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A THEORETICAL BASIS FOR
LIFE ASSURANCE IN DEVELOPING
COUNTRIES WITH PARTICULAR
REFERENCE TO EGYPT

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of Doctor of Philosophy

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TABLE OF CONTENTS

	Page No.
ACKNOWLEDGEMENT	5
ABSTRACT	6
CHAPTER ONE: INTRODUCTION	8
1.1 Purpose of Study	8
1.2 Outline of Study	9
CHAPTER TWO: THE ECONOMIC SITUATION OF THE DEVELOPING COUNTRIES AND INDUSTRIAL ASSURANCE	11
2.1 Introduction	11
2.2 The Developing Countries and Insurance	11
2.3 The Economic Development of Egypt	13
2.4 Economic Basis of Life Assurance	18
2.4.1 Family Purposes	18
2.4.2 Business Purposes	20
2.5 Industrial Life Assurance	21
2.6 Origin and Development	22
2.7 Industrial Life Assurance in Egypt	24
2.8 Evaluation of Industrial Assurance Policies in Egypt	26
CHAPTER THREE: THE MORTALITY RATES OF EGYPT	29
3.1 Introduction	29
3.2 Factors Affecting Mortality Rates	35
3.3 Definition of the Mortality Rates	36
3.4 The Life Table	36
3.5 The Egyptian Mortality Rates	37
3.6 The Period of Investigation	37
3.7 The Unit of Investigation	38
3.8 The Data Collected	41
3.9 The Formulae Used	42
3.10 The Crude Mortality Rates	44
3.11 Comparison of Actual and Expected Deaths by the A24-29 U.	47
3.12 Graduation	50
3.13 Graduation by Reference to A Standard Table	51
3.14 Test of Graduation	58
3.15 χ^2 Test	60

	Page No.
CHAPTER FOUR: ANALYSIS OF THE EGYPTIAN MORTALITY RATES	65
4.1 Introduction	65
4.2 Comparison between Mortality Rates Based on Policies and Sums Assured	65
4.3 Comparison between Expected Deaths by the New Tables and The A24-29 U.	67
4.4 Comparison between Expected Deaths by the New Tables and The A24-29 U. (Light)	70
4.5 Comparison with Earlier Egyptian Experience	73
4.6 Conclusion	75
CHAPTER FIVE: THE MONETARY TABLES	92
5.1 Introduction	92
5.2 The Egyptian Life Tables	92
5.3 The Monetary Tables	93
5.4 Comparison between Premiums Based on The New Tables and The A24-29 U.	129
5.5 The Interest Rates Used by The Egyptian Companies	140
CHAPTER SIX: ANALYSIS OF THE PREMIUM LOADINGS	144
6.1 Introduction	144
6.2 Office Premiums	144
6.3 Expenses of Industrial Assurance	148
6.4 Analysis of Expense Loadings	150
6.4.1 Direct Charges	150
6.4.2 Apportionable Charges	151
6.4.2.1 Head office charges	152
6.4.2.2 District office charges	154
6.4.2.3 Field staff charges	155
6.5 Expense Loadings in the Egyptian Companies	155
CHAPTER SEVEN: THE IDEAL INDUSTRIAL LIFE ASSURANCE POLICY	160
7.1 Intrduction	160
7.2 Factors influencing the Design of the Ideal Policy	160
7.2.1 The Knowledge of Insurance	161
7.2.2 The Per-Capita Income	164
7.2.3 Social Insurance System	165
7.2.4 Saving Channels	165
7.2.5 Salesmen	166

	Page No.
7.3 The Benefits of the Suggested Policy	167
7.4 The Sum Assured	170
7.5 New Premiums	171
7.6 The Office Premiums	183
CHAPTER EIGHT: CONCLUSIONS	196
8.1 Introduction	196
8.2 How to Reduce the Premiums to the Minimum Level	196
8.2.1 The Mortality Rates	196
8.2.2 The Interest Rate	197
8.2.3 The Loading Rates	198
8.3 The Benefits of the Ideal Policy	200
Appendix I	201
Appendix II	204
Appendix III	217
Appendix IV	260
References	303

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ABSTRACT

This research is concerned with industrial life assurance as a kind of life assurance which is more suitable to the developing countries with low per-capita income level. However, the research aim of this study is to apply the theoretical basis of life assurance in designing an ideal industrial life policy, which suits the Egyptian market and other similar developing countries. In this study, two approaches to design the ideal policy are developed.

The first approach concerns the possibility of reducing the premiums of the policy to a minimum level which suit the per-capita income of Egypt and other developing countries. In this respect, the research constructed for the first time in the history of Egyptian insurance a mortality rate based on Egyptian experience.

The research also includes a complete set of monetary tables based on Egyptian mortality rates (policies and sums assured) and interest rates varying between 4% and 7%.

The loading rates are comprehensively analysed, and in order to reduce the cost of industrial life assurance, the researcher suggests that this branch should be charged only with direct expenses, while exempted from any share of indirect expenses. In this case, we may call the industrial life assurance "the social industrial life assurance".

The second approach concerns the benefits of the policy according to the circumstances of the Egyptian market. In this respect, the factors affecting and influencing the

design of the ideal policy are discussed. Such factors are: the knowledge of insurance among the population, the per-capita income and its capacity to buy life assurance, the benefits of the social insurance system, and finally the salesmanship of the people working in the area of life assurance.

In view of the above mentioned factors, the researcher suggests the term insurance with a refund of the premiums in case of insured survival, as an ideal policy in view of the circumstances of the Egyptian market.

Finally, the complete calculation of the official premiums for the suggested policy are presented.

CHAPTER ONE

INTRODUCTION

Life assurance, one of the largest and most important industries in the world, has wide-ranging social and economic objectives. Its first concern is with personal economic independence. It provides men and women with an institution through which they can systematically create financial security for their families and enterprises. It also serves the economy as an important channel through which capital is made available to business and industry. It is an industry that affects everyone, directly or indirectly. Thus, it is an important field of study that merits the thoughtful attention of all who would consider themselves knowledgeable in business, economics, or finance.

1.1 Purpose of the Study

This study is concerned with industrial life assurance, so-called*, as a kind of life assurance which is more suitable to the developing countries with low per-capita income levels. However, the research aim of this study is the design of an ideal industrial policy to suit the population of Egypt and of other similar developing countries.

In the following chapters, two approaches to design the ideal policy will be developed. The first one is the possibility to reduce the premium of the policy to a

* "industrial life assurance" is the name associated by custom with the issue of policies with relatively small sums assured, by which the premiums are collected weekly (or monthly). The system is particularly suited to low income weekly wage earners.

minimum level to suit the per-capita income of Egypt and other developing countries. The second one is to discuss the policy benefits according to the circumstances of the Egyptian market.

1.2 Outline of the study

This research includes eight chapters.

The first chapter is the introduction which includes the purpose of the study and the outline of the research.

The aim of chapter two is to indicate that the industrial life assurance is the best facultative protection against the economic risks of both life and death in developing countries. Throughout this chapter the researcher will discuss the economic situation of developing countries with particular reference to Egypt. Also, the chapter discusses the economic basis of life assurance, the definition of industrial life assurance and its origin; and it covers industrial life assurance in Egypt and its evaluation.

The full procedure of calculating mortality rates based on the experience of the Egyptian company will be represented in chapter three. Chapter four includes a comprehensive analysis of the Egyptian mortality rates obtained in chapter three.

The researcher's aim in chapter five is to construct monetary tables based on Egyptian mortality rates (policies and sums assured). To fulfill these aims, the chapter includes a life table based on the Egyptian mortality rates.

Using this table with some interest rates, monetary tables are constructed.

Chapter six presents a comprehensive analysis of the premium loadings with the objective of reducing them to the minimum level possible. Throughout this chapter the researcher presents his recommendations in this matter.

The ideal industrial life policy, from the researcher's point of view, to suit the Egyptian market and other similar developing countries is presented in chapter seven.

Chapter eight summarises the conclusions of this study.

CHAPTER TWO

THE ECONOMIC SITUATION OF THE DEVELOPING COUNTRIES AND INDUSTRIAL LIFE ASSURANCE

2.1 Introduction

The chapter aims to indicate that industrial life assurance is the best facultative protection against the risks of both life and death in developing countries.

Throughout this chapter the researcher will discuss the economic situation of developing countries with particular reference to Egypt. The chapter also discusses the economic basis of life assurance, the definition of industrial life assurance and its origin.

Finally, it discusses industrial life assurance in Egypt and its evaluation.

2.2 The Developing Countries and Insurance

Nowadays, the economists classify the world into developed and developing countries. The major economic distinction between these two groups is the wide difference in the level of per-capita income; the distinction is between rich and poor countries. Currently, while the developed countries have per-capita national income ranging from \$1500 to over \$4000 a year, the majority of the underdeveloped countries in Asia, Africa and Latin America typically fall within the per capita income bracket of \$100 to \$500 per year. The average per-capita income for all the underdeveloped countries taken together is about \$200 (Myint, H., 1974, P7).

The backwardness of poor countries is therefore largely due: (Maddison, A., 1970, P22)

- a) to the fact that their development commenced when several of the developed countries had already a century of economic growth.
- b) to the fact that growth, once started, arose mainly from the productivity gains of international specialisation - and not from high investment, industrialisation and technical change, as in the developed countries.
- c) to the fact that, many of these economies were dominated politically by the developed countries. Effectively, most of them were colonies until the 1930s, and for this reason they suffered from various forms of foreign exploitation. Some kinds of exploitation did not necessarily hinder their growth. The control of the economy by a colonial bureaucratic elite was not necessarily worse for development than control by a local semi-feudal oligarchy. The displaced local elite in colonies naturally had strong grievances at their loss of power and income, and the presence of a foreign ruling class may have helped destroy a few native industries producing luxury goods, such as the textile industry of Dacca. But the growth-impeding impact of foreign economic dominance was mainly due to certain characteristics which allowed the developed countries to draw resources away from these economies.

The raising of income levels is generally called economic growth in rich countries, and in poor countries it is called "development". Generally "development" means establishing a productive system which allows the

use of all unused human and natural sources in order to increase the per-capita income faster than the increase in population (El-Mahgoub, R., 1968, P226).

In this respect, judged by any standards the insurance industry plays a major role in economic development. It enables individuals and firms to obtain financial security against many of the risks which beset everyday life; it provides a major source of long-term capital, and it is the largest net contributor to the country's invisible overseas earnings.

The insurance company is considered as a major investor in the development plans with its accumulated funds, especially for the life branch. Moreover, life assurance tends to increase rather than decrease personal earnings. Firstly, life offices together with other institutions provide an organisational framework through which savings can be made. More important, however, is the pressure brought to bear on individuals by the representatives, agents and advertising of the life offices to set aside part of their current income in order to obtain financial security against premature death or old age (Carter, R.L., 1970, P37).

2.3 The Economic Development of Egypt

Egypt was a developing country in 1975, trying to gain the momentum for self-sustaining economic growth. Per-Capita gross national product (GNP) was the equivalent of about US\$240 but, because of inequalities of income distribution, some of the population had a yearly income as low as 60 per cent of the national average. Economic growth had been low for the previous ten years, leaving

many with little if any improvement in their standard of living.

The obstacles to economic growth were many. The population was large and increasing at $2\frac{1}{2}$ per cent or more a year. The economy had to grow at a substantially higher rate if investment funds and consumption improvements were to be achieved. Moreover, the population had long since passed the desirable ratio of individuals to arable land. Less than 4 per cent of the country, primarily those areas reached by water from the River Nile through an extensive irrigation system, could be cultivated. Quick and easy expansion of agricultural output, the most important sector of the economy, was not feasible, and growth was limited largely to small yearly improvements in yields through expensive increases in inputs (Nyrop, R.F. & others, 1976, P247).

The first National Economic Plan was ready by 1960 which drew on the basis of so-called Arab Socialism Principles; this meant the domination of the economy by the government.

The plan comprised of three stages:

1. The First Five Year Plan (1960/61 - 1964/65)
2. The Second Five Year Plan (1965/66 - 1969-70)
3. The Third Five Year Plan (1970/71 - 1974/75)

The aims of the Development Plan can be summed up in the following way: (Mahklouf, H., 1977, P180):

1. To liberate the national economy from its limited scope to enable it to compete with other more progressive economies.

2. To allocate a fair share of investments to the different sectors of economy and to realise a state of balance among them.
3. To direct production to meet the requirements of local consumption.
4. To raise the standard of living and, at the same time, increase production potential for future economic expansion.
5. To provide a great permanent manpower so that a maximum number of individuals may share the outcome of production and development to fulfil social justice.

In 1963 it looked as if Egypt had entered onto the road of sustained growth. For about 6 years its national product per-capita had increased steadily by over 3 per cent per year. The level of investments and the expansion of education and health services gave a good promise that the economy should be able to continue at this rate of growth. Inflationary pressures and large balance of payments deficits had arisen, however, and the shortage of foreign exchange was becoming a serious problem. Only piecemeal measures and palliatives were undertaken to meet the foreign exchange problem, which might have led to stagnation. Firm demand management and wage policies and improved investment planning, however, could probably have gradually redressed the balance of payments without retarding growth. Indeed, most observers of the Egyptian economy agree that such measures could even have accelerated growth.

Two serious political miscalculations, two wars, put an end, a temporary one, it is hoped, to this promising development. Egypt's involvement from 1963 in the Yemen War, originally expected to be both limited and brief, led to soaring defence expenditures, which threw the economy more and more out of balance and caused a gradual slowdown of growth. The War of June 1967, apart from resulting in the destruction and occupation of parts of the country, brought a further increase in defence expenditures, and development came to a standstill. (Hansen, B., 1972, P23).

Despite all the above, there are some reasons for long term optimism about Egypt's economic developments, these are:-

1. The continuation of the peace efforts by the Egyptian government towards a final settlement regarding the Middle East conflict which the country's economy has suffered from since 1948. These efforts have culminated in the disengagement agreements signed with Israel in 1974 and 1975. These gave Egypt the opportunity to re-open the canal, to return to the oil fields and to commence rebuilding the canal's cities. The Suez Canal's revenues are estimated to reach a level of around £E300 million by year 1980; these could increase to a possible £E500 million per year as a result of physical expansion and greater use of the canal. Such gains would help the economy.
2. The new economic Open Door Policy that was declared by the government in 1974. One aspect

of this policy was to encourage foreign investors to contribute funds and know-how to develop business in Egypt, taking advantage of its low cost but relatively skilled manpower, its large internal market and its key geographic location. According to the investment law foreign investment is allowed in a range of industrial mining, energy, tourism, land reclamation, animal husbandry and banking activities, in addition to housing construction and rehabilitation for Arab investors. Free zones have been established at the Suez Canal zone where investments are not necessarily related to the National Plan.

The joint companies formed between Egypt and the individual oil producing states appear to be very sound investments and capable of high returns over many years. Arab and foreign investments valued at approximately E£671 millions were agreed upon by the government during 1976 in addition to a US\$1 billion defence industries complex.

3. The expectation of the geologists concerning large oil and gas reserves with Egypt's borders, most probably in the western desert near the Libian border. The response of the international oil companies has created an atmosphere of optimism for Egyptian oil. Some twenty firm agreements were reportedly signed by the end of 1974 and forty more during 1975 and 1976.

Recently seven oil and gas fields were discovered, and the oil production is put (by the companies) at one million barrels per day by 1980-82.

4. The country's climatic, physical and historical endowments give it a tremendous potential for the development of tourism, therefore the earnings from tourism is expected to increase.

2.4 Economic Basis of Life Assurance

A human life is possessed of many values, most of them irreplaceable and not susceptible to measurement. Life Assurance is concerned with the economic value of a human life, which is derived from its earning capacity. Life assurance is not oblivious to the other values associated with a human life; in fact, the life assurance transaction has strong moral and social overtones. Yet, the foundation of life assurance is the economic value of the human life. Since such economic value may arise out of either a family or a business relationship, it seems advantageous to discuss the functions of life assurance under the following headings (McGill, P., 1967, P3).

2.4.1 Family Purposes:

It would be difficult, if not impossible, to prepare a list of all needs that might possibly arise after the death of the income producer. However, the following is to outline the general categories of needs that are likely to be found in any family situation.

1. Clean up fund; the first need in point of time is a fund to meet the expenses that grow out of the death of the insured and to liquidate all current outstanding obligations. There are many types of obligation to be met, and ready cash should be available for that purpose. These items include the bills of the last illness, burial expense, personal obligation, unpaid pledges and estate, inheritance, income, and property taxes.
2. Readjustment income; in order to cushion the economic and emotional shock, it is considered highly desirable that the adjustment be postponed for a period following the producer's death. The income during this period should be approximately equivalent to the family's share of the producer's earning at the time of his death.
3. Income during dependency period; after expiration of the readjustment period, income should be provided in a reduced amount until the children, if any, are able to support themselves. This is sometimes called the "critical period" income. This period is considered so important that life assurance companies have created special policies to meet the needs of the period.
4. Life income for widow; after the children have become self-supporting, however, the widow will still have needs as an individual and will require an income from some source.

5. Special needs; such as mortgage redemption needs, education needs and emergency needs.

2.4.2 Business Purposes

Life assurance serves a wide variety of purposes in the business world, but most of the services can be grouped as follows:

1. Key-Man Indemnification; the purpose of this assurance is to indemnify a business concern for the loss of earnings occasioned by the death of a key officer or employee.
2. Credit Enhancement; life assurance can serve to enhance the credit of a business concern in two general ways: the first one is the improvement in the general credit rating of the concern, as insuring the lives of key personnel not only assures banks and other prospective lenders that the business will have a financial cushion in the event that a key person should die, but improves the liquidity of the firm through the accumulation of cash values which are available at all times. As a result, the firm will not only be able to command more credit, but will be able to obtain it on better terms.

The second way is the availability of assurance as collateral. In this respect, it may protect the lender only against loss arising out of the death of a key man or the borrower, or it may provide protection against both the unwillingness and the inability of the borrower to repay the loan.

3. Employer Welfare Plans; employer welfare plans provide three types of benefit that can be financed through the insurance mechanism; disability benefits, including income replacement and indemnification of medical, surgical, and hospital costs; death benefits; and old age benefits.

In the light of the discussion so far, it can be said that the life assurance is concerned with the economic value of a human life as well as a major sustenance to the development plans by its accumulated funds.

In this respect the researcher's view is that industrial life assurance as the kind of life assurance which is more convenient to the developing countries with their low per-capita incomes.

2.5 Industrial Life Assurance

Industrial assurance is defined (Industrial Assurance Act, 1923 1(2)) as assurance effected on human life, premiums in respect of which are received by means of collectors, and are payable at intervals of less than two months (Allaway, G.W.E., 1954, P2).

In other words, it can be said that the industrial assurance consists of the granting of life policies for small amounts, the premiums for which are payable at weekly or monthly intervals and are collected by means of collectors regularly at the homes of the policyholders (New, L.J., P97).

The following are the general characteristics of the industrial assurance (McGill, D. 1967, PP 711-713), the first one is the frequency of premium payment which may be paid weekly or monthly.

The second is the limitation on the amount of insurance per policy or per life.

The third is the collection of the premium by the company's representative at the policy-holder's home or place of business.

The fourth is that the insurance is normally sold in premium units, rather than units of insurance.

The fifth is that it is generally written on all members of the family from birth to sixty-five or seventy years of age. The final one is the general omission of medical examinations.

2.6 Origin and Development

Industrial life assurance originated in Great Britain in the nineteenth century. The term "industrial" was used to identify weekly premium insurance because these policies were intended to be sold to workers in industry. Throughout the seventeenth and eighteenth centuries there had been a spectacular growth of local associations known as Friendly Societies and Burial Clubs, which undertook through a system of mutual aid to relieve the worker from financial hardships imposed by sickness and death.

In 1853, a committee of the House of Commons investigated the financial structure of the Friendly Societies and Burial Clubs, and its report called attention to the defects of these societies and to the need for making dependable life assurance available to the lower income groups. Largely, as a result of this report, the Prudential Assurance Company of London issued the first industrial policy on November 13, 1854, and the first claim was paid on January 4, 1855. The company applied the principles of ordinary assurance, in that the premiums were varied by age of issue and were computed on a level premium basis. It followed the precedent of the Friendly Society, however, in the administration of premium payments. Premiums were payable weekly and were collected by company representatives calling at the home of policy-holders. This was the beginning of industrial life assurance as it is known today (McGill, D.1967, PP 713-716).

2.7 Industrial Life Assurance in Egypt

The modern insurance in Egypt was not known until the second half of the nineteenth century when Italian and English companies started to transact insurance business as a service to their subjects living in Egypt.

At that time some difficulties affected the insurance market. These can be summarised as follows:

1. As an act of patriotism Egyptians refused to deal with the foreign companies.
2. The local per-capita income was too small.
3. Some Egyptians looked to insurance as an act against the Islamic Religion.

The first Egyptian company was established in 1900. The number increased to 11 Egyptian companies compared with 113 foreign ones in 1956.

In 1961, the Government nationalised all the insurance companies. Moreover, the Government amalgamated all the insurance companies into three companies to deal with all kinds of insurance, and one company for re-insurance.

In 1965, industrial assurance took an active part in the Egyptian market. It can be said that in this year we witnessed the real appearance of this kind of assurance in Egypt.

In view of the characteristics of the industrial assurance mentioned previously the researcher's view is that industrial assurance is the most suitable form of life assurance, due to the special characteristics of the Egyptian market.

Egypt is a developing country, the per-capita income is too small, and the capacity of the individual to save is very limited, this is why the industrial assurance, with its small weekly (monthly) premiums is suitable to Egypt.

Nevertheless, the fact remains that industrial assurance forms only a small proportion of life assurance in force in Egypt, which can be seen from the following figures collected at 31 December 1976:

	Sums assured in force per thousand E.£
All life assurance	310385
Industrial assurance amount	39198
Per cent	12.6

Source: Statistical Yearbook on the Egyptian Insurance Market 1976

The reasons for these low figures and the lack of success in this kind of life assurance lies in:

1. Lack of insurance knowledge among the Egyptians in general, and the working class in particular whom this industrial assurance is designed to help most.
2. The per-capita income is low in Egypt, therefore the ability of working people to buy industrial assurance is small.

Moreover, the prices of life assurance in Egypt are high. For instance, the price for a term policy to a person aged 30 years, for a period of 10 years, and the sum assured £1000: is £1.75 in a company of U.K., whilst

about £12.6 in an Egyptian company, which will justify the reason mentioned.

3. Most of the working class are satisfied with the benefits of social insurance, but it is a fact that there are some categories, for example, agricultural workers which have no protection from social insurance.
4. The issue of the legitimacy of life assurance in Islamic Religion. Without any doubt this has affected the life assurance market in Egypt.
5. Most of the industrial policies have many aspects which make them too difficult to understand, particularly among the working class, owing to their lack of insurance knowledge.
6. The wrong method used to market industrial assurance, which can be called "The semi-compulsory method" and which leads to many lapses.

2.8 Evaluation of Industrial Assurance Policies in Egypt

We can summarise the situation as follows:

1. The bases:
All the industrial assurance policies take an endowment form.
2. The advantages:
 - a) The sum assured will be paid at the end of the contract.
 - b) The sum assured will be paid when the insured dies.

- c) Payment of large sums if the insured dies by an accident.
- d) Payment of the policy cash value after a fixed period from the beginning of the contract.
- 3. The insured:
The insured may be one person, couple or family.
- 4. Medical examination:
All policies are issued without medical examination up to a fixed sum assured.
- 5. The bounds of sum assured:
Extends from 50 (E.£) to 1000 E.£.
- 6. Maximum age:
The policies are issued for people up to 65 years old.

If we consider the characteristics of industrial assurance mentioned previously and the conditions and advantages of industrial assurance in Egypt, it can be said that industrial assurance in Egypt is nearer to ordinary life assurance than a strict definition of industrial life assurance.

The two following reasons may support my view:

- 1. Industrial assurance was created to give insurance protection to workers at suitable prices. In fact the Egyptian prices are high. Moreover, a policy with a sum assured to 1000 E.£., is hardly an industrial insurance policy as commonly understood in Europe.

2. Most of the policies have complicated terms, which must be difficult for the working class to understand.

Therefore this research will design an ideal industrial policy, based on the Egyptian mortality rates and reasonable interest and loading rates. It will also take into account the lack of insurance knowledge amongst the Egyptian people.

CHAPTER THREE

THE MORTALITY RATES OF EGYPT

3.1 Introduction

Life assurance contracts are usually of a long duration and whilst this can also apply to other financial contracts it is the element of mortality that distinguishes contracts of life assurance from the other. While it was considered in the early days that the mortality element was uncertain, this was overcome with a whole range of mortality tables and the continuing flow of new data from which such trends may be deduced (H. Fisher & J. Young, 1971, P105).

3.2 Factors Affecting Mortality Rates

These factors can be described as follows:

a) Age

There is a relationship between the rate of mortality and age, and the following table (3.1) may be useful to explain this relationship.

As can be seen, once the new born infant has survived the hazard of the first few days of life, mortality falls rapidly, and during childhood the risk is very small. In adolescence the impact and strain of industrial life brings a rise in mortality. These and other factors lead to a continuing increase in risk of death as age advances. At later ages the wearing out of the human frame rather than inimical qualities of the environment becomes the dominant cause of mortality (B. Benjamin & H. Haycocks, 1970, P6).

Table (3.1)

England and Wales Rates of
Mortality per 1000 (1965)

Age group	Males	Females
0-	21.48	16.39
1-4	0.87	0.76
5-9	0.48	0.31
10-14	0.42	0.29
15-19	1.00	0.40
20-24	1.05	0.45
25-34	1.07	0.68
35-44	2.48	1.79
45-54	7.36	4.36
55-64	21.40	10.30
65-74	53.00	28.30
75-84	118.40	79.20
85 and over	242.40	197.10

Source: B. Benjamin & H. Haycocks, 1970.

Generally speaking, the curves of mortality rates take the form of J-shaped curves with rates maintained at insignificant levels until advanced ages where there would be a sudden upward rise.

b) Sex

It is well known that sex affects the rates of mortality, and that each sex has its own set of rates. As can be seen from the previous table, the death rates for females are lower than those for males at all ages.

We may say too that, in most countries we find males with mortality rates higher than females, and an explanation may be given for this in medical terms as follows (B. Benjamin & H. Haycocks, 1970, P8):

1. In infancy and early childhood, boys are generally more vulnerable to some birth hazards, to infection, and to injuries, these being the principle causes of death at these ages.
2. In early and middle adult life the principal causes of death are accidents and violence, tuberculosis, heart disease and cancer and the death rates are higher in men.
3. At more advanced ages the process of physical deterioration and the lessening resistance to disease associated with general wear and tear appear to proceed faster in men.

Meanwhile, in the less developed countries, the curve of variation of mortality with age is U-shaped, with high infant mortality and relatively high mortality

in childhood, causing a slower fall in the left-hand side of the curve than in developed countries, and generally a heavier adult mortality causing an earlier and slower rise in the right-hand side of the curve. Lack of good registration data in the less developed countries makes it impossible to make wide-ranging comparisons of the age patterns of mortality. It is clear, however, that in less developed countries the mortality differentials between the two sexes are less regular. Though the mortality of males is, overall, usually higher, there are numerous examples of particular age-groups where the mortality of males is lower than that of females. Life expectancy at birth is higher for males in India and Pakistan, and was so until 1967 in Sri-Lanka (B. Benjamin, 1974, P11).

c) Marital Status

Marital status has a direct influence on mortality for both sexes, for instance, a married woman will have some influence on her longevity (Anderson J. & Dow, 1964, P250). On the one hand she will in general enjoy a more natural and regular life and a more protected life than a spinster; on the other hand, she will be exposed to risk of child-birth (though this mortality risk is now much diminished).

Generally, the marital condition is related to the mortality for certain causes - arising partly from the selective force of marriage itself, and also because the contentment and happiness of married life (as well as the protection and discipline) are favourable to well-being and partly (in specific causes for women) from sexual

expression, pregnancy and childbirth. For example, it has long been known that carcinoma of the breast, corpus uteri and ovary is commoner among single women while carcinoma of the cervix uteri is commoner among married women and those that have been married.

As proof of the selective force of marriage it should be noted that married women's mortality is generally lighter than that of single women (except in advanced ages) and that an exceptional rise in marriage rates as after World War II, with many "marginal" marriages of spinsters who would not normally marry, tends to increase the mortality of married women as a whole (Benjamin, B., 1965, P42).

d) Environment

It is a matter of common knowledge that country life is in general more healthy than life in the towns. King tried to obtain a measure of this influence by investigating separately the mortality of the county boroughs, urban districts and rural districts and of the county of London. For both sexes, the rural districts showed the lightest mortality in nearly all age groups, while the county boroughs or the county of London usually showed the heaviest mortality (Anderson, J., & Dow, , 1964, P251).

e) Geographical District

Sub-divisions on these lines were first made by Watson in his investigation of the 1921 Census Data (Anderson, J., & Dow, 1964, P251). He chose eleven districts, and the mortality of each district was

investigated separately for county boroughs, urban districts and rural districts and, of course, for each sex separately, so that a considerable number of classes were segregated. The results showed a considerable degree of difference in the mortality rates experienced by the various districts.

On the narrower question of geographical or regional variations in mortality within the national boundaries, the following exercise may provide a warning against taking such variations too much at face value. In England and Wales it has been shown (General Register Office, 1955, No.22) that "levels of mortality (standardised for sex and age) tend to arrange themselves into three broad bands that run across the country from south west to north east. The highest levels of mortality are found in most of Wales and in the northern counties of England. Counties with intermediate levels of mortality, both in their urban and rural components are distributed in a line running from Cornwall north-westwards through the Midlands and on towards the Humber and the Wash. The third area, of low mortality, starts on the south coast of Dorset and likewise runs north-west to include the home counties and counties on towards East Anglia". It might be thought that this mortality gradient is a purely geographical or climatic variation. Analysis soon shows that the social and economic factors are probably more important (Benjamin, B., 1965, P44).

f) Social and Economic Factors

Social, economic and cultural factors are as important in influencing differentials as the more

commonly measured factors of age and sex and marital conditions.

In general, it may be said that the standard of living, nutrition, occupation, urbanisation, housing, climate, education and culture are all part of the social and economic factors affecting mortality (Benjamin & Haycocks, 1970, P351).

3.3 Definition of the Mortality Rate

The rate of mortality may be defined in various ways, such as that rate of mortality at a specified age is the ratio of the number of persons in a particular population dying within one year from the attainment of that age to the number who were under observation for one year from attainment of that age or until death, if occurring within the year (Elderton, W. & Sherlock, E. 1959, P2).

We may define this rate in other words as follows (Anderson & Dow, 1964, P9):

If θ_x deaths occur between exact age x and $x+1$ among a group of P_x lives of exact age x who remain under observation until the attainment of exact age $x+1$ or who would have so remained if they had not passed out of observation by death previously, then the annual rate of mortality experienced by these lives at exact age x is

$$q_x = \frac{\theta_x}{P_x}$$

The condition that all the lives remain under observation until age $x+1$ is of particular importance. If some of these lives were observed only until age $x+t$

(where $t < 1$), we could not tell whether any deaths among them occurred between age $x+t$ and $x+1$. This condition expresses a fundamental principle, namely that we must not include in P_x any lives among whom deaths may have occurred without our knowledge, nor in θ_x deaths occurring among lives who were not included in P_x . The deaths included in θ_x and the lives included in P_x must correspond exactly.

3.4 The Life Table

When values of graduated q_x have been obtained over the available range of ages, the life table can be built up by starting with any suitable radix and applying successively the relations:

$$d_x = l_x \times q_x, \quad l_{x+1} = l_x - d_x$$

The process used to obtain the graduated q_x could be summarized as follows (Anderson & Dow, 1964, P7):

- a) The scope of the investigation must be decided, i.e. the lives to be included, the period to be covered and the subdivisions of data to be made.
- b) The data must be collected, analysed and tabulated in a form suitable for calculating what are known as the crude rates of mortality q_x^0 , i.e. the rates obtained direct from the data without adjustment.
- c) The crude rates of mortality must be graduated. Once the graduation is complete, the mortality table is ready for use, either for calculation of some of the many functions involving probabilities of life and death, or of monetary functions such as premiums.

3.5 The Egyptian Mortality Rates

The life assurance premiums in Egypt are based on foreign experience, i.e. the A 1924-29 Ultimate Life Table with some modifications.

The researcher aims in this research to construct for the first time in the history of Egypt, a mortality rate based on Egyptian experience.

The use by the companies of Egyptian mortality rates will be more appropriate than using those based on foreign experience, since they relate more closely to Egyptian circumstances, which differ from the ones of other experiences.

Moreover, the A 1924-29 U. which was derived from the experience of assured lives during this period is today out-of-date, and does not fulfil the needs of the companies from such a table.

3.6 The Period of Investigation

The first task in constructing the mortality rates is to select the period of investigation. In this respect, the period chosen by the researcher is four years, from 1-7-1972 to 30-6-1976, and the reasons behind this choice are:

First, industrial life assurance started to play an active role in Egypt from 1965 onwards, and the four year period chosen for this research as a period of investigation may be considered an up-to-date period.

Second, in 1967 the conflict between the Arabs and Israel ended with the Six Day War. The Arabs started from that time an Attrition War which extended till 1970.

All these events resulted in high deaths for the Egyptians, and compelled the researcher to exclude this period from the investigation.

On the other hand, although the 1973 War was included in the period of investigation chosen, the researcher has excluded from θ_x all deaths caused by this war, moreover no comparison can be made between the deaths in both wars, due to the fact that the Six Day War deaths were much higher.

3.7 The Unit of Investigation

There are four different units which have been suggested for investigation of life office mortality (Anderson & Dow, 1964, P152):

- a) Lives. Each life assured is included in the investigation once only, i.e. one unit is included in the exposed to risk for each full year during which the life is under observation, and one unit in θ_x in the year of death. Clearly this method gives a true rate of mortality.
- b) Policies. Each policy contributes one unit to the exposed to risk for each full year that it is in force, and one unit to θ_x in the year of death. A life who is assured under more than one policy is therefore included more than once in the exposed to risk at the appropriate ages, and similarly at the age of death. By this method we obtain a rate of discontinuance of policies by death instead of a rate of mortality.

- c) Sums Assured. Each policy contributes to the exposed to risk for each full year that it is in force, and to θ_x at the age of death a number of units equal to the sum assured. This gives us a rate of claim or rate of payment of unit sum assured by death.
- d) Sums at Risk. Each policy contributes to the exposed to risk, and to the deaths a number of units equal to the sum at risk, i.e. the difference between the sum assured and the reserve value, sometimes called the death strain. This gives what we may call a rate of strain.

In view of data available in Egypt, the units of investigation are both of policies and sums assured.

In fact, there are wide discussions about using policies as a unit of investigation. In this respect, there are two cases to be considered (Anderson & Dow, 1964, P153):

1. Two or more policies effected simultaneously.
Clearly, there is no theoretical advantage in using policies instead of lives as the unit in this case. It is quite a simple matter to eliminate simultaneous duplicates effected with the same office and this is usually done. It is more troublesome to eliminate the duplicates if two or more policies are effected simultaneously with different offices.
2. Two or more policies effected at different times.
The generally accepted view in this matter is that,

as the ultimate table is a combination of a series of select tables, the data should be a combination of the data which would be used if the selected tables were extended indefinitely, i.e. a unit should be included for each policy, except where two or more were effected at the same time.

There is, however, an overriding practical point that the exclusion of duplicates would be a complication in data collection that would not be acceptable unless there was a strong justification for it. The inclusion of duplicate lives in insurance data increases the sampling variance of the rates. This strengthens the need for graduation, the purpose of which is to remove this variance (Benjamin & Haycocks, 1970, P65).

The argument in favour of using the sum assured as the unit is that mortality rates depend on the size of the policy and that, in particular, lives holding very large policies experience on the average heavier mortality than assured lives as a whole. Evidence in favour of the last statement has been adduced in America.

Generally, if mortality depends on the sum assured to an appreciable extent, separate tables should be constructed for different ranges of sums assured, otherwise the rates of mortality would only be applicable to an office having a similar distribution of sums assured to that of the whole experience, whereas in actual fact the distribution differs very considerably between one office and another (Anderson & Dow, 1964, P154).

3.8 The Data Collected

In 1961, the Egyptian Government nationalized the insurance industry and amalgamated all the insurance companies into three to deal with all kinds of insurance, and one company for re-insurance.

The data had been collected from all these companies who are dealing with industrial life insurance concerned with the period of investigation (1-7-1972 to 30-6-1976).

The ages at which the policies in force are tabulated are intended to be the nearest ages on 31 December, and deaths too are recorded to the nearest age at death.

This data is distributed through separate ages from the age of 10 to the age of 65.

In the meantime the data concerning deaths had been collected following these guide lines (C.M.I.R. No1):

No policies should be included in the return of deaths unless at the time of death it would have qualified for inclusion in the 'in force'. Equally, no policy becoming a death claim should be omitted from the deaths if at the time of death it was qualified for inclusion in the 'in force' unless it should belong to one of the excluded categories of death claim such as:

1. Deaths from suicide when the sum assured is not paid.
2. Deaths from any cause excluded from cover by the terms of the policy, where the sum assured is not paid.

3. Deaths from war when the sum assured is not paid.
4. Death claims repudiated by reason of non-disclosure of essential information on the proposal form.
5. Deaths occurring after the policy has been removed from the 'in force' register as a lapse - whether a claim payment is made or not.

The assured lives experience was not sub-divided into sections according to whether the policies were whole life or endowment assurance, whether they were with or without profits, and whether they were effected with or without medical examination. The reason for this is that the industrial life assurance in Egypt is an endowment, without profit and without medical examination.

The researcher regrets that he could not find any analysed data to construct the selected mortality rates for Egypt. Meanwhile, he hopes that data will be available in the future to construct these rates.

3.9 The Formulae Used

From the point of view of practical convenience, the census method will be used (Markan, 1969, P115).

We can explain the theory of the census method as follows (Anderson & Dow, 1964, P87):

For example, in the case where P_{x+t} is the number of lives attaining exact age $x+t$ during the period of investigation, $P_{x+t}\Delta t$ represents the total length of the period of exposure falling between exact ages $x+t$

and $x+t + \Delta t$ at all points of time within the limits of the investigation. The integration gives the sum of these totals for all ages between x and $x+1$. Clearly we shall obtain the same result if we reverse the processes of summation, i.e. if we sum the periods of exposure between ages x and $x+1$ separately for each point of time and take the total of these summations.

If, therefore, the experience covers n years and sP_x is the number of lives aged between x and $x+1$ at a point of time s years from the beginning of the investigation period, we have

$$E_x^c = \int_0^n {}^sP_x ds. \quad (3.1)$$

where n is the time length of the period of investigation. Assuming that sP_x is approximately linear over unit time intervals

$$E_x^c = \frac{1}{2} {}^0P_x + \sum_{s=1}^{n-1} {}^sP_x + \frac{1}{2} {}^nP_x \quad (3.2)$$

where $E_x = E_x^c + \frac{1}{2}\theta_x$

The rate of mortality at exact age x is then given by

the expression $\frac{\theta_x}{E_x}$, where θ_x is the number of deaths between exact ages x and $x+1$ during the period of investigation.

Since sP_x is the number of lives who would have been recorded at age x last birthday if a census had been taken at time s , this method is generally known as the census method.

At the same time, if sP_x is the number of lives who would have been recorded at nearest age at census if a census had been taken at time s , and θ_x is the number of deaths recorded at nearest age at death, we have

$${}^oq_{(x)} = \frac{\theta_{(x)}}{E_{(x)}} = {}^oq_{x-\frac{1}{2}} \quad (3.3)$$

3.10 The Crude Mortality Rates

By using the census method

$${}^oq_{(x)} = \frac{\theta_{(x)}}{E_{(x)}^c + \frac{1}{2} \theta_{(x)}} = {}^oq_{x-\frac{1}{2}} \quad (3.4)$$

where:

$\theta_{(x)}$ the actual deaths between 1.7.72 and 30.6.76

$$E_x^c = P_{31.12.72} + P_{31.12.73} + P_{31.12.74} + P_{31.12.75}.$$

Grouping the data in quinary age groups, tables (3.2) and (3.3) show the crude mortality rates of Egypt based on policies and sums assured successively.

Table (3.2)
The Crude Mortality Rates of Egypt
(Policies)

Age group (nearest age)	Exposed to risk	Deaths	$q_{x-\frac{1}{2}}$
11-15	37342.5	27	0.000723
16-20	26708	28	0.001048
21-25	29508	40	0.001356
26-30	49086.5	69	0.001406
31-35	329393	466	0.001415
36-40	322633	644	0.001996
41-45	284706.5	847	0.002975
46-50	148856	728	0.004891
51-55	58648.5	481	0.008201
56-60	18996	262	0.013792
61-65	2791	64	0.022931
All ages	1308669	3656	0.002794

Table (3.3)

The Crude Mortality Rates of Egypt
(Sums Assured)

Age group (nearest age)	Exposed to risk	Deaths	$q_{x-\frac{1}{2}}$
11-15	5713131	4150	0.000726
16-20	3726524	4080	0.001095
21-25	4157310	5744	0.001382
26-30	7851767	11240	0.001431
31-35	34016808	48898	0.001437
36-40	34477834	72054	0.002090
41-45	27757959	86028	0.003099
46-50	15412222	77716	0.005042
51-55	5885404	49234	0.008365
56-60	1734099	24702	0.014245
61-65	205073	4812	0.023465
All ages	140938131	388658	0.002758

From tables (3.2) and (3.3), we can see that the crude mortality rates based on policies are close to those based on sums assured. In the meantime, the crude mortality rates based on sums assured are a little higher for all age groups than the ones based on the policies.

The ratio of ${}^o q_x$ based on policies to ${}^o q_x$ based on sums assured is a little higher for age groups up to 40 than the age groups above 40. The following table (3.4) shows this matter:

Table (3.4): Ratio of Crude Mortality Rates Based on Policies to those Based on Sum Assured

Age group (nearest age)	${}^o q_{x-\frac{1}{2}}$		Ratio 1/2
	Policies(1)	Sums Assured(2)	%
11-40	0.001603	0.001625	98.6
41-65	0.004634	0.004755	97.4

In view of this result we may say that the difference between the sets of crude mortality rates is more marked in the older ages.

3.11 Comparison of Actual and Expected Deaths by the A 24-29 U

The standard table of mortality used in Egypt at the present time for life assurance calculation is the A 1924-29 U. table, which was derived from the experience of assured lives during the period 1924-29.

The tables (3.5) and (3.6) show the comparison of actual and expected deaths by 1924 - 29 U. for both policies and sums assured successively.

Table (3.5)
Comparison of Actual and Expected Deaths
by the A 24-29 U. Table (Policies)

Age group	Actual deaths	Expected deaths	100 A/E
10½-14½	27	67.59	39.9
15½-19½	28	60.89	45.9
20½-24½	40	69.34	57.6
25½-29½	69	115.59	59.6
30½-34½	466	848.18	54.9
35½-39½	644	1066.30	60.3
40½-44½	847	1288.29	65.7
45½-49½	728	934.07	77.9
50½-54½	481	555.98	86.5
55½-59½	262	290.44	90.2
60½-64½	64	70.12	91.2
All ages	3656	5366.79	68.1

Table (3.6)

Comparison of Actual and Expected Deaths
by the A 24-29 U. Table (Sums Assured)

Age group	Actual deaths	Expected deaths	100 A/E
10½-14½	4150	10340.76	40.1
15½-19½	4080	8496.47	48.0
20½-24½	5744	9769.67	58.7
25½-29½	11240	18490.91	60.7
30½-34½	48898	87593.28	55.8
35½-39½	72054	113949.24	63.2
40½-44½	86028	125604.76	68.4
45½-49½	77716	96711.69	80.3
50½-54½	49234	55793.62	88.2
55½-59½	24702	26514.37	93.1
60½-64½	4812	5152.45	93.3
All ages	388658	558417.22	69.6

From these tables, it may be said that a very substantial reduction in mortality rates has taken place, the greatest proportionate reduction in mortality has occurred at the younger ages. Meanwhile, the percentages of A/E based on sums assured are somewhat higher than those based on policies.

We can summarize the above result in the following table (3.7):

Table (3.7)
The Percentages of Actual Deaths and
the Expected Deaths for Both Policies
and Sums Assured

Age group	100 A/E	
	Policies	Sums Assured
10½-39½	57.1	58.7
40½-64½	75.8	78.2
All ages	68.1	69.6

From the previous table, we can see how much we do need to construct a mortality rate based on our present experience.

3.12 Graduation

The problem of graduation arises in connection with the construction of mortality tables because a series of observed mortality rates will be found to contain irregularities which we have reason to believe are not a feature of the true, underlying rates of mortality (Miller, Morton D. 1946, P1).

In the course of time the term 'graduation' has been both extended and narrowed in its application,

according to the particular interest of different writers. Our concern is mainly with the principles and methods of adjusting a set of observed rates to provide a suitable basis for actuarial calculation (Benjamin & Haycocks, 1970, P181).

Generally, there are three types of graduation processes (Benjamin & Haycocks, 1970, P33):

1. The graphical method in which a hypothetical curve is drawn, by inspection, through the area bounded by the confidence intervals. There is clearly, and may rightly be an element of subjective judgement. Use is made of experience as to what a curve of death rates should look like.
2. Finite difference methods which depend on the principle that the standard error of the weighted mean of two or more independent (or imperfectly correlated) random errors is less than the sum of the corresponding process of moving averages employed extensively in time series analysis.
3. Curve-fitting methods which are based on the assumption that the underlying values have a particular mathematical form, the parameters of which may be estimated from the observed values.

3.13 Graduation by Reference to a Standard Table

Where the data are scanty, but are known to come from an experience similar to that for which a standard

(graduated) table already exists, it may be possible to use this standard table as a 'base curve' for graduating the new data (Benjamin & Haycocks, 1970, P308).

This method of graduation depends on establishing a relationship between q'_x (the rate derived from the data) and q_x (the rate is obtained from the standard table).

The simplest formulae which might be used:

$$q'_x = a q_x + b \text{ (if } b=0 \text{ this becomes } q'_x/q_x = \text{constant}).$$

For obtaining the constants a and b :

if we assume for every age that $q'_x = a q_x + b$, it follows that

$$\left. \begin{aligned} E_x q'_x &= a E_x q_x + b E_x \\ \left[\begin{aligned} E_x q'_x &= a [E_x q_x + b] E_x \\ \text{and } \sum^2 E_x q'_x &= a \sum^2 E_x q_x + b \sum^2 E_x \end{aligned} \right\} \end{aligned} \right\} \quad (3.5)$$

$E_x q'_x$ is merely the actual deaths observed at age x , while $E_x q_x$ is the expected deaths according to the standard table.

When the data are grouped and E_x is not available for individual ages the expected deaths are usually calculated by using q_x for the central age of the group. The slight error thus introduced is not a serious matter when the data are scanty and sampling errors are therefore considerable (Benjamin & Haycocks, 1970, P309).

The above method of graduation which is particularly valuable when the data are scanty will be used to graduate the Egyptian mortality rates.

Meanwhile, we can consider the A 1924-29 Ultimate as a reasonable standard table, since it has been used already in Egypt.

By using the above mentioned method, we can say that:

$$q'_x \text{ (graduated)} = a q_x \text{ (the A 24-29 U)} + b$$

where a and b are constants.

So, by using the equation (3.5) we can obtain a and b as follows (Appendix 1):

$$q'_x \text{ (graduated)} = 0.937158 q_x \text{ (A 24-29 U.)} \\ - 0.001049 \text{ (Policies)}$$

$$q'_x \text{ (graduated)} = 0.960755 q_x \text{ (A 24-29 U.)} \\ - 0.001049 \text{ (Sums Assured)}$$

Tables (3.8) and (3.9) show the graduated mortality rates of Egypt based on policies and sums assured successively.

Table (3.8)
 Graduated Mortality Rates (Policies)

Age	q_x	Age	q_x
10	0.000412	30	0.001209
11	0.000506	31	0.001256
12	0.000600	32	0.001322
13	0.000694	33	0.001406
14	0.000787	34	0.001509
15	0.000881	35	0.001631
16	0.000975	36	0.001781
17	0.001059	37	0.001949
18	0.001115	38	0.002146
19	0.001143	39	0.002362
20	0.001153	40	0.002587
21	0.001153	41	0.002821
22	0.001153	42	0.003065
23	0.001153	43	0.003318
24	0.001153	44	0.003589
25	0.001153	45	0.003889
26	0.001153	46	0.004227
27	0.001153	47	0.004611
28	0.001162	48	0.005051
29	0.001181	49	0.005548

Table (3.8)
Continued

Age	q_x
50	0.006110
51	0.006738
52	0.007441
53	0.008228
54	0.009109
55	0.010103
56	0.011237
57	0.012539
58	0.014020
59	0.015660
60	0.017441
61	0.019343
62	0.021386
63	0.023607
64	0.026062

Table (3.9)

Graduated Mortality Rates (Sums Assured)

Age	q_x	Age	q_x
10	0.000449	30	0.001266
11	0.000545	31	0.001314
12	0.000641	32	0.001381
13	0.000738	33	0.001468
14	0.000834	34	0.001573
15	0.000930	35	0.001698
16	0.001026	36	0.001852
17	0.001112	37	0.002025
18	0.001170	38	0.002227
19	0.001199	39	0.002448
20	0.001208	40	0.002678
21	0.001208	41	0.002918
22	0.001208	42	0.003168
23	0.001208	43	0.003428
24	0.001208	44	0.003706
25	0.001208	45	0.004014
26	0.001208	46	0.004360
27	0.001208	47	0.004753
28	0.001218	48	0.005205
29	0.001237	49	0.005714

Table (3.9)

Continued

Age	q_x
50	0.006291
51	0.006934
52	0.007655
53	0.008462
54	0.009365
55	0.010383
56	0.011546
57	0.012881
58	0.014399
59	0.016081
60	0.017906
61	0.019857
62	0.021951
63	0.024228
64	0.026745

3.14 Test of Graduation

Once the graduation has been made, the task is not completed because the graduation must be tested as to its acceptability.

We can consider the tests of graduation under the following two measurements:

a) Test of smoothness

We will not discuss the tests of smoothness since, the graduation has been made by reference to a standard table (A 24-29) which is smooth, the results are satisfactory as far smoothness is concerned.

b) Tests for Adherence to Data

The tests for adherence to data, may be summarized as follows (Benjamin & Haycocks, 1970, P199):

1. The smallness of the individual values of the totals in the columns showing the deviations $\sum(A-E)$ and the accumulated deviation $\sum \sum(A-E)$. The smallness of the deviations and accumulated deviations are necessary for a good graduation; each of them may be very small indeed without giving any indication that the adherence to sample data is too close. The test can give evidence of departure from the data but it gives insufficient undergraduation (i.e. the graduation is too close to the facts).
2. The number of changes of sign of the deviation and the accumulated deviations. It is difficult to say how many changes of sign are to be expected or how many are to be regarded as satisfactory.

The problem often arises of how far the number of changes can differ from the number of non-changes before we may regard the graduation as suspect.

3. Comparison of each deviation with the standard error, both age by age and in suitable age-groups. In this respect, we can say that the deviation should not exceed twice the standard error ($\sqrt{E_X q_X P_X}$), or at any rate, three times the standard error.

The deviations should bear reasonable ratios to the standard errors, although here again small ratios are insufficient evidence of undergraduation.

4. Comparison of each deviation with its approximate probable error. We may take the probable error as roughly $\frac{2}{3}$ (standard error) and from the definition of probable error we should expect roughly half the observed deviations to fall short of this value and the rest to exceed it.

In theory this test reveals undergraduation as well as overgraduation (i.e. distortion), but it is rather insensitive.

5. Comparison of the total of the deviations, irrespective of sign, with four-fifths of the total of the standard error.

Evidence of undergraduation is obtained in this case more reliably than by (4), but the mere addition of deviation irrespective of sign is not satisfactory.

What is required is a means of finding a combined probability that the observed deviations as a set, would arise from random sampling. One such means is the χ^2 test.

3.15 χ^2 Test

To combine deviations by straightforward addition is clearly unsatisfactory since positive and negative items will tend to cancel out. Test (5) mentioned previously avoids this difficulty by ignoring signs. Another obvious way is to square the deviations before adding. Furthermore, before we can calculate probabilities we need to express the deviations in terms of their standard errors. It would seem logical therefore to divide each deviation by its standard error before squaring and adding, thus arriving at a function

$$\sum \frac{(\theta_x - E_x q_x)^2}{E_x P_x q_x} \quad (3.6)$$

or more generally

$$\sum \left\{ \frac{\text{actual value} - \text{expected value}}{\text{standard error}} \right\}^2$$

This function is known as χ^2 (Benjamin & Haycocks, 1970, P200).

By using χ^2 table, we accept or reject the graduation. In this respect, we can say, if the critical probability is less than 0.001 or greater than 0.999 the hypothesis (i.e. the graduation under test) would be rejected; in the first case because it

leads to too small a probability of data (i.e. the graduation is too far from the facts), and in the second instance because the data are apparently undergraduated (i.e. the graduation is too close to the facts) (Seal, H.L., 1943, P9).

In many instances the χ^2 test has tended to become the central test (Beard, R.E., 1951, P417), so that, this test will be used to examine the graduation.

Table (3.10) shows the calculation of χ^2 to test the graduation of the mortality rates based on policies.

By reference to χ^2 table (Yamane, T., 1967, P1081)

$$P (\chi^2 > 10.6475) = 40\%$$

where $f = 10$

Hence, the graduation should be considered reasonable according to the probability obtained.

To test the graduation for mortality rates based on sums assured, table (3.11) shows the calculation of χ^2 . Exposed to risk and deaths measured in units of E.£ 107, because this allows values of χ^2 to be of the right order of size.

The factor is an approximately E.£107 and the following table shows that:

Detail	E.£	Units	Factor (E.£)
Exposed to risk	140938131	1308669	107.695
Actual deaths	388658	3656	106.306

*E.£ = Egyptian pound

Table (3.10)
Calculation of χ^2 for Experience Based on Policies

Age group (1)	Exposed to risk E_x (2)	Actual deaths A (3)	Expected deaths E (4)	Deviation A-E (5)	(Standard error) ² $E_x q_x p_x$ (6)	(A-E) ² (7)	χ^2 (8) = $\frac{7}{8}$
10½-14½	37342.5	27	24.16	+ 2.84	24.14	8.06	0.3338
15½-19½	26708	28	29.03	- 1.03	28.99	1.06	0.0365
20½-24½	29508	40	34.02	+ 5.98	33.98	35.76	1.0523
25½-29½	49086.5	69	56.79	+12.21	56.72	149.08	2.6283
30½-34½	329393	466	449.29	+16.71	448.67	279.22	0.6223
35½-39½	322633	644	660.42	-16.42	659.06	269.61	0.4090
40½-44½	284706.5	847	908.49	-61.49	905.59	3781.02	4.1752
45½-49½	148856	728	719.12	+ 8.88	715.64	78.85	0.1101
50½-54½	58648.5	481	459.45	+21.55	455.85	464.40	1.0187
55½-59½	18996	262	252.25	+ 9.75	248.90	95.06	0.2372
60½-64½	2791	64	62.78	+ 1.22	61.36	1.48	0.0241
Total	1308669	3656	3655.80	+ 0.20			$\chi^2 = 10.6475$

Table (3.11)

Calculation of χ^2 for Experience Based on Sums Assured
(Exposed to risk and deaths are measured in units of E£.107)

Age group (1)	Exposed to risk E_x (2)	Actual deaths A (3)	Expected deaths E (4)	Deviation A-E (5)	(Standard error) ² (6) $E_x q_x P_x$	(A-E) ² (7)	χ^2 (8) = $\frac{7}{6}$
10½-14½	53393.74	38.78	36.78	+ 2.00	36.75	4.00	0.1088
15½-19½	34827.32	38.13	39.73	- 1.60	39.68	2.56	0.0645
20½-24½	38853.36	53.68	46.93	+ 6.75	46.87	45.56	0.9720
25½-29½	73381.00	105.04	89.01	+16.03	88.90	256.96	2.8904
30½-34½	317914.09	456.99	452.70	+ 4.29	452.05	18.40	0.0407
35½-39½	322222.74	673.40	685.04	-11.64	683.58	135.48	0.1981
40½-44½	259420.17	804.00	855.56	-51.56	852.73	2658.43	3.1175
45½-49½	144039.45	726.31	717.17	+ 9.14	713.59	83.53	0.1170
50½-54½	55003.77	460.13	443.22	+16.91	439.64	285.94	0.6503
55½-59½	16206.53	230.85	221.05	+ 9.80	218.03	96.04	0.4404
60½-64½	1916.57	44.97	44.25	+ 0.72	43.93	0.51	0.0116
Total	1317178.74	3632.28	3631.44	+ 0.84			$\chi^2 = 8.6113$

By reference to χ^2 table (Yamane, T., 1967, P1081)

$$P (\chi^2 > 8.6113) = 57\%$$

where $f = 10$

Hence, the graduation should be considered reasonable according to the probability obtained.

CHAPTER FOUR

ANALYSIS OF THE EGYPTIAN MORTALITY RATES

4.1 Introduction

The researcher concluded the previous chapter by presenting the mortality rates based on the Egyptian experience for both policies and sums assured, and in an attempt to uncover the shape of the curves for both of these rates, graphs were drawn as shown in figures (4.1) and (4.2).

From both these figures, we may say that mortality curves take the form of J-shape revealing a slow rise from the ages of 10 to 20, then it remains flat up to the age of 35 and from there it rises steadily up to the age of 45, finally starting from the age of 45 onwards a sharp rise is witnessed in these curves.

