AN ECONOMIC ANALYSIS OF THE TAXATION AND REGULATION OF LIFE INSURANCE IN AUSTRALIA

by

Ian Ross Harper

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This thesis is my own work.

Ian R. Harper
To my wife, Roslyn, for her patience, support and encouragement.
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I.R.H.
ABSTRACT

In matters of taxation and regulation, it is widely considered that life insurance warrants special treatment. This view derives not so much from the desire to subsidize life insurance as from the belief that there is something inherently special about life insurance. This thesis sets out to challenge the notion that there is anything inherently special about the economics of life insurance. In particular, it disputes the belief that life insurance warrants special treatment in matters of taxation and regulation. Insurance is depicted as a process of trade in contingent claims and a theoretical model of life insurance is constructed on this basis. The model is an application of the Arrow-Debreu Complete Contingent Markets model. It extends the work of Marshall (1974a, b) by incorporating transaction costs in the manner of Foley (1970) and develops the special case of life insurance using a result due to Malinvaud (1972, 1973). The conclusion emerges from the model that the economics of life insurance is fundamentally no different from the economics of any other productive activity. This conclusion provides the basis for a critical assessment of the current taxation and regulatory treatment of life insurance in Australia. Options for the reform of life insurance taxation are discussed as well as the recommendations of the recent (Campbell) Committee of Inquiry into the Australian Financial System in respect of the taxation and regulation of life insurance.
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In matters of taxation and regulation, it is widely considered that life insurance warrants special treatment. This view derives not so much from the desire to subsidize life insurance as from the belief that there is something inherently special about life insurance. In the case of taxation, the "special nature" of life insurance is thought to pose particular and complex problems for the taxation of income generated through life insurance companies. Thus, in a submission to the (Campbell) Committee of Inquiry into the Australian Financial System, the Commonwealth Treasury comments (Commonwealth of Australia, 1980a, p. 24, emphasis added):

"Although life offices are companies they are, because of the nature of life insurance business, different in significant respects from other companies. These differences make it difficult to devise income tax arrangements for life offices which dovetail neatly into the rest of the income tax system".

The industry itself regards taxation of life insurance as raising special problems. In its submission to the Campbell Inquiry, the Life Insurance Federation of Australia remarks (LIFA, 1979, paras. 5.2.3 and 5.2.4, pp. 48-49):

"The apparent complexities of the subject arise from aspects of life insurance for which there are no direct parallels in other commercial undertakings, in particular -
the long-term nature of life insurance contracts and the resultant obligations extending many years into the future;

- the practice of setting level annual premiums ... [and]

- the allocation of the bulk of any financial surplus in the form of a deferred benefit to policyholders who, therefore, play a role as both customers and stakeholders in the business.

Such features pose conceptual problems for any taxing system irrespective of its underlying logic ...".

With respect to regulation, the "special nature" of life insurance has been used to defend the setting up of special regulations to govern life insurance business. In almost every case, these regulations provide protection for life insurance policyholders which is additional to that already provided by the general law governing companies and contracts. A good example of the standard view is that put forward by Gray (1977, p. 170):

"Life insurance has characteristics which make it different from the general run of commercial transactions. Policies of life insurance are usually effected for the purpose of family protection. The sums payable under policies can have a material effect on the position of widows, orphans and people whose working years have ended. Apart from the family home, life insurance policies frequently represent the most important savings of many families. The consequences of maladministration are, therefore, unusually serious .... Practically no policy owners are in a position to determine whether [the reserves held by a life insurance company to secure its policy liabilities are] adequate. Further, [reserves which are] adequate may be squandered by the unskilful, plundered by the unscrupulous or not adequately protected by the weak .... The life insurance contract usually runs for a long term of years, and a policy owner cannot readily take his existing policies from one life company, should he be dissatisfied with it, to another .... Because of such considerations, a statutory supervision of life insurance is to be found in all countries where it is transacted to any extent. It has been considered insufficient to rely solely on the general law concerning companies and contracts".

This thesis sets out to challenge the notion that there is anything inherently special about the economics of life insurance. In particular,
it disputes the belief that life insurance warrants special treatment in matters of taxation and regulation.

