

# Unit-linked insurance

## A general report



Münchener Rück  
Munich Re Group



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## 1 INTRODUCTION AND MANAGEMENT SUMMARY

This paper has been written to help organizations wanting to know the basics of unit-linked insurance or considering whether to introduce such plans in their markets. The paper will define unit-linked insurance, consider the market conditions necessary to support this type of business, list the critical success factors, and examine the common problem areas that may affect this business. There is also a discussion on product design and pricing as well as marketing and product launch.

Additional papers provide more in-depth information on unit-linked plans. These are unit-linked policies in the UK; unit-linked policies in the USA; investment management and unit pricing; and pricing and profit testing.

The key points of this paper are:

- Unit-linked policies are “unbundled”. This means that the investment, expense and insurance elements of the policy are separately identifiable.
- The investment rewards (and risks) are transferred from the insurer to the client (although it is possible to have some investment guarantees).
- The insurer should match the investment link by holding the appropriate assets.
- Unbundling makes the resulting policies more flexible and gives the client choices. Insurers also gain flexibility because guarantees are less onerous than for conventional policies. This means that lower reserves are required for unit-linked business compared to conventional business and less capital may therefore be required to write new business.
- Unit-linked policies were first successful in countries with well-developed investment markets – notably the UK and USA. The development of these markets and the products sold in them are the subject of separate papers in this series.
- The development of sales methods used in these markets highlights the need for adequate regulation of the sales process.
- Local regulations have sometimes been a barrier to the development of unit-linked policies but the popularity of unit-linked business in Western Europe has increased significantly since 1997. The reasons are:
  - Deregulation, harmonization and globalization of markets
  - Buoyant share prices and popularity of shares
  - Low interest rates and falling annual bonus rates on traditional insurance
  - Good administration system solutions
- We predict advances in the market share of unit-linked policies outside of Western Europe as these factors influence other markets.
- Detailed planning is needed to ensure successful product launches, acceptable pricing and adequate business processing systems and procedures. Other financial considerations are also important. Munich Re can contribute the necessary technical expertise and the previous experience necessary to support such ventures.



## 2 WHAT IS UNIT LINKING?

The following are the characteristics of unit-linked plans. These will be explained in more detail in later sections and in the additional papers.

### 2.1 UNIT-LINKED POLICIES ARE SAID TO BE UNBUNDLED

Unbundling means the separate identification of the constituent parts of the insurance policy. That is, the investment element, expense and administration charges, and benefit charges (e.g. mortality charge), as well as the benefits themselves, are clearly identified to the client.

Until the 1960s, most life insurance policies were conventional policies, whereby the client was not aware of what portion of the premium covered expenses or benefits, nor, indeed, of how investment returns were allocated to the policy. The first step to unbundling was to identify the investment element separately from the other elements of the product. Because this was explained to the client and formed a legal part of the policy, it was the real start of unbundling. Some more years passed before the level of unbundling that we see today was achieved.

As time went on in the 1960s and 1970s, the other major parts of life insurance policies (mortality and expenses) also became unbundled. Product designers did this by setting out the way that expense and mortality costs would affect the policy. It was then a short step to design products that reduce (or do not offer) guarantees for these parts (subject to local regulations and the competitive environment allowing this).

Unbundled products are also said to be transparent because the client can see the progress of the policy. This is aided in some countries by the requirement to send an annual report on the status and performance of the policy, including explicit reporting of charges taken from, and investment returns allocated to, the policy.

In practice, however, the details of unbundled policies are quite complicated and whether transparency is achieved from the client's point of view depends primarily on the clarity of the communication from the insurer and the extent to which the client is interested in such detail.

### **The origins of unbundling**

### **Unbundled products are transparent**

## 2.2 UNIT-LINKED POLICIES MAKE USE OF UNIT-LINKED FUNDS

In the UK, unbundled policies are generally referred to as being unit-linked because the investment element of the policy is housed in funds that are divided into units of equal value. We will refer to unit-linked policies throughout the rest of this paper.

A unit-linked policy is one whose underlying investments are identifiable and determine its cash values.

### **Funds may consist of a mixture of asset types**

It is important to recognize that the assets of the funds may not be shares – they may be fixed-interest securities, money market instruments, property, derivative instruments, as well as shares. Indeed, the assets of a particular fund may consist of a mixture of these asset types. The client normally has a choice of funds having different characteristics to which premiums can be allocated.

## 2.3 UNIT-LINKED POLICIES SHOULD BE MATCHED

Linking implies matching. It would not be prudent to link the value of a policy to an asset, unless that asset actually forms part of the fund.

So, we also note that the unit-linked policy liability should be matched by holding the appropriate asset or assets to which it is linked.

### **Risk and reward are transferred to the client**

From this arrangement, we can immediately see that the investment risk and reward are transferred from the insurer to the client. This is the real distinguishing feature of unit linking. Of course, the policy might offer some investment guarantees but in many countries this is now the exception rather than the rule.

The main advantage for the insurer of policies with few or no guarantees is that the insurer is usually permitted to hold lower reserves which makes more efficient use of capital by reducing new-business strain.

## 2.4 EXPLICIT CHARGES ARE ASSESSED AGAINST THE POLICY

The use of explicit charges is again a consequence of unbundling, unlike more traditional plans where the client is not aware how much of the premium covers expenses and administration.

### **Charges can be assessed against the premium or the cash value**

Insurers assess various explicitly stated charges to pay for insurance benefits and expenses of administration and to provide a profit margin. These charges are covered in more detail in Section 5.2. Essentially, the charges can be assessed directly against the premium (by reducing the amount allocated to purchase units) or against the cash value (by cancelling units or reducing the unit return). Expense charges and insurance benefit charges may or may not be guaranteed. Sometimes a maximum guaranteed charge is stated, but actual charges are lower.

Again, the weaker the guarantees on the policy, the lower the reserves required to be held against it and the more efficient the insurer's use of capital.

## 2.5 UNIT-LINKED LIFE INSURANCE AND UNIT TRUSTS ARE NOT THE SAME

It is important to recognize the difference between investing in a unit-linked life insurance policy and investing in a unit trust. A unit-linked fund is divided into units of equal value in the same way as a unit trust. In a unit trust, the units are beneficially owned by the client. In a unit-linked fund, the units are notional and are a method of establishing each client's call on the assets within the fund. On the surface, the distinction is small but in practice there are two significant differences:

**Unit trust holders are the beneficial owners of the assets**

### 2.5.1 UNIT PRICING

In a unit trust, as the investments are beneficially owned by the client, the unit price must reflect exactly the underlying assets. In a unit-linked fund, the insurer can, in theory, set any unit price it wishes, although in practice there are strong reasons (and in some countries mandates) to set prices equitably. The value of the client's investment is simply the total value of the fund times the proportion of the number of units held by the client to the total number of units in the fund.

### 2.5.2 INSOLVENCY

In the event of insolvency, the units in a unit trust are still available to the clients. In a unit-linked fund, the assets within the fund are usually available equally with the other assets of the insurer to meet liabilities and there is no guarantee that the full value of the assets will be available to clients.

This, however, may not be the case in all countries. Some countries legislate that the assets of unit-linked insurance policies belong not to the insurance company but to the clients, meaning that unit-linked funds are essentially segregated assets held for the benefit of the clients. In such cases, insolvency would not diminish the assets in the funds available to clients. Also, unit prices would always have to reflect the true value of underlying investments (adjusted for items such as the investment management charges and some other specified costs) and would not be subject to manipulation by the insurer.

**Legislation and unit linking**

## 2.6 UNIT-LINKED LIFE INSURANCE MARKET SHARES

The table below shows the major countries where unit-linked plans have, in many cases, a large market share:

**Table 1 Selected unit-linked markets**

Country	Sold from	Unit-linked plans' market share (%)	In year	Comments/(sources)
Belgium	1993	2%	1995	As % of revenue prems.
		5%	1996	(LIMRA)
		11%	1997	(UPEA)
		20%	1998	(UPEA)
		48%	1999	(UPEA)
Canada	Late 1970s	8%	1986	Market share is as UK
		34%	1995	Figures exclude extra "dump-ins"
		38%	1996	
		44%	1997	
		52%	1998	
		54%	1999	(Source: LIMRA)
France	1970s	13%	1990	As % of new AP <sup>1</sup> (Groupe Consultatif)
		14%	1995	
		26%	1998	(IBC Conference 6.99)
		38%	1999	(FFSA)
Germany	1970s	4.7%	1996	As % of new premiums (Tillinghast)
		6.4%	1997	
		10.9%	1998	(IBC Conference 6.99)
		12.4%	1999	(GDV statistics)
Italy	1980s	49%	1998	As % of new premiums
		58%	1999	(ANIA)
Japan		0.3%	1997	(Life Insurance Business in Japan )
		0.25%	1998	(1997/1998 and 1998/1999)
Netherlands	Early 1980s	14%	1993	Market share is % of all individual
		26%	1994	life new AP <sup>1</sup>
		30%	1995	(Groupe Consultatif)
		43%	1998	(IBC Conference 6.99)

Country	Sold from	Unit-linked plans' market share (%)		In year	Comments/(sources)	
Portugal	1994	Under 5%		1995	(Groupe Consultatif)	
		5%		1998	(IBC Conference 6.99)	
		16%		1999	(EPAS)	
Spain	1980s	Still in its infancy		1996	(LIMRA)	
		18%		1998	(IBC Conference 6.99)	
		30%		1999	(UNESPA, ICEA)	
Sweden	c. 1990	Life	Pension		Market share is as UK	
		61%	33%	1996	(Source: Swedish	
		82%	37%	1997	Insurance Federation)	
UK	Early 1960s	Life	Pension			
		26%	n/a	1975	Market share is % of	
		46%	44%	1985	respective new	
		40%	55%	1995	individual business	
		43%	59%	1996	premium	
		41%	51%	1997	(using AP plus 10% SP) <sup>1</sup>	
		45%	52%	1998		
40%	53%	1999	(Source: ABI)			
USA	c. 1970	Universal	Variable			
		but in effect	38%	4%	1985	Market share is as UK
		from late	24%	15%	1995	Figures exclude extra
		1970s	22%	20%	1996	"dump-ins"
			21%	29%	1997	
			20%	34%	1998	
		19%	40%	1999	(Source: LIMRA)	

<sup>1</sup>AP = annual premium, SP = single premium.

Ireland and Australia are two other countries with unit-linked market shares of 70% or so. The product names (e.g. "Universal Life" and "Variable Life" in North America) will be fully described in a later paper in this series.

The figures for some of the European markets show a sudden jump in unit-linked sales recently. The biggest reasons for this are:

- The 3rd Life Insurance Directive which has liberalized many of the markets in the European Community as well as harmonized them
- The anticipation and introduction of the euro in 1999
- The decline in interest rates to German levels in the euro currencies
- Reduced bonuses on conventional products
- The very strong European stock markets for some years
- The increased popularity of shares as an investment medium
- The increased publicity of stock market performances and of indices such as the DAX index
- Pressure from and changes in distribution systems

## 3 WHY OFFER UNIT-LINKED POLICIES?

### 3.1 GENERAL CONSIDERATIONS

A product will only provide good sales volumes in a market if it meets the requirements of the parties involved in the transaction. For an insurance product, this means meeting the requirements of the client, the distributor (assumed to be an intermediary) and the insurer. In this section we look at how a unit-linked policy meets the needs of the three parties.