4.2 Comparison between Mortality Rates based on Policies and Sums Assured

Table (4.1) shows the ratio of mortality rates based on policies to the ones based on sums assured. For all ages the mortality rates based on sums assured are higher than the ones based on policies by varying percentages. Meanwhile, it can be said that this increase in ratio is accompanied by an increase in age as follows:

Age	Ratio %
10	91.75
30	95.49
60	97.40

Table (4.1)

Ratio of Mortality Rates Based on Policies
to the Ones Based on Sums Assured

Age	q_x		Ratio 1/2 %
	Policies (1)	Sums Assured (2)	
10	0.000412	0.000449	91.75
15	0.000881	0.000930	94.73
20	0.001153	0.001208	95.44
25	0.001153	0.001208	95.44
30	0.001209	0.001266	95.49
35	0.001631	0.001698	96.05
40	0.002587	0.002678	96.60
45	0.003889	0.004014	96.88
50	0.006110	0.006291	97.12
55	0.010103	0.010383	97.30
60	0.017441	0.017906	97.40

Figures (4.3) and (4.4) show the mortality rates for both policies and sums assured. From these figures, we can say that both of them nearly take the same shape.

4.3 Comparisons between Expected Deaths by the New Tables and The A 24-29 U.

Tables (4.2) and 4.3) show the expected deaths by the new tables (Policies and Sums Assured) and by the A 24-29 U.

In order to point out the characteristics of some of these results, a summary table is presented:

Age group	Ratio %	
	Policies	Sums Assured
10½-39½	56.24	58.10
40½-64½	76.52	78.79
All ages	68.11	69.58

It can be seen from all these data that the greatest proportionate reduction in mortality occurred at the younger ages, and to a lesser extent at the older ages.

The progress in the environment of people have effected to reduce the mortality rates between both countries, and also the long period between both tables.

The general trend of the ratio of expected deaths by the new tables to the expected deaths by the A 24-29 U. increases with the increase in age until it reaches 89.53% (policies) and 91.98% (sums assured) for the age group 60½-64½.

Table (4.2)

Ratio of Expected Deaths by New Table
(Policies) to Expected Deaths by the
A 24-29 U. Table

Age group	Expected Deaths by		100 1/2
	New Table (1)	A 24-29 U.(2)	
10½-14½	24.16	67.59	35.70
15½-19½	29.03	60.89	47.60
20½-24½	34.02	69.34	49.06
25½-29½	56.79	115.59	49.13
30½-34½	449.29	848.18	52.97
35½-39½	660.42	1066.30	61.93
40½-44½	908.49	1288.29	70.51
45½-49½	719.12	934.07	76.98
50½-54½	459.45	555.98	82.63
55½-59½	252.25	290.44	86.85
60½-64½	62.78	70.12	89.53
All ages	3655.80	5366.79	68.11

Table (4.3)

Ratio of Expected Deaths by New Table
(Sums Assured) to Expected Deaths by
the A 24-29 U. Table

Age group	Expected Deaths by		100 1/2
	New Table (1)	A 24-29 U.(2)	
10½-14½	3936.34	10340.76	38.06
15½-19½	4251.96	8496.47	50.04
20½-24½	5022.03	9769.67	51.40
25½-29½	9524.19	18490.91	51.50
30½-34½	48439.93	87593.28	55.30
35½-39½	73299.87	113949.24	64.32
40½-44½	91545.74	125604.76	72.88
45½-49½	76737.45	96711.69	79.34
50½-54½	47424.58	55793.62	85.00
55½-59½	23653.11	26514.37	89.20
60½-64½	4734.93	5152.45	91.89
All ages	388570.13	558417.22	69.58

This result may suggest that in view of the unavailability of data for ages starting from 65 and over, we can use with some confidence the rates of the A 24-29 U. for these ages. Especially when we look at the curves drawn for the new table and the A 24-29 U. as shown in figures (4.5) and (4.6), and see how close they are to each other by every increase in age, which means that in advanced ages the two curves will be closer together.

4.4 Comparison Between Expected Deaths by New Tables and the A 24-29 U. (Light)

Tables (4.4) and (4.5) show the expected deaths by new tables (policies and sums assured) and the A 24-29 U. (Light). From these tables, we see that there is some reduction in mortality at the younger and middle ages, whilst at the older ages it exceeds the A 24-29 U. (Light).

The previous result can be seen more clearly from the following summary table, and from the curves drawn for these data, shown in figures (4.7) and (4.8).

Age group	Ratio %	
	Policies	Sums Assured
10½-39½	69.02	71.22
40½-49½	90.47	93.42
50½-64½	102.54	105.09

Table (4.4)

Ratio of Expected Death by the
New Table (Policies) to Expected
Deaths by The A 24-29 U.(Light)

Age group	Expected Deaths by		100 1/2
	New Table (1)	A 24-29 U.(Light) (2)	
10½-14½	24.16	60.30	40.06
15½-19½	29.03	45.00	64.51
20½-24½	34.02	52.81	64.41
25½-29½	56.79	98.41	57.70
30½-34½	449.29	704.90	63.73
35½-39½	660.42	854.97	77.24
40½-44½	908.49	1034.90	87.78
45½-49½	719.12	765.11	93.98
50½-54½	459.45	464.20	98.97
55½-59½	252.25	234.03	107.78
60½-64½	62.78	57.06	110.02
All ages	3655.80	4371.69	83.62

Table (4.5)

Ratio of Expected Deaths by the
New Table (Sums Assured) to
Expected Deaths by The A 24-29 U. (Light)

Age group	Expected Deaths by		100 1/2
	New Table (1)	A 24-29 U.(Light) (2)	
10½-14½	3936.34	9226.70	42.66
15½-19½	4251.96	6279.19	67.71
20½-24½	5022.03	7441.58	67.48
25½-29½	9524.19	15742.79	60.49
30½-34½	48439.93	72795.96	66.54
35½-39½	73299.87	91366.26	80.22
40½-44½	91545.74	100900.18	90.72
45½-49½	76737.45	79218.82	96.86
50½-54½	47424.58	46582.97	101.80
55½-59½	23653.11	21364.09	110.71
60½-64½	4734.93	4192.71	112.93
All ages	388570.13	455111.25	85.37

Moreover, to confirm the previous results, especially for the older ages, table (4.6) shows a comparison in the expectation of life for Egypt, England and Wales. This comparison reveals how this expectation is low in Egypt, and why the above results are quite normal.

4.5 Comparison with Earlier Egyptian Experience

Unfortunately, there is no available graduated mortality rates in the insurance field based on the Egyptian experience. Apart from the crude mortality rates for both, the Social Insurance and the Government Insurance & Pensions, which were published in 1968 in the Annual Report of the General Organization for Insurance.

Tables (4.7), (4.8), (4.9) and (4.10) show the ratio of the new tables to those crude rates. From these tables, we can say that the new tables represent a light mortality rate compared with those crude mortality rates, an expected result since the experience which form the base of those rates is quite different from the experience of the new tables, and since the Social Insurance and Government Insurance & Pensions are compulsory, while the Industrial Assurance is facultative.

As a final word, while the researcher agrees with all the limitations inherited in this kind of comparison, he still sees it as useful in indicating the reliability of the new rates.

Table (4.6)
Expectation of Life for Egypt,
England and Wales

Country	Date	Expectation of Life	
		Male	Female
Egypt	1960	51.6	53.8
England & Wales	1970-72	68.9	75.1

Source: United Nations Statistical Yearbook, 1976

4.6 Conclusion

Although this is the first attempt to construct the mortality rates for Egypt based on the experience of the insurance companies, this attempt has revealed an encouraging result. Both mortality rates based on policies and sums assured represent a reduction in mortality rates compared with the A24-29 U. table which has been in use in the Egyptian market. The greatest reduction is at the younger ages which have been more effected by the changes in the environment than people of advanced ages.

Table (4.7)

Ratio of New Table (Policies) to
Crude Mortality Rates of Social
Insurance

Age	Mortality Rates		100 1/2
	New (1)	Social Insurance (2)	
20	.001153	.00200	57.65
25	.001153	.00200	57.65
30	.001209	.00210	57.57
35	.001631	.00292	55.85
40	.002587	.00458	56.48
45	.003889	.00734	52.98
50	.006110	.01039	58.80
55	.010103	.01595	63.34
60	.017441	.02754	63.32

Source: Annual Report of the General Organization
for Insurance, 1968

Table (4.8)

Ratio of New Table (Sums assured) to
Crude Mortality Rates of Social
Insurance

Age	Mortality Rates		100 1/2
	New (1)	Social Insurance (2)	
20	.001208	.00200	60.40
25	.001208	.00200	60.40
30	.001266	.00210	60.28
35	.001698	.00292	58.15
40	.002678	.00458	58.47
45	.004014	.00734	54.68
50	.006291	.01039	60.54
55	.010383	.01595	65.09
60	.017906	.02754	65.01

Source: Annual Report of the General Organization for
Insurance, 1968.

Table (4.9)

Ratio of New Table (Policies) to
Crude Mortality Rates of Government
Insurance & Pension

Age	Mortality Rates		100 1/2
	New (1)	Ins. & Pension (2)	
20	.001153	.0015	76.86
25	.001153	.0016	72.06
30	.001209	.0019	63.63
35	.001631	.0028	58.25
40	.002587	.0042	61.59
45	.003889	.0068	57.19
50	.006110	.0108	56.57
55	.010103	.0179	56.44
60	.017441	.0373	46.75

Source: Annual Report of the General Organization
for Insurance, 1968.

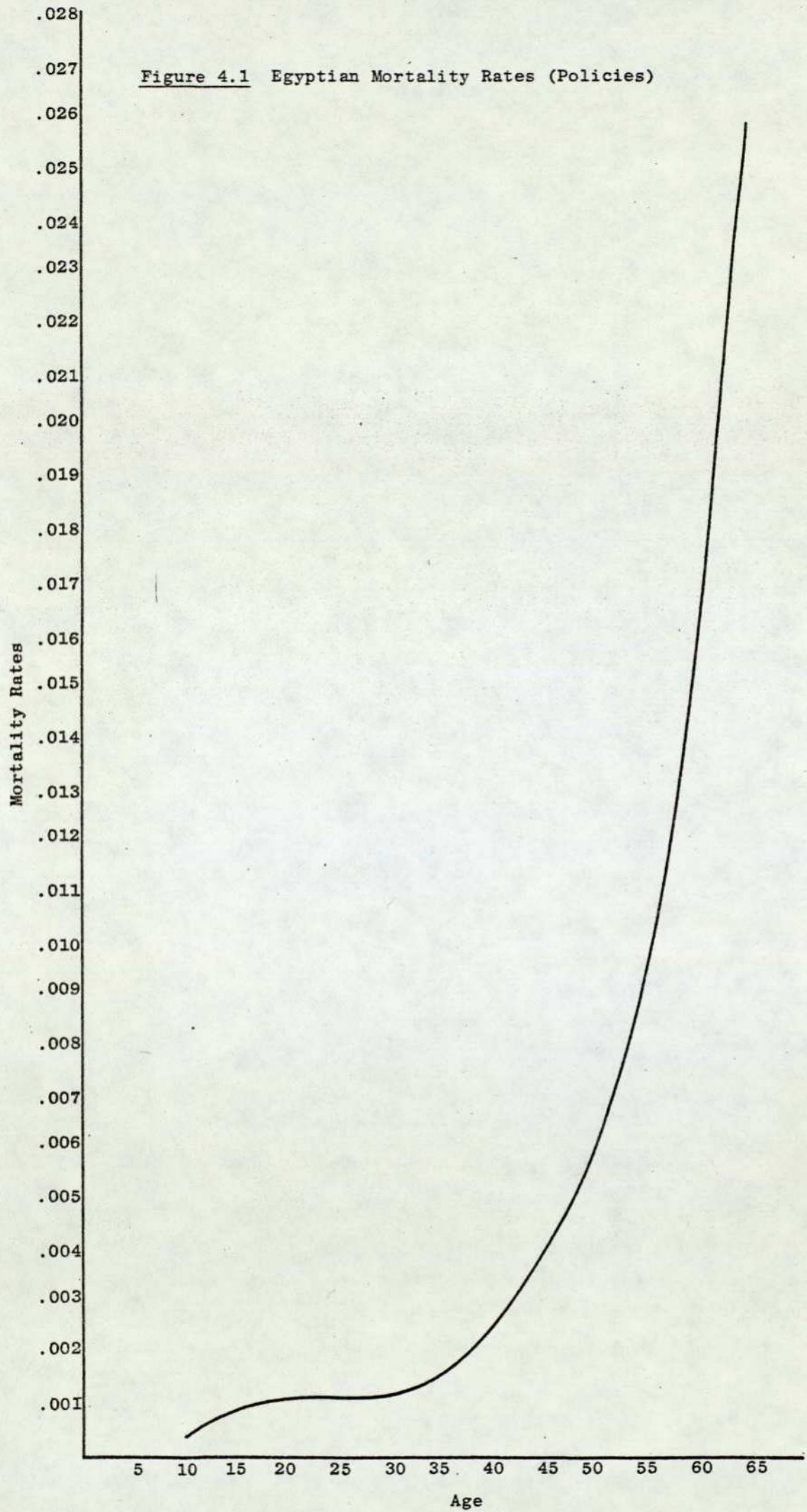
Table (4.10)

Ratio of New Table (Sums Assured) to
Crude Mortality Rates of Government
Insurance & Pension

Age	Mortality Rates		100 1/2
	New (1)	Ins. & Pension (2)	
20	.001208	.0015	80.53
25	.001208	.0016	75.50
30	.001266	.0019	66.63
35	.001698	.0028	60.64
40	.002678	.0042	63.76
45	.004014	.0068	59.02
50	.006291	.0108	58.25
55	.010383	.0179	58.00
60	.017906	.0373	48.00

Source: Annual Report of the General Organization
for Insurance, 1968.

Figure 4.1 Egyptian Mortality Rates (Policies)



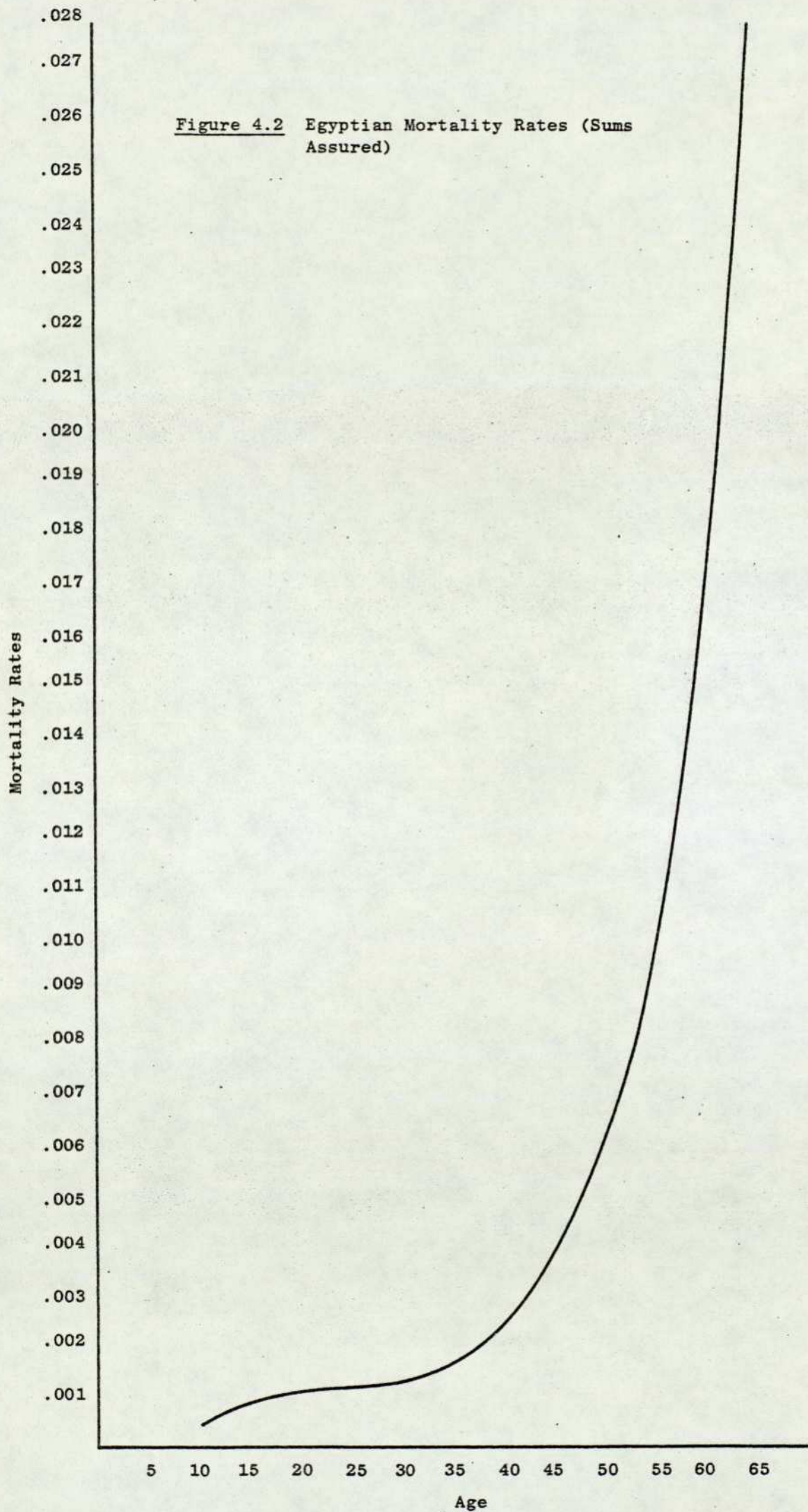


Figure 4.3 Mortality Rates Based
on Policies and Sums
Assured

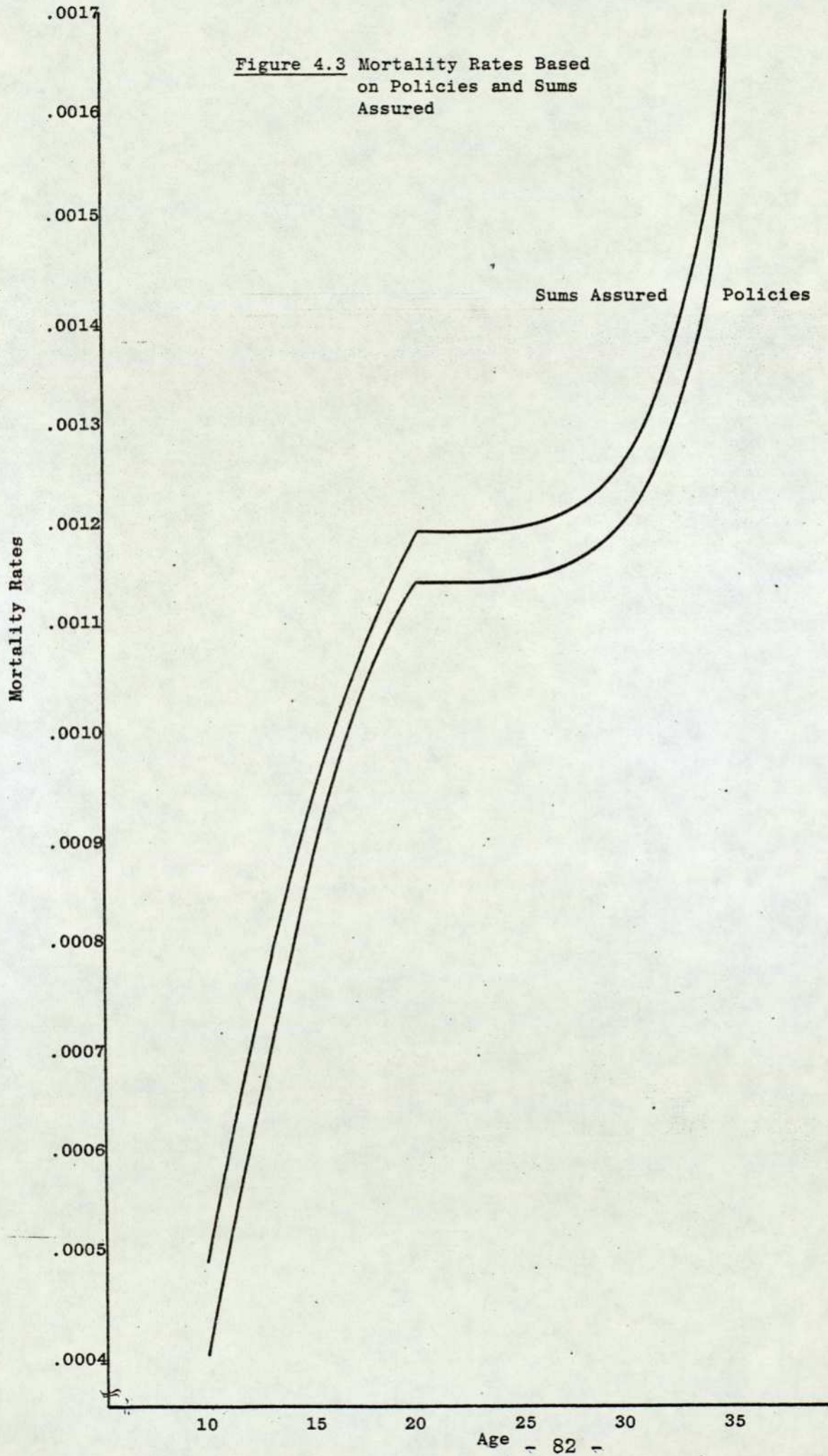


Figure 4.3 Mortality Rates Based
on Policies and Sums
Assured

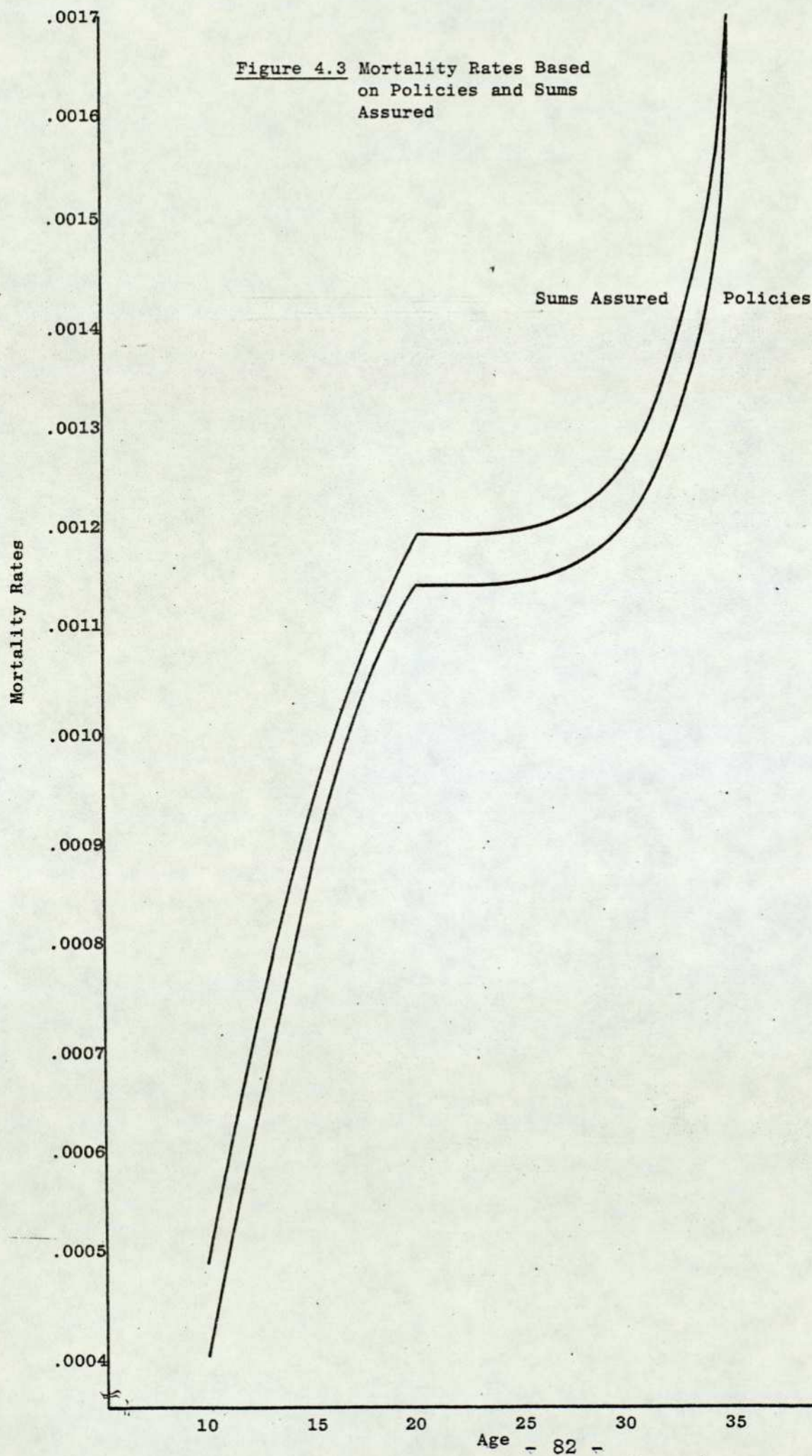


Figure 4.4 Mortality Rates Based on Policies and Sums Assured

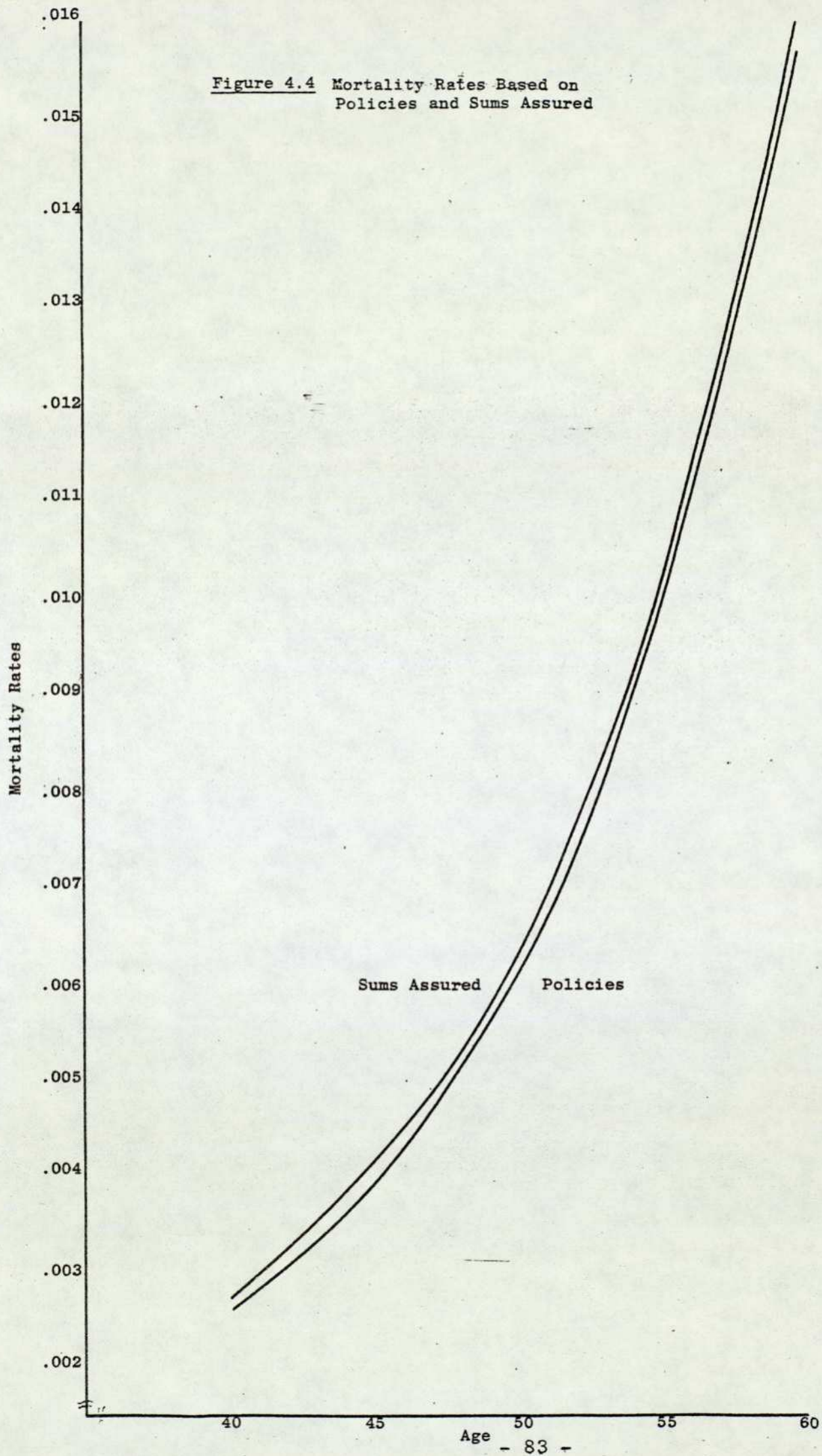
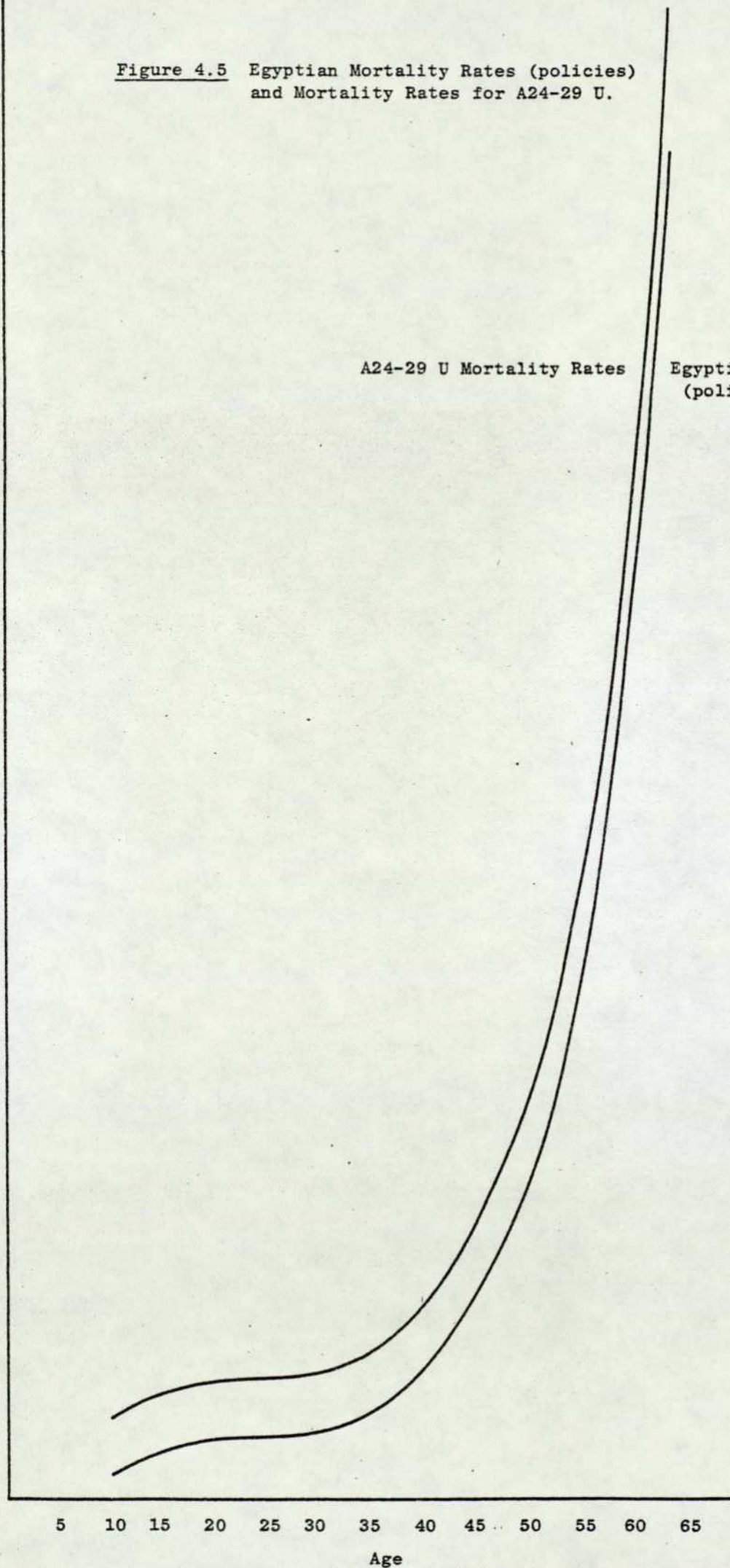


Figure 4.5 Egyptian Mortality Rates (policies)
and Mortality Rates for A24-29 U.

Mortality Rates

A24-29 U Mortality Rates

Egyptian Mortality Rates
(policies)



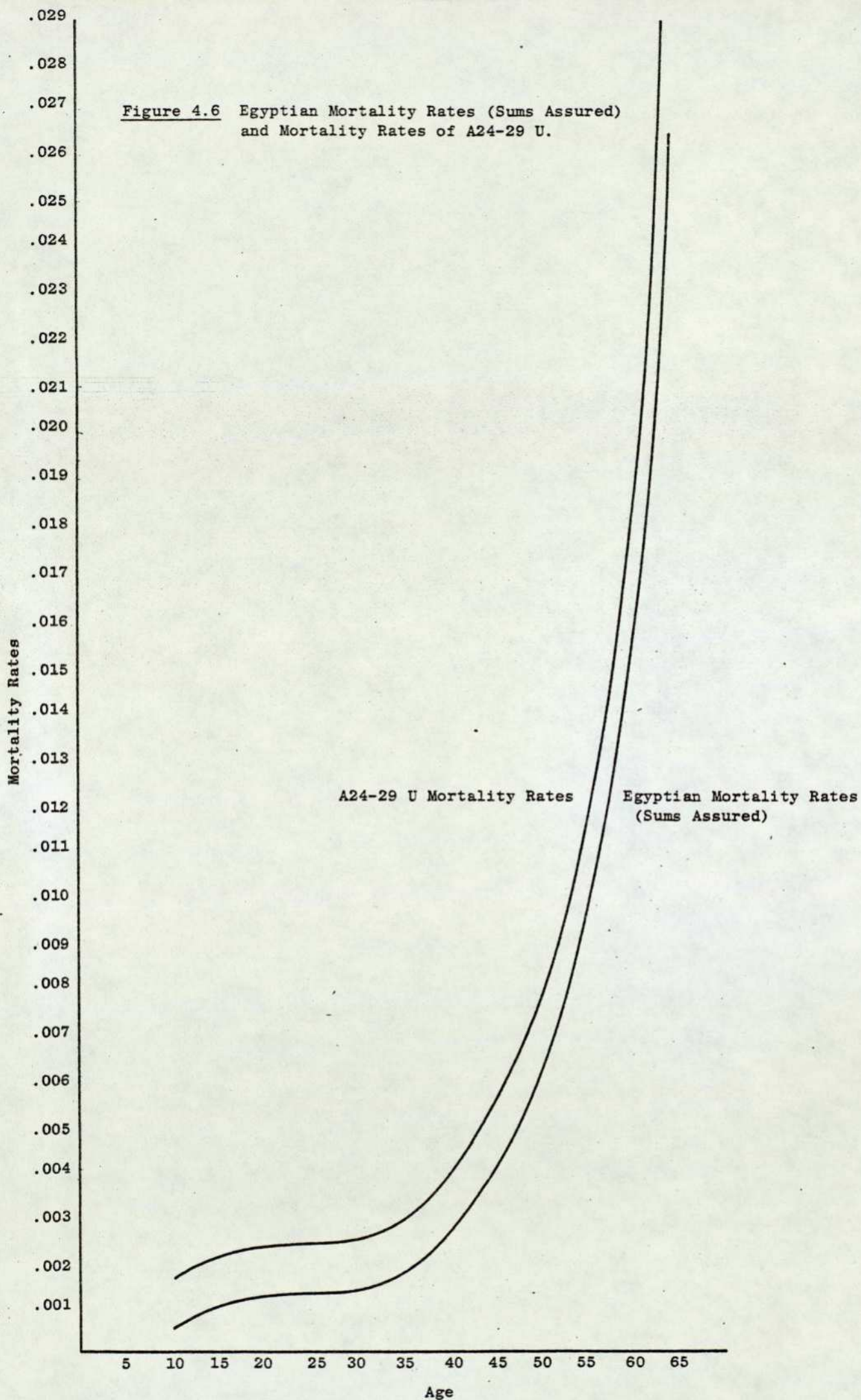
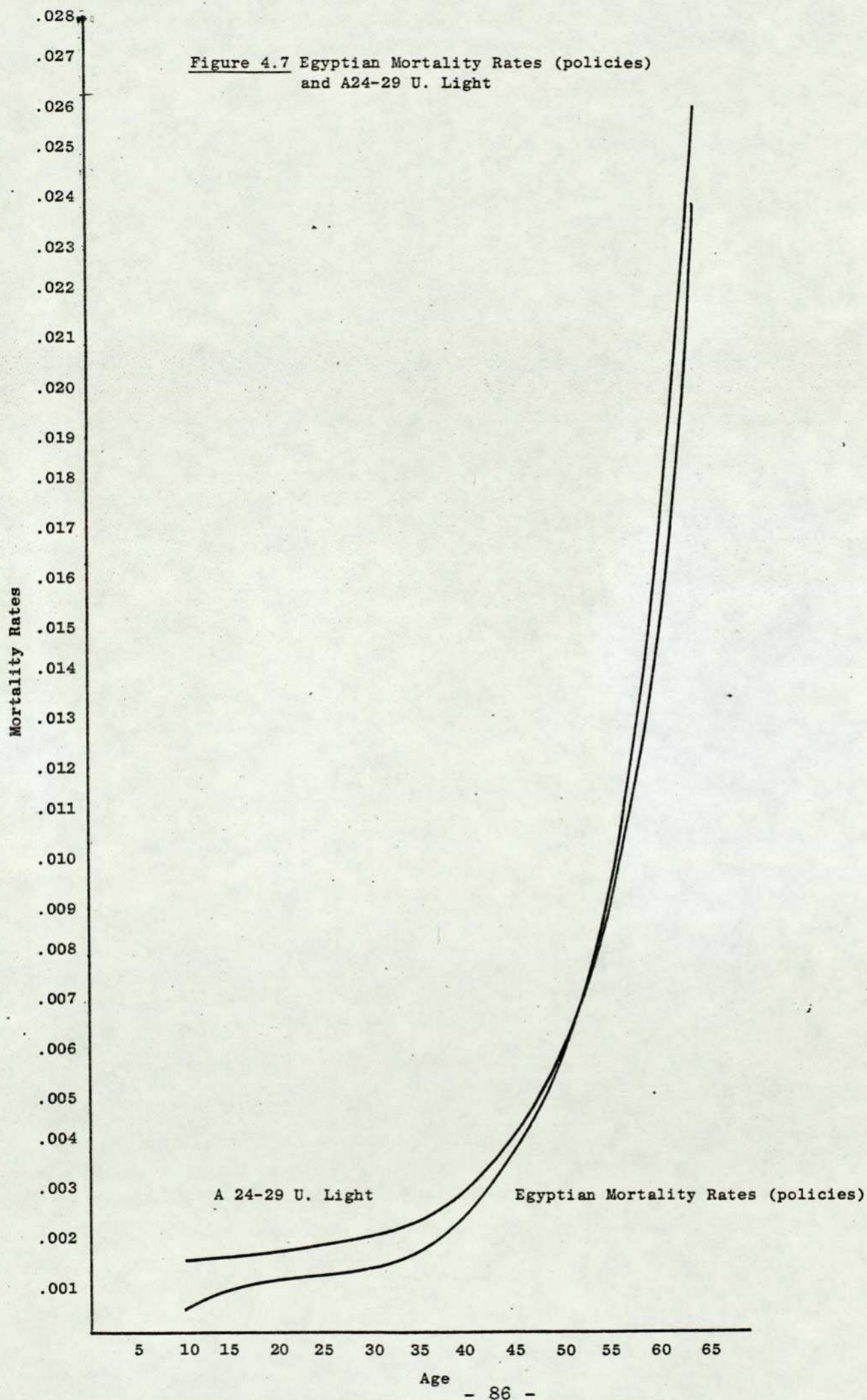
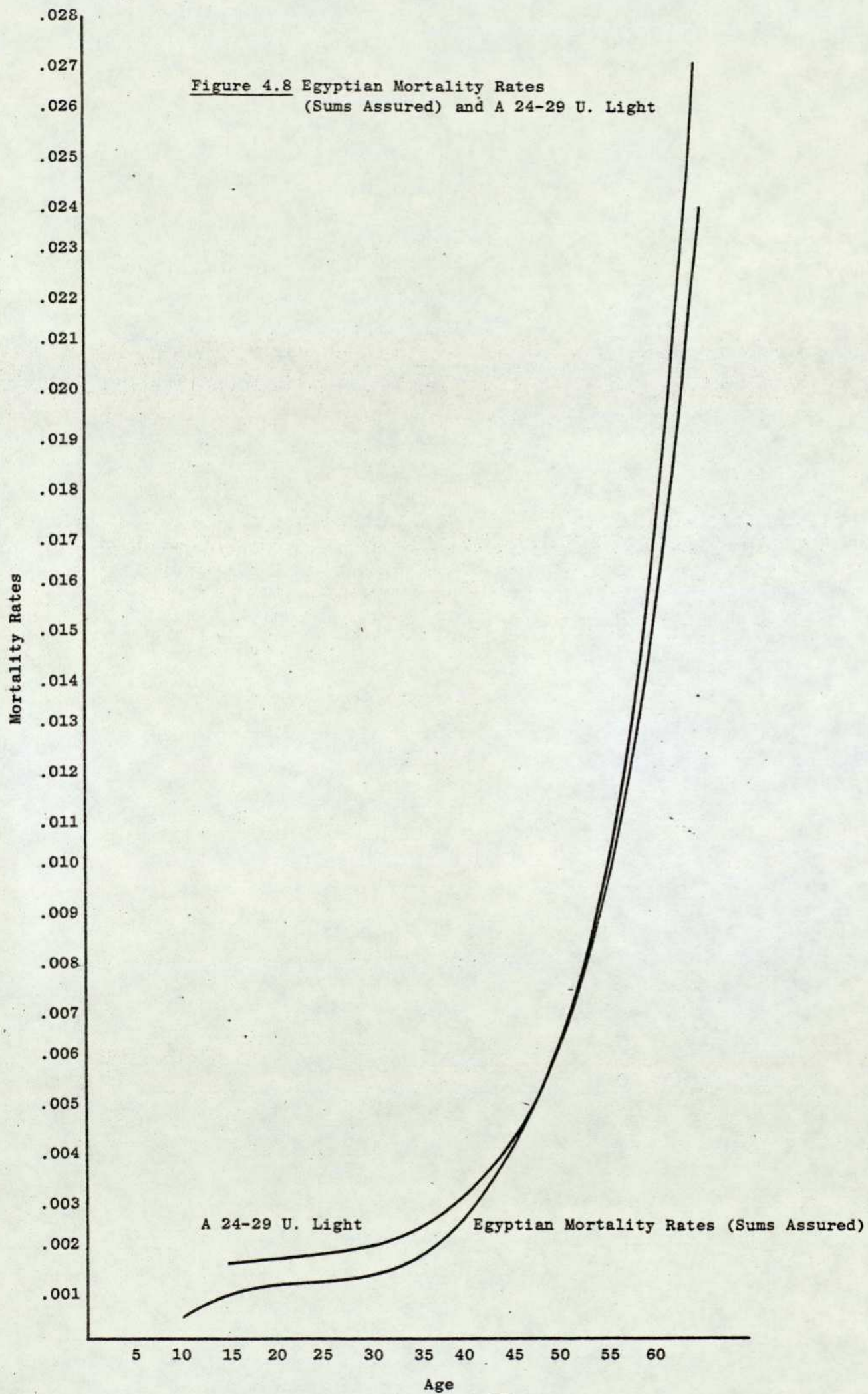


Figure 4.7 Egyptian Mortality Rates (policies)
and A24-29 U. Light





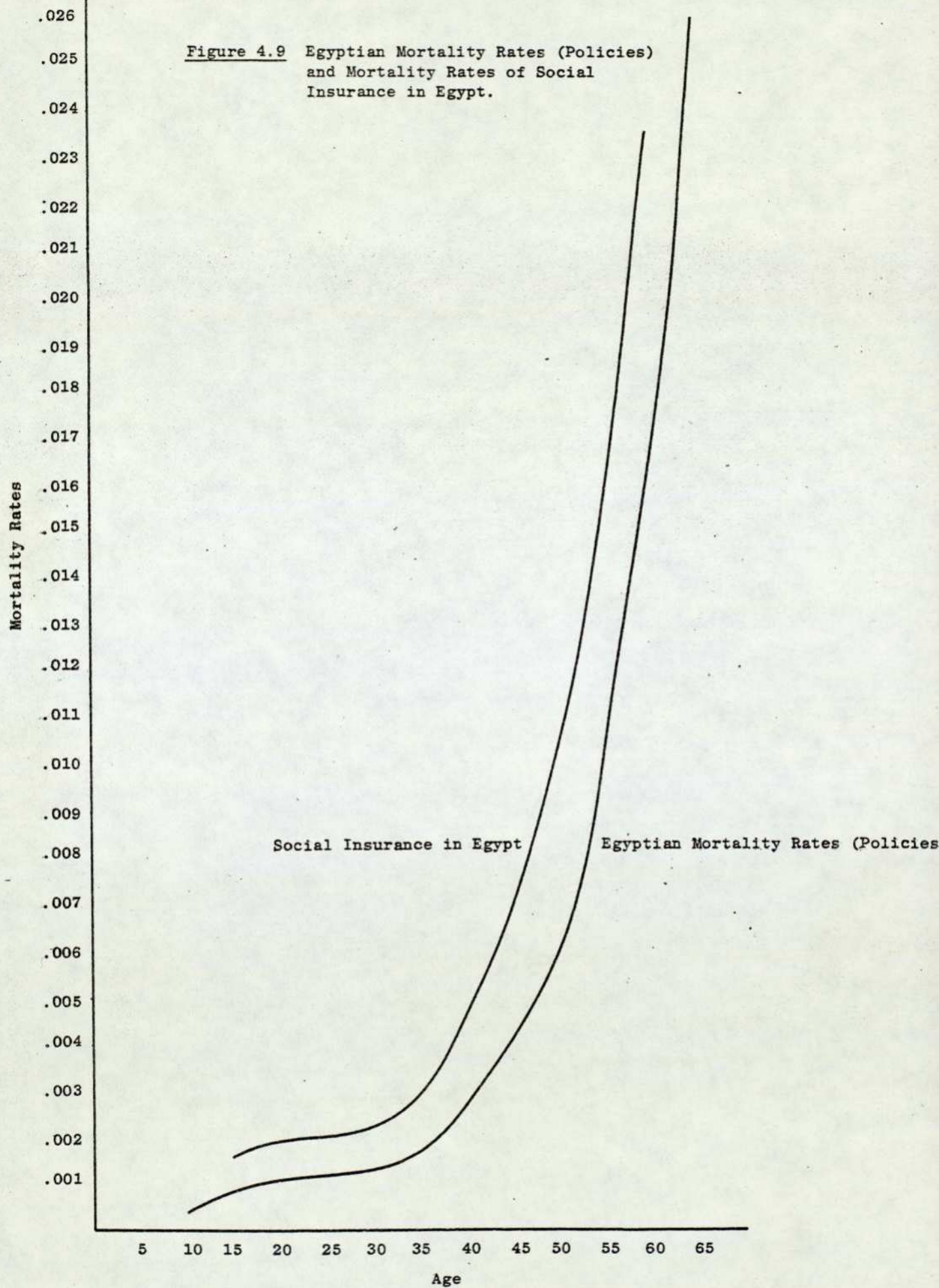


Figure 4.10 Egyptian Mortality Rates (Sums Assured) and Mortality Rates of Social Insurance in Egypt

Mortality Rates

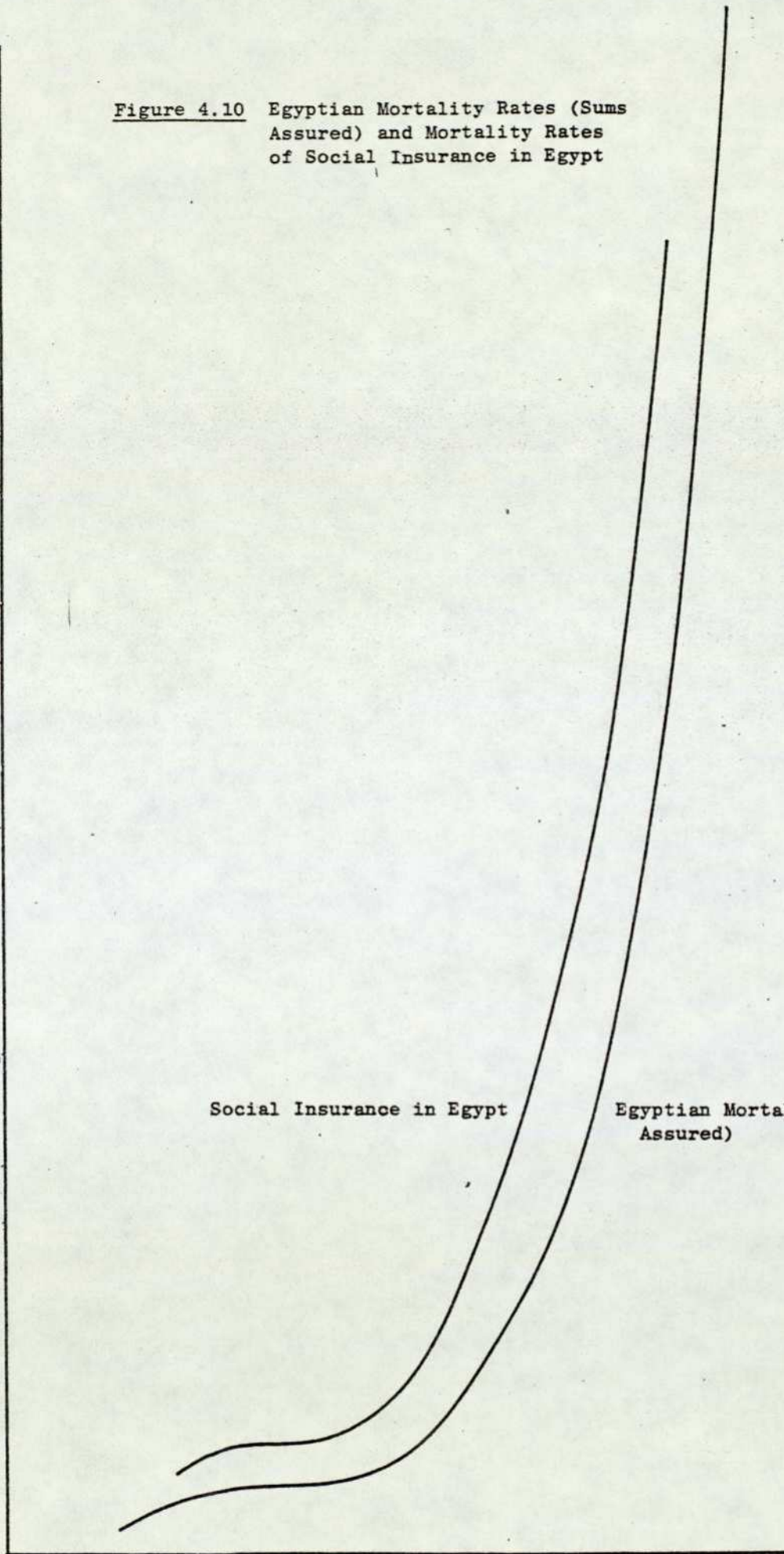
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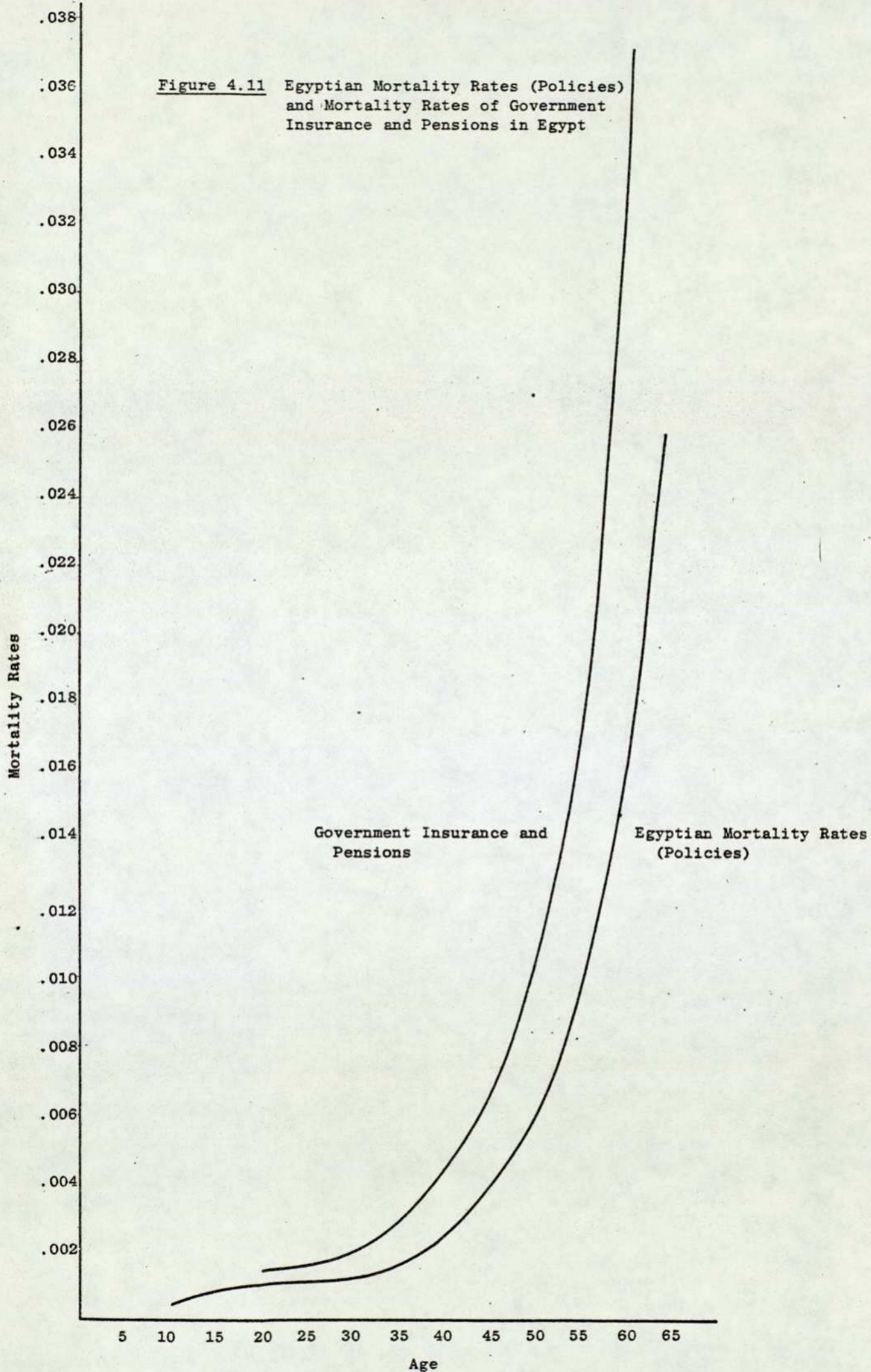
Social Insurance in Egypt

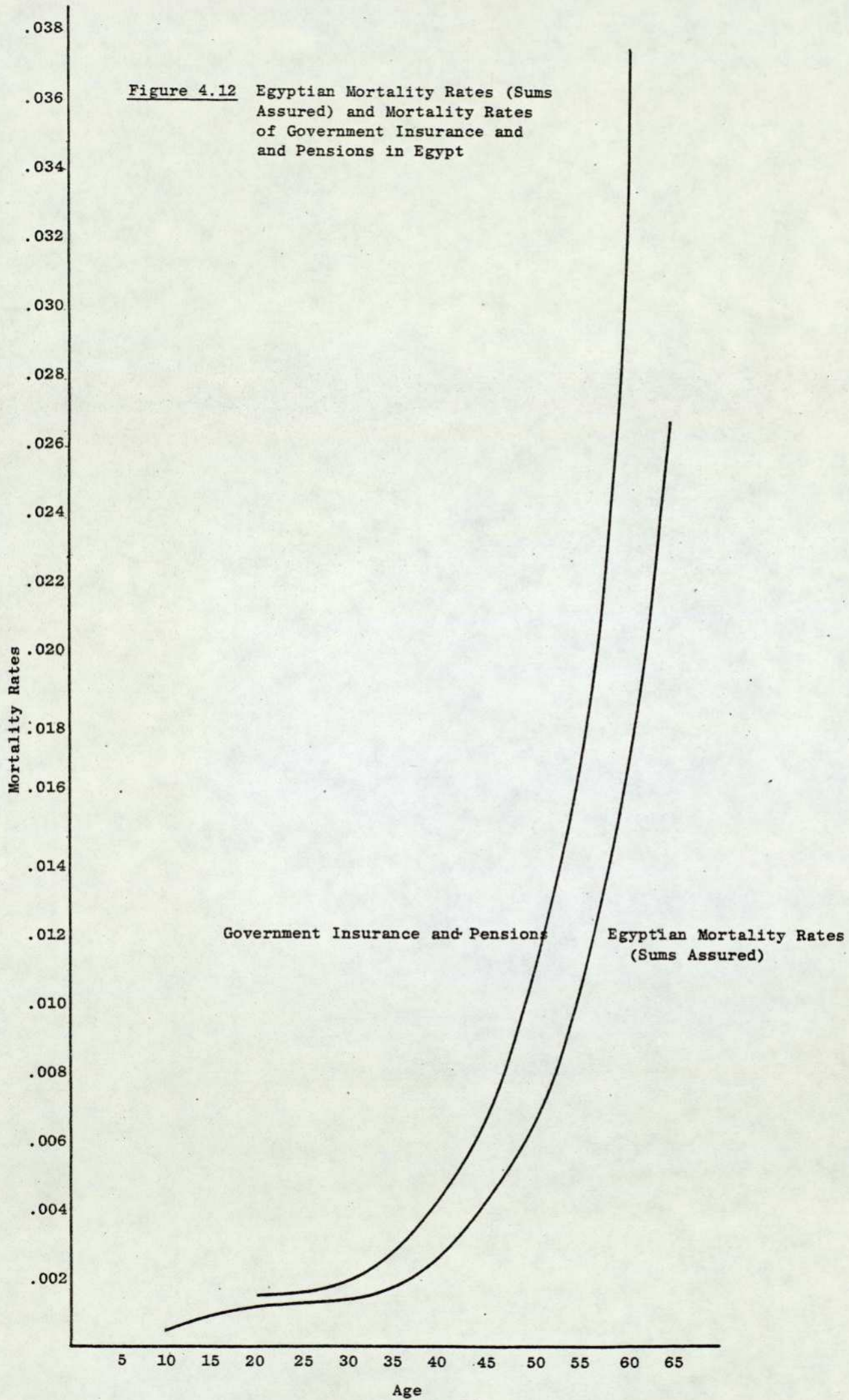
Egyptian Mortality Rates (Sums Assured)

5 10 15 20 25 30 35 40 45 50 55 60 65

Age







CHAPTER FIVE

THE MONETARY TABLES

5.1 Introduction

The researcher's aim in this chapter is to construct monetary tables based on the Egyptian rates (policies and sums assured).