The argument begins in Chapter 2 with a general discussion of the economics of insurance. Two views of insurance are presented: that of insurance as the accumulation of reserves (Willett, 1901), and that of insurance as trade in contingent claims (Marshall, 1974a, b). The contingent claims model of insurance is adopted, and developed in Chapter 3 within the general equilibrium framework of Arrow (1953) and Debreu (1959). It is then extended to include proportional transaction costs along the lines of Foley (1970). This extension enables the introduction of the insurance firm as a broker of contingent claims (Marshall, 1974a). In Chapter 4, the general model developed in Chapter 3 is specialized to the case of life insurance, and certain results derived with the help of a model by Malinvaud (1972, 1973). These first three chapters provide the theoretical framework within which the central argument of the thesis is conducted.

Chapters 5, 6 and 7 are devoted to a discussion of the taxation of life insurance in Australia. Chapter 5 provides a summary of the current tax law as it relates to life insurance companies and life insurance policyholders. Chapter 6 draws on the theoretical discussion of Chapter 4 to establish that there is nothing inherent in the economics of life insurance which warrants its special tax treatment. Moreover, it demonstrates that, with the aid of the theoretical framework, the perceived complexity of life insurance taxation disappears. Chapter 7 discusses options for tax reform in the light of the conclusions of
Chapter 6. In particular, it discusses the proposals put forward by the recent (Campbell) Committee of Inquiry into the Australian Financial System for the reform of life insurance taxation in Australia.

Chapters 8 and 9 consider the regulation of life insurance in Australia. Chapter 8 summarizes the main provisions of the Life Insurance Act 1945. This Act is the principal instrument regulating the conduct of life insurance business in Australia. Some consider the 30/20 rule to serve a regulatory function; this rule forms part of the tax law governing life insurance and is accordingly discussed in Chapter 5. Chapter 9 uses the theoretical framework developed in the early part of the thesis to assess the regulation of life insurance. The view which emerges from the theoretical analysis is that there is nothing inherently special about the economics of life insurance. This conclusion is used to dispute the special regulation of life insurance in Australia. Once again, the relevant recommendations of the Campbell Inquiry are discussed.

Previous research on the topic of this thesis is virtually non-existent. Apart from two recent Treasury documents, one a submission to the Law Reform Commission (Commonwealth of Australia, 1979) and the other a submission to the Campbell Inquiry (Commonwealth of Australia, 1980b), there has been no serious attempt to analyse the regulation of life insurance in Australia. The situation regarding taxation is somewhat better; what the literature lacks in scope, it makes up in depth. Again, there is a very useful submission by Treasury to the Campbell Inquiry (Commonwealth of Australia, 1980a). Unfortunately, the major
review of Australia's taxation system undertaken by the Taxation Review (Asprey) Committee (Commonwealth of Australia, 1975) all but ignores taxation of life insurance. This is because the Committee recommends that, "... a review of the taxation aspects of life insurance be undertaken by a separately-constituted committee ..." (p. 379). The main reference on taxation is a Master of Commerce thesis by R.W. Nottle (1978). Nottle's work is encyclopaedic; he provides a comprehensive overview of various systems used to tax life insurance both in Australia (since 1915) and in a number of overseas countries. In addition, he attempts to assess the validity of these systems against certain "benchmark" systems developed by him.

The difficulty with Nottle's work is that it is firmly premised on the belief that there is something special about life insurance. This is partly a reflection of his broad approach to the topic; rather than conduct a purely economic analysis, Nottle adopts an approach which, "... [draws on] a wide range of disciplines [including] accounting, actuarial science, economics, history, law and politics" (Nottle, 1978, pp. v-vi). It is partly also a reflection of his concern for institutional and other constraints which characterize the real world. The approach adopted in this thesis, on the other hand, is purely economic. Moreover, the argument is conducted throughout at the conceptual level. Its aim is to establish the validity of a specific proposition. Since this proposition contradicts the basic premise of Nottle's work, there is very little to be borrowed from his analysis. Nevertheless, his thesis remains a rich source both of historical and of descriptive detail.
The conclusions of this thesis bear directly on issues considered by the recent (Campbell) Committee of Inquiry into the Australian Financial System. Indeed, the importance of the subject is supported by the considerable space devoted to the issues in the Committee's Final Report (Commonwealth of Australia, 1981). It is for this reason that the recommendations of the Committee in respect of taxation and regulation of life insurance are discussed in some detail in Chapters 7 and 9, respectively.