### 3.2 THE CLIENT

Unit-linked policies can be designed to do almost anything a conventional policy can, but they can also offer more flexibility. The notable exception is achieving the smoothing of investment returns which was traditionally the objective of conventional policies.

#### **Meeting the needs of the client**

Over the years, the smoothing of investment returns on conventional policies has been reduced as actuaries, through competitive pressures, have increased the terminal bonus element of maturity payouts. The volatility of investment returns under conventional policies has therefore increased and the main perceived advantage of such policies has diminished. The major disadvantage of conventional policies lies in their bundled nature and, in particular, that the cash value of the policy at a particular time is not clear to the client. The transparent nature of a unit-linked policy has a major appeal to clients who wish to monitor the progress of the value of their investment. This has enabled single premium life insurance policies to compete successfully with mutual funds and other open-ended collective investment schemes.

#### **Client control over the investment strategy**

Further advantages of unit-linking are that the client has control over the investment strategy for the policy and may be more comfortable with unit linking as the concept is closer to other collective investment vehicles than a conventional policy. Notably, clients may control the degree of investment risk by directing premiums to the funds most appropriate in relation to their risk tolerance. Those clients willing to take on more risk, for example by investing solely in an equity share fund, would expect to earn better returns over the long term, as has been demonstrated by historical returns in many countries (see Section 3.5).

### 3.3 THE INTERMEDIARY

The transparency and flexibility of unit-linked policies provide the intermediary with products that meet a wide variety of client needs and which are easy to explain (in principle) to clients, particularly in terms of demonstrating investment performance compared to that of competitors.

It is also possible for the intermediary to show how unit-linked contracts have the potential to outperform their conventional with-profits counterparts based on past performance. In general, the maturity values of unit-linked policies invested in managed or balanced funds where the underlying investments are a mix of shares, bonds, property and cash should be similar to the maturity value of a conventional with-profits policy. The maturity values of unit-linked plans invested in equity share funds would be expected to be higher. In practice, results have varied considerably between insurers depending on their relative investment performance.

In addition, where the intermediary is acting as the client's investment adviser, the regular requirement to review the investment strategy for the policy with the client gives the intermediary a reason to contact the client with the possibility of further sales as a consequence of the meeting. The quality of unit-linked business should be better than that of conventional business, in terms of persistency, for this reason.

**Regular reviews of clients' investment strategies**

### 3.3.1 USES FOR UNIT-LINKED PRODUCTS

To date, unit-linked products have been structured in many different ways:

- Endowment assurances
- Open-ended whole life policies
- Savings for retirement (deferred pensions)
- Pensions in payment

Many of these offer the choice of

- Single or regular (monthly, annual or other) premiums
- Flexible premiums
- A single or a multiple life basis
- A range of covers that can be added (depending on local licensing regulations), e.g.
  - Life cover
  - Guaranteed insurability options
  - Critical illness
  - Disability
  - Health
  - Long term care
  - Redundancy

These products can be applied in a wide variety of situations.

#### Wide range of applications

##### Personal lines

- Family protection
- Mortgage or loan repayment
- Inheritance or estate tax planning
- Lump-sum investment
- Saving for retirement
- Saving for school or college fees
- Drawing retirement income
- Charitable giving

##### Business lines

- Key person insurance
- Partnership buy-sell agreements
- Other partnership situations
- Employee pension and other benefits
- Executive benefits

Of course, none of this is new just because a unit-linked policy is involved.

The main points really are:

- Unit-linked policies can satisfy the same needs as conventional policies.
- Unit-linked policies are easy for the intermediary to explain and easy for the client to understand. Of course, the actual level of understanding of the average client will still be very low, but will nonetheless be better than for typical conventional policies.
- The flexibility and choices under unit-linked policies enable clients to choose the insurance coverages they require and to control the level of investment risk associated with the policy.

In fact, most recent product advances (both in terms of product design and covers offered) have been under unit-linked policies.

### 3.4 THE INSURER

The insurer should only offer unit-linked products in response to a demand from the market or where it is believed that market conditions will support unit-linked innovation and where it can make a sufficient profit. Clear indications of where unit-linked plans may be successful are flat or stagnating sales of traditional with profits products, and increases in sales of pure investment-linked trusts (or mutual funds). Offering unit-linked insurance would be a method to retain existing customers or attract new customers who may otherwise purchase pure protection insurance (term insurance) and place their savings in investment-linked trusts or other pure investments.

Unit-linked policies are usually less capital intensive than conventional with-profits policies, i.e. the finance required to support equal volumes of with profits and unit-linked business is lower for unit-linked business. There are two main reasons for this:

- The guarantees under unit-linked business are usually much weaker than under a conventional with-profits policy (if they exist at all).
- The reserving requirements under a unit-linked policy are much less onerous than under a conventional with-profits policy. This partly reflects the weaker guarantees but is mainly a result of using a valuation basis under which the reserve is roughly equal to the surrender value at all times.

The lower capital requirement for unit-linked business means that unit-linked products are suitable products for insurers in start-up situations. In countries where bancassurance has been successful, the bancassurers have often started by selling unit-linked products. In some cases, insurers have responded to competition from the bancassurers by introducing unit-linked products themselves.

Unit-linked policies are often more profitable than conventional with-profits policies, particularly for proprietary life offices. The reason for this is that many proprietary life offices operate a 90/10 (or other split) gate within their life fund. This means that at least 90% of the profits of the business must go to the with-profits policyholders, and the shareholders take a maximum of 10%. The requirement to split the profits in this way is written into the Memorandum and Articles of Association of the insurer (the basic documents governing its operations) and would be virtually impossible to circumvent. In some cases, the requirement to split the profits relates only to the profits arising from with profits business, but often the requirement covers profits arising from non-profit business as well. Non-profit business could include unit-linked business.

However, by writing unit-linked business in a separate fund or even a separate company, the requirement to distribute any profits arising from the business to anyone other than the shareholders is removed.

**Circumstances suitable for unit linking**

**Unit-linked business is capital efficient**

**Profitability of unit-linked business**

### Transfer of investment risk to the client

Insurers will need to decide whether to write unit-linked business either

- in the existing life fund with segregated assets;
- in a separate fund containing unit-linked assets only;
- in a separate company.

### 3.5 A REVIEW OF HISTORICAL RETURNS

This section reviews some of the historical investment returns in selected countries.<sup>1</sup> Since one of the fundamental characteristics of unit-linked plans is to transfer some or all of the investment risk to the client, it is useful to have a basic knowledge and understanding of some of the historical returns of the various main classes of investment. For example, access to possible superior returns on equity shares is one of the clear advantages of unit-linked plans, but one which also brings about a degree of risk.

Only the period 1900 to 1995 will be examined. There is a common adage that buying shares for the long term provides superior returns (in a buy-and-hold strategy with reinvestment of dividends in shares). This is largely confirmed when looking at historical returns.

The tables in the appendix show average annual returns earned in the USA, UK, Japan, Germany, France, Italy, and Canada (the G7 countries), as well as Australia. For each country, the tables show that total returns from shares (capital gains as well as reinvested dividends) have provided higher returns than bills, bonds, or increases in the consumer price index in the period 1900 to 1995 (starting later in some countries), as well as in the more recent period of 1950–1995.

### Conclusions relating to historical returns

Some conclusions about historical returns in the selected countries may be drawn:

- Shares have provided superior returns to bonds and bills over the long term. Some decades have been exceptions, usually as a result of war or economic dislocations.
- An important historical component of the total return from shares has been dividends (which have been assumed to be reinvested in the same shares).
- Returns on shares have increased over time. Data indicate that returns to investors were higher after World War Two than before, essentially because of capital gains rather than increased dividend yields. This is a reflection of the economically stable environment after World War Two and of the strong bull runs which have occurred in this period. This greater role of capital gains in relation to dividend yield in the total return, however, may not be sustainable.

<sup>1</sup>Data and conclusions are adapted from Global Financial Data ([www.globalfindata.com](http://www.globalfindata.com)).

- Shares have provided the best security against inflation. Bond returns have been lower than inflation (resulting in losses in real terms) more often than the return on shares has been lower than inflation. Even in countries with historically low inflation, there were periods in which inflation was high or rising, such as the 1910s, 1940s and 1970s, and this caused bonds to experience lower returns than inflation rates. Shareholders are also hurt by inflation, but to a lesser extent than bondholders. High inflation tends to reduce real returns on shares and hyperinflation can destroy many years of good returns in a short time span, but even so, shares have generally outperformed bonds in real terms in these inflationary periods.
- There is some evidence that the real returns on shares over the long term are less volatile than the real returns on bonds. Share price volatility is higher over shorter periods, but over several decades returns are more stable. The return on shares ultimately depends on corporate profits, and economic expansions tend to be longer than economic contractions. In other words, bull markets on shares will tend to be longer than bear markets. This is less true of bonds, when sustained periods of inflation can have a very negative impact and bear markets in bonds can last many years. Shares may be more volatile than bonds when measured in nominal returns, as has been the case over some periods in Italy or France, but even in these cases volatility has been lower when analysed in real returns.
- Shares perform best in sustained periods of economic growth in a stable environment with low inflation, where corporations are free to maximize profits. When such conditions do not exist, investors may suffer, sometimes very severely. Economic depressions, such as the one in the USA in the 1930s, have resulted in lower returns on shares compared to both bills and bonds. However, the stabilization of the world economy in the 1950s and the reduction in inflation since the 1980s, have resulted in superior share price growth. High economic growth rates have provided very high returns on shares in Japan and other developing markets.
- Long-term government bonds tend to outperform bills in countries where there is no high inflation. In countries with high inflation, bills can outperform bonds because of capital losses on bonds.

Despite the favourable returns experienced by shares, investors should realize that they face substantial potential negative returns. This can be seen when looking at the tables showing the worst 12-month total returns on shares since 1900. For example, when only looking at more recent times, the UK experienced large negative returns in 1973 and 1974 and Japan had some very large negative returns in the early 1990s. Of course, very high returns have also been earned at other times. What is important is that investors should be aware of the potential risks and returns of their investments.

### **Shares have provided the long-term best security against inflation**

### **Potential risks and returns of shares**

## 4 CRITICAL SUCCESS FACTORS FOR UNIT-LINKED BUSINESS

### 4.1 EFFICIENT INVESTMENT MARKETS

#### Asset prices easily available

A key area in which a unit-linked policy differs from a conventional with-profits policy is that the investments of the unit-linked policy should be able to be valued at any point in time. This means that a price for the individual investments of a unit-linked fund should be available at any time, i.e. efficient investment markets. This covers not only share markets but also government bond markets, corporate bond markets and (as far as possible) property markets.

### 4.2 A DEMAND FOR TRANSPARENT INVESTMENTS

In markets where shares, bonds and property are popular investment media, there is a predisposition towards investments that can be easily valued. This weighs heavily in favour of a unit-linked policy rather than a conventional policy.

### 4.3 A WELL-DEVELOPED LIFE INSURANCE MARKET

#### Market features

A well-developed life insurance market can be characterized by the following:

- A need for protection and savings
- A stable economic background
- Consumer wealth
- A sophisticated banking system able to process mass transactions
- An advanced supervision system which allows the introduction of new classes of business
- Trust in financial services institutions
- A taxation regime that does not disadvantage life insurance in general or unit-linked life insurance in particular

### 4.4 ADEQUATE SYSTEMS

#### Quotation system

The flexibility of unit-linked products means that there can be a large number of options as to how the policy is put together. There are options regarding the choice of add-on insurance benefits, the term of the policy and whether the cash value is payable as part of the sum insured or in addition to the sum insured on the occurrence of the insured event. This means that complex point-of-sale illustration systems are required to support unit-linked products.