The approach to fulfil this aim is:

1. To construct life tables based on the Egyptian mortality rates obtained in chapter three.
2. By using some interest rates, the life tables were used to construct the monetary tables.
3. Comments were made in this chapter about the difference between the new tables and the A 24-29 U., with an emphasis on the benefits which could be obtained by using the new tables, summary tables were used to sustain the arguments.

5.2 The Egyptian Life Tables

When values of mortality rates have been obtained over the available range of ages, the life tables can be built up by starting with any suitable radix, say 9999999, and applying successively the relations:

$$d_x = l_x \times q_x$$

$$l_{x+1} = l_x - d_x$$

The data available from the Egyptian market show mortality rates for successive ages from 10 to 64 inclusive, we can, with confidence use the rates of the A 24-29 U. for ages starting from 65 to 99 inclusive, especially as the two curves of mortality are moving

closer with every age increase, as mentioned previously in chapter four. Tables (5.1) and (5.2) present the Egyptian life table based on experience of policies and sums assured successively.

5.3 The Monetary Tables

In order to compute the single and annual premiums for any kind of life assurance policies, we need a commutation function, which in this case are as follows (Hooker, P.F. & Longley-Cook, L.H., 1953, P32 & 44):

$$D_x = v^x \times l_x$$

$$N_x = \sum_{t=0}^{\infty} D_{x+t}$$

$$S_x = \sum_{t=0}^{\infty} N_{x+t}$$

$$C_x = v^{x+1} \times d_x$$

$$M_x = \sum_{t=0}^{\infty} C_{x+t}$$

$$R_x = \sum_{t=0}^{\infty} M_{x+t}$$

As for calculating the single and annual premiums for the whole life assurance and the endowment assurance, the successive equations used were:

$$A_x = \frac{M_x}{D_x}, \quad P_x = \frac{M_x}{N_x}$$

$$A_{x:\overline{n}|} = \frac{M_x - M_{x+n} + D_{x+n}}{D_x}, \quad P_{x:\overline{n}|} = \frac{M_x - M_{x+n} + D_{x+n}}{N_x - N_{x+n}}$$

Table (5.1)

THE EGYPTIAN LIFE TABLE (POLICIES)

Age	l_x	d_x	P_x	q_x
10	9999999	4120	.999588	.000412
11	9995879	5058	.999494	.000506
12	9990821	5994	.999400	.000600
13	9984827	6929	.999306	.000694
14	9977898	7853	.999213	.000787
15	9970045	8784	.999119	.000881
16	9961261	9712	.999025	.000975
17	9951549	10539	.998941	.001059
18	9941010	11084	.998885	.001115
19	9929926	11350	.998857	.001143
20	9918576	11436	.998847	.001153
21	9907140	11423	.998847	.001153
22	9895717	11410	.998847	.001153
23	9884307	11397	.998847	.001153
24	9872910	11383	.998847	.001153
25	9861527	11370	.998847	.001153
26	9850157	11357	.998847	.001153
27	9838800	11344	.998847	.001153
28	9827456	11420	.998838	.001162
29	9816036	11593	.998819	.001181
30	9804443	11854	.998791	.001209
31	9792589	12299	.998744	.001256
32	9780290	12930	.998678	.001322
33	9767360	13733	.998594	.001406
34	9753627	14718	.998491	.001509
35	9738909	15884	.998369	.001631
36	9723025	17317	.998219	.001781
37	9705708	18916	.998051	.001949
38	9686792	20788	.997854	.002146
39	9666004	22831	.997638	.002362

Table (5.1) Continued

Age	l_x	d_x	P_x	q_x
40	9643173	24947	.997413	.002587
41	9618226	27133	.997179	.002821
42	9591093	29397	.996935	.003065
43	9561696	31726	.996682	.003318
44	9529970	34203	.996411	.003589
45	9495767	36929	.996111	.003889
46	9458838	39983	.995773	.004227
47	9418855	43430	.995389	.004611
48	9375425	47355	.994949	.005051
49	9328070	51752	.994452	.005548
50	9276318	56678	.993890	.006110
51	9219640	62122	.993262	.006738
52	9157518	68141	.992559	.007441
53	9089377	74787	.991772	.008228
54	9014590	82114	.990891	.009109
55	8932476	90245	.989897	.010103
56	8842231	99360	.988763	.011237
57	8742871	109627	.987461	.012539
58	8633244	121038	.985980	.014020
59	8512206	133301	.984340	.015660
60	8378905	146136	.982559	.017441
61	8232769	159246	.880657	.019343
62	8073523	172660	.978614	.021386
63	7900863	186516	.976393	.023607
64	7714347	201051	.973938	.026062
65	7513296	239524	.968120	.031880
66	7273772	256328	.964760	.035240
67	7017444	274242	.960920	.039080
68	6743202	292520	.956620	.043380
69	6450682	310407	.951880	.048120
70	6140275	327092	.946730	.053270
71	5813183	341873	.941190	.058810
72	5471310	354158	.935270	.064730
73	5117152	363522	.928960	.071040
74	4753630	369690	.922230	.077770

Table (5.1) Continued

Age	l_x	d_x	P_x	q_x
75	4383940	372503	.915030	.084970
76	4011437	371780	.907320	.092680
77	3639657	367351	.899070	.100930
78	3272306	359103	.890260	.109740
79	2913203	347050	.880870	.119130
80	2566153	331290	.870900	.129100
81	2234863	312032	.860380	.139620
82	1922831	289694	.849340	.150660
83	1633137	264911	.837790	.162210
84	1368226	238413	.825750	.174250
85	1129813	211004	.813240	.186760
86	918809	183514	.800270	.199730
87	735295	156728	.786850	.213150
88	578567	131346	.772980	.227020
89	447221	107932	.758660	.241340
90	339289	86895	.743890	.256110
91	252394	68482	.728670	.271330
92	183912	52783	.713000	.287000
93	131129	39748	.696880	.303120
94	91381	29215	.680300	.319700
95	62166	20934	.663250	.336750
96	41232	14608	.645720	.354280
97	26624	9912	.627690	.372310
98	16712	6532	.609140	.390860
99	10180	4173	.590050	.409950

Table (5.2)
THE EGYPTIAN LIFE TABLE (SUMS ASSURED)

Age	l_x	d_x	P_x	q_x
10	9999999	4490	.999551	.000449
11	9995509	5448	.999455	.000545
12	9990061	6404	.999359	.000641
13	9983657	7368	.999262	.000738
14	9976289	8320	.999166	.000834
15	9967969	9270	.999070	.000930
16	9958699	10218	.998974	.001026
17	9948481	11063	.998888	.001112
18	9937418	11627	.998830	.001170
19	9925791	11901	.998801	.001199
20	9913890	11976	.998792	.001208
21	9901914	11962	.998792	.001208
22	9889952	11947	.998792	.001208
23	9878005	11933	.998792	.001208
24	9866075	11918	.998792	.001208
25	9854157	11904	.998792	.001208
26	9842253	11889	.998792	.001208
27	9830364	11875	.998792	.001208
28	9818489	11959	.998782	.001218
29	9806530	12131	.998763	.001237
30	9794399	12400	.998734	.001266
31	9781999	12854	.998686	.001314
32	9769145	13491	.998619	.001381
33	9755654	14321	.998532	.001468
34	9741333	15323	.998427	.001573
35	9726010	16515	.998302	.001698
36	9709495	17982	.998148	.001852
37	9691513	19625	.997975	.002025
38	9671888	21539	.997773	.002227
39	9650349	23624	.997552	.002448
40	9626725	25780	.997322	.002678
41	9600945	28016	.997082	.002918
42	9572929	30327	.996832	.003168
43	9542602	32712	.996572	.003428
44	9509890	35244	.996294	.003706

Table (5.2) Continued

Age	l_x	d_x	P_x	q_x
45	9474646	38031	.995986	.004014
46	9436615	41144	.995640	.004360
47	9395471	44657	.995247	.004753
48	9350814	48671	.994795	.005205
49	9302143	53152	.994286	.005714
50	9248991	58185	.993709	.006291
51	9190806	63729	.993066	.006934
52	9127077	69868	.992345	.007655
53	9057209	76642	.991538	.008462
54	8980567	84103	.990635	.009365
55	8896464	92372	.989617	.010383
56	8804092	101652	.988454	.011546
57	8702440	112096	.987119	.012881
58	8590344	123692	.985601	.014399
59	8466652	136152	.983919	.016081
60	8330500	149166	.982094	.017906
61	8181334	162457	.980143	.019857
62	8018877	176022	.978049	.021951
63	7842855	190017	.975772	.024228
64	7652838	204675	.973255	.026745
65	7448163	237447	.968120	.031880
66	7210716	254106	.964760	.035240
67	6956610	271864	.960920	.039080
68	6684746	289984	.956620	.043380
69	6394762	307716	.951880	.048120
70	6087046	324257	.946730	.053270
71	5762789	338910	.941190	.058810
72	5423879	351088	.935270	.064730
73	5072791	360371	.928960	.071040
74	4712420	366485	.922230	.077770
75	4345935	369274	.915030	.084970
76	3976661	368557	.907320	.092680
77	3608104	364166	.899070	.100930
78	3243938	355990	.890260	.109740
79	2887948	344041	.880870	.119130

Table (5.2) Continued

Age	l_x	d_x	P_x	q_x
80	2543907	328418	.870900	.129100
81	2215489	309327	.860380	.139620
82	1906162	287182	.849340	.150660
83	1618980	262615	.837790	.162210
84	1356365	236347	.825750	.174250
85	1120018	209175	.813240	.186760
86	910843	181923	.800270	.199730
87	728920	155369	.786850	.213150
88	573551	130208	.772980	.227020
89	443343	106996	.758660	.241340
90	336347	86142	.743890	.256110
91	250205	67888	.728670	.271330
92	182317	52325	.713000	.287000
93	129992	39403	.696880	.303120
94	90589	28961	.680300	.319700
95	61628	20753	.663250	.336750
96	40875	14481	.645720	.354280
97	26394	9827	.627690	.372310
98	16567	6475	.609140	.390860
99	100 2	4137	.590050	.409950

By using computer programs (Appendix II), and interest rates from 4% to 7%, tables (5.3) to (5.16) inclusive, present the monetary tables based on policies, and tables (5.17) to (5.30) inclusive, present monetary tables based on sums assured.

Appendices (III & IV) present the single and annual premiums for the whole life and the endowment based on data of policies and sums assured successively.

Since the computer deals only with capital letters, the following symbols are used instead of the original ones:

DX as D_x

NX as N_x

SX as S_x

CX as C_x

MX as M_x

RX as R_x

AX as A_x

PX as P_x

NAX as $A_{x:\overline{n}}$

NPX as $P_{x:\overline{n}}$

Table (5.3)
MONETARY FUNCTIONS (POLICIES) AT .040 PER CENT INTEREST RATE

X	DX	NX	SX
10	6755641.	156718149.	3115039062.
11	6493132.	149962508.	2958320913.
12	6240237.	143469376.	2808358405.
13	5996628.	137229138.	2664889030.
14	5761987.	131232510.	2527659892.
15	5536012.	125470522.	2396427382.
16	5318399.	119934510.	2270956859.
17	5108859.	114616112.	2151022342.
18	4907162.	109507253.	2036406237.
19	4713164.	104600091.	1926898985.
20	4526709.	99886926.	1822298894.
21	4347586.	95360218.	1722411968.
22	4175551.	91012632.	1627051750.
23	4010324.	86837081.	1536039118.
24	3851634.	82826757.	1449202038.
25	3699224.	78975123.	1366375281.
26	3552846.	75275898.	1287400158.
27	3412259.	71723053.	1212124259.
28	3277235.	68310794.	1140401206.
29	3147526.	65033559.	1072090412.
30	3022893.	61886033.	1007056854.
31	2903113.	58863140.	945170821.
32	2787949.	55960027.	886307681.
33	2677176.	53172077.	830347654.
34	2570589.	50494901.	777175577.
35	2467990.	47924312.	726680676.
36	2369197.	45456322.	678756363.
37	2274017.	43087125.	633300042.
38	2182293.	40813108.	590212917.
39	2093856.	38630815.	549399809.
40	2008567.	36536959.	510768994.
41	1926318.	34528392.	474232034.
42	1847004.	32602074.	439703642.
43	1770522.	30755070.	407101569.
44	1696776.	28984548.	376346499.
45	1625660.	27287771.	347361952.
46	1557056.	25662111.	320074181.
47	1490840.	24105055.	294412070.
48	1426891.	22614215.	270307015.
49	1365080.	21187324.	247692800.
50	1305295.	19822244.	226505476.
51	1247423.	18516949.	206683232.
52	1191363.	17269526.	188166283.
53	1137917.	16078163.	170896757.
54	1084291.	14941146.	154818594.
55	1033090.	13856855.	139677448.
56	983320.	12823765.	126020593.
57	934875.	11840445.	113196826.
58	887647.	10905570.	101356383.
59	841541.	10017923.	90450813.
60	796502.	9176382.	80432891.
61	752510.	8379880.	71256509.
62	709571.	7627370.	62876629.
63	667639.	6917799.	55249259.
64	626853.	6250110.	48331461.
65	587034.	5623257.	42081351.
66	546461.	5036223.	36458094.
67	506927.	4489762.	31421871.
68	468381.	3982835.	26932110.
69	430929.	3514454.	22949272.
70	394325.	3083625.	19434821.
71	358961.	2689300.	16351196.
72	324856.	2330339.	13661896.
73	292142.	2005483.	11331557.
74	260951.	1713341.	9326073.
75	231400.	1452390.	7612733.
76	203595.	1220990.	6160342.
77	177621.	1017395.	4939352.
78	153551.	839775.	3921957.
79	131443.	686223.	3082182.
80	111331.	554781.	2395959.
81	93229.	443450.	1841178.
82	77127.	350221.	1397728.
83	62986.	273094.	1047507.
84	50741.	210106.	774414.
85	40288.	159365.	564300.
86	31503.	119078.	404942.
87	24242.	87574.	285862.
88	18341.	63333.	198291.
89	13632.	44992.	134958.
90	9944.	31360.	89966.
91	7113.	21416.	58606.
92	4984.	14303.	37191.
93	3417.	9319.	22886.
94	2289.	5903.	13564.
95	1498.	3613.	7666.
96	955.	2116.	4053.
97	593.	1161.	1936.
98	358.	568.	771.
99	210.	210.	210.

X	CX	MX	RX
10	2676.	727901.	36898250.
11	3159.	725225.	36170349.
12	3600.	722065.	35445124.
13	4001.	718466.	34723059.
14	4360.	714464.	34004599.
15	4690.	710104.	33290129.
16	4986.	705414.	32580029.
17	5202.	700428.	31874611.
18	5261.	695226.	31174189.
19	5180.	689965.	30478957.
20	5019.	684785.	29788992.
21	4820.	679766.	29104207.
22	4629.	674946.	28424441.
23	4446.	670317.	27749495.
24	4270.	665871.	27079178.
25	4101.	661601.	26413307.
26	3939.	657500.	25751706.
27	3783.	653561.	25094206.
28	3662.	649778.	24440646.
29	3574.	646116.	23790867.
30	3514.	642542.	23144751.
31	3506.	639028.	22502209.
32	3544.	635522.	21863182.
33	3619.	631978.	21227660.
34	3730.	628358.	20595689.
35	3870.	624628.	19967324.
36	4057.	620758.	19342696.
37	4261.	616701.	18721938.
38	4503.	612439.	18105237.
39	4755.	607936.	17492798.
40	4996.	603181.	16884862.
41	5225.	598184.	16281681.
42	5443.	592959.	15683497.
43	5649.	587516.	15090537.
44	5855.	581867.	14503022.
45	6079.	576012.	13921154.
46	6329.	569933.	13345143.
47	6610.	563604.	12775210.
48	6930.	556994.	12211606.
49	7232.	550064.	11654612.
50	7669.	542782.	11104548.
51	8082.	535113.	10561766.
52	8524.	527032.	10026652.
53	8996.	518508.	9499621.
54	9497.	509512.	8981113.
55	10036.	500015.	8471601.
56	10625.	489979.	7971586.
57	11272.	479355.	7481607.
58	11966.	468083.	7002252.
59	12672.	456117.	6534169.
60	13357.	443445.	6078052.
61	13996.	430088.	5634606.
62	14591.	416092.	5204518.
63	15156.	401501.	4788426.
64	15709.	386345.	4386926.
65	17995.	370636.	4000581.
66	18517.	352641.	3629944.
67	19049.	334125.	3277303.
68	19537.	315076.	2943178.
69	19934.	295539.	2628103.
70	20198.	275605.	2332563.
71	20299.	255407.	2056959.
72	20219.	235109.	1801551.
73	19956.	214889.	1566443.
74	19514.	194934.	1351553.
75	18906.	175420.	1156619.
76	18143.	156514.	981199.
77	17238.	138371.	824685.
78	16203.	121133.	686314.
79	15057.	104931.	565180.
80	13820.	89874.	460250.
81	12516.	76054.	370375.
82	11173.	63538.	294321.
83	9824.	52365.	230783.
84	8502.	42541.	178418.
85	7235.	34039.	135877.
86	6050.	26805.	101838.
87	4968.	20754.	75033.
88	4004.	15786.	54279.
89	3163.	11782.	38493.
90	2449.	8619.	26710.
91	1856.	6170.	18091.
92	1375.	4315.	11921.
93	996.	2939.	7600.
94	704.	1943.	4667.
95	485.	1240.	2724.
96	325.	755.	1484.
97	212.	429.	729.
98	135.	217.	300.
99	83.	83.	83.

Table (5.5)

MUNETARY FUNCTIONS (POLICIES) AT .045 PER CENT INTEREST RATE

X	DX	NX	SX
10	6439276.	130839986.	2558746336.
11	6159446.	130400710.	2421906350.
12	5891226.	124241262.	2291505640.
13	5634155.	110350036.	2167264370.
14	5387794.	112715881.	2048914343.
15	5151726.	107328087.	1936198462.
16	4925538.	102176361.	1828870375.
17	4708838.	97250823.	1726694014.
18	4501293.	92541985.	1629443192.
19	4302655.	88040692.	1536901207.
20	4112667.	83736037.	1448860515.
21	3931029.	79625370.	1365122478.
22	3757413.	75694342.	1285497108.
23	3591464.	71936929.	1209802766.
24	3432645.	68345465.	1137865837.
25	3281232.	64912620.	1069520372.
26	3136314.	61631388.	1004607752.
27	2997797.	58495074.	942976364.
28	2865398.	55497276.	884481290.
29	2738821.	52631878.	828984014.
30	2617786.	49893057.	776352136.
31	2502030.	47275270.	726459079.
32	2391280.	44773240.	679183809.
33	2285281.	42381960.	634410569.
34	2183797.	40096679.	592028609.
35	2086605.	37912882.	551931930.
36	1993494.	35826278.	514019048.
37	1904252.	33832783.	478192771.
38	1818699.	31928531.	444359987.
39	1736647.	30109832.	412431456.
40	1657938.	28373184.	382321624.
41	1582439.	26715246.	353948440.
42	1510024.	25132807.	327233193.
43	1440570.	23622783.	302100387.
44	1373962.	22182212.	278477604.
45	1310077.	20808250.	256295391.
46	1248787.	19498173.	235487141.
47	1189960.	18249386.	215988966.
48	11333467.	17059425.	1972739583.
49	1079179.	15925958.	180680157.
50	1026978.	14846779.	164754199.
51	976749.	13819801.	149907420.
52	928390.	12843052.	136087619.
53	881801.	11914661.	123244568.
54	836886.	11032860.	111329907.
55	793553.	10195974.	100297047.
56	751709.	9402421.	90101073.
57	711255.	8650712.	80698652.
58	672093.	7939457.	72047940.
59	634134.	7267364.	64108483.
60	597324.	6633230.	56841119.
61	561632.	6035906.	50207889.
62	527052.	5474274.	44171983.
63	493569.	4947222.	38697709.
64	461165.	4453653.	33750486.
65	429805.	3992488.	29296833.
66	398185.	3562683.	25304345.
67	367610.	3164498.	21741663.
68	338032.	2796888.	18577165.
69	309444.	2458855.	15780277.
70	281869.	2149412.	13321422.
71	255363.	1867543.	11172010.
72	229995.	1612180.	9304468.
73	205844.	1382185.	7692286.
74	182987.	1126340.	6310103.
75	161489.	993354.	5133762.
76	141404.	831865.	4140409.
77	122774.	690461.	3308544.
78	105629.	567687.	2618083.
79	89988.	462058.	2050397.
80	75854.	372070.	1588339.
81	63217.	296216.	1216269.
82	52048.	232999.	920054.
83	42303.	180951.	687052.
84	33915.	138648.	506104.
85	26799.	104733.	367456.
86	20856.	77934.	262723.
87	15971.	57078.	184789.
88	12026.	41107.	127710.
89	8876.	29081.	86604.
90	6459.	20165.	57523.
91	4597.	13727.	37337.
92	3206.	9130.	23610.
93	2137.	5924.	14480.
94	1459.	3737.	8556.
95	950.	2279.	4819.
96	603.	1329.	2540.
97	372.	726.	1211.
98	224.	354.	484.
99	130.	130.	130.

X	CX	HX	RX
10	2539.	546572.	26648111.
11	2983.	544033.	26101534.
12	3382.	541050.	25557506.
13	3741.	537668.	25016456.
14	4058.	533927.	24478788.
15	4343.	529869.	23944861.
16	4595.	525525.	23414993.
17	4772.	520930.	22889467.
18	4883.	516158.	22368537.
19	4706.	511355.	21852379.
20	4538.	506649.	21341024.
21	4337.	502111.	20834375.
22	4146.	497774.	20332264.
23	3963.	493628.	19834490.
24	3787.	489665.	19340862.
25	3620.	485878.	18851197.
26	3460.	482258.	18365315.
27	3308.	478797.	17883061.
28	3166.	475490.	17404264.
29	3095.	472303.	16928774.
30	3029.	469208.	16456471.
31	3007.	466179.	15987263.
32	3025.	463172.	15521084.
33	3075.	460147.	15057912.
34	3153.	457072.	14597765.
35	3257.	453919.	14140693.
36	3398.	450662.	13686774.
37	3551.	447264.	13236112.
38	3735.	443713.	12788847.
39	3925.	439978.	12345134.
40	4104.	436053.	11905156.
41	4272.	431948.	11469103.
42	4429.	427677.	11037152.
43	4574.	423248.	10609476.
44	4719.	418674.	10186231.
45	4875.	413955.	9767557.
46	5051.	409079.	9353602.
47	5251.	404028.	8944523.
48	5479.	398777.	8540492.
49	5729.	393299.	8141718.
50	6005.	387569.	7748449.
51	6298.	381565.	7360850.
52	6611.	375267.	6979285.
53	6943.	368656.	6604018.
54	7295.	361713.	6235362.
55	7672.	354418.	5873644.
56	8083.	346746.	5519231.
57	8534.	338663.	5172485.
58	9017.	330129.	4833822.
59	9503.	321112.	4503693.
60	9969.	311602.	4182582.
61	10396.	301639.	3870973.
62	10786.	291244.	3569333.
63	11150.	280457.	3278090.
64	11501.	269308.	2997632.
65	13112.	257806.	2728325.
66	13428.	244694.	2470517.
67	13748.	231266.	2225824.
68	14032.	217519.	1994558.
69	14249.	203486.	1777039.
70	14369.	189237.	1573553.
71	14371.	174869.	1384316.
72	14246.	160497.	1209448.
73	13993.	146251.	1048950.
74	13618.	132257.	902699.
75	13131.	118639.	770442.
76	12541.	105509.	651803.
77	11858.	92968.	546294.
78	11023.	81110.	453326.
79	10259.	70017.	372217.
80	9371.	59758.	302200.
81	8446.	50387.	242442.
82	7504.	41941.	192054.
83	6566.	34437.	150113.
84	5655.	27871.	115676.
85	4789.	22216.	87805.
86	3986.	17426.	65590.
87	3258.	13440.	48164.
88	2613.	10182.	34724.
89	2054.	7570.	24542.
90	1583.	5515.	16972.
91	1194.	3932.	11457.
92	880.	2739.	7524.
93	634.	1858.	4785.
94	446.	1224.	2927.
95	306.	778.	1703.
96	204.	472.	925.
97	133.	267.	453.
98	84.	135.	186.
99	51.	51.	51.

X	UX	NX	SX
10	6139132.	120207483.	2117444641.
11	5844333.	114068351.	1997237157.
12	5563263.	108223968.	1883168806.
13	5295167.	102660705.	1774944836.
14	5039517.	97365538.	1672284134.
15	4795762.	92326021.	1574918596.
16	4563368.	87530259.	1482592574.
17	4341828.	82966891.	1395062315.
18	4130695.	78625063.	1312095424.
19	3929669.	74494368.	1233470361.
20	3738207.	70564759.	1158975993.
21	3556072.	66826552.	1088411234.
22	3382850.	63270460.	1021584682.
23	3218047.	59887610.	958314223.
24	3061273.	56669563.	898426612.
25	2912136.	53608291.	841757049.
26	2770265.	50696155.	788148758.
27	2635396.	47925889.	737452603.
28	2506921.	45290583.	689526714.
29	2384770.	42783662.	644236131.
30	2268827.	40398892.	601452469.
31	2157890.	38130365.	561053577.
32	2052552.	35972475.	522923212.
33	1952227.	33919923.	486950737.
34	1856650.	31967696.	453030814.
35	1765570.	30111046.	421063116.
36	1678752.	28345477.	390952071.
37	1595964.	26666724.	362606595.
38	1517004.	25070760.	335939870.
39	1441665.	23553757.	310869110.
40	1369771.	22112092.	287315353.
41	1301169.	20742321.	265203262.
42	1235713.	19441152.	244460941.
43	1173262.	18205439.	225019789.
44	1113685.	17032177.	206814350.
45	1056846.	15918492.	189782174.
46	1002605.	14861646.	173863682.
47	950826.	13859041.	159002036.
48	901373.	12908215.	145142995.
49	854115.	12006841.	132234281.
50	808930.	11152727.	120227939.
51	765702.	10343797.	109075213.
52	724326.	9578095.	98731415.
53	684761.	8853769.	89153320.
54	646731.	8169068.	80299551.
55	611324.	7522337.	72130483.
56	575388.	6912013.	64608146.
57	541631.	6336624.	57696134.
58	509559.	5794793.	51359510.
59	478421.	5285234.	45564717.
60	448569.	4806743.	40279483.
61	419758.	4358174.	35472740.
62	392037.	3938416.	31114566.
63	365333.	3546380.	27176150.
64	339769.	3180996.	23629770.
65	315156.	2841227.	20448774.
66	290580.	2526071.	17607546.
67	266991.	2235491.	15081476.
68	244340.	1966500.	12845985.
69	222610.	1724161.	10877485.
70	201807.	1501551.	9153324.
71	181959.	1299744.	7651723.
72	163103.	1117784.	6352030.
73	145281.	954682.	5234285.
74	128534.	809400.	4279564.
75	112823.	680867.	3470163.
76	98381.	567974.	2789297.
77	85013.	469592.	2221323.
78	72793.	384579.	1751731.
79	61719.	311786.	1367152.
80	51777.	250068.	1055365.
81	42946.	198291.	805296.
82	35190.	155345.	607007.
83	28465.	120155.	451662.
84	22712.	91690.	331507.
85	17861.	68978.	239817.
86	13834.	51117.	170838.
87	10544.	37283.	119724.
88	7901.	26739.	82439.
89	5817.	18838.	55700.
90	4203.	13021.	36862.
91	2976.	8818.	23841.
92	2066.	5841.	15023.
93	1433.	3775.	9182.
94	931.	2371.	5407.
95	603.	1440.	3036.
96	381.	837.	1595.
97	234.	456.	758.
98	140.	221.	306.
99	51.	51.	81.

X	CX	MX	RX
10	2409.	414920.	19372675.
11	2816.	412511.	18957754.
12	3179.	409695.	18545243.
13	3500.	406516.	18135548.
14	3777.	403017.	17729032.
15	4024.	399239.	17326015.
16	4237.	395215.	16926776.
17	4379.	390978.	16531561.
18	4386.	386599.	16140583.
19	4278.	382212.	15753984.
20	4105.	377935.	15371772.
21	3905.	373830.	14993837.
22	3715.	369925.	14620007.
23	3534.	366210.	14250082.
24	3361.	362676.	13883872.
25	3198.	359315.	13521196.
26	3042.	356117.	13161881.
27	2894.	353075.	12805764.
28	2774.	350181.	12452689.
29	2682.	347407.	12102507.
30	2612.	344725.	11755101.
31	2581.	342112.	11410376.
32	2584.	339531.	11068264.
33	2614.	336947.	10728732.
34	2668.	334333.	10391785.
35	2742.	331665.	10057453.
36	2848.	328922.	9725788.
37	2962.	326075.	9396866.
38	3100.	323112.	9070791.
39	3243.	320012.	8747679.
40	3375.	316769.	8427667.
41	3496.	313394.	8110899.
42	3607.	309898.	7797505.
43	3708.	306291.	7487607.
44	3807.	302583.	7181310.
45	3914.	298777.	6878733.
46	4036.	294862.	6579956.
47	4175.	290826.	6285094.
48	4336.	286651.	5994268.
49	4513.	282315.	5707617.
50	4707.	277802.	5425303.
51	4914.	273094.	5147501.
52	5133.	268181.	4874407.
53	5365.	263048.	4606226.
54	5611.	257682.	4343178.
55	5872.	252072.	4085496.
56	6158.	246199.	3833424.
57	6471.	240042.	3587225.
58	6804.	233571.	3347183.
59	7136.	226767.	3113612.
60	7451.	219631.	2886845.
61	7733.	212180.	2667214.
62	7985.	204447.	2455034.
63	8215.	196462.	2250587.
64	8433.	188248.	2054125.
65	8569.	179814.	1865877.
66	8752.	170245.	1686063.
67	8937.	160493.	1515816.
68	10095.	150556.	1355325.
69	10202.	140461.	1204769.
70	10238.	130259.	1064308.
71	10191.	120021.	934049.
72	10055.	109829.	814026.
73	9829.	99775.	704198.
74	9520.	89945.	604424.
75	9136.	80425.	514479.
76	8684.	71289.	434054.
77	8172.	62606.	362764.
78	7608.	54434.	300159.
79	7002.	46826.	245725.
80	6366.	39824.	198899.
81	5711.	33457.	159075.
82	5049.	27747.	125618.
83	4397.	22698.	97871.
84	3769.	18300.	75173.
85	3177.	14531.	56873.
86	2631.	11354.	42342.
87	2140.	8723.	30988.
88	1708.	6582.	22265.
89	1337.	4874.	15683.
90	1025.	3537.	10809.
91	759.	2512.	7272.
92	565.	1742.	4760.
93	405.	1178.	3018.
94	284.	773.	1840.
95	193.	489.	1067.
96	129.	296.	570.
97	83.	167.	283.
98	52.	84.	116.
99	32.	32.	32.

MONETARY FUNCTIONS (POLICIES) AT .055 PER CENT INTEREST RATE

X	DX	NX	SX
10	5854305.	100184535.	1764752210.
11	5546818.	100330230.	1650567683.
12	5254937.	94763412.	1558237452.
13	4978042.	89528425.	1463454040.
14	4715249.	84550383.	1373925615.
15	4465913.	79635134.	1289375233.
16	4229353.	75369221.	1209540099.
17	4004966.	71139858.	1134170870.
18	3792156.	67134892.	1063031020.
19	3590453.	63342735.	995896120.
20	3399383.	59752282.	932553393.
21	3218449.	56352099.	872801111.
22	3047145.	53134450.	816448212.
23	2884959.	50087304.	763313762.
24	2731405.	47202345.	713226458.
25	2586025.	44470940.	666024112.
26	2448382.	41884915.	621553172.
27	2318066.	39436533.	579668257.
28	2194685.	37118468.	540231723.
29	2077853.	34923782.	503113256.
30	1967203.	32845929.	468169473.
31	1862393.	30878727.	435343544.
32	1763084.	29016334.	404464817.
33	1668960.	27253250.	375448483.
34	1579729.	25684289.	348195234.
35	1495114.	24004561.	322610944.
36	1414858.	22509447.	298606384.
37	1338709.	21094589.	276096937.
38	1266446.	19755880.	255002348.
39	1197846.	18489434.	235246460.
40	1132717.	17291588.	216257033.
41	1070888.	16158871.	199465445.
42	1012196.	15087983.	183306574.
43	956487.	14075786.	168218592.
44	903615.	13119299.	154142806.
45	853433.	12215684.	141023507.
46	805795.	11362251.	128807822.
47	760558.	10556456.	117445571.
48	717584.	9795896.	106889115.
49	676739.	9078314.	97093217.
50	637900.	8401575.	88014903.
51	600950.	7763674.	79613329.
52	565783.	7162724.	71849654.
53	532297.	6596941.	64686930.
54	500395.	6064645.	58089989.
55	469988.	5564249.	52025344.
56	440985.	5094262.	46461092.
57	413299.	4653276.	41366833.
58	386840.	4239978.	36713557.
59	361532.	3853138.	32473579.
60	337318.	3491606.	28620442.
61	314156.	3154287.	25128830.
62	292019.	2840131.	21974549.
63	270875.	2548112.	19134415.
64	250693.	2277237.	16586305.
65	231431.	2026544.	14309060.
66	212372.	1795114.	12282524.
67	194207.	1582742.	10487411.
68	176888.	1388535.	8904669.
69	160393.	1211647.	7516134.
70	144716.	1051254.	6304482.
71	129864.	906538.	5253234.
72	115855.	776674.	4346696.
73	102707.	660819.	3570022.
74	90436.	558112.	2909203.
75	79055.	467676.	2351091.
76	68567.	388621.	1883415.
77	58969.	320054.	1494795.
78	50253.	261085.	1174741.
79	42406.	210832.	913656.
80	35407.	168426.	702823.
81	29228.	133020.	534397.
82	23836.	103791.	401378.
83	19190.	79955.	297586.
84	15239.	60765.	217631.
85	11927.	45527.	156866.
86	9194.	33599.	111339.
87	6974.	24405.	77740.
88	5202.	17431.	53332.
89	3811.	12229.	35904.
90	2741.	8418.	23672.
91	1932.	5677.	15257.
92	1335.	3745.	9580.
93	902.	2410.	5835.
94	596.	1508.	3425.
95	384.	912.	1917.
96	242.	525.	1004.
97	148.	287.	476.
98	86.	139.	190.
99	51.	51.	51.

Table (5.10)
MONETARY FUNCTIONS (POLICIES) AT .055 PER CENT INTEREST RATE

X	CX	HX	RX
10	2236.	318590.	14180679.
11	2660.	316304.	13862080.
12	2988.	313643.	13545784.
13	3274.	310655.	13232141.
14	3518.	307381.	12921486.
15	3730.	303863.	12614105.
16	3909.	300134.	12310242.
17	4020.	296225.	12010109.
18	4076.	292205.	11713884.
19	3890.	288197.	11421679.
20	3715.	284307.	11133482.
21	3517.	280592.	10849175.
22	3330.	277074.	10568583.
23	3153.	273744.	10291509.
24	2985.	270591.	10017765.
25	2826.	267606.	9747173.
26	2676.	264789.	9479567.
27	2533.	262104.	9214781.
28	2417.	259571.	8952683.
29	2326.	257153.	8693112.
30	2254.	254827.	8435952.
31	2217.	252573.	8181132.
32	2209.	250356.	7928559.
33	2224.	248146.	7678203.
34	2250.	245922.	7430030.
35	2311.	243663.	7184134.
36	2389.	241351.	6940472.
37	2473.	238963.	6699120.
38	2576.	236490.	6460157.
39	2682.	233914.	6223668.
40	2778.	231232.	5989754.
41	2863.	228454.	5758522.
42	2941.	225591.	5530068.
43	3008.	222650.	5304477.
44	3074.	219642.	5081827.
45	3146.	216568.	4862186.
46	3229.	213422.	4645648.
47	3324.	210193.	4432196.
48	3436.	206869.	4222002.
49	3559.	203434.	4015139.
50	3694.	199875.	3811700.
51	3836.	196181.	3611825.
52	3991.	192342.	3415644.
53	4151.	188352.	3223302.
54	4320.	184201.	3034950.
55	4501.	179880.	2850749.
56	4697.	175379.	2670869.
57	4912.	170682.	2495490.
58	5141.	165770.	2324806.
59	5366.	160629.	2159038.
60	5576.	155263.	1998408.
61	5760.	149686.	1843145.
62	5920.	143927.	1693459.
63	6061.	138007.	1549532.
64	6193.	131946.	1411525.
65	6993.	125753.	1279580.
66	7094.	118760.	1153827.
67	7194.	111666.	1035067.
68	7273.	104472.	923402.
69	7316.	97198.	818930.
70	7307.	89883.	721731.
71	7239.	82576.	631849.
72	7108.	75336.	549273.
73	6916.	68228.	473937.
74	6667.	61312.	405709.
75	6367.	54646.	344397.
76	6023.	48278.	289751.
77	5641.	42255.	241473.
78	5227.	36614.	199218.
79	4788.	31386.	162604.
80	4333.	26598.	131218.
81	3868.	22265.	104620.
82	3404.	18397.	82355.
83	2950.	14993.	63958.
84	2517.	12043.	48965.
85	2111.	9526.	36920.
86	1741.	7414.	27397.
87	1409.	5674.	19983.
88	1119.	4264.	14309.
89	872.	3145.	10045.
90	665.	2273.	6900.
91	497.	1608.	4626.
92	363.	1111.	3016.
93	259.	748.	1907.
94	181.	489.	1159.
95	123.	308.	674.
96	81.	186.	362.
97	52.	104.	177.
98	33.	52.	72.
99	20.	20.	20.

X	DX	NX	SX
10	5583947.	94276493.	1480821237.
11	5265704.	88692546.	1386544744.
12	4965132.	83426842.	1297852195.
13	4681277.	78461710.	1214425356.
14	4413234.	73780433.	1135963646.
15	4160151.	69367199.	1062183213.
16	3921213.	65207048.	992816014.
17	3695651.	61285835.	927608966.
18	3482771.	57590183.	866323131.
19	3261970.	54107412.	808732946.
20	3092659.	50825442.	754625536.
21	2914239.	47732284.	703800093.
22	2746112.	44818545.	656067310.
23	2587685.	42072433.	611248762.
24	2438397.	39484748.	569176332.
25	2297722.	37046351.	529691584.
26	2165163.	34748629.	492645232.
27	2040252.	32583466.	457896603.
28	1922547.	30543214.	425313137.
29	1811616.	28620667.	394769923.
30	1707053.	26809052.	366149256.
31	1608480.	25101999.	339340204.
32	1515528.	23493519.	314238282.
33	1427853.	21977991.	290744686.
34	1345138.	20550137.	268766696.
35	1267083.	19204999.	248216558.
36	1193412.	17937917.	229011559.
37	1123855.	16744505.	211073642.
38	1058174.	15620650.	194329138.
39	996135.	14562476.	178708487.
40	937530.	13566341.	164146011.
41	882175.	12628811.	150579670.
42	829892.	11746636.	137950859.
43	780518.	10916744.	126204223.
44	733894.	10136226.	115287479.
45	689868.	9402332.	105151253.
46	648288.	8712464.	95748921.
47	609007.	8064176.	87036457.
48	571886.	7455169.	78972282.
49	536790.	6883283.	71517113.
50	503596.	6346493.	64633830.
51	472188.	5842897.	58287338.
52	442459.	5370709.	52444441.
53	414308.	4928250.	47073733.
54	387641.	4513942.	42145483.
55	362368.	4126301.	37631541.
56	338402.	3763934.	33505239.
57	315660.	3425531.	29741302.
58	294059.	3109071.	26315774.
59	273524.	2815813.	23205903.
60	254001.	2542288.	20390090.
61	235444.	2288287.	17847801.
62	217821.	2052843.	15559514.
63	201097.	1835022.	13506671.
64	185235.	1633926.	11671649.
65	170196.	1448690.	10037723.
66	155444.	1278494.	8589033.
67	141477.	1123051.	7310539.
68	128253.	981574.	6187488.
69	115745.	853321.	5205914.
70	103939.	737576.	4352593.
71	92832.	633637.	3615017.
72	82427.	540805.	2981384.
73	72728.	458379.	2440574.
74	63737.	385651.	1982196.
75	55453.	321914.	1596545.
76	47869.	266461.	1274631.
77	40974.	218592.	1008170.
78	34753.	177618.	789578.
79	29188.	142865.	611964.
80	24256.	113676.	469096.
81	19929.	89421.	355420.
82	16176.	69492.	265999.
83	12961.	53317.	196507.
84	10244.	40356.	143190.
85	7980.	30112.	102835.
86	6122.	22132.	72723.
87	4622.	16009.	50591.
88	3431.	11387.	34582.
89	2502.	7956.	23192.
90	1791.	5454.	15239.
91	1257.	3663.	9786.
92	864.	2406.	6123.
93	581.	1542.	3716.
94	382.	961.	2174.
95	245.	579.	1213.
96	153.	334.	634.
97	93.	181.	300.
98	55.	87.	119.
99	32.	32.	32.

X	CX	NX	RX
10	2170.	247524.	10454830.
11	2514.	245354.	10207300.
12	2810.	242840.	9961950.
13	3065.	240030.	9719112.
14	3277.	236965.	9479082.
15	3458.	233688.	9242110.
16	3607.	230231.	9008420.
17	3692.	226624.	8778197.
18	3663.	222932.	8551570.
19	3539.	219260.	8328641.
20	3364.	215729.	8109370.
21	3170.	212365.	7893644.
22	2987.	209195.	7681270.
23	2815.	206208.	7472083.
24	2652.	203394.	7265875.
25	2499.	200741.	7062481.
26	2355.	198242.	6861740.
27	2219.	195887.	6663498.
28	2100.	193668.	6467611.
29	2018.	191560.	6273943.
30	1947.	189542.	6082383.
31	1906.	187595.	5892841.
32	1890.	185689.	5705247.
33	1894.	183799.	5519558.
34	1915.	181905.	5335759.
35	1950.	179990.	5153855.
36	2005.	178040.	4973862.
37	2066.	176035.	4795822.
38	2142.	173969.	4619790.
39	2220.	171826.	4445821.
40	2288.	169607.	4273992.
41	2348.	167318.	4104389.
42	2400.	164971.	3937070.
43	2443.	162571.	3772099.
44	2485.	160128.	3609520.
45	2531.	157643.	3449401.
46	2585.	155112.	3291750.
47	2649.	152527.	3136646.
48	2725.	149878.	2984119.
49	2810.	147153.	2834241.
50	2903.	144343.	2687089.
51	3002.	141440.	2542746.
52	3106.	138439.	2401300.
53	3216.	135333.	2262867.
54	3331.	132117.	2127534.
55	3454.	128786.	1995417.
56	3587.	125332.	1866632.
57	3734.	121744.	1741300.
58	3889.	118010.	1619556.
59	4041.	114121.	1501542.
60	4179.	110080.	1387424.
61	4296.	105901.	1277344.
62	4395.	101604.	1171443.
63	4479.	97210.	1069839.
64	4554.	92731.	972629.
65	5119.	88177.	879898.
66	5160.	83058.	791721.
67	5216.	77890.	708662.
68	5249.	72674.	630772.
69	5254.	67426.	558098.
70	5223.	62171.	490672.
71	5150.	56948.	428500.
72	5033.	51798.	371552.
73	4874.	46764.	319752.
74	4676.	41890.	272991.
75	4445.	37214.	231101.
76	4185.	32769.	193887.
77	3901.	28583.	161118.
78	3598.	24682.	132532.
79	3280.	21084.	107853.
80	2954.	17803.	86770.
81	2625.	14849.	68960.
82	2299.	12224.	54117.
83	1983.	9925.	41893.
84	1684.	7942.	31967.
85	1406.	6258.	24022.
86	1154.	4852.	17767.
87	929.	3698.	12912.
88	735.	2769.	9217.
89	570.	2034.	6448.
90	433.	1464.	4414.
91	322.	1032.	2950.
92	234.	710.	1910.
93	166.	476.	1208.
94	115.	310.	732.
95	78.	195.	422.
96	51.	117.	227.
97	33.	66.	111.
98	20.	33.	42.
99	12.	12.	12.

X	DX	NX	SX
10	5327260.	64095776.	1254622160.
11	5000061.	70760516.	1160526393.
12	4692517.	73768455.	1087757877.
13	4403476.	69075930.	1013989422.
14	4131850.	64672462.	944913484.
15	3876618.	60540612.	880241022.
16	3636810.	56663294.	819700411.
17	3411516.	53027184.	763036417.
18	3199909.	49615668.	710009234.
19	3001259.	46415760.	660393565.
20	2814862.	43414501.	613977806.
21	2640016.	40599638.	570563305.
22	2476030.	37959622.	529963667.
23	2322230.	35483592.	492004044.
24	2177984.	33161362.	456520452.
25	2042697.	30983379.	423359089.
26	1915814.	28940682.	392375741.
27	1796812.	27024868.	363435029.
28	1685202.	25228055.	336410161.
29	1580511.	23542853.	311182106.
30	1482295.	21962342.	287639253.
31	1390144.	20480047.	265676911.
32	1303660.	19089903.	245196864.
33	1222475.	17786243.	226106961.
34	1146250.	16563768.	208320748.
35	1074667.	15417517.	191756950.
36	1007431.	14342850.	176339433.
37	944260.	13335419.	161996583.
38	884901.	12391158.	148661164.
39	829110.	11506257.	136270006.
40	776666.	10677147.	124763749.
41	727380.	9900478.	114086602.
42	681059.	9173099.	104186124.
43	637532.	8492040.	95013025.
44	596635.	7854508.	86520985.
45	558210.	7257873.	78666476.
46	522103.	6699663.	71408603.
47	488165.	6177561.	64708940.
48	456257.	5689396.	58531379.
49	426247.	5233138.	52841984.
50	398011.	4806892.	47608845.
51	371436.	4408881.	42801953.
52	346416.	4037445.	38393073.
53	322853.	3691028.	34355625.
54	300654.	3368175.	30664600.
55	279733.	3067521.	27296424.
56	260036.	2787788.	24228903.
57	241394.	2527782.	21441115.
58	223819.	2286388.	18913333.
59	207212.	2062569.	16626944.
60	191519.	1855357.	14564375.
61	176693.	1663839.	12709010.
62	162700.	1487145.	11045179.
63	149503.	1324445.	9558034.
64	137064.	1174943.	8233589.
65	125345.	1037878.	7058646.
66	113942.	912534.	6020768.
67	103218.	798591.	5108234.
68	93131.	695373.	4309643.
69	83653.	602243.	3614269.
70	74768.	518589.	3012027.
71	66465.	443821.	2493438.
72	58738.	377357.	2049616.
73	51583.	318619.	1672259.
74	44994.	267036.	1353641.
75	38962.	222042.	1086605.
76	33476.	183079.	864564.
77	28519.	149604.	681485.
78	24078.	121084.	531881.
79	20126.	97008.	410797.
80	16646.	76882.	313789.
81	13612.	60236.	236906.
82	10997.	46624.	176670.
83	8770.	35627.	130046.
84	6899.	26857.	94419.
85	5349.	19958.	67562.
86	4085.	14609.	47602.
87	3069.	10524.	32996.
88	2268.	7455.	22472.
89	1646.	5187.	15010.
90	1172.	3541.	9831.
91	819.	2368.	6290.
92	560.	1549.	3922.
93	375.	989.	2372.
94	245.	614.	1383.
95	157.	369.	769.
96	98.	212.	401.
97	59.	114.	189.
98	35.	55.	75.
99	20.	20.	20.

MONETARY FUNCTIONS (POLICIES) AT .065 PER CENT INTEREST RATE

X	CX	MX	RX
10	2061.	194643.	7765728.
11	2376.	192582.	7571085.
12	2643.	190206.	7378503.
13	2869.	187563.	7186297.
14	3053.	184693.	7000732.
15	3207.	181640.	6816041.
16	3329.	178433.	6634401.
17	3392.	175104.	6455968.
18	3350.	171711.	6280865.
19	3221.	168361.	6109153.
20	3047.	165140.	5940792.
21	2858.	162093.	5775652.
22	2681.	159234.	5613568.
23	2514.	156554.	5454325.
24	2358.	154040.	5297771.
25	2211.	151682.	5143732.
26	2074.	149470.	4992050.
27	1945.	147396.	4842580.
28	1839.	145451.	4695184.
29	1753.	143612.	4549733.
30	1683.	141859.	4406120.
31	1639.	140177.	4264261.
32	1616.	138537.	4124084.
33	1614.	136919.	3985547.
34	1624.	135305.	3848624.
35	1646.	133681.	3713323.
36	1685.	132035.	3579642.
37	1728.	130350.	3447607.
38	1783.	128622.	3317256.
39	1839.	126839.	3188634.
40	1887.	125001.	3061294.
41	1927.	123114.	2936794.
42	1960.	121187.	2813680.
43	1986.	119227.	2692493.
44	2011.	117241.	2573266.
45	2038.	115230.	2456025.
46	2072.	113192.	2340794.
47	2114.	111120.	2227603.
48	2164.	109006.	2116483.
49	2220.	106842.	2007477.
50	2283.	104622.	1900635.
51	2350.	102338.	1796019.
52	2420.	99988.	1693675.
53	2494.	97568.	1593686.
54	2572.	95074.	1496110.
55	2654.	92502.	1401045.
56	2743.	89848.	1308543.
57	2842.	87105.	1218694.
58	2946.	84263.	1131589.
59	3047.	81317.	1047326.
60	3136.	78270.	966009.
61	3209.	75133.	887740.
62	3267.	71924.	812606.
63	3314.	68657.	740682.
64	3354.	65343.	672025.
65	3752.	61989.	606682.
66	3770.	58237.	544693.
67	3786.	54467.	486456.
68	3793.	50679.	431990.
69	3780.	46886.	381311.
70	3740.	43106.	334425.
71	3670.	39366.	291319.
72	3570.	35696.	251953.
73	3441.	32126.	216257.
74	3286.	28685.	184131.
75	3109.	25399.	155446.
76	2913.	22291.	130047.
77	2703.	19378.	107756.
78	2481.	16675.	88379.
79	2251.	14194.	71704.
80	2018.	11943.	57510.
81	1785.	9925.	45567.
82	1556.	8140.	35642.
83	1336.	6585.	27502.
84	1129.	5249.	20917.
85	938.	4120.	15668.
86	766.	3182.	11548.
87	614.	2416.	8366.
88	483.	1802.	5950.
89	373.	1318.	4145.
90	282.	945.	2830.
91	209.	663.	1885.
92	151.	455.	1222.
93	107.	304.	767.
94	74.	197.	463.
95	50.	123.	266.
96	32.	74.	143.
97	21.	41.	65.
98	13.	20.	28.
99	8.	8.	0.

X	DX	NX	SX
10	5083492.	75336412.	1062700034.
11	4748970.	70252919.	987363621.
12	4436044.	65503949.	911110702.
13	4143348.	61067905.	851606753.
14	3869601.	56924557.	790538840.
15	3613603.	53054956.	733614291.
16	3374224.	49441353.	680559335.
17	3150406.	46067129.	631117982.
18	2941186.	42916724.	585050853.
19	2745707.	39975537.	542134129.
20	2563149.	37229830.	502158592.
21	2392704.	34666682.	464928762.
22	2233594.	32273978.	430262080.
23	2085064.	30040384.	397988103.
24	1946411.	27955320.	367947719.
25	1816978.	26008909.	339992398.
26	1696153.	24191931.	313983489.
27	1583362.	22495779.	289791558.
28	1478071.	20912417.	267295779.
29	1379779.	19434346.	246383362.
30	1287981.	18054576.	226949017.
31	1202266.	16766595.	208894440.
32	1122202.	15564329.	192127846.
33	1047400.	14442128.	176563517.
34	977502.	13394728.	162121385.
35	912175.	12417226.	148726661.
36	851109.	11505051.	136309430.
37	794013.	10653941.	124804385.
38	740622.	9859929.	114150444.
39	690684.	9119307.	104290515.
40	643975.	8428623.	95171208.
41	600289.	7784648.	86742586.
42	559435.	7184359.	78957938.
43	521234.	6624924.	71773579.
44	485518.	6103691.	65148655.
45	452127.	5618173.	59044964.
46	420905.	5166046.	53426791.
47	391706.	4745141.	48260742.
48	364393.	4353435.	43515604.
49	338834.	3989042.	39162169.
50	314910.	3650208.	35173127.
51	292510.	3335298.	31522918.
52	271532.	3042788.	28187620.
53	251880.	2771256.	25144832.
54	233465.	2519376.	22373570.
55	216204.	2285940.	19854201.
56	200019.	2069706.	17568291.
57	184833.	1869688.	15498584.
58	170575.	1684855.	13628897.
59	157181.	1514280.	11944042.
60	144597.	1357099.	10429761.
61	132781.	1212502.	9072662.
62	121694.	1079721.	7860160.
63	111300.	958027.	6780439.
64	101563.	846727.	5822412.
65	92445.	745163.	4975685.
66	83643.	652718.	4230521.
67	75416.	569075.	3577803.
68	67728.	493659.	3008720.
69	60552.	425930.	2515069.
70	53867.	365379.	2089139.
71	47661.	311512.	1723760.
72	41924.	263851.	1412240.
73	36645.	221927.	1148390.
74	31815.	185282.	926471.
75	27421.	153468.	741189.
76	23449.	126047.	587721.
77	19884.	102597.	461675.
78	16708.	82713.	359077.
79	13901.	66005.	276362.
80	11444.	52104.	210359.
81	9315.	40660.	158256.
82	7490.	31345.	117596.
83	5945.	23855.	86250.
84	4655.	17910.	62395.
85	3592.	13255.	44485.
86	2730.	9663.	31230.
87	2042.	6932.	21567.
88	1502.	4890.	14635.
89	1085.	3389.	9744.
90	769.	2304.	6356.
91	535.	1535.	4052.
92	364.	1000.	2517.
93	243.	636.	1517.
94	158.	393.	882.
95	100.	235.	485.
96	62.	134.	254.
97	38.	72.	119.
98	22.	35.	47.
99	13.	13.	10.