While this thesis is concerned solely with life insurance, its main conclusion applies equally well to general insurance. The decision to concentrate on life insurance reflects the simple fact that, historically, taxation and regulation of life insurance have been more prominent issues than any raised in connection with the special treatment of general insurance.²
The economics of insurance is a relatively neglected topic. It is some indication of this neglect that for many years the only significant work in the area was that of Allan H. Willett (1901). More recently, the subject has received closer attention. In an article surveying the economics of uncertainty and information, Hirshleifer and Riley (1979) provide an extended discussion of insurance markets, "... in order to illustrate ... a number of the salient issues of uncertainty theory" (p. 1386).

Of the recent work done on the economics of insurance,¹ by far the greater part has concerned itself with the twin phenomena of "moral hazard" and "adverse selection". Beginning with the work of Arrow (1963), a small but growing literature has developed.² In part, this reflects an increasing interest within the profession generally in the analysis of the role of incentives in economic activity. While these questions are of obvious importance, they have no direct bearing on this thesis. As noted in Chapters 6 and 9, respectively, the existence of "moral hazard" and "adverse selection" cannot be used to defend the special taxation or regulatory treatment of life insurance.

Of that part of recent work done on the economics of insurance which is not concerned with the problems of moral hazard and adverse selection, a major contribution is the work of John M. Marshall (1969, 1974a,b).
Marshall was amongst the first to develop a view of insurance which broke with the traditional view formulated by Willett (1901). The ideas of Marshall form the basis of the theoretical model developed in the following two chapters of this thesis. The present chapter is devoted to an exposition of the two views of insurance.

2.1 Insurance as the Accumulation of Reserves

According to Willett (1901, p. 72):

"We should define insurance ... as that social device for making accumulations to meet uncertain losses of capital which is carried out through the transfer of the risks of many individuals to one person or to a group of persons. Wherever there is accumulation for uncertain losses, or wherever there is a transfer of risk, there is one element of insurance; only where these are joined with the combination of risks in a group is the insurance complete".

The salient features are therefore: (i) the accumulation of reserves to meet uncertain losses, (ii) the transfer of risks and (iii) the combination of risks.

Individuals and firms who face the risk of loss lay up reserves. "[The] fruit-dealer who at irregular intervals suffers loss through decay must add to the price of his fruit enough to cover such uncertain loss" (Willett, p. 71). While such reserves may be accumulated by the individuals and firms themselves, Willett does not regard such self-insurance as constituting "a complete conception of insurance" (pp. 71-72). It is usual, and indeed more efficient for individuals and firms to transfer their risks to others. The others levy a fee for accepting the risks out of which they accumulate reserves on behalf of all the risks combined. The gain in efficiency which results from the
combination of risks is due to the fact that the reserves required to indemnify the aggregate risk are smaller than the sum of the reserves required to indemnify each risk individually. This property is in turn due to the operation of the laws of large numbers.

Assume that each of a group of n individuals is faced with an independent risk of incurring a loss L with probability \( \pi \). Let \( k \) denote the number of losses which actually occur within the group. In order to indemnify his own risk, an individual needs to set aside reserves equal in value to L. If each individual self-insures in this way, total reserves set aside by the group are equal in value to \( nL \). An individual may, on the other hand, transfer his risk to an insurer. If each individual transfers his risk, the insurer must set aside sufficient reserves to indemnify the aggregate risk. The insurer knows from the weak law of large numbers\(^3\) that the probability of the average actual loss, \( kL/n \), lying outside an arbitrary neighbourhood of the expected loss, \( n\pi L \), is arbitrarily close to zero for sufficiently large \( n \). Choosing an arbitrary \( \delta > 0 \), the insurer charges each individual a premium equal to \( (\pi + \delta)L \), thereby creating reserves equal to \( n(\pi + \delta)L \). He is then assured by the weak law of large numbers that the probability that \( \left( \frac{k}{n} - \pi \right) > \delta \) or \( kL > n(\pi + \delta)L \) (the group loss exceeds his reserves) is within an \( \varepsilon \)-neighbourhood of zero \( (\varepsilon(n, \delta) > 0) \). When \( n \) is large, \( \varepsilon \) and \( \delta \) will be small. The effect of the transfer and combination of risks is to reduce the size of the reserves required to indemnify the group loss from \( nL \) to \( (\pi + \delta)nL \). The existence of insurance is therefore explained by the need to indemnify loss and the economies which are available in this process.
through the transfer and combination of risks. This view of the insurance process will be referred to as the reserves view of insurance.