#### Efficient administration systems

Once written, unit-linked policies are complex from a record-keeping point of view as there are large amounts of data required to be held and large numbers of transactions to be processed. A powerful and efficient administration system is needed to manage a unit-linked portfolio.

#### 4.5 A VIABLE DISTRIBUTION SYSTEM

Access to the market through one or more of the following:

- A tied sales force – well trained, well paid and well motivated
- A reliable independent sales network
- Another financial services organization (e.g. a bank)
- Other direct access to the market (direct response or other distribution agreements with third parties)

#### 4.6 A GOOD INVESTMENT TRACK RECORD

To be successful in the unit-linked market, an insurer must be able to demonstrate a good history of investment performance. For a new entrant to the unit-linked market, this is clearly impossible (unless, for example, it relies on tracker funds which replicate the performance of well-known stock indices) and the insurer must rely on its reputation in the market or else rely on someone else's track record. This is often done by using external fund managers to manage the investments, or by investing in funds managed by another fund manager. In either case, the pedigree of the external fund manager becomes part of the marketing message.

**Investment performance  
track record is vital**

## 5 PRODUCT DESIGN AND PRICING

### 5.1 PRODUCT DESIGN (TECHNICAL SPECIFICATION)

The product specification should include (where relevant):

#### CLASS OF PRODUCT

- The technical class of product – e.g. whole life, endowment, pension
- Versions available – single life, joint life (first death, last survivor), business
- Premium options – single, regular, flexible
- Allowable insurance benefit add-ons

#### INVESTMENTS

- Fund links available and investment objectives of each fund
- Investment guarantees (or lack of investment guarantees)
- Method and frequency of unit pricing
- The investment accounting and management system to be used

#### MARKETING AND DISTRIBUTION

- The distribution channels through which the product is available
- Variations of product design by distribution channel, if any
- The initial and renewal commission payable and clawback rules
- Capabilities of illustration system to be used
- Marketing material to be available
- Other sales aids to be available
- Training and qualification standards of unit-linked insurance intermediaries

#### ACTUARIAL AND TECHNICAL

- Charging structure (see Section 5.2 for more detail)
- Insurance benefit charges
- Review provisions (if relevant)
- Policy limits (age limits, maximum and minimum premiums/sums insured, minimum investment in individual funds, fund link rules, rules for fund switches, etc.)
- Underwriting rules
- Management and statistical information required
- Valuation and reserving bases
- Solvency margin requirements
- Corporate tax implications
- Policyholder tax implications

#### ADMINISTRATION

- Business processing rules – new and ongoing business
- Policy and endorsement wordings
- Cash processing rules – allocation of cash to policies, late processing rules
- Permitted policy changes (by the insurer and by the client)

- Availability of loans and/or partial withdrawals and the rules for administering them
- Non-forfeiture provisions

#### OTHER SPECIFICATIONS REQUIRED

- Administration system specification
- Investment accounting and management system specification
- Illustrations system specification
- Management information system specification

### 5.2 PRODUCT PRICING

This means the level and type of charges that the insurer can take under the policy. The types of charge which can be levied are initial charges, surrender charges, renewal charges, fund management charges, and switch or redirection charges.

In addition, charges are taken for add-on benefits if the premium for such benefits is not included in the total premium payable.

#### 5.2.1 INITIAL CHARGES

Initial charges are intended to cover the marketing, distribution and other new business costs relating to the policy. There are many different variations of initial charges, but essentially, whatever method is used, the effect is that less money is actually allocated to the policy than is received from the client for a period of time. Some possible ways of doing this are:

- Allocate no money to the policy for a period of months.
- Allocate only a proportion of each premium to the policy for a period of months.
- Allocate money received in the early months of a policy to units that have a higher fund management charge than those purchased by later premiums. In the event of the policy being surrendered, the future excess fund management charges, in excess of the regular charges that would have been levied on these units, are levied at the point of surrender. As such, the excess fund management charges will be received regardless of whether the policy runs its full term or not, and only the amount of money required to purchase the units net of the excess fund management charges needs to be allocated to the policy.

#### 5.2.2 SURRENDER CHARGES

Surrender charges (also called surrender penalties or back-end charges) are, as their name suggests, applied when a policy is surrendered. They are used to recover costs already incurred to the extent that they have not been recovered from the charges made prior to surrender.

#### Types of charge

#### Methods of taking initial charges

### Methods of taking renewal charges

#### 5.2.3 RENEWAL CHARGES

These are intended to cover the ongoing costs of administering the policy and any renewal commissions payable. There are various methods of taking renewal charges:

- An explicit percentage of each premium
- A policy fee deducted from the premium before it is allocated to units
- A policy fee deducted from the funds under management
- A bid/offer spread, whereby the price at which units are bought by clients is higher than the price at which the insurer will redeem them. For example, units may be sold at 100 and redeemed at 95 (redeemed in the case of surrenders, partial withdrawals, or to pay certain charges). Both the bid price and the offer price of the units will change over time to reflect the performance of the underlying investments and other factors, but the spread between these prices will usually remain within certain bounds established in the insurance contract, often close to a constant percentage such as 5%.

#### 5.2.4 FUND MANAGEMENT CHARGES

These are intended to cover the ongoing costs of managing the investments of the policy and any asset or trail commissions payable. These charges are almost always a percentage of the funds under management.

#### 5.2.5 SWITCH OR REDIRECTION CHARGES

These cover the additional administration costs associated with switching investments between funds and redirecting premiums. The objective of these charges is to discourage excessively frequent switches and premium redirections but often a number of free switches is allowed. Usually there is no charge for redirection of premiums.

#### 5.2.6 ADD-ON BENEFIT CHARGES

These are usually calculated using a current cost method (unless the premium for add-on benefits is included in the total premium). This means that risk premium rates are applied each month to the sum at risk under each benefit. Any charge over and above the pure risk premium charge will help offset expenses.

### 5.3 PROFITABILITY

#### Pricing assumptions

Some assumptions about the future must be made to price the product profitably. These are:

- The average size of policy the office expects to write, (i.e. the average premium and level of benefits), including the timing of premiums and charges for fully flexible policies. These averages may be related to age, sex and other factors such as the distribution channel.
- The expected costs for the product. They should be what the company thinks it needs to spend to acquire and administer the product. This should include overhead (or indirect) costs. The amounts might be divided into

initial and renewal costs and might be related to premiums, benefits or simply to each policy. In order to allocate expenses at the policy level, sales volumes will have to be estimated. Any expected increases in these amounts, due to inflation or other factors, should also be considered.

- Economic assumptions such as future returns on unit-linked and other funds, future inflation rates, future tax rates and rules.
- Lapse assumptions – calculated in accordance with the time since the policy was written, and (if possible) with age, distribution method or other factors.
- The expected death and other benefit claim rates. These are not necessarily the same as the charges for the benefits.
- The valuation method for the policy liabilities (or the reserves) and the need for any solvency margin. These will be in accordance with the rules laid down by the appropriate supervisory authorities.

These assumptions need to be based on good information. The best information is the experience of similar existing policies. If such information does not exist (or is not available), research will be necessary.

Upon finalizing the items covered in Sections 5.1, 5.2, and 5.3, the expected profits from the business can be projected.

#### 5.4 PROFIT TESTING

This is the process whereby the levels of charges required to price the product profitably are derived.

This is done by choosing a charging structure and projecting the cash flows (charges extracted less costs incurred) over the life of a portfolio of business. This requires a set of per-policy expenses to go with the charging structure. Where the add-on insurance benefits are a significant component of the policy, they should be allowed for in the profit-testing process. The pricing of add-on insurance benefits is discussed more fully in the pricing and profitability paper in this series. In general, the pricing of these benefits means that they are at least as profitable as their stand-alone counterparts and it is not therefore essential to profit test the unit-linked policy with such benefits included.

Where the primary purpose of the policy is investment, the mix of add-on insurance benefits will be difficult to predict with any accuracy and it would therefore be unwise to rely on the results of profit tests that assume a particular mix of add-on insurance benefits. For investment oriented policies it is usual, therefore, to ignore any add-on insurance benefits in the profit-testing process.

Any built-in benefits should, of course, be included in the profit-testing process.

The pricing and profitability report in this series of reports contains a set of product design and pricing assumptions for a typical UK unit-linked policy. A disk is also available containing a simplified profit-testing spreadsheet. The assumptions and charging structure in the spreadsheet can be altered to see the effect on profitability.

**Profitability depends on the charging structure**

### **Profit-testing targets are required**

The profit-testing result is generally expressed as either a rate of return on capital invested or as a present value of future profits at a fixed discount rate. In either case the insurer will have a target that needs to be met or exceeded. The objectives of the profit-testing process are:

- to produce a charging structure that is marketable, meets the insurer's financial target, and can be supported by the administration system;
- to produce a charging structure that is fairly insensitive to the mix of business written (in terms of age, sex, premium level, etc.).

In this connection, it is worth noting that the better the incidence of charges matches the incidence of incurred expenses, the more robust the profitability of the product. In particular, profitability will not be vulnerable to a lapse experience significantly different to the assumptions in the profit test.

## **5.5 CHOOSING A CHARGING STRUCTURE**

### **The marketing influence on the choice of charging structure**

The pattern of expenses incurred for a life insurance policy will always be high acquisition costs followed by much lower but steadily increasing renewal costs. There will also usually be a high initial commission followed by a much lower renewal commission. Ideally, therefore, the charging structure should match this incidence of expenses with a high initial charge followed by a much lower level of renewal charges. For marketing reasons, this may be unacceptable and the insurer may have to either recoup initial expenses over a period of time by taking charges that (significantly) exceed the renewal expenses or disguise the high initial charges. It was this latter approach that gave rise to the concept of initial units (units that have a high fund management charge as described in Section 5.2.1).

### **Levellized charging structures**

The alternative approach of taking higher renewal charges makes the insurer vulnerable to early lapses, particularly if no surrender penalty is applied. Taking charges more evenly can be accomplished in a variety of ways, but the main ones are:

- A high bid/offer spread.
- An allocation rate of (significantly) less than 100%. This may be increased after a period of years to 100% or more and can be marketed as a loyalty bonus.
- An investment fee (often expressed as a percentage of the premium). This is effectively an additional bid/offer spread.
- A high fund management fee on all units. This could be reduced after a period of years (for example by allocating bonus units) to bring the fund management charge into line with the market norm.

These can be used either in isolation or in combination.

## 5.6 SENSITIVITY ANALYSES

The profit-testing process leads to a charging structure that provides sufficient profit to the insurer based on a central set of assumptions relating to the experience of the portfolio. If the experience is more favourable than the assumptions, the profitability of the product will be greater, and vice versa.

The insurer should satisfy itself that the risk of an adverse experience is acceptable and should further be aware of the effects of an adverse experience. This is the process of sensitivity testing.

The key assumptions relating to the experience of the portfolio are varied to see what effect this has on the profitability of the portfolio. This normally means that the following are examined for their effect on profitability:

- New business volumes
- Expenses
- Lapses
- Mix of business
- Average premium size
- Investment returns

New business volumes and expense levels are related in that per policy expense levels will be lower the higher the volume of business written.

Ideally, the charging structure would mean that profitability would be fairly insensitive to changes in the lapse experience or the mix of business. However, as we have seen, marketing pressures may mean that the charging structure does not fully match the incidence of expenses under the policy. Furthermore, there may be specific demographic groups targeted where the charging structure is favourable to the client in the hope of attracting high volumes of business in these areas. The effect on the profitability of the portfolio of writing more business than expected of these groups should be investigated.

Average premium size can have a significant effect on profitability. The majority of charges are related directly or indirectly to the premium, whereas the majority of costs are, in reality, fixed costs. If the average premium is lower than expected, the charges will be lower than expected and, since they are matched against fixed costs, profitability will be reduced.

The investment return on the funds under management usually has a significant effect on profitability for lump-sum (single premium) business but a much smaller effect on the profitability of regular premium business. The reason for this is that the majority of charges under a regular premium policy come from the premiums themselves – it is only when the funds have built up that the fund management charge becomes the dominant element of the total charge extracted from the policy. As this does not normally occur for several years under a regular premium policy, the building up of the funds does not have a major impact on profitability – i.e. the profitability of regular premium policies is less sensitive to the investment return earned.

**Profit-testing assumptions are never exactly borne out in practice**

**Specific groups may be targeted to attract high volumes of business**

**Premium size and its effect on profitability**

**Returns on investment funds and their effect on profitability**

For lump-sum policies the fund management charge is often the only charge after an initial charge has been taken. A change of 1% in the investment return assumption has a similar result on the present value of profits as changing the discount rate (used to value the stream of fund management charges) by the same amount (but in the opposite direction). This will clearly have a major impact on the profitability of the policy. The table below shows the effect of different investment returns on the profitability of typical (notional) single premium and regular premium policies.

Investment return %	Profit as % of annual premium	Profit as % of single premium
5.00	33.80	2.60
7.00	34.40	2.80
10.00	35.30	3.20
12.00	36.00	3.50
15.00	37.10	4.10

When profit testing a lump-sum policy it is therefore important to analyse the likely pattern of investments in the various funds as this can have a substantial effect on the overall return on the portfolio and hence on profitability. In general, the more risky the investments of a fund, the higher the expected investment return but the more volatile (i.e. unpredictable) these returns will be. In theory therefore, the more the investments are directed towards risky funds, the higher the expected profitability of the lump-sum product. Of course, there is a greater risk that the expected investment return will not be achieved and sensitivity analyses will reveal the effect of an investment return different from the expected return.

**Sensitivity analysis does not quantify the risk of an adverse experience**

It is important to recognize that sensitivity analyses do not quantify the risk that profitability targets will not be met. They simply show the effect on the profitability of the portfolio of departures from the central experience. The pricing actuary must use his or her judgement to decide whether the risk of the profitability portfolio being inadequate is acceptable.

**Stochastic models can be used to assess the risk of an adverse experience**

Stochastic modelling tools can help with this aspect. In essence such techniques enable the pricing actuary to quantify the risk that a certain variable will differ from its expected value and by how much. The most powerful stochastic models relate to future investment performance and can therefore be applied very well to the pricing of lump-sum business. In this situation a stochastic model could be used to model the future investment returns on each fund, year by year. In a sophisticated stochastic model, lapse rates and inflation rates could be allowed to vary depending on the investment returns. The profitability of the product can then be calculated on the basis of the future returns. This process can then be repeated with different sets of future returns and repeating the process many times means that an expected value for the profitability can be derived. An indication of the probability that the profitability will lie within certain bounds can also be derived.

## 6 MARKETING AND THE PRODUCT LAUNCH

### 6.1 CLIENT BROCHURES

The product development process for a unit-linked policy is little different from the process for any other type of life insurance contract. Part of this process is to consider the target market for the product and the marketing message to be conveyed. Material to support the sales message must also be developed.

The two key sales messages are normally:

- The unbundled nature of the product – i.e. that the investment and insurance elements of the policy can be controlled separately. Clients can therefore structure their insurance benefits to meet their exact needs, control the amounts that will be invested and the nature of the investments.
- The possible application or applications of the savings element in the future, e.g. mortgage repayment, pension provision, school fees, etc. The various applications may be covered in one client brochure, but more often specific applications or groups of applications are covered in separate client brochures.

The client brochure concentrates on these messages but, of course, adapts them to any particular requirements of the chosen target market. The point-of-sale illustration system should be able to reinforce the messages in the client brochure, as the most common point of reference for clients after the sale is the printed illustration given to them at the point of sale.

Client brochures may also deal with investment performance, but in many countries what can be said is limited by regulation. Such limitations were usually imposed following very aggressive selling in the hope for future investment returns based on the then very high investment returns in the early 1980s. When policy maturity values are calculated based on, say, 15% investment return before expenses, the effect of expenses reducing this to, say, 12% still leaves an impressive figure at maturity. However, when expenses reduce an investment return of 6% to 3%, the resulting maturity value is considerably less impressive.

When the high projected returns failed to materialize it became clear that the investment was in fact a very poor investment and many countries took action by limiting the rates of investment return that could be used in projecting maturity values.

Client brochures provide basic details on the range of investment funds available and the level of risk relating to each, but do not usually discuss possible investment returns.

#### **Key sales messages**

#### **Adapting the message to the target market**

#### **Regulation often limits details on investment performance**

## Informing the intermediary

### 6.2 MATERIAL FOR THE INTERMEDIARY

The normal range of new product material for intermediaries consists of:

- An outline of the product (usually a simplified version of the full technical specification covered in Section 5)
- The target market for the product and a description of how the product meets the needs of the target market
- A guide to the use of the point-of-sale illustration software
- A commission guide. Where the unit-linked product is being introduced alongside, or to replace a conventional product, a comparison of the commission payable on sales of the two products is often made. Commission is almost always based on the premium payable for unit-linked business. Where commission is also based on the premium for the existing product, the scales are usually very similar. For example, the commission rates on a 10-year with profits endowment and a 10-year unit-linked endowment would normally be the same.
- Sales aids for use with clients. These might be booklets of case studies or a simple gadget designed to calculate how much life cover the client needs or how much pension provision or savings the client should be making in order to meet its financial goals.
- Investment performance data. Where regulation limits what the client brochure can say about projected future performance, there are usually similar restrictions on what can be given to intermediaries. However, there are usually no limitations on what can be said about past investment performance. Insurers therefore provide intermediaries with considerable amounts of historical investment performance data. Intermediaries use this information to assess which insurers produce consistent investment returns and are therefore suitable candidates to manage their clients' investments. A good investment track record is therefore vital for the success of a new unit-linked product, as outlined in Section 4.6.

### 6.3 PRODUCT LAUNCH

The objective of the product launch is to inform intermediaries and staff of the details of the new product, how it works and the procedures to follow. A briefing and launch pack for the financial press may also be appropriate in some countries.

### 6.3.1 STAFF

Staff briefings on the new product should be tailored to the needs of the staff in question. This means that three or four separate briefing seminars could be required.

For a unit-linked product this might mean seminars for:

- Staff who deal directly with intermediaries. These staff will need to be familiar with all the details of the new product.
- Administration staff who need to be aware of how the administration system for the product works. Underwriting staff may require a separate briefing, particularly if there are new types of add-on insurance benefit being offered under the product.
- Investment department staff who need to be aware of the investment aims of each of the funds available.
- Other staff who are not directly involved with the product.

**Training staff on the new product**

### 6.3.2 INTERMEDIARIES

The main event for intermediaries is normally a product launch seminar introducing the new product. It will also

- identify the target market,
- explain how the product meets the needs of the target market,
- explain the main features of the product, including commission terms and conditions,
- introduce the marketing material and sales aids that are available, including point-of-sale illustration systems,
- provide a point of reference for future enquiries.

**A product launch seminar can clarify the message**

### 6.3.3 PRESS

Coverage of a new product launch in the financial press is common in many countries. A press release and/or briefing is required to ensure that coverage in the press is accurate.

Additional advertising related to the product could be arranged to coincide with the press release.

## 7 LEARNING FROM EXPERIENCE – COMMON PROBLEM AREAS

### 7.1 GUARANTEES

Some policies offer guarantees relating to one or more of the elements of the policy.

#### 7.1.1 INVESTMENT GUARANTEES

These come in various forms, for example:

- The price of a unit is guaranteed to increase by at least x% each year.
- The price of a unit will never go down.
- The value of the policy will never be less than the amount of money put into the policy. (This type of guarantee usually only applies after a period of time).
- The price of a unit will always be at least x% of its highest ever value.
- The maturity value of the policy will be at least premiums paid plus compound interest of x%.

#### **Guarantee implications for policy reserving**

The guarantee has implications for the investments required to back the funds and for policy reserving, as the following examples illustrate.

- The guarantee that the price of a unit will never go down is usually associated with funds invested solely in money-market instruments, and no additional reserve is required in respect of the guarantee.
- The guarantee that the maturity value of the policy will be at least premiums paid plus compound interest of x% has little effect on the investment strategy of the funds (and it may operate at policy level anyway) and an explicit reserve for the maturity value guarantee is held.

#### **Investment guarantees can be difficult to administer**

In general, these sorts of guarantee are rarely invoked and their value is mainly as a marketing tool giving comfort to clients. In the event that the guarantee is invoked, it can become very onerous to administer, and few if any administration systems are able to cope with the complexities of invoked guarantees. As an example, consider the case where a guarantee that the unit price will not fall exists, and that this guarantee has been invoked. For a regular premium policy the system will need to be able to allow for the following:

- The unit price of new units will be the actual unit price allowing for the market value of investments in the fund.
- The price of units being encashed will vary, depending on when they were purchased, so that it is possible to have a number of different unit prices applying to the same policy. This requires either very complex system processing or heavy manual intervention.

In practice, most insurers assume that guarantees will not be invoked and do not design their systems to cope with this eventuality.

### 7.1.2 EXPENSE GUARANTEES

These restrict the charges that the insurer can levy on the policy. As long as the charges actually being levied are not influenced by the restriction, no additional reserves are required.

Where the guarantee is invoked (i.e. the insurer would like to make higher charges but cannot due to the guarantee) prudence (if not regulation) will require the establishment of an additional reserve to cover this shortfall.

### 7.1.3 ADD-ON BENEFIT PREMIUM RATE GUARANTEES

These restrict the charges that the insurer can make for the additional benefits attaching to the policy. Similar considerations to those for expense guarantees apply in respect of any additional reserves for these guarantees.

## 7.2 POLICY REVIEWS

Policies that have current costed add-on insurance benefits (see Section 5.2.6) where the sum at risk is the total sum insured less the value of units usually contain review provisions. This is particularly relevant for policies that have a target maturity value.

### 7.2.1 POLICIES WITH NO TARGET MATURITY VALUE

The maximum level of add-on benefits is usually determined such that the policy surrender value is always at least a certain amount after a certain time. This could be of the form that the surrender value is always at least \$1,000 after five years.

Poor investment performance leads to the difference between the total sum insured and the value of units being larger than expected, and hence the cost of the benefits cover is higher than expected and the maximum benefits that can be supported are therefore lower. At review, if the existing benefits are greater than the maximum supportable benefits, the review provisions give the insurer the right to ask for a higher overall premium if existing benefit levels are to be maintained. Alternatively, the insurer can reduce the current benefits to a level that can be supported by the current premiums.

**Other guarantees may require additional reserves**

**The relationship between investment performance and premiums**

### 7.2.2 POLICIES WITH A TARGET MATURITY VALUE

For a policy with a target maturity value, the maximum level of add-on benefits might be determined such that, for example, the projected maturity value allowing for 7% unit growth is to be at least equal to the target maturity value.