X	CX	MX	RX
10	1957.	154935.	3813350.
11	2246.	152978.	3658421.
12	2487.	150732.	3505443.
13	2687.	148245.	3354711.
14	2846.	145558.	3206467.
15	2975.	142711.	3060909.
16	3075.	139736.	2918198.
17	3118.	136661.	2778462.
18	3065.	133543.	2641801.
19	2933.	130478.	2508258.
20	2762.	127545.	2377780.
21	2578.	124783.	2250234.
22	2407.	122205.	2125451.
23	2247.	119798.	2003246.
24	2097.	117551.	1883448.
25	1958.	115454.	1765897.
26	1828.	113496.	1650443.
27	1706.	111668.	1536947.
28	1605.	109962.	1425279.
29	1523.	108357.	1315317.
30	1455.	106834.	1206960.
31	1411.	105379.	1100126.
32	1387.	103967.	994747.
33	1376.	102581.	890779.
34	1379.	101205.	788199.
35	1390.	99826.	686994.
36	1417.	98436.	587168.
37	1446.	97019.	488732.
38	1485.	95573.	391713.
39	1525.	94087.	296141.
40	1557.	92563.	202053.
41	1583.	91006.	109491.
42	1603.	89423.	2018485.
43	1616.	87821.	1929062.
44	1629.	86204.	1841242.
45	1643.	84576.	1755037.
46	1663.	82932.	1670462.
47	1688.	81270.	1587529.
48	1720.	79582.	1506260.
49	1757.	77861.	1426675.
50	1798.	76105.	1348817.
51	1842.	74306.	1272712.
52	1888.	72464.	1198406.
53	1937.	70576.	1125941.
54	1988.	68639.	1055365.
55	2041.	66652.	986728.
56	2101.	64610.	920074.
57	2166.	62510.	855464.
58	2235.	60344.	792954.
59	2300.	58109.	732610.
60	2357.	55808.	674502.
61	2400.	53451.	618693.
62	2432.	51051.	565242.
63	2456.	48619.	514191.
64	2474.	46163.	465572.
65	2754.	43689.	419409.
66	2755.	40935.	375720.
67	2754.	38180.	334785.
68	2746.	35426.	296604.
69	2723.	32680.	261174.
70	2682.	29957.	228499.
71	2620.	27275.	198542.
72	2536.	24655.	171267.
73	2433.	22119.	146611.
74	2312.	19686.	124492.
75	2178.	17374.	104802.
76	2031.	15196.	87431.
77	1876.	13165.	72232.
78	1714.	11290.	59070.
79	1548.	9576.	47780.
80	1381.	8028.	38204.
81	1215.	6648.	30172.
82	1055.	5432.	23527.
83	901.	4376.	18092.
84	758.	3476.	13717.
85	627.	2718.	10241.
86	510.	2091.	7523.
87	407.	1582.	5431.
88	319.	1175.	3850.
89	245.	856.	2672.
90	184.	612.	1815.
91	136.	427.	1207.
92	98.	292.	780.
93	69.	194.	486.
94	47.	125.	294.
95	32.	78.	166.
96	21.	47.	90.
97	13.	26.	44.
98	8.	13.	18.
99	5.	5.	7.

X	DX	NX	SX
10	6755641.	150490569.	3106218220.
11	6492892.	149742928.	2949219659.
12	6239763.	149250036.	2799976731.
13	5995926.	137010273.	2656726690.
14	5761056.	131014348.	2519716422.
15	5534859.	125253289.	2388702075.
16	5317031.	119718430.	2263448780.
17	5107284.	114401399.	2143730350.
18	4905389.	109294115.	2029328957.
19	4711202.	104388726.	1920034842.
20	4524570.	99677525.	1815646110.
21	4345293.	95152955.	1715968591.
22	4173119.	90807662.	1620815630.
23	4007767.	86634544.	1530007974.
24	3848966.	82626777.	1443373431.
25	3696460.	78777809.	1360746654.
26	3549995.	75081349.	1281968845.
27	3409333.	71531354.	1206887496.
28	3274245.	68122021.	1135356141.
29	3144478.	64847776.	1067234120.
30	3019796.	61703299.	1002386344.
31	2899974.	58683503.	940683045.
32	2784772.	55783529.	881999542.
33	2673968.	52998756.	826216013.
34	2567349.	50324788.	773217257.
35	2464721.	47757440.	722892460.
36	2365900.	45292718.	675135029.
37	2270691.	42926818.	629842310.
38	2178935.	40656127.	586915492.
39	2090464.	38477192.	546259362.
40	2005141.	36386727.	507782173.
41	1922857.	34381586.	471392446.
42	1843506.	32458729.	437013860.
43	1766986.	30615222.	404555131.
44	1693201.	28848236.	373939909.
45	1622044.	27155035.	345091673.
46	1553398.	25532990.	317936638.
47	1487139.	23979593.	292403647.
48	1423145.	22492454.	268424054.
49	1361286.	21069309.	245231601.
50	1301450.	19708023.	224862292.
51	1243521.	18406573.	205154269.
52	1187403.	17163052.	186747696.
53	1132993.	15975649.	169584645.
54	1080198.	14842655.	153608996.
55	1028925.	13762457.	138766341.
56	979079.	12733532.	125003883.
57	930552.	11754453.	112270351.
58	883236.	10823901.	100515898.
59	837437.	9943065.	89691997.
60	791901.	9103628.	79751332.
61	747809.	8311727.	70647704.
62	704769.	7563919.	62335977.
63	662797.	6859150.	54772058.
64	621855.	6196363.	47912908.
65	581945.	5574509.	41716544.
66	541724.	4992564.	36142035.
67	502532.	4450840.	31149472.
68	464320.	3948308.	26698632.
69	427094.	3483987.	22750324.
70	390906.	3056893.	19266337.
71	355849.	2665986.	16209445.
72	322040.	2310137.	13543458.
73	289610.	1988097.	11233321.
74	258688.	1698488.	9245224.
75	229394.	1439799.	7546736.
76	201830.	1210405.	6106937.
77	176081.	1008575.	4896532.
78	152220.	832495.	3887957.
79	130303.	680274.	3055462.
80	110366.	549971.	2375187.
81	92421.	439805.	1825210.
82	76459.	347185.	1385611.
83	62442.	270726.	1038420.
84	50301.	208285.	767700.
85	39938.	157984.	559412.
86	31230.	118045.	401432.
87	24031.	86815.	283387.
88	18182.	62783.	196572.
89	13514.	44602.	133780.
90	9858.	31088.	89187.
91	7051.	21230.	58099.
92	4940.	14179.	36869.
93	3387.	9238.	22690.
94	2270.	5851.	13451.
95	1435.	3562.	7600.
96	947.	2097.	4010.
97	588.	1150.	1921.
98	355.	563.	774.
99	250.	208.	200.

X	CX	MX	RX
10	2917.	736349.	37018042.
11	3403.	733432.	36281693.
12	3846.	730029.	35548261.
13	4255.	726163.	34818232.
14	4620.	721928.	34092049.
15	4949.	717308.	33370121.
16	5246.	712359.	32652812.
17	5461.	707113.	31940453.
18	5519.	701652.	31233340.
19	5431.	696134.	30531687.
20	5255.	690702.	29835554.
21	5047.	685447.	29144851.
22	4847.	680399.	28459405.
23	4655.	675552.	27779005.
24	4471.	670897.	27103453.
25	4294.	666426.	26432556.
26	4123.	662133.	25766130.
27	3960.	658009.	25103997.
28	3835.	654049.	24445988.
29	3740.	650215.	23791939.
30	3676.	646474.	23141724.
31	3664.	642798.	22495250.
32	3698.	639134.	21852452.
33	3774.	635436.	21213319.
34	3883.	631662.	20577881.
35	4024.	627779.	19946219.
36	4213.	623755.	19318440.
37	4421.	619542.	18694686.
38	4666.	615120.	18075144.
39	4921.	610455.	17460024.
40	5163.	605534.	16849569.
41	5395.	600371.	16244035.
42	5616.	594976.	15643664.
43	5824.	589360.	15048689.
44	6034.	583536.	14459329.
45	6260.	577502.	13875793.
46	6512.	571242.	13298291.
47	6797.	564729.	12727050.
48	7123.	557933.	12162320.
49	7479.	550810.	11604388.
50	7872.	543331.	11053578.
51	8291.	535458.	10510242.
52	8740.	527168.	9974788.
53	9219.	518428.	9447621.
54	9727.	509209.	8929193.
55	10272.	499482.	8419984.
56	10870.	489209.	7920502.
57	11525.	478340.	7431293.
58	12229.	466814.	6952953.
59	12943.	454586.	6486139.
60	13634.	441643.	6031553.
61	14278.	428009.	5589909.
62	14875.	413731.	5161901.
63	15440.	398855.	4748170.
64	15992.	383415.	4349312.
65	17639.	367423.	3965900.
66	18356.	349584.	3598476.
67	18884.	331228.	3248892.
68	19366.	312345.	2917664.
69	19761.	292977.	2605319.
70	20023.	273216.	2312342.
71	20123.	253193.	2039127.
72	20044.	233070.	1785934.
73	19783.	213027.	1552863.
74	19344.	193244.	1339836.
75	18742.	173900.	1146592.
76	17986.	155158.	972693.
77	17088.	137171.	817535.
78	16062.	120083.	680364.
79	14926.	104021.	560281.
80	13700.	89095.	456260.
81	12407.	75395.	367165.
82	11076.	62987.	291770.
83	9739.	51911.	228782.
84	8426.	42172.	176871.
85	7172.	33744.	134699.
86	5998.	26572.	100955.
87	4925.	20574.	74363.
88	3969.	15649.	53808.
89	3136.	11680.	38159.
90	2426.	8544.	26479.
91	1840.	6117.	17934.
92	1363.	4277.	11818.
93	987.	2914.	7540.
94	696.	1927.	4627.
95	481.	1229.	2700.
96	323.	748.	1471.
97	210.	426.	723.
98	133.	215.	297.
99	82.	82.	82.

X	QX	NX	SX
10	6439276.	136665928.	2552009154.
11	6159220.	130226652.	2415343226.
12	5890776.	124067431.	2285116572.
13	5633495.	118176654.	2161049143.
14	5386925.	112543159.	2042872499.
15	5150653.	107156234.	1930329331.
16	4924271.	102005580.	1823173097.
17	4707386.	97081309.	1721167517.
18	4499667.	92373923.	1624086208.
19	4300863.	87874256.	1531712285.
20	4110724.	83573393.	1443838026.
21	3928955.	79462670.	1360264632.
22	3755224.	75533715.	1280801962.
23	3589174.	71778491.	1205268251.
24	3430469.	68189317.	1133489760.
25	3278780.	64758848.	1065300443.
26	3133798.	61480069.	1000541592.
27	2995227.	58346271.	939061526.
28	2862784.	55351044.	880715252.
29	2736169.	52488260.	825364211.
30	2615105.	49752091.	772875951.
31	2499324.	47136986.	723123860.
32	2388555.	44637662.	675986874.
33	2282542.	42249107.	631349212.
34	2181044.	39966565.	589100105.
35	2083841.	37785520.	549133540.
36	1990720.	35701680.	511348020.
37	1901467.	33710959.	475646340.
38	1815901.	31809492.	441935381.
39	1733835.	29993591.	410125888.
40	1655110.	28259756.	380132297.
41	1579596.	26604646.	351872541.
42	1507164.	25025050.	325267892.
43	1437694.	23517885.	300242842.
44	1371067.	22080192.	276724960.
45	1307164.	20709125.	254644768.
46	1245853.	19401961.	233935643.
47	1187006.	18156108.	214533682.
48	1130492.	16969102.	196377574.
49	1076180.	15838610.	179408472.
50	1023953.	14762430.	163569862.
51	973695.	13738478.	148807431.
52	925304.	12764783.	135068953.
53	878681.	11839479.	122304170.
54	833727.	10960798.	110464691.
55	790354.	10127071.	99503893.
56	748466.	9336717.	89326822.
57	707966.	8588251.	80040105.
58	668753.	7880285.	71451854.
59	630740.	7211532.	63571569.
60	593873.	6580792.	56360037.
61	558124.	5986918.	49779245.
62	523484.	5426795.	43792327.
63	489946.	4905311.	38363532.
64	457458.	4415365.	33458221.
65	426079.	3957877.	29042856.
66	394733.	3531798.	25084980.
67	364423.	3137065.	21553182.
68	335102.	2772641.	18416117.
69	306751.	2437539.	15643476.
70	279426.	2130778.	13205936.
71	253149.	1851353.	11075156.
72	228001.	1598204.	9223802.
73	204060.	1370203.	7625602.
74	181401.	1166143.	6255392.
75	160089.	984742.	5089257.
76	140178.	824653.	4104512.
77	121710.	684475.	3279862.
78	104713.	562765.	2595387.
79	89208.	458052.	2032621.
80	75197.	368844.	1574562.
81	62669.	293648.	1205722.
82	51597.	230979.	912077.
83	41936.	179382.	681098.
84	33621.	137446.	501716.
85	26567.	103825.	364274.
86	20675.	77258.	260445.
87	15833.	56583.	183187.
88	11922.	40750.	126603.
89	8818.	28829.	85853.
90	6402.	20010.	57024.
91	4557.	13608.	37014.
92	3178.	9051.	23406.
93	2168.	5873.	14352.
94	1446.	3705.	8482.
95	941.	2259.	4777.
96	597.	1318.	2518.
97	369.	720.	1200.
98	222.	351.	480.
99	129.	129.	129.

X	CX	MX	RX
10	2767.	554069.	26764242.
11	3212.	551302.	26210174.
12	3614.	548089.	25658872.
13	3979.	544476.	25110783.
14	4299.	540497.	24566307.
15	4584.	536198.	24025810.
16	4835.	531614.	23489611.
17	5009.	526779.	22957997.
18	5038.	521770.	22431217.
19	4935.	516732.	21909447.
20	4752.	511797.	21392715.
21	4542.	507046.	20880910.
22	4341.	502504.	20373872.
23	4149.	498163.	19871369.
24	3962.	494013.	19373206.
25	3790.	490048.	18879192.
26	3622.	486258.	18389144.
27	3462.	482635.	17902887.
28	3337.	479173.	17420251.
29	3239.	475836.	16941078.
30	3168.	472597.	16465242.
31	3143.	469429.	15992645.
32	3157.	466286.	15523216.
33	3206.	463130.	15056930.
34	3283.	459923.	14593800.
35	3386.	456640.	14133877.
36	3528.	453254.	13677237.
37	3685.	449726.	13223983.
38	3870.	446041.	12774257.
39	4062.	442172.	12328215.
40	4241.	438110.	11886044.
41	4411.	433869.	11447934.
42	4569.	429458.	11014065.
43	4716.	424889.	10584607.
44	4862.	420172.	10159719.
45	5021.	415310.	9739546.
46	5198.	410289.	9324236.
47	5399.	405091.	8913947.
48	5631.	399692.	8508856.
49	5884.	394061.	8109164.
50	6164.	388177.	7715103.
51	6461.	382013.	7326926.
52	6778.	375552.	6944913.
53	7115.	368774.	6569362.
54	7472.	361658.	6200588.
55	7853.	354187.	5838930.
56	8270.	346334.	5484743.
57	8727.	338064.	5138409.
58	9215.	329338.	4800345.
59	9706.	320123.	4471008.
60	10176.	310417.	4150882.
61	10605.	300241.	3840468.
62	10996.	289635.	3540227.
63	11359.	278639.	3250592.
64	11709.	267280.	2971953.
65	12996.	255571.	2704673.
66	13311.	242573.	2449102.
67	13628.	229261.	2206529.
68	13911.	215633.	1977267.
69	14126.	201722.	1761634.
70	14244.	187597.	1559912.
71	14247.	173353.	1372315.
72	14123.	159186.	1198963.
73	13872.	144983.	1039857.
74	13500.	131111.	894874.
75	13017.	117611.	763763.
76	12432.	104594.	646152.
77	11755.	92162.	541558.
78	10996.	80406.	449397.
79	10170.	69410.	368990.
80	9290.	59240.	299580.
81	8373.	49951.	240340.
82	7439.	41577.	190389.
83	6510.	34139.	148812.
84	5606.	27629.	114673.
85	4748.	22023.	87044.
86	3952.	17275.	65021.
87	3229.	13323.	47746.
88	2590.	10094.	34423.
89	2037.	7504.	24329.
90	1569.	5467.	16825.
91	1183.	3898.	11357.
92	873.	2715.	7459.
93	629.	1842.	4744.
94	442.	1213.	2902.
95	303.	771.	1686.
96	203.	468.	917.
97	132.	265.	450.
98	83.	134.	184.
99	51.	51.	51.

X	DX	NX	SX
10	6139132.	120066386.	2112264664.
11	5844167.	113929254.	1992196270.
12	5562840.	106085087.	1878267024.
13	5294546.	102522247.	1770181937.
14	5038704.	97227701.	1667659689.
15	4794764.	92188997.	1570431989.
16	4562195.	87394233.	1478242992.
17	4340489.	82832039.	1390848756.
18	4129202.	78491549.	1308016719.
19	3927973.	74362347.	1229525170.
20	3736441.	70434374.	1155162823.
21	3554216.	66697934.	1084728449.
22	3380879.	63143717.	1018030515.
23	3215995.	59762838.	954886798.
24	3059153.	56546843.	895123960.
25	2909960.	53487690.	838577117.
26	2768042.	50577730.	785089427.
27	2633046.	47805688.	734511697.
28	2504634.	45176641.	686702009.
29	2382460.	42672007.	641525368.
30	2266203.	40289547.	598853361.
31	2155556.	38023344.	558563814.
32	2050213.	35867788.	520540470.
33	1949887.	33817575.	484672683.
34	1854309.	31867687.	450855108.
35	1763231.	30013378.	418987421.
36	1676416.	28250147.	388974043.
37	1593630.	26573730.	360723897.
38	1514670.	24980100.	334150166.
39	1439330.	23465431.	309170066.
40	1367435.	22026101.	285704636.
41	1298831.	20659666.	263678535.
42	1233373.	19359835.	243019869.
43	1170919.	18126462.	223660034.
44	1111338.	16955543.	205533572.
45	1054495.	15844205.	188578029.
46	1000250.	14789710.	172733824.
47	948465.	13789460.	157944115.
48	899007.	12840994.	144154655.
49	851741.	11941987.	131313661.
50	806546.	11090247.	119371674.
51	763307.	10283700.	108281427.
52	721918.	9520393.	97997727.
53	682278.	8798475.	88477334.
54	644290.	8116196.	79678859.
55	607863.	7471906.	71562663.
56	572907.	6864043.	64090757.
57	539326.	6291136.	57226714.
58	507027.	5751810.	50935579.
59	475930.	5244763.	45183768.
60	445978.	4768853.	39938985.
61	417135.	4322876.	35170132.
62	389383.	3905740.	30847256.
63	362791.	3516357.	26941516.
64	337060.	3153657.	23425158.
65	312424.	2816597.	20271501.
66	288061.	2504172.	17454905.
67	264676.	2216111.	14950733.
68	242221.	1951435.	12734621.
69	220680.	1709214.	10783186.
70	200058.	1488534.	9073973.
71	180382.	1288476.	7585439.
72	161689.	1108094.	6296963.
73	144022.	948405.	5188868.
74	127419.	802384.	4242463.
75	111914.	674964.	3440080.
76	97529.	563050.	2765116.
77	84276.	465521.	2202066.
78	72162.	381245.	1736542.
79	61184.	309083.	1355300.
80	51328.	247900.	1046216.
81	42573.	196572.	798316.
82	34885.	153998.	601745.
83	28218.	119113.	447746.
84	22515.	90895.	328633.
85	17707.	68380.	237738.
86	13714.	50674.	169357.
87	10452.	36960.	118684.
88	7833.	26507.	81724.
89	5266.	18675.	55217.
90	4166.	12908.	36543.
91	2952.	8742.	23634.
92	2048.	5790.	14892.
93	1391.	3742.	9102.
94	923.	2351.	5360.
95	598.	1428.	3009.
96	378.	830.	1582.
97	232.	452.	752.
98	139.	219.	300.
99	81.	81.	81.

X	CX	MX	RX
10	2625.	421545.	19480292.
11	3034.	418920.	19058740.
12	3396.	415887.	18639820.
13	3721.	412490.	18223940.
14	4032.	408769.	17811449.
15	4247.	404767.	17402660.
16	4456.	400520.	16997914.
17	4597.	396062.	16597393.
18	4601.	391465.	16201331.
19	4485.	386864.	15809860.
20	4299.	382379.	15423002.
21	4089.	378060.	15040623.
22	3890.	373991.	14662543.
23	3700.	370101.	14288552.
24	3519.	366401.	13918451.
25	3348.	362882.	13552050.
26	3184.	359534.	13189160.
27	3029.	356349.	12829634.
28	2905.	353320.	12473285.
29	2807.	350415.	12119965.
30	2732.	347608.	11769550.
31	2698.	344875.	11421942.
32	2696.	342178.	11077067.
33	2726.	339481.	10734889.
34	2778.	336755.	10395400.
35	2851.	333977.	10058652.
36	2957.	331126.	9724675.
37	3073.	328169.	9393549.
38	3212.	325096.	9065380.
39	3356.	321883.	8740264.
40	3488.	318527.	8418401.
41	3610.	315040.	8099873.
42	3721.	311430.	7784834.
43	3823.	307709.	7473403.
44	3923.	303886.	7165694.
45	4031.	299964.	6861808.
46	4153.	295933.	6561844.
47	4293.	291779.	6265911.
48	4457.	287486.	5974132.
49	4635.	283029.	5686646.
50	4832.	278394.	5403617.
51	5041.	273562.	5125223.
52	5263.	268521.	4851661.
53	5499.	263258.	4583140.
54	5746.	257760.	4319882.
55	6011.	252013.	4062122.
56	6300.	246002.	3810109.
57	6616.	239702.	3564107.
58	6953.	233086.	3324405.
59	7299.	226133.	3091319.
60	7605.	218844.	2865185.
61	7889.	211239.	2646341.
62	8140.	203350.	2435103.
63	8369.	195210.	2231753.
64	8585.	186841.	2036543.
65	8786.	178255.	1849702.
66	9668.	168770.	1671447.
67	9851.	159102.	1502677.
68	10007.	149251.	1343576.
69	10113.	139243.	1194325.
70	10150.	129130.	1055061.
71	10103.	118980.	925951.
72	9968.	108877.	806971.
73	9744.	98910.	698094.
74	9438.	89165.	599184.
75	9057.	79728.	510019.
76	8609.	70671.	430291.
77	8101.	62063.	359619.
78	7542.	53962.	297556.
79	6942.	46420.	243594.
80	6311.	39478.	197174.
81	5661.	33167.	157696.
82	5005.	27506.	124529.
83	4359.	22501.	97022.
84	3736.	18142.	74522.
85	3149.	14405.	56380.
86	2609.	11256.	41975.
87	2122.	8647.	30719.
88	1694.	6525.	22072.
89	1325.	4832.	15547.
90	1016.	3506.	10715.
91	763.	2490.	7209.
92	560.	1727.	4719.
93	402.	1167.	2991.
94	281.	766.	1824.
95	192.	485.	1050.
96	127.	293.	573.
97	82.	166.	280.
98	52.	83.	115.
99	31.	31.	31.

X	DX	NX	SX
10	5854305.	100072483.	1760742769.
11	5546613.	100210177.	1654670287.
12	5254557.	94671565.	1554452109.
13	4977459.	89416977.	1459780543.
14	4714489.	84439518.	1370363568.
15	4464983.	79725030.	1285924049.
16	4228275.	75260047.	1206199020.
17	4003732.	71031172.	1130938973.
18	3790786.	67028040.	1059907201.
19	3588958.	63237254.	992879161.
20	3397777.	59648296.	929641907.
21	3216751.	56250519.	869993611.
22	3045370.	53033767.	813743093.
23	2883120.	49986397.	760709325.
24	2729514.	47105277.	710720928.
25	2584092.	44375763.	663615651.
26	2446417.	41791671.	619239888.
27	2316078.	39345253.	577448217.
28	2192683.	37029175.	538102963.
29	2075841.	34836493.	501073788.
30	1965188.	32760652.	466237295.
31	1860379.	30795464.	433476643.
32	1761075.	28935886.	402681179.
33	1666960.	27174011.	373746093.
34	1577738.	25507051.	346572082.
35	1493133.	23929313.	321065032.
36	1412889.	22436180.	297135719.
37	1336751.	21023290.	274699539.
38	1264497.	19686539.	253676249.
39	1195906.	18422042.	233989709.
40	1130785.	17226136.	215567667.
41	1068964.	16095351.	198341531.
42	1010279.	15026387.	182246180.
43	954577.	14016107.	167219793.
44	901711.	13061530.	153203686.
45	851535.	12159819.	140142156.
46	803902.	11308285.	127982337.
47	758670.	10504383.	116674053.
48	715701.	9745713.	106169670.
49	674858.	9030012.	96423957.
50	636021.	8355154.	87393946.
51	599071.	7719133.	79038792.
52	563902.	7120062.	71319659.
53	530413.	6556160.	64199597.
54	498507.	6025747.	57643437.
55	468093.	5527240.	51617690.
56	439083.	5059147.	46090449.
57	411387.	4620064.	41031302.
58	384918.	4208677.	36411236.
59	359597.	3823759.	32202561.
60	335369.	3464162.	28378801.
61	312194.	3128792.	24914640.
62	290042.	2816599.	21785847.
63	268887.	2526557.	18969240.
64	248694.	2257670.	16442692.
65	229424.	2008976.	14185022.
66	210531.	1779552.	12176040.
67	192523.	1569021.	10396494.
68	175355.	1376498.	8827473.
69	159003.	1201143.	7450976.
70	143461.	1042140.	6249833.
71	128738.	898679.	5207692.
72	114851.	769941.	4309013.
73	101816.	655090.	3539073.
74	89652.	553274.	2883983.
75	78370.	463621.	2330709.
76	67972.	385252.	1867086.
77	58457.	317279.	1481836.
78	49817.	258822.	1164557.
79	42038.	209005.	905732.
80	35100.	166966.	696730.
81	28975.	131866.	529764.
82	23630.	102892.	397896.
83	19023.	79262.	295006.
84	15107.	60239.	215744.
85	11824.	45132.	155506.
86	9114.	33308.	110374.
87	6914.	24193.	77066.
88	5157.	17280.	52873.
89	3778.	12123.	35593.
90	2717.	8345.	23470.
91	1916.	5628.	15125.
92	1323.	3712.	9497.
93	894.	2369.	5784.
94	591.	1495.	3395.
95	381.	904.	1900.
96	232.	524.	996.
97	147.	204.	472.
98	87.	138.	186.
99	50.	50.	50.

Table (5.24)
MONETARY FUNCTIONS (SUMS ASSURED) AT .055 PER CENT INTEREST RATE

X	CX	MX	RX
10	2492.	324433.	14277689.
11	2866.	321941.	13953250.
12	3193.	319076.	13631309.
13	3482.	315883.	13312233.
14	3727.	312401.	12996350.
15	3936.	308674.	12683949.
16	4112.	304738.	12375272.
17	4220.	300626.	12070530.
18	4204.	296406.	11769910.
19	4079.	292202.	11473504.
20	3891.	288123.	11181302.
21	3683.	284233.	10893179.
22	3487.	280549.	10608947.
23	3301.	277062.	10328397.
24	3125.	273761.	10051332.
25	2959.	270636.	9777574.
26	2801.	267677.	9506939.
27	2652.	264876.	9239262.
28	2531.	262224.	8974387.
29	2434.	259692.	8712169.
30	2358.	257258.	8452471.
31	2317.	254900.	8195213.
32	2305.	252583.	7940313.
33	2319.	250277.	7687731.
34	2352.	247958.	7437453.
35	2403.	245606.	7189495.
36	2480.	243202.	6943890.
37	2566.	240722.	6700687.
38	2669.	238156.	6459965.
39	2775.	235487.	6221809.
40	2870.	232712.	5986322.
41	2957.	229842.	5753610.
42	3034.	226885.	5523768.
43	3102.	223851.	5296882.
44	3168.	220750.	5073031.
45	3240.	217582.	4852281.
46	3322.	214342.	4634694.
47	3418.	211020.	4420357.
48	3531.	207602.	4209336.
49	3655.	204071.	4001734.
50	3793.	200416.	3797463.
51	3937.	196623.	3597247.
52	4092.	192686.	3400624.
53	4254.	188594.	3207938.
54	4425.	184340.	3019344.
55	4607.	179915.	2835004.
56	4805.	175308.	2655089.
57	5023.	170503.	2479781.
58	5253.	165480.	2309276.
59	5481.	160226.	2143790.
60	5692.	154745.	1983572.
61	5876.	149053.	1828827.
62	6035.	143177.	1679774.
63	6175.	137142.	1536596.
64	6305.	130967.	1399454.
65	6433.	124663.	1268487.
66	7032.	117730.	1143824.
67	7132.	110698.	1026094.
68	7210.	103566.	915397.
69	7252.	96356.	811830.
70	7244.	89103.	715472.
71	7176.	81860.	626371.
72	7047.	74683.	544512.
73	6856.	67637.	469820.
74	6609.	60781.	402192.
75	6312.	54172.	341411.
76	5971.	47860.	287239.
77	5593.	41889.	239379.
78	5182.	36296.	197491.
79	4747.	31114.	161192.
80	4295.	26367.	130081.
81	3835.	22072.	103713.
82	3374.	18238.	81641.
83	2925.	14863.	63404.
84	2495.	11938.	48541.
85	2093.	9443.	36603.
86	1726.	7350.	27160.
87	1397.	5624.	19810.
88	1110.	4228.	14185.
89	864.	3118.	9950.
90	660.	2254.	6844.
91	493.	1594.	4586.
92	360.	1101.	2992.
93	257.	741.	1891.
94	179.	465.	1149.
95	122.	306.	665.
96	80.	164.	359.
97	52.	104.	175.
98	32.	52.	71.
99	20.	20.	20.

Table (5.24)
 MONETARY FUNCTIONS (SUMS ASSURED) AT .055 PER CENT INTEREST RATE

X	CX	FX	RX
10	2492.	324433.	14277689.
11	2666.	321941.	13953250.
12	3193.	319076.	13631309.
13	3482.	315883.	13312233.
14	3727.	312401.	12996350.
15	3936.	308674.	12683949.
16	4112.	304738.	12375272.
17	4220.	300626.	12070536.
18	4204.	296406.	11769910.
19	4079.	292202.	11473504.
20	3891.	288123.	11181302.
21	3683.	284233.	10893179.
22	3487.	280549.	10608947.
23	3301.	277062.	10328397.
24	3125.	273761.	10051332.
25	2959.	270636.	9777574.
26	2801.	267677.	9506939.
27	2652.	264876.	9239262.
28	2531.	262224.	8974387.
29	2434.	259692.	8712169.
30	2358.	257258.	8452471.
31	2317.	254900.	8195213.
32	2305.	252583.	7940313.
33	2319.	250277.	7687731.
34	2352.	247958.	7437453.
35	2403.	245606.	7189495.
36	2480.	243202.	6943890.
37	2566.	240722.	6700687.
38	2669.	238156.	6459965.
39	2775.	235487.	6221804.
40	2870.	232712.	5986322.
41	2957.	229842.	5753610.
42	3034.	226885.	5523768.
43	3102.	223851.	5296882.
44	3168.	220750.	5073031.
45	3240.	217582.	4852281.
46	3322.	214342.	4634699.
47	3415.	211020.	4420357.
48	3531.	207602.	4209336.
49	3655.	204071.	4001734.
50	3793.	200416.	3797463.
51	3937.	196623.	3597247.
52	4092.	192686.	3400624.
53	4254.	188594.	3207938.
54	4425.	184340.	3019344.
55	4607.	179915.	2835004.
56	4805.	175308.	2655089.
57	5023.	170503.	2479781.
58	5253.	165480.	2309276.
59	5481.	160226.	2143796.
60	5692.	154745.	1983572.
61	5876.	149053.	1828827.
62	6035.	143177.	1679774.
63	6175.	137142.	1536596.
64	6305.	130967.	1399454.
65	6933.	124663.	1268487.
66	7032.	117730.	1143824.
67	7132.	110698.	1026094.
68	7210.	103566.	915397.
69	7252.	96356.	811830.
70	7244.	89103.	715472.
71	7176.	81860.	626371.
72	7047.	74683.	544512.
73	6856.	67637.	469826.
74	6609.	60781.	402192.
75	6312.	54172.	341411.
76	5971.	47860.	287239.
77	5593.	41889.	239379.
78	5182.	36296.	197491.
79	4747.	31114.	161195.
80	4295.	26367.	130081.
81	3835.	22072.	103713.
82	3374.	18238.	81641.
83	2925.	14863.	63404.
84	2495.	11938.	48541.
85	2093.	9443.	36603.
86	1726.	7350.	27160.
87	1397.	5624.	19810.
88	1110.	4228.	14185.
89	864.	3118.	9958.
90	660.	2254.	6844.
91	493.	1594.	4586.
92	360.	1101.	2992.
93	257.	741.	1891.
94	179.	465.	1149.
95	122.	306.	662.
96	80.	164.	359.
97	52.	104.	175.
98	32.	52.	71.
99	20.	20.	20.

X	DX	NX	SX
10	5583947.	94165513.	1477696832.
11	5265509.	80601565.	1383511320.
12	4964754.	63336056.	1294909754.
13	4680728.	78371302.	1211573698.
14	4412522.	73690574.	1133202397.
15	4159285.	69278051.	1059511823.
16	3920205.	65116766.	990233772.
17	3694512.	61198561.	925115005.
18	3461513.	57504050.	863916444.
19	3280603.	54022537.	806412394.
20	3091198.	50741934.	752389857.
21	2912702.	47650736.	701647924.
22	2744512.	44738035.	653997188.
23	2586035.	41993522.	609259153.
24	2436709.	39407488.	567265631.
25	2296005.	36970779.	527856143.
26	2163426.	34674774.	490887364.
27	2038502.	32511348.	456212590.
28	1920792.	30472845.	423701242.
29	1809861.	28552053.	393228397.
30	1705304.	26742192.	364676344.
31	1606741.	25036888.	337934152.
32	1513801.	23430147.	312897264.
33	1426142.	21916346.	289467117.
34	1343442.	20490204.	267550771.
35	1265405.	19146761.	247060568.
36	1191751.	17861357.	227913806.
37	1122211.	16689606.	210032449.
38	1056546.	15567395.	193342843.
39	994522.	14510849.	177775449.
40	935931.	13516327.	163264600.
41	880590.	12580396.	149746273.
42	828321.	11699806.	137167877.
43	778959.	10871486.	125468071.
44	732348.	10092527.	114596582.
45	688334.	9360179.	104504056.
46	646765.	8671845.	95143879.
47	607495.	8025080.	86472034.
48	570385.	7417585.	78446954.
49	535298.	6847200.	71029369.
50	502113.	6311902.	64182169.
51	470711.	5809790.	57870267.
52	440988.	5339078.	52060477.
53	412842.	4898091.	46721399.
54	386178.	4485249.	41823308.
55	360907.	4099071.	37338059.
56	336943.	3738165.	33238988.
57	314200.	3401222.	29500823.
58	292597.	3087022.	26099602.
59	272061.	2794424.	23012580.
60	252534.	2522364.	20218156.
61	233973.	2269830.	17695792.
62	216347.	2035857.	15425962.
63	199620.	1819510.	13390102.
64	183758.	1619890.	11570595.
65	168721.	1436132.	9950705.
66	154096.	1267411.	8514574.
67	140251.	1113315.	7247163.
68	127141.	973064.	6133848.
69	114741.	845923.	5160789.
70	103038.	731182.	4314860.
71	92027.	628144.	3583678.
72	81712.	536117.	2955534.
73	72097.	454405.	2419416.
74	63184.	382308.	1965012.
75	54972.	319123.	1582704.
76	47454.	264151.	1263581.
77	40619.	216697.	999430.
78	34452.	176078.	782733.
79	28935.	141626.	606655.
80	24045.	112691.	465029.
81	19756.	88645.	352338.
82	16035.	68890.	263693.
83	12849.	52854.	194803.
84	10155.	40006.	141949.
85	7911.	29851.	101943.
86	6069.	21940.	72093.
87	4582.	15870.	50153.
88	3401.	11288.	34282.
89	2480.	7887.	22994.
90	1775.	5406.	15107.
91	1246.	3631.	9701.
92	856.	2385.	6070.
93	576.	1529.	3684.
94	379.	953.	2155.
95	243.	574.	1202.
96	152.	331.	620.
97	93.	179.	297.
98	55.	86.	118.
99	32.	32.	32.

X	DX	NX	SX
10	5327260.	84021334.	1246170934.
11	4999876.	76694074.	1164149600.
12	4692160.	73694196.	1085455526.
13	4402960.	69002038.	1011761328.
14	4131184.	64599077.	942759291.
15	3875811.	60467894.	878160213.
16	3635874.	56592083.	817692319.
17	3410464.	52956208.	761100231.
18	3198752.	49545745.	708144028.
19	3000009.	46346992.	658598283.
20	2813533.	43346983.	612251291.
21	2638623.	40533451.	568904300.
22	2474587.	37894827.	528370857.
23	2320749.	35420240.	490476030.
24	2176476.	33099490.	455055790.
25	2041170.	30923015.	421956299.
26	1914277.	28881844.	391033285.
27	1795272.	26967567.	362151441.
28	1683665.	25172296.	335183873.
29	1578980.	23488631.	310011577.
30	1480777.	21909651.	286522946.
31	1388640.	20428874.	264613296.
32	1302174.	19040234.	244184422.
33	1221010.	17738059.	225144188.
34	1144806.	16517049.	207406129.
35	1073244.	15372243.	190889080.
36	1006030.	14299000.	175516837.
37	942879.	13292970.	161217837.
38	883540.	12350091.	147924867.
39	827767.	11466551.	135574777.
40	775344.	10638783.	124108226.
41	726073.	9863440.	113469443.
42	679769.	9137367.	103606003.
43	636259.	8457598.	94468636.
44	595378.	7821339.	86011038.
45	556969.	7225962.	78189699.
46	520876.	6668993.	70963737.
47	486953.	6148117.	64294744.
48	455060.	5661164.	58146627.
49	425062.	5206105.	52485463.
50	396839.	4781043.	47229358.
51	370274.	4384204.	42498310.
52	345265.	4013930.	38114112.
53	321710.	3668665.	34100182.
54	299519.	3346955.	30431512.
55	278605.	3047435.	27084563.
56	258885.	2768830.	24037127.
57	240278.	2509945.	21268291.
58	222707.	2269668.	18758352.
59	206103.	2046961.	16488684.
60	190412.	1840858.	14441723.
61	175589.	1650446.	12600866.
62	161599.	1474856.	10950420.
63	148405.	1313258.	9475564.
64	135971.	1164652.	8162306.
65	124258.	1028881.	6997454.
66	112955.	904623.	5968573.
67	102323.	791668.	5063950.
68	92323.	689345.	4272282.
69	82928.	597022.	3582931.
70	74120.	514094.	2985912.
71	65889.	439974.	2471821.
72	58229.	374085.	2031848.
73	51136.	315856.	1657762.
74	44604.	264721.	1341906.
75	38624.	220117.	1077185.
76	33186.	181492.	857062.
77	28272.	148307.	675577.
78	23867.	120034.	527270.
79	19951.	96167.	407236.
80	16502.	76216.	311066.
81	13494.	59714.	234852.
82	10902.	46220.	175138.
83	8694.	35318.	128919.
84	6839.	26624.	93601.
85	5303.	19785.	66971.
86	4049.	14482.	47192.
87	3043.	10433.	32710.
88	2248.	7390.	22277.
89	1632.	5142.	14888.
90	1162.	3510.	9746.
91	812.	2348.	6236.
92	555.	1536.	3888.
93	372.	981.	2352.
94	243.	609.	1371.
95	155.	365.	762.
96	97.	210.	397.
97	59.	113.	187.
98	35.	54.	74.
99	20.	20.	20.

Table (5.28)
MONETARY FUNCTIONS (SUMS ASSURED) AT .065 PER CENT INTEREST RATE

X	CX	MX	RX
10	2246.	199187.	7840910.
11	2559.	196941.	7641723.
12	2624.	194382.	7444282.
13	3051.	191558.	7250400.
14	3235.	188507.	7058842.
15	3384.	185272.	6870335.
16	3523.	181887.	6685063.
17	3561.	178364.	6503176.
18	3514.	174823.	6324792.
19	3377.	171309.	6149968.
20	3121.	167932.	5978659.
21	2993.	164740.	5810727.
22	2807.	161747.	5645987.
23	2632.	158941.	5484240.
24	2469.	156308.	5325299.
25	2315.	153839.	5168991.
26	2171.	151524.	5015152.
27	2036.	149353.	4863628.
28	1926.	147317.	4714275.
29	1834.	145391.	4566958.
30	1760.	143557.	4421567.
31	1713.	141797.	4278010.
32	1689.	140083.	4136213.
33	1683.	138395.	3996130.
34	1691.	136712.	3857735.
35	1711.	135021.	3721024.
36	1749.	133310.	3586003.
37	1793.	131560.	3452693.
38	1848.	129768.	3321133.
39	1903.	127920.	3191365.
40	1950.	126017.	3063442.
41	1989.	124068.	2937428.
42	2022.	122078.	2813360.
43	2048.	120056.	2691282.
44	2072.	118008.	2571226.
45	2099.	115936.	2453217.
46	2132.	113837.	2337281.
47	2173.	111705.	2223444.
48	2224.	109532.	2111739.
49	2281.	107308.	2002207.
50	2344.	105027.	1894900.
51	2411.	102683.	1789873.
52	2482.	100272.	1687190.
53	2556.	97790.	1586918.
54	2634.	95234.	1489128.
55	2716.	92600.	1393893.
56	2807.	89884.	1301293.
57	2906.	87078.	1211409.
58	3011.	84171.	1124331.
59	3112.	81160.	1040160.
60	3201.	78048.	958999.
61	3274.	74847.	880951.
62	3331.	71573.	806104.
63	3376.	68242.	734531.
64	3415.	64866.	666289.
65	3720.	61452.	601423.
66	3738.	57732.	539971.
67	3755.	53994.	482239.
68	3761.	50240.	428245.
69	3747.	46479.	378005.
70	3707.	42732.	331526.
71	3638.	39025.	288794.
72	3539.	35386.	249769.
73	3411.	31847.	214382.
74	3257.	28436.	182532.
75	3082.	25179.	154099.
76	2888.	22098.	128920.
77	2679.	19210.	106822.
78	2459.	16530.	87612.
79	2232.	14071.	71082.
80	2000.	11839.	57011.
81	1769.	9839.	45172.
82	1542.	8070.	35333.
83	1324.	6528.	27263.
84	1119.	5203.	20736.
85	930.	4084.	15533.
86	759.	3154.	11448.
87	609.	2395.	8294.
88	479.	1786.	5899.
89	370.	1307.	4113.
90	280.	937.	2806.
91	207.	658.	1869.
92	150.	451.	1211.
93	106.	301.	760.
94	73.	195.	459.
95	49.	122.	264.
96	32.	73.	142.
97	21.	41.	69.
98	13.	20.	28.
99	8.	8.	8.

X	DX	NX	SX
10	5083492.	75275044.	1060763892.
11	4748794.	70191552.	985488847.
12	4435707.	65442758.	915297290.
13	4142863.	61007051.	849854538.
14	3868977.	56864188.	788847487.
15	3612851.	52995211.	731983299.
16	3373356.	49382361.	678988081.
17	3149434.	46009005.	629605727.
18	2940123.	42659570.	583596722.
19	2744554.	39919447.	540737152.
20	2561938.	37174883.	500617704.
21	2391442.	34612946.	463642821.
22	2232292.	32221504.	429029876.
23	2083734.	29969211.	396808372.
24	1945063.	27905477.	366819160.
25	1815620.	25950414.	338913683.
26	1694792.	24144793.	312953270.
27	1582004.	22456002.	288808476.
28	1476722.	20867998.	266358475.
29	1378433.	19391275.	245490477.
30	1286662.	18012842.	226099202.
31	1200965.	16726180.	208086360.
32	1120923.	15525214.	191360180.
33	1046145.	14404292.	175834966.
34	976270.	13358147.	161430674.
35	910967.	12381877.	148022527.
36	849925.	11470910.	135690650.
37	792851.	10620985.	124219740.
38	739482.	9828134.	113598755.
39	689556.	9088652.	103720621.
40	642876.	8399086.	94681969.
41	599210.	7756210.	86282883.
42	558375.	7156999.	78526674.
43	520193.	6598624.	71369674.
44	484495.	6078431.	64771050.
45	451121.	5593936.	58692610.
46	419916.	5142815.	53098682.
47	390734.	4722899.	47955867.
48	363436.	4332166.	43232967.
49	337892.	3968729.	38900802.
50	313983.	3630837.	34932072.
51	291576.	3316955.	31301235.
52	270630.	3025259.	27984380.
53	250989.	2754630.	24959120.
54	232584.	2503641.	22204491.
55	215333.	2271057.	19700850.
56	199156.	2055725.	17429792.
57	183978.	1856569.	15374068.
58	169727.	1672591.	13517499.
59	156340.	1502864.	11844908.
60	143762.	1346524.	10342045.
61	131951.	1202762.	8995521.
62	120870.	1070811.	7792759.
63	110483.	949940.	6721948.
64	100754.	839457.	5772007.
65	91644.	738704.	4932550.
66	82918.	647060.	4193846.
67	74763.	564142.	3546787.
68	67141.	489379.	2982645.
69	60027.	422238.	2493266.
70	53400.	362211.	2071028.
71	47248.	308811.	1708817.
72	41560.	261563.	1400005.
73	36327.	220003.	1138442.
74	31539.	183676.	918439.
75	27183.	152137.	734763.
76	23246.	124954.	582626.
77	19712.	101708.	457672.
78	16563.	81996.	355965.
79	13781.	65433.	273969.
80	11345.	51652.	208536.
81	9234.	40307.	156884.
82	7425.	31073.	116576.
83	5894.	23649.	85503.
84	4615.	17755.	61854.
85	3561.	13140.	44094.
86	2707.	9579.	30954.
87	2024.	6872.	21380.
88	1489.	4848.	14508.
89	1075.	3359.	9660.
90	763.	2284.	6301.
91	530.	1521.	4017.
92	361.	991.	2495.
93	241.	630.	1504.
94	157.	390.	874.
95	100.	233.	487.
96	62.	133.	252.
97	37.	72.	116.
98	22.	34.	47.
99	12.	12.	12.

X	CX	MX	RX
10	2133.	158951.	5878666.
11	2419.	156817.	5719716.
12	2657.	154398.	5562898.
13	2857.	151741.	5408500.
14	3016.	148884.	5256759.
15	3140.	145868.	5107875.
16	3235.	142728.	4962008.
17	3273.	139493.	4819280.
18	3215.	136220.	4679780.
19	3075.	133005.	4543566.
20	2892.	129930.	4410561.
21	2700.	127037.	4280632.
22	2520.	124337.	4153595.
23	2353.	121817.	4029257.
24	2196.	119465.	3907440.
25	2050.	117269.	3787976.
26	1913.	115219.	3670707.
27	1786.	113306.	3555488.
28	1681.	111519.	3442183.
29	1594.	109839.	3330663.
30	1522.	108245.	3220825.
31	1475.	106723.	3112580.
32	1447.	105248.	3005857.
33	1435.	103801.	2900610.
34	1435.	102366.	2796809.
35	1446.	100930.	2694443.
36	1471.	99485.	2593513.
37	1500.	98014.	2494028.
38	1539.	96513.	2396014.
39	1578.	94974.	2299501.
40	1609.	93397.	2204527.
41	1634.	91788.	2111130.
42	1653.	90153.	2019342.
43	1667.	88500.	1929189.
44	1678.	86834.	1840689.
45	1692.	85156.	1753855.
46	1711.	83463.	1668699.
47	1736.	81752.	1585236.
48	1768.	80017.	1503484.
49	1804.	78249.	1423467.
50	1846.	76444.	1345219.
51	1890.	74598.	1268774.
52	1936.	72709.	1194176.
53	1985.	70772.	1121468.
54	2036.	68787.	1050695.
55	2090.	66752.	981908.
56	2149.	64662.	915156.
57	2212.	62513.	850494.
58	2284.	60299.	787980.
59	2350.	58014.	727682.
60	2406.	55665.	669667.
61	2447.	53259.	614002.
62	2480.	50810.	560743.
63	2502.	48331.	509933.
64	2518.	45829.	461602.
65	2730.	43311.	415773.
66	2731.	40580.	372463.
67	2731.	37849.	331882.
68	2722.	35119.	294033.
69	2700.	32397.	258914.
70	2659.	29697.	226518.
71	2597.	27039.	196821.
72	2514.	24442.	169782.
73	2412.	21928.	145344.
74	2292.	19516.	123413.
75	2159.	17223.	103897.
76	2014.	15065.	86673.
77	1859.	13051.	71607.
78	1699.	11192.	58557.
79	1534.	9493.	47366.
80	1369.	7959.	37872.
81	1205.	6590.	29914.
82	1045.	5385.	23323.
83	893.	4340.	17938.
84	752.	3446.	13594.
85	622.	2695.	10152.
86	505.	2073.	7458.
87	403.	1568.	5384.
88	316.	1165.	3816.
89	243.	849.	2652.
90	183.	606.	1803.
91	134.	424.	1197.
92	97.	289.	773.
93	68.	192.	484.
94	47.	124.	291.
95	31.	78.	167.
96	20.	46.	84.
97	13.	26.	43.
98	8.	13.	18.
99	5.	5.	5.

5.4 Comparison Between Premiums Based on The New Tables and The A 24-29 U.

A comparison is made between premiums based on the A 1924-29 U. and the new Egyptian Tables (policies and sums assured) for the whole life and endowment at 4% and 6% interest rates.

Tables (5.31) to (5.34) show the comparison for the whole life assurance at 4% and 6% interest rates successively, and tables (5.35) to 5.38 show the same comparison for the endowment assurance.

From these tables we see that:

1. The premiums according to the new tables were effected by the rate of interest. The following summary table shows the ratio of the annual premiums using the new tables to the ones using the A 24-29 U. for the whole life at 4% and 6% interest rates:

Age	Interest Rate			
	4%		6%	
	Policies %	Sums Assured %	Policies %	Sums Assured %
10	82.21	83.27	71.17	72.71
20	87.23	88.16	79.94	81.28
30	91.08	91.90	86.75	87.90
40	93.96	94.72	91.66	92.66
50	96.11	96.77	95.00	95.84
60	98.24	98.62	97.85	98.32

The above table shows that by increasing the rate of interest, the annual premiums were substantially reduced for the younger ages, and slightly reduced for the others. So, when Egyptian companies use

Table (5.31)

Comparison between The New Table (Policies) and The A 1924-29 U.
for The Whole Life Assurance Premiums at 4% Interest Rate

Age	The new table (Policies)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
10	.107747	.004645	.12818	.00565	84.06	82.21
20	.151277	.006856	.16971	.00786	89.14	87.23
30	.212559	.010383	.22856	.01140	93.00	91.08
40	.300304	.016509	.31352	.01757	95.78	93.96
50	.415831	.027382	.42554	.02849	97.72	96.11
60	.556741	.048325	.56122	.04919	99.20	98.24

Table (5.32)

Comparison between The New Table (Sums Assured) and the A 1924-29 U.
for The Whole Life Assurance Premiums at 4% Interest Rate

Age	The new table (Sums Assured)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
10	.108998	.004705	.12818	.00565	85.04	83.27
20	.152656	.006929	.16971	.00786	89.95	88.16
30	.214079	.010477	.22856	.01140	93.66	91.90
40	.301991	.016642	.31352	.01757	96.32	94.72
50	.417481	.027569	.42554	.02849	98.11	96.77
60	.557700	.048513	.56122	.04919	99.37	98.62

Table (5.33)

Comparison between The New Table (policies) and The A 1924-29 U.
for The Whole Life Assurance Premiums at 6% Interest Rate

Age	The new table (Policies)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
10	.044328	.002626	.06119	.00369	72.44	71.17
20	.069755	.004245	.08580	.00531	81.30	79.94
30	.111034	.007070	.12586	.00815	88.22	86.75
40	.180908	.012502	.19414	.01364	93.18	91.66
50	.286624	.022744	.29725	.02394	96.43	95.00
60	.433385	.043300	.43877	.04425	98.77	97.85

Table (5.34)

Comparison between The New Table (Sums Assured) and The A 1924-29 U.
for The Whole Life Assurance Premiums at 6% Interest Rate

Age	The new table (Sums Assured)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
10	.045250	.002683	.06119	.00369	73.95	72.71
20	.070845	.004316	.08580	.00531	82.57	81.28
30	.112342	.007164	.12586	.00815	89.26	87.90
40	.182533	.012639	.19414	.01364	94.02	92.66
50	.288416	.022944	.29725	.02394	97.03	95.84
60	.434559	.043507	.43877	.04425	99.04	98.32

Table (5.35)

Comparison between The New Table (Policies) and The A 1924-29 U.
for The Endowment Premiums (period of 20 years) at 4% Interest Rate

Age	The new table (Policies)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
20	.461742	.032994	.46700	.03370	98.87	97.91
25	.462597	.033108	.46789	.03382	98.87	97.89
30	.464805	.033403	.47019	.03413	98.85	97.87
35	.469088	.033983	.47469	.03476	98.82	97.76
40	.476079	.034949	.48204	.03579	98.76	97.65
45	.487439	.036576	.49392	.03754	98.69	97.43
50	.506783	.039520	.51362	.04061	98.67	97.32
55	.538187	.044822	.54427	.04593	98.88	97.59

Table (5.36)

Comparison between The New Table (Sums Assured) and The A 24-29 U.
for The Endowment Premiums (period of 20 years) at 4% Interest Rate

Age	The new table (Sums Assured)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single	Annual	Single	Annual	Single	Annual
	£	£	£	£	%	%
20	.461991	.033027	.46700	.03370	98.93	98.00
25	.462867	.033144	.46789	.03382	98.93	98.00
30	.465128	.033446	.47019	.03413	98.92	98.00
35	.469514	.034041	.47469	.03476	98.91	97.93
40	.476670	.035032	.48204	.03579	98.89	97.88
45	.488288	.036701	.49392	.03754	98.86	97.77
50	.507912	.039698	.51362	.04061	98.89	97.75
55	.539375	.045037	.54427	.04593	99.10	98.06

Table (5.37)

Comparison between The New Table (Policies) and The A 24-29 U.
for The Endowment Premiums (Period of 20 years) at 6% Interest Rate

Age	The new table (Policies)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
20	.318061	.026400	.32421	.02716	98.10	97.20
25	.318997	.026514	.32523	.02728	98.08	97.19
30	.321487	.026819	.32783	.02761	98.07	97.14
35	.326397	.027428	.33298	.02826	98.02	97.06
40	.334418	.028440	.34141	.02934	97.95	96.93
45	.347403	.030132	.35500	.03115	97.86	96.73
50	.369563	.033181	.37758	.03434	97.88	96.62
55	.405734	.038646	.41308	.03984	98.22	97.00

Table (5.38)

Comparison between The New Table (Sums Assured) and The A 24-29 U.
for The Endowment Premiums (period of 20 years) at 6% Interest Rate

Age	The new table (Sums Assured)(1)		The A 24-29 U.(2)		Ratio 1/2	
	Single £	Annual £	Single £	Annual £	Single %	Annual %
20	.318352	.026436	.32421	.02716	98.19	97.33
25	.319312	.026553	.32523	.02728	98.18	97.34
30	.321862	.026866	.32783	.02761	98.18	97.31
35	.326890	.027489	.33298	.02826	98.17	97.27
40	.335101	.028528	.34141	.02934	98.15	97.23
45	.348382	.030263	.35500	.03115	98.14	97.15
50	.370878	.033369	.37758	.03434	98.23	97.17
55	.407162	.038875	.41308	.03984	98.57	97.58

the new tables with a high interest rate, this reduction in premiums will be quite observable at the younger ages.

2. The premiums, according to the new tables, were effected by the period of the policy. The following summary table indicates that observation which include the ratio of the annual premiums by the new tables (policies) to the ones by the A 24-29 U. for whole life and endowment (period of 20 years) at 6% interest rate:

Age	Whole Life %	Endowment %
20	79.94	97.20
30	86.75	97.17
40	91.66	96.93
50	95.00	96.62

From this table the effect in the premiums is more noticeable in whole life rather than in endowment.

3. The reduction in the annual premiums is bigger than in the single premiums as can be shown in tables (5.31) to (5.38) inclusive. This shows how effective the use of the new tables will be in calculating the premiums of industrial life assurance, since the single premiums are not in use with this kind of assurance.
4. In general, it has to be said that the reduction in the premiums, according to the new tables, is not quite so large, if we compare it with the

reduction in mortality rates obtained in chapter three.

This is clearly shown in the following table which includes:

- a. The ratio of the annual premiums for the whole life assurance using the new table (policies) at 6% interest rate, to the ones using the A 24-29 U.
- b. The ratio of mortality rates according to the new table (policies), to the ones using the A 24-29 U.

Age	Ratio of Premiums %	Ratio of Mortality Rates %
10	71.17	26.41
20	79.94	49.06
30	86.75	50.17
40	91.66	66.68
50	95.00	79.97
60	97.85	88.40

In the researcher's opinion, this result is expected due to the fact that the mortality rates for the ages from 65 to 99 in the A 24-29 U. were used to establish the new tables, which meant that mortality rate curves based on the Egyptian experience, and the A 24-29 U. were going to move closer to each other with every increase in age, as discussed earlier in chapter four.

5. A final point that must be mentioned is that all the comparisons discussed above, were between the Egyptian experience of industrial life assurance and the A 24-29 U. which represent the experience of ordinary life assurance in the British companies during this period.

This is due to the fact that mortality rates in industrial life assurance are higher than that in the ordinary life assurance for two basic reasons; first, industrial assurance is written largely on persons in the low-income groups, which are subject, almost without exception, to a higher death rate at all ages. Second, is the difference in selection standards. Not only is there no medical examination in the typical case, but the range of anticipated mortality within which industrial assurance will be written at standard rates is much wider than that of ordinary assurance. (McGill, D.M., 1967, P729).

5.5 The Interest Rates Used by The Egyptian Companies

It is a well known fact that the higher interest rate we use, the smaller premiums are obtained. This is why the insurance companies try to use the highest interest rate in order to reduce the premium to its minimum. This depends of course on the companies to realize an interest rate higher than the one used in calculating the premium.

The Egyptian insurance companies are using interest rate in the range of 3½% to 4½%, which can be considered low in view of the other saving channels, which give interest rates up to 7%. This means in other words, a strong competition between the companies and the other saving channels, which can be said to be the turning point of the companies. Especially, as nearly all ordinary life and all industrial life assurance policies transacted in Egypt are saving policies, i.e. endowment policies.

