	11 080
47 "	6 092	9 294	9 774	11 080
48 "	6 092	9 294	9 774	11 080
49 "	6 092	9 294	9 774	11 080
50 "	6 092	9 294	9 774	11 080
51 "	6 330	10 396	11 710	12 921
52 "	6 330	10 396	11 710	12 921
53 "	6 330	10 396	11 710	12 921
54 "	6 330	10 396	11 710	12 921
55 "	6 330	10 396	11 710	12 921
56 "	6 330	10 396	11 710	12 921
57 "	6 330	10 396	11 710	12 921
58 "	6 330	10 396	11 710	12 921
59 "	6 330	10 396	11 710	12 921
60 "	6 330	10 396	11 710	12 921
61 "	6 330	10 396	11 710	12 921
62 "	6 330	10 396	11 710	12 921
63 "	6 330	10 396	11 710	12 921
64 "	6 330	10 396	11 710	12 921
65 "	6 330	10 396	11 710	12 921

APPENDIX XX: AGE-EARNINGS PROFILES (POST-TAX) OF TEACHERS
BELONGING TO CATEGORIES B, D AND E - FEMALES

AGE	CATEGORY		
	B	D	E
	R	R	R
20 years	2 140	-	-
21 "	2 140	-	-
22 "	2 140	4 347	-
23 "	2 140	4 347	4 914
24 "	2 140	4 347	4 914
25 "	2 140	4 347	4 914
26 "	4 219	5 602	6 178
27 "	4 219	5 602	6 178
28 "	4 219	5 602	6 178
29 "	4 219	5 602	6 178
30 "	4 219	5 602	6 178
31 "	4 203	6 304	7 306
32 "	4 203	6 304	7 306
33 "	4 203	6 304	7 306
34 "	4 203	6 304	7 306
35 "	4 203	6 304	7 306
36 "	4 283	6 412	7 914
37 "	4 283	6 412	7 914
38 "	4 283	6 412	7 914
39 "	4 283	6 412	7 914
40 "	4 283	6 412	7 914
41 "	4 279	6 974	7 914
42 "	4 279	6 974	7 914
43 "	4 279	6 974	7 914
44 "	4 279	6 974	7 914
45 "	4 279	6 974	7 914
46 "	4 279	6 974	7 914
47 "	4 279	6 974	7 914
48 "	4 279	6 974	7 914
49 "	4 279	6 974	7 914
50 "	4 279	6 974	7 914
51 "	4 279	6 974	7 914
52 "	4 279	6 974	7 914
53 "	4 279	6 974	7 914
54 "	4 279	6 974	7 914
55 "	4 279	6 974	7 914
56 "	4 279	6 974	7 914
57 "	4 279	6 974	7 914
58 "	4 279	6 974	7 914
59 "	4 279	6 974	7 914
60 "	4 279	6 974	7 914

APPENDIX XXI: COST-NET BENEFIT-STREAM (POST-TAX) OF TEACHERS BELONGING TO CATEGORIES B, D, E AND F - MALES

Year of investment	CATEGORY			
	B	D	E	F
	R	R	R	R
1	2 881	4 488	5 208	5 568
2	3 055	866	224	391
3	253	866	224	391
4	-208	866	224	1 044
5	-208	866	719	1 044
6	-208	885	719	1 044
7	-208	885	719	1 044
8	-208	885	719	1 044
9	844	885	719	638
10	844	885	445	638
11	844	1 014	445	638
12	844	1 014	445	638
13	844	1 014	445	638
14	479	1 014	445	1 384
15	479	1 014	744	1 384
16	479	928	744	1 384
17	479	928	744	1 384
18	479	928	744	1 384
19	38	928	744	1 306
20	38	928	480	1 306
21	38	1 697	480	1 306
22	38	1 697	480	1 306
23	38	1 697	480	1 306
24	-1 039	1 697	480	1 306
25	-1 039	1 697	480	1 306
26	-1 039	1 697	480	1 306
27	-1 039	1 697	480	1 306
28	-1 039	1 697	480	1 306
29	-1 039	1 697	480	1 211
30	-1 039	1 697	1 314	1 211
31	-1 039	1 676	1 314	1 211
32	-1 039	1 676	1 314	1 211
33	-1 039	1 676	1 314	1 211
34	-743	1 676	1 314	1 211
35	-743	1 676	1 314	1 211
36	-743	1 676	1 314	1 211
37	-743	1 676	1 314	1 211
38	-743	1 676	1 314	1 211
39	-743	1 676	1 314	1 211
40	-743	1 676	1 314	1 211
41	-743	1 676	1 314	1 211
42	-743	1 676	1 314	1 211
43	-743	1 676	1 314	1 211
44	-743	1 676	1 314	
45	-743	1 676		
46	-743			
47	-743			
48	-743			

APPENDIX XXII: COST-NET BENEFIT-STREAM (POST-TAX) OF TEACHERS
                   BELONGING TO CATEGORIES B, D AND E -   FEMALES

Year of investment	CATEGORY		
	B	D	E
	R	R	R
1	2 194	3 746	4 466
2	2 342	610	567
3	69	610	567
4	-314	610	567
5	-314	610	576
6	-314	543	576
7	-314	543	576
8	-314	543	576
9	1 346	543	576
10	1 346	543	1 002
11	1 346	676	1 002
12	1 346	676	1 002
13	1 346	676	1 002
14	1 191	676	1 002
15	1 191	676	1 502
16	1 191	721	1 502
17	1 191	721	1 502
18	1 014	721	1 502
19	1 014	721	1 502
20	1 014	721	940
21	1 014	1 003	940
22	1 014	1 003	940
23	1 014	1 003	940
24	955	1 003	940
25	955	1 003	940
26	955	1 003	940
27	955	1 003	940
28	955	1 003	940
29	955	1 003	940
30	955	1 003	940
31	955	1 003	940
32	955	1 003	940
33	955	1 003	940
34	955	1 003	940
35	955	1 003	940
36	955	1 003	940
37	955	1 003	940
38	955	1 003	940
39	955	1 003	940
40	955	1 003	
41	955		
42	955		
43	955		