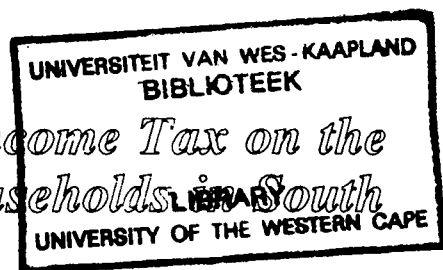Ada Isobel Southgate

University of the Western Cape

Mini-Dissertation in part fulfilment of the requirements for a Masters degree

The effect of Personal Income Tax on the savings behaviour of households in South Africa

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ACKNOWLEDGMENTS

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Last, but not least, to my husband Jacques and my parents, thank you for your continuous encouragement and support.

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1. INTRODUCTION

The "new" South Africa faces a big challenge. Unemployment, poverty and economic hardship still characterise the life of the majority of South Africans. Most people expect this to change under democracy. This will only be possible, however, if the economy can grow fast enough.

What type of economic policies can a future government adopt to bring about economic growth and the reduction of poverty? More specifically, can the government raise taxes in order to spend more on the poor without reducing economic growth?

From macroeconomic theory, the following relationship is identified:

$$(S - I) = (T - G) + (X - M), \text{ where}$$

S = Saving   G = Government Spending

I = Investment   X = Exports

T = Taxes   M = Imports

Assuming a closed economy, or exports equal to imports (X = M), this relationship changes to:

$$(S - I) = (T - G)$$
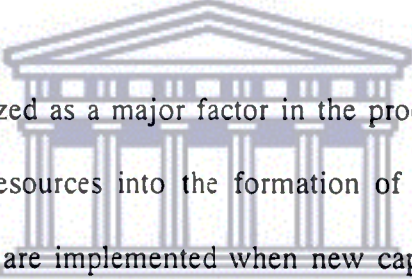
The above identity implies that when the fiscal gap (T - G) changes, one can expect a change in the Savings gap (S - I).

In South Africa, government expenditure already exceeds tax revenue. The previous Minister of Finance, Mr. Derek Keys, stated the following in his Budget Speech for the fiscal year 1993/94:

" We are tackling the total R40 billion by which the planned expenditure this year exceeds revenue." (Budget Speech, 17 March 1993)

The increased expenditure, given the existing deficit, will pressurise government to increase taxes. If this were to happen, the question that comes to mind is whether a savings constraint will develop. At the moment South Africa is not experiencing a savings constraint. This can be attributed to the fact that investment declined more than saving over the past few years. However, if investment has to increase over the next few years to achieve higher economic growth, the question arises whether domestic saving will increase enough to finance it. This will be difficult if an increasing tax burden has a negative impact on saving.

Saving has long been recognized as a major factor in the process of economic development, directly by its diversion of resources into the formation of capital, and indirectly through changes in technology which are implemented when new capital is put to use. Few would dispute that domestic saving is important for the financing of development and it is evident that a country will require higher saving rates if it wants to invest more.

The situation explained above leads to a difficult choice. If a higher deficit is undesirable or unsustainable, should government encourage higher private saving rates to stimulate growth and development by reducing taxation, or should it raise taxes to spend more on human development or social infrastructure? This research dissertation wants to investigate this difficult choice.

2. OBJECTIVE OF DISSERTATION

The primary objective of this dissertation is to establish the effect of personal income tax on the savings behaviour of households. This requires that a more microeconomic analysis be adopted in the rest of the dissertation.

It can be argued that an increase in personal income tax will reduce disposable income and thus result in a fall in personal saving. The analysis of this dissertation will focus on the relationship between a change in household saving (at microeconomic level), and a change in personal income tax. Should a negative relationship be found, it can be deduced that personal income tax can have an impact on the savings constraint at the aggregate level.

Specific objectives include the following:

* To establish discretionary and contractual saving for households;

* To analyze the effect of a change in personal income tax on the composition of personal saving;

* To interpret the result with respect to some of the more well-known theories of household savings behaviour; and

* To draw policy conclusions from the analysis.

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3. BACKGROUND

3.1 SAVING IN SOUTH AFRICA

3.1.1 Gross Domestic Saving:

In South Africa, the volume of Gross Domestic Saving (GDS) remained relatively stable throughout the last decade. In the sixties GDS as a percentage of Gross Domestic Product (GDP) was 23.5% as compared with 26.5% during the seventies. The early eighties showed a slight decrease to 25.4%, with the late eighties following a similar trend (23.3%). In the early nineties, GDS fell to 18.4%, the lowest for the past three decades. These trends are shown below:

TABLE 1: Gross Domestic Saving (As percentage of Gross Domestic Product)

YEARS	60-69	70-79	80-84	85-89	90-92
Net Personal Saving	6.2	5.3	2.2	2.2	1.2
Net Corporate Saving	2.6	5.1	7.8	5.6	4.3
Net Government Saving	4.2	3.0	0.9	(1.1)	(2.8)
Depreciation	10.5	13.1	14.5	16.6	15.7
Gross Domestic Saving	23.5	26.5	25.4	23.3	18.4

Source: Own calculations (Data source: South African Reserve Bank Bulletin, 1985-1992 issues)

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Even though the level of GDS has remained relatively stable over the previous three decades, the composition of saving has changed dramatically. Net personal saving fell from 6.2% of GDP in the sixties, to 1.2% of GDP in the early nineties. Net corporate saving, on the other hand, remained quite stable for the past three decades, only taking a slight downturn to 4.3% in the early nineties. Net government saving showed a rapid decrease from the seventies (3%) to the eighties (0.9%), and thereafter became negative in the latter part of the eighties and early nineties. Accompanying the decline in net saving was the growth in depreciation allowances. Provision for depreciation has increased from 10.5% in the sixties to 16.6% in the late eighties, and only slightly dropping to 15.7% in the early nineties.

According to Roux A. et.al. (1991), the escalation in depreciation has been caused by increases in the relative cost of imported capital goods, as well as by changes in technology. If this is so, then the trend in saving is an indication of a long-term contraction in the funds which are available for net capital accumulation. One should take into consideration that the exchange rate has fluctuated over the past few years and this lead to changes in the cost of capital. What could also be the cause of the increase in depreciation, is the general slow down of economic growth. When a relatively constant proportion of the capital stock is taken as a measure of depreciation each year, a deceleration in economic growth will induce an increase in the ratio of depreciation to National Income.

3.1.2 <u>Personal Saving in South Africa</u>:

During the past decade, the share of Personal Saving in Gross Domestic Saving fell in comparison with Corporate saving. Net Personal Saving fell from 6.2% in the sixties to 2.2% in the eighties, (refer to above table). Various reasons have been put forward to explain this phenomenon.

According to Loots (1991), the combination of low growth in Gross Domestic Product and the high inflation rate that we have experienced for the past decades, increased the household

income tax burden.[1] There was also an increasing reliance on indirect taxes, compensating for a decline in corporate taxes, which increased the overall tax burden on households.

Changes also occurred in the composition of Personal Saving:

TABLE 2: Financial Assets Acquired (Mean percentage of National Income)

	70-74	75-79	80-84	85-89
Bank Deposits	6.6	5.1	6.1	2.4
Contractual Saving	4.9	5.6	8.3	11.2
Other Securities	0.3	1.0	0.6	0.0

Source: Roux, A. et.al. (1991) [2]

Contractual Saving with Life Assurance companies and Pension Funds grew from an average of 4.9% of National Income in the early seventies to reach 11.2% by the end of the eighties. By contrast, Discretionary Saving, which mainly consists of saving with deposit-taking intermediaries, diminished sharply in relative terms.

Various reasons have been given for the growth in Contractual Saving. According to Roux et.al. (1991), factors such as unexpected inflation and other factors which caused negative real interest rates, depressed the returns to fixed interest securities. In contrast, the contractual intermediaries were able, given the steady performance of equity and property, to provide a hedge against inflation. The unequal pattern of returns have discouraged discretionary saving. Roux et. al. (1991) states that the most important factor influencing such behaviour is the tax system. Contributions to retirement funds are exempt from tax whereas other forms of saving

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[1] In Loots (1991), the explanation for this occurrence is bracket creep. This means that because of inflation, people have been pushed into higher income brackets, thus they had to pay higher taxes than before.

[2] This table is from: Financial Economic Development in South Africa: Roux A., Nattrass N. & Donaldson A: June 1991

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are not. Also, the marginal tax rate applied to the proceeds of contractual saving is more favourable to high income groups, but unfavourable to low income groups.[3] Another reason for the growth in contractual saving is the growth of trade unionism and provident funds.

According to Loots (1991), the increase in contractual saving can be explained as a rational response to the changing environment, i.e. inflation, the real interest rate, etc. As far as tax policies are concerned, the general belief is that tax policies are biased in that it favours life assurers. However the life assurers feel that this is not the case because their dividend income is highly taxed, they pay the top marginal rate on taxable income, which thus reduces the benefits to the policy-holder who therefore effectively carries the additional tax burden. Loots (1991) therefore argues that it is not the tax benefits as such but rather the investment freedom of life assurers that contributed to the shift towards contractual saving. This may have helped to prevent an even further decline in Personal Saving during a period when Personal Income Tax increased.