The following table (5.39) illustrates this point:

Table (5.39)
Ordinary Life Assurance
In Force at 31st December, 1974

Type of Insurance	No. of policies %	Sums Assured %	Office Premiums %
Endowment	95.3	94.2	94.9
Term Insurance	2.4	2.9	2.5
Whole Life	.4	.8	.5
Others	1.9	2.1	2.1
Total	100.00	100.00	100.00

Source: The General Egyptian Organization for Insurance, 1974

The above table reveals that, the endowment policies contribute over 95% of all the ordinary life assurance in Egypt.

To illustrate why the competition is turning in favour of the saving channels, let us examine the following example (El-Mansoury, M.T., 1971, P250):

If we suppose that a person aged 20 years, buys an endowment policy for E.£100 and period of 10 years. The annual premium of this policy is E.£9.700 according to the tariff of the biggest Egyptian company.

If the same person buys, instead a term policy for the same sum assured and period, the premium will be E.£0.970 according to the same company, and invests the difference between the premiums of the two policies, which is equal to E.£8.730 in a saving bank which gives 3.5% interest rate.

We can see that the second case is preferred, because the person will get E.£.100 in case of death plus the accumulated sums from the saving bank as shown in the following table:

Year	Accumulated sums at end of each year* E.£
First	9.036
Second	18.385
Third	28.067
Fourth	38.080
Fifth	48.452
Sixth	59.181
Seventh	70.294
Eighth	81.783
Ninth	93.682
Tenth	106.000

*Calculated by $8.730 \times \ddot{s}_{\overline{n}|} 3\frac{1}{2}\%$

Or otherwise, in case of maturity the person will earn only the savings from the bank which are E.£106.

All the previous discussions point out how important it will be to conduct a separate study about the varying effects of increasing or decreasing the interest rates using in calculating the premiums. Because this is out of the stream of this research, it can be said that the interest rate must be increased in view of the following:

1. There are other savings channels which give interest rates up to 7%, such as The Investment Certificates issued by The National Bank of Egypt which give 7% interest rate.
2. With the new Egyptian strategy of economic development called "The Open Door Policy", the law of investment in insurance companies does need a great change in order to deal with the new situation.

CHAPTER SIX

ANALYSIS OF THE PREMIUM LOADINGS

6.1 Introduction

Industrial life assurance is a special type of life assurance business specially created to suit people who are in the low income bracket of the society.

In order that this type of assurance fulfills its role in providing them with the insurance they need, its price must be kept to a minimum, which means in other words that the premium loadings which affect the level of prices must be maintained to the minimum level possible.

To explore the possibilities of achieving this aim, this chapter includes the following:

1. A study of the methods used to compute the office premiums.
2. A comprehensive study and analysis of the different kinds of premium loadings.
3. A study of the methods Egyptian companies use in computing these premium loadings.
4. Finally, the researcher's recommendations for the Egyptian companies to use in order to achieve the main objective of this type of life assurance.

6.2 Office Premium

The premiums so far calculated in the last chapter were based on interest and mortality rates, are known as net premiums. These premiums are defined as the premiums which in the aggregate will be sufficient to pay all claims on the assumption that death takes place exactly according to the mortality table adopted as a basis for

calculation and that the net premiums will be invested so as to yield the rate of interest assumed in the calculations (Maclean, J.B., 1962, P90).

The office premium is arrived at by adding to the net premium a loading for expenses and a margin to cover contingencies, profits, etc.

Generally, it can be said that, it is not possible in the case of industrial assurance to relate the expense loadings to the various items of expenditure so closely as in the case of ordinary assurance. Consequently, industrial assurance premium formulae are often more simple than the relatively complex formulae sometimes employed for the ordinary assurance (Coe, N.E. & Ogborn, M.E. 1952, P390).

The chief item of expense is the remuneration of the agency staff which probably accounts for about 60% of the total expenses (Fisher, H.F. & Young, J., 1971, P347).

For the purpose of calculating the office premium, we can divide the expenses into (Hooker & Longley-Cook, 1953, P99):

- a) Initial expenses, i.e. those which are incurred when the policy is issued, and
- b) Renewal expenses, i.e. those which are incurred from time-to-time (mainly, but not exclusively, in connection with the payment of renewal premiums) after the issue of the policy.

An expense, whether initial or renewal, may come in any one of the following three categories:

1. Expenses which may be regarded as varying in direct proportion to the premium (e.g. the renewal commission to the agent).
2. Expenses which may be regarded as varying in direct proportion to the sum assured (e.g. the initial commission to the agent and the stamp duty on the policy).
3. Expenses which are practically independent of the sum assured and premium (e.g. postage, stationery, etc.).

In industrial assurance, it is customary to use mortality tables in which no account is taken of selection to calculate monthly, as well as weekly premiums on continuous functions, and to allow in the formula for immediate payment of claims.

If the renewal expenses are (k) per unit premium, and if the excess of the initial expenses over the renewal expenses is (K) per unit of the first year's premiums

$$P' \bar{a} = \bar{A} + K P' + k P' \bar{a}$$

hence

$$P' = \frac{\bar{A}}{\bar{a} - K - k\bar{a}}$$

It is usual to express the excess initial expenses in the form $K(1-k)$, in which case the formula becomes

$$P' = \frac{\bar{A}}{(1-k)(\bar{a}-K)}$$

Hence, the sum assured for a premium of 1 per annum is

$$\frac{1}{P} = (1-k) \frac{\bar{a}-K}{\bar{A}} \quad (6.1)$$

This expression must be multiplied by $\frac{365\frac{1}{4}}{7 \times 240}$ to give the sum assured in £s for a premium of 1d. a week or by $\frac{365\frac{1}{4}}{28 \times 20}$ to give the sum assured for a premium of 1s.0d. a month*.

Meanwhile, in practice, we can calculate the fractional premiums (i.e. premiums more frequent than annual) on an approximate basis. By adding a percentage to the office premium and dividing the result by the number of fractional premiums during the year (Attwood, J.A., 1964, P138).

This latter method to calculate the monthly premiums is used by the Egyptian companies.

Generally, the main criticisms to the industrial assurance have been that the expenses are excessive, and that the number of "abortive" assurance has been very high; that too large a proportion of the business has been transacted on lives other than breadwinners; and that extravagance in funeral expenses has been encouraged (Britt, K.J., 1953, P301).

The above criticism means that the expense loadings must be calculated very carefully. Because the aim behind it is to obtain not only the best possible estimate of the actual loading related to the particular

*A month in industrial assurance business is a period of four weeks.

element (e.g policy, sum assured, or premium) but also to introduce these loading into the premium calculations in such a way that the contribution to expenses from these loadings is as little affected as possible by variations in the distribution of business by age, term and size of the policy in the future (Allanach, M.C., 1964, P18).

6.3 Expenses of Industrial Assurance

There is much misunderstanding about the cost of industrial assurance. This form of assurance has been more widely criticized and maligned than any other branch of the industry. Because the price is demonstrably higher to the policyholder, critics have implied that companies make excessively large amounts of money on industrial policies at the expense of the lower income groups for which these policies are primarily written (Mehr, R.I., 1970, P267).

Generally, the rates are higher than ordinary rates because of the mortality and the expense factors (Magee, J.H., 1958, P115).

The greater expense of industrial assurance is due almost entirely to the cost of the additional service to the policyholder by having the premiums collected in small amounts at short intervals at his home. An analysis of a large American company revealed that about 90% of the excess of industrial over ordinary expenses was due to this additional service. Some American companies, including the largest, offer the policyholder a refund of

10% of the weekly premiums if payment is made direct to the company for at least a year (Maclean, J.B., 1962, P410).

In this respect, too, a study has been made by Joseph Belth and E. Leverett covering industrial policies issued by 44 American companies and ordinary policies issued by 86 companies. On the industrial side, prices were determined with and without the discount for paying premiums directly to the company office. On the ordinary side, prices were determined using monthly and annual premiums for the amount of \$1000 and \$2000.

This study revealed that, for the non-participating industrial straight life and 20 - payment life policies, issued by the companies studied the means of the 20 - year level prices (without discount) per \$1000 of protection were \$27.66 and \$35.44, respectively. For participating industrial straight life and 20 - payment life policies, the means level prices (without discount), based on projected dividends, were \$27.24 and \$35.30, respectively. The mean level prices of the various industrial policies without discount exceeded the mean level prices of the corresponding \$1000 ordinary policies with monthly premiums from 42 per cent to 67 per cent. The mean level prices of the various industrial policies with discount exceeded the mean level prices of the corresponding \$1000 ordinary policies with monthly premiums from 22 per cent to 39 per cent, and exceeded the mean level prices of the corresponding \$1000 ordinary policies with annual premiums from 47 per cent to 75 per cent.

The above figures show that the price of industrial assurance is higher than the ordinary assurance, with or without discount for direct payment to the company.

6.4 Analysis of Expense Loadings

The expenses an office has to meet in connection with an assurance or an annuity contract arises continually during the currency of the policy, but with unequal incidence. Procuration expenses arise before the contract is established and in setting-up the policy in the books of the office (initial expenses). Other expenses arise during the premium-paying period (renewal expenses). Still a different level of expense arises during the period, if any, after premiums have ceased (running expenses) and finally there are expenses when the policy goes off the books (terminal expenses). (Asbury, C.J., 1964, P31).

Expenses can be divided into two distinct categories (Lane, L.H., 1964, P127):

1. Direct charges, i.e. those expenses which, by their very nature, belong solely to a particular insurance branch.
2. Apportionable charges, i.e. those expenses which can not be allocated direct to any one insurance branch.

6.4.1 Direct Charges

These expenses will normally be dealt with by straightforward entry in the appropriate branch ledgers

and comprise such items as commissions, policy stamps and so on. These direct charges are quite simply related to the variable which governs them. Thus, policy stamps can be related to new sums assured. Commissions are usually a fixed percentage of new sums assured and/or renewal premiums. The salaries will probably be incurred entirely in securing new business. Direct stationery and printing costs such as policy and proposal forms should be related to new policies.

6.4.2 Apportionable Charges

These expenses call for initial entry in an all branches (i.e. industrial branch, ordinary branch, group branch, general branch) ledger. They normally represent the bulk of expenses and comprise, in the main, the following items:

Head Office Charges

Salaries of management and clerical staff

Wages of maintenance staff and artisans

Staff pension scheme contributions

National insurance and graduated pension scheme contributions

Rents and rates

Stationery, printing and office equipment
(excluding known direct charges such as
printing costs of policy forms, renewal
notices, etc.)

Maintenance of building, heating and lighting

Publicity

Postage

Auditor's fees

Legal costs

Bank charges

Miscellaneous costs

District Offices

Salaries of clerical staff

Staff pension scheme contributions

National insurance and graduated pension scheme
contributions

Rents and rebates

Maintenance, heating and lighting

Miscellaneous costs

Field Staff (district managers, their assistants
and agents, excluding branch specialists)

Salaries

Staff pension scheme contributions

National insurance and graduated pension scheme
contributions

Expense allowances

The above items can be allocated to the branches
in such ways as follows:

6.4.2.1 Head Office Charges

The departments at Head Office can be divided into two main groups. Those engaged essentially in insurance business and those engaged in servicing the staff of the insurance departments (i.e. personnel department, postal department, stores and printing section, heating, lighting and maintenance engineers, machine repairs, etc.).

The first step to allocate the above charges is to determine the salaries and overheads of each insurance department concerned with each branch (i.e. industrial branch, ordinary branch,...).

The most appropriate method for apportioning these charges is by time. So, we need the individual time-sheets which should be obtained yearly in respect of management and executive offices showing their estimated proportion of time spent on average between branches. Also, we need the time-sheets for each insurance department in the Head Office showing the total salary roll of the staff, the number of staff and an estimate of their average over-all time proportion spent between branches.

From these time-sheets three important ratios can be derived:

1. Clerical Salary Ratio

The ratio in which total clerical salaries should be apportioned to branches is obtained by weighting each insurance departments' branch time proportions by its salary roll and dividing the sum of these items in each branch by the total salary roll of the insurance departments.

2. Clerical Staff Ratio

A ratio showing the proportions of the total clerical staff employed in each branch, obtained by weighting each insurance departments branch time proportions by its number of staff, and dividing the sum of these items in each branch by the total staff of the insurance departments.

3. Clerical Floor Space Ratio

A ratio showing the proportions of floor space occupied by each branch obtained by

weighting each insurance departments' branch time proportions by its occupied floor space, and dividing the sum of these items in each branch by the total floor space occupied by the insurance departments.

By using the latter ratios, the charges can be allocated to the branches as follows:

Item of expense	Basis of allocation to branches
Salaries of management and executive offices.	Time salary share based on individual time sheets.
Salaries of clerical staff (including clerical servicing department).	Clerical salary ratio.
Wages of maintenance staff and artisans.	Clerical floor ratio.
Staff pension scheme contribution.	As for total salaries and total wages.
National insurance graduated pension scheme contributions.	Clerical staff ratio.
Rents and rates.	Clerical floor space ratio.
Stationery, printing and office equipment (excluding direct charges).	Clerical staff ratio.
Maintenance of buildings, heating and lighting.	Clerical floor space ratio.

Meanwhile, there are other charges such as publicity, postage and others which can not be spread by any of the above ratio and which require individual treatment.

6.4.2.2 District Office Charges

These charges can be allocated by similar methods described in allocating the Head Office charges.

6.4.2.3 Field Staff Charges

Salaries, expense allowances and other overhead costs of the field staff will, it is assumed, relate entirely to the work of collecting premiums and servicing policies, since commissions and incentive awards are virtually due to new business emoluments which may be deemed to pay for new business time. However, for all practical purposes the treatment of such costs as an annual "per policy" cost will not measurably effect the premium loadings.

Finally, it should be borne in mind that, the above analysis has dealt with the subject in general terms, since the offices are different from the administrative organization's point of view.

6.5 Expense Loadings in The Egyptian Companies

The rate of expense loadings in the industrial branch are as follows:

- 2-3 per thousand of the sum assured
- 5-10 per cent of premiums
- The actual commission, which is about 60% of the first premium.

The question that arises is whether the above loadings used by the Egyptian companies are excessive or not.

Before answering this question, the researcher would like to point out that:

1. There is a separate branch for industrial assurance in the Egyptian companies, but these branches contain different sections; issuing, claims, etc.

2. There are no separate accounts for the industrial branch, and the expenses of the industrial, ordinary and life group branches are all grouped together in one account.

Therefore, it will be very difficult to answer this question accurately due to the unavailability of the data needed for that matter.

As an alternative the researcher includes the following ratios of the production expenses to the new premiums and the administrative expenses and overheads to the premiums in force in 1975 and 1976:

Detail	1975 %	1976 %
Ratio of production expenses to the new premiums	63.5	69.3
Ratio of administrative expenses and overheads to the premiums in force	17.5	17.6

Source: The annual statistical yearbook on the Egyptian Insurance Market, 1976.

which clearly indicate that the expenses of production have increased, whilst administrative expenses remain almost unchanged.

As applied to the Egyptian companies, the indirect expenses are allocated to the branches by the ratio of the new premiums of each branch to the aggregate of new premiums of the company.

To conclude this section, the researcher recommends the following points for the Egyptian companies to apply in order to be able to judge whether the industrial branch realizes a profit or loss in conducting its business, and also to be able to reduce the expense loadings to a minimum level.

First: A separate account must be made for the industrial branch as well as for other branches, as this represents the fundamental step needed for the analysis of the expense loadings, in order to judge their estimation.

Second: The expenses should be divided into direct and indirect, which the direct representing solely the expenses of the industrial branch, and the indirect representing expenses belonging to all insurance branches, which can not be allocated directly to any one insurance branch.

Moreover, these indirect expenses should be allocated to branches by scientific methods, such as the time basis described previously in the analysis of the expense loadings.

Third: The researcher suggests that in order to reduce the cost of the industrial life assurance, this branch should be charged only with direct expenses, whilst being exempted from his share of the indirect expenses.

This treatment of expenses will achieve the following:

1. The cost of industrial assurance will be suitable for those people, who have a low income and for whom this type of assurance has been specially designed.
2. It will represent a social solidarity between the insureds through other branches contributing in the cost of the industrial branch.

In this respect, we may call the industrial life assurance "the social industrial life assurance". Moreover, this sort of assurance is suitable for less developed countries, which is distinguishable by low income, and by the majority of the population not buying life assurance, because they have not enough money to save for it.

3. It can be said, in this context that the social industrial life assurance will be an important supplement to social insurance in providing for retirement and other benefits (Wright, W.W.J.R., 1964, P241).
4. Because the social industrial assurance is designed for people who have a low income, then, we should fix a maximum sum assured for every individual, so as to avoid the exploitation or the misuse of this type of assurance by the people who can

afford the other types of life assurance.

Finally, social industrial assurance differs from social insurance in that, the latter one is compulsory, while the first one is facultative. Also, the difference between the social industrial assurance and the industrial assurance is that, the expenses in the first type are subsidized by other insurance branches, this is not the case in the second one.

Fourth: For fixing the actual rates, the researcher recommends the method developed by Miss Monica Allanach in her paper represented in the 17th International Congress of Actuaries in 1964.

In this paper the calculations considered were in two stages. In the first, once the original data applicable to all businesses were available, the new renewal expenses appropriate to annual premium business were obtained for the main tables. The second stage is to make an appropriate allocation of these expenses according to sums assured, premiums or number of policies to enable premium loadings to be obtained.

CHAPTER SEVEN

THE IDEAL INDUSTRIAL LIFE ASSURANCE POLICY

7.1 Introduction

This chapter includes the ideal industrial life policy from the researcher's point of view, which suits the Egyptian market and other similar less developed countries.

Throughout this chapter the researcher will discuss the factors which effect the determination of the suitable insurance policy. The chapter includes also the benefits of the suggested policy and the suitable sum assured according to the circumstances of the Egyptian market.

Finally, it includes the full premium calculations for the suggested policy and an analysis of the suitable interest rate and expense loadings.

7.2 Factors Influencing the Design of The Ideal Policy

As a first step towards designing the ideal assurance policy for the Egyptian market, the researcher will discuss in this section the different factors effecting and influencing this design. Such factors are: the knowledge of insurance among the population, the per-capita income and its capacity to buy life assurance, the benefits of the social insurance system, the competition of other saving channels and finally the salesmanship of the people working in the area of life assurance.

Each of these factors will be studied and analysed for its implications to the Egyptian market.

7.2.1 The Knowledge of Insurance

The knowledge of insurance means the individuals realizing the special benefits from insurance, either to themselves or to their society, and so they decide to buy in order to gain this suitable utility.

To measure the knowledge of insurance between countries, two indications may be used.

The first one is; the ratio of life sums assured in force to the national income. The higher ratio indicates a high level of knowledge and awareness of insurance and its benefits. The disadvantage of this indicator is that the sums assured in force are accumulated sums through many years, while the national income is the added value realized by using the product elements within one year.

The second indicator overcomes this disadvantage by using the premiums income instead of sums assured in force, in computing the previous ratio.

The following table shows both ratios for some countries in 1973. This table indicates that there are some countries where the sums assured in force exceeded the national income such as U.S.A., Japan, Canada, Australia, Netherlands and Sweden. Also, there are other countries with sums assured in force exceeding half of the national income such as U.K., France and Switzerland. Meanwhile, in the case of Egypt these ratios represent a very small ratio, either to the national income or in comparison with the other countries.

The Country	Ratio of Sums Assured to National Income (per cent)	Ratio of Premiums Income to National Income (per thousand)
U.S.A.	151.8	28.3
Japan	154.6	28.7
Canada	150.1	25.3
U.K.	96.3	25.5
W. Germany	43.1	17.9
France	53.5	10.8
Australia	100.9	23.4
Netherlands	102.2	21.3
Sweden	116.9	17.8
Switzerland	69.2	22.3
Belgium	43.9	10.8
Italy	12.2	4.4
India	19.9	7.8
Egypt	5.7	2.6

Source: United Nations Statistical Yearbook 1976,
and The Annual Report of The General Egyptian
Organization for Insurance, 1974.

In general, it can be concluded that, the ratio of premium income to national income which are high in developed countries such as the U.S.A., and the U.K. compared with a small one in the less developed countries, reflects the varying degrees in insurance knowledge and awareness between these two different types of developed countries.

From the researcher's point of view, the reasons for this lack of insurance knowledge in Egypt are as follows:

1. The ratio of illiteracy in Egypt is still very high which effects without any doubt, the understanding of life assurance and its benefits.
2. Some religious men interpret and see insurance as an act contrary to the rules of the Islamic Religion, their damaging effect on the people's point of view and degree of acceptance of insurance when we know that the official religion of the country is Islam, and when most of the population are illiterate.
3. The insurance was not known till the second half of the nineteenth century. When Italian and English companies started to transact with insurance as a service to their subjects living in Egypt, while the first Egyptian company was established in 1900. If we compare this evolution of the insurance market with its counter part in the developed countries like the U.K. and U.S.A. where it commenced earlier, we can see that we still need time for people to understand and accept insurance.

In the light of the above discussion, the suggested policy should take into account this lack of insurance knowledge and it should be constructed in very simple terms, enabling the people to understand and accept.

7.2.2 The Per-Capita Income

Per-capita income is one of the factors which influence the success of any insurance policy, due to the fact that it reflects the average intake of the individual which he uses firstly to cover his living expenses and if any is left after this, he may use it to buy a life assurance.

The following table (7.1) shows the per-capita income in Egypt and other countries belonging to different camps and levels of development.

Table (7.1)
The Per-Capita per \$ in 1973

The Country	Per-Capita per \$
U.S.A.	5566
Canada	4816
Japan	3275
U.K.	2898
France	4301
Belgium	4297
Italy	2314
Argentina	1420
India	123
Kenya	197
Nigeria	201
Pakistan	149
Egypt	245

Source: United Nations Statistical Yearbook 1976.

It may be seen from this table that the per-capita income for Egypt is very low, therefore it is out of the question to suggest a policy with high premiums, as most of the population are unable to afford it.

In this respect, the saving policies such as the endowment are undesirable. Protection policies such as whole life and term insurance are more acceptable due to their low cost, hence their low price may appeal to prospective buyers.

7.2.3 Social Insurance System

This factor is a result of the previous one, in the sense that when people have an income as low as in Egypt, they tend to accept any social insurance system devised by the Government and feel quite satisfied with it.

In this case, life assurance policy aims will be two-fold:

1. To sustain and supplement the benefits of the social insurance system which are in reality a bare minimum insufficient to give people a proper income for their living.
2. To cover workers who are not covered by the system like the agricultural workers.

7.2.4 Saving Channels

It must take into account the competition of the saving channels other than life assurance which effect on purchasing life assurance.

As described previously in chapter five, different saving channels compete fiercely with life assurance

for attracting individual's savings.

As to their impact on the ideal life assurance policy which the researcher is trying to devise, we must in this respect distinguish between two kinds of life assurance, the saving policies where the sum assured will be paid in case of the insured life, and the protection policies where the sum assured will be paid only in the case of the insured's death.

The saving channels compete strongly with the first kind. Therefore, the ideal policy must ensure that the rate of interest used in the calculation of the premiums must be at least equivalent to the interest rate used by other saving channels.

Meanwhile, for the protection policies, it is preferable as well to use an interest rate near or equivalent to the market interest rate.

7.2.5 Salesmen

The qualifications of salesmen working in the insurance market is also a factor we should take into account when we suggest a new policy, especially from the point of view of the terms of the policy and its marketing policies.

By considering the education of the Egyptian salesmen as an indication of their qualifications, the researcher includes the following table showing the percentage of the highest level of education attained by salesmen working in the area of life assurance in the year 1970:

Qualification	Percentage %
Uneducated	20
Primary	24
Preparatory	14
Secondary	37
College	5
Total	100

Source: El-Mansoury, 1971, P267.

The above table indicates that about 58% of the salesmen attained the level of preparatory education, and that 5% only have some sort of college degree.

The implications of this result are the need for a new recruiting policy which will encourage more educated people to enter into this field, together with a comprehensive training programme, in order to obtain a new breed of people capable of implementing a more vigorous marketing policy. As for the near future, due to the fact that those ideas may take many years to implement and give results, the researcher advocates the devise of a suggested policy using simple terms and easy conditions to suit these prevailing conditions.

7.3 The Benefits of The Suggested Policy

The policies can be classified into three groups: the first; where the sum assured is paid only in the case of the insured's survival, such as pure endowment. The second group; where the sum assured is paid only in case of the insured's death, such as term insurance and whole life assurance. The third group; where the sum

assured is paid in either of these two groups, such as endowment.

In the meantime, policies can be classified into two groups: The first is, the saving policy which includes the first and third groups in the previous classification. The second, is the protection policies which the second group in the previous classification includes.

By analysing the previous mentioned factors for their implications on the two groups of policies in relation to the Egyptian market, it may be said that the saving policies are easy to understand among the population, their premiums are expensive according to the per-capita income, they can play a role in sustaining the social insurance system, the saving channels other than insurance are in a strong position in comparison with them, since they offer a higher interest rate, and finally that salesmen find them easy to market and usually get a high commission for this.

As to the protection policies, they are more difficult to understand among the population since the sum assured will be paid only in case of death, the premiums are reasonable according to the per-capita income, they are not in competition with the other saving channels, and finally salesmen are not likely to prefer them because they face difficulties in marketing them, and because the commission is low in view of its cheap premiums.

We can summarize the above discussion and analysis as follows:

Factor	Saving Policies	Protection Policies
Insurance Knowledge	Suitable	Unsuitable
Per-Capita	Unsuitable	Suitable
Social Insurance	Suitable	Suitable
Saving Channels	Unsuitable	Suitable
Salesmen	Suitable	Unsuitable

To see how these factors, previously discussed, and analyzed influence the Egyptian market, the following table is used for that purpose:

Table (7.2)

The Percentage of Number of Policies,
Sums Assured and Office Premiums to
The Life Assurance in Force at 31.12.74

Type of Assurance	No. of Policies %	Sums Assured %	Office Premiums %
Saving Policies	97.2	96.3	97.0
Protection Policies	2.8	3.7	3.0
Total	100.0	100.0	100.0

Source: The Annual Report of The General Egyptian Organization for Insurance, 1974.

The above table reveals that nearly all the life policies in the Egyptian market are saving policies, inspite of the fact that the per-capita in Egypt is low, and that the other saving channels are using an interest rate higher than the one used by the insurance companies.

This supports the result obtained previously, that the saving policies are suitable to both factors, insurance knowledge and salesmen, in other words, it is easily understood amongst the individuals and salesmen.

As to the effects of per-capita and the competition from other saving channels, these can be seen from the percentage of the No. of policies in force in 1974 to the population in the same year which is 1.7% and is considered very very low.

In the light of all the discussion so far, the researcher suggests the term insurance with a refund of the premiums in case of insured survival as an ideal policy in view of the circumstances of the Egyptian market.

The suggested policy is easily understood by the population since the insured will get the premiums back in case of survival. Therefore, it will be easy to market from the salesman's point of view. Also, the premium will be reasonable to the per-capita income, and will sustain the social insurance system as a life assurance. Meanwhile, it will not be in a weaker position against other saving channels from the competition point of view since it will be calculated on the highest interest rate available in the market.

7.4. The Sum Assured

The maximum sum assured will be two hundred Egyptian pounds for each policy, which is considered reasonable from the per-capita point of view.

Meanwhile, the maximum number of policies allowed for each person is two. By that, we can prevent the misuse of the policy from those people who can buy ordinary life assurance.

7.5. Net Premiums

The Egyptian life table constructed in chapter four will be used to calculate the net premiums for the suggested policy.

The interest rate used, must be near or equal to the highest rate in the market. In this respect, 6% interest rate tax free is considered sufficient, in view of some saving channels who give up to 7% interest rate tax free, such as the Investment Certificate.

A new law permitting the Egyptian companies to invest their premiums more freely is required, otherwise there is no hope for life assurance to take place.

The equations used to construct the single and annual net premiums of term insurance with refund premiums are as follows:

$$\text{Single premium (A)} = \frac{M_x - M_{x+n} + A \times D_{x+n}}{D_x} \quad (7.1)$$

$$\text{Annual premium (P)} = \frac{M_x - M_{x+n} + n \times P \times D_{x+n}}{N_x - N_{x+n}} \quad (7.2)$$

For the computer purposes the equations were as follows:

$$NAX = \frac{M_x - M_{x+n}}{D_x - D_{x+n}} \quad (\text{Single})$$

$$NPX = \frac{M_x - M_{x+n}}{N_x - N_{x+n} - n \times D_{x+n}} \quad (\text{Annual})$$

Tables (7.3) to (7.7) represent the single and annual premiums of the suggested policy based on the experience of policies, and tables (7.8) to (7.12) represent the same premiums based on the experience of sums assured.

The computer programmes are represented in appendix (II).

TERM INSURANCE WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.3)

N= 5

X	NAX	NPX
10	0.009718	0.003368
11	0.011248	0.003898
12	0.012774	0.004427
13	0.014266	0.004945
14	0.015644	0.005423
15	0.016824	0.005834
16	0.017742	0.006154
17	0.018355	0.006368
18	0.018684	0.006484
19	0.018819	0.006531
20	0.018854	0.006544
21	0.018854	0.006544
22	0.018854	0.006544
23	0.018854	0.006544
24	0.018880	0.006552
25	0.018961	0.006580
26	0.019127	0.006637
27	0.019435	0.006743
28	0.019950	0.006921
29	0.020699	0.007180
30	0.021710	0.007529
31	0.023019	0.007982
32	0.024648	0.008545
33	0.026591	0.009217
34	0.028878	0.010008
35	0.031507	0.010918
36	0.034449	0.011936
37	0.037638	0.013041
38	0.041049	0.014223
39	0.044609	0.015458
40	0.048306	0.016740
41	0.052190	0.018086
42	0.056337	0.019522
43	0.060842	0.021080
44	0.065830	0.022804
45	0.071401	0.024728
46	0.077636	0.026880
47	0.084588	0.029279
48	0.092303	0.031940
49	0.100810	0.034875
50	0.110157	0.038098
51	0.120404	0.041629
52	0.131659	0.045504
53	0.144053	0.049764
54	0.157696	0.054449
55	0.172613	0.059570
56	0.188727	0.065112
57	0.205847	0.071019
58	0.223754	0.077221
59	0.242270	0.083648
60	0.261359	0.090278
61	0.281531	0.098216
62	0.310622	0.106624
63	0.336822	0.115633
64	0.364157	0.125348
65	0.392493	0.135855

TERM INSURANCE WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.4)

N=10

X	NAX	NPX
10	0.012762	0.002539
11	0.014029	0.002792
12	0.015162	0.003018
13	0.016155	0.003217
14	0.017000	0.003387
15	0.017690	0.003526
16	0.018216	0.003632
17	0.018568	0.003703
18	0.018756	0.003741
19	0.018845	0.003759
20	0.018900	0.003770
21	0.018970	0.003784
22	0.019102	0.003810
23	0.019322	0.003853
24	0.019656	0.003919
25	0.020135	0.004013
26	0.020789	0.004143
27	0.021663	0.004315
28	0.022790	0.004538
29	0.024199	0.004817
30	0.025906	0.005155
31	0.027917	0.005553
32	0.030217	0.006009
33	0.032792	0.006519
34	0.035627	0.007082
35	0.038715	0.007695
36	0.042060	0.008360
37	0.045660	0.009076
38	0.049541	0.009847
39	0.053715	0.010675
40	0.058220	0.011568
41	0.063120	0.012538
42	0.068482	0.013597
43	0.074379	0.014760
44	0.080898	0.016044
45	0.088114	0.017464
46	0.096100	0.019035
47	0.104935	0.020770
48	0.114701	0.022686
49	0.125468	0.024794
50	0.137274	0.027102
51	0.150117	0.029612
52	0.163971	0.032320
53	0.178803	0.035225
54	0.194587	0.038325
55	0.211315	0.041622
56	0.231055	0.045406
57	0.251770	0.049401
58	0.273428	0.053603
59	0.295952	0.058003
60	0.319259	0.062599
61	0.343258	0.067398
62	0.367867	0.072418
63	0.392975	0.077685
64	0.418453	0.083223
65	0.444151	0.089058

TERM INSURANCE WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.5)

N=15

	X	NAX	NPX
	10	0.014236	0.002055
	11	0.015195	0.002195
	12	0.016053	0.002320
	13	0.016806	0.002430
	14	0.017453	0.002525
	15	0.017996	0.002604
	16	0.018435	0.002668
	17	0.018777	0.002718
	18	0.019044	0.002757
	19	0.019291	0.002792
	20	0.019577	0.002833
	21	0.019947	0.002886
	22	0.020441	0.002956
	23	0.021078	0.003047
	24	0.021887	0.003163
	25	0.022890	0.003306
	26	0.024103	0.003480
	27	0.025543	0.003686
	28	0.027229	0.003927
	29	0.029165	0.004204
	30	0.031360	0.004519
	31	0.033829	0.004873
	32	0.036582	0.005269
	33	0.039629	0.005706
	34	0.042992	0.006189
	35	0.046689	0.006720
	36	0.050747	0.007302
	37	0.055175	0.007937
	38	0.060006	0.008628
	39	0.065259	0.009379
	40	0.070973	0.010194
	41	0.077214	0.011082
	42	0.084060	0.012053
	43	0.091602	0.013122
	44	0.099934	0.014299
	45	0.109122	0.015594
	46	0.119200	0.017013
	47	0.130174	0.018558
	48	0.142042	0.020228
	49	0.154802	0.022026
	50	0.168464	0.023953
	51	0.184319	0.026148
	52	0.201169	0.028487
	53	0.219043	0.030975
	54	0.237925	0.033615
	55	0.257766	0.036408
	56	0.278469	0.039350
	57	0.299901	0.042435
	58	0.321900	0.045654
	59	0.344306	0.049000
	60	0.366997	0.052475
	61	0.389882	0.056092
	62	0.412907	0.059871
	63	0.436014	0.063839
	64	0.459140	0.068026
	65	0.482207	0.072462

TERM INSURANCE WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.6)

N=20

X	NAX	NPX
10	0.014956	0.001740
11	0.015793	0.001838
12	0.016568	0.001929
13	0.017284	0.002014
14	0.017946	0.002091
15	0.018561	0.002163
16	0.019133	0.002230
17	0.019671	0.002293
18	0.020194	0.002353
19	0.020755	0.002418
20	0.021401	0.002492
21	0.022168	0.002580
22	0.023079	0.002685
23	0.024147	0.002807
24	0.025383	0.002949
25	0.026805	0.003113
26	0.028434	0.003300
27	0.030295	0.003514
28	0.032421	0.003759
29	0.034834	0.004036
30	0.037557	0.004350
31	0.040618	0.004702
32	0.044033	0.005095
33	0.047818	0.005530
34	0.051998	0.006011
35	0.056597	0.006538
36	0.061646	0.007117
37	0.067175	0.007749
38	0.073233	0.008441
39	0.079857	0.009194
40	0.087087	0.010014
41	0.094966	0.010906
42	0.103528	0.011872
43	0.112804	0.012918
44	0.122839	0.014048
45	0.133673	0.015268
46	0.146200	0.016659
47	0.159640	0.018153
48	0.174025	0.019752
49	0.189354	0.021460
50	0.205605	0.023277
51	0.222725	0.025202
52	0.240648	0.027234
53	0.259291	0.029373
54	0.278561	0.031619
55	0.298363	0.033974
56	0.318598	0.036441
57	0.339155	0.039021
58	0.359918	0.041717
59	0.380776	0.044533
60	0.401648	0.047480
61	0.422482	0.050576
62	0.443254	0.053849
63	0.463944	0.057330
64	0.484534	0.061057
65	0.505000	0.065066

TERM INSURANCE WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.7)

N=25

X	NAX	NPX
10	0.015644	0.001556
11	0.016530	0.001645
12	0.017391	0.001731
13	0.018233	0.001816
14	0.019063	0.001898
15	0.019885	0.001980
16	0.020701	0.002061
17	0.021514	0.002141
18	0.022337	0.002222
19	0.023210	0.002308
20	0.024175	0.002403
21	0.025267	0.002510
22	0.026517	0.002632
23	0.027945	0.002772
24	0.029576	0.002932
25	0.031435	0.003114
26	0.033552	0.003322
27	0.035955	0.003557
28	0.038678	0.003823
29	0.041745	0.004124
30	0.045182	0.004460
31	0.049023	0.004835
32	0.053293	0.005251
33	0.058025	0.005712
34	0.063254	0.006221
35	0.069007	0.006779
36	0.075304	0.007389
37	0.082150	0.008050
38	0.089559	0.008764
39	0.097540	0.009532
40	0.106120	0.010356
41	0.115944	0.011289
42	0.126494	0.012288
43	0.137822	0.013360
44	0.149967	0.014509
45	0.162940	0.015738
46	0.176727	0.017048
47	0.191289	0.018439
48	0.206575	0.019911
49	0.222517	0.021464
50	0.239051	0.023097
51	0.256108	0.024813
52	0.273623	0.026614
53	0.291528	0.028505
54	0.309756	0.030492
55	0.328241	0.032582
56	0.346912	0.034783
57	0.365695	0.037105
58	0.384511	0.039555
59	0.403293	0.042145
60	0.422006	0.044893
61	0.440642	0.047820
62	0.459225	0.050959
63	0.477781	0.054343
64	0.496337	0.058012
65	0.514904	0.062005

TERM INSURANCE WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.8)

N= 5

X	NAX	NPX
10	0.010392	0.003601
11	0.011960	0.004145
12	0.013522	0.004687
13	0.015052	0.005217
14	0.016462	0.005707
15	0.017670	0.006127
16	0.018607	0.006454
17	0.019234	0.006674
18	0.019569	0.006791
19	0.019704	0.006839
20	0.019736	0.006850
21	0.019736	0.006850
22	0.019736	0.006850
23	0.019736	0.006850
24	0.019764	0.006859
25	0.019848	0.006888
26	0.020019	0.006947
27	0.020337	0.007057
28	0.020863	0.007238
29	0.021628	0.007502
30	0.022663	0.007860
31	0.024000	0.008322
32	0.025665	0.008898
33	0.027656	0.009587
34	0.029996	0.010396
35	0.032687	0.011327
36	0.035695	0.012368
37	0.038957	0.013498
38	0.042440	0.014705
39	0.046077	0.015967
40	0.049854	0.017277
41	0.053826	0.018653
42	0.058064	0.020121
43	0.062666	0.021713
44	0.067760	0.023473
45	0.073446	0.025436
46	0.079809	0.027632
47	0.086900	0.030078
48	0.094769	0.032793
49	0.103440	0.035784
50	0.112965	0.039068
51	0.123397	0.042662
52	0.134852	0.046606
53	0.147458	0.050939
54	0.161325	0.055700
55	0.176478	0.060901
56	0.192835	0.066527
57	0.210202	0.072520
58	0.228348	0.078806
59	0.247096	0.085317
60	0.266405	0.092026
61	0.289652	0.099753
62	0.313770	0.107898
63	0.338954	0.116575
64	0.365238	0.125875
65	0.392493	- 178 - 0.135855

TERM INSURANCE WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.9)

N=10

X	NAX	NPX
10	0.013511	0.002688
11	0.014806	0.002946
12	0.015966	0.003178
13	0.016983	0.003382
14	0.017847	0.003556
15	0.018552	0.003698
16	0.019089	0.003807
17	0.019448	0.003879
18	0.019640	0.003918
19	0.019730	0.003936
20	0.019784	0.003947
21	0.019857	0.003961
22	0.019992	0.003988
23	0.020217	0.004032
24	0.020560	0.004100
25	0.021050	0.004196
26	0.021719	0.004328
27	0.022614	0.004505
28	0.023768	0.004733
29	0.025210	0.005018
30	0.026956	0.005364
31	0.029011	0.005771
32	0.031363	0.006237
33	0.033997	0.006759
34	0.036895	0.007334
35	0.040053	0.007961
36	0.043474	0.008641
37	0.047154	0.009373
38	0.051117	0.010160
39	0.055381	0.011006
40	0.059981	0.011918
41	0.064986	0.012908
42	0.070460	0.013990
43	0.076480	0.015177
44	0.083130	0.016487
45	0.090489	0.017935
46	0.098628	0.019535
47	0.107629	0.021302
48	0.117576	0.023253
49	0.128534	0.025398
50	0.140544	0.027746
51	0.153599	0.030297
52	0.167674	0.033048
53	0.182731	0.035997
54	0.198741	0.039142
55	0.215695	0.042485
56	0.235130	0.046239
57	0.255508	0.050198
58	0.276800	0.054357
59	0.298926	0.058704
60	0.321803	0.063233
61	0.345346	0.067951
62	0.369470	0.072871
63	0.394069	0.078016
64	0.419014	0.083406
65	0.444151	0.089058

TERM INSURANCE WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.10)

N=15

X	NAX	NPX
10	0.015016	0.002168
11	0.015997	0.002311
12	0.016876	0.002439
13	0.017646	0.002552
14	0.018309	0.002649
15	0.018864	0.002730
16	0.019313	0.002796
17	0.019662	0.002847
18	0.019935	0.002886
19	0.020187	0.002922
20	0.020478	0.002964
21	0.020856	0.003018
22	0.021362	0.003090
23	0.022014	0.003183
24	0.022843	0.003301
25	0.023869	0.003448
26	0.025109	0.003625
27	0.026583	0.003836
28	0.028308	0.004083
29	0.030287	0.004366
30	0.032531	0.004688
31	0.035056	0.005050
32	0.037869	0.005454
33	0.040985	0.005902
34	0.044421	0.006395
35	0.048200	0.006937
36	0.052346	0.007532
37	0.056869	0.008181
38	0.061801	0.008886
39	0.067162	0.009652
40	0.072992	0.010484
41	0.079359	0.011389
42	0.086340	0.012380
43	0.094028	0.013468
44	0.102517	0.014667
45	0.111872	0.015986
46	0.122128	0.017430
47	0.133290	0.019000
48	0.145355	0.020698
49	0.158315	0.022524
50	0.172185	0.024480
51	0.187923	0.026670
52	0.204641	0.029002
53	0.222363	0.031483
54	0.241076	0.034113
55	0.260728	0.036894
56	0.281226	0.039822
57	0.302434	0.042889
58	0.324190	0.046084
59	0.346336	0.049402
60	0.368744	0.052841
61	0.391328	0.056412
62	0.414029	0.060135
63	0.436790	0.064034
64	0.459543	0.068134
65	0.482207	0.072462

TERM INSURANCE WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.11)

N=20

X	NAX	NPX
10	0.015752	0.001833
11	0.016609	0.001933
12	0.017402	0.002027
13	0.018135	0.002113
14	0.018813	0.002193
15	0.019441	0.002266
16	0.020026	0.002335
17	0.020576	0.002399
18	0.021111	0.002461
19	0.021684	0.002526
20	0.022344	0.002602
21	0.023128	0.002692
22	0.024060	0.002799
23	0.025152	0.002924
24	0.026417	0.003070
25	0.027871	0.003237
26	0.029537	0.003428
27	0.031441	0.003647
28	0.033614	0.003897
29	0.036080	0.004181
30	0.038863	0.004501
31	0.041991	0.004861
32	0.045479	0.005263
33	0.049347	0.005707
34	0.053615	0.006197
35	0.058311	0.006736
36	0.063465	0.007327
37	0.069106	0.007972
38	0.075283	0.008677
39	0.082035	0.009445
40	0.089403	0.010280
41	0.097429	0.011188
42	0.106145	0.012171
43	0.115585	0.013235
44	0.125789	0.014384
45	0.136798	0.015624
46	0.149289	0.017016
47	0.162683	0.018509
48	0.177012	0.020109
49	0.192273	0.021817
50	0.208445	0.023632
51	0.225474	0.025555
52	0.243295	0.027585
53	0.261824	0.029721
54	0.280969	0.031963
55	0.300637	0.034313
56	0.320726	0.036772
57	0.341125	0.039342
58	0.361715	0.042025
59	0.382383	0.044823
60	0.403048	0.047746
61	0.423655	0.050812
62	0.444176	0.054046
63	0.464590	0.057477
64	0.484875	0.061140
65	0.505000	0.065068

TERM INSURANCE WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.12)

N=25

X	NAX	NPX
10	0.016456	0.001637
11	0.017362	0.001728
12	0.018244	0.001817
13	0.019106	0.001903
14	0.019955	0.001988
15	0.020795	0.002071
16	0.021630	0.002154
17	0.022460	0.002236
18	0.023302	0.002319
19	0.024194	0.002406
20	0.025179	0.002503
21	0.026296	0.002612
22	0.027574	0.002737
23	0.029034	0.002881
24	0.030701	0.003044
25	0.032602	0.003230
26	0.034765	0.003442
27	0.037221	0.003682
28	0.040003	0.003955
29	0.043136	0.004261
30	0.046646	0.004604
31	0.050567	0.004987
32	0.054925	0.005412
33	0.059754	0.005883
34	0.065088	0.006401
35	0.070954	0.006970
36	0.077373	0.007591
37	0.084347	0.008265
38	0.091891	0.008992
39	0.100012	0.009773
40	0.108739	0.010611
41	0.118564	0.011545
42	0.129107	0.012547
43	0.140422	0.013621
44	0.152547	0.014772
45	0.165493	0.016002
46	0.179245	0.017314
47	0.193767	0.018707
48	0.209006	0.020180
49	0.224896	0.021734
50	0.241370	0.023368
51	0.258361	0.025085
52	0.275803	0.026887
53	0.293628	0.028779
54	0.311769	0.030765
55	0.330157	0.032853
56	0.348723	0.035052
57	0.367389	0.037368
58	0.386073	0.039810
59	0.404707	0.042389
60	0.423252	0.045119
61	0.441699	0.048024
62	0.460066	0.051130
63	0.478378	0.054473
64	0.496655	0.058086
65	0.514904	0.062005

7.6 The Office Premiums

For calculating the office premiums, there are some charges to the net premiums which should be added.

The following is the researcher's opinion about these charges and how to deal with them as the data available permits.

In general the researcher would like to point out that the determination of these charges depends on the following:

1. The circumstances of each company and its policy towards its expenditure.
2. The need for a comprehensive analysis of the expenses as described in chapter six.

First: The commission of production

The suggested policy should be charged with the real commission which is 60% from the first premium.

This percentage is determined according to the commission which the Egyptian companies pay to their salesmen in the industrial branch.

Second: The administrative expenses and overheads

The suggested policy will be charged with direct administrative expenses only as recommended in chapter six.

For determining the percentage of direct administrative expenses which should be added in order to calculate the office premiums, we can use the

the percentage of the direct expenses to the aggregate expenses as a base to reduce the charges.

The following table shows the percentage of direct expenses to the aggregate expenses at the industrial branch in one of the Egyptian companies:

Year	Percentage %
1975	69
1976	67

The above table indicates that the percentage of direct expenses does not exceed 69% from all the charges. So, we can consider 70% as an acceptable and safe percentage.

As we pointed out in chapter six the following percentage charges are applied by the Egyptian companies to calculate the premiums:

- 2 - 3 per thousand of the sum assured annually
- 5 - 10 per cent of the premium annually.

So, on average we can say that these charges are:

- $2\frac{1}{2}$ per thousand of the sum assured
- $7\frac{1}{2}$ per cent of the premium.

In other words the above percentage equal $13\frac{1}{2}\%$ approximately from the premium to cover direct and indirect expenses. Hence, the percentage which covers direct expenses could only be 9.45% ($13\frac{1}{2} \times 70\%$), or

- 1 per thousand of the sum assured
- 7 per cent of the premium.

By using the above charges and 60% from the first premium, the equation of calculating the annual premium could be as follows:

$$\bar{P} \times \ddot{a} = P \times \ddot{a} + .001 \times \ddot{a} + .07 \times \bar{P} \times \ddot{a} + .60 \times \bar{P}$$

where:

$\bar{P}$ the office premium of the suggested policy

P the net premium of the same policy

$\ddot{a}$ the single premium of the immediate annuity

hence

$$\bar{P} = \frac{\ddot{a}(P + .001)}{\ddot{a} \times .93 - .60} \quad (7.3)$$

To calculate the monthly premiums, 3% will be added to cover the extra expenses caused by monthly payments.

The equation is as follows:

$$\text{The monthly premium} = \frac{\bar{P} (1.03)}{12} \quad (7.4)$$

The symbols used for the computer are as follows:

The annual office premium of the suggested policy is $\underline{NP \text{ BAR } X}$

The monthly premium of the same policy is $\underline{M \text{ NP BAR } X}$

The computer programmes are presented in appendix (II).

Tables (7.13) to (7.17) show the annual and monthly office premiums of the suggested policy based on the policy experience. Tables (7.18) to (7.22) show the same premiums based on the sums assured experience.

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.13)

N= 5

	X	NPBARX	MNPBARX
10	10	0.005490	0.000471
	11	0.006158	0.000529
12	12	0.006823	0.000586
	13	0.007474	0.000642
14	14	0.008075	0.000693
	15	0.008592	0.000737
16	16	0.008995	0.000772
	17	0.009264	0.000795
18	18	0.009409	0.000808
	19	0.009469	0.000813
20	20	0.009485	0.000814
	21	0.009485	0.000814
22	22	0.009485	0.000814
	23	0.009485	0.000814
24	24	0.009496	0.000815
	25	0.009531	0.000818
26	26	0.009602	0.000824
	27	0.009736	0.000836
28	28	0.009960	0.000855
	29	0.010285	0.000883
30	30	0.010725	0.000921
	31	0.011294	0.000969
32	32	0.012002	0.001030
	33	0.012848	0.001103
34	34	0.013843	0.001188
	35	0.014988	0.001286
36	36	0.016270	0.001396
	37	0.017660	0.001516
38	38	0.019148	0.001644
	39	0.020703	0.001777
40	40	0.022317	0.001916
	41	0.024012	0.002061
42	42	0.025821	0.002216
	43	0.027784	0.002385
44	44	0.029956	0.002571
	45	0.032380	0.002779
46	46	0.035093	0.003012
	47	0.038118	0.003272
48	48	0.041475	0.003560
	49	0.045178	0.003878
50	50	0.049247	0.004227
	51	0.053708	0.004610
52	52	0.058604	0.005030
	53	0.063992	0.005493
54	54	0.069920	0.006001
	55	0.076406	0.006558
56	56	0.083432	0.007161
	57	0.090931	0.007805
58	58	0.098813	0.008481
	59	0.106995	0.009184
60	60	0.115448	0.009909
	61	0.125574	0.010778
62	62	0.136330	0.011702
	63	0.147894	0.012694
64	64	0.160417	0.013769
	65	0.174028	0.014937

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.14)

N=10

	X	NPBARX	MNPBARX
10	10	0.004149	0.000356
	11	0.004446	0.000382
12	12	0.004712	0.000404
	13	0.004945	0.000424
14	14	0.005144	0.000442
	15	0.005308	0.000456
16	16	0.005432	0.000466
	17	0.005516	0.000473
18	18	0.005560	0.000477
	19	0.005581	0.000479
20	20	0.005594	0.000480
	21	0.005610	0.000482
22	22	0.005641	0.000484
	23	0.005691	0.000489
24	24	0.005769	0.000495
	25	0.005879	0.000505
26	26	0.006031	0.000518
	27	0.006233	0.000535
28	28	0.006495	0.000557
	29	0.006822	0.000586
30	30	0.007218	0.000620
	31	0.007686	0.000660
32	32	0.008221	0.000706
	33	0.008820	0.000757
34	34	0.009480	0.000814
	35	0.010200	0.000876
36	36	0.010981	0.000943
	37	0.011821	0.001015
38	38	0.012727	0.001092
	39	0.013701	0.001176
40	40	0.014750	0.001266
	41	0.015889	0.001364
42	42	0.017134	0.001471
	43	0.018502	0.001588
44	44	0.020012	0.001718
	45	0.021683	0.001861
46	46	0.023532	0.002020
	47	0.025575	0.002195
48	48	0.027832	0.002389
	49	0.030317	0.002602
50	50	0.033040	0.002836
	51	0.036002	0.003090
52	52	0.039201	0.003365
	53	0.042636	0.003660
54	54	0.046306	0.003975
	55	0.050215	0.004310
56	56	0.054705	0.004695
	57	0.059453	0.005103
58	58	0.064459	0.005533
	59	0.069713	0.005984
60	60	0.075216	0.006456
	61	0.080980	0.006951
62	62	0.087033	0.007470
	63	0.093410	0.008018
64	64	0.100150	0.008596
	65	0.107292	0.009209

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.15)

N=15

	X	NPBARX	MNPBARX
10	10	0.003506	0.000301
	11	0.003666	0.000315
12	12	0.003810	0.000327
	13	0.003936	0.000338
14	14	0.004045	0.000347
	15	0.004136	0.000355
16	16	0.004210	0.000361
	17	0.004267	0.000366
18	18	0.004312	0.000370
	19	0.004353	0.000374
20	20	0.004399	0.000378
	21	0.004460	0.000383
22	22	0.004541	0.000390
	23	0.004645	0.000399
24	24	0.004778	0.000410
	25	0.004942	0.000424
26	26	0.005141	0.000441
	27	0.005378	0.000462
28	28	0.005655	0.000485
	29	0.005974	0.000513
30	30	0.006335	0.000544
	31	0.006742	0.000579
32	32	0.007197	0.000618
	33	0.007699	0.000661
34	34	0.008254	0.000709
	35	0.008865	0.000761
36	36	0.009534	0.000818
	37	0.010264	0.000881
38	38	0.011059	0.000949
	39	0.011923	0.001023
40	40	0.012860	0.001104
	41	0.013882	0.001192
42	42	0.015001	0.001288
	43	0.016231	0.001393
44	44	0.017588	0.001510
	45	0.019081	0.001638
46	46	0.020718	0.001778
	47	0.022500	0.001931
48	48	0.024430	0.002097
	49	0.026507	0.002275
50	50	0.028737	0.002467
	51	0.031279	0.002685
52	52	0.033990	0.002917
	53	0.036879	0.003165
54	54	0.039950	0.003429
	55	0.043205	0.003708
56	56	0.046641	0.004003
	57	0.050252	0.004313
58	58	0.054031	0.004638
	59	0.057973	0.004976
60	60	0.062082	0.005329
	61	0.066376	0.005697
62	62	0.070884	0.006084
	63	0.075641	0.006492
64	64	0.080688	0.006926
	65	0.086071	0.007388

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.16)

N=20

	X	NPBARX	MNPBARX
10	10	0.003112	0.000267
	11	0.003224	0.000277
12	12	0.003328	0.000286
	13	0.003423	0.000294
14	14	0.003512	0.000301
	15	0.003594	0.000308
16	16	0.003670	0.000315
	17	0.003741	0.000321
18	18	0.003810	0.000327
	19	0.003883	0.000333
20	20	0.003967	0.000341
	21	0.004067	0.000349
22	22	0.004186	0.000359
	23	0.004325	0.000371
24	24	0.004487	0.000385
	25	0.004673	0.000401
26	26	0.004886	0.000419
	27	0.005129	0.000440
28	28	0.005407	0.000464
	29	0.005723	0.000491
30	30	0.006080	0.000522
	31	0.006481	0.000556
32	32	0.006928	0.000595
	33	0.007423	0.000637
34	34	0.007970	0.000684
	35	0.008570	0.000736
36	36	0.009229	0.000792
	37	0.009950	0.000854
38	38	0.010737	0.000922
	39	0.011596	0.000995
40	40	0.012531	0.001076
	41	0.013548	0.001163
42	42	0.014650	0.001257
	43	0.015844	0.001360
44	44	0.017135	0.001471
	45	0.018530	0.001590
46	46	0.020121	0.001727
	47	0.021830	0.001874
48	48	0.023663	0.002031
	49	0.025622	0.002199
50	50	0.027710	0.002378
	51	0.029924	0.002568
52	52	0.032266	0.002770
	53	0.034736	0.002982
54	54	0.037336	0.003205
	55	0.040069	0.003439
56	56	0.042939	0.003686
	57	0.045951	0.003944
58	58	0.049110	0.004215
	59	0.052421	0.004499
60	60	0.055901	0.004798
	61	0.059573	0.005113
62	62	0.063475	0.005448
	63	0.067647	0.005806
64	64	0.072138	0.006192
	65	0.077001	0.006609

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE Table (7.17)

N=25

	X	NPBARX	MNPBARX
10	10	0.002887	0.000248
	11	0.002988	0.000256
12	12	0.003085	0.000265
	13	0.003180	0.000273
14	14	0.003274	0.000281
	15	0.003366	0.000289
16	16	0.003458	0.000297
	17	0.003549	0.000305
18	18	0.003640	0.000312
	19	0.003737	0.000321
20	20	0.003844	0.000330
	21	0.003965	0.000340
22	22	0.004103	0.000352
	23	0.004262	0.000366
24	24	0.004442	0.000381
	25	0.004648	0.000399
26	26	0.004883	0.000419
	27	0.005149	0.000442
28	28	0.005450	0.000468
	29	0.005790	0.000497
30	30	0.006170	0.000530
	31	0.006595	0.000566
32	32	0.007066	0.000607
	33	0.007588	0.000651
34	34	0.008164	0.000701
	35	0.008796	0.000755
36	36	0.009487	0.000814
	37	0.010236	0.000879
38	38	0.011046	0.000948
	39	0.011917	0.001023
40	40	0.012853	0.001103
	41	0.013911	0.001194
42	42	0.015046	0.001291
	43	0.016265	0.001396
44	44	0.017573	0.001508
	45	0.018972	0.001628
46	46	0.020466	0.001757
	47	0.022054	0.001893
48	48	0.023737	0.002037
	49	0.025514	0.002190
50	50	0.027388	0.002351
	51	0.029359	0.002520
52	52	0.031434	0.002698
	53	0.033617	0.002885
54	54	0.035917	0.003083
	55	0.038344	0.003291
56	56	0.040907	0.003511
	57	0.043620	0.003744
58	58	0.046493	0.003991
	59	0.049543	0.004252
60	60	0.052791	0.004531
	61	0.056266	0.004830
62	62	0.060010	0.005151
	63	0.064067	0.005499
64	64	0.068488	0.005879
	65	0.073327	0.006294