The reserves view of insurance explains why certain risks (e.g., the risk of large-scale catastrophe) are not insured: such risks do not obey a law of large numbers. In other words, the insurer would require reserves no smaller than the sum of those required to indemnify such risks individually. Since there is no gain available from the transfer and combination of such risks, they are by Willett's definition "uninsurable".

Under the reserves view of insurance, the role of the insurance firm is that of fund manager. It accepts and combines risks into a single fund, and manages the reserves necessary to indemnify the aggregate risk which it bears. The reserves view of insurance and the managerial role of the insurance firm are both enshrined within the insurance literature. This literature is concerned particularly with the procedures for establishing reserves appropriate to different types of risk and with the efficient management of these reserves once they have been established.

2.2 Insurance as Trade in Contingent Claims

A totally different view of the insurance process emerges from the work of Marshall (1969, 1974a,b). Founded upon the pioneering efforts of Arrow (1953) and Debreu (1959), Marshall's approach, "... passes over the fund and the management of insurance firms while stressing the
reciprocity and mutuality of insurance contracts" (Marshall, 1974a, p. 670). In Marshall's view, insurance is a process of trade in contingent claims.  

Trade in contingent claims may be illustrated with the help of an example constructed by Marshall (1974b, p. 478) and a diagram drawn originally by Brainard and Dolbear (1971, p. 361). The example considers the case of two individuals, a farmer and a hunter, and two possible states of Nature, prosperity and famine. The hunter has the same endowment in both states, but the farmer has a high endowment in the case of prosperity and a low endowment in the case of famine. The situation is depicted in Figure 1 using the familiar Edgeworth box diagram. The dimensions of the box represent the social totals of goods available for consumption in each of the two states. The 45° lines represent positions of certainty for the two individuals, respectively. The indifference curves are drawn convex to their respective origins as implied by the risk-aversion of each individual.  

The social endowment point is shown as D in the diagram. This is a point on the hunter's 45° certainty line representing the fact that the hunter's consumption possibilities are independent of which state should eventuate. Point D represents a position of risk for the farmer, however, since his consumption possibilities vary with the state of Nature. Risk-aversion on the part of the farmer leads him to seek a position of greater certainty; he wishes to "insure". At the same time, the hunter is prepared to relinquish his position of certainty provided he receives adequate compensation. Clearly there is scope for mutually advantageous trade.
Consumption in Famine

Consumption in Prosperity

Figure 1
The farmer offers the hunter claims to consumption which are valid only in the event of prosperity. In exchange, the hunter offers the farmer claims to consumption which are valid only in the event of famine. Such a process of trade in contingent claims eventually leads to an equilibrium position within the lens-shaped "region of mutual advantage". The point C on the contract curve TT in Figure 1 is such an equilibrium position. At C, the farmer enjoys much greater certainty of consumption than at the social endowment point, D. The hunter, on the other hand, is exposed to risk, which was not the case at D. He is still better off at C than at D, however, since he has more than adequate compensation for the risk he bears at C in the terms of trade offered him by the farmer.

The terms of trade at C are given by the slope of the price line, AB. They are agreed to by both parties after initial negotiation. The slope of AB indicates the number of claims to consumption in prosperity which the farmer must sacrifice in order to obtain a given number of claims to consumption in famine from the hunter. The sacrifice of claims to consumption contingent upon prosperity is equivalent to the payment of an insurance "premium" by the farmer, and the receipt of claims to consumption contingent upon famine equivalent to an insurance "indemnity".