Poor investment performance will mean that the projected maturity value target will not be met and this effect is magnified by the fact that the difference between the total sum insured and the value of units, and hence the cost of the cover, is higher than expected.

The review provisions under this type of policy are more general. This is because a higher overall premium may not be required if a lower than expected target maturity value is acceptable. This will largely depend on the purpose of the policy – for example, if it is to repay a loan or mortgage on maturity, a premium increase would be appropriate.

### 7.2.3 PROBLEMS

- In the case of policies with no target maturity value, clients often do not understand why the current level of benefits cannot be supported in the future.
- In the case of policies with a target maturity value, clients often think that the maturity value is guaranteed and cannot understand why a premium increase is required.

**Premium increases are difficult to explain to clients**

In both cases, the problem is best addressed at the point of sale, but by the time the review comes around, the explanations given have been forgotten. Premium increases at review cause considerable problems with clients and lapse rates show significant peaks following reviews.

### 7.3 SALES METHODS

**Distribution methods influence persistency and the average premium**

The sales method will have a great influence on the quality (i.e. the persistency) and the average premium of the business. The two extremes are:

- High volumes, low premium, low margin, high lapses
- Low volumes, large premium, high margin, low lapses

Of course, anything in between is possible. This is a very important factor in the policy pricing assumptions, and it is a common error to assume that the quality and average premium of the business will not vary by distribution channel.

## 7.4 MISSELLING

Misselling of insurance and investment products has not been confined to unit-linked products. Misselling in general falls under three categories:

- The sale of an inappropriate product
- The use of unrealistic assumptions to illustrate the benefits under the product
- Failure to explain the way the product works, including an explanation of policy factors that are and are not guaranteed or subject to review

In relation to unit-linked products, the potential client should be fully aware that its contract does not guarantee returns (unless otherwise stated) and that point-of-sale illustrations are used only to demonstrate how benefits would be affected under hypothetical investment scenarios. However, intermediaries may be tempted to use unrealistic return assumptions for these illustrations in order to facilitate the sale, especially in a competitive environment. In unregulated markets with no illustration guidelines, some purchasers may be misled into believing that the rates were guaranteed or that there were some minimum guarantees.

Widespread misselling of investment products can result in the local regulator imposing remedial action on the insurers (for example the pensions review in the UK) or in class action lawsuits against them (for example the “vanishing premium” class action in the USA).

The UK pensions review arose from sales of inappropriate products. The “vanishing premium” class action arose from sales of universal-life policies where the high interest rates of the early 1980s were assumed to continue far into the future. As interest rates actually fell, clients were notified that they would have to pay premiums for a longer period of time than illustrated in order to maintain their benefits or achieve their cash-surrender value objectives. In the end, the insurance companies paid heavy fines and illustration guidelines were created.

In the UK the use of investment plans in connection with mortgages has recently been called into question. In this case the point-of-sale illustrations used were very reasonable in the investment climate of the time and did not assume the continuation of historically high investment returns (as in the vanishing premium illustrations). However, it was not clear (or made clear) to clients that the policy did not guarantee to repay their mortgage at maturity. As interest rates have fallen to historic lows, the risk that such policies will not repay the mortgage has increased significantly, but clients have not understood that in order to eliminate this risk, they will have to pay an increased premium.

**How insurance products may be missold**

**The UK pensions review**

To avoid these potential problems, the life insurance regulator may impose rules on the industry relating to some or all of

- the obligations of the intermediary to know its clients' financial position and to document this;
- the rates of return that may be used in illustrations. Certain illustrated rates may be required, for example, 3%, 6%, and 9%, and there may be a maximum rate not to be exceeded, such as 10%;
- the demonstration how the product meets the client's needs, how the product works, the risks associated with the product and their documentation.

### **The main areas of misselling**

In respect of unit-linked business, the rates of return used in point-of-sale illustrations and the nature of the guarantees (if any) on the policy are the main areas where misselling can occur. Life insurers must be very careful in their training of intermediaries in these areas, particularly where there is no local regulation of these issues.

## 7.5 INVESTMENT FUND LINKS

### **The range of investment funds**

Decisions will be needed on which investment fund links to offer. Even in developed markets, the vast majority of money invested in unit-linked products is in managed or balanced funds where the investments are a mix of shares, bonds, property and cash. Specialist funds investing in more unusual types of asset tend to attract little money and are rarely cost-effective for new entrants to the unit-linked market.

## 7.6 UNIT PRICING

### 7.6.1 GENERAL

### **The unit pricing system is usually separate from the main administration system**

The unit pricing module is generally separate from the main administration system and tracks all the investment transactions as part of the process of arriving at a unit price. It is vital that the unit pricing system is accurate and interfaces correctly with the general ledger system where cash transactions are processed. Small rounding errors in the calculation of the unit price can be quickly magnified and result in significant discrepancies between the number or value of units created and the numbers or values of units that should have been created.

### 7.6.2 FREQUENCY OF PRICING

The frequency of unit pricing and whether to use historic or forward prices are further areas requiring careful consideration. Using historic prices means that the price at which a unit can be bought or sold of a unit is fixed for a period.

The period depends on the frequency of unit pricing.

The danger of using historic prices is that clients can use market information since the previous pricing to either buy or sell units. If prices are only recalculated weekly, this gives a big window for either buying cheap or selling dear. It is possible (unless contrary to insurance or other regulations) to adjust unit prices so that this antiselective selling or buying activity has no direct effect on the profitability of the insurer. However, such unit price adjustments will have the effect of magnifying downward unit price movements and diminishing upward movements, with the consequential detrimental effect on the investment performance track record.

The effects of this type of activity can be restricted by reducing the window by having daily or even twice-daily pricing. This is not always practical as unit pricing ties up considerable systems processing resources.

Alternatively, the problem can be eradicated altogether by using forward pricing. Under this mechanism, the unit price is calculated after all the transactions have been completed. This has the obvious disadvantage to the client that the price at which units are bought is not accurately known at the time of purchase.

The subject of unit pricing is dealt with in more detail in a separate paper.

### 7.6.3 ILLIQUID INVESTMENTS

There are occasions when money flows out of certain funds very rapidly – during a stock market crash for example. In this situation, the insurer must be able to realize the investments in the fund to pay the clients. If the investments cannot be readily realized there is a risk that the insurer could be forced to pay the client whilst still holding the investments. If the investments subsequently fall in value before the insurer can sell them, the insurer suffers that loss. This is a particular risk in property funds where a rush of surrenders could force the sale of one or more properties and in the emerging markets where there is no guarantee that shares can be easily bought and sold.

To protect against this risk, many unit-linked policies include a condition that investments in funds where there may be a problem with liquidity could be subject to a delay in encashments or switches to give the insurer the chance to dispose of the relevant assets. The funds to which this rule applies and when the unit price will be determined in such a situation will also be set out in the policy terms and conditions.

### **Problems with historic pricing**

### **Use of forward pricing**

### **Protecting against the need to realize illiquid assets**

#### 7.6.4 TAX

Tax on income is easily allowed for in the calculation of the unit price, but tax on capital gains (if relevant) can be much more complex. The situation in respect of unrealized gains is particularly difficult. If all the investors in a particular fund pulled out at the same time, the assets would have to be sold and an immediate capital gains tax liability on the fund would arise. The tax due would be deducted from the value of the assets before calculating the final unit price.

#### **Deferring capital gains tax**

When there is only a small net turnover of units there will be little or no need to realize assets and little or no capital gains tax liability on the fund would result. In effect the capital gains tax liability on the fund is deferred. The length of time for which it is deferred is a matter of judgement and is usually allowed for in the unit price by using a lower rate of tax on unrealized gains. This rate needs to be carefully monitored to ensure that the fund performance is neither exaggerated nor understated.

It should be noted that in some countries taxation on capital gains and other investment income is not necessarily reflected directly in the fund's unit price.

### 7.7 SYSTEMS

#### 7.7.1 QUOTATION SYSTEMS

#### **Quotation systems and administration systems must be consistent**

The quotation system, or point-of-sale illustration system, needs to produce figures consistent with those produced by the main administration system. Discrepancies between the two are a frequent source of client complaints.

The quotation system is a very powerful marketing tool, particularly in the area of future projected benefits. Most developed markets have gone through a period of "telephone number projection" selling, where the projected benefits are based on grossly unrealistic future investment returns. This has generally led to regulation on maximum permitted projection rates.

#### 7.7.2 ADMINISTRATION SYSTEMS

The administration systems required will inevitably be very complex. Many off-the-shelf software packages are available, but invariably require some degree of customization. Adapting an existing conventional administration system is possible but normally takes longer and is more error prone than using an off-the-shelf package.

#### **Pros and cons of third party administration**

A further alternative is a third party administration agreement, whereby the administration is outsourced to a third party. Under such agreements, a company that already has a suitable administration system carries out policy administration. This could be another insurer or a specialist provider. The advantages of a swift entry to the market via this route need to be weighed against the restrictions imposed on product design. In the longer term, costs and service levels may also become issues.

Whichever solution is chosen, it is important to recognize that very considerable resources, both financial and human, will need to be invested in the development and maintenance of the administration system.

## 7.8 VALUATION AND RESERVING

In general, the reserve held in respect of a unit-linked policy is the value of units allocated to the policy. In some cases, additional reserves are held in respect of guarantees as described above.

Fund management and other ongoing charges are subject to competitive pressures and where an insurer is unable to extract sufficient charges to cover current and future expenses, it is required to set up an additional reserve to cover the shortfall. Such reserves are known as non-unit or sterling reserves to differentiate them from the normal unit reserves.

## 7.9 TRANSITION STRATEGY

The launch of a new product will have an impact on sales of existing products. The loss of sales of existing products must be allowed for in assessing the financial viability of a new product. Equally, there are very likely to be conversions from existing policies to the new policy and it is important to manage this carefully, particularly in relation to the terms on which conversions are allowed and whether any commissions are payable to advisers on conversion. This aspect needs very careful consideration as the new product launch gives advisers a reason to review a client's business. If the new product is suitable and available from other insurers, who will pay commission on the business, it will be difficult to prevent such a switch unless commission is payable on conversions. This is not a major issue for insurers who have a tied-agent system.

### **Additional non-unit reserves**

### **The impact of a new product on existing products**

## 8 SUMMARY

Unit-linked insurance is business where the cash value of the policy can easily be calculated at any time by reference to the assets that the policy has been invested in. The transparent nature of these policies gives them considerable advantages over their conventional counterparts for the client, the intermediary and the insurer:

- The client can see what has happened to the money invested in the policy and can work out the cash value of the policy at any time.
- As such, unit-linked policies are easier for an intermediary to explain to a client than a comparable with-profits policy. This leads to a better understanding by the client of the nature of the investment and as a consequence, the persistency of unit-linked business is often better than the persistency of comparable with-profits products.
- The flexibility of unit-linked policies means that the intermediary can more easily demonstrate how a given combination of benefits can meet the needs of a particular client.
- As the client is in control of the investment strategy for the policy, frequent reviews should be undertaken. This again has a beneficial effect on persistency but is more time-consuming for the intermediary, although it allows the intermediary to have more contact with the client and this may generate further leads or selling opportunities. Also, unit-linked policies allow the client to choose funds that are suitable in relation to its risk tolerance.
- Unit-linked business is capital efficient for the insurer and may be more profitable than other existing classes of business. Introducing unit-linked business may enable the insurer to compete more effectively in its market, particularly against the bancassurers.
- As many product innovations now occur in connection with unit-linked policies, the insurer may also be able to enjoy a (temporary) competitive edge over the rest of the market, if its new unit-linked product incorporates some product innovation.

To successfully introduce unit-linked plans, there should be sufficient critical success factors to make the product viable. This means there should be some of the following: efficient investment markets, a demand for transparent investments, a well-developed insurance market, adequate systems, viable distribution channels, and a good investment track record.

The problems for the insurer in relation to administration systems, investment accounting and investment management should not be underestimated:

- Unit-linked business is a very complex class of business to administer due to the large amounts of current and historic data required to be kept on each policy. Both the administrative processes and the policy administration system are therefore complicated.
- The point-of-sale illustration system will also be complex as a result of the large number of options available to the client.
- In addition, the insurer will require a sophisticated investment accounting and investment management system to ensure that the correct assets are purchased and/or sold to match the investments/surrenders made by the clients.
- The development of these systems can be a time-consuming and expensive exercise which can lead in turn to a very long lead time between the initial decision to launch a unit-linked product and its actual launch. The availability of off-the-shelf administration and investment management packages can shorten this lead time considerably and can even be a cheaper alternative than developing a system from scratch.

Other potential problem areas with respect to unit-linked plans relate to the provision of guarantees, policy reviews, sales methods, misselling, investment fund links, unit pricing, valuation, and the need for a transition strategy when introducing unit-linked funds.

Under a unit-linked product, the insurer must live within the margins of the premium basis. Under a conventional with profits policy, bonus rates can be reduced to cover expense overruns. In the situation where a unit-linked portfolio suffers expense overruns, the insurer can usually (subject to the terms and conditions of the policy) increase the fund management charge. Alternatively, it could value the assets below their market value and use the difference to cover the expense overruns (although this would be clearly detrimental to existing unit holders and in practice would not be acceptable). In both cases, the insurer's investment performance will be depressed, and it will find it very difficult to continue to attract new business if it takes this type of action to cover expense overruns. In practice, the insurer must live within the margins of the premium basis, allowing for any further limitations imposed upon it by market practices.

Despite the expense, the potentially long lead time of introducing unit-linked business and the restrictions on the charges that can be taken to cover expenses, the experience of insurers who have entered this market has been generally very favourable.



## **APPENDIX:**

### **INVESTMENT RETURNS IN SELECTED COUNTRIES**

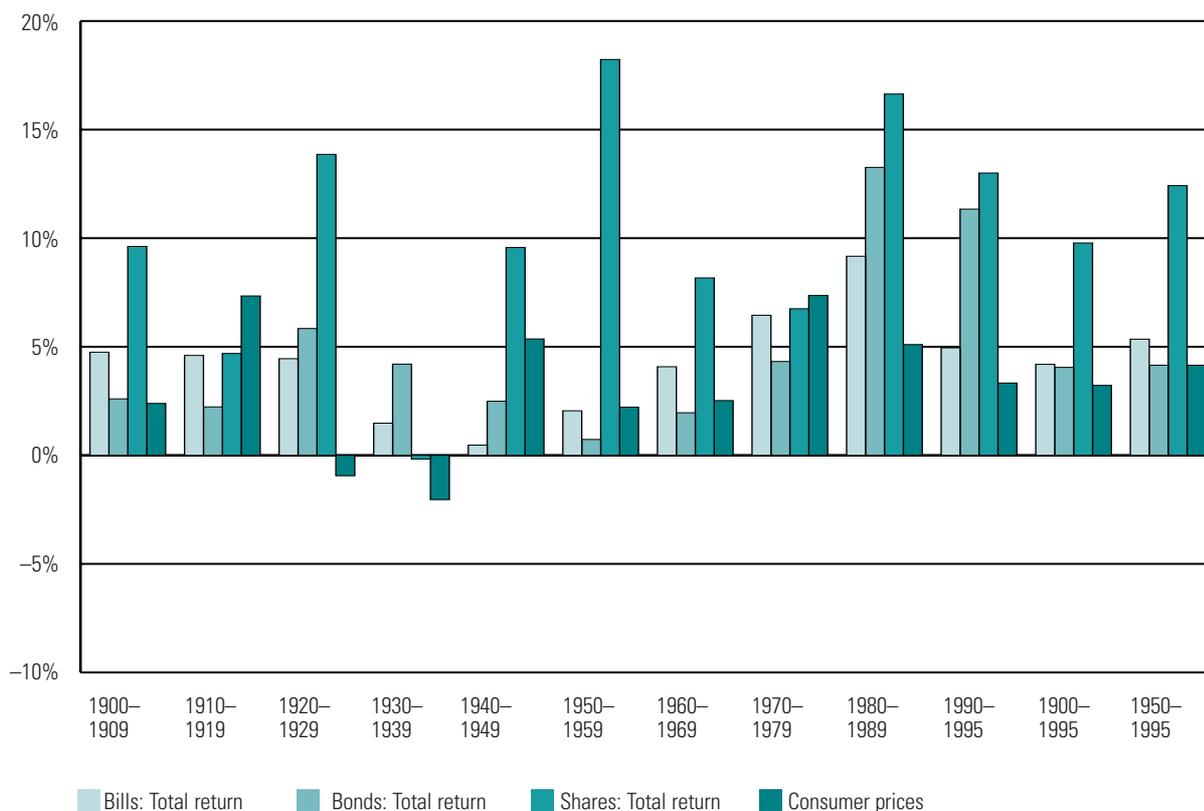
## USA

## AVERAGE ANNUAL RETURNS (in %)

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1900–1909	4.75	2.60	5.52	4.11	9.62	2.39
1910–1919	4.60	2.23	-1.65	6.34	4.69	7.34
1920–1929	4.45	5.84	9.42	4.44	13.86	-0.94
1930–1939	1.48	4.20	-5.26	5.09	-0.17	-2.04
1940–1949	0.47	2.49	2.98	6.59	9.57	5.36
1950–1959	2.05	0.73	13.58	4.65	18.23	2.22
1960–1969	4.08	1.96	4.39	3.78	8.17	2.52
1970–1979	6.45	4.32	1.60	5.14	6.75	7.36
1980–1989	9.17	13.26	12.59	4.04	16.64	5.10
1990–1995	4.95	11.34	9.72	3.28	13.00	3.33
1900–1995	4.19	4.05	4.94	4.84	9.78	3.22
1950–1995	5.35	4.15	8.15	4.27	12.42	4.15

## THE FOUR BEST AND WORST 12-MONTH TOTAL RETURN ON SHARES FROM 1900 (IN YEAR ENDING)

Best year ending	Percentage return	Worst year ending	Percentage return
March 1936	76.15%	September 1931	-47.77%
January 1934	60.95%	September 1974	-41.40%
August 1929	51.94%	December 1937	-38.60%
July 1983	51.80%	September 1930	-38.36%



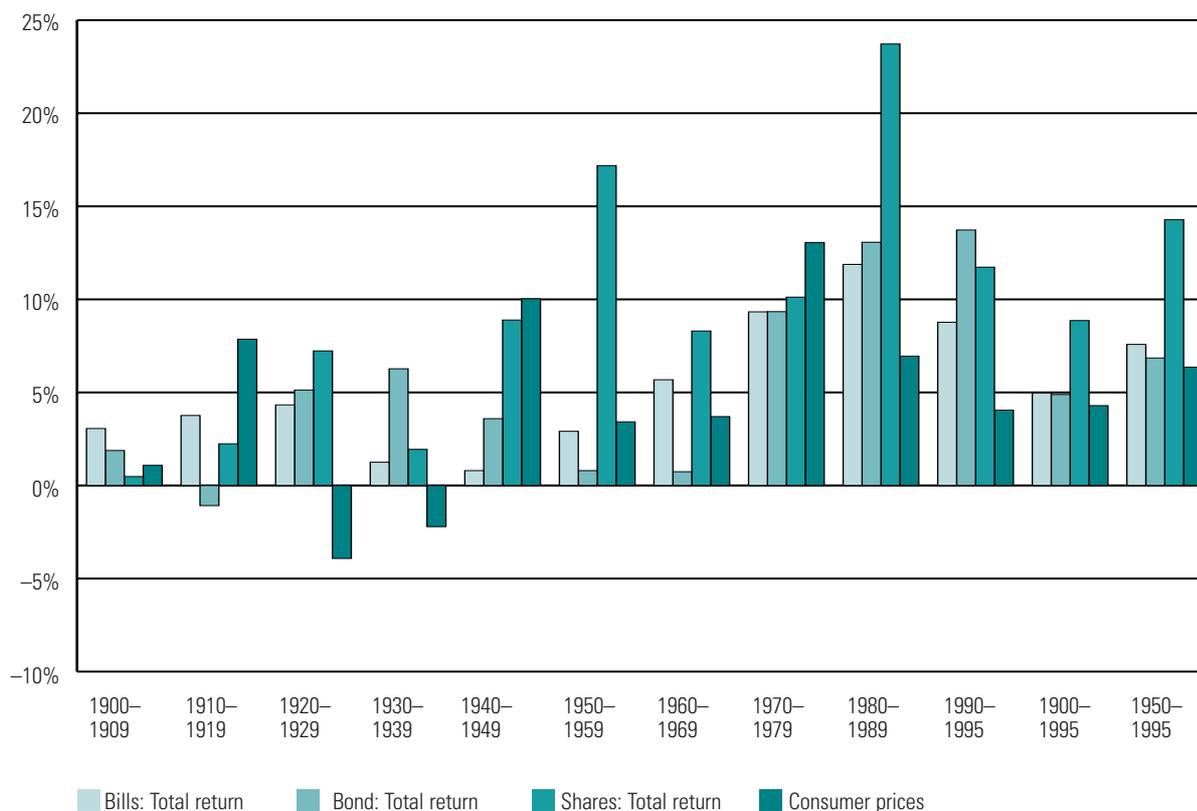
## UK

## AVERAGE ANNUAL RETURNS (in %)

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1900–1909	3.06	1.88	-2.58	3.06	0.48	1.08
1910–1919	3.76	-1.08	-2.00	4.23	2.24	7.86
1920–1929	4.33	5.13	2.25	4.98	7.23	-3.92
1930–1939	1.25	6.27	-2.61	4.54	1.94	-2.21
1940–1949	0.80	3.59	3.63	5.26	8.89	10.03
1950–1959	2.91	0.80	10.66	6.52	17.18	3.42
1960–1969	5.68	0.74	3.26	5.04	8.30	3.70
1970–1979	9.33	9.34	4.54	5.58	10.12	13.05
1980–1989	11.88	13.07	18.02	5.70	23.72	6.95
1990–1995	8.77	13.73	6.95	4.79	11.73	4.05
1900–1995	4.97	4.89	3.92	4.94	8.86	4.29
1950–1995	7.58	6.85	8.70	5.58	14.28	6.36

## THE FOUR BEST AND WORST 12-MONTH TOTAL RETURN ON SHARES FROM 1900 (IN YEAR ENDING)

Best year ending	Percentage return	Worst year ending	Percentage return
December 1975	136.33%	November 1974	-58.99%
October 1977	83.21%	September 1931	-33.51%
January 1976	69.04%	December 1973	-31.36%
February 1972	60.03%	July 1940	-29.64%



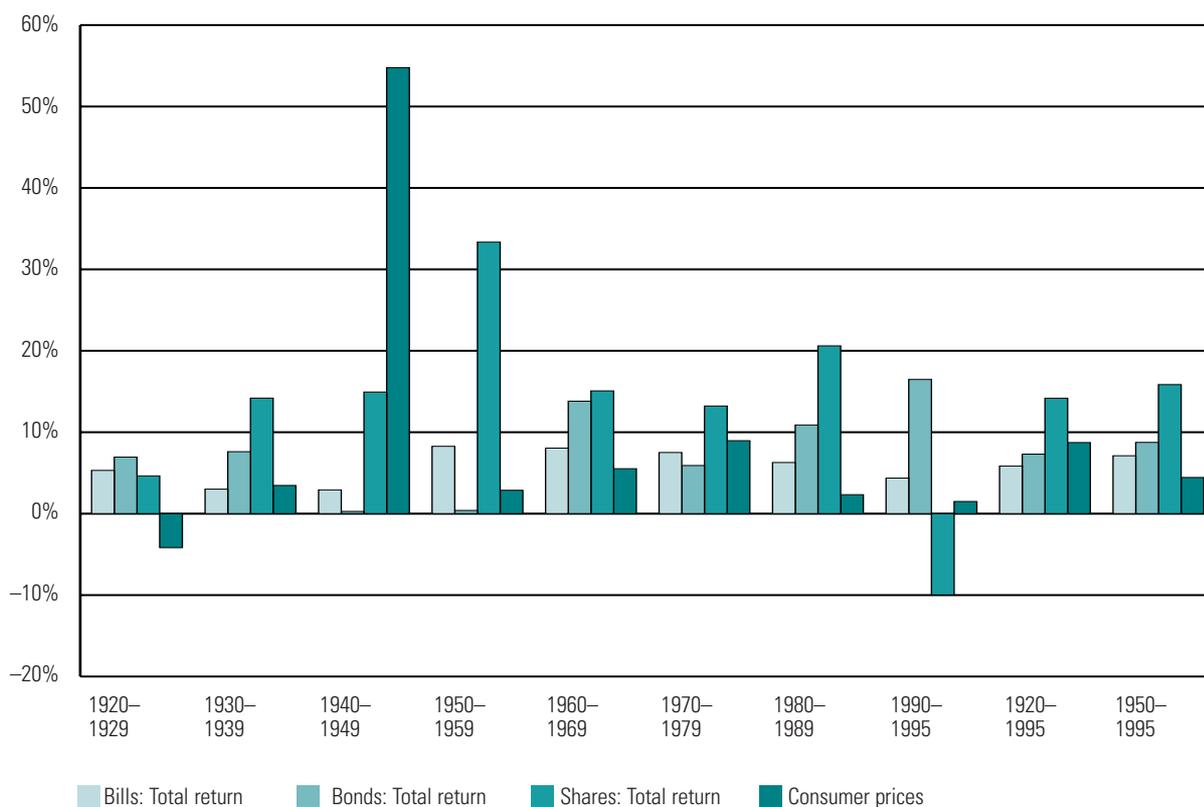
## JAPAN

### AVERAGE ANNUAL RETURNS (in %)

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1920–1929	5.31	6.95	-2.49	7.14	4.64	-4.17
1930–1939	3.01	7.61	7.75	6.44	14.19	3.46
1940–1949	2.92	0.27	9.35	5.59	14.94	54.76
1950–1959	8.27	0.39	23.05	10.30	33.36	2.87
1960–1969	8.05	13.81	10.43	4.65	15.08	5.52
1970–1979	7.51	5.91	10.79	2.44	13.22	8.96
1980–1989	6.28	10.89	19.47	1.14	20.61	2.33
1990–1995	4.37	16.48	-10.60	0.63	-9.97	1.49
1920–1995	5.85	7.31	9.18	5.00	14.17	8.73
1950–1995	7.11	8.75	11.96	3.89	15.85	4.44

### THE TEN BEST AND WORST 12-MONTH STOCK TOTAL RETURNS FROM 1900 (IN YEAR ENDING)

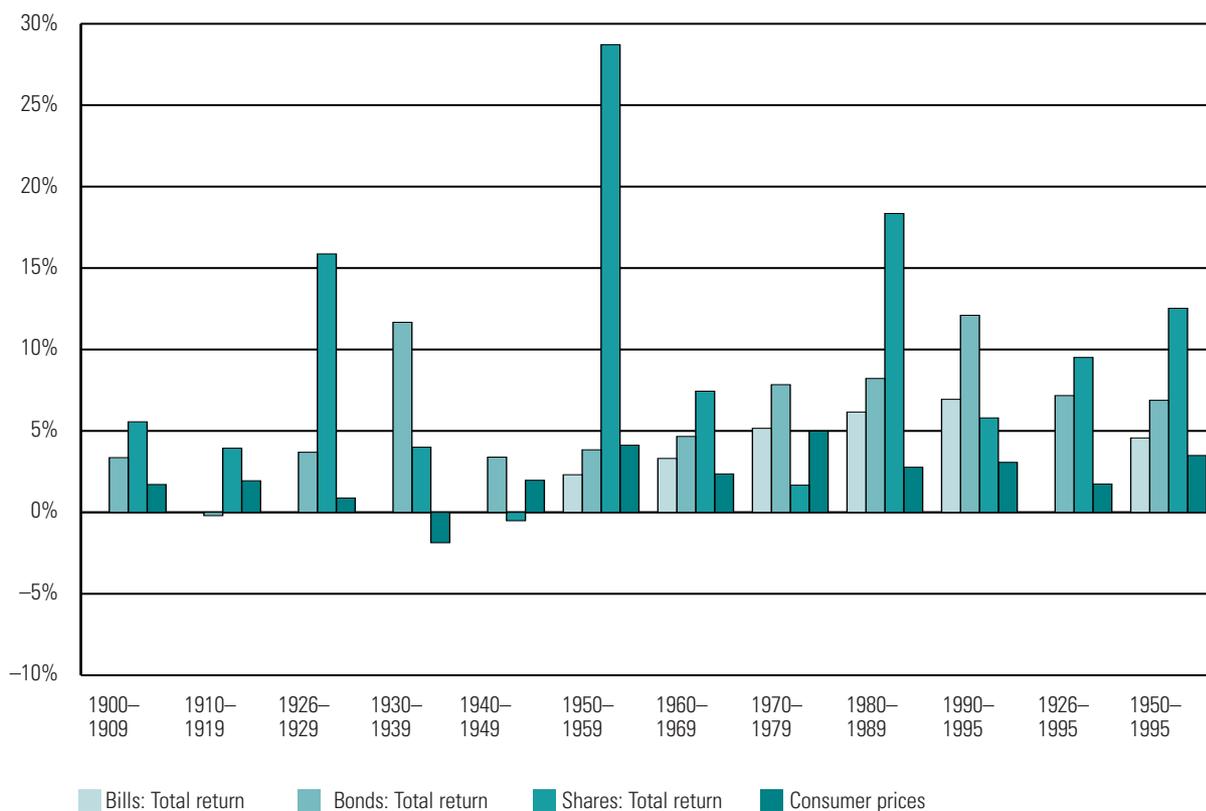
Best year ending		Percentage return	Worst year ending		Percentage return
January	1949	215.51%	October	1920	-53.57%
November	1948	149.19%	January	1921	-49.67%
January	1953	140.55%	May	1950	-46.62%
November	1952	123.13%	July	1946	-44.37%



**GERMANY**

## AVERAGE ANNUAL RETURNS (in %)

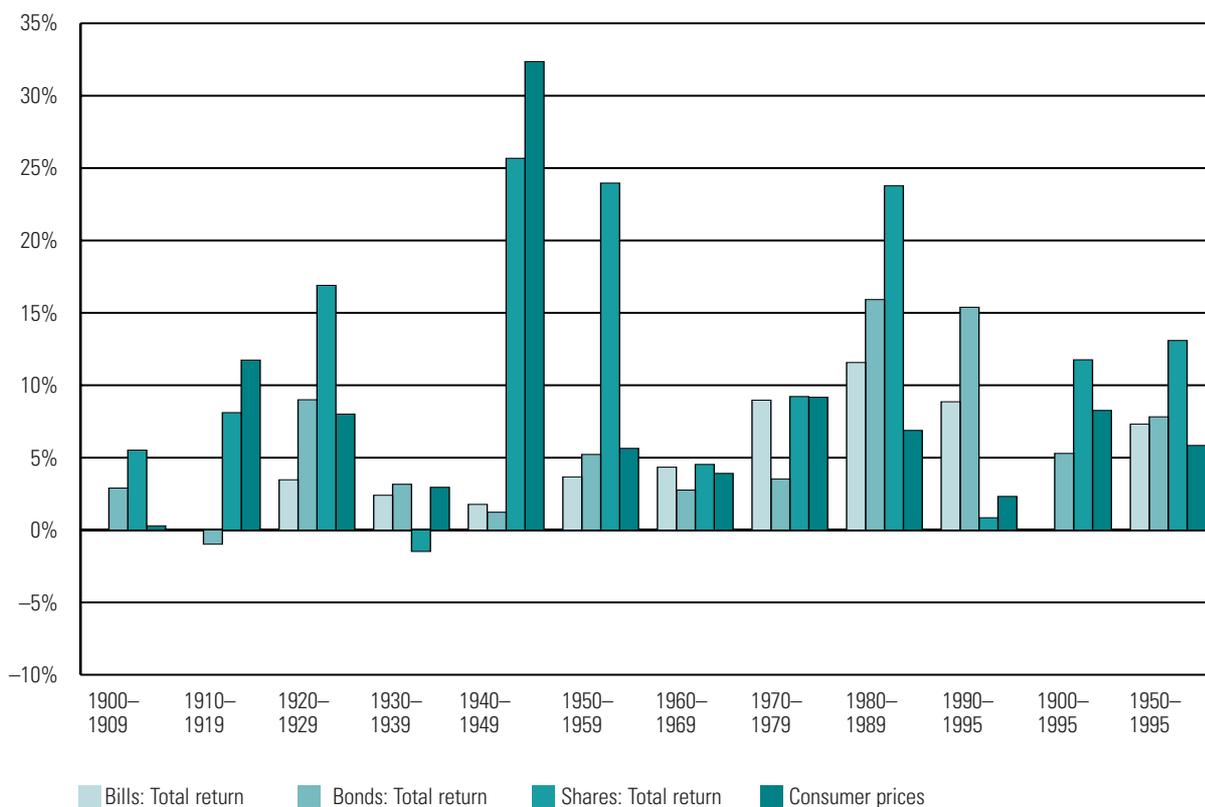
Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1900–1909		3.36	0.33	5.22	5.56	1.71
1910–1919		-0.20	-1.40	5.34	3.94	1.94
1926–1929		3.69	9.01	6.86	15.87	0.88
1930–1939		11.67	-0.45	4.46	4.00	-1.86
1940–1949		3.39	-4.10	3.59	-0.51	1.97
1950–1959	2.31	3.84	25.22	3.48	28.71	4.12
1960–1969	3.31	4.66	4.07	3.37	7.44	2.36
1970–1979	5.16	7.84	-2.21	3.89	1.67	4.99
1980–1989	6.16	8.22	13.66	4.69	18.35	2.77
1990–1995	6.94	12.10	3.91	1.91	5.80	3.07
1926–1995		7.17	5.53	3.97	9.51	1.74
1950–1995	4.57	6.88	8.93	3.60	12.53	3.49



**FRANCE**

**AVERAGE ANNUAL RETURNS (in %)**

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1900–1909		2.90	1.44	4.08	5.52	0.29
1910–1919		-0.98	4.08	4.03	8.11	11.74
1920–1929	3.47	9.00	12.95	3.95	16.90	8.01
1930–1939	2.40	3.16	-5.39	3.91	-1.48	2.95
1940–1949	1.77	1.23	23.63	2.06	25.68	32.36
1950–1959	3.67	5.22	19.14	4.83	23.97	5.64
1960–1969	4.34	2.76	1.45	3.08	4.53	3.91
1970–1979	8.97	3.53	3.17	6.06	9.22	9.17
1980–1989	11.57	15.92	17.83	5.95	23.78	6.88
1990–1995	8.86	15.39	-3.21	4.06	0.85	2.32
1900–1995		5.29	7.54	4.22	11.76	8.26
1950–1995	7.32	7.82	8.26	4.83	13.09	5.84



**ITALY****AVERAGE ANNUAL RETURNS (in %)**

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer Prices
1925–1929	3.56	0.67	–2.84	3.23	0.39	1.52
1930–1939	4.93	6.05	1.86	4.62	6.48	0.34
1940–1949	5.02	4.77	27.86	2.52	30.38	46.54
1950–1959	3.55	3.94	17.11	6.36	23.47	3.06
1960–1969	3.74	3.41	–0.15	4.18	4.03	3.44
1970–1979	11.21	4.17	–5.89	3.60	–2.28	13.08
1980–1989	15.83	18.30	23.62	2.67	26.30	10.60
1990–1995	14.64	13.65	–2.53	2.67	0.15	5.21
1925–1995	7.88	6.84	7.72	4.11	11.83	10.65
1950–1995	9.24	8.09	6.57	3.99	10.56	7.16

**CANADA****AVERAGE ANNUAL RETURNS (in %)**

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1934–1939	0.22	5.48	3.00	3.12	6.12	0.89
1940–1949	0.47	5.29	2.48	5.96	8.44	4.43
1950–1959	2.11	–3.12	8.33	4.94	13.27	2.44
1960–1969	4.54	1.46	6.27	3.61	9.88	2.60
1970–1979	7.27	5.58	5.92	4.49	10.41	7.57
1980–1989	11.86	14.14	8.15	4.10	12.25	6.22
1990–1995	7.79	14.10	2.90	3.18	6.09	2.42
1934–1995	4.95	5.86	5.77	4.55	10.33	4.11
1950–1995	6.56	5.55	6.60	4.13	10.73	4.39

**AUSTRALIA****AVERAGE ANNUAL RETURNS (in %)**

Years	Bills Total return	Bonds Total return	Shares Capital growth	Shares Dividend yield	Shares Total return	Consumer prices
1900–1909		1.59	6.85	6.70	13.54	–1.88
1910–1919		0.36	2.72	6.96	9.69	8.46
1920–1929		6.36	7.31	8.08	15.39	0.41
1930–1939	0.51	8.56	3.83	6.32	10.15	–1.01
1940–1949	1.22	5.39	4.09	6.01	10.10	5.32
1950–1959	1.38	–0.13	8.10	7.16	15.26	6.42
1960–1969	3.77	3.19	7.69	6.26	13.95	2.48
1970–1979	7.29	3.38	1.24	8.11	9.35	10.12
1980–1989	14.16	11.39	12.67	5.00	17.67	8.31
1990–1995	8.42	14.15	4.95	4.58	9.52	3.01
1900–1995		4.98	5.94	6.59	12.55	4.13
1950–1995	6.79	5.60	7.03	6.39	13.42	6.29

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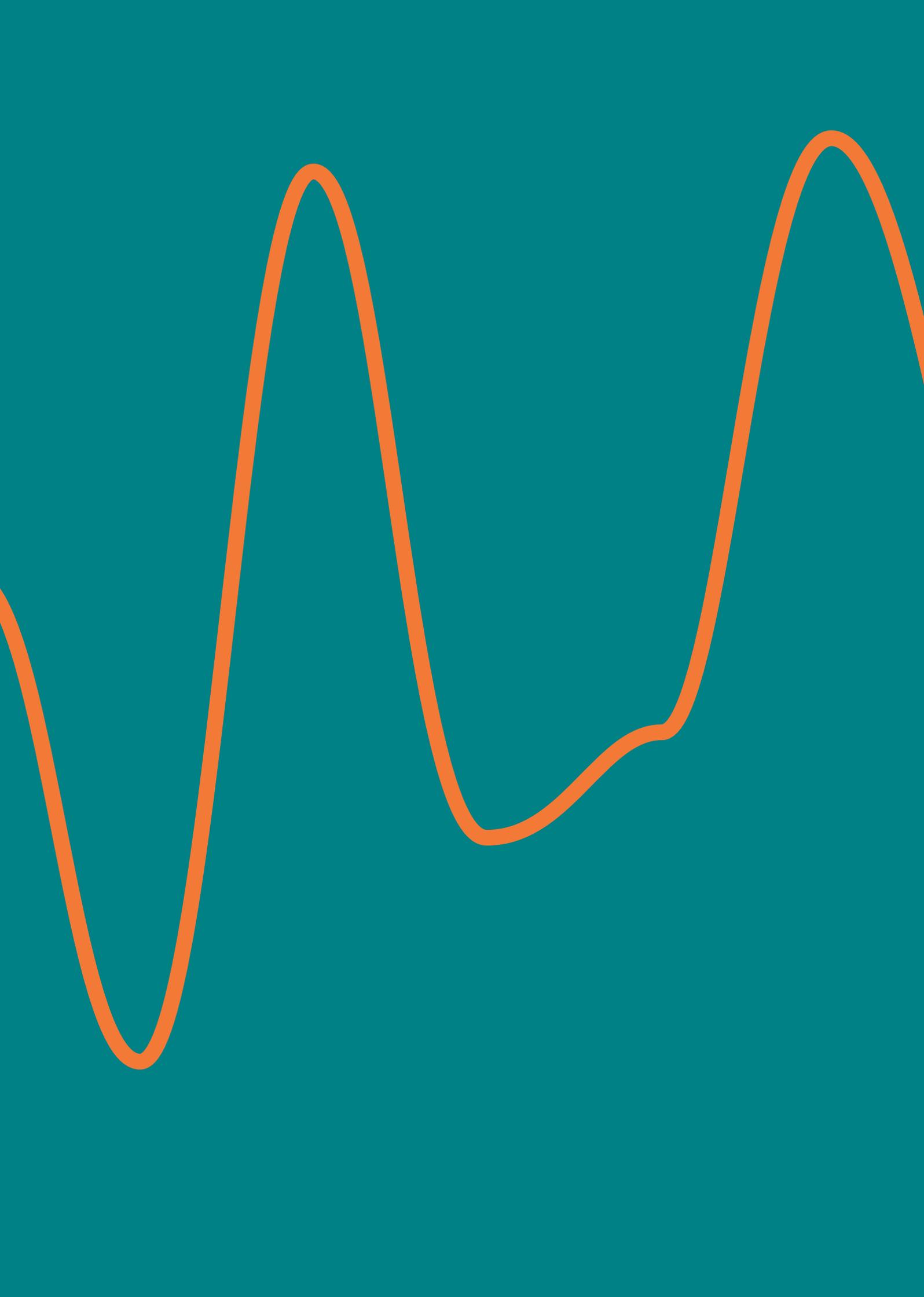
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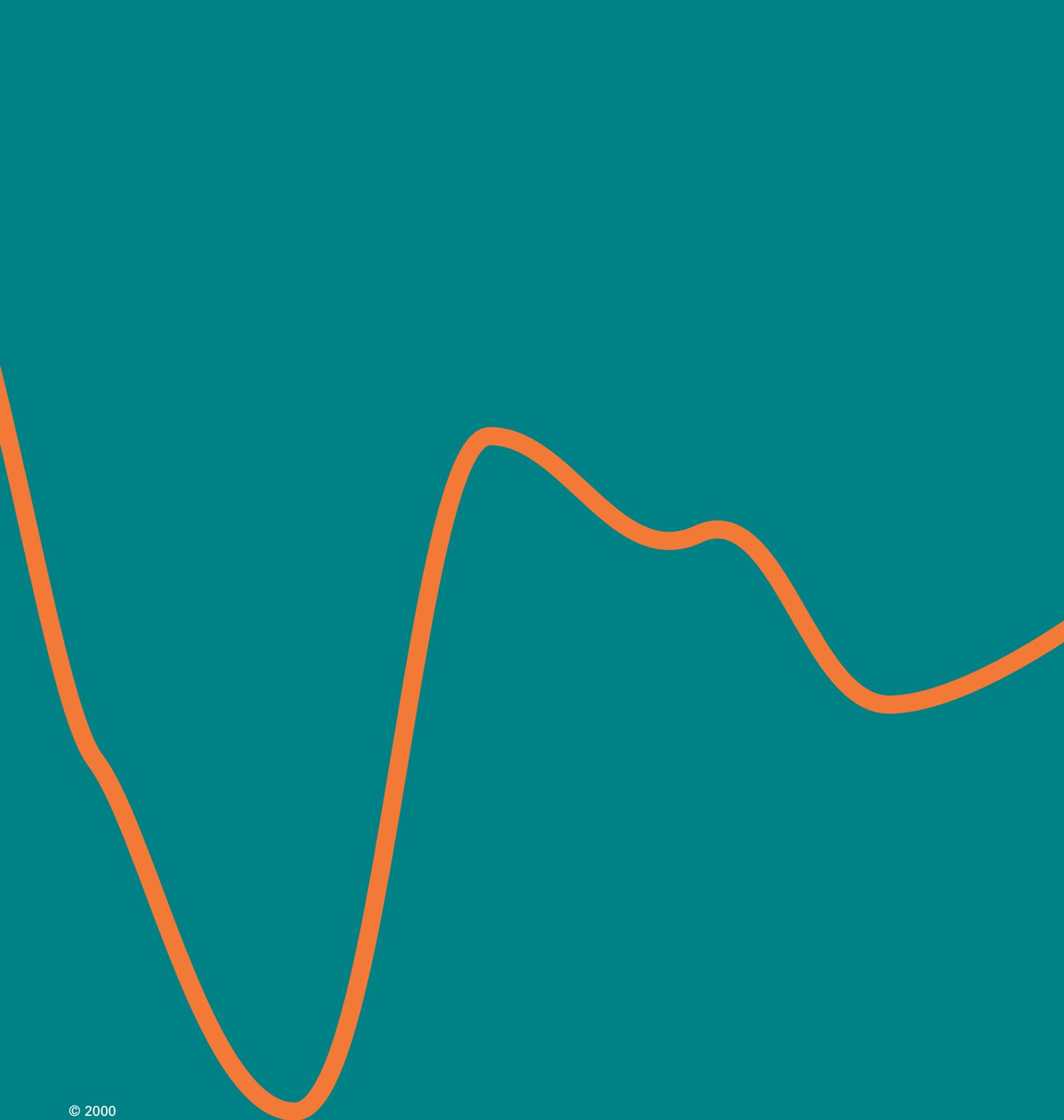
### Abbreviations used:

JIA Journal of the Institute of Actuaries

SS Institute of Actuaries Students' Society paper







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Münchener Rückversicherungs-Gesellschaft  
Central Division: Corporate Communications

Königinstrasse 107

80802 München

Germany

Tel.: +49 (0)89/38 91-0

Fax: +49 (0)89/39 90 56

<http://www.munichre.com>

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Order number 302-02740