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.18)

N= 5

	X	NPBARX	MNPBARX
10	10	0.005784	0.000496
12	11	0.006468	0.000555
	12	0.007149	0.000614
14	13	0.007816	0.000671
	14	0.008433	0.000724
16	15	0.008961	0.000769
	16	0.009373	0.000804
18	17	0.009648	0.000828
	18	0.009796	0.000841
20	19	0.009856	0.000846
	20	0.009870	0.000847
22	21	0.009870	0.000847
	22	0.009870	0.000847
24	23	0.009870	0.000847
	24	0.009882	0.000848
26	25	0.009918	0.000851
	26	0.009992	0.000858
28	27	0.010130	0.000869
	28	0.010358	0.000889
30	29	0.010691	0.000918
	30	0.011140	0.000956
32	31	0.011722	0.001006
	32	0.012446	0.001068
34	33	0.013313	0.001143
	34	0.014331	0.001230
36	35	0.015503	0.001331
	36	0.016813	0.001443
38	37	0.018235	0.001565
	38	0.019755	0.001696
40	39	0.021343	0.001832
	40	0.022993	0.001974
42	41	0.024727	0.002122
	42	0.026575	0.002281
44	43	0.028581	0.002453
	44	0.030799	0.002644
46	45	0.033273	0.002856
	46	0.036041	0.003094
48	47	0.039127	0.003358
	48	0.042551	0.003652
50	49	0.046326	0.003976
	50	0.050473	0.004332
52	51	0.055013	0.004722
	52	0.059998	0.005150
54	53	0.065478	0.005620
	54	0.071503	0.006137
56	55	0.078093	0.006703
	56	0.085227	0.007315
58	57	0.092837	0.007968
	58	0.100830	0.008655
60	59	0.109121	0.009366
	60	0.117679	0.010101
62	61	0.127543	0.010947
	62	0.137969	0.011842
64	63	0.149113	0.012799
	64	0.161101	0.013828
	65	0.174028	0.014937

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.19)

N=10

	X	NPBARX	MNPBARX
	10	0.004324	0.000371
	11	0.004627	0.000397
	12	0.004900	0.000421
	13	0.005139	0.000441
	14	0.005343	0.000459
	15	0.005509	0.000473
	16	0.005637	0.000484
	17	0.005722	0.000491
	18	0.005768	0.000495
	19	0.005789	0.000497
	20	0.005801	0.000498
	21	0.005818	0.000499
	22	0.005849	0.000502
	23	0.005901	0.000507
	24	0.005980	0.000513
	25	0.006094	0.000523
	26	0.006249	0.000536
	27	0.006456	0.000554
	28	0.006724	0.000577
	29	0.007058	0.000606
	30	0.007464	0.000641
	31	0.007941	0.000682
	32	0.008488	0.000729
	33	0.009101	0.000781
	34	0.009776	0.000839
	35	0.010513	0.000902
	36	0.011311	0.000971
	37	0.012170	0.001045
	38	0.013095	0.001124
	39	0.014090	0.001209
	40	0.015161	0.001301
	41	0.016325	0.001401
	42	0.017596	0.001510
	43	0.018992	0.001630
	44	0.020533	0.001762
	45	0.022237	0.001909
	46	0.024120	0.002070
	47	0.026202	0.002249
	48	0.028501	0.002446
	49	0.031030	0.002663
	50	0.033799	0.002901
	51	0.036810	0.003160
	52	0.040061	0.003439
	53	0.043549	0.003738
	54	0.047274	0.004058
	55	0.051238	0.004398
	56	0.055695	0.004780
	57	0.060404	0.005185
	58	0.065360	0.005610
	59	0.070553	0.006056
	60	0.075979	0.006522
	61	0.081648	0.007008
	62	0.087583	0.007518
	63	0.093815	0.008052
	64	0.100374	0.008615
	65	0.107292	0.009209

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.20)

N=15

	X	NPBARX	MNPBARX
10	10	0.003635	0.000312
12	11	0.003799	0.000326
	12	0.003947	0.000339
14	13	0.004076	0.000350
	14	0.004187	0.000359
16	15	0.004281	0.000367
	16	0.004356	0.000374
18	17	0.004415	0.000379
	18	0.004460	0.000383
20	19	0.004502	0.000386
	20	0.004550	0.000390
22	21	0.004611	0.000396
	22	0.004694	0.000403
24	23	0.004801	0.000412
	24	0.004937	0.000424
26	25	0.005105	0.000438
	26	0.005309	0.000456
28	27	0.005551	0.000476
	28	0.005834	0.000501
30	29	0.006160	0.000529
	30	0.006529	0.000560
32	31	0.006946	0.000596
	32	0.007410	0.000636
34	33	0.007924	0.000680
	34	0.008491	0.000729
36	35	0.009115	0.000782
	36	0.009799	0.000841
38	37	0.010544	0.000905
	38	0.011356	0.000975
40	39	0.012237	0.001050
	40	0.013194	0.001132
42	41	0.014236	0.001222
	42	0.015377	0.001320
44	43	0.016631	0.001427
	44	0.018013	0.001546
46	45	0.019533	0.001677
	46	0.021198	0.001820
48	47	0.023011	0.001975
	48	0.024973	0.002143
50	49	0.027083	0.002325
	50	0.029348	0.002519
52	51	0.031884	0.002737
	52	0.034589	0.002969
54	53	0.037470	0.003216
	54	0.040531	0.003479
56	55	0.043773	0.003757
	56	0.047193	0.004051
58	57	0.050785	0.004359
	58	0.054539	0.004681
60	59	0.058448	0.005017
	60	0.062517	0.005366
62	61	0.066758	0.005730
	62	0.071200	0.006111
64	63	0.075875	0.006513
	64	0.080819	0.006937
	65	0.086071	0.007388

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.21)

N=20

	X	NPBARX	MNPBARX
	10	0.003218	0.000276
	11	0.003332	0.000286
	12	0.003438	0.000295
	13	0.003537	0.000304
	14	0.003627	0.000311
	15	0.003711	0.000319
	16	0.003789	0.000325
	17	0.003861	0.000331
	18	0.003932	0.000337
	19	0.004006	0.000344
	20	0.004093	0.000351
	21	0.004195	0.000360
	22	0.004316	0.000370
	23	0.004459	0.000383
	24	0.004624	0.000397
	25	0.004814	0.000413
	26	0.005031	0.000432
	27	0.005281	0.000453
	28	0.005565	0.000478
	29	0.005888	0.000505
	30	0.006252	0.000537
	31	0.006662	0.000572
	32	0.007118	0.000611
	33	0.007624	0.000654
	34	0.008182	0.000702
	35	0.008796	0.000755
	36	0.009468	0.000813
	37	0.010203	0.000876
	38	0.011006	0.000945
	39	0.011881	0.001020
	40	0.012834	0.001102
	41	0.013869	0.001190
	42	0.014992	0.001287
	43	0.016206	0.001391
	44	0.017519	0.001504
	45	0.018936	0.001625
	46	0.020528	0.001762
	47	0.022239	0.001909
	48	0.024072	0.002066
	49	0.026032	0.002234
	50	0.028119	0.002414
	51	0.030332	0.002603
	52	0.032672	0.002804
	53	0.035140	0.003016
	54	0.037736	0.003239
	55	0.040463	0.003473
	56	0.043326	0.003719
	57	0.046328	0.003976
	58	0.049471	0.004246
	59	0.052763	0.004529
	60	0.056216	0.004825
	61	0.059854	0.005138
	62	0.063710	0.005468
	63	0.067823	0.005821
	64	0.072237	0.006200
	65	0.077001	0.006609

ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE
WITH REFUND PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE Table (7.22)

N=25

	X	NPBARX	MNPBARX
10	10	0.002979	0.000256
12	11	0.003082	0.000265
	12	0.003181	0.000273
14	13	0.003279	0.000281
	14	0.003375	0.000290
16	15	0.003469	0.000298
	16	0.003563	0.000306
18	17	0.003656	0.000314
	18	0.003749	0.000322
20	19	0.003848	0.000330
	20	0.003957	0.000340
22	21	0.004081	0.000350
	22	0.004222	0.000362
24	23	0.004384	0.000376
	24	0.004569	0.000392
26	25	0.004779	0.000410
	26	0.005019	0.000431
28	27	0.005291	0.000454
	28	0.005599	0.000481
30	29	0.005945	0.000510
	30	0.006334	0.000544
32	31	0.006767	0.000581
	32	0.007248	0.000622
34	33	0.007781	0.000668
	34	0.008368	0.000718
36	35	0.009012	0.000774
	36	0.009716	0.000834
38	37	0.010480	0.000900
	38	0.011304	0.000970
40	39	0.012191	0.001046
	40	0.013142	0.001128
42	41	0.014203	0.001219
	42	0.015341	0.001317
44	43	0.016562	0.001422
	44	0.017872	0.001534
46	45	0.019274	0.001654
	46	0.020770	0.001783
48	47	0.022360	0.001919
	48	0.024045	0.002064
50	49	0.025825	0.002217
	50	0.027700	0.002378
52	51	0.029673	0.002547
	52	0.031750	0.002725
54	53	0.033934	0.002913
	54	0.036234	0.003110
56	55	0.038660	0.003318
	56	0.041221	0.003538
58	57	0.043928	0.003770
	58	0.046793	0.004016
60	59	0.049830	0.004277
	60	0.053059	0.004554
62	61	0.056508	0.004850
	62	0.060215	0.005168
64	63	0.064222	0.005512
	64	0.068576	0.005886
	65	0.073327	0.006294

CHAPTER EIGHT

CONCLUSIONS

8.1 Introduction

This research was undertaken to apply the theoretical basis of life assurance in designing an ideal industrial life policy, which suits the Egyptian market and other similar developing countries.

In the preceding chapters, two approaches to design the ideal policy were developed. The first approach was: how to reduce the premiums of the policy to a minimum level to suit the per-capita income of Egypt and other similar developing countries. In this respect, the elements of calculating premiums were comprehensively discussed. The second approach was: discussing the benefits of the policy according to the circumstances of the Egyptian market. In this respect, the factors affecting the design of the ideal policy were discussed.

8.2 How to Reduce the Premiums to the Minimum Level

In this respect, the mortality rates, the interest rates and the loading rates were discussed.

8.2.1 The Mortality Rates

Life assurance contracts are usually of a long duration and while this can also apply to other financial contracts it is the element of mortality that distinguishes contracts of life assurance from other contracts. On this account, this research constructed, for the first time in the history of Egyptian insurance, a mortality table based on Egyptian experience. According to the data

available, the period of investigation was four years, from 1 July 1972 to 30 June 1976, and the units of investigation were policies and sums assured.

For computing convenience, the census method was used to derive the mortality rates.

Graduation by reference to a standard table was used to smooth the Egyptian mortality rates, since this method is particularly valuable when the data are scanty. The A1924-29U was considered a reasonable standard table, since it had already been used in Egypt. The graduation proved to be reasonable, according to the χ^2 test probabilities obtained for the fits of mortality rates based both on policies and on sums assured. A complete life table was derived based on policies and sums assured.

Although this is the first attempt to construct mortality rates for Egypt based on the experience of the insurance companies, it gave encouraging results. Both mortality rates based on policies and sums assured represent a reduction in mortality rates compared with the A24-29U table, which has hitherto been in use in the Egyptian market. The greatest reduction was at the younger ages which have been more affected by changes in the environment than the advanced ages.

8.2.2 The Interest Rate

It is a well known fact that the higher interest rate we use, the smaller the premiums we obtain. This is why the insurance companies try to justify the highest

interest rate in order to reduce the premium to its minimum.

The Egyptian insurance companies are using interest rates in the range of $3\frac{1}{2}\%$ to $4\frac{1}{4}\%$, which could be considered low in view of the other saving channels, which give interest rates up to 7%. The researcher suggests that the interest rate must be increased in view of the following:

1. There are other saving channels which give interest rates up to 7%, such as The Investment Certificates issued by The National Bank of Egypt.
2. With the new Egyptian strategy of economic development called "The Open Door Policy", the law of investment in insurance companies needs considerable adjustment.

The research also included a complete set of monetary tables based on Egyptian mortality rates (policies and sums assured) and interest rates varying between 4% and 7%. A comparison has been made between the functions based on Egyptian experience and those based on the A24-29 U table. In brief, it can be said that when the Egyptian companies use the new tables, they will obtain a marked reduction in the premiums.

8.2.3 The Loading Rates

Industrial life assurance is a special type of life assurance business, specially created to suit people of the low income bracket in the society.

In order that this type of assurance fulfills its role in providing those with low incomes with the insurance they need, its price must be kept to a minimum, in other words the premium loadings which affect the level of prices must be maintained to the minimum level possible.

In this respect, the researcher recommends the following criteria for the Egyptian companies to apply in order to be able to judge whether the industrial branch realizes a profit or a loss in conducting its operations, and also to be able to reduce the expense loadings to a minimum level.

1. A separate account must be made for industrial branches as well as for other branches.
2. The expenses should be divided into direct and indirect expenses. Moreover, these indirect expenses should be allocated to branches by scientific methods, such as the time basis.
3. The researcher suggests that in order to reduce the cost of industrial life assurance, this branch should be charged only with direct expenses, while exempted from any share of the indirect expenses. In this respect, we may call the industrial life assurance "the social industrial life assurance".
4. For fixing the actual rates, the researcher recommends the method developed by Miss Monica Allanach in her paper which was represented in the 17th International Congress of Actuaries in 1964.

8.3 The Benefits of the Ideal Policy

The factors affecting and influencing the design of the ideal policy were discussed. Such factors are: the knowledge of insurance among the population, the per-capita income and its capacity to buy life assurance, the benefits of the social insurance system, and the competition of other saving channels and finally the salesmanship of the people working in the area of life assurance.

Generally, in the light of the factors mentioned above, the researcher suggests the term insurance with a refund of the premiums in case of insured survival as an ideal policy in view of the circumstances of the Egyptian market.

The suggested policy is easy to understand by the population since the insured will get the premiums back in case of survival to this end of the term. Therefore, it will be easy to market from the salesman's point of view. Also, the premium will be appropriate to the per-capita income, and will sustain the "social industrial assurance" system as a life assurance. It will not be in a weaker position against other saving channels from the competitive point of view since it will be calculated on the highest interest rate available in the market.

Finally, the research includes a complete calculation of the official premiums for the suggested policy.

Appendix I

Graduation by a Standard Table (The A 1924-29 U.)

$${}^1q_x = a q_x + b$$

where a and b constant

to obtain a and b.

If we assume for every age (age group) that

$${}^1q_x = a q_x + b, \text{ it follows that}$$

$$E_x {}^1q_x = a E_x q_x + b E_x$$

$$\left. \begin{aligned} \sum E_x {}^1q_x &= a \sum E_x q_x + b \sum E_x \\ \sum^2 E_x {}^1q_x &= a \sum^2 E_x q_x + b \sum^2 E_x \end{aligned} \right\} \quad (1)$$

where

$E_x {}^1q_x$ is merely the actual deaths observed at age x, while $E_x q_x$ is the expected deaths according to the standard table (the A 24-29 U.). By solving the equation (1) we can get the constant a and b.

For graduating the mortality rates based on policies, we consider:

$$q_x' \text{ (graduated)} = a q_x \text{ (A 24-29)} + b$$

Age group	E_x	$\sum E_x$	$E_x q_x$	$\sum E_x q_x$	θ_x	$\sum \theta_x$
10½-14½	37342.5	37342.5	68	68	27	27
15½-19½	26708	64050.5	61	129	28	55
20½-24½	29508	93558.5	69	198	40	95
25½-29½	49086.5	142645	116	314	69	164
30½-34½	329393	472038	848	1162	466	630
35½-39½	322633	794671	1066	2228	644	1274
40½-44½	284706.5	1079377.5	1288	3516	847	2121
45½-49½	148856	1228233.5	934	4450	728	2849
50½-54½	58648.5	1286882	556	5006	481	3330
55½-59½	18996	1305878	290	5296	262	3592
60½-64½	2791	1308669	70	5366	64	3656
Total	1308669	7813344	5366	27733	3656	17793

$$3656 = 5366 a + 1308669 b$$

$$17793 = 27733 a + 7813344 b$$

$$a = 0.937158, \quad b = -0.001049$$

$$q_x' = 0.937158 q_x \text{ (A 24-29 U.)} - 0.001049$$

Also, for graduating the mortality rates based on sums assured, we consider:

$$q_x \text{ (graduated)} = a q_x \text{ (A 24-29)} + b$$

Age group	E_x	$\sum E_x$	$E_x q_x$	$\sum E_x q_x$	θ_x	$\sum \theta_x$
10½-14½	5713131	5713131	10340.76	10340.76	4150	4150
15½-19½	3726524	9439655	8496.47	18837.23	4080	8230
20½-24½	4157310	13596965	9769.67	28606.90	5744	13974
25½-29½	7851767	21448732	18490.91	47097.81	11240	25214
30½-34½	34016808	55465540	87593.28	134691.09	48898	74112
35½-39½	34477834	89943374	113949.24	248640.33	72054	146166
40½-44½	27757959	117701333	125604.76	374245.09	86028	232194
45½-49½	15412222	133113555	96711.69	470956.78	77716	309910
50½-54½	5885404	138998959	55793.62	526750.40	49234	359144
55½-59½	1734099	140733058	26514.37	553264.77	24702	383846
60½-64½	205073	140938131	5152.45	558417.22	4812	388658
Total	140938131	867092433	558417.22	2971848.38	388658	1945598

$$388658 = 558417.22 a + 140938131 b$$

$$1945598 = 2971848.38 a + 867092433 b$$

$$a = 0.960755, \quad b = -0.001049$$

$$q_x = 0.960755 q_x \text{ (A 24-29)} - 0.001049$$

APPENDIX II

Computer Programs

- A.1 Monetary Functions (policies)
- A.2 Monetary Functions (policies)
- A.3 Monetary Functions (sums assured)
- A.4 Monetary Functions (sums assured)
- A.5 Whole Life Single and Annual Premiums (policies)
- A.6 Whole Life Single and Annual Premiums (sums assured)
- A.7 Endowment Single and Annual Premiums (policies)
- A.8 Endowment Single and Annual Premiums (sums assured)
- A.9 Term Insurance with Refund Premiums (policies)
- A.10 Term Insurance with Refund Premiums (sums assured)
- A.11 Annual and Monthly Office Premiums of Term Insurance (policies)
- A.12 Annual and Monthly Office Premiums of Term Insurance (sums assured)


```

MASTER MORT (A.1)
REALL,N
DIMENSION L(100),N(100),S(100),D(100),V(100)
READ(1,100)(L(J),J=10,99)
100 FORMAT(10F0.0)
P=.035
DO 1 J=1,7
P=P+.005
DO 2 I=1,100
V(I)=1./((1.+P)**I)
2 CONTINUE
DO 3 I=10,99
D(I)=V(I)*L(I)
3 CONTINUE
N(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
N(J1)=N(J3)+D(J1)
4 CONTINUE
S(99)=N(99)
DO 6 K=10,98
J2=108-K
J4=J2+1
S(J2)=S(J4)+N(J2)
6 CONTINUE
WRITE(6,103)P
103 FORMAT(1H1,10X,'MONETARY FUNCTIONS (POLICIES) AT ',F4.3,' PER CENT
1 INTEREST RATE')
WRITE(6,101)
101 EFORMAT(/,1H , ' X DX NX
1 SX ,,,)
DO 8 I=10,99
8 WRITE(6,102)I,D(I),N(I),S(I)
102 FORMAT(1H ,9X,12,2X,F10.0,4X,F16.0,8X,F16.0)
1 CONTINUE
STOP
END

```


MASTER MORT

(A.2)

REALM

DIMENSION D(100),C(100),M(100),R(100),V(100)

READ(1,100)(D(J),J=10,99)

100 FORMAT(10F0,0)

P=.035

DO 1 J=1,7

P=P+.005

DO 2 I=1,100

V(I)=1./(1.+P)**I

2 CONTINUE

DO 3 I=10,99

C(I)=V(I+1)*D(I)

3 CONTINUE

M(99)=C(99)

DO 4 K=10,98

J1=108-K

J3=J1+1

M(J1)=M(J3)+C(J1)

4 CONTINUE

R(99)=M(99)

DO 6 K=10,98

J2=108-K

J4=J2+1

R(J2)=R(J4)+M(J2)

6 CONTINUE

WRITE(6,103)P

103 FORMAT(1H1,10X,'MONETARY FUNCTIONS (POLICIES) AT ',F4.3,' PER CENT
1 INTEREST RATE')

WRITE(6,101)

101 FORMAT(//1H,' X CX MX
1 RX ',/)

DO 8 I=10,99

8 WRITE(6,102)I,C(I),M(I),R(I)

102 FORMAT(1H,9X,I2,2X,F10.0,4X,F16.0,8X,F16.0)

1 CONTINUE

STOP

END


```

MASTER MORT
REALL,N
DIMENSION L(100),N(100),S(100),D(100),V(100)
READ(1,100)(L(J),J=10,99)
100 FORMAT(10F0.0)
P=.035
DO 1 J=1,7
P=P+.005
DO 2 I=1,100
V(I)=1./(1.+P)**I
2 CONTINUE
DO 3 I=10,99
D(I)=V(I)*L(I)
3 CONTINUE
N(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
N(J1)=N(J3)+D(J1)
4 CONTINUE
S(99)=N(99)
DO 6 K=10,98
J2=108-K
J4=J2+1
S(J2)=S(J4)+N(J2)
6 CONTINUE
WRITE(6,103)P
103 FORMAT(1H1,10X,'MONETARY FUNCTIONS (SUMS ASSURED) AT ',F4.3,' PER
CENT INTEREST RATE!')
WRITE(6,101)
101 FORMAT(/1H,'
1          SX          X          DX          NX
1          1,/)
DO 8 I=10,99
8 WRITE(6,102)I,D(I),N(I),S(I)
102 FORMAT(1H,9X,12,2X,F10.0,4X,F16.0,8X,F16.0)
1 CONTINUE
STOP
END

```

(A.3)


```

MASTER MORT (A.4)
REALM
DIMENSION D(100),C(100),M(100),R(100),V(100)
READ(1,100)(D(J),J=10,99)
100 FORMAT(10F0.0)
P=.035
DO 1 J=1,7
P=P+.005
DO 2 I=1,100
V(I)=1./(1.+P)**I
2 CONTINUE
DO 3 J=10,99
C(I)=V(I+1)*D(I)
3 CONTINUE
M(99)=C(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
4 CONTINUE
R(99)=M(99)
DO 6 K=10,98
J2=108-K
J4=J2+1
R(J2)=R(J4)+M(J2)
6 CONTINUE
WRITE(6,103)P
103 FORMAT(1H1,10X,'MONETARY FUNCTIONS (SUMS ASSURED) AT ',F4.3,' PER
CENT INTEREST RATE')
WRITE(6,101)
101 FORMAT(//1H, 'X CX MX
1 RX ',/)
DO 8 I=10,99
8 WRITE(6,102)I,C(I),M(I),R(I)
102 FORMAT(1H,9X,I2,2X,F10.0,4X,F16.0,8X,F16.0)
1 CONTINUE
STOP
END

```



```

MASTER MORT
REAL L,M,N
DIMENSION L(100),N(100),D(100),V(100),P1(100),C(100),M(100),P(100)
1, A(100)
READ(1,100)(L(J),J=10,99)
100 FORMAT(10F8.0)
READ(1,100)(D1(J),J=10,99)
P1=.035
DO 1 J=1,7
P1=P1+.005
DO 2 I=1,100
V(I)=1./(1.+P1)**I
2 CONTINUE
DO 3 I=10,99
C(I)=V(I+1)*D1(I)
D(I)=V(I)*L(I)
3 CONTINUE
M(99)=C(99)
N(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
N(J1)=N(J3)+D(J1)
4 CONTINUE
DO 6 K=10,65
A(K)=M(K)/D(K)
P(K)=M(K)/N(K)
6 CONTINUE
WRITE(6,103)P1
103 FORMAT(1H1,10X,'WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) A
T ',F4.3/1H,20X,'PER CENT INTEREST RATE')
WRITE(6,101)
101 FORMAT(/1H,
X
AX
PX
',/)
DO 8 I=10,65
8 WRITE(6,102)I,A(I),P(I)
102 FORMAT(1H,9X,I2,9X,F9.6,9X,F9.6)
1 CONTINUE
STOP

```



```

MASTER MORT (A.6)
REAL L,M,N
DIMENSION L(100),N(100),D(100),V(100),D1(100),C(100),M(100),P(100)
1, A(100)
READ(1,100)(L(J),J=10,99)
100 FORMAT(10F0.0)
READ(1,100)(D1(J),J=10,99)
P1=.035
DO 1 J=1,7
P1=P1+.005
DO 2 I=1,100
V(I)=1./(1.+P1)**I
2 CONTINUE
DO 3 I=10,99
C(I)=V(I+1)*D1(I)
D(I)=V(I)*L(I)
3 CONTINUE
M(99)=C(99)
N(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
N(J1)=N(J3)+D(J1)
4 CONTINUE
DO 6 K=10,65
A(K)=M(K)/D(K)
P(K)=M(K)/N(K)
6 CONTINUE
WRITE(6,103)P1
103 FORMAT(1H1,10X,'WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURE
10) AT 1.04.3/1H,20X,'PER CENT INTEREST RATE')
WRITE(6,101)
101 FORMAT(//1H,' X AX PX ',/)
DO 8 I=10,65
8 WRITE(6,102)I,A(I),P(I)
102 FORMAT(1H,9X,12,9X,F9.6,9X,F9.6)
1 CONTINUE
STOP
END

```


MASTER HORT

(A.7)

REALL, M, N1, NA, NP

DIMENSION L(100), N1(100), D(100), V(100), D1(100), C(100), M(100), NP(100), NA(100)

READ(1,100)(L(J), J=10,99)

100 FORMAT(10F8.0)

READ(1,100)(D1(J), J=10,99)

N=0

DO 30 NN=1,5

N=N+5

D1=.035

DO 1 J=1,7

D1=D1+.005

DO 2 I=1,100

V(I)=1./(1.+D1)**I

2 CONTINUE

DO 3 I=10,99

C(I)=V(I+1)*D1(I)

D(I)=V(I)+C(I)

3 CONTINUE

M(99)=C(99)

N1(99)=D(99)

DO 4 K=10,98

J1=108-K

J3=J1+1

M(J1)=M(J3)+C(J1)

N1(J1)=N1(J3)+D(J1)

4 CONTINUE

DO 6 K=10,65

J4=N+K

NA(K)=(M(K)-M(J4)+D(J4))/D(K)

NP(K)=(M(K)-M(J4)+D(J4))/(N1(K)-N1(J4))

6 CONTINUE

WRITE(6,103)P1

103 FORMAT(1H1,10X,'ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT',
'F4.5/1H',20X,'PER CENT INTEREST RATE')

WRITE(6,104)N

104 FORMAT(1H,30X,'N=',I2)

WRITE(6,101)

101 FORMAT(1H,10X,'X',10X,'NAX',10X,'NPX',10X,'I,/')

DO 8 I=10,65

8 WRITE(6,102)I,NA(I),NP(I)

102 FORMAT(1H,10X,I2,9X,F9.6,9X,F9.6)

1 CONTINUE

30 CONTINUE

STOP

END


```

MASTER HORT (A.8)
REAL L, M, N1, NA, NP
DIMENSION L(100), N1(100), D(100), V(100), D1(100), C(100), M(100), NP(100), NA(100)
READ(1,100)(L(J), J=10,99)
100 FORMAT(10F8.0)
READ(1,100)(N1(J), J=10,99)
N=0
DO 30 NN=1,5
N=N+5
P1=.035
DO 1 J=1,7
P1=P1+.005
DO 2 I=1,100
V(I)=1/(1+.P1)**I
2 CONTINUE
DO 3 I=10,99
C(I)=V(I+1)*D1(I)
D(I)=V(I)*L(I)
3 CONTINUE
M(99)=C(99)
N1(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
N1(J1)=N1(J3)+D(J1)
4 CONTINUE
DO 6 K=10,65
J4=N+K
NA(K)=(M(K)-M(J4)+D(J4))/D(K)
NP(K)=(M(K)-M(J4)+D(J4))/(N1(K)-N1(J4))
6 CONTINUE
WRITE(6,103)P1
103 FORMAT(1H1,10X,'ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURE
1)-AT ',F4.3/1H,20X,'PER CENT INTEREST RATE')
WRITE(6,104)N
104 FORMAT(1H,30X,'N=',I2)
WRITE(6,101)
101 FORMAT(1H,1X,NAX,NPX,1,/)
DO 8 I=10,65
8 WRITE(6,102)I,NA(I),NP(I)
102 FORMAT(1H,20X,I2,9X,F9.6,9X,F9.6)
1 CONTINUE
30 CONTINUE
STOP
END

```


(A.9)

```
MASTER MORT
REALL,M,N1,NA,NP
DIMENSION L(100),N1(100),D(100),V(100),D1(100),C(100),M(100),NP(1
10),NA(100)
READ(1,100)(L(J),J=10,99)
100 FORMAT(10F8.0)
READ(1,100)(D1(J),J=10,99)
N=0
DO 30 NN=1,5
N=N+5
P1=.035
DO 1 J=1,7
P1=P1+.005
DO 2 I=1,100
V(I)=1./(1.+P1)**I
2 CONTINUE
DO 3 I=10,99
C(I)=V(I+1)*D1(I)
D(I)=V(I)*L(I)
3 CONTINUE
M(99)=C(99)
N1(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
N1(J1)=N1(J3)+D(J1)
4 CONTINUE
DO 6 K=10,65
J4=N+K
NA(K)=(M(K)-M(J4))/(D(K)-D(J4))
NP(K)=(M(K)-M(J4))/(N1(K)-N1(J4)-N*D(J4))
6 CONTINUE
WRITE(6,103)P1
103 FORMAT(1H1,10X,'TERM INSURANCE WITH REFUND PREMIUMS (POLICIES) AT
1',F4,3/1H,20X,'PER CENT INTEREST RATE')
WRITE(6,104)N
104 FORMAT(/1H,30X,'N=',12)
WRITE(6,101)
101 FORMAT(/1H,' X NAX NPX ',/)
DO 8 I=10,65
8 WRITE(6,102)I,NA(I),NP(I)
102 FORMAT(1H,9X,I2,9X,F9.6,9X,F9.6)
1 CONTINUE
30 CONTINUE
STOP
END
```


(A.10)

```
MASTER HORT
REALL,M,N1,NA,NP
DIMENSION L(100),N1(100),D(100),V(100),D1(100),C(100),M(100),NP(10
0),NA(100)
100 READ(1,100)(L(J),J=10,99)
FORMAT(10F8.0)
READ(1,100)(D1(J),J=10,99)
N=0
DO 30 NH=1,5
N=N+5
P1=.035
DO 1 J=1,7
P1=P1+.005
DO 2 I=1,100
V(I)=1./(1.+P1)**I
2 CONTINUE
DO 3 I=10,99
C(I)=V(I+1)*D1(I)
D(I)=V(I)*L(I)
3 CONTINUE
M(99)=C(99)
N1(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
N1(J1)=N1(J3)+D(J1)
4 CONTINUE
DO 6 K=10,65
J4=N+K
NA(K)=(M(K)-M(J4))/(D(K)-D(J4))
NP(K)=(N1(K)-N1(J4))/(N1(K)-N1(J4)-N*D(J4))
6 CONTINUE
WRITE(6,103)P1
103 FORMAT(1H1,10X,'TERM INSURANCE WITH REFUND PREMIUMS (SUMS ASSURED)
AT ',F4.3/1H',20X,'PER CENT INTEREST RATE')
WRITE(6,104)N
104 FORMAT(1H',30X,'N=',I2)
WRITE(6,101)
101 FORMAT(1H',,X,NAX,NPX',/)
DO 8 I=10,65
8 WRITE(6,102)I,NA(I),NP(I)
102 FORMAT(1H',9X,I2,9X,F9.6,9X,F9.6)
1 CONTINUE
30 CONTINUE
STOP
END
```


(A.11)

```
MASTER MORT
REALL,M,N1,NA,NP,NPBAR,MNPBAR
DIMENSION L(100),N1(100),D(100),V(100),D1(100),C(100),M(100),NP(100),NA(100),NPBAR(100),MNPBAR(100)
100 READ(1,100)(L(J),J=10,99)
FORMAT(10F8.0)
READ(1,100)(D1(J),J=10,99)
N=0
DO 30 NN=1,5
N=N+5
P1=.035
DO 1 J=1,7
P1=P1+.005
DO 2 I=1,100
V(I)=1./(1.+P1)**I
2 CONTINUE
DO 3 I=10,99
C(I)=V(I+1)*D1(I)
D(I)=V(I)*L(I)
3 CONTINUE
M(99)=C(99)
N1(99)=D(99)
DO 4 K=10,98
J1=108-K
J3=J1+1
M(J1)=M(J3)+C(J1)
N1(J1)=N1(J3)+D(J1)
4 CONTINUE
DO 7 K=10,65
J4=N+K
NA(K)=(N1(K)-N1(J4))/D(K)
NP(K)=(M(K)-M(J4))/(N1(K)-N1(J4)-N*D(J4))
7 CONTINUE
DO 6 K=10,65
J4=N+K
NPBAR(K)=(NA(K)*(NP(K)+0.001))/(0.93*NA(K)-0.60)
MNPBAR(K)=NPBAR(K)*1.03/12
6 CONTINUE
WRITE(6,103)P1
103 FORMAT(1H1,10X,'ANNUAL AND MONTHLY OFFICE PREMIUMS OF TERM INSURANCE'/'1H ,10X,'WITH REFUND PREMIUMS (POLICIES) AT ',F4.3/1H ,20X,'PERCENT INTEREST RATE')
WRITE(6,104)N
104 FORMAT(1H ,30X,'N=',I2)
WRITE(6,101)
101 FORMAT(//1H ,1X NPBARX MNPBARX',/)
DO 8 I=10,65
8 WRITE(6,102)I,NPBAR(I),MNPBAR(I)
102 FORMAT(1H ,9X,I2,9X,F9.6,9X,F9.6)
1 CONTINUE
30 CONTINUE
STOP
END
```


APPENDIX III

Single and Annual Premiums
(policies) for the Whole
Life and Endowment

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .040
PER CENT INTEREST RATE

X	AX	PX
10	0.107767	0.004645
11	0.111691	0.004836
12	0.115711	0.005033
13	0.119812	0.005236
14	0.123996	0.005444
15	0.128270	0.005660
16	0.132637	0.005882
17	0.137101	0.006111
18	0.141676	0.006349
19	0.146391	0.006596
20	0.151277	0.006856
21	0.156355	0.007128
22	0.161642	0.007416
23	0.167148	0.007719
24	0.172880	0.008039
25	0.178849	0.008377
26	0.185063	0.008735
27	0.191533	0.009112
28	0.198270	0.009512
29	0.205277	0.009935
30	0.212559	0.010383
31	0.220118	0.010856
32	0.227955	0.011357
33	0.236061	0.011886
34	0.244441	0.012444
35	0.253092	0.013034
36	0.262012	0.013656
37	0.271194	0.014313
38	0.280640	0.015006
39	0.290343	0.015737
40	0.300304	0.016509
41	0.310532	0.017324
42	0.321038	0.018188
43	0.331832	0.019103
44	0.342925	0.020075
45	0.354325	0.021109
46	0.366032	0.022209
47	0.378044	0.023381
48	0.390355	0.024630
49	0.402954	0.025962
50	0.415831	0.027382
51	0.428975	0.028899
52	0.442377	0.030518
53	0.456024	0.032249
54	0.469904	0.034101
55	0.484000	0.036084
56	0.498291	0.038209
57	0.512747	0.040485
58	0.527330	0.042921
59	0.542002	0.045530
60	0.556741	0.048325
61	0.571538	0.051324
62	0.586399	0.054552
63	0.601329	0.058039
64	0.616325	0.061814
65	0.631371	0.065911

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .040
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.822100	0.177735
11	0.822132	0.177774
12	0.822164	0.177813
13	0.822196	0.177852
14	0.822227	0.177891
15	0.822258	0.177928
16	0.822284	0.177960
17	0.822304	0.177984
18	0.822315	0.177997
19	0.822320	0.178003
20	0.822321	0.178005
21	0.822321	0.178005
22	0.822321	0.178005
23	0.822321	0.178005
24	0.822321	0.178005
25	0.822321	0.178005
26	0.822323	0.178007
27	0.822326	0.178011
28	0.822332	0.178019
29	0.822343	0.178032
30	0.822359	0.178051
31	0.822381	0.178079
32	0.822410	0.178114
33	0.822445	0.178157
34	0.822488	0.178208
35	0.822538	0.178269
36	0.822596	0.178340
37	0.822661	0.178420
38	0.822733	0.178509
39	0.822810	0.178602
40	0.822890	0.178700
41	0.822973	0.178802
42	0.823060	0.178909
43	0.823154	0.179024
44	0.823257	0.179151
45	0.823373	0.179294
46	0.823504	0.179456
47	0.823653	0.179640
48	0.823822	0.179849
49	0.824012	0.180085
50	0.824225	0.180350
51	0.824463	0.180647
52	0.824729	0.180979
53	0.825028	0.181354
54	0.825365	0.181778
55	0.825748	0.182262
56	0.826182	0.182813
57	0.826671	0.183437
58	0.827211	0.184131
59	0.827797	0.184888
60	0.828427	0.185708
61	0.829102	0.186594
62	0.829929	0.187689
63	0.830934	0.189033
64	0.832150	0.190680
65	0.833607	0.192688

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .040
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.676446	0.080410
11	0.676568	0.080455
12	0.676684	0.080498
13	0.676792	0.080538
14	0.676889	0.080574
15	0.676972	0.080604
16	0.677038	0.080629
17	0.677084	0.080645
18	0.677109	0.080655
19	0.677119	0.080658
20	0.677122	0.080660
21	0.677123	0.080660
22	0.677126	0.080661
23	0.677131	0.080663
24	0.677141	0.080667
25	0.677159	0.080673
26	0.677186	0.080683
27	0.677228	0.080699
28	0.677288	0.080721
29	0.677369	0.080751
30	0.677473	0.080789
31	0.677604	0.080838
32	0.677762	0.080896
33	0.677947	0.080965
34	0.678159	0.081043
35	0.678397	0.081132
36	0.678661	0.081230
37	0.678947	0.081337
38	0.679256	0.081452
39	0.679585	0.081575
40	0.679934	0.081706
41	0.680310	0.081847
42	0.680719	0.082001
43	0.681170	0.082172
44	0.681672	0.082362
45	0.682238	0.082577
46	0.682874	0.082820
47	0.683591	0.083095
48	0.684396	0.083405
49	0.685299	0.083755
50	0.686311	0.084149
51	0.687446	0.084594
52	0.688716	0.085096
53	0.690135	0.085662
54	0.691715	0.086298
55	0.693466	0.087011
56	0.695398	0.087807
57	0.697587	0.088721
58	0.700040	0.089760
59	0.702767	0.090937
60	0.705793	0.092268
61	0.709149	0.093776
62	0.712880	0.095495
63	0.717031	0.097460
64	0.721639	0.099710
65	0.726732	0.102285

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .040
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.557390	0.048436
11	0.557600	0.048477
12	0.557793	0.048515
13	0.557967	0.048549
14	0.558119	0.048579
15	0.558246	0.048604
16	0.558345	0.048623
17	0.558413	0.048637
18	0.558454	0.048645
19	0.558477	0.048650
20	0.558496	0.048653
21	0.558518	0.048658
22	0.558552	0.048664
23	0.558601	0.048674
24	0.558669	0.048688
25	0.558762	0.048706
26	0.558885	0.048730
27	0.559045	0.048762
28	0.559247	0.048802
29	0.559495	0.048851
30	0.559792	0.048910
31	0.560140	0.048979
32	0.560540	0.049059
33	0.560992	0.049149
34	0.561496	0.049249
35	0.562053	0.049361
36	0.562666	0.049484
37	0.563335	0.049619
38	0.564062	0.049766
39	0.564850	0.049925
40	0.565705	0.050099
41	0.566638	0.050290
42	0.567665	0.050501
43	0.568804	0.050736
44	0.570076	0.051000
45	0.571502	0.051297
46	0.573104	0.051634
47	0.574899	0.052015
48	0.576906	0.052444
49	0.579140	0.052926
50	0.581616	0.053467
51	0.584351	0.054072
52	0.587423	0.054761
53	0.590855	0.055543
54	0.594677	0.056429
55	0.598917	0.057433
56	0.603601	0.058566
57	0.608746	0.059842
58	0.614361	0.061273
59	0.620450	0.062873
60	0.627023	0.064659
61	0.634102	0.066654
62	0.641714	0.068887
63	0.649882	0.071391
64	0.658619	0.074203
65	0.667922	0.077359

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .040
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.460097	0.032776
11	0.460380	0.032814
12	0.460638	0.032848
13	0.460870	0.032878
14	0.461073	0.032905
15	0.461246	0.032928
16	0.461389	0.032947
17	0.461501	0.032962
18	0.461586	0.032973
19	0.461661	0.032983
20	0.461742	0.032994
21	0.461843	0.033007
22	0.461973	0.033025
23	0.462138	0.033047
24	0.462344	0.033074
25	0.462597	0.033108
26	0.462903	0.033149
27	0.463270	0.033197
28	0.463706	0.033256
29	0.464216	0.033324
30	0.464805	0.033403
31	0.465478	0.033494
32	0.466240	0.033596
33	0.467092	0.033711
34	0.468039	0.033840
35	0.469088	0.033983
36	0.470243	0.034141
37	0.471510	0.034315
38	0.472899	0.034506
39	0.474417	0.034717
40	0.476079	0.034949
41	0.477910	0.035207
42	0.479933	0.035493
43	0.482176	0.035814
44	0.484669	0.036173
45	0.487439	0.036576
46	0.490511	0.037029
47	0.493954	0.037542
48	0.497795	0.038124
49	0.502062	0.038780
50	0.506783	0.039520
51	0.511989	0.040351
52	0.517709	0.041286
53	0.523968	0.042335
54	0.530788	0.043509
55	0.538187	0.044822
56	0.546170	0.046287
57	0.554731	0.047917
58	0.563851	0.049723
59	0.573507	0.051719
60	0.583680	0.053923
61	0.594361	0.056356
62	0.605550	0.059045
63	0.617239	0.062023
64	0.629406	0.065322
65	0.642015	0.068977

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .040
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.380610	0.023634
11	0.380966	0.023670
12	0.381297	0.023703
13	0.381601	0.023734
14	0.381879	0.023762
15	0.382133	0.023787
16	0.382361	0.023810
17	0.382565	0.023831
18	0.382753	0.023850
19	0.382943	0.023869
20	0.383156	0.023891
21	0.383406	0.023916
22	0.383706	0.023946
23	0.384062	0.023982
24	0.384483	0.024025
25	0.384976	0.024075
26	0.385553	0.024134
27	0.386223	0.024202
28	0.386999	0.024282
29	0.387890	0.024373
30	0.388905	0.024477
31	0.390053	0.024596
32	0.391342	0.024729
33	0.392780	0.024879
34	0.394377	0.025046
35	0.396146	0.025232
36	0.398101	0.025439
37	0.400252	0.025668
38	0.402617	0.025922
39	0.405206	0.026202
40	0.408041	0.026512
41	0.411149	0.026855
42	0.414596	0.027239
43	0.418419	0.027671
44	0.422659	0.028157
45	0.427353	0.028703
46	0.432538	0.029317
47	0.438244	0.030005
48	0.444496	0.030776
49	0.451315	0.031636
50	0.458718	0.032595
51	0.466717	0.033661
52	0.475322	0.034844
53	0.484536	0.036154
54	0.494355	0.037603
55	0.504769	0.039202
56	0.515757	0.040965
57	0.527283	0.042901
58	0.539297	0.045023
59	0.551746	0.047342
60	0.564586	0.049872
61	0.577782	0.052633
62	0.591314	0.055649
63	0.605155	0.058948
64	0.619275	0.062560
65	0.633628	0.066518

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .045
PER CENT INTEREST RATE

X	Ax	PX
10	0.084881	0.003994
11	0.088325	0.004172
12	0.091840	0.004355
13	0.095430	0.004543
14	0.099099	0.004737
15	0.102853	0.004937
16	0.106694	0.005143
17	0.110628	0.005357
18	0.114669	0.005578
19	0.118846	0.005808
20	0.123192	0.006050
21	0.127730	0.006306
22	0.132478	0.006576
23	0.137445	0.006862
24	0.142641	0.007165
25	0.148078	0.007485
26	0.153766	0.007825
27	0.159716	0.008185
28	0.165942	0.008568
29	0.172448	0.008974
30	0.179238	0.009404
31	0.186320	0.009861
32	0.193692	0.010345
33	0.201352	0.010857
34	0.209302	0.011399
35	0.217539	0.011973
36	0.226066	0.012579
37	0.234877	0.013220
38	0.243973	0.013897
39	0.253349	0.014612
40	0.263009	0.015368
41	0.272964	0.016169
42	0.283225	0.017017
43	0.293806	0.017917
44	0.304720	0.018874
45	0.315977	0.019894
46	0.327581	0.020980
47	0.339531	0.022139
48	0.351821	0.023376
49	0.364443	0.024695
50	0.377388	0.026105
51	0.390648	0.027610
52	0.404212	0.029219
53	0.418072	0.030941
54	0.432213	0.032785
55	0.446622	0.034761
56	0.461277	0.036878
57	0.476148	0.039149
58	0.491195	0.041581
59	0.506378	0.044185
60	0.521675	0.046977
61	0.537076	0.049974
62	0.552590	0.053202
63	0.568223	0.056690
64	0.583972	0.060469
65	0.599821	0.064573

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .045
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.802641	0.175130
11	0.802677	0.175170
12	0.802712	0.175209
13	0.802747	0.175248
14	0.802782	0.175286
15	0.802816	0.175323
16	0.802845	0.175356
17	0.802867	0.175380
18	0.802879	0.175394
19	0.802885	0.175400
20	0.802886	0.175401
21	0.802886	0.175401
22	0.802886	0.175401
23	0.802886	0.175401
24	0.802886	0.175401
25	0.802886	0.175402
26	0.802888	0.175403
27	0.802891	0.175407
28	0.802898	0.175415
29	0.802910	0.175428
30	0.802928	0.175448
31	0.802952	0.175475
32	0.802984	0.175510
33	0.803023	0.175553
34	0.803070	0.175605
35	0.803125	0.175666
36	0.803189	0.175738
37	0.803261	0.175818
38	0.803341	0.175907
39	0.803425	0.176001
40	0.803513	0.176099
41	0.803605	0.176201
42	0.803702	0.176309
43	0.803805	0.176425
44	0.803919	0.176552
45	0.804047	0.176695
46	0.804191	0.176858
47	0.804356	0.177043
48	0.804542	0.177253
49	0.804752	0.177489
50	0.804987	0.177755
51	0.805250	0.178053
52	0.805544	0.178387
53	0.805873	0.178763
54	0.806245	0.179189
55	0.806667	0.179674
56	0.807147	0.180228
57	0.807686	0.180854
58	0.808282	0.181550
59	0.808929	0.182311
60	0.809624	0.183133
61	0.810370	0.184023
62	0.811282	0.185121
63	0.812391	0.186469
64	0.813732	0.188122
65	0.815342	0.190138

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .045
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.644884	0.078200
11	0.645017	0.078246
12	0.645144	0.078289
13	0.645262	0.078329
14	0.645367	0.078365
15	0.645458	0.078396
16	0.645530	0.078421
17	0.645580	0.078438
18	0.645607	0.078448
19	0.645618	0.078451
20	0.645622	0.078453
21	0.645623	0.078453
22	0.645626	0.078454
23	0.645631	0.078456
24	0.645642	0.078460
25	0.645661	0.078466
26	0.645691	0.078476
27	0.645736	0.078492
28	0.645801	0.078514
29	0.645888	0.078544
30	0.646001	0.078583
31	0.646143	0.078632
32	0.646313	0.078691
33	0.646515	0.078760
34	0.646745	0.078839
35	0.647004	0.078928
36	0.647291	0.079028
37	0.647602	0.079135
38	0.647937	0.079252
39	0.648294	0.079376
40	0.648674	0.079508
41	0.649082	0.079651
42	0.649526	0.079806
43	0.650015	0.079978
44	0.650561	0.080170
45	0.651175	0.080387
46	0.651866	0.080632
47	0.652644	0.080909
48	0.653518	0.081222
49	0.654498	0.081575
50	0.655598	0.081972
51	0.656829	0.082421
52	0.658209	0.082928
53	0.659750	0.083498
54	0.661465	0.084139
55	0.663367	0.084858
56	0.665466	0.085661
57	0.667843	0.086582
58	0.670506	0.087630
59	0.673468	0.088815
60	0.676753	0.090155
61	0.680398	0.091675
62	0.684452	0.093406
63	0.688963	0.095385
64	0.693975	0.097652
65	0.699517	0.100248

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .045
PER CENT INTERST RATE

N=15

X	NAX	NPX
10	0.518991	0.046463
11	0.519217	0.046505
12	0.519425	0.046543
13	0.519612	0.046578
14	0.519776	0.046609
15	0.519913	0.046634
16	0.520020	0.046654
17	0.520094	0.046668
18	0.520138	0.046676
19	0.520163	0.046681
20	0.520182	0.046685
21	0.520206	0.046689
22	0.520241	0.046696
23	0.520293	0.046706
24	0.520366	0.046719
25	0.520464	0.046738
26	0.520595	0.046762
27	0.520764	0.046794
28	0.520979	0.046834
29	0.521243	0.046884
30	0.521559	0.046943
31	0.521931	0.047013
32	0.522358	0.047094
33	0.522840	0.047185
34	0.523379	0.047287
35	0.523974	0.047400
36	0.524630	0.047524
37	0.525344	0.047661
38	0.526122	0.047810
39	0.526964	0.047972
40	0.527877	0.048148
41	0.528874	0.048341
42	0.529971	0.048554
43	0.531187	0.048791
44	0.532544	0.049058
45	0.534068	0.049359
46	0.535778	0.049700
47	0.537695	0.050085
48	0.539838	0.050518
49	0.542224	0.051006
50	0.544869	0.051553
51	0.547792	0.052164
52	0.551073	0.052860
53	0.554739	0.053650
54	0.558822	0.054545
55	0.563353	0.055558
56	0.568359	0.056702
57	0.573859	0.057989
58	0.579864	0.059434
59	0.586376	0.061047
60	0.593411	0.062849
61	0.600989	0.064860
62	0.609143	0.067112
63	0.617901	0.069637
64	0.627277	0.072472
65	0.637270	0.075655

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .045
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.418549	0.030908
11	0.418850	0.031036
12	0.419125	0.031071
13	0.419371	0.031103
14	0.419588	0.031130
15	0.419773	0.031154
16	0.419925	0.031173
17	0.420044	0.031189
18	0.420134	0.031200
19	0.420211	0.031210
20	0.420295	0.031221
21	0.420399	0.031234
22	0.420534	0.031251
23	0.420706	0.031273
24	0.420920	0.031301
25	0.421183	0.031335
26	0.421503	0.031376
27	0.421886	0.031425
28	0.422343	0.031484
29	0.422877	0.031553
30	0.423494	0.031633
31	0.424201	0.031725
32	0.425001	0.031829
33	0.425896	0.031945
34	0.426892	0.032076
35	0.427994	0.032221
36	0.429209	0.032381
37	0.430540	0.032557
38	0.431999	0.032751
39	0.433594	0.032965
40	0.435341	0.033200
41	0.437263	0.033461
42	0.439387	0.033750
43	0.441741	0.034074
44	0.444358	0.034438
45	0.447266	0.034846
46	0.450493	0.035303
47	0.454109	0.035822
48	0.458144	0.036409
49	0.462626	0.037072
50	0.467587	0.037819
51	0.473058	0.038659
52	0.479070	0.039602
53	0.485653	0.040660
54	0.492830	0.041845
55	0.500619	0.043169
56	0.509029	0.044646
57	0.518055	0.046289
58	0.527677	0.048109
59	0.537871	0.050120
60	0.548621	0.052339
61	0.559919	0.054788
62	0.571767	0.057496
63	0.584160	0.060492
64	0.597078	0.063813
65	0.610486	0.067491

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .045
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.338432	0.022029
11	0.338807	0.022066
12	0.339155	0.022100
13	0.339475	0.022132
14	0.339767	0.022161
15	0.340032	0.022187
16	0.340271	0.022210
17	0.340483	0.022231
18	0.340676	0.022250
19	0.340869	0.022270
20	0.341086	0.022291
21	0.341340	0.022316
22	0.341646	0.022347
23	0.342010	0.022383
24	0.342441	0.022426
25	0.342946	0.022476
26	0.343538	0.022535
27	0.344226	0.022604
28	0.345025	0.022684
29	0.345943	0.022776
30	0.346989	0.022882
31	0.348174	0.023002
32	0.349505	0.023137
33	0.350990	0.023288
34	0.352640	0.023458
35	0.354468	0.023646
36	0.356487	0.023855
37	0.358709	0.024087
38	0.361151	0.024344
39	0.363825	0.024627
40	0.366752	0.024940
41	0.369960	0.025286
42	0.373517	0.025674
43	0.377463	0.026110
44	0.381838	0.026599
45	0.386685	0.027150
46	0.392039	0.027768
47	0.397934	0.028462
48	0.404397	0.029238
49	0.411450	0.030104
50	0.419112	0.031069
51	0.427398	0.032142
52	0.436318	0.033332
53	0.445878	0.034650
54	0.456076	0.036107
55	0.466905	0.037716
56	0.478344	0.039487
57	0.490358	0.041433
58	0.502898	0.043564
59	0.515909	0.045893
60	0.529348	0.048433
61	0.543183	0.051204
62	0.557394	0.054230
63	0.571959	0.057541
64	0.586847	0.061166
65	0.602015	0.065138

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .050
PER CENT INTEREST RATE

X	Ax	PX
10	0.067586	0.003452
11	0.070583	0.003616
12	0.073643	0.003786
13	0.076771	0.003960
14	0.079971	0.004139
15	0.083248	0.004324
16	0.086606	0.004515
17	0.090049	0.004712
18	0.093592	0.004917
19	0.097265	0.005131
20	0.101101	0.005356
21	0.105124	0.005594
22	0.109353	0.005847
23	0.113799	0.006115
24	0.118472	0.006400
25	0.123385	0.006703
26	0.128550	0.007025
27	0.133979	0.007367
28	0.139686	0.007732
29	0.145677	0.008120
30	0.151960	0.008533
31	0.158540	0.008972
32	0.165419	0.009439
33	0.172596	0.009934
34	0.180073	0.010458
35	0.187851	0.011015
36	0.195932	0.011604
37	0.204312	0.012228
38	0.212994	0.012888
39	0.221974	0.013586
40	0.231257	0.014326
41	0.240856	0.015109
42	0.250785	0.015940
43	0.261059	0.016824
44	0.271696	0.017765
45	0.282706	0.018769
46	0.294096	0.019840
47	0.305867	0.020985
48	0.318015	0.022207
49	0.330535	0.023513
50	0.343419	0.024909
51	0.356659	0.026402
52	0.370249	0.027999
53	0.384179	0.029710
54	0.398438	0.031544
55	0.413013	0.033510
56	0.427884	0.035619
57	0.443019	0.037882
58	0.458379	0.040307
59	0.473922	0.042906
60	0.489626	0.045602
61	0.505482	0.048686
62	0.521500	0.051911
63	0.537688	0.055398
64	0.554045	0.059179
65	0.570555	0.063287

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .050
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.783733	0.172568
11	0.783772	0.172607
12	0.783811	0.172646
13	0.783849	0.172686
14	0.783887	0.172725
15	0.783924	0.172762
16	0.783955	0.172794
17	0.783979	0.172818
18	0.783993	0.172832
19	0.783999	0.172838
20	0.784000	0.172840
21	0.784000	0.172840
22	0.784000	0.172840
23	0.784000	0.172840
24	0.784000	0.172840
25	0.784001	0.172840
26	0.784002	0.172842
27	0.784006	0.172846
28	0.784014	0.172854
29	0.784027	0.172867
30	0.784046	0.172886
31	0.784073	0.172914
32	0.784107	0.172949
33	0.784150	0.172992
34	0.784201	0.173044
35	0.784261	0.173106
36	0.784331	0.173178
37	0.784409	0.173258
38	0.784496	0.173347
39	0.784588	0.173442
40	0.784684	0.173540
41	0.784784	0.173643
42	0.784889	0.173751
43	0.785002	0.173867
44	0.785126	0.173995
45	0.785266	0.174139
46	0.785423	0.174302
47	0.785603	0.174488
48	0.785806	0.174698
49	0.786034	0.174936
50	0.786291	0.175203
51	0.786577	0.175502
52	0.786897	0.175837
53	0.787257	0.176214
54	0.787662	0.176642
55	0.788122	0.177129
56	0.788645	0.177684
57	0.789235	0.178313
58	0.789883	0.179012
59	0.790588	0.179775
60	0.791345	0.180600
61	0.792159	0.181493
62	0.793153	0.182595
63	0.794361	0.183947
64	0.795623	0.185605
65	0.797579	- 231 - 0.187629

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .050
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.614939	0.076047
11	0.615082	0.076093
12	0.615218	0.076137
13	0.615345	0.076178
14	0.615458	0.076214
15	0.615556	0.076246
16	0.615634	0.076271
17	0.615687	0.076288
18	0.615717	0.076298
19	0.615729	0.076302
20	0.615733	0.076303
21	0.615734	0.076303
22	0.615737	0.076304
23	0.615743	0.076306
24	0.615755	0.076310
25	0.615775	0.076316
26	0.615806	0.076326
27	0.615854	0.076342
28	0.615924	0.076364
29	0.616018	0.076395
30	0.616139	0.076434
31	0.616291	0.076483
32	0.616475	0.076542
33	0.616690	0.076612
34	0.616936	0.076692
35	0.617214	0.076782
36	0.617521	0.076882
37	0.617855	0.076991
38	0.618215	0.077108
39	0.618599	0.077234
40	0.619006	0.077367
41	0.619444	0.077511
42	0.619920	0.077668
43	0.620445	0.077841
44	0.621030	0.078035
45	0.621688	0.078254
46	0.622430	0.078501
47	0.623264	0.078780
48	0.624202	0.079095
49	0.625253	0.079451
50	0.626433	0.079852
51	0.627754	0.080304
52	0.629233	0.080815
53	0.630886	0.081390
54	0.632727	0.082037
55	0.634768	0.082761
56	0.637020	0.083570
57	0.639570	0.084498
58	0.642427	0.085554
59	0.645605	0.086748
60	0.649128	0.088097
61	0.653039	0.089627
62	0.657390	0.091370
63	0.662234	0.093363
64	0.667618	0.095647
65	0.673577	0.098262

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .050
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.483414	0.044561
11	0.483654	0.044604
12	0.483875	0.044644
13	0.484075	0.044679
14	0.484249	0.044710
15	0.484395	0.044737
16	0.484509	0.044757
17	0.484588	0.044771
18	0.484635	0.044780
19	0.484661	0.044784
20	0.484681	0.044788
21	0.484706	0.044792
22	0.484744	0.044799
23	0.484798	0.044809
24	0.484873	0.044822
25	0.484976	0.044841
26	0.485113	0.044865
27	0.485291	0.044897
28	0.485517	0.044938
29	0.485795	0.044988
30	0.486128	0.045048
31	0.486520	0.045119
32	0.486970	0.045200
33	0.487479	0.045292
34	0.488047	0.045395
35	0.488677	0.045510
36	0.489369	0.045636
37	0.490124	0.045774
38	0.490945	0.045925
39	0.491835	0.046089
40	0.492798	0.046267
41	0.493850	0.046462
42	0.495008	0.046678
43	0.496291	0.046918
44	0.497723	0.047187
45	0.499330	0.047492
46	0.501134	0.047836
47	0.503158	0.048224
48	0.505419	0.048663
49	0.507937	0.049155
50	0.510729	0.049707
51	0.513815	0.050325
52	0.517279	0.051028
53	0.521149	0.051825
54	0.525459	0.052729
55	0.530243	0.053750
56	0.535530	0.054904
57	0.541340	0.056203
58	0.547685	0.057659
59	0.554568	0.059286
60	0.562007	0.061102
61	0.570024	0.063129
62	0.578656	0.065398
63	0.587934	0.067943
64	0.597877	0.070800
65	0.608485	0.074008

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .050
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.380953	0.029304
11	0.381270	0.029344
12	0.381559	0.029380
13	0.381819	0.029412
14	0.382047	0.029440
15	0.382243	0.029465
16	0.382403	0.029485
17	0.382527	0.029500
18	0.382621	0.029512
19	0.382701	0.029522
20	0.382787	0.029533
21	0.382894	0.029546
22	0.383032	0.029563
23	0.383208	0.029585
24	0.383428	0.029613
25	0.383699	0.029647
26	0.384028	0.029688
27	0.384424	0.029738
28	0.384896	0.029797
29	0.385449	0.029867
30	0.386089	0.029948
31	0.386822	0.030040
32	0.387652	0.030146
33	0.388582	0.030264
34	0.389617	0.030396
35	0.390762	0.030543
36	0.392024	0.030705
37	0.393407	0.030883
38	0.394924	0.031080
39	0.396580	0.031296
40	0.398393	0.031534
41	0.400387	0.031797
42	0.402591	0.032090
43	0.405035	0.032418
44	0.407750	0.032785
45	0.410768	0.033196
46	0.414118	0.033659
47	0.417872	0.034183
48	0.422061	0.034776
49	0.426715	0.035444
50	0.431867	0.036198
51	0.437550	0.037045
52	0.443798	0.037996
53	0.450641	0.039062
54	0.458105	0.040256
55	0.466211	0.041590
56	0.474968	0.043078
57	0.484374	0.044733
58	0.494408	0.046566
59	0.505046	0.048590
60	0.516274	0.050823
61	0.528086	0.053287
62	0.540486	0.056010
63	0.553473	0.059024
64	0.567030	0.062363
65	0.581123	0.066064

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .050
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.301154	0.020521
11	0.301545	0.020559
12	0.301906	0.020594
13	0.302239	0.020626
14	0.302543	0.020656
15	0.302818	0.020683
16	0.303064	0.020707
17	0.303281	0.020728
18	0.303477	0.020748
19	0.303672	0.020767
20	0.303890	0.020788
21	0.304146	0.020814
22	0.304455	0.020844
23	0.304822	0.020880
24	0.305257	0.020923
25	0.305770	0.020974
26	0.306369	0.021033
27	0.307069	0.021102
28	0.307882	0.021183
29	0.308816	0.021276
30	0.309882	0.021382
31	0.311092	0.021503
32	0.312451	0.021640
33	0.313967	0.021793
34	0.315653	0.021964
35	0.317519	0.022154
36	0.319582	0.022366
37	0.321852	0.022600
38	0.324345	0.022859
39	0.327076	0.023145
40	0.330063	0.023461
41	0.333338	0.023810
42	0.336968	0.024201
43	0.340993	0.024640
44	0.345458	0.025133
45	0.350406	0.025687
46	0.355873	0.026309
47	0.361895	0.027007
48	0.368501	0.027787
49	0.375714	0.028659
50	0.383556	0.029629
51	0.392041	0.030707
52	0.401184	0.031903
53	0.410992	0.033227
54	0.421466	0.034691
55	0.432599	0.036306
56	0.444374	0.038084
57	0.456756	0.040038
58	0.469697	0.042177
59	0.483142	0.044513
60	0.497050	0.047060
61	0.511390	0.049839
62	0.526146	0.052874
63	0.541298	0.056194
64	0.556820	0.059829
65	0.572668	0.063814

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .055
PER CENT INTEREST RATE

X	AX	PX
10	0.054420	0.003000
11	0.057024	0.003153
12	0.059685	0.003309
13	0.062405	0.003470
14	0.065189	0.003635
15	0.068041	0.003806
16	0.070964	0.003982
17	0.073964	0.004164
18	0.077055	0.004353
19	0.080268	0.004550
20	0.083635	0.004758
21	0.087182	0.004979
22	0.090929	0.005215
23	0.094887	0.005465
24	0.099067	0.005733
25	0.103482	0.006018
26	0.108145	0.006322
27	0.113070	0.006646
28	0.118272	0.006993
29	0.123759	0.007363
30	0.129538	0.007758
31	0.135617	0.008180
32	0.141999	0.008628
33	0.148683	0.009105
34	0.155674	0.009612
35	0.162973	0.010151
36	0.170583	0.010722
37	0.178502	0.011328
38	0.186735	0.011971
39	0.195278	0.012651
40	0.204139	0.013373
41	0.213332	0.014138
42	0.222872	0.014952
43	0.232779	0.015818
44	0.243070	0.016742
45	0.253761	0.017729
46	0.264859	0.018783
47	0.276367	0.019911
48	0.288286	0.021118
49	0.300609	0.022409
50	0.313333	0.023790
51	0.326451	0.025269
52	0.339958	0.026853
53	0.353848	0.028551
54	0.368110	0.030373
55	0.382733	0.032328
56	0.397699	0.034427
57	0.412976	0.036680
58	0.428524	0.039097
59	0.444302	0.041688
60	0.460286	0.044467
61	0.476471	0.047455
62	0.492868	0.050676
63	0.509485	0.054160
64	0.526325	0.057944
65	0.543372	0.062053

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .055
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.765358	0.170047
11	0.765400	0.170087
12	0.765441	0.170126
13	0.765483	0.170166
14	0.765524	0.170204
15	0.765563	0.170242
16	0.765598	0.170274
17	0.765623	0.170299
18	0.765638	0.170313
19	0.765645	0.170319
20	0.765646	0.170320
21	0.765646	0.170320
22	0.765646	0.170320
23	0.765646	0.170320
24	0.765646	0.170320
25	0.765647	0.170321
26	0.765648	0.170322
27	0.765652	0.170326
28	0.765661	0.170334
29	0.765675	0.170348
30	0.765696	0.170367
31	0.765724	0.170395
32	0.765762	0.170430
33	0.765807	0.170473
34	0.765862	0.170526
35	0.765927	0.170587
36	0.766003	0.170659
37	0.766088	0.170740
38	0.766181	0.170829
39	0.766281	0.170924
40	0.766384	0.171023
41	0.766492	0.171126
42	0.766606	0.171235
43	0.766728	0.171351
44	0.766861	0.171480
45	0.767012	0.171624
46	0.767182	0.171788
47	0.767376	0.171974
48	0.767595	0.172186
49	0.767842	0.172424
50	0.768118	0.172692
51	0.768427	0.172992
52	0.768773	0.173328
53	0.769161	0.173707
54	0.769598	0.174136
55	0.770095	0.174625
56	0.770659	0.175182
57	0.771293	0.175813
58	0.771995	0.176514
59	0.772756	0.177280
60	0.773574	0.178109
61	0.774452	0.179005
62	0.775524	0.180109
63	0.776828	0.181466
64	0.778406	0.183129
65	0.780303	0.185161

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .055
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.586520	0.073950
11	0.586672	0.073996
12	0.586817	0.074041
13	0.586952	0.074082
14	0.587073	0.074119
15	0.587177	0.074151
16	0.587260	0.074176
17	0.587317	0.074194
18	0.587349	0.074203
19	0.587362	0.074207
20	0.587366	0.074209
21	0.587367	0.074209
22	0.587370	0.074210
23	0.587377	0.074212
24	0.587389	0.074216
25	0.587410	0.074222
26	0.587444	0.074232
27	0.587494	0.074248
28	0.587568	0.074270
29	0.587667	0.074301
30	0.587796	0.074340
31	0.587957	0.074390
32	0.588152	0.074450
33	0.588380	0.074520
34	0.588642	0.074601
35	0.588937	0.074691
36	0.589264	0.074792
37	0.589619	0.074902
38	0.590001	0.075021
39	0.590409	0.075147
40	0.590842	0.075282
41	0.591307	0.075427
42	0.591813	0.075585
43	0.592371	0.075760
44	0.592992	0.075955
45	0.593691	0.076175
46	0.594479	0.076424
47	0.595365	0.076706
48	0.596361	0.077024
49	0.597478	0.077382
50	0.598730	0.077787
51	0.600134	0.078243
52	0.601705	0.078757
53	0.603461	0.079337
54	0.605416	0.079988
55	0.607585	0.080718
56	0.609979	0.081534
57	0.612689	0.082469
58	0.615724	0.083532
59	0.619099	0.084734
60	0.622862	0.086092
61	0.626997	0.087632
62	0.631621	0.089386
63	0.636771	0.091393
64	0.642500	0.093693
65	0.648845	0.096328

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .055
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.450439	0.042730
11	0.450692	0.042773
12	0.450925	0.042814
13	0.451135	0.042850
14	0.451319	0.042882
15	0.451473	0.042909
16	0.451594	0.042929
17	0.451678	0.042944
18	0.451727	0.042953
19	0.451755	0.042957
20	0.451775	0.042961
21	0.451801	0.042965
22	0.451840	0.042972
23	0.451895	0.042982
24	0.451974	0.042995
25	0.452081	0.043014
26	0.452223	0.043039
27	0.452407	0.043071
28	0.452643	0.043112
29	0.452932	0.043162
30	0.453279	0.043223
31	0.453689	0.043294
32	0.454159	0.043376
33	0.454691	0.043469
34	0.455286	0.043574
35	0.455944	0.043690
36	0.456668	0.043817
37	0.457458	0.043957
38	0.458318	0.044110
39	0.459248	0.044275
40	0.460256	0.044455
41	0.461356	0.044652
42	0.462565	0.044870
43	0.463906	0.045113
44	0.465403	0.045385
45	0.467082	0.045692
46	0.468968	0.046040
47	0.471082	0.046432
48	0.473446	0.046875
49	0.476078	0.047372
50	0.478997	0.047930
51	0.482225	0.048553
52	0.485846	0.049262
53	0.489893	0.050067
54	0.494400	0.050978
55	0.499403	0.052008
56	0.504933	0.053172
57	0.511013	0.054481
58	0.517653	0.055949
59	0.524860	0.057588
60	0.532650	0.059417
61	0.541051	0.061459
62	0.550103	0.063744
63	0.559839	0.066307
64	0.570282	0.069186
65	0.581435	0.072418

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .055
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.346918	0.027693
11	0.347248	0.027733
12	0.347550	0.027770
13	0.347821	0.027804
14	0.348060	0.027833
15	0.348263	0.027858
16	0.348431	0.027878
17	0.348560	0.027894
18	0.348657	0.027906
19	0.348739	0.027916
20	0.348826	0.027927
21	0.348934	0.027940
22	0.349074	0.027957
23	0.349253	0.027979
24	0.349477	0.028007
25	0.349753	0.028041
26	0.350090	0.028083
27	0.350494	0.028133
28	0.350978	0.028192
29	0.351545	0.028263
30	0.352202	0.028344
31	0.352956	0.028438
32	0.353810	0.028544
33	0.354766	0.028664
34	0.355831	0.028797
35	0.357010	0.028946
36	0.358310	0.029110
37	0.359734	0.029291
38	0.361294	0.029490
39	0.362999	0.029708
40	0.364863	0.029948
41	0.366914	0.030214
42	0.369180	0.030510
43	0.371692	0.030840
44	0.374483	0.031211
45	0.377587	0.031626
46	0.381033	0.032093
47	0.384894	0.032621
48	0.389203	0.033219
49	0.393990	0.033893
50	0.399291	0.034653
51	0.405140	0.035506
52	0.411573	0.036464
53	0.418621	0.037538
54	0.426313	0.038740
55	0.434670	0.040084
56	0.443705	0.041581
57	0.453415	0.043246
58	0.463782	0.045090
59	0.474782	0.047126
60	0.486401	0.049372
61	0.498636	0.051849
62	0.511494	0.054586
63	0.524978	0.057615
64	0.539075	0.060972
65	0.553750	0.064691

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .055
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.268186	0.019105
11	0.268588	0.019144
12	0.268962	0.019181
13	0.269305	0.019214
14	0.269617	0.019245
15	0.269900	0.019272
16	0.270151	0.019297
17	0.270372	0.019318
18	0.270570	0.019338
19	0.270765	0.019357
20	0.270982	0.019378
21	0.271238	0.019403
22	0.271546	0.019433
23	0.271913	0.019470
24	0.272349	0.019513
25	0.272863	0.019563
26	0.273466	0.019623
27	0.274170	0.019692
28	0.274990	0.019773
29	0.275933	0.019867
30	0.277010	0.019974
31	0.278233	0.020097
32	0.279608	0.020234
33	0.281143	0.020389
34	0.282849	0.020562
35	0.284740	0.020754
36	0.286828	0.020967
37	0.289125	0.021203
38	0.291649	0.021465
39	0.294412	0.021753
40	0.297435	0.022071
41	0.300747	0.022422
42	0.304419	0.022816
43	0.308490	0.023257
44	0.313006	0.023753
45	0.318011	0.024309
46	0.323544	0.024935
47	0.329642	0.025636
48	0.336334	0.026420
49	0.343645	0.027295
50	0.351598	0.028269
51	0.360211	0.029351
52	0.369499	0.030552
53	0.379471	0.031881
54	0.390132	0.033349
55	0.401476	0.034969
56	0.413489	0.036753
57	0.426137	0.038712
58	0.439372	0.040857
59	0.453142	0.043199
60	0.467407	0.045752
61	0.482137	0.048536
62	0.497322	0.051577
63	0.512945	0.054904
64	0.528981	0.058548
65	0.545391	0.062543

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE

X	AX	PX
10	0.044328	0.002626
11	0.046595	0.002766
12	0.048909	0.002911
13	0.051274	0.003059
14	0.053694	0.003212
15	0.056173	0.003369
16	0.058714	0.003531
17	0.061322	0.003698
18	0.064010	0.003871
19	0.066810	0.004052
20	0.069755	0.004245
21	0.072872	0.004449
22	0.076179	0.004668
23	0.079688	0.004901
24	0.083413	0.005151
25	0.087365	0.005419
26	0.091560	0.005705
27	0.096011	0.006012
28	0.100735	0.006341
29	0.105740	0.006693
30	0.111034	0.007070
31	0.116628	0.007473
32	0.122524	0.007904
33	0.128724	0.008363
34	0.135231	0.008852
35	0.142050	0.009372
36	0.149186	0.009925
37	0.156635	0.010513
38	0.164405	0.011137
39	0.172493	0.011799
40	0.180908	0.012502
41	0.189666	0.013249
42	0.198786	0.014044
43	0.208286	0.014892
44	0.218189	0.015798
45	0.228512	0.016766
46	0.239264	0.017803
47	0.250451	0.018914
48	0.262076	0.020104
49	0.274134	0.021378
50	0.286624	0.022744
51	0.299542	0.024207
52	0.312885	0.025777
53	0.326648	0.027461
54	0.340823	0.029269
55	0.355400	0.031211
56	0.370363	0.033298
57	0.385682	0.035540
58	0.401316	0.037947
59	0.417224	0.040529
60	0.433385	0.043300
61	0.449792	0.046280
62	0.466459	0.049495
63	0.483398	0.052975
64	0.500615	0.056754
65	0.518091	0.060867

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.747498	0.167567
11	0.747542	0.167607
12	0.747587	0.167647
13	0.747631	0.167686
14	0.747675	0.167725
15	0.747717	0.167763
16	0.747754	0.167796
17	0.747782	0.167820
18	0.747798	0.167834
19	0.747805	0.167840
20	0.747806	0.167842
21	0.747806	0.167842
22	0.747806	0.167842
23	0.747806	0.167842
24	0.747806	0.167842
25	0.747807	0.167842
26	0.747809	0.167844
27	0.747813	0.167848
28	0.747822	0.167856
29	0.747837	0.167869
30	0.747859	0.167889
31	0.747890	0.167916
32	0.747930	0.167952
33	0.747979	0.167995
34	0.748038	0.168048
35	0.748107	0.168110
36	0.748188	0.168182
37	0.748279	0.168263
38	0.748379	0.168353
39	0.748485	0.168448
40	0.748596	0.168547
41	0.748712	0.168651
42	0.748834	0.168760
43	0.748964	0.168877
44	0.749107	0.169005
45	0.749268	0.169150
46	0.749450	0.169315
47	0.749657	0.169502
48	0.749892	0.169714
49	0.750156	0.169953
50	0.750452	0.170222
51	0.750783	0.170523
52	0.751155	0.170861
53	0.751569	0.171241
54	0.752037	0.171671
55	0.752569	0.172162
56	0.753172	0.172721
57	0.753851	0.173354
58	0.754602	0.174058
59	0.755418	0.174826
60	0.756295	0.175658
61	0.757233	0.176557
62	0.758331	0.177664
63	0.759775	0.179025
64	0.761465	0.180693
65	0.763498	0.182733

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.559542	0.071907
11	0.559702	0.071954
12	0.559856	0.071999
13	0.559998	0.072041
14	0.560126	0.072078
15	0.560237	0.072110
16	0.560325	0.072136
17	0.560385	0.072154
18	0.560419	0.072164
19	0.560433	0.072168
20	0.560437	0.072169
21	0.560438	0.072169
22	0.560441	0.072170
23	0.560448	0.072172
24	0.560461	0.072176
25	0.560483	0.072183
26	0.560518	0.072193
27	0.560571	0.072208
28	0.560649	0.072231
29	0.560753	0.072262
30	0.560888	0.072301
31	0.561058	0.072351
32	0.561263	0.072412
33	0.561504	0.072482
34	0.561780	0.072564
35	0.562090	0.072655
36	0.562435	0.072757
37	0.562809	0.072868
38	0.563213	0.072987
39	0.563642	0.073115
40	0.564099	0.073251
41	0.564589	0.073397
42	0.565122	0.073556
43	0.565710	0.073732
44	0.566365	0.073929
45	0.567101	0.074151
46	0.567931	0.074402
47	0.568864	0.074686
48	0.569914	0.075007
49	0.571091	0.075368
50	0.572411	0.075775
51	0.573889	0.076234
52	0.575545	0.076753
53	0.577396	0.077337
54	0.579456	0.077993
55	0.581743	0.078729
56	0.584266	0.079550
57	0.587122	0.080492
58	0.590321	0.081562
59	0.593877	0.082772
60	0.597822	0.084139
61	0.602201	0.085689
62	0.607076	0.087454
63	0.612509	0.089474
64	0.618555	0.091789
65	0.625257	0.094443

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.419865	0.040966
11	0.420129	0.041011
12	0.420373	0.041052
13	0.420592	0.041089
14	0.420785	0.041121
15	0.420946	0.041148
16	0.421073	0.041170
17	0.421161	0.041185
18	0.421212	0.041193
19	0.421241	0.041198
20	0.421263	0.041202
21	0.421289	0.041206
22	0.421329	0.041213
23	0.421386	0.041223
24	0.421466	0.041236
25	0.421576	0.041255
26	0.421723	0.041280
27	0.421913	0.041312
28	0.422156	0.041353
29	0.422455	0.041404
30	0.422815	0.041465
31	0.423238	0.041537
32	0.423726	0.041620
33	0.424278	0.041714
34	0.424895	0.041820
35	0.425578	0.041937
36	0.426331	0.042066
37	0.427150	0.042207
38	0.428043	0.042361
39	0.429008	0.042529
40	0.430054	0.042710
41	0.431195	0.042910
42	0.432449	0.043130
43	0.433839	0.043375
44	0.435391	0.043649
45	0.437133	0.043959
46	0.439088	0.044310
47	0.441281	0.044706
48	0.443735	0.045153
49	0.446462	0.045654
50	0.449491	0.046217
51	0.452840	0.046846
52	0.456597	0.047562
53	0.460795	0.048373
54	0.465471	0.049291
55	0.470663	0.050330
56	0.476405	0.051502
57	0.482715	0.052821
58	0.489610	0.054299
59	0.497097	0.055950
60	0.505193	0.057792
61	0.513927	0.059848
62	0.523344	0.062148
63	0.533482	0.064729
64	0.544365	0.067627
65	0.556001	0.070883

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.316091	0.026161
11	0.316432	0.026203
12	0.316745	0.026240
13	0.317026	0.026275
14	0.317273	0.026305
15	0.317484	0.026330
16	0.317657	0.026351
17	0.317791	0.026368
18	0.317890	0.026380
19	0.317973	0.026390
20	0.318061	0.026400
21	0.318169	0.026414
22	0.318311	0.026431
23	0.318491	0.026453
24	0.318718	0.026480
25	0.318997	0.026514
26	0.319338	0.026556
27	0.319749	0.026606
28	0.320240	0.026666
29	0.320817	0.026737
30	0.321487	0.026819
31	0.322256	0.026914
32	0.323127	0.027022
33	0.324105	0.027143
34	0.325192	0.027278
35	0.326397	0.027428
36	0.327725	0.027594
37	0.329180	0.027776
38	0.330774	0.027977
39	0.332515	0.028198
40	0.334418	0.028440
41	0.336511	0.028709
42	0.338824	0.029007
43	0.341386	0.029340
44	0.344235	0.029713
45	0.347403	0.030132
46	0.350920	0.030602
47	0.354862	0.031135
48	0.359261	0.031738
49	0.364149	0.032417
50	0.369563	0.033181
51	0.375537	0.034040
52	0.382110	0.035004
53	0.389315	0.036085
54	0.397182	0.037295
55	0.405734	0.038646
56	0.414986	0.040152
57	0.424936	0.041827
58	0.435566	0.043680
59	0.446854	0.045727
60	0.458787	0.047983
61	0.471365	0.050472
62	0.484599	0.053221
63	0.498494	0.056264
64	0.513041	0.059635
65	0.528209	0.063373

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .060
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.239010	0.017778
11	0.239422	0.017818
12	0.239804	0.017856
13	0.240156	0.017890
14	0.240479	0.017921
15	0.240763	0.017950
16	0.241019	0.017975
17	0.241242	0.017997
18	0.241439	0.018016
19	0.241634	0.018035
20	0.241848	0.018056
21	0.242101	0.018081
22	0.242407	0.018111
23	0.242772	0.018147
24	0.243205	0.018190
25	0.243717	0.018241
26	0.244319	0.018301
27	0.245022	0.018370
28	0.245842	0.018452
29	0.246787	0.018546
30	0.247868	0.018654
31	0.249095	0.018777
32	0.250477	0.018916
33	0.252019	0.019072
34	0.253735	0.019246
35	0.255635	0.019439
36	0.257735	0.019654
37	0.260044	0.019892
38	0.262580	0.020155
39	0.265356	0.020445
40	0.268392	0.020765
41	0.271719	0.021119
42	0.275406	0.021514
43	0.279493	0.021957
44	0.284028	0.022455
45	0.289056	0.023014
46	0.294616	0.023642
47	0.300745	0.024345
48	0.307476	0.025132
49	0.314834	0.026009
50	0.322842	0.026986
51	0.331522	0.028072
52	0.340889	0.029275
53	0.350957	0.030607
54	0.361730	0.032079
55	0.373206	0.033703
56	0.385373	0.035491
57	0.398199	0.037454
58	0.411639	0.039602
59	0.425640	0.041947
60	0.440165	0.044504
61	0.455188	0.047292
62	0.470700	0.050337
63	0.486692	0.053669
64	0.503140	0.057319
65	0.520008	0.061323

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .065
PER CENT INTEREST RATE

X	Ax	Px
10	0.036537	0.002315
11	0.038516	0.002445
12	0.040534	0.002578
13	0.042594	0.002715
14	0.044700	0.002856
15	0.046855	0.003000
16	0.049063	0.003149
17	0.051327	0.003302
18	0.053661	0.003461
19	0.056097	0.003627
20	0.058667	0.003804
21	0.061398	0.003992
22	0.064310	0.004195
23	0.067415	0.004412
24	0.070726	0.004645
25	0.074256	0.004896
26	0.078019	0.005165
27	0.082032	0.005454
28	0.086311	0.005765
29	0.090864	0.006100
30	0.095703	0.006459
31	0.100836	0.006845
32	0.106268	0.007257
33	0.112001	0.007698
34	0.118041	0.008169
35	0.124393	0.008671
36	0.131061	0.009206
37	0.138045	0.009775
38	0.145352	0.010380
39	0.152982	0.011024
40	0.160945	0.011707
41	0.169257	0.012435
42	0.177939	0.013211
43	0.187014	0.014040
44	0.196504	0.014927
45	0.206428	0.015877
46	0.216800	0.016895
47	0.227627	0.017988
48	0.238914	0.019160
49	0.250658	0.020416
50	0.262861	0.021765
51	0.275521	0.023212
52	0.288636	0.024765
53	0.302205	0.026434
54	0.316223	0.028227
55	0.330680	0.030155
56	0.345563	0.032229
57	0.360842	0.034459
58	0.376479	0.036854
59	0.392432	0.039425
60	0.408680	0.042186
61	0.425219	0.045157
62	0.442066	0.048364
63	0.459236	0.051838
64	0.476733	0.055614
65	0.494548	0.059727

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .065
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.730135	0.165128
11	0.730183	0.165168
12	0.730230	0.165208
13	0.730278	0.165247
14	0.730324	0.165287
15	0.730369	0.165324
16	0.730408	0.165357
17	0.730438	0.165382
18	0.730454	0.165396
19	0.730462	0.165402
20	0.730464	0.165404
21	0.730464	0.165404
22	0.730464	0.165404
23	0.730464	0.165404
24	0.730464	0.165404
25	0.730464	0.165404
26	0.730466	0.165406
27	0.730471	0.165410
28	0.730480	0.165418
29	0.730496	0.165431
30	0.730520	0.165451
31	0.730553	0.165478
32	0.730595	0.165514
33	0.730647	0.165558
34	0.730709	0.165610
35	0.730783	0.165672
36	0.730869	0.165745
37	0.730966	0.165826
38	0.731072	0.165916
39	0.731186	0.166012
40	0.731304	0.166111
41	0.731426	0.166215
42	0.731556	0.166325
43	0.731694	0.166442
44	0.731847	0.166571
45	0.732018	0.166717
46	0.732212	0.166882
47	0.732432	0.167069
48	0.732681	0.167282
49	0.732962	0.167522
50	0.733277	0.167792
51	0.733629	0.168094
52	0.734022	0.168433
53	0.734464	0.168815
54	0.734962	0.169246
55	0.735527	0.169739
56	0.736168	0.170300
57	0.736891	0.170935
58	0.737689	0.171641
59	0.738556	0.172412
60	0.739487	0.173247
61	0.740486	0.174149
62	0.741706	0.175259
63	0.743188	0.176623
64	0.744984	0.178297
65	0.747148	0.180345

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .065
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.533026	0.069918
11	0.534095	0.069966
12	0.534255	0.070011
13	0.534405	0.070053
14	0.534540	0.070091
15	0.534656	0.070123
16	0.534748	0.070150
17	0.534812	0.070168
18	0.534847	0.070178
19	0.534862	0.070182
20	0.534867	0.070183
21	0.534868	0.070183
22	0.534871	0.070184
23	0.534878	0.070186
24	0.534891	0.070190
25	0.534914	0.070196
26	0.534951	0.070207
27	0.535006	0.070222
28	0.535087	0.070245
29	0.535196	0.070276
30	0.535337	0.070316
31	0.535515	0.070366
32	0.535729	0.070427
33	0.535981	0.070498
34	0.536270	0.070580
35	0.536595	0.070672
36	0.536956	0.070775
37	0.537347	0.070887
38	0.537770	0.071007
39	0.538220	0.071136
40	0.538698	0.071273
41	0.539212	0.071420
42	0.539770	0.071581
43	0.540384	0.071758
44	0.541020	0.071957
45	0.541841	0.072180
46	0.542709	0.072433
47	0.543686	0.072719
48	0.544735	0.073042
49	0.546017	0.073406
50	0.547398	0.073816
51	0.548946	0.074279
52	0.550679	0.074801
53	0.552616	0.075389
54	0.554773	0.076050
55	0.557167	0.076791
56	0.559810	0.077618
57	0.562800	0.078567
58	0.566148	0.079644
59	0.569871	0.080862
60	0.574001	0.082237
61	0.578585	0.083796
62	0.583690	0.085572
63	0.589382	0.087604
64	0.595721	0.089934
65	0.602753	0.092607

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .065
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.391507	0.039269
11	0.391780	0.039314
12	0.392033	0.039356
13	0.392262	0.039393
14	0.392462	0.039426
15	0.392630	0.039454
16	0.392762	0.039476
17	0.392854	0.039491
18	0.392907	0.039500
19	0.392937	0.039505
20	0.392959	0.039509
21	0.392986	0.039513
22	0.393026	0.039520
23	0.393085	0.039530
24	0.393167	0.039543
25	0.393279	0.039562
26	0.393429	0.039587
27	0.393624	0.039619
28	0.393873	0.039660
29	0.394180	0.039711
30	0.394550	0.039773
31	0.394986	0.039846
32	0.395489	0.039929
33	0.396057	0.040024
34	0.396693	0.040131
35	0.397398	0.040249
36	0.398174	0.040380
37	0.399020	0.040523
38	0.399940	0.040678
39	0.400936	0.040847
40	0.402013	0.041031
41	0.403189	0.041232
42	0.404482	0.041454
43	0.405914	0.041701
44	0.407513	0.041978
45	0.409307	0.042291
46	0.411321	0.042645
47	0.413580	0.043044
48	0.416107	0.043495
49	0.418920	0.044001
50	0.422042	0.044568
51	0.425494	0.045203
52	0.429367	0.045924
53	0.433695	0.046741
54	0.438515	0.047666
55	0.443867	0.048712
56	0.449786	0.049893
57	0.456297	0.051221
58	0.463412	0.052710
59	0.471138	0.054371
60	0.479497	0.056225
61	0.488520	0.058293
62	0.498254	0.060608
63	0.508741	0.063205
64	0.520010	0.066122
65	0.532072	0.069399

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .065
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.288155	0.024706
11	0.288506	0.024748
12	0.288828	0.024787
13	0.289117	0.024822
14	0.289371	0.024853
15	0.289589	0.024879
16	0.289767	0.024901
17	0.289904	0.024917
18	0.290005	0.024930
19	0.290089	0.024940
20	0.290177	0.024950
21	0.290285	0.024963
22	0.290427	0.024981
23	0.290608	0.025003
24	0.290835	0.025030
25	0.291116	0.025064
26	0.291459	0.025106
27	0.291873	0.025156
28	0.292370	0.025217
29	0.292954	0.025288
30	0.293632	0.025371
31	0.294412	0.025466
32	0.295296	0.025575
33	0.296287	0.025697
34	0.297392	0.025833
35	0.298615	0.025985
36	0.299964	0.026152
37	0.301442	0.026337
38	0.303060	0.026540
39	0.304827	0.026762
40	0.306758	0.027007
41	0.308881	0.027277
42	0.311226	0.027578
43	0.313824	0.027914
44	0.316713	0.028290
45	0.319926	0.028712
46	0.323495	0.029185
47	0.327494	0.029721
48	0.331957	0.030328
49	0.336917	0.031011
50	0.342412	0.031780
51	0.348477	0.032644
52	0.355152	0.033614
53	0.362472	0.034701
54	0.370468	0.035917
55	0.379166	0.037275
56	0.388581	0.038789
57	0.398713	0.040471
58	0.409546	0.042333
59	0.421058	0.044389
60	0.433238	0.046654
61	0.446088	0.049152
62	0.459624	0.051912
63	0.473854	0.054967
64	0.488773	0.058352
65	0.504354	0.062105

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .065
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.213175	0.016535
11	0.213593	0.016577
12	0.213982	0.016615
13	0.214340	0.016651
14	0.214665	0.016683
15	0.214957	0.016712
16	0.215216	0.016737
17	0.215439	0.016760
18	0.215636	0.016779
19	0.215828	0.016798
20	0.216039	0.016819
21	0.216288	0.016844
22	0.216589	0.016874
23	0.216949	0.016909
24	0.217377	0.016952
25	0.217884	0.017003
26	0.218480	0.017062
27	0.219179	0.017132
28	0.219995	0.017214
29	0.220937	0.017308
30	0.222014	0.017417
31	0.223239	0.017541
32	0.224619	0.017680
33	0.226160	0.017837
34	0.227874	0.018012
35	0.229773	0.018207
36	0.231872	0.018424
37	0.234179	0.018663
38	0.236714	0.018928
39	0.239486	0.019219
40	0.242518	0.019541
41	0.245841	0.019895
42	0.249521	0.020292
43	0.253601	0.020737
44	0.258129	0.021236
45	0.263149	0.021796
46	0.268703	0.022426
47	0.274829	0.023131
48	0.281559	0.023919
49	0.288920	0.024798
50	0.296938	0.025777
51	0.305633	0.026864
52	0.315026	0.028070
53	0.325130	0.029404
54	0.335952	0.030877
55	0.347494	0.032503
56	0.359745	0.034293
57	0.372676	0.036258
58	0.386243	0.038409
59	0.400395	0.040756
60	0.415097	0.043314
61	0.430328	0.046104
62	0.446082	0.049151
63	0.462353	0.052486
64	0.479124	0.056141
65	0.496360	0.060151

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .070
PER CENT INTEREST RATE

X	AX	PX
10	0.030478	0.002057
11	0.032213	0.002178
12	0.033979	0.002301
13	0.035779	0.002428
14	0.037616	0.002557
15	0.039493	0.002690
16	0.041413	0.002826
17	0.043379	0.002967
18	0.045405	0.003112
19	0.047521	0.003264
20	0.049761	0.003426
21	0.052152	0.003600
22	0.054712	0.003786
23	0.057455	0.003988
24	0.060394	0.004205
25	0.063542	0.004439
26	0.066914	0.004691
27	0.070526	0.004964
28	0.074396	0.005258
29	0.078533	0.005576
30	0.082947	0.005917
31	0.087650	0.006285
32	0.092646	0.006680
33	0.097939	0.007103
34	0.103534	0.007556
35	0.109437	0.008039
36	0.115656	0.008556
37	0.122188	0.009106
38	0.129044	0.009693
39	0.136223	0.010317
40	0.143736	0.010982
41	0.151603	0.011690
42	0.159845	0.012447
43	0.168486	0.013256
44	0.177551	0.014123
45	0.187062	0.015054
46	0.197034	0.016053
47	0.207476	0.017127
48	0.218395	0.018280
49	0.229793	0.019519
50	0.241671	0.020849
51	0.254030	0.022279
52	0.266872	0.023815
53	0.280197	0.025467
54	0.294002	0.027245
55	0.308281	0.029158
56	0.323022	0.031217
57	0.338196	0.033433
58	0.353767	0.035815
59	0.369694	0.038374
60	0.385956	0.041123
61	0.402553	0.044084
62	0.419504	0.047282
63	0.436825	0.050749
64	0.454525	0.054520
65	0.472597	0.058631

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .070
PER CENT INTEREST RATE

N = 5

X	NAX	NPX
10	0.713255	0.162728
11	0.713305	0.162768
12	0.713355	0.162808
13	0.713406	0.162848
14	0.713455	0.162888
15	0.713502	0.162925
16	0.713544	0.162958
17	0.713575	0.162983
18	0.713593	0.162997
19	0.713600	0.163004
20	0.713603	0.163005
21	0.713603	0.163005
22	0.713603	0.163005
23	0.713603	0.163005
24	0.713603	0.163005
25	0.713603	0.163006
26	0.713605	0.163007
27	0.713610	0.163011
28	0.713620	0.163019
29	0.713637	0.163033
30	0.713662	0.163052
31	0.713696	0.163080
32	0.713741	0.163116
33	0.713796	0.163160
34	0.713862	0.163212
35	0.713940	0.163275
36	0.714031	0.163348
37	0.714133	0.163429
38	0.714246	0.163519
39	0.714365	0.163615
40	0.714490	0.163715
41	0.714620	0.163820
42	0.714757	0.163929
43	0.714903	0.164047
44	0.715064	0.164177
45	0.715245	0.164323
46	0.715450	0.164488
47	0.715683	0.164676
48	0.715946	0.164890
49	0.716243	0.165131
50	0.716576	0.165402
51	0.716948	0.165705
52	0.717364	0.166045
53	0.717830	0.166428
54	0.718357	0.166861
55	0.718954	0.167355
56	0.719632	0.167918
57	0.720395	0.168555
58	0.721240	0.169263
59	0.722156	0.170037
60	0.723140	0.170874
61	0.724197	0.171780
62	0.725485	0.172893
63	0.727052	0.174260
64	0.728950	0.175939
65	0.731239	- 255 - 0.177995

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .070
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.509598	0.067981
11	0.509773	0.068029
12	0.509941	0.068075
13	0.510097	0.068117
14	0.510238	0.068156
15	0.510359	0.068189
16	0.510456	0.068215
17	0.510523	0.068233
18	0.510560	0.068244
19	0.510576	0.068248
20	0.510580	0.068249
21	0.510581	0.068249
22	0.510585	0.068250
23	0.510592	0.068252
24	0.510606	0.068256
25	0.510629	0.068263
26	0.510667	0.068273
27	0.510725	0.068289
28	0.510808	0.068311
29	0.510922	0.068342
30	0.511068	0.068382
31	0.511253	0.068433
32	0.511476	0.068494
33	0.511738	0.068566
34	0.512038	0.068648
35	0.512377	0.068741
36	0.512752	0.068845
37	0.513160	0.068957
38	0.513601	0.069079
39	0.514069	0.069209
40	0.514567	0.069347
41	0.515102	0.069495
42	0.515685	0.069657
43	0.516322	0.069836
44	0.517036	0.070036
45	0.517838	0.070261
46	0.518741	0.070516
47	0.519758	0.070804
48	0.520901	0.071129
49	0.522184	0.071495
50	0.523621	0.071908
51	0.525232	0.072374
52	0.527036	0.072900
53	0.529052	0.073492
54	0.531298	0.074158
55	0.533790	0.074904
56	0.536542	0.075737
57	0.539655	0.076691
58	0.543140	0.077776
59	0.547015	0.079001
60	0.551314	0.080384
61	0.556086	0.081952
62	0.561402	0.083738
63	0.567332	0.085782
64	0.573940	0.088127
65	0.581276	0.090817

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .070
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.365194	0.037635
11	0.365476	0.037681
12	0.365737	0.037724
13	0.365973	0.037762
14	0.366180	0.037796
15	0.366354	0.037824
16	0.366491	0.037846
17	0.366586	0.037862
18	0.366642	0.037871
19	0.366673	0.037876
20	0.366695	0.037880
21	0.366722	0.037884
22	0.366763	0.037891
23	0.366822	0.037900
24	0.366905	0.037914
25	0.367019	0.037933
26	0.367172	0.037957
27	0.367370	0.037990
28	0.367625	0.038032
29	0.367939	0.038083
30	0.368317	0.038145
31	0.368763	0.038218
32	0.369278	0.038303
33	0.369861	0.038399
34	0.370513	0.038506
35	0.371235	0.038626
36	0.372032	0.038758
37	0.372899	0.038902
38	0.373844	0.039059
39	0.374865	0.039230
40	0.375970	0.039415
41	0.377175	0.039618
42	0.378500	0.039842
43	0.379967	0.040091
44	0.381605	0.040370
45	0.383443	0.040686
46	0.385507	0.041042
47	0.387822	0.041445
48	0.390412	0.041899
49	0.393295	0.042409
50	0.396496	0.042981
51	0.400035	0.043620
52	0.404006	0.044347
53	0.408442	0.045170
54	0.413384	0.046101
55	0.418872	0.047155
56	0.424943	0.048343
57	0.431622	0.049680
58	0.438923	0.051178
59	0.446854	0.052850
60	0.455438	0.054714
61	0.464708	0.056794
62	0.474715	0.059122
63	0.485504	0.061734
64	0.497110	0.064669
65	0.509544	0.067967

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .070
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.262828	0.023325
11	0.263186	0.023368
12	0.263515	0.023408
13	0.263812	0.023443
14	0.264072	0.023475
15	0.264296	0.023502
16	0.264478	0.023524
17	0.264618	0.023541
18	0.264720	0.023553
19	0.264804	0.023563
20	0.264892	0.023574
21	0.265000	0.023587
22	0.265141	0.023604
23	0.265321	0.023626
24	0.265548	0.023653
25	0.265829	0.023687
26	0.266172	0.023729
27	0.266588	0.023780
28	0.267087	0.023840
29	0.267675	0.023912
30	0.268358	0.023995
31	0.269144	0.024092
32	0.270036	0.024201
33	0.271038	0.024324
34	0.272155	0.024462
35	0.273389	0.024615
36	0.274752	0.024784
37	0.276245	0.024970
38	0.277880	0.025175
39	0.279664	0.025399
40	0.281613	0.025645
41	0.283755	0.025918
42	0.286121	0.026220
43	0.288742	0.026558
44	0.291656	0.026937
45	0.294899	0.027361
46	0.298501	0.027838
47	0.302537	0.028377
48	0.307042	0.028987
49	0.312050	0.029674
50	0.317598	0.030447
51	0.323724	0.031316
52	0.330467	0.032290
53	0.337866	0.033382
54	0.345951	0.034603
55	0.354751	0.035967
56	0.364283	0.037488
57	0.374548	0.039177
58	0.385530	0.041046
59	0.397210	0.043109
60	0.409578	0.045382
61	0.422638	0.047889
62	0.436411	0.050658
63	0.450909	0.053723
64	0.466130	0.057120
65	0.482052	0.060887

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (POLICIES) AT .070
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.190279	0.015373
11	0.190705	0.015416
12	0.191099	0.015455
13	0.191462	0.015492
14	0.191791	0.015525
15	0.192086	0.015554
16	0.192346	0.015580
17	0.192570	0.015603
18	0.192765	0.015622
19	0.192953	0.015641
20	0.193159	0.015662
21	0.193403	0.015686
22	0.193698	0.015716
23	0.194051	0.015752
24	0.194475	0.015794
25	0.194972	0.015844
26	0.195560	0.015904
27	0.196251	0.015974
28	0.197058	0.016056
29	0.197992	0.016150
30	0.199061	0.016259
31	0.200278	0.016384
32	0.201649	0.016524
33	0.203181	0.016682
34	0.204886	0.016858
35	0.206775	0.017054
36	0.208863	0.017271
37	0.211158	0.017512
38	0.213678	0.017778
39	0.216434	0.018070
40	0.219447	0.018393
41	0.222749	0.018749
42	0.226406	0.019146
43	0.230459	0.019592
44	0.234957	0.020092
45	0.239946	0.020653
46	0.245468	0.021283
47	0.251560	0.021989
48	0.258257	0.022778
49	0.265586	0.023658
50	0.273575	0.024638
51	0.282244	0.025725
52	0.291617	0.026931
53	0.301708	0.028266
54	0.312527	0.029740
55	0.324079	0.031367
56	0.336355	0.033157
57	0.349328	0.035123
58	0.362957	0.037274
59	0.377192	0.039621
60	0.392001	0.042179
61	0.407366	0.044969
62	0.423287	0.048016
63	0.439761	0.051352
64	0.456776	0.055010
65	0.474302	0.059025

APPENDIX IV

Single and Annual Premiums
(Sums Assured) for the Whole
Life and Endowment

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .040
PER CENT INTEREST RATE

X	AX	PX
10	0.108998	0.004705
11	0.112959	0.004898
12	0.116996	0.005096
13	0.121113	0.005300
14	0.125312	0.005510
15	0.129598	0.005727
16	0.133977	0.005950
17	0.138452	0.006181
18	0.143037	0.006420
19	0.147761	0.006669
20	0.152656	0.006929
21	0.157745	0.007204
22	0.163043	0.007493
23	0.168561	0.007798
24	0.174306	0.008120
25	0.180288	0.008460
26	0.186516	0.008819
27	0.193002	0.009199
28	0.199756	0.009601
29	0.206780	0.010027
30	0.214079	0.010477
31	0.221657	0.010954
32	0.229510	0.011457
33	0.237638	0.011990
34	0.246037	0.012552
35	0.254706	0.013145
36	0.263644	0.013772
37	0.272843	0.014433
38	0.282303	0.015130
39	0.292019	0.015865
40	0.301991	0.016642
41	0.312228	0.017462
42	0.322741	0.018330
43	0.333540	0.019251
44	0.344635	0.020228
45	0.356033	0.021267
46	0.367737	0.022373
47	0.379742	0.023550
48	0.392042	0.024805
49	0.404625	0.026143
50	0.417481	0.027569
51	0.430598	0.029091
52	0.443967	0.030715
53	0.457573	0.032451
54	0.471403	0.034307
55	0.485441	0.036293
56	0.499663	0.038419
57	0.514039	0.040694
58	0.528527	0.043128
59	0.543089	0.045730
60	0.557700	0.048513
61	0.572351	0.051495
62	0.587045	0.054698
63	0.601785	0.058149
64	0.616567	0.061877
65	0.631371	0.065911

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .040
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.822113	0.177752
11	0.822146	0.177792
12	0.822179	0.177832
13	0.822212	0.177872
14	0.822244	0.177911
15	0.822275	0.177949
16	0.822302	0.177982
17	0.822322	0.178006
18	0.822334	0.178020
19	0.822339	0.178027
20	0.822340	0.178028
21	0.822340	0.178028
22	0.822340	0.178028
23	0.822340	0.178028
24	0.822340	0.178028
25	0.822340	0.178028
26	0.822342	0.178030
27	0.822345	0.178034
28	0.822352	0.178042
29	0.822363	0.178056
30	0.822379	0.178076
31	0.822402	0.178103
32	0.822431	0.178139
33	0.822467	0.178183
34	0.822511	0.178236
35	0.822562	0.178299
36	0.822622	0.178372
37	0.822689	0.178454
38	0.822763	0.178544
39	0.822841	0.178640
40	0.822923	0.178740
41	0.823008	0.178845
42	0.823098	0.178955
43	0.823194	0.179073
44	0.823299	0.179204
45	0.823418	0.179350
46	0.823553	0.179516
47	0.823705	0.179705
48	0.823879	0.179919
49	0.824073	0.180161
50	0.824292	0.180433
51	0.824535	0.180737
52	0.824808	0.181078
53	0.825114	0.181463
54	0.825460	0.181898
55	0.825852	0.182393
56	0.826296	0.182959
57	0.826797	0.183599
58	0.827350	0.184311
59	0.827951	0.185088
60	0.828595	0.185929
61	0.829288	0.186839
62	0.830109	0.187928
63	0.831084	0.189234
64	0.832240	0.190804
65	0.833607	0.192688

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .040
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.676504	0.080432
11	0.676629	0.080478
12	0.676748	0.080522
13	0.676859	0.080563
14	0.676959	0.080599
15	0.677044	0.080631
16	0.677111	0.080655
17	0.677158	0.080673
18	0.677185	0.080682
19	0.677194	0.080686
20	0.677197	0.080687
21	0.677198	0.080687
22	0.677200	0.080688
23	0.677206	0.080690
24	0.677216	0.080694
25	0.677234	0.080701
26	0.677262	0.080711
27	0.677305	0.080727
28	0.677367	0.080750
29	0.677449	0.080780
30	0.677556	0.080820
31	0.677691	0.080870
32	0.677852	0.080930
33	0.678042	0.081000
34	0.678259	0.081080
35	0.678503	0.081171
36	0.678774	0.081272
37	0.679067	0.081381
38	0.679383	0.081500
39	0.679720	0.081626
40	0.680078	0.081760
41	0.680463	0.081905
42	0.680882	0.082063
43	0.681344	0.082238
44	0.681859	0.082433
45	0.682438	0.082654
46	0.683090	0.082903
47	0.683824	0.083184
48	0.684649	0.083503
49	0.685573	0.083861
50	0.686610	0.084266
51	0.687771	0.084722
52	0.689071	0.085237
53	0.690524	0.085818
54	0.692140	0.086470
55	0.693932	0.087202
56	0.695908	0.088019
57	0.698127	0.088948
58	0.700594	0.089908
59	0.703318	0.091177
60	0.706318	0.092502
61	0.709626	0.093994
62	0.713284	0.095683
63	0.717333	0.097605
64	0.721808	0.099794
65	0.726732	0.102285

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .040
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.557517	0.048460
11	0.557732	0.048503
12	0.557930	0.048542
13	0.558109	0.048577
14	0.558264	0.048607
15	0.558394	0.048633
16	0.558495	0.048653
17	0.558565	0.048667
18	0.558607	0.048675
19	0.558630	0.048680
20	0.558649	0.048683
21	0.558672	0.048688
22	0.558707	0.048695
23	0.558757	0.048705
24	0.558827	0.048719
25	0.558922	0.048737
26	0.559048	0.048762
27	0.559212	0.048795
28	0.559419	0.048836
29	0.559673	0.048886
30	0.559977	0.048947
31	0.560334	0.049017
32	0.560744	0.049099
33	0.561207	0.049191
34	0.561723	0.049295
35	0.562294	0.049409
36	0.562922	0.049535
37	0.563607	0.049674
38	0.564352	0.049824
39	0.565159	0.049988
40	0.566033	0.050166
41	0.566989	0.050362
42	0.568041	0.050578
43	0.569207	0.050819
44	0.570509	0.051090
45	0.571969	0.051395
46	0.573608	0.051741
47	0.575445	0.052131
48	0.577498	0.052571
49	0.579782	0.053066
50	0.582314	0.053621
51	0.585111	0.054242
52	0.588235	0.054945
53	0.591710	0.055740
54	0.595563	0.056637
55	0.599823	0.057650
56	0.604513	0.058789
57	0.609648	0.060069
58	0.615235	0.061500
59	0.621275	0.063094
60	0.627778	0.064868
61	0.634762	0.066844
62	0.642253	0.069049
63	0.650273	0.071514
64	0.658831	0.074273
65	0.667922	0.077359

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .040
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.460307	0.032804
11	0.460597	0.032842
12	0.460862	0.032877
13	0.461099	0.032909
14	0.461307	0.032936
15	0.461484	0.032960
16	0.461631	0.032979
17	0.461745	0.032994
18	0.461832	0.033006
19	0.461908	0.033016
20	0.461991	0.033027
21	0.462094	0.033041
22	0.462227	0.033059
23	0.462397	0.033081
24	0.462608	0.033109
25	0.462867	0.033144
26	0.463181	0.033186
27	0.463557	0.033236
28	0.464004	0.033296
29	0.464526	0.033366
30	0.465128	0.033446
31	0.465818	0.033539
32	0.466598	0.033645
33	0.467471	0.033763
34	0.468441	0.033895
35	0.469514	0.034041
36	0.470698	0.034203
37	0.471995	0.034382
38	0.473416	0.034578
39	0.474969	0.034794
40	0.476670	0.035032
41	0.478543	0.035296
42	0.480613	0.035590
43	0.482908	0.035919
44	0.485456	0.036287
45	0.488288	0.036701
46	0.491427	0.037165
47	0.494932	0.037690
48	0.498831	0.038282
49	0.503147	0.038949
50	0.507912	0.039698
51	0.513151	0.040539
52	0.518895	0.041483
53	0.525167	0.042539
54	0.531989	0.043719
55	0.539375	0.045037
56	0.547332	0.046505
57	0.555852	0.048135
58	0.564913	0.049938
59	0.574489	0.051927
60	0.584561	0.054119
61	0.595118	0.056533
62	0.606159	0.059196
63	0.617674	0.062137
64	0.629639	0.065387
65	0.642015	0.068977

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .040
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.380910	0.023664
11	0.381275	0.023701
12	0.381614	0.023735
13	0.381926	0.023766
14	0.382211	0.023795
15	0.382470	0.023821
16	0.382703	0.023845
17	0.382913	0.023866
18	0.383105	0.023885
19	0.383299	0.023905
20	0.383516	0.023927
21	0.383772	0.023953
22	0.384080	0.023984
23	0.384445	0.024021
24	0.384875	0.024065
25	0.385381	0.024116
26	0.385971	0.024176
27	0.386658	0.024247
28	0.387453	0.024328
29	0.388365	0.024422
30	0.389403	0.024529
31	0.390578	0.024650
32	0.391898	0.024787
33	0.393370	0.024940
34	0.395004	0.025112
35	0.396814	0.025302
36	0.398814	0.025515
37	0.401014	0.025750
38	0.403432	0.026010
39	0.406079	0.026297
40	0.408977	0.026615
41	0.412152	0.026966
42	0.415664	0.027359
43	0.419548	0.027800
44	0.423844	0.028294
45	0.428590	0.028848
46	0.433822	0.029470
47	0.439568	0.030167
48	0.445855	0.030945
49	0.452700	0.031814
50	0.460122	0.032780
51	0.468131	0.033852
52	0.476735	0.035041
53	0.485938	0.036357
54	0.495734	0.037811
55	0.506113	0.039414
56	0.517053	0.041178
57	0.528515	0.043114
58	0.540450	0.045232
59	0.552801	0.047544
60	0.565522	0.050062
61	0.578580	0.052805
62	0.591950	0.055795
63	0.605607	0.059059
64	0.619515	0.062624
65	0.633628	0.066518

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .045
PER CENT INTEREST RATE

X	AX	PX
10	0.086045	0.004054
11	0.089508	0.004233
12	0.093042	0.004418
13	0.096650	0.004607
14	0.100335	0.004803
15	0.104103	0.005004
16	0.107958	0.005212
17	0.111905	0.005426
18	0.115958	0.005648
19	0.120146	0.005880
20	0.124503	0.006124
21	0.129054	0.006381
22	0.133815	0.006653
23	0.138796	0.006940
24	0.144008	0.007245
25	0.149460	0.007567
26	0.155166	0.007909
27	0.161135	0.008272
28	0.167380	0.008657
29	0.173906	0.009066
30	0.180718	0.009499
31	0.187822	0.009959
32	0.195217	0.010446
33	0.202901	0.010962
34	0.210873	0.011508
35	0.219134	0.012085
36	0.227684	0.012696
37	0.236515	0.013341
38	0.245631	0.014022
39	0.255025	0.014742
40	0.264701	0.015503
41	0.274671	0.016308
42	0.284944	0.017161
43	0.295535	0.018067
44	0.306457	0.019029
45	0.317719	0.020054
46	0.329324	0.021147
47	0.341271	0.022312
48	0.353556	0.023554
49	0.366167	0.024880
50	0.379096	0.026295
51	0.392333	0.027806
52	0.405868	0.029421
53	0.419690	0.031148
54	0.433785	0.032996
55	0.448137	0.034974
56	0.462725	0.037094
57	0.477515	0.039364
58	0.492465	0.041793
59	0.507535	0.044390
60	0.522699	0.047170
61	0.537947	0.050149
62	0.553284	0.053352
63	0.568714	0.056804
64	0.584233	0.060534
65	0.599821	0.064573