In this example, the ratio of the indemnity to the premium is smaller than the ratio of the probabilities of the two states, prosperity and famine. As noted, the former is depicted as the slope of the line AB in Figure 1. The latter is depicted as the slope of either individual's indifference curves at the point of intersection with their respective
The fact that the indemnity/premium ratio is smaller than the ratio of the probabilities explains why the hunter is prepared to insure the farmer. For if

\[-(\Delta C_f^f/\Delta C_p^p) = \frac{\pi_p}{\pi_f}\]

where

\[
\Delta C_f^f = \text{the increase in the farmer's consumption in famine (the "indemnity")}
\]

\[
\Delta C_p^f = \text{the decrease in the farmer's consumption in prosperity (the "premium")}
\]

\[
\pi_p = \text{the probability of prosperity}
\]

\[
\pi_f = \text{the probability of famine}
\]

then

\[
\pi_p \cdot \Delta C_p^f + \pi_f \cdot \Delta C_f^f < 0.
\]

That is, the mathematical expectation of the farmer's insurance is negative. The farmer "pays" for his insurance by accepting a gamble offered by the hunter which is biased in the hunter's favour. This is consistent with the hunter being a risk-averse individual like the farmer. He can only be induced to bear risk by being offered a risk premium which raises the certainty equivalent of the gamble.

The point C, being a point on the contract curve TT, represents a Pareto optimal allocation of contingent consumption between the two
traders. It may also be interpreted as a point at which the aggregate risk faced by this society is shared optimally between its two members. Indeed, this is the interpretation placed upon insurance when viewed as trade in contingent claims. It is interpreted as a process by which the mutual sharing of risks amongst the members of a society is arranged, each participating freely in the process and receiving rewards commensurate with risks borne.

It is important to note that the risk discussed in this example is social risk. The two states, prosperity and famine, are social states. Individuals may or may not be affected (as in the example), but the aggregate social outcome is uncertain. In this case, trade in contingent claims results in the optimal sharing of the social risk amongst the various members of society.

There is a special case in which the social outcome is certain, even though individual outcomes are uncertain. This is the case of pure individual risk. It may be illustrated as in Figure 2, again using the Edgeworth box diagram. The hunter and the farmer are now assumed to have fixed initial incomes. They both face the risk, however, that a hazard (say, accidental injury) will impose a fixed loss on exactly one of them (with probabilities fixed but not necessarily equal for each individual). There is individual risk without social risk; thus, the Edgeworth box is drawn square to reflect the fixed social total of goods available for consumption. The two states of Nature are, respectively, "loss strikes hunter" and "loss strikes farmer". The two 45° certainty lines familiar from Figure 1 have merged to become the single 45° main diagonal in Figure 2. Each individual's risk-aversion leads him to seek out a position of certainty in preference to his uncertain initial situation;
Loss Strikes Hunter

Figure 2
and, unlike the case of social risk, there is an arrangement by which both individuals can achieve positions of certainty.

Beginning at the social endowment point, D, each individual seeks to exchange income in his non-loss state (the "premium") for compensation to be received in his loss state (the "indemnity"). Since both individuals have equal initial incomes and both face the risk of losing the same fixed amount, both can achieve positions of certainty by agreeing to offset each others' losses. Such mutual insurance is depicted in Figure 2 as a move from the social endowment point, D, to the equilibrium position, C. Since C lies on the 45° main diagonal, which is also now the contract curve, the common slope of the two traders' indifference curves through C is equal to the ratio of the probabilities of the two states of Nature. Thus, the indemnity/premium ratio is equal to the ratio of the probabilities and the gamble upon which the traders eventually agree is "actuarially fair".

If both individuals achieve positions of certainty through mutual insurance, then it must be true for each that

\[ w - p = w - L + i \]

where

\[ w = \text{the equal initial income} \]
\[ p = \text{the premium} \]
\[ L = \text{the fixed loss} \]
\[ i = \text{the indemnity} \]
The left-hand-side of this expression represents the income which the insured individual receives in his non-loss state; the right-hand-side represents that which he receives in his loss state. Since the indemnity/premium ratio equals the ratio of the probabilities, then for each individual

\[ i = \frac{(1-\pi)}{\pi} \cdot p \]

where

\[ \pi = \text{the probability of loss for the individual in question}. \]

These two expressions may be solved for \( p \) and \( i \) to obtain:

\[ p = \pi \cdot L \]
\[ i = (1-\pi) \cdot L \]

Thus, with insurance, each individual enjoys a sure income equal to \((w-\pi \cdot L)\).