From the above discussion it is evident that tax policy may have had an impact on the saving decision of individuals. It is this relationship that is to be explored in this dissertation.

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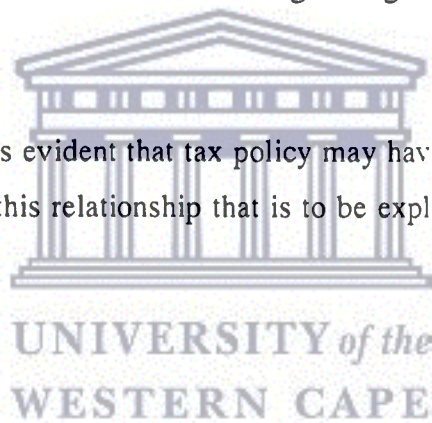
[3]   An analysis by the Committee on the Promotion of Equal Competition for Funds in Financial Markets accepted that the tax structure favours contractual institutions, but came out against any measures to "level the playing fields". The Committee's argument for tax concessions are that it is essential to encourage individuals to provide for their own retirement. The Committee also rejected the introduction of offsetting changes to the taxation of interest income as it was argued such a concession would cause other distortions in the economy.

3.2   PERSONAL INCOME TAX IN SOUTH AFRICA

3.2.1   Tax Structure:

The tax structure in South Africa underwent some significant changes in the eighties. During this period there was a move away from direct taxes towards indirect taxes. This can be seen from the graph below:

FIGURE 1:   Direct vs Indirect Taxes as % of GDP
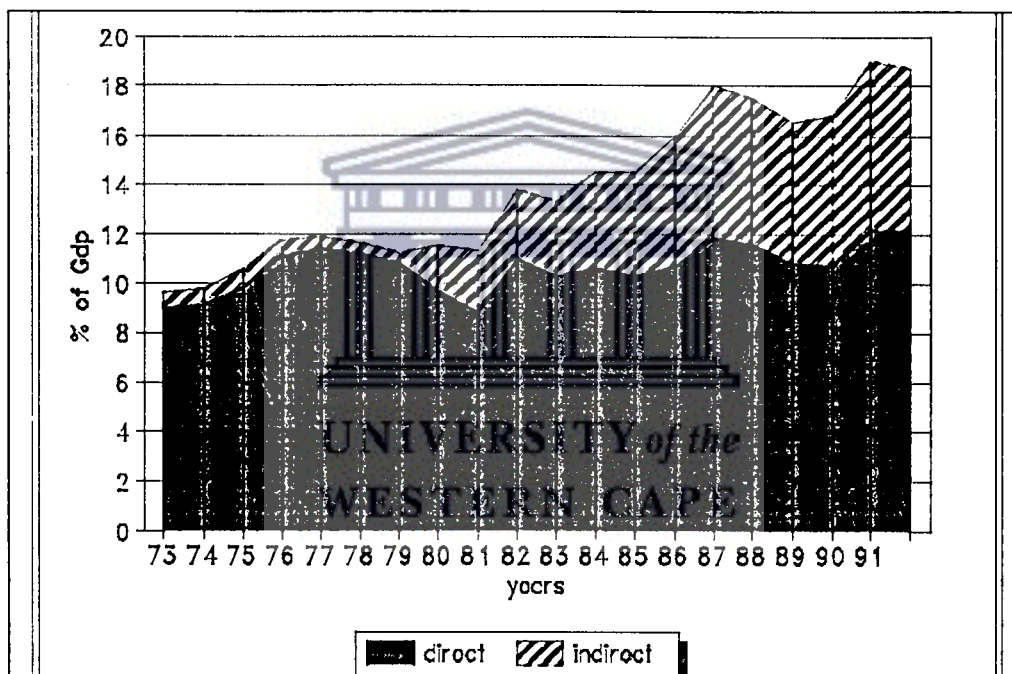
Source: Own calculations (Data from: Inland Revenue Statistical Bulletin, 1989/1990)

From the late seventies, the share of indirect taxes as a percentage of Gross Domestic Product increased more than the share of direct taxes, especially after the introduction of sales tax (GST at that time and recently VAT). This is very clear on the graph from 1979 onwards. Although direct taxes are still a relatively large component of tax collected, it is clear to see that there is a move towards more indirect taxation as the latter has shown a greater percentage change than direct taxes.

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3.2.2 Direct Taxes:

Within the structure of direct taxes, there has also been some significant changes.

TABLE 3: Composition of Direct Taxes (as % GDP)

YEARS	GOLD MINES	OTHER MINES	INDV.	COMPANY	NON-RESIDENT	TOT.
1975	2.2	0.2	4.0	4.2	0.3	10.9
1980	1.9	0.2	3.2	3.0	0.3	8.6
1985	1.3	0.2	5.9	3.1	0.2	10.7
1990	0.4	0.5	7.1	4.0	0.2	12.2

Source: Own calculations (Data from: Inland Revenue Statistical Bulletin, 1989/1990)

From the above table, taxes on gold mines have decreased since the seventies (2.2%) to 0.4% in the early nineties. This is in line with the poor performance of the gold industry over the last two decades. Taxes on individuals have compensated for the loss in revenue. From the seventies to the early nineties, it has increased from 4% to 7.1%. Company tax, as well as other mines and non-resident shareholders, have remained relatively stable over this period.

What the above observation points to, is that more Personal Income Tax was collected during the last three decades than from other direct sources. One would therefore expect to find the tax rate to have increased over this period. However, a comparison of the top marginal tax rates for 1985 and 1990 show a different picture:

TABLE 4: Top marginal tax rates:

YEARS	1975	1980	1985	1990
Top marginal rate	60%	55%	50%	44%

Source: Inland Revenue Statistical Bulletin,1990

Various reasons have been given for this phenomena that the personal income tax revenue still increases even though the top marginal tax rates have been reduced. According to Loots (1991), the four most likely reasons for this occurrence are the following:

1. The reduction of the tax avoidance incentive because of the decrease of the top marginal tax rate;

2. The removal and/or limitation of tax reliefs;

3. The lowering of the effective threshold and the fact that a higher proportion of the population now earn taxable incomes; and

4. The movement of individuals into higher income brackets.

The latter is illustrated by the graph below:

FIGURE 2: Distribution of Married Taxpayers according to Taxable Income: 1985 & 1990
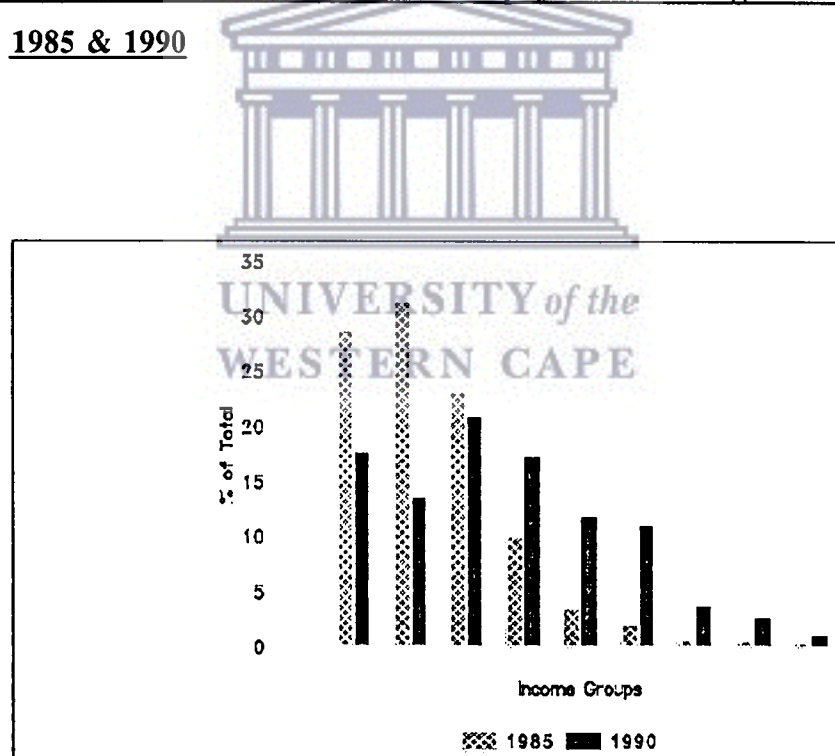
Source: Own calculations: (Inland Revenue Statistical bulletin, 1989/1990)

South Africa has three main tax schedules namely: married persons, unmarried persons and

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married women. For simplicity sake, I have only looked at the movement of married persons.[4] As can be seen from the graph, from 1985 to 1990, the percentage of taxpayers in the lower income brackets decreased and those in the middle income and higher income brackets increased. There is clearly a shift of taxpayers from the lower to the higher income brackets.

The foregoing analysis has shown that Personal Income Tax still makes the largest contribution to Direct Taxes. At a microeconomic level, even though top marginal tax rates have decreased, revenue collection from Personal Income Tax has not been reduced. This can be contributed to the fact that inflation has pushed taxpayers into higher tax brackets (bracket creep).