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .045
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.802656	0.175147
11	0.802692	0.175187
12	0.802729	0.175227
13	0.802765	0.175267
14	0.802801	0.175307
15	0.802835	0.175345
16	0.802865	0.175378
17	0.802887	0.175402
18	0.802900	0.175417
19	0.802906	0.175423
20	0.802907	0.175424
21	0.802907	0.175424
22	0.802907	0.175424
23	0.802907	0.175424
24	0.802907	0.175424
25	0.802907	0.175425
26	0.802909	0.175426
27	0.802912	0.175430
28	0.802920	0.175439
29	0.802932	0.175452
30	0.802950	0.175472
31	0.802975	0.175500
32	0.803007	0.175536
33	0.803047	0.175580
34	0.803095	0.175633
35	0.803152	0.175696
36	0.803218	0.175770
37	0.803292	0.175852
38	0.803373	0.175943
39	0.803460	0.176039
40	0.803550	0.176139
41	0.803644	0.176244
42	0.803743	0.176355
43	0.803849	0.176474
44	0.803966	0.176604
45	0.804097	0.176751
46	0.804245	0.176918
47	0.804414	0.177107
48	0.804605	0.177323
49	0.804819	0.177565
50	0.805061	0.177838
51	0.805330	0.178144
52	0.805631	0.178486
53	0.805969	0.178872
54	0.806350	0.179309
55	0.806782	0.179806
56	0.807273	0.180374
57	0.807825	0.181016
58	0.808436	0.181731
59	0.809099	0.182511
60	0.809810	0.183355
61	0.810574	0.184268
62	0.811481	0.185361
63	0.812556	0.186671
64	0.813832	0.188246
65	0.815342	0.190138

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .045
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.644947	0.078222
11	0.645084	0.078268
12	0.645215	0.078313
13	0.645334	0.078354
14	0.645443	0.078391
15	0.645536	0.078423
16	0.645609	0.078448
17	0.645660	0.078466
18	0.645688	0.078475
19	0.645700	0.078479
20	0.645703	0.078480
21	0.645704	0.078481
22	0.645707	0.078482
23	0.645713	0.078484
24	0.645724	0.078488
25	0.645743	0.078494
26	0.645774	0.078505
27	0.645820	0.078520
28	0.645886	0.078543
29	0.645976	0.078574
30	0.646092	0.078614
31	0.646237	0.078664
32	0.646415	0.078724
33	0.646619	0.078795
34	0.646854	0.078877
35	0.647119	0.078968
36	0.647415	0.079070
37	0.647732	0.079181
38	0.648076	0.079300
39	0.648441	0.079427
40	0.648830	0.079563
41	0.649249	0.079709
42	0.649704	0.079869
43	0.650205	0.080045
44	0.650764	0.080242
45	0.651393	0.080464
46	0.652101	0.080716
47	0.652897	0.081000
48	0.653793	0.081321
49	0.654797	0.081682
50	0.655922	0.082090
51	0.657183	0.082551
52	0.658595	0.083070
53	0.660172	0.083655
54	0.661927	0.084313
55	0.663873	0.085051
56	0.666020	0.085874
57	0.668430	0.086812
58	0.671110	0.087870
59	0.674068	0.089058
60	0.677326	0.090392
61	0.680919	0.091895
62	0.684893	0.093597
63	0.689293	0.095532
64	0.694159	0.097737
65	0.699517	0.100248

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .045
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.519127	0.046488
11	0.519358	0.046531
12	0.519572	0.046571
13	0.519764	0.046607
14	0.519931	0.046638
15	0.520071	0.046664
16	0.520180	0.046684
17	0.520257	0.046699
18	0.520301	0.046707
19	0.520327	0.046712
20	0.520346	0.046715
21	0.520370	0.046720
22	0.520407	0.046727
23	0.520460	0.046737
24	0.520534	0.046751
25	0.520635	0.046770
26	0.520769	0.046795
27	0.520943	0.046827
28	0.521165	0.046869
29	0.521434	0.046919
30	0.521758	0.046980
31	0.522138	0.047052
32	0.522576	0.047135
33	0.523070	0.047228
34	0.523621	0.047333
35	0.524232	0.047449
36	0.524904	0.047577
37	0.525636	0.047717
38	0.526432	0.047869
39	0.527294	0.048035
40	0.528229	0.048216
41	0.529250	0.048414
42	0.530373	0.048632
43	0.531618	0.048876
44	0.533008	0.049150
45	0.534567	0.049459
46	0.536317	0.049808
47	0.538279	0.050202
48	0.540471	0.050647
49	0.542911	0.051147
50	0.545616	0.051708
51	0.548604	0.052336
52	0.551941	0.053046
53	0.555654	0.053849
54	0.559772	0.054756
55	0.564324	0.055778
56	0.569338	0.056928
57	0.574829	0.058220
58	0.580804	0.059664
59	0.587266	0.061272
60	0.594226	0.063061
61	0.601704	0.065054
62	0.609729	0.067277
63	0.618326	0.069762
64	0.627508	0.072544
65	0.637270	0.075655

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .045
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.418770	0.031026
11	0.419079	0.031065
12	0.419360	0.031101
13	0.419613	0.031133
14	0.419835	0.031162
15	0.420024	0.031186
16	0.420180	0.031206
17	0.420301	0.031222
18	0.420393	0.031233
19	0.420473	0.031244
20	0.420558	0.031254
21	0.420665	0.031268
22	0.420803	0.031286
23	0.420979	0.031309
24	0.421198	0.031337
25	0.421468	0.031371
26	0.421796	0.031414
27	0.422188	0.031464
28	0.422656	0.031525
29	0.423203	0.031595
30	0.423835	0.031677
31	0.424559	0.031771
32	0.425378	0.031878
33	0.426295	0.031998
34	0.427315	0.032131
35	0.428443	0.032280
36	0.429687	0.032444
37	0.431050	0.032625
38	0.432544	0.032824
39	0.434176	0.033043
40	0.435963	0.033284
41	0.437929	0.033551
42	0.440102	0.033849
43	0.442511	0.034181
44	0.445187	0.034553
45	0.448160	0.034972
46	0.451457	0.035441
47	0.455139	0.035971
48	0.459235	0.036570
49	0.463770	0.037243
50	0.468777	0.038000
51	0.474285	0.038850
52	0.480325	0.039802
53	0.486924	0.040867
54	0.494104	0.042058
55	0.501883	0.043388
56	0.510268	0.044868
57	0.519251	0.046511
58	0.528812	0.048328
59	0.538923	0.050333
60	0.549567	0.052540
61	0.560734	0.054970
62	0.572424	0.057650
63	0.584630	0.060610
64	0.597330	0.063880
65	0.610486	0.067491

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .045
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.338744	0.022060
11	0.339129	0.022098
12	0.339485	0.022133
13	0.339813	0.022165
14	0.340112	0.022195
15	0.340384	0.022222
16	0.340627	0.022246
17	0.340844	0.022267
18	0.341042	0.022287
19	0.341240	0.022306
20	0.341461	0.022328
21	0.341722	0.022354
22	0.342035	0.022385
23	0.342408	0.022422
24	0.342849	0.022466
25	0.343367	0.022518
26	0.343972	0.022579
27	0.344678	0.022649
28	0.345496	0.022731
29	0.346435	0.022826
30	0.347506	0.022934
31	0.348719	0.023057
32	0.350081	0.023196
33	0.351601	0.023351
34	0.353290	0.023524
35	0.355160	0.023717
36	0.357226	0.023932
37	0.359499	0.024170
38	0.361995	0.024433
39	0.364729	0.024723
40	0.367720	0.025044
41	0.370999	0.025399
42	0.374624	0.025796
43	0.378633	0.026240
44	0.383068	0.026738
45	0.387969	0.027297
46	0.393373	0.027924
47	0.399312	0.028626
48	0.405814	0.029410
49	0.412897	0.030285
50	0.420581	0.031257
51	0.428879	0.032337
52	0.437802	0.033534
53	0.447353	0.034858
54	0.457531	0.036320
55	0.468326	0.037931
56	0.479717	0.039705
57	0.491667	0.041650
58	0.504125	0.043779
59	0.517035	0.046100
60	0.530350	0.048628
61	0.544038	0.051380
62	0.558078	0.054381
63	0.572445	0.057655
64	0.587107	0.061232
65	0.602015	0.065138

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .050
PER CENT INTEREST RATE

X	AX	PX
10	0.068665	0.003511
11	0.071682	0.003677
12	0.074762	0.003848
13	0.077909	0.004023
14	0.081126	0.004204
15	0.084419	0.004391
16	0.087791	0.004583
17	0.091248	0.004782
18	0.094804	0.004987
19	0.098490	0.005202
20	0.102338	0.005429
21	0.106375	0.005669
22	0.110619	0.005923
23	0.115081	0.006193
24	0.119772	0.006480
25	0.124703	0.006784
26	0.129887	0.007109
27	0.135337	0.007453
28	0.141067	0.007821
29	0.147081	0.008212
30	0.153388	0.008628
31	0.159994	0.009070
32	0.166899	0.009540
33	0.174103	0.010039
34	0.181607	0.010567
35	0.189412	0.011128
36	0.197520	0.011721
37	0.205925	0.012349
38	0.214631	0.013014
39	0.223634	0.013717
40	0.232938	0.014461
41	0.242556	0.015250
42	0.252503	0.016086
43	0.262793	0.016976
44	0.273442	0.017923
45	0.284462	0.018932
46	0.295859	0.020009
47	0.307633	0.021160
48	0.319781	0.022388
49	0.332295	0.023700
50	0.345168	0.025103
51	0.358390	0.026602
52	0.371955	0.028205
53	0.385851	0.029921
54	0.400067	0.031759
55	0.414588	0.033728
56	0.429393	0.035839
57	0.444448	0.038102
58	0.459711	0.040524
59	0.475139	0.043116
60	0.490706	0.045890
61	0.506403	0.048865
62	0.522237	0.052064
63	0.538212	0.055515
64	0.554325	0.059246
65	0.570555	0.063287

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .050
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.783750	0.172584
11	0.783789	0.172624
12	0.783829	0.172665
13	0.783868	0.172705
14	0.783907	0.172745
15	0.783945	0.172783
16	0.783977	0.172816
17	0.784002	0.172841
18	0.784016	0.172855
19	0.784022	0.172862
20	0.784023	0.172863
21	0.784023	0.172863
22	0.784023	0.172863
23	0.784023	0.172863
24	0.784023	0.172863
25	0.784023	0.172863
26	0.784025	0.172865
27	0.784029	0.172869
28	0.784037	0.172877
29	0.784050	0.172891
30	0.784070	0.172911
31	0.784097	0.172939
32	0.784133	0.172975
33	0.784176	0.173019
34	0.784228	0.173073
35	0.784290	0.173136
36	0.784362	0.173210
37	0.784443	0.173292
38	0.784531	0.173383
39	0.784626	0.173480
40	0.784724	0.173581
41	0.784826	0.173686
42	0.784934	0.173797
43	0.785050	0.173917
44	0.785177	0.174048
45	0.785320	0.174195
46	0.785482	0.174362
47	0.785665	0.174553
48	0.785874	0.174769
49	0.786108	0.175012
50	0.786371	0.175286
51	0.786664	0.175593
52	0.786992	0.175937
53	0.787361	0.176324
54	0.787776	0.176762
55	0.788247	0.177261
56	0.788782	0.177831
57	0.789385	0.178476
58	0.790050	0.179193
59	0.790773	0.179976
60	0.791549	0.180823
61	0.792382	0.181740
62	0.793369	0.182836
63	0.794541	0.184150
64	0.795933	0.185731
65	0.797579	0.187629

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .050
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.615007	0.076069
11	0.615153	0.076116
12	0.615293	0.076161
13	0.615423	0.076203
14	0.615539	0.076240
15	0.615639	0.076272
16	0.615719	0.076298
17	0.615774	0.076316
18	0.615804	0.076326
19	0.615816	0.076330
20	0.615820	0.076331
21	0.615821	0.076331
22	0.615824	0.076332
23	0.615830	0.076334
24	0.615842	0.076338
25	0.615863	0.076345
26	0.615895	0.076355
27	0.615944	0.076371
28	0.616016	0.076394
29	0.616112	0.076425
30	0.616236	0.076465
31	0.616392	0.076515
32	0.616580	0.076576
33	0.616801	0.076648
34	0.617053	0.076730
35	0.617337	0.076822
36	0.617653	0.076925
37	0.617995	0.077036
38	0.618364	0.077157
39	0.618756	0.077285
40	0.619174	0.077422
41	0.619623	0.077570
42	0.620111	0.077731
43	0.620649	0.077908
44	0.621248	0.078107
45	0.621922	0.078331
46	0.622682	0.078585
47	0.623536	0.078871
48	0.624497	0.079195
49	0.625573	0.079559
50	0.626781	0.079971
51	0.628135	0.080435
52	0.629647	0.080959
53	0.631339	0.081549
54	0.633222	0.082212
55	0.635310	0.082955
56	0.637615	0.083785
57	0.640201	0.084730
58	0.643076	0.085796
59	0.646250	0.086993
60	0.649746	0.088337
61	0.653601	0.089850
62	0.657866	0.091563
63	0.662590	0.093512
64	0.667818	0.095733
65	0.673577	0.098262

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .050
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.483558	0.044587
11	0.483804	0.044631
12	0.484030	0.044671
13	0.484235	0.044708
14	0.484413	0.044740
15	0.484562	0.044767
16	0.484679	0.044788
17	0.484760	0.044802
18	0.484808	0.044811
19	0.484835	0.044815
20	0.484855	0.044819
21	0.484881	0.044824
22	0.484919	0.044831
23	0.484974	0.044840
24	0.485052	0.044854
25	0.485158	0.044873
26	0.485298	0.044899
27	0.485480	0.044931
28	0.485712	0.044973
29	0.485996	0.045024
30	0.486337	0.045086
31	0.486739	0.045158
32	0.487200	0.045242
33	0.487722	0.045336
34	0.488304	0.045442
35	0.488949	0.045560
36	0.489658	0.045689
37	0.490432	0.045831
38	0.491273	0.045985
39	0.492183	0.046153
40	0.493170	0.046336
41	0.494248	0.046536
42	0.495433	0.046757
43	0.496747	0.047003
44	0.498215	0.047280
45	0.499858	0.047592
46	0.501704	0.047945
47	0.503774	0.048343
48	0.506088	0.048793
49	0.508663	0.049298
50	0.511518	0.049865
51	0.514673	0.050498
52	0.518196	0.051216
53	0.522117	0.052027
54	0.526464	0.052942
55	0.531272	0.053973
56	0.536568	0.055134
57	0.542370	0.056437
58	0.548685	0.057893
59	0.555517	0.059514
60	0.562877	0.061318
61	0.570788	0.063326
62	0.579283	0.065566
63	0.588390	0.068071
64	0.598126	0.070873
65	0.608485	0.074008

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .050
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.381184	0.029333
11	0.381509	0.029373
12	0.381805	0.029410
13	0.382072	0.029443
14	0.382305	0.029473
15	0.382505	0.029497
16	0.382669	0.029518
17	0.382796	0.029534
18	0.382892	0.029546
19	0.382974	0.029556
20	0.383061	0.029567
21	0.383171	0.029581
22	0.383312	0.029598
23	0.383493	0.029621
24	0.383718	0.029649
25	0.383996	0.029684
26	0.384333	0.029726
27	0.384739	0.029777
28	0.385222	0.029838
29	0.385789	0.029910
30	0.386444	0.029993
31	0.387195	0.030088
32	0.388045	0.030196
33	0.388998	0.030317
34	0.390057	0.030452
35	0.391229	0.030603
36	0.392522	0.030769
37	0.393939	0.030952
38	0.395490	0.031154
39	0.397185	0.031375
40	0.399040	0.031619
41	0.401081	0.031889
42	0.403336	0.032190
43	0.405835	0.032525
44	0.408612	0.032902
45	0.411697	0.033324
46	0.415121	0.033798
47	0.418944	0.034334
48	0.423196	0.034938
49	0.427907	0.035617
50	0.433108	0.036381
51	0.438831	0.037238
52	0.445110	0.038198
53	0.451971	0.039272
54	0.459441	0.040473
55	0.467538	0.041813
56	0.476272	0.043304
57	0.485635	0.044959
58	0.495606	0.046789
59	0.506160	0.048807
60	0.517277	0.051028
61	0.528952	0.053473
62	0.541186	0.056168
63	0.553975	0.059144
64	0.567300	0.062432
65	0.581123	0.066063

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .050
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.301476	0.020552
11	0.301875	0.020591
12	0.302246	0.020627
13	0.302588	0.020661
14	0.302898	0.020691
15	0.303180	0.020719
16	0.303431	0.020743
17	0.303653	0.020765
18	0.303854	0.020785
19	0.304054	0.020804
20	0.304276	0.020826
21	0.304539	0.020852
22	0.304855	0.020883
23	0.305231	0.020920
24	0.305677	0.020964
25	0.306201	0.021016
26	0.306816	0.021077
27	0.307532	0.021148
28	0.308365	0.021231
29	0.309321	0.021326
30	0.310413	0.021435
31	0.311650	0.021560
32	0.313041	0.021700
33	0.314594	0.021857
34	0.316318	0.022032
35	0.318229	0.022227
36	0.320340	0.022444
37	0.322661	0.022684
38	0.325211	0.022950
39	0.328002	0.023243
40	0.331055	0.023566
41	0.334402	0.023924
42	0.338101	0.024324
43	0.342193	0.024772
44	0.346720	0.025273
45	0.351724	0.025836
46	0.357245	0.026467
47	0.363314	0.027173
48	0.369962	0.027962
49	0.377208	0.028842
50	0.385075	0.029820
51	0.393576	0.030905
52	0.402724	0.032108
53	0.412526	0.033438
54	0.422982	0.034907
55	0.434083	0.036526
56	0.445811	0.038307
57	0.458129	0.040260
58	0.470988	0.042396
59	0.484329	0.044725
60	0.498109	0.047260
61	0.512297	0.050020
62	0.526873	0.053028
63	0.541817	0.056311
64	0.557097	0.059897
65	0.572668	0.063814

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .055
PER CENT INTEREST RATE

X	AX	PX
10	0.055418	0.003059
11	0.058043	0.003212
12	0.060723	0.003370
13	0.063463	0.003533
14	0.066264	0.003700
15	0.069132	0.003872
16	0.072072	0.004049
17	0.075086	0.004232
18	0.078191	0.004422
19	0.081417	0.004621
20	0.084798	0.004830
21	0.088360	0.005053
22	0.092123	0.005290
23	0.096098	0.005543
24	0.100297	0.005812
25	0.104731	0.006099
26	0.109416	0.006405
27	0.114364	0.006732
28	0.119590	0.007082
29	0.125102	0.007455
30	0.130908	0.007853
31	0.137015	0.008277
32	0.143425	0.008729
33	0.150140	0.009210
34	0.157160	0.009721
35	0.164490	0.010264
36	0.172131	0.010840
37	0.180080	0.011450
38	0.188341	0.012097
39	0.196911	0.012783
40	0.205797	0.013509
41	0.215014	0.014280
42	0.224577	0.015099
43	0.234503	0.015971
44	0.244812	0.016901
45	0.255518	0.017894
46	0.266628	0.018954
47	0.278145	0.020089
48	0.290068	0.021302
49	0.302391	0.022599
50	0.315109	0.023987
51	0.328214	0.025472
52	0.341701	0.027062
53	0.355561	0.028766
54	0.369784	0.030592
55	0.384357	0.032551
56	0.399259	0.034652
57	0.414458	0.036905
58	0.429910	0.039319
59	0.445572	0.041903
60	0.461417	0.044670
61	0.477438	0.047639
62	0.493642	0.050833
63	0.510037	0.054280
64	0.526620	0.058010
65	0.543372	0.062053

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .055
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.765375	0.170064
11	0.765418	0.170104
12	0.765461	0.170145
13	0.765504	0.170185
14	0.765546	0.170225
15	0.765586	0.170263
16	0.765621	0.170297
17	0.765647	0.170321
18	0.765663	0.170336
19	0.765669	0.170342
20	0.765671	0.170344
21	0.765671	0.170344
22	0.765671	0.170344
23	0.765671	0.170344
24	0.765671	0.170344
25	0.765671	0.170344
26	0.765673	0.170346
27	0.765677	0.170350
28	0.765686	0.170358
29	0.765700	0.170372
30	0.765721	0.170392
31	0.765751	0.170420
32	0.765789	0.170456
33	0.765836	0.170501
34	0.765892	0.170554
35	0.765959	0.170617
36	0.766036	0.170691
37	0.766123	0.170774
38	0.766219	0.170866
39	0.766321	0.170963
40	0.766427	0.171064
41	0.766538	0.171170
42	0.766654	0.171281
43	0.766779	0.171401
44	0.766916	0.171533
45	0.767071	0.171681
46	0.767245	0.171848
47	0.767443	0.172039
48	0.767668	0.172256
49	0.767921	0.172501
50	0.768205	0.172775
51	0.768521	0.173083
52	0.768875	0.173428
53	0.769273	0.173817
54	0.769721	0.174257
55	0.770230	0.174758
56	0.770807	0.175330
57	0.771457	0.175977
58	0.772176	0.176696
59	0.772956	0.177482
60	0.773793	0.178332
61	0.774693	0.179252
62	0.775758	0.180351
63	0.777022	0.181670
64	0.778524	0.183255
65	0.780303	0.185161

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .055
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.586592	0.073972
11	0.586747	0.074019
12	0.586896	0.074065
13	0.587035	0.074107
14	0.587159	0.074145
15	0.587266	0.074178
16	0.587350	0.074204
17	0.587409	0.074222
18	0.587442	0.074232
19	0.587455	0.074236
20	0.587458	0.074237
21	0.587460	0.074237
22	0.587463	0.074238
23	0.587470	0.074240
24	0.587482	0.074244
25	0.587504	0.074251
26	0.587538	0.074261
27	0.587590	0.074277
28	0.587666	0.074300
29	0.587767	0.074332
30	0.587899	0.074372
31	0.588064	0.074423
32	0.588264	0.074484
33	0.588498	0.074556
34	0.588766	0.074639
35	0.589069	0.074732
36	0.589404	0.074836
37	0.589767	0.074948
38	0.590159	0.075070
39	0.590577	0.075199
40	0.591020	0.075337
41	0.591497	0.075486
42	0.592016	0.075648
43	0.592587	0.075828
44	0.593224	0.076028
45	0.593940	0.076254
46	0.594746	0.076509
47	0.595654	0.076798
48	0.596674	0.077124
49	0.597818	0.077492
50	0.599100	0.077907
51	0.600537	0.078374
52	0.602145	0.078902
53	0.603942	0.079496
54	0.605943	0.080165
55	0.608162	0.080914
56	0.610611	0.081751
57	0.613359	0.082702
58	0.616414	0.083776
59	0.619786	0.084981
60	0.623500	0.086334
61	0.627597	0.087857
62	0.632130	0.089582
63	0.637153	0.091544
64	0.642714	0.093780
65	0.648845	0.096328

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .055
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.450590	0.042756
11	0.450849	0.042800
12	0.451087	0.042842
13	0.451303	0.042879
14	0.451491	0.042912
15	0.451649	0.042939
16	0.451772	0.042960
17	0.451858	0.042975
18	0.451909	0.042984
19	0.451937	0.042989
20	0.451958	0.042993
21	0.451984	0.042997
22	0.452023	0.043004
23	0.452081	0.043014
24	0.452161	0.043028
25	0.452271	0.043047
26	0.452416	0.043072
27	0.452606	0.043105
28	0.452847	0.043147
29	0.453143	0.043199
30	0.453499	0.043261
31	0.453918	0.043334
32	0.454400	0.043418
33	0.454945	0.043514
34	0.455554	0.043621
35	0.456229	0.043740
36	0.456971	0.043871
37	0.457780	0.044014
38	0.458661	0.044170
39	0.459613	0.044340
40	0.460645	0.044525
41	0.461771	0.044727
42	0.463010	0.044951
43	0.464383	0.045199
44	0.465915	0.045479
45	0.467634	0.045794
46	0.469563	0.046150
47	0.471727	0.046552
48	0.474146	0.047006
49	0.476837	0.047516
50	0.479823	0.048088
51	0.483122	0.048728
52	0.486807	0.049452
53	0.490906	0.050270
54	0.495454	0.051193
55	0.500483	0.052234
56	0.506024	0.053404
57	0.512096	0.054718
58	0.518707	0.056185
59	0.525861	0.057820
60	0.533570	0.059637
61	0.541861	0.061660
62	0.550768	0.063916
63	0.560324	0.066438
64	0.570546	0.069260
65	0.581435	0.072418

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .055
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.347157	0.027722
11	0.347495	0.027764
12	0.347804	0.027801
13	0.348082	0.027836
14	0.348326	0.027865
15	0.348535	0.027891
16	0.348706	0.027912
17	0.348838	0.027928
18	0.348937	0.027941
19	0.349021	0.027951
20	0.349109	0.027962
21	0.349220	0.027975
22	0.349364	0.027993
23	0.349548	0.028016
24	0.349777	0.028044
25	0.350060	0.028079
26	0.350405	0.028121
27	0.350820	0.028173
28	0.351315	0.028234
29	0.351896	0.028306
30	0.352568	0.028390
31	0.353341	0.028486
32	0.354215	0.028595
33	0.355195	0.028718
34	0.356285	0.028855
35	0.357492	0.029007
36	0.358823	0.029175
37	0.360281	0.029360
38	0.361878	0.029564
39	0.363622	0.029788
40	0.365530	0.030035
41	0.367629	0.030307
42	0.369947	0.030611
43	0.372517	0.030950
44	0.375371	0.031329
45	0.378544	0.031755
46	0.382066	0.032233
47	0.385999	0.032774
48	0.390374	0.033383
49	0.395221	0.034069
50	0.400574	0.034838
51	0.406466	0.035702
52	0.412932	0.036669
53	0.420001	0.037751
54	0.427701	0.038961
55	0.436052	0.040310
56	0.445065	0.041811
57	0.454733	0.043477
58	0.465037	0.045318
59	0.475950	0.047348
60	0.487456	0.049581
61	0.499548	0.052039
62	0.512233	0.054748
63	0.525510	0.057738
64	0.539361	0.061042
65	0.553750	0.064691

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .055
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.268514	0.019137
11	0.268926	0.019177
12	0.269308	0.019214
13	0.269660	0.019249
14	0.269981	0.019280
15	0.270269	0.019308
16	0.270527	0.019333
17	0.270753	0.019356
18	0.270955	0.019375
19	0.271155	0.019395
20	0.271376	0.019417
21	0.271638	0.019443
22	0.271954	0.019474
23	0.272330	0.019511
24	0.272777	0.019555
25	0.273303	0.019607
26	0.273921	0.019668
27	0.274642	0.019739
28	0.275481	0.019822
29	0.276446	0.019918
30	0.277549	0.020028
31	0.278801	0.020153
32	0.280208	0.020295
33	0.281780	0.020453
34	0.283526	0.020630
35	0.285460	0.020827
36	0.287597	0.021046
37	0.289947	0.021288
38	0.292528	0.021556
39	0.295352	0.021851
40	0.298442	0.022177
41	0.301828	0.022538
42	0.305570	0.022940
43	0.309708	0.023390
44	0.314288	0.023894
45	0.319353	0.024460
46	0.324941	0.025094
47	0.331089	0.025804
48	0.337825	0.026597
49	0.345173	0.027480
50	0.353155	0.028463
51	0.361787	0.029553
52	0.371083	0.030760
53	0.381053	0.032095
54	0.391698	0.033569
55	0.403013	0.035194
56	0.414980	0.036980
57	0.427565	0.038939
58	0.440718	0.041081
59	0.454383	0.043415
60	0.468517	0.045956
61	0.483090	0.048722
62	0.498088	0.051735
63	0.513492	0.055024
64	0.529275	0.058617
65	0.545391	0.062543

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE

X	AX	PX
10	0.045250	0.002683
11	0.047538	0.002825
12	0.049872	0.002971
13	0.052257	0.003121
14	0.054695	0.003275
15	0.057190	0.003434
16	0.059747	0.003597
17	0.062370	0.003765
18	0.065072	0.003940
19	0.067886	0.004122
20	0.070845	0.004316
21	0.073977	0.004522
22	0.077301	0.004742
23	0.080829	0.004978
24	0.084573	0.005229
25	0.088546	0.005499
26	0.092763	0.005788
27	0.097238	0.006097
28	0.101987	0.006429
29	0.107019	0.006784
30	0.112342	0.007164
31	0.117966	0.007570
32	0.123893	0.008005
33	0.130125	0.008468
34	0.136665	0.008960
35	0.143518	0.009485
36	0.150687	0.010043
37	0.158169	0.010635
38	0.165970	0.011264
39	0.174089	0.011931
40	0.182533	0.012639
41	0.191320	0.013392
42	0.200466	0.014193
43	0.209991	0.015046
44	0.219916	0.015958
45	0.230259	0.016933
46	0.241028	0.017976
47	0.252229	0.019094
48	0.263864	0.020290
49	0.275927	0.021571
50	0.288416	0.022944
51	0.301326	0.024414
52	0.314654	0.025989
53	0.328392	0.027679
54	0.342532	0.029492
55	0.357062	0.031438
56	0.371965	0.033527
57	0.387208	0.035770
58	0.402747	0.038174
59	0.418539	0.040748
60	0.434559	0.043507
61	0.450799	0.046468
62	0.467268	0.049656
63	0.483977	0.053098
64	0.500924	0.056824
65	0.518091	0.060867

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.747516	0.167584
11	0.747562	0.167625
12	0.747608	0.167665
13	0.747654	0.167706
14	0.747699	0.167746
15	0.747742	0.167784
16	0.747779	0.167818
17	0.747808	0.167843
18	0.747824	0.167858
19	0.747831	0.167864
20	0.747833	0.167865
21	0.747833	0.167865
22	0.747833	0.167865
23	0.747833	0.167865
24	0.747833	0.167865
25	0.747833	0.167866
26	0.747835	0.167867
27	0.747839	0.167871
28	0.747849	0.167880
29	0.747864	0.167893
30	0.747887	0.167913
31	0.747918	0.167942
32	0.747959	0.167978
33	0.748009	0.168023
34	0.748070	0.168076
35	0.748141	0.168140
36	0.748224	0.168214
37	0.748317	0.168297
38	0.748420	0.168389
39	0.748529	0.168487
40	0.748642	0.168588
41	0.748761	0.168694
42	0.748885	0.168806
43	0.749019	0.168926
44	0.749166	0.169059
45	0.749331	0.169207
46	0.749518	0.169375
47	0.749730	0.169567
48	0.749971	0.169785
49	0.750241	0.170030
50	0.750545	0.170306
51	0.750884	0.170615
52	0.751263	0.170961
53	0.751688	0.171351
54	0.752168	0.171792
55	0.752713	0.172295
56	0.753331	0.172869
57	0.754027	0.173518
58	0.754796	0.174240
59	0.755631	0.175029
60	0.756528	0.175882
61	0.757491	0.176805
62	0.758631	0.177908
63	0.759984	0.179230
64	0.761592	0.180820
65	0.763498	- 286 - 0.182733

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.559618	0.071930
11	0.559782	0.071977
12	0.559939	0.072023
13	0.560086	0.072066
14	0.560217	0.072105
15	0.560330	0.072138
16	0.560420	0.072164
17	0.560482	0.072182
18	0.560516	0.072192
19	0.560531	0.072196
20	0.560534	0.072198
21	0.560536	0.072198
22	0.560539	0.072199
23	0.560546	0.072201
24	0.560559	0.072205
25	0.560582	0.072211
26	0.560618	0.072222
27	0.560672	0.072238
28	0.560752	0.072261
29	0.560859	0.072293
30	0.560997	0.072333
31	0.561171	0.072384
32	0.561381	0.072446
33	0.561628	0.072519
34	0.561911	0.072602
35	0.562229	0.072696
36	0.562582	0.072801
37	0.562966	0.072914
38	0.563379	0.073037
39	0.563819	0.073168
40	0.564287	0.073307
41	0.564789	0.073457
42	0.565336	0.073620
43	0.565938	0.073801
44	0.566609	0.074003
45	0.567363	0.074231
46	0.568213	0.074488
47	0.569169	0.074779
48	0.570244	0.075108
49	0.571449	0.075478
50	0.572801	0.075896
51	0.574314	0.076367
52	0.576009	0.076899
53	0.577903	0.077498
54	0.580012	0.078171
55	0.582351	0.078926
56	0.584933	0.079769
57	0.587829	0.080727
58	0.591049	0.081808
59	0.594603	0.083022
60	0.598518	0.084383
61	0.602837	0.085916
62	0.607616	0.087652
63	0.612915	0.089627
64	0.618783	0.091878
65	0.625257	0.094443

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.420022	0.040993
11	0.420292	0.041038
12	0.420561	0.041080
13	0.420767	0.041118
14	0.420964	0.041151
15	0.421129	0.041179
16	0.421259	0.041201
17	0.421349	0.041216
18	0.421402	0.041225
19	0.421431	0.041230
20	0.421452	0.041234
21	0.421479	0.041238
22	0.421520	0.041245
23	0.421579	0.041255
24	0.421661	0.041269
25	0.421774	0.041288
26	0.421924	0.041314
27	0.422119	0.041347
28	0.422368	0.041389
29	0.422675	0.041441
30	0.423043	0.041504
31	0.423477	0.041577
32	0.423977	0.041663
33	0.424542	0.041759
34	0.425174	0.041867
35	0.425874	0.041987
36	0.426645	0.042120
37	0.427485	0.042265
38	0.428399	0.042423
39	0.429387	0.042594
40	0.430458	0.042781
41	0.431627	0.042985
42	0.432911	0.043211
43	0.434335	0.043462
44	0.435924	0.043744
45	0.437706	0.044062
46	0.439706	0.044421
47	0.441950	0.044828
48	0.444459	0.045286
49	0.447251	0.045800
50	0.450348	0.046377
51	0.453772	0.047023
52	0.457595	0.047753
53	0.461849	0.048578
54	0.466568	0.049509
55	0.471788	0.050557
56	0.477541	0.051737
57	0.483846	0.053061
58	0.490713	0.054539
59	0.498145	0.056185
60	0.506158	0.058015
61	0.514778	0.060052
62	0.524065	0.062323
63	0.533993	0.064862
64	0.544665	0.067703
65	0.556001	0.070883

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.316336	0.026101
11	0.316685	0.026233
12	0.317006	0.026272
13	0.317294	0.026307
14	0.317547	0.026338
15	0.317763	0.026364
16	0.317940	0.026386
17	0.318077	0.026402
18	0.318178	0.026415
19	0.318263	0.026425
20	0.318352	0.026436
21	0.318463	0.026449
22	0.318608	0.026467
23	0.318793	0.026490
24	0.319025	0.026518
25	0.319312	0.026553
26	0.319661	0.026596
27	0.320082	0.026647
28	0.320585	0.026709
29	0.321176	0.026781
30	0.321862	0.026866
31	0.322650	0.026963
32	0.323542	0.027073
33	0.324543	0.027197
34	0.325657	0.027335
35	0.326890	0.027489
36	0.328251	0.027659
37	0.329740	0.027847
38	0.331372	0.028053
39	0.333153	0.028279
40	0.335101	0.028528
41	0.337243	0.028803
42	0.339608	0.029109
43	0.342230	0.029450
44	0.345143	0.029833
45	0.348382	0.030263
46	0.351976	0.030745
47	0.355992	0.031289
48	0.360459	0.031903
49	0.365410	0.032594
50	0.370878	0.033369
51	0.376899	0.034238
52	0.383508	0.035212
53	0.390736	0.036301
54	0.398614	0.037518
55	0.407162	0.038875
56	0.416393	0.040386
57	0.426302	0.042061
58	0.436870	0.043913
59	0.448070	0.045952
60	0.459887	0.048196
61	0.472319	0.050665
62	0.485373	0.053386
63	0.499052	0.056390
64	0.513342	0.059708
65	0.528209	0.063373

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .060
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.259342	0.017810
11	0.259764	0.017852
12	0.240156	0.017890
13	0.240516	0.017925
14	0.240843	0.017958
15	0.241138	0.017987
16	0.241400	0.018012
17	0.241628	0.018035
18	0.241830	0.018055
19	0.242029	0.018074
20	0.242248	0.018096
21	0.242507	0.018121
22	0.242820	0.018152
23	0.243194	0.018189
24	0.243638	0.018233
25	0.244162	0.018285
26	0.244778	0.018346
27	0.245499	0.018418
28	0.246338	0.018501
29	0.247306	0.018598
30	0.248412	0.018708
31	0.249669	0.018835
32	0.251082	0.018977
33	0.252662	0.019137
34	0.254417	0.019315
35	0.256361	0.019514
36	0.258510	0.019734
37	0.260872	0.019978
38	0.263466	0.020248
39	0.266304	0.020545
40	0.269407	0.020873
41	0.272808	0.021235
42	0.276566	0.021639
43	0.280722	0.022092
44	0.285322	0.022598
45	0.290411	0.023166
46	0.296029	0.023803
47	0.302211	0.024515
48	0.308989	0.025311
49	0.316386	0.026197
50	0.324427	0.027182
51	0.333128	0.028276
52	0.342508	0.029487
53	0.352576	0.030825
54	0.363336	0.032303
55	0.374785	0.033931
56	0.386909	0.035721
57	0.399674	0.037685
58	0.413032	0.039830
59	0.426927	0.042169
60	0.441319	0.044713
61	0.456181	0.047482
62	0.471501	0.050499
63	0.487266	0.053792
64	0.503449	0.057390
65	0.520008	0.061323

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .065
PER CENT INTEREST RATE

X	AX	PX
10	0.037390	0.002371
11	0.039389	0.002503
12	0.041427	0.002638
13	0.043507	0.002776
14	0.045630	0.002918
15	0.047802	0.003064
16	0.050026	0.003214
17	0.052305	0.003369
18	0.054654	0.003529
19	0.057103	0.003696
20	0.059687	0.003874
21	0.062434	0.004064
22	0.065363	0.004268
23	0.068487	0.004487
24	0.071817	0.004722
25	0.075368	0.004975
26	0.079155	0.005246
27	0.083192	0.005538
28	0.087498	0.005852
29	0.092079	0.006190
30	0.096947	0.006552
31	0.102112	0.006941
32	0.107576	0.007357
33	0.113344	0.007802
34	0.119419	0.008277
35	0.125806	0.008783
36	0.132511	0.009323
37	0.139530	0.009897
38	0.146872	0.010507
39	0.154536	0.011156
40	0.162531	0.011845
41	0.170875	0.012579
42	0.179588	0.013360
43	0.188691	0.014195
44	0.198207	0.015088
45	0.208156	0.016044
46	0.218550	0.017070
47	0.229395	0.018169
48	0.240697	0.019348
49	0.252451	0.020612
50	0.264659	0.021967
51	0.277316	0.023421
52	0.290421	0.024981
53	0.303970	0.026656
54	0.317957	0.028454
55	0.332372	0.030386
56	0.347196	0.032463
57	0.362404	0.034693
58	0.377947	0.037085
59	0.393785	0.039649
60	0.409892	0.042398
61	0.426261	0.045350
62	0.442906	0.048529
63	0.459838	0.051964
64	0.477057	0.055686
65	0.494548	0.059727

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .065
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.730155	0.165145
11	0.730204	0.165185
12	0.730252	0.165226
13	0.730301	0.165267
14	0.730349	0.165308
15	0.730395	0.165346
16	0.730435	0.165380
17	0.730465	0.165405
18	0.730482	0.165419
19	0.730490	0.165426
20	0.730492	0.165427
21	0.730492	0.165427
22	0.730492	0.165427
23	0.730492	0.165427
24	0.730492	0.165427
25	0.730492	0.165428
26	0.730494	0.165429
27	0.730499	0.165433
28	0.730509	0.165442
29	0.730525	0.165455
30	0.730549	0.165475
31	0.730583	0.165504
32	0.730626	0.165540
33	0.730679	0.165585
34	0.730743	0.165639
35	0.730819	0.165703
36	0.730908	0.165777
37	0.731007	0.165861
38	0.731116	0.165953
39	0.731232	0.166051
40	0.731352	0.166153
41	0.731478	0.166259
42	0.731611	0.166372
43	0.731753	0.166492
44	0.731909	0.166625
45	0.732085	0.166774
46	0.732283	0.166943
47	0.732509	0.167135
48	0.732765	0.167353
49	0.733052	0.167600
50	0.733375	0.167876
51	0.733736	0.168186
52	0.734139	0.168534
53	0.734591	0.168925
54	0.735101	0.169368
55	0.735680	0.169872
56	0.736337	0.170448
57	0.737077	0.171099
58	0.737895	0.171824
59	0.738783	0.172616
60	0.739737	0.173472
61	0.740760	0.174398
62	0.741972	0.175503
63	0.743411	0.176829
64	0.745120	0.178425
65	0.747148	0.180345

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .065
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.534006	0.069941
11	0.534178	0.069989
12	0.534343	0.070035
13	0.534497	0.070079
14	0.534635	0.070118
15	0.534753	0.070151
16	0.534848	0.070178
17	0.534914	0.070196
18	0.534950	0.070206
19	0.534965	0.070211
20	0.534969	0.070212
21	0.534970	0.070212
22	0.534973	0.070213
23	0.534981	0.070215
24	0.534994	0.070219
25	0.535018	0.070226
26	0.535055	0.070236
27	0.535112	0.070252
28	0.535195	0.070276
29	0.535306	0.070307
30	0.535451	0.070348
31	0.535633	0.070400
32	0.535853	0.070462
33	0.536111	0.070535
34	0.536407	0.070619
35	0.536740	0.070714
36	0.537110	0.070819
37	0.537511	0.070933
38	0.537943	0.071057
39	0.538405	0.071189
40	0.538895	0.071329
41	0.539421	0.071481
42	0.539994	0.071645
43	0.540623	0.071827
44	0.541326	0.072031
45	0.542115	0.072260
46	0.543004	0.072519
47	0.544005	0.072813
48	0.545130	0.073144
49	0.546392	0.073517
50	0.547806	0.073938
51	0.549391	0.074412
52	0.551165	0.074948
53	0.553147	0.075551
54	0.555355	0.076229
55	0.557804	0.076989
56	0.560508	0.077838
57	0.563541	0.078804
58	0.566912	0.079892
59	0.570633	0.081113
60	0.574732	0.082483
61	0.579254	0.084026
62	0.584259	0.085772
63	0.589810	0.087759
64	0.595962	0.090024
65	0.602753	0.092607

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .065
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.391668	0.039295
11	0.391948	0.039342
12	0.392208	0.039384
13	0.392442	0.039423
14	0.392647	0.039457
15	0.392819	0.039485
16	0.392954	0.039508
17	0.393048	0.039523
18	0.393103	0.039533
19	0.393133	0.039538
20	0.393155	0.039541
21	0.393182	0.039546
22	0.393224	0.039553
23	0.393284	0.039563
24	0.393368	0.039576
25	0.393483	0.039596
26	0.393636	0.039621
27	0.393836	0.039654
28	0.394092	0.039697
29	0.394407	0.039749
30	0.394785	0.039812
31	0.395232	0.039887
32	0.395747	0.039973
33	0.396330	0.040070
34	0.396981	0.040179
35	0.397703	0.040301
36	0.398498	0.040435
37	0.399365	0.040581
38	0.400307	0.040741
39	0.401327	0.040914
40	0.402431	0.041102
41	0.403635	0.041309
42	0.404959	0.041536
43	0.406425	0.041790
44	0.408062	0.042074
45	0.409898	0.042395
46	0.411959	0.042757
47	0.414271	0.043167
48	0.416856	0.043629
49	0.419734	0.044148
50	0.422926	0.044730
51	0.426456	0.045381
52	0.430397	0.046117
53	0.434782	0.046948
54	0.439648	0.047886
55	0.445031	0.048942
56	0.450965	0.050131
57	0.457471	0.051464
58	0.464557	0.052953
59	0.472229	0.054610
60	0.480503	0.056452
61	0.489408	0.058501
62	0.498987	0.060786
63	0.509277	0.063340
64	0.520304	0.066200
65	0.532072	0.069399

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .065
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.288405	0.024736
11	0.288764	0.024780
12	0.289093	0.024819
13	0.289390	0.024855
14	0.289651	0.024887
15	0.289873	0.024914
16	0.290056	0.024936
17	0.290196	0.024953
18	0.290299	0.024965
19	0.290385	0.024976
20	0.290474	0.024986
21	0.290585	0.025000
22	0.290730	0.025017
23	0.290916	0.025040
24	0.291149	0.025068
25	0.291436	0.025103
26	0.291788	0.025146
27	0.292213	0.025198
28	0.292721	0.025260
29	0.293319	0.025333
30	0.294014	0.025418
31	0.294812	0.025516
32	0.295718	0.025627
33	0.296734	0.025752
34	0.297865	0.025892
35	0.299117	0.026047
36	0.300498	0.026219
37	0.302012	0.026408
38	0.303668	0.026616
39	0.305476	0.026844
40	0.307452	0.027095
41	0.309625	0.027372
42	0.312024	0.027681
43	0.314682	0.028025
44	0.317636	0.028410
45	0.320921	0.028843
46	0.324568	0.029328
47	0.328643	0.029877
48	0.333177	0.030495
49	0.338201	0.031190
50	0.343753	0.031970
51	0.349867	0.032845
52	0.356580	0.033824
53	0.363926	0.034920
54	0.371935	0.036143
55	0.380631	0.037508
56	0.390027	0.039025
57	0.400121	0.040709
58	0.410892	0.042569
59	0.422316	0.044618
60	0.434379	0.046871
61	0.447080	0.049350
62	0.460430	0.052081
63	0.474437	0.055096
64	0.489089	0.058426
65	0.504354	0.062105

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .065
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.213507	0.016568
11	0.213937	0.016611
12	0.214336	0.016650
13	0.214703	0.016687
14	0.215036	0.016720
15	0.215335	0.016749
16	0.215599	0.016775
17	0.215828	0.016798
18	0.216030	0.016818
19	0.216226	0.016838
20	0.216441	0.016859
21	0.216696	0.016884
22	0.217004	0.016915
23	0.217373	0.016952
24	0.217812	0.016996
25	0.218331	0.017047
26	0.218942	0.017108
27	0.219658	0.017180
28	0.220493	0.017264
29	0.221457	0.017361
30	0.222560	0.017472
31	0.223814	0.017599
32	0.225226	0.017742
33	0.226804	0.017903
34	0.228558	0.018082
35	0.230502	0.018282
36	0.232649	0.018504
37	0.235010	0.018750
38	0.237601	0.019021
39	0.240436	0.019320
40	0.243536	0.019649
41	0.246932	0.020013
42	0.250684	0.020419
43	0.254833	0.020872
44	0.259427	0.021380
45	0.264510	0.021950
46	0.270124	0.022588
47	0.276304	0.023302
48	0.283084	0.024100
49	0.290487	0.024988
50	0.298540	0.025975
51	0.307261	0.027071
52	0.316669	0.028284
53	0.326776	0.029625
54	0.337589	0.031105
55	0.349107	0.032735
56	0.361318	0.034528
57	0.374190	0.036493
58	0.387676	0.038641
59	0.401722	0.040981
60	0.416291	0.043528
61	0.431357	0.046298
62	0.446914	0.049317
63	0.462951	0.052612
64	0.479446	0.056213
65	0.496360	0.060151

WHOLE LIFE SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .070
PER CENT INTEREST RATE

X	AX	PX
10	0.031266	0.002112
11	0.033023	0.002234
12	0.034808	0.002359
13	0.036627	0.002487
14	0.038481	0.002618
15	0.040375	0.002752
16	0.042310	0.002890
17	0.044291	0.003032
18	0.046331	0.003178
19	0.048461	0.003332
20	0.050715	0.003495
21	0.053122	0.003670
22	0.055699	0.003859
23	0.058461	0.004062
24	0.061419	0.004281
25	0.064589	0.004517
26	0.067984	0.004772
27	0.071622	0.005047
28	0.075518	0.005344
29	0.079684	0.005664
30	0.084128	0.006009
31	0.088864	0.006381
32	0.093894	0.006779
33	0.099222	0.007206
34	0.104854	0.007663
35	0.110795	0.008151
36	0.117051	0.008673
37	0.123622	0.009228
38	0.130515	0.009820
39	0.137730	0.010450
40	0.145279	0.011120
41	0.153181	0.011834
42	0.161457	0.012597
43	0.170130	0.013412
44	0.179225	0.014286
45	0.188765	0.015223
46	0.198762	0.016229
47	0.209227	0.017310
48	0.220167	0.018470
49	0.231579	0.019716
50	0.243467	0.021054
51	0.255828	0.022491
52	0.268664	0.024034
53	0.281975	0.025692
54	0.295753	0.027475
55	0.309994	0.029392
56	0.324682	0.031455
57	0.339787	0.033671
58	0.355267	0.036051
59	0.371080	0.038603
60	0.387201	0.041340
61	0.403627	0.044281
62	0.420371	0.047450
63	0.437448	0.050878
64	0.454862	0.054594
65	0.472597	0.058631

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .070
PER CENT INTEREST RATE

N= 5

X	NAX	NPX
10	0.713276	0.162745
11	0.713327	0.162786
12	0.713379	0.162827
13	0.713430	0.162868
14	0.713481	0.162909
15	0.713530	0.162947
16	0.713572	0.162981
17	0.713604	0.163006
18	0.713622	0.163021
19	0.713630	0.163027
20	0.713632	0.163029
21	0.713632	0.163029
22	0.713632	0.163029
23	0.713632	0.163029
24	0.713632	0.163029
25	0.713633	0.163029
26	0.713634	0.163031
27	0.713640	0.163035
28	0.713650	0.163043
29	0.713667	0.163057
30	0.713695	0.163077
31	0.713728	0.163105
32	0.713774	0.163142
33	0.713830	0.163187
34	0.713898	0.163241
35	0.713978	0.163305
36	0.714071	0.163380
37	0.714176	0.163464
38	0.714292	0.163556
39	0.714414	0.163654
40	0.714542	0.163757
41	0.714675	0.163864
42	0.714815	0.163976
43	0.714965	0.164097
44	0.715130	0.164230
45	0.715316	0.164380
46	0.715526	0.164549
47	0.715764	0.164742
48	0.716035	0.164962
49	0.716339	0.165209
50	0.716680	0.165486
51	0.717061	0.165797
52	0.717487	0.166146
53	0.717965	0.166538
54	0.718504	0.166983
55	0.719116	0.167489
56	0.719811	0.168067
57	0.720593	0.168720
58	0.721458	0.169447
59	0.722396	0.170241
60	0.723404	0.171100
61	0.724487	0.172029
62	0.725767	0.173138
63	0.727287	0.174468
64	0.729094	0.176068
65	0.731239	0.177995

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .070
PER CENT INTEREST RATE

N=10

X	NAX	NPX
10	0.509681	0.068004
11	0.509860	0.068053
12	0.510032	0.068100
13	0.510193	0.068143
14	0.510337	0.068183
15	0.510461	0.068217
16	0.510560	0.068244
17	0.510629	0.068262
18	0.510667	0.068273
19	0.510682	0.068277
20	0.510686	0.068278
21	0.510688	0.068278
22	0.510691	0.068279
23	0.510699	0.068281
24	0.510713	0.068285
25	0.510737	0.068292
26	0.510776	0.068303
27	0.510835	0.068319
28	0.510921	0.068342
29	0.511037	0.068374
30	0.511187	0.068415
31	0.511376	0.068467
32	0.511605	0.068529
33	0.511873	0.068603
34	0.512181	0.068688
35	0.512528	0.068783
36	0.512913	0.068889
37	0.513331	0.069005
38	0.513782	0.069129
39	0.514262	0.069262
40	0.514772	0.069404
41	0.515320	0.069556
42	0.515916	0.069722
43	0.516571	0.069906
44	0.517302	0.070110
45	0.518123	0.070342
46	0.519049	0.070603
47	0.520090	0.070898
48	0.521261	0.071231
49	0.522574	0.071607
50	0.524047	0.072031
51	0.525695	0.072509
52	0.527542	0.073048
53	0.529605	0.073655
54	0.531903	0.074338
55	0.534453	0.075104
56	0.537269	0.075959
57	0.540427	0.076930
58	0.543937	0.078026
59	0.547810	0.079254
60	0.552077	0.080633
61	0.556785	0.082184
62	0.561998	0.083941
63	0.567781	0.085939
64	0.574193	0.088218
65	0.581276	0.090817

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .070
PER CENT INTEREST RATE

N=15

X	NAX	NPX
10	0.365359	0.037662
11	0.365649	0.037709
12	0.365916	0.037753
13	0.366158	0.037792
14	0.366370	0.037827
15	0.366549	0.037856
16	0.366689	0.037879
17	0.366786	0.037895
18	0.366843	0.037904
19	0.366874	0.037909
20	0.366896	0.037913
21	0.366924	0.037917
22	0.366966	0.037924
23	0.367027	0.037934
24	0.367112	0.037948
25	0.367229	0.037967
26	0.367385	0.037992
27	0.367589	0.038026
28	0.367850	0.038068
29	0.368171	0.038121
30	0.368559	0.038185
31	0.369016	0.038260
32	0.369543	0.038346
33	0.370140	0.038445
34	0.370808	0.038555
35	0.371549	0.038678
36	0.372365	0.038813
37	0.373254	0.038961
38	0.374221	0.039122
39	0.375266	0.039297
40	0.376398	0.039487
41	0.377632	0.039695
42	0.378989	0.039925
43	0.380492	0.040180
44	0.382169	0.040467
45	0.384050	0.040790
46	0.386162	0.041156
47	0.388531	0.041569
48	0.391180	0.042034
49	0.394130	0.042557
50	0.397403	0.043144
51	0.401021	0.043800
52	0.405062	0.044542
53	0.409559	0.045379
54	0.414549	0.046323
55	0.420070	0.047387
56	0.426158	0.048584
57	0.432833	0.049926
58	0.440107	0.051424
59	0.447983	0.053091
60	0.456481	0.054944
61	0.465630	0.057005
62	0.475477	0.059303
63	0.486063	0.061872
64	0.497417	0.064748
65	0.509544	0.067967

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .070
PER CENT INTEREST RATE

N=20

X	NAX	NPX
10	0.263080	0.023355
11	0.263448	0.023399
12	0.263785	0.023440
13	0.264089	0.023477
14	0.264356	0.023509
15	0.264584	0.023537
16	0.264771	0.023559
17	0.264915	0.023577
18	0.265019	0.023589
19	0.265105	0.023600
20	0.265194	0.023610
21	0.265304	0.023624
22	0.265449	0.023641
23	0.265633	0.023664
24	0.265866	0.023692
25	0.266154	0.023727
26	0.266506	0.023770
27	0.266932	0.023822
28	0.267443	0.023884
29	0.268045	0.023957
30	0.268744	0.024043
31	0.269550	0.024141
32	0.270463	0.024254
33	0.271489	0.024380
34	0.272632	0.024521
35	0.273897	0.024678
36	0.275293	0.024851
37	0.276822	0.025042
38	0.278495	0.025252
39	0.280320	0.025482
40	0.282315	0.025734
41	0.284508	0.026014
42	0.286928	0.026324
43	0.289609	0.026670
44	0.292590	0.027058
45	0.295905	0.027494
46	0.299587	0.027982
47	0.303699	0.028534
48	0.308277	0.029156
49	0.313350	0.029854
50	0.318958	0.030639
51	0.325134	0.031518
52	0.331919	0.032502
53	0.339346	0.033603
54	0.347447	0.034833
55	0.356247	0.036203
56	0.365762	0.037728
57	0.375990	0.039418
58	0.386915	0.041286
59	0.398505	0.043343
60	0.410754	0.045604
61	0.423663	0.048090
62	0.437246	0.050830
63	0.451514	0.053854
64	0.466459	0.057195
65	0.482052	0.060887

ENDOWMENT SINGLE AND ANNUAL PREMIUMS (SUMS ASSURED) AT .070
PER CENT INTEREST RATE

N=25

X	NAX	NPX
10	0.190614	0.015407
11	0.191050	0.015450
12	0.191455	0.015491
13	0.191826	0.015528
14	0.192163	0.015562
15	0.192465	0.015592
16	0.192731	0.015619
17	0.192960	0.015642
18	0.193159	0.015662
19	0.193352	0.015681
20	0.193562	0.015702
21	0.193812	0.015727
22	0.194114	0.015758
23	0.194476	0.015794
24	0.194908	0.015838
25	0.195419	0.015890
26	0.196022	0.015951
27	0.196729	0.016022
28	0.197556	0.016106
29	0.198512	0.016203
30	0.199606	0.016315
31	0.200852	0.016442
32	0.202255	0.016586
33	0.203824	0.016748
34	0.205569	0.016928
35	0.207502	0.017129
36	0.209639	0.017352
37	0.211986	0.017599
38	0.214563	0.017871
39	0.217381	0.018171
40	0.220462	0.018502
41	0.223837	0.018867
42	0.227565	0.019273
43	0.231688	0.019728
44	0.236255	0.020237
45	0.241307	0.020807
46	0.246889	0.021447
47	0.253039	0.022162
48	0.259787	0.022960
49	0.267161	0.023850
50	0.275187	0.024838
51	0.283885	0.025934
52	0.293276	0.027148
53	0.303374	0.028490
54	0.314188	0.029971
55	0.325719	0.031602
56	0.337957	0.033396
57	0.350874	0.035362
58	0.364423	0.037510
59	0.378554	0.039851
60	0.393229	0.042397
61	0.408428	0.045167
62	0.424147	0.048186
63	0.440381	0.051481
64	0.457111	0.055084
65	0.474302	0.059025

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