This is precisely the result which is achieved under reserves-based insurance. Each individual is charged a premium equal to the mathematical expectation of the hazard he faces. These premiums are then set aside in a reserve, and eventually paid over to the individual who sustains the loss. In the present example if \( \pi_f \) is the probability that the farmer sustains the loss, the two premiums are \( \pi_f \cdot L \) and \( (1-\pi_f) \cdot L \). Clearly these sum to \( L \) which is just sufficient to cover the loss.
Reserves-based insurance is possible in the case of pure individual risk since the aggregate outcome is certain (i.e., there is no social risk). When the aggregate loss is known with certainty, there is no problem in determining the appropriate reserve to set aside. Moreover, the "actuarial" prices which emerge from this view of insurance coincide with those established by trade in contingent claims. In short, trade in contingent claims (mutual insurance) and insurance on the reserves principle are equivalent in the special case of pure individual risk.13

In the real world, there are very few situations in which the aggregate loss is perfectly certain. There are many situations, however, in which the aggregate loss per capita, i.e., the average loss, is virtually certain. These situations are those in which a law of large numbers applies. They are also situations in which, as noted above, the accumulation of an appropriate reserve presents no particular difficulty; and hence, in which reserves-based insurance is possible.

Again, in situations in which a law of large numbers applies, trade in contingent claims and reserves-based insurance are equivalent, at least for all practical purposes. It is true that, under reserves-based insurance, the residual risk that the average actual loss will differ significantly from the mathematical expectation of an individual hazard is borne by the insurers; whereas it is borne by the mutually insured in the case of trade in contingent claims. Given a large insured population, however, this risk is insignificant.

While the two views of insurance are equivalent in cases where a law of large numbers applies, they could not be more distinct in cases
where such a law does not apply. Social risks are "uninsurable" risks according to the theory which views insurance as the accumulation of reserves. The theory of insurance as trade in contingent claims, on the other hand, explains how social risks can be insured. Of course, in reality insurance of social risks is not widely observed. It is generally not possible to buy insurance against losses arising out of large-scale catastrophes such as war or economic depression.

Insurance of social risks is not unobserved, however. Lloyd's of London is famous for accepting risks which ordinary insurance companies would refuse to handle. The reserves theory of insurance simply cannot explain this phenomenon. The contingent claims theory, on the other hand, explains it as just another example of trade in contingent claims. There is a price (albeit high) at which Lloyd's can be induced to issue a claim contingent upon almost any event. The subsequent sharing of the risk amongst individual Lloyd's underwriters (i.e., reinsurance) is also fully consistent with the contingent claims view of insurance.

Thus, the theory of insurance as trade in contingent claims is the more complete theory. It can provide an explanation of insurance whether or not the risk involved obeys a law of large numbers. As the more complete theory, it underlies the analysis presented in the remaining chapters of this thesis. In the following chapter, the theory is generalized, and discussion turns to the role of the insurance firm in the contingent claims model of insurance.
CHAPTER 3

THE INSURANCE FIRM AS A BROKER OF CONTINGENT CLAIMS*

The simple model of trade in contingent claims presented in Chapter 2 may be generalized to include producers as well as consumers, and many more than two states of Nature. In fact, when fully extended, the model becomes the Complete Contingent Markets model familiar from the work of Arrow (1953) and Debreu (1959). In this model, there is a large but finite number of separately-identifiable states of Nature. Claims to each of a finite number of goods are indexed according to the state upon which they are contingent. Each type of contingent claim is regarded as a separate commodity and has its own market in which it may be bought and sold. It is in this sense that the model is said to be "complete": there are as many separate markets as there are contingent claims to be traded.