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[4]   Since the study that is conducted focuses on households, it is essential to look at the effect of taxation on married taxpayers.

4. THEORETICAL BACKGROUND

At this stage of the dissertation it is necessary to sketch the theoretical considerations upon which the empirical analysis will be based. The objective is to find the most appropriate theory that would best explain the savings behaviour of South African households. Three of the more well-known theories on savings behaviour are discussed briefly.

4.1 KEYNESIAN THEORY

The Keynesian revolution based on underemployment equilibrium made saving a function of income. The Keynesian savings function, in its most commonly used form, is linear with a constant marginal propensity to save (MPS):

$$S = a_0 + a_1 Y$$
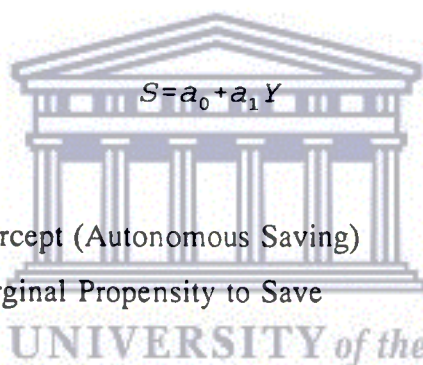
where:

S = Saving a_0 = Intercept (Autonomous Saving)

Y = Income a_1 = Marginal Propensity to Save

Here the assumption is that a_0 is less than zero and that a_1 lies between 0 and 1, such that as the level of income rises, the average propensity to save (APS) will also increase.

Further modifications on the above savings function led to various other forms where income is the major determinant of saving.

4.1.1 The Absolute Income Hypothesis:

In empirical applications, the absolute income hypothesis generally takes one of the following two forms:

i)   In the first form, the level of saving, or of consumption expenditure,[5] is expressed as a function of income and of other variables:

$$S = a_0 + a_1 Y + a_2 Z + u$$

where: S = Saving

Y = Income

Z = Conglomeration of other variables

u = Stochastic term, a_0; a_1 and a_2 being parameters[6]

ii)   In the other form the saving ratio is expressed as a function of the same independent variables:

$$\frac{S}{Y} = a_0 + a_1 Y + a_2 Z + u$$

In i) the marginal propensity is a constant and if logarithms of the variables are used, the income elasticity is also constant (a_1). Form ii) does not possess this property but may be more realistic for this reason.
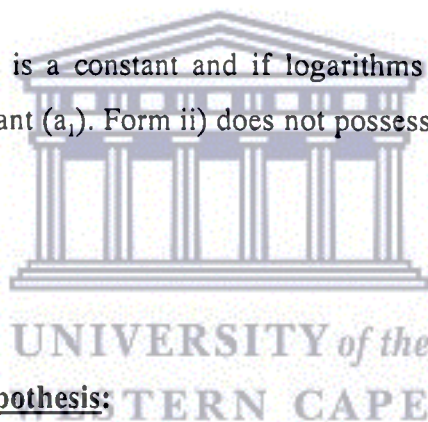
4.1.2   Relative Income Hypothesis:

Questions about the adequacy of the Absolute income hypothesis arose because of its inability to reconcile budget data on saving with observed long-term trends. The relative income hypothesis was developed as a solution to this problem of inconsistency. The underlying assumption is that the saving rate depends not on the level of income but on the relative

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5   Consumption and saving functions are the same, in theory, the one being the complement of the other. Substantial differences can be obtained in empirical work according to which term is being measured.

6   A distinction is made here between saving and savings. Saving represents a flow, i.e. the difference between income and consumption during a particular period, whereas savings represents a stock as of a certain point in time.

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position of the individual on the income scale, i.e:

$$\frac{S}{Y} = a_0 + a_1 \frac{Y}{\overline{Y}}$$

where S and Y represent individual saving and income, respectively, and Y represents average income.

Additional theoretical support of this hypothesis was provided by the work of Modigliani and Duesenberry.[7] Duesenberry supplied psychological support for this hypothesis noting that a strong tendency exists in our social system for people to emulate their neighbours and, at the same time, to strive constantly toward a higher standard of living.

On the basis of the above reasoning, the relative income hypothesis could be transformed into one expressing the saving rate as a function of the ratio of current income to the highest level previously reached, i.e.:

$$\frac{S}{Y} = a_0 + a_1 \frac{Y}{Y_0}$$
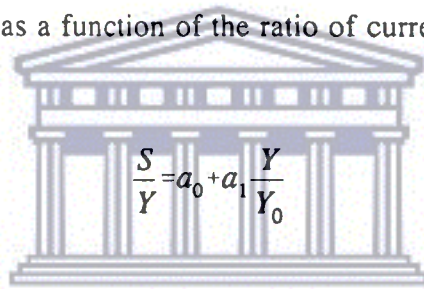
where Y_0 represents the highest level of income previously attained (after deflation for changes in prices and population).

The implication of this hypothesis is that the saving ratio in the long run is constant, independent of the absolute level of income, although in the short run (from one cycle to another) the rate depends on the ratio of current income to peak income.

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[7]   The first propounders of this theory was Dorothy Brady and Rose Friedman (Brady D. & Friedman R.: Savings and the Income Distribution, 1947); so mentioned in Ferber, 1972.

4.1.3 <u>Keynesian theory on the effect of Personal Income Tax on Personal Saving:</u>

If all households saved at the same rate, the effect on personal saving of an income tax would be the same no matter how the tax bill was distributed among them. However, the fraction saved (average propensity to save) rises as we move up the income scale. Thus, taxes collected from higher incomes may be expected to fall more heavily on saving than do those collected from lower incomes.

4.2   <u>PERMANENT INCOME HYPOTHESIS</u>

The permanent income hypothesis of Friedman rests on three fundamental tenets.

i)   A consumer unit's measured (observed) income (Y) and consumption (C) in a particular period may be segregated into transitory and permanent components, i.e.:

$$Y = Y_{pt} + Y_{tt}$$
$$C = C_{pt} + C_{tt}$$

where Y_{pt} = Permanent Income in period t, Y_{tt} = Transitory Income
C_{pt} = Permanent Consumption, C_{tt} = Transitory Consumption

ii)   The second tenet is that permanent consumption is a multiple of permanent income:[1]

$$C_{pt} = k \, Y_{pt}$$

where k = constant

iii)   Transitory and permanent income are assumed to be uncorrelated, as are transitory and permanent consumption, and transitory consumption and transitory income:

$$r \, (Y_{pt}, Y_{tt}) = r \, (C_{pt}, C_{tt}) = r \, (Y_{tt}, C_{tt}) = 0$$

Thus, individuals are assumed to determine their standard of living on the basis of expected returns from their resources over their lifetime. The expenditure of the consumer unit are set as a constant proportion (k) of this permanent level of income, the value of k varying for consumer units of different types and of different tastes. Actual consumption and actual income deviate from these planned, or permanent, levels to the extent that transitory factors enter into it.

The central tenet of this hypothesis is the assumption that the proportion of permanent income saved by the individual in a given period is independent of his actual income during that period and furthermore that transitory income may have little or no effect on current consumption.

In its most simple form, the linear equation for saving is:

$$S_t = a_0 + a_1 Y_{pt} + a_2 Y_{tt}$$

where:

Y_{pt} = permanent income

Y_{tt} = transitory income

S_t = saving at time period t
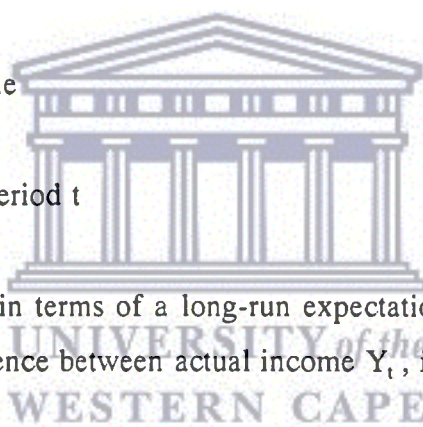
Permanent income is defined in terms of a long-run expectation over a planning period, and transitory income is the difference between actual income Y_t, in any period, t, and permanent income.

According to Mikesell et. al.(1973), the definition of permanent income used in any empirical study depends upon available statistical information. Some researchers might opt to define Y_{pt} in terms of a three-year moving average, while others find a two-year average to be sufficient.[8] Irrespective of the measure used, a crucial relationship from the standpoint of empirical tests is the relative size of the marginal propensities to save out of permanent and transitory income.

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[8]   A discreet version of Friedman's original description of permanent income is given by Colin Wright: Estimating Permanent Income: A note, Journal of Political Economy, 1969.
In Mikesell & Zinser : The definition of permanent income, as stated above, is used by J.G. Williamson (Personal Saving in Developing Nations: An Intertemporal Cross-Section from Asia, Economic Record, June 1968.

Friedman's hypothesis is that individuals consume virtually no transitory income ($MPS_t = 1$). This implies a heavy reliance on past behaviour as a determinant of consumption spending, but that changes in transitory income will immediately lead to changes in the level of saving.

4.2.1 Effect of changes in the Personal Income Tax rate on Saving:

The permanent income hypothesis postulates that transitory changes in after-tax income would not affect current consumption. Thus we would expect that such changes would entirely lead to changes in saving. We should, however, make a distinction between contractual (forced) saving and discretionary saving. Contractual saving includes such items as life assurance, contribution to pension funds, etc. which are of a long-term nature, whereas discretionary saving refer more to bank deposits, etc. Thus, changes in transitory income would therefore affect discretionary saving and not contractual saving. If the tax rate were to change, this would affect saving in the way individuals view such changes. If it is perceived to be transitory changes, tax payments would surely be made out of transitory income and vice versa. Thus we would have the following functional relationship:

$$Sd = f(Y_t) ; \quad Sc = F(Y_p)$$

where: Sd = Discretionary Saving Y_t = Transitory Income

Sc = Contractual Saving Y_p = Permanent Income

Two alternative specifications of the permanent income hypothesis are found in studies of saving behaviour, namely:

4.2.2 The Asset Adjustment Approach:

Saving may be viewed as a means of accumulating assets which perform specific functions for the saver. One assumption is that the desired level of assets is a direct function of permanent income and that the desired stock of assets is acquired only over a fairly long period of time. Models employing assets have been formulated as follows:

Assume that the desired stock of assets (A^*) is a function of permanent income. Saving consists of a stock adjustment by which an individual closes a gap between actual and desired asset holdings (S') and some fraction of current transitory income that is set aside by the

individual (S'').

$$A^{\cdot}_t = d_o + d_1 Y_{pt}$$

$$S'_t = b_o(A^{\cdot}_t - A_{t-1}), \quad S''_t = b_1 + b_2 Y_{tt}$$

$$S_t = S'_t + S''_t = c_o + c_1 Y_{pt} + c_2 Y_{tt} + c_3 A_{t-1}$$

where A_{t-1} is the individuals' stock of assets at time t-1, b_o is the stock of adjustment coefficient, and the cs are simple linear combinations of the preceding coefficients.[9]

According to Mikesell et. al.(1973), it would be very difficult to test the above equation for developing countries, the reason being that sufficient data simply do not exist for the developing countries. This is also the case for South Africa.

As a consequence, it is necessary to seek substitutes for the asset variables. These, however, will not be discussed here as the focus is more on the original specification of the permanent income hypothesis.

4.2.3 Average Saving and Growth Rates:

An implication of the permanent income approach to saving is that the average saving rate is related to the rate of growth of income. According to Mikesell et.al.(1973), Singh (1971) tested the above statement, by making use of the following equation:[10]

$$APS_t = m_0 + m_1 g + m_2 \left(\frac{1}{Y_t}\right)$$

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[9] The equation is that derived by Friend [43, 1966, p.12]

[10] The following is provided by Singh (The determinants of aggregate Savings, Development economics: Theory and findings, 1972), to explain his result:
If we assume that income has been growing at a steady rate, g, then income in year t - T is given by:
$$Y_{t-T} = (1-gT)Y_t$$
Permanent income is now defined to be a non-weighted average of income over the previous n periods.
$$Y_{pt} = (1/n)(1-gT)Y_t = [1-g(n+1)/2]Y_t$$
Substituting of this into: $S_t = a_0 + a_1 Y_{pt} + a_2 Y_{Tt}$, will give the equation in the discussion in the text, where: $m_0 = a_1$
$$m_1 = (a_2 - a_1)(n+1)/2$$
$$m_2 = a_0$$

where g = rate of growth in income

Singh found a significant correlation between the average rate of saving and g: the estimated value of the coefficient on g was 1.4. Singh points out that a gradual increase in the level of aggregate or per-capita GDP will only have a small effect on the average savings ratio, whereas a large increase in the rate of growth of GDP would have a substantial effect on the savings ratio.

4.3   LIFE CYCLE HYPOTHESIS

The life-cycle hypothesis postulates that individuals adopt a planning horizon for their lifetime consumption. It is assumed that individuals plan no net life-time saving but attempt to spread their life-time consumption evenly over their lives by accumulating enough saving during their earning years to maintain the consumption standard during retirement.

The model implies that in a society with stationary population and income there would be no aggregate net personal saving since the dis-saving of the retired would exactly offset the saving of the employed. However, in a society with a growing population and/or growing per capita income, aggregate net personal saving is positive because the working population tends to be larger than the retired population, and the higher the level of current per capita income the larger will be the amount of saving necessary to maintain an individual's consumption level in retirement.

Thus an increase in income in a particular year will affect that year's consumption but will also increase saving since the individual seeks to equalize consumption over his remaining life span.

4.4   CONCLUSION

It is evident that the theories discussed above all focus on income, in different forms, as the explanatory variable for savings behaviour. However, one needs to find the theory that would best suit the conditions in South Africa.

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The Keynesians postulate that saving is a function of income. Extensions of this theory focuses on relative income and also average income growth as explanatory variables. However, these theories do not clearly show the effect of certain events that have taken place in South Africa over the past few years. A very important issue is the relative changes in real incomes that were experienced by the Black and White population groups, respectively. It is postulated that there is a lag in perception of the permanency of these changes, which might therefore also have an effect on the saving behaviour of households. In addition to this, households also experienced rather substantial changes in Personal Income Tax. These changes will definitely have an impact on personal disposable income, which will therefore also affect personal saving. Given the postulation of a lag in the perception of the permanency of changes in income, it is Discretionary saving that will most likely be affected when disposable income changes due to changes in Personal Income Tax.

Given the above, this dissertation will attempt to find the significance of these changes on the saving behaviour of households, based on certain theoretical considerations. The Permanent Income Hypothesis appears to provide the most appropriate theoretical basis for an empirical analysis of saving behaviour in South Africa.

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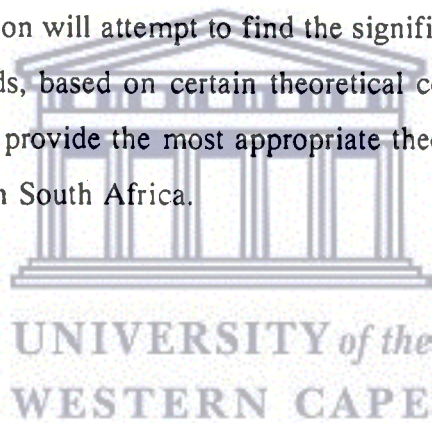
5.   EMPIRICAL ANALYSIS

5.1   INTRODUCTION

The analytical objective of the subsequent sections is to examine and evaluate to what extent the Personal Income Tax policy of the past few years has affected the savings behaviour of households, in the light of the foregoing theoretical considerations. Therefore the emphasis will be on the composition of Personal Saving, i.e. Discretionary and Contractual Saving, which will be evaluated in terms of the Permanent Income Hypothesis.

5.2   DATA

For the evaluation of Household Saving in 1985, data were extracted from the Survey of Household Expenditure issue for 1985. This contains data on white households only, categorised within income groups. For the evaluation of Household Saving in 1990, data were taken from the Survey of Household Expenditure for 1990. The data are average annual figures for all population groups as per income group (weighted for 12 areas). Income tax data were obtained from Inland Revenue, issues 1985 - 1990, as well as from the National Accounts, SARB, 1990.

5.3   METHODOLOGY:

The empirical analysis is of a microeconomic nature in that the savings behaviour of households classified according to income group is evaluated. The method of analysis consists of two components:

i) The exploration of data, by calculating and evaluating various statistical tables.

ii) The use of Econometric Techniques, to regress the effect of Personal Income Tax changes against Discretionary and Contractual Saving. The processes involved here will be discussed at a later stage.

As for i), the statistical tables were calculated to assist in the exploratory stage of the analysis. Initially, household saving (both Discretionary and Contractual) for 1985 was calculated. These calculations involved the use of the above-mentioned data from the Household Expenditure

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Survey. The same procedure was followed for 1990. In both cases, the tables classify the data according to income group.

Following this, a comparison between household saving for 1985 and 1990 was made. This was made possible by taking into account the inflationary impact on saving and also regrouping the 1990 data. To establish the effect of tax changes on the different income groups, a tax table was calculated. This table specifically looks at the effect of the Income Tax rate changes on Income for the years 1985 and 1990.

5.4 RESULTS OF THE ANALYSIS OF THE COMPOSITION OF SAVING AND INCOME TAX SHARES

5.4.1 Household Saving (1985)

The calculation of the statistical table for household saving in 1985 is given in the Appendix. It should be noted that the figures in the table are the average figure per income group.

TABLE 5: Household Saving: 1985[11]

INCOME GROUP (1985 incomes)	UNDER 8250	8251-16250	16251-22850	22851-30650	30651-38000	38001-54350	54351-66670	66671-OVER
Average Total Income	8239.95	12956.38	20823.55	28293.2	35416.35	46057.92	62299	93891.22
Average Total Expenditure	8377.85	13423.43	21334.88	28867.56	35863.19	46050.5	61509.69	91264.44
Income Tax	87.5	530.69	1518.04	2718.68	3996.9	6407.15	9796.02	18354.72
Contractual Saving	180.4	1353.43	2727.95	4187.24	5067.46	6533.76	8193.01	10906.24
Discretionary Saving	130	1417.07	3734.66	6331.56	8617.52	12948.33	18783.34	31887.74
Total Saving	310.4	2770.5	6462.61	10518.8	13684.98	19482.09	26981.35	42793.98
Contr. Saving % of Total Income	2.19	10.45	13.10	14.80	14.31	14.19	13.16	11.62
Discr. Saving % Total Income	1.58	10.94	17.93	22.38	24.33	28.11	30.15	33.96
Total Saving % Total Income	3.77	21.38	31.04	37.18	38.64	42.30	43.31	45.58
Tax % Total Income	1.06	4.10	7.29	9.61	11.29	13.91	15.72	19.55

Source: Own calculations (Data: Survey of Household Expenditure, 1985)

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[11] The boundaries for the income groups have been adjusted for the following reason: the average total income exceeded the income group boundaries - this occurred because CSS uses average direct income to classify households to income groups. Average total income consist of average direct income + average indirect income.

From the above table, total saving as a percentage of total income has increased over the different income groups with the lowest income group (under 6000) saving 3.77% of total income and higher income group (45000 - 54999) saving 43.31% of total income. This seems to support the Keynesian hypothesis that saving increases with an increase in income. The analysis also dis-aggregates total saving into Contractual saving and Discretionary saving. Contractual saving as a percentage of Total Income increases as income rises, over different income groups. For the lowest income group, 2.19% is saved by taking out life assurance, contribution to pension funds, etc. There is a big jump from the first to the second income group, from 2.19 to 10.45%. Thereafter, the increase in Contractual saving as a percentage of total income increases gradually to 14.19% (income group: 30000 - 44999) and decreases slightly for the last two income groups. One reason for this decrease might be that the higher income groups have taken out the maximum life assurance and therefore the balance of their saving goes into discretionary saving. This assumption can be validated in that the discretionary saving as a percentage of total income for the higher income groups is much higher than for the middle and lower income groups. Discretionary saving is lower than Contractual saving for the lowest income group, but for the rest Discretionary saving as a percentage of total income is higher.

The general conclusion that can be drawn from the 1985 saving data, is that saving is positive for all income groups, and that it increases with the increase in income.

5.4.2 HOUSEHOLD SAVING (1990)

The calculation of the statistical table for household saving in 1990 is given in the Appendix. The 1990 data differ from the 1985 data in that it is calculated for all population groups.[12] Also, it is calculated in real terms (1985 prices) to make a comparison between household saving in 1985 and 1990 possible. Again, the table contains average figures per income group.

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[12]   In 1985 only White household data available. Data in 1990 available for all population groups.

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TABLE 6: Real Household Saving: 1990 (1985 prices)[13]

INCOME GROUP	0 - 3999	4000 - 5999	6000 - 9999	10000 - 15999	16000 - 24999	25000 - 39999	40000 - 59999	60000 - 99999
Avg Real Income								
Whites	10,075.30	4,493.39	5,742.63	9,430.44	12,585.40	20,315.77	28,412.14	43,183.61
Coloureds	2,375.57	2,929.92	4,577.59	6,887.67	10,343.63	16,595.74	24,193.72	38,236.92
Asians	2,661.83	2,791.34	4,281.28	6,864.59	10,510.33	16,305.92	24,985.79	40,492.66
Blacks	1,635.61	2,736.20	4,204.19	6,430.60	10,142.29	15,969.26	24,695.65	38,656.33
Avg Real Expenditure								
Whites	8,427.85	6,061.79	6,960.29	9,418.71	13,550.86	21,592.43	29,416.55	44,163.27
Coloureds	2,903.08	3,055.58	4,494.64	6,460.24	9,248.24	15,078.78	21,883.05	27,915.50
Asians	2,864.14	3,015.56	4,206.89	7,126.88	10,291.76	15,414.90	22,642.73	31,749.60
Blacks	1,938.65	2,681.80	3,985.86	5,693.17	8,239.11	11,612.24	18,165.99	28,772.77
Real Income Tax								
Whites	402.83	368.17	334.26	519.36	1,142.09	2,2443.16	3,392.00	5,541.78
Coloureds	42.25	20.45	94.46	223.23	414.64	1,065.16	1,830.07	3,107.98
Asians	19.49	33.44	77.04	268.70	584.70	1,129.72	2,226.51	3,682.16
Blacks	26.89	42.02	98.59	183.32	353.45	560.74	1,125.37	1,727.50
Real Conu.Saving								
Whites	318.23	290.84	264.06	410.28	902.22	1,772.03	2,679.59	4,377.85
Coloureds	43.95	21.27	98.25	232.21	431.32	1,108.00	1,903.68	3,232.98
Asians	20.61	35.35	81.44	284.03	618.07	1,194.18	2,353.54	3,892.25
Blacks	32.85	51.35	120.47	223.99	431.87	685.15	1,375.05	2,110.77
Real Disc. Saving								
Whites	2,368.51	(909.38)	(619.34)	941.36	1,078.84	2,738.53	5,067.18	8,939.97
Coloureds	(441.30)	(83.94)	275.66	882.87	1,941.35	3,690.13	6,044.42	16,662.38
Asians	(162.21)	(155.44)	232.87	290.44	1,421.35	3,214.92	6,923.11	16,317.46
Blacks	(243.30)	147.77	437.39	1,144.75	2,688.50	5,602.92	9,030.07	13,721.84
Real Total Saving								
Whites	2,686.74	(618.54)	(355.28)	1,351.64	1,981.06	4,510.56	7,746.77	13,317.83
Coloureds	(397.35)	(62.66)	373.92	1,115.08	2,372.67	4,798.13	7,948.10	19,895.35
Asians	(141.60)	(120.09)	314.31	574.47	2,039.41	4,409.10	9,276.65	20,209.71
Blacks	(210.45)	199.11	557.85	1,368.74	3,120.37	6,288.06	10,405.12	15,832.61
Discr. Sav. % of Income								
Whites	23.51	(20.24)	(10.79)	9.98	8.57	13.48	17.83	20.70
Coloureds	(18.58)	(2.86)	6.02	12.82	18.77	22.24	24.98	43.58
Asians	(6.09)	(5.57)	5.44	4.23	13.52	19.72	27.71	40.30
Blacks	(14.88)	5.40	10.40	17.80	26.51	35.09	36.57	35.50
Conu. Sav % of Income								
Whites	3.16	6.47	4.60	4.35	7.17	8.72	9.43	10.14
Coloureds	1.85	0.73	2.15	3.37	4.17	6.68	7.87	8.46
Asians	0.77	1.27	1.90	4.14	5.88	7.32	9.42	9.61
Blacks	2.01	1.88	2.87	3.48	4.26	4.29	5.57	5.46
Tax % Income								
Whites	4.00	8.19	5.82	5.51	9.07	11.04	11.94	12.83
Coloureds	1.78	0.70	2.06	3.24	4.01	6.42	7.56	8.13
Asians	0.73	1.20	1.80	3.91	5.56	6.93	8.91	9.09
Blacks	1.64	1.54	2.35	2.85	3.48	3.51	4.56	4.47

Source: Own calculations (Data: Survey of Household Expenditure, 1990) [14]

Real total saving as a percentage of real total income seems to be negative for the lower

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[13] Boundaries for income groups in 1990 differ from those in 1985. The Central Statistical Services used different boundaries in 1985 as opposed to 1990 issue of the Survey of Household Expenditure.

[14] The "Black" population group refers to the "African" population group.

income groups for mostly all the population groups, with the exception of the first White income group.[15] For the middle and higher income groups, the percentage of real total saving to real total income is positive for all income groups and population groups. An interesting point is that real total saving of Black households in the middle and higher income groups is higher than those of the White income groups. This might be explained by the fact that over the past few years, per-capita income for Whites has remained static or has decreased while that of Blacks has increased. This shown in the following table:

TABLE 7: Real per Capita Income: (Rand)[16]

POPULATION GROUP	1978	1988	GROWTH RATE(%)
Whites	3 718.47	3739.70	0.57
Blacks	352.09	435.97	23.82

Source: Own calculations: (Data: Final social accounting matrix for South Africa, 1988

According to Table 7, the incomes of Blacks have appeared to increase substantially, but when one looks at their savings behaviour, the following deductions can be made:

There is a lag in perception of these real increases in income to be of a permanent nature, therefore it is not immediately translated into Contractual saving. The lag in the adjustment of perceptions has resulted in significant differences in Discretionary saving between Blacks and Whites. This is shown in the 1990 data, where Discretionary saving for Blacks (as well as for Asians and Coloureds) is more than Contractual saving.

In the case of Whites, because their incomes have remained the same in most cases, they still perceive their permanent income to be the same and therefore we observe the consistent

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15   The percentage of total saving as a percentage of total income for White households are extremely high in comparison with that of the other population groups. A possible explanation is that most pensioners fall in this category which causes the high level of total saving.

16   The data is total income per head of the population. It would be ideal to evaluate after-tax income rather than total income growth. Unfortunately, this was not available. In the table, White total incomes show a relatively small positive growth rate, however, the after-tax income may have declined.

Contractual saving behaviour during this period. In the cases where real incomes have declined, there appears to be a perception that at least a significant proportion of it is only of a transitory nature. Very little adjustment is therefore made to Contractual saving.

The composition of total saving also shows some considerable differences. Real contractual saving as a percentage of real total income is positive for all income groups for all population groups. In the case of contractual saving, Whites seem to save more than the other population groups, for all income groups. Given the fact that Whites have had more time to adjust to higher incomes (they have been earning high incomes for a long period of time), they regard a greater proportion of their income to be permanent. Blacks, on the other hand, are still busy adjusting to the recent increases in real income. Taking this into account, it therefore seems logical to expect Contractual saving of Whites to be much higher than the other population groups.

Real discretionary saving as a percentage of real total income are, on the other hand, negative for the lower income groups for all population groups (with the exception of the White income group: 0 - 3999 = 23.51). Discretionary saving shows the same tendency as contractual saving for the middle and higher income groups to increase as we move up the income scale.

5.4.3 Comparison of 1985 and 1990 Data

This section is essential to establish what has happened to personal saving and its components over a five year period. Observed changes can then be discussed in the light of the effect of tax rate changes.

It should be pointed out that the data for 1990 and 1985 have been regrouped in an effort to make the two more compatible. This was necessary because income group brackets for 1985 and 1990 differed and regrouping was necessary to make meaningful comparisons. Also, only White households are compared since we only have White household data for 1985.

Another important factor to point out is that real values for 1990 data (at 1985 prices) were used in the regrouping process. This was done to remove the effect of inflation. The method

of regrouping is discussed in the Appendix.

TABLE 8: Regrouped data: 1985 & 1990 (1985 Prices) [17]

Income group (1985 incomes)	Under 8250	8251-16250	16251-22850	22851-30650	30651-38000	38001-54350
Average Total Income 1985 1990	8,239.95 10,075.30	12,956.38 19,666.46	20,823.55 12,585.40	28,293.20 20,315.77	35,416.35 28,412.14	46,057.92 43,183.61
Average Total Exp. 1985 1990	8,377.85 8,427.85	13,423.43 22,440.79	21,334.88 13,550.86	28,867.56 21,592.43	35,863.19 29,416.55	46,050.50 44,163.27
Income Tax 1985 1990	87.50 402.83	530.69 1,221.79	1,518.04 1,142.09	2,718.68 2,243.16	3,996.90 3,392.00	6,407.15 5,541.78
Contr. Saving 1985 1990	180.40 318.23	1,353.43 965.18	2,727.95 902.22	4,187.24 1,772.03	5,067.46 2,679.59	6,533.76 4,377.85
Discr. Saving 1985 1990	130.00 2,368.51	1,417.07 (587.36)	3,734.66 1,078.84	6,331.56 2,738.53	8,617.52 5,067.18	12,948.33 8,939.97
Total Saving 1985 1990	310.40 2,686.74	2,770.50 377.82	6,462.61 1,981.06	10,518.80 4,510.56	13,684.98 7,746.77	19,482.09 13,317.83
Total Saving % Income 1985 1990	3.77 26.67	21.38 1.92	31.04 15.74	37.18 22.20	38.64 27.27	42.30 30.84
Discr. Saving % Income 1985 1990	1.58 23.51	10.94 (2.99)	17.93 8.57	22.38 13.48	24.33 17.83	28.11 20.70
Contr. Saving % Income 1985 1990	2.19 3.16	10.45 4.91	13.10 7.17	14.80 8.72	14.31 9.43	14.19 10.14
Tax % Income 1985 1990	1.06 4.00	4.10 6.21	7.29 9.07	9.61 11.04	11.29 11.94	13.91 12.83

Source: Own calculations (Data: Survey of Household Expenditure, 1990); (Base: 1985 =100)

a) Discretionary Saving as a percentage of Income:

The change in discretionary saving can clearly be seen in the following graph:

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[17] Boundaries for income groups are those of 1985 - the adjusted boundaries (for similar reasons as before). In one or two cases, the 1990 average total income may exceed this, but this may be ascribed to the regrouping process.

Figure 3 Real Discr. Saving % Real Income
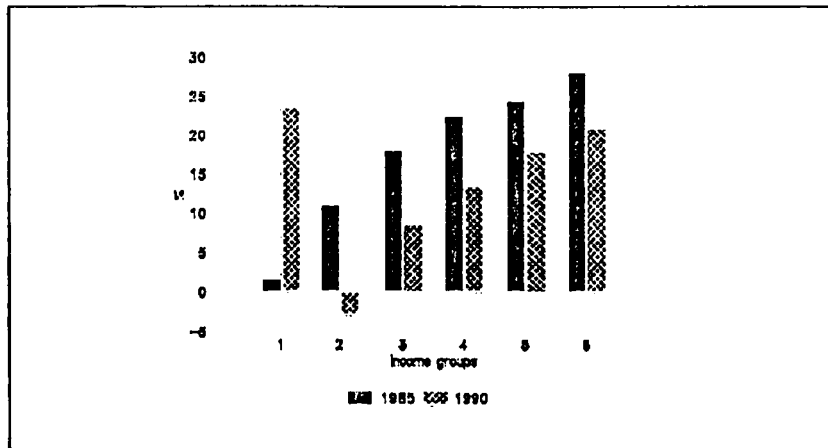
Except for the first income group, discretionary saving decreased for all the income groups from 1985 to 1990. It should be remembered that the first income group is a boundary category and is apt to show significant differences from the other groups. For instance, this group contains lower income taxpayers who may have experienced real income increases during this period.

The same comparison can be made for Contractual saving:

Figure 4 Real Contr. Saving % Real Income
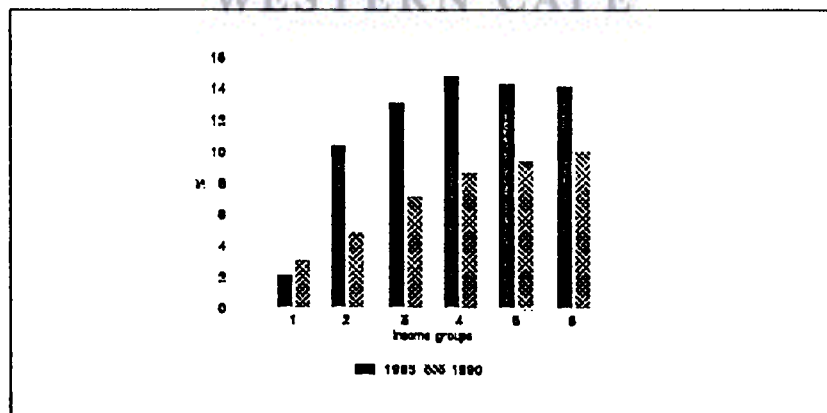
As can be seen from the graph, there is a decrease in contractual saving over the income

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groups (except for the first group, as explained above).

Looking at both graphs, it is evident that both Contractual and Discretionary saving have decreased, the latter showing more variation over the income groups.

The question to raise would be whether changes in Personal Income Tax contributed to the changes above. The table in the next section was calculated to throw some light on this possibility.

5.4.4 EFFECT OF TAX CHANGES: 1985 TO 1990

The calculation for the tax table is given in the Appendix.

TABLE 9: Tax changes [18]

Taxable Income 1985	Taxable Income 1990	Tax Paid:1985 1985 rates	Tax paid:1990 (1990 rates)	Eff.tax rate (1985 rates)	Eff. tax rate (1990 rates)	% Point change
2,000	3,532	240	565.12	12.0	16.0	4.0
5,000	8,830	600	1,489.40	12.0	16.9	4.9
8,000	14,128	1,120	2,525.60	14.0	17.9	3.9
13,000	22,958	1,860	4,509.92	14.31	19.6	5.29
20,500	36,203	4,050	8,246.99	19.76	22.8	3.04
32,500	57,395	8,790	16,231.95	27.05	28.3	1.25
50,000	88,300	17,360	29,452	34.72	33.4	(1.32)
80,000	141,280	32,360	52,763.20	40.45	37.3	(3.15)

Source: Own calculations (Data: Inland Revenue bulletins, 1985 - 1990)

From the tax table, the following analysis can be made:

The tax rates used in this analysis are the 1985 and 1990 tax rates.[19]   The calculation focuses on the taxable income of 1985 and 1990, after adjusting 1990 for accumulative inflation. In this case, the effective tax rate is calculated for 1985 taxable income using 1985

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[18]   The first two columns of the table show taxable income for 1985 and 1990. The income for 1990 is the 1990 nominal equivalent of the real income level of 1985 - first column of table.

[19]   The tax rate tables used for these calculations are for married persons, received from Inland Revenue, Pretoria.

tax rates, and for 1990 taxable income using 1990 tax rates. By doing this calculation, one can clearly determine the effect of the change in the tax paid in 1985, with 1985 tax rates, and the tax paid in 1990, with 1990 tax rates for the same real incomes. The percentage point change in this case emphasises the above result. The lower income groups have experienced a higher increase in the effective tax rate. The result even shows that the higher income groups have paid less tax in 1990 than in 1985. This could be explained by the fact that the lowering of the top marginal rate benefitted higher income groups because a large percentage of income falls within these income brackets. This is illustrated by the following graph:

Figure 5 Real Income Tax as % of Real Income
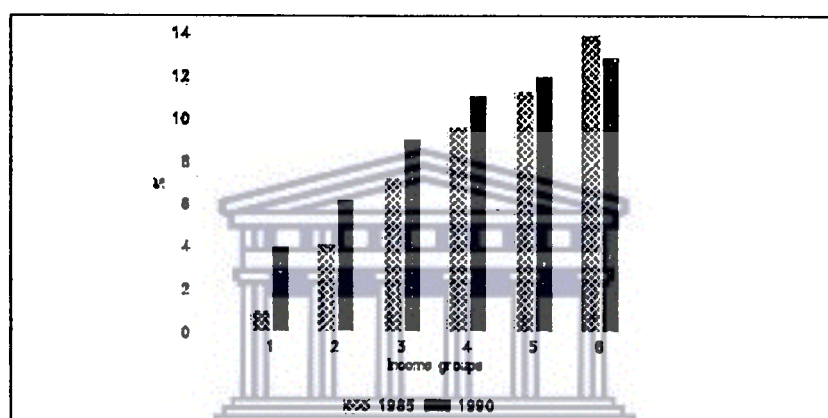
Source: Own calculations (Data from statistical table: Regrouped Data, 1985 & 1990)

The graph clearly shows that income tax across the income groups have increased from 1985 to 1990. It is also evident that the lower income groups have been affected more heavily by the change in tax paid than the higher income groups.

5.4.5 CONCLUSION

From the exploratory stage, it is evident that Personal Income Tax has affected the incomes of households and therefore also their saving behaviour. At the same time, a significant reduction in Discretionary and Contractual saving was observed.

Earlier on, it was mentioned that the Permanent Income Hypothesis states that transitory

income changes lead to changes in Discretionary Saving and changes in permanent income lead to changes in Contractual Saving. Therefore, if tax changes are perceived to be temporary, it will affect transitory income and therefore Discretionary Saving.

The subsequent empirical analysis will put more emphasis on these theoretical considerations and test whether this explains the saving behaviour of South African households.

5.5 RESULTS OF REGRESSION ANALYSIS

5.5.1 INTRODUCTION

In the previous section, the exploration of sample data suggested that, strictly speaking, if tax increases faster than income does, this will have a negative effect on the saving behaviour of households. It was also shown that even though real incomes have increased for certain population groups, components of Personal saving actually decreased. It is postulated that this was caused by the increases in Personal Income Tax being paid. From the tax table, this was confirmed since it is evident from this table that Personal Income Tax has had a noticeable effect on the income of South African households.

The above suggestions take us to the theme of this section: to examine the effect of Personal Income Tax on the components of Personal saving, i.e. Discretionary and Contractual saving, by making use of the Permanent Income Hypothesis as theoretical basis.

5.5.2 DATA

The data that were used in the regression analysis, are the following:
Household survey data obtained from the Central Statistical Services (CSS) for the year 1990. The data was collected by the Human Sciences Research Council by making use of a questionnaire entitled: Expenditure patterns of households in the RSA.

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The data is very detailed and has a sample size of more or less 3000 households, with details on income and expenditure patterns by population group, sex, occupational sector, etc.

5.5.3 METHODOLOGY

The technique for empirical testing involves ordinary least squares (OLS) on a cross-sectional basis. As with the exploratory data, the following is calculated:

1. Total Income
2. Income Tax
3. Contractual Saving
4. Discretionary Saving [20]

Variables Chosen:

The analysis done is not entirely based on the previous section since the present data is not time series data. Also, more focus will be given to the microeconomic behaviour of the total sample of households rather than the individual income groups.

The dependent variable in the first regression is Discretionary Saving and the independent variables are Total Income and Personal Income Tax. For the second regression, the dependent variable will be Contractual Saving and the independent variables will be Total Income and Personal Income Tax. [21]

The regression equations will therefore be:

1) $S_d = f(T; Y)$

2) $S_c = f(T; Y)$

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[20] The basis on which the data is calculated is the same as in the exploratory stage. For details, refer to these calculations in the Appendix.

[21] Unfortunately, a distinction cannot be drawn between transitory and permanent income with the available data. Therefore, in both regressions, total income is used as a proxy.

where:

Sd = Discretionary Saving

Sc = Contractual Saving

T = Personal Income Tax

Y = Total Income

5.5.4 RESULTS

a) Discretionary Saving:

TABLE 10: Discretionary Saving regressed against Personal Income Tax and Total Income:

| Variable	Coefficient	Standard Error	T-Statistic
T (Personal Income Tax	-1.94	0.0063	-30.6
Y (Total Income)	1.0036	0.0016	615.3
R^2 = 0.99			
Durbin Watson = 1.52			

Source: (Own Calculations, Data: Expenditure patterns of Households in RSA, 1990)

b) Contractual Saving:

TABLE 13: Contractual Saving regressed against Personal Income Tax and Total Income:

Variable	Coefficient	Standard Error	T-Statistic
T (Personal Income Tax)	0.24	0.009	24.1
Y (Total Income)	-0.0001	0.00025	-0.46
R^2 = 0.15			
Durbin Watson = 1.80			

Source: (Own Calculations, Data: Expenditure patterns of Households in RSA, 1990)
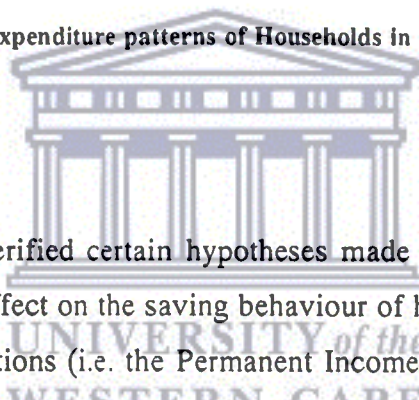
Discussion of Results:

The regression results have verified certain hypotheses made earlier. One of these was that Personal Income Tax has an effect on the saving behaviour of households. More importantly, based on theoretical considerations (i.e. the Permanent Income Hypothesis), it was suggested that when transitory income changes, Discretionary saving will also change, and also that permanent income changes will affect Contractual saving. The above regression test has proven this assumption to be correct. The results show that households perceive the changes in their income to be of a permanent nature only after some significant lag. Tax changes that are viewed to be temporary, will thus affect transitory income and therefore also Discretionary saving. From the above, if there is a positive change in Personal Income Tax of 1 unit, then Discretionary saving will be negatively affected, i.e. there will be a decrease of 1.94 units. These conclusions are strengthened by the weak results obtained for Contractual saving. This strengthens the view that changes in income are initially viewed as transitory.

Significance of Results:

It is important to establish the validity of results obtained. The first regression equation, for

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Discretionary saving, shows high significant relevance. The standard error for the sample coefficients are very small, leading to the fact that the T-Statistic are very large. Thus, statistically, there is a significant relationship (at a 95% level of significance) between Discretionary saving and Personal Income Tax as well as Total Income. The R^2 (0.99) shows that the independent variables explain virtually the total variation in Discretionary saving.

For Contractual saving, the results also show statistical relevance, but the R^2 (0.15) is much lower than the former regression. This just serves the purpose of enhancing the fact that South African households perceive certain tax changes to be permanent only after a significant lag and therefore permanent income, as well as Contractual saving, remain the same.

5.5.5 CONCLUSION

In previous sections, assumptions were made about the behaviour of South African households. One of these was that there is a lag in the perception of the permanency of the changes in income. The empirical investigation in the previous section has proven this to be true. Since households see income changes to be transitory, it most likely only Discretionary saving that will be severely affected when there is a temporary (as perceived by households) change in Personal Income Tax.

The earlier comparison of saving behaviour between 1985 and 1990 clearly supports the notion adjustment to Contractual saving is made to new perceived levels of permanent income if a long enough time lag is allowed. In the short run, before adjustment occurs, a change in Personal Income Tax is more likely to be perceived as transitory and therefore will have a significant impact on Discretionary saving.

6.   GENERAL CONCLUSION

This dissertation investigated the effect of Personal Income Tax changes on the saving behaviour of households in South Africa.

In the previous section, regression analysis was used in this investigation process. The results of these tests gave a clear indication that there is a relationship between Personal Income Tax and Personal Saving.

These findings can be summarised as follows:

*   Personal Income Tax affect the composition of Personal Saving, i.e. Discretionary and Contractual Saving, in different ways.

*   The results show that Discretionary Saving has a negative relationship with Personal Income Tax.

*   Contractual Saving, on the other hand, is more or less constant when Personal Income Tax changes, verifying that households tend to have a lag in the perception of the permanency of tax and income changes. Given sufficient time, however, households will adjust their saving behaviour to the new perceived income, by changing Contractual saving.

When one relates these findings to the theoretical explanations of the relationship between income tax and saving behaviour, it is evident that the Permanent Income Hypothesis provides an explanation of the savings behaviour of different households in South Africa.

The Permanent income hypothesis states that a proportion of permanent income saved by an individual in a given period, is independent of its income during that period and furthermore that transitory income may have little or no effect on current consumption. As mentioned before, transitory changes to income would lead to changes in discretionary saving rather than

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contractual saving. In terms of the theory presented, it was suggested that households at first perceive the changes in their income to be of a transitory nature. Thus, whenever an income tax change occurs (eg. income tax rates increase), the strong possibility arises that households will initially adjust Discretionary saving.

The above analysis shows that in the short run Discretionary saving is likely to be reduced and that households keep Contractual saving and consumption more or less stable. This can be seen from the fact that Contractual saving remains virtually constant when an income tax change occurs.

If the government decides to increase tax revenue by raising Personal Income Tax rates, this effectively means that, in the short run, saving of households will fall. After an adjustment lag, ceteris paribus, it will be reflected in a permanent reduction in Contractual saving. Therefore it can be expected that less domestic funds will be available for investment purposes.

Thus a future government, assuming it keeps expenditure constant, will have to make a choice between a potential savings gap (shortage of saving is a constraint on investment) or a fiscal gap, resulting in a higher deficit and the potential for crowding out.

This difficult trade-off may well have far-reaching implications for economic growth and development in South Africa.

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8. APPENDIX: CALCULATION OF STATISTICAL TABLES

HOUSEHOLD SAVINGS BEHAVIOUR: 1990 DATA

To determine what saving will be for each income group, I have made use of the following:
Households: Particulars according to income group and population group: Summary of average annual expenditure (I have made use of tables for the population groups i.e. Whites; Coloureds; Asians and Blacks).

These tables consist of nine (9) income groups and shows total average expenditure for each income group according to population group. Included in the expenditure figures are the following : Income tax, Insurance.etc.

Since insurance can be seen as forced saving (contractual saving), it is therefore necessary to reduce total expenditure by the insurance amount.
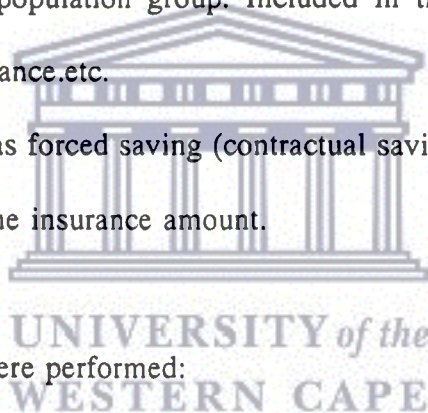
The following calculations were performed:

Starting with total expenditure (TE):

TE = Consumption (C) + Discretionary Saving (DS)+ Income Tax (T) + Contractual Saving (CS) which could also = Disposable Income (Yd) + T + CS

From the above we can deduct the following:

TE - T - C = DS + CS

therefore:

Total Saving (TS) = DS + CS
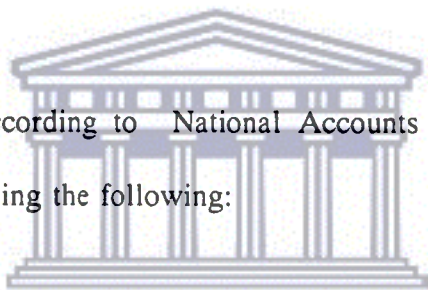
and also:

TS - CS = DS

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To estimate the amount of Contractual Saving, data from Households: Particulars according to population group: Average expenditure on income tax, Insurance, etc. were used.

The difference between this table and the previous one is that the income tax and insurance figures are not specified according to income group, but only according to population group.

Thus, before doing the above calculations, some method of estimating insurance per income group has to be devised. This was done as follows:

For each population group, after defining contractual saving, the percentage of contractual saving from the table was calculated. These percentages were then used to calculate the income tax and insurance figures tables according to income groups.

Contractual saving, which according to National Accounts definition, is only long-term insurance, is defined as including the following:

1.   Contribution to Pension Funds

2.   Life and Endowment policies

3.   Loan and credit facility repayments

4.   Unemployment Insurance

The first two categories are clearly long-term in that it is only paid out after the individual retires. Loan and credit facility repayments form part of domestic saving since it reduces outstanding debt and is therefore treated as part of saving by the household sector.

Data obtained from CSS tables for contractual saving and income tax as per population group

were used to calculate the percentage of contractual saving from the total as well as income tax as a percentage from the total.

These percentage figures were then used to determine the contractual saving and the income tax figures for the different income groups.

Real Data:

To check whether there was any real changes to saving, one has to compute real values. The 1990 data were transformed by doing the following:

Taking the nominal data for 1990, this were deflated by making use of the CPI-deflator, with 1985 as the base year. Thus, each category of income was transformed into real values. This step is important because we remove the inflationary impact on the data.
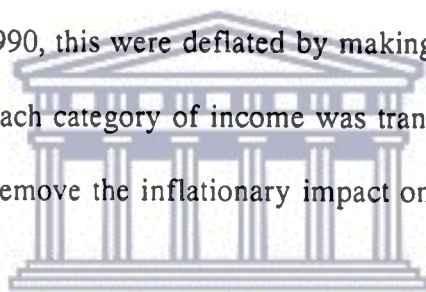
HOUSEHOLD SAVINGS BEHAVIOUR: 1985 DATA

The data used were also obtained from the Survey of Household Expenditure as published by Central Statistical Services, but the 1985 issue was used. One problem that emerged from the use of this issue is that it only contains data for White households and therefore the savings behaviour of White income groups only can be calculated and evaluated. However, the assumption that will be made when the data are analyzed, is that all household income groups behave more or less in a similar manner. It is for this reason that, when drawing comparisons, what is found for White income groups will also be assumed to be the behaviour of other population income groups. This assumption can be validated on the basis that the data for 1990

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shows that income groups for different population groups behave in a similar pattern.

Given the above, basically the same calculation was done using the data for 1985. The only differences occurred with the calculation of Contractual saving and the income groups. Contractual saving in the 1985 issues of Survey of Household expenditure is already allocated into respective income groups so that the calculations as done for 1990 are not necessary. Also, another difference is that the income groups differ. However, this problem is not a major crisis and will be discussed at a later stage.

The tables used for the above calculations are:

1.   Households: Particulars according to income group (direct income): Summary of Average Annual expenditure

2.   Households: Particulars according to income group (direct income): Average expenditure on Income Tax, Insurance, etc. for the period 1 November 1984 to 31 October 1985

TAX TABLE:

The tax table uses the following data sources:

1.   Tax rates tables for married persons taken from the Inland Revenue Statistical Tables, for 1985 and 1990.

2.   The income levels are calculated from the income of the different income groups (1990 data), where the average income is calculated for each income group.

3.   It is assumed that the average income for each income group is earned by the head

of the household and that this is the only income per household. It is also assumed that each married person only have two dependents.

4.   The average income is assumed to be the taxable income after taking into account the rebates, number of dependents, etc.

5.   The accumulative inflation rate is calculated from 1985 to 1990. It is assumed that 1985 is the base year.

The first phase includes the calculation of the taxable income for the years 1985 and 1990. Thereafter, using the tax rates of 1985, the effective tax paid by each income group is calculated for the years 1985 and 1990. By dividing taxable income by the effective tax paid, we obtain the effective tax rate paid for 1985 and 1990, assuming that the tax rate does not change. This will effectively give us the tax paid with no change in the tax rate but income adjusted for inflation, for 1990. Thus we are basically looking at the concept of bracket creep. This is shown in the following table:

Taxable Income		Tax Paid	1985 rates	Effective tax rate	Effective tax rate
1985	1990	1985	1990	1985	1990 (1985 rates)
2000	3532	240	423.84	12.0	12.0
5000	8830	600	1076.20	12.0	12.19
8000	14128	1120	2133.28	14.0	15.10
13000	22958	1860	4904.88	14.31	21.36
20500	36203	4050	10517.44	19.76	29.05
32500	57395	8790	21057.50	27.05	36.69
50000	88300	17360	36510.00	34.72	41.35
80000	141280	32360	63000.00	40.45	44.59

Source: Own calculations (Data: Inland Revenue bulletins, 1985 - 1990)

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The above table is expanded in the text.

The next step involved calculating the tax paid with 1985 and 1990 rates. Thus the result from the above is the effective tax paid, initially with 1985 tax rates and thereafter with 1990 tax rates.

REGROUPED DATA:

In this section, the data for 1990 are made compatible with that of 1985 so that generalised comparisons can be drawn. This was done as follows:

Firstly, the 1990 data used, are the real data. This is necessary when making a comparison over time. Thus, by taking away the inflationary impact, it can be determined whether there was any real changes.

Secondly, to regroup the 1990 data, I have calculated the (deflated) mean of each income group in 1990 and compared this with the mean of the income groups in 1985.

Deflated mean (1990)	Mean (1985)
Income Group	Income group
a. 982	1. 3000
b. 3436	2. 12000
c. 5480	3. 21000
d. 8836	4. 30000

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e. 13991   5. 39000

f. 22091   6. 55000

g. 34364

h. 54001

Comparing the means, I have regrouped the 1990 income groups as follows:

Income groups:

1. = a

2. b + c + d

3. = e

4. = f

5. = g

6. = h

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