Prior to trade, each consumer possesses an initial endowment of contingent claims. This defines the quantity of goods available to the consumer in each of the various states of Nature. Consumers have preferences over contingent consumption and given the possibility of trade, may seek to exchange their endowed bundle of contingent claims for a different and preferred bundle. They achieve this by entering the separate markets for contingent claims and buying and selling claims as appropriate. Producers are also active in the markets for contingent claims, buying contingent inputs and selling contingent outputs so as to maximize profit. In general equilibrium, a set of prices is established such that each contingent market clears, each consumer achieves the most

*This chapter is a slightly revised version of Harper (1981a).
preferred contingent consumption bundle in his budget set, and each producer maximizes profit over his production set. As in the simple model of Chapter 2, such an equilibrium allocation of contingent claims represents an optimal risk-sharing arrangement for the economy. Put slightly differently, in contingent claims equilibrium, each producer and consumer is optimally insured.

Clearly, in such a model of insurance, there is no role for the insurance firm. Consumers obtain their utility-maximizing consumption vectors across states of Nature, as do producers their profit-maximizing production vectors across states of Nature by simply buying and selling contingent claims in the various markets; the insurance industry is without raison d'etre. Additional restrictions must be imposed upon the contingent claims model of insurance before it will predict the emergence of insurance firms. One way in which this can be achieved is by revoking the assumption of costless transaction, i.e., by assuming that the exchange process itself consumes scarce resources. This was the approach adopted by Marshall (1974a). In his model, firms arise which specialize in intermediation (so-called "brokerage firms") by virtue of their superior transaction technology, and hence, "... offer their services at costs less than those individuals would face if they made the transactions themselves" (Marshall, 1974a, p. 672). Insurance firms are then characterized as brokerage firms whose operations centre on particular markets only.

Thus, for Marshall, the role of the insurance firm is that of broker of contingent claims. The purpose of this chapter is to take Marshall's idea and to develop it within the Arrow-Debreu framework.
His own model of costly trade in contingent claims is not based on an Arrow-Debreu foundation (Marshall, 1974a, sections 3 and 4). As a result, it is not clear how his model relates to more familiar models of general equilibrium in the absence of transaction costs, or how the existence and Pareto optimality of an equilibrium allocation for the Marshall economy might be proved. The model developed in this chapter is an attempt to overcome these deficiencies.

3.1 A Model of Costly Trade in Contingent Claims

The model is an amalgam of the Arrow-Debreu Complete Contingent Markets model, and a model of general equilibrium with costly marketing developed by Foley (1970). There are I consumers (i:1,2,...,I), J producers (j:1,2,...,J), H goods (h:1,2,...,H), and S elementary states of Nature (s:1,2,...,S). There are therefore HS contingent commodities, claims to which are the objects of trade amongst agents. In the world of Arrow-Debreu, where there are no transaction costs, claims to each of the contingent commodities command a price (in terms of some numeraire) which, in equilibrium, clears the market for claims to that contingent commodity. In the world of Foley, however, there are transaction costs. Specifically, some constant proportion of the value of the commodities transacted is consumed by the transaction process (the transaction technology is characterized by constant average cost). In his model, two prices rule in each market: a buyer's price and a lower seller's price, the difference (or 'spread') between the two prices yielding a return which compensates the factors employed in the operation of markets. Splicing the two models together, we have HS contingent commodity markets
in each of which rule a buyer's price and a seller's price for claims to
the contingent commodity in question.

Consumers in this hybrid model have no choice but to buy at the
buyer's price and sell at the seller's price in any market. Producers,
on the other hand, may involve themselves in marketing activities,
buying the contingent claim to be marketed at the seller's ("wholesale")
price, and selling it at the buyer's ("retail") price. Of course,
producers are not obliged to market any of their output; some will no
doubt specialize in transformation activities, hiring factors at the
buyer's price, and selling their product at the seller's price. Some
others, however, will specialize in marketing activities. These are the
firms Marshall refers to as "brokerage firms" (Marshall, 1974a, p. 671).
The majority of producers, though, will more likely engage in a mixture
of marketing and transformation activities. What determines whether or
not a particular producer will market claims to a particular contingent
commodity is the spread between the buyer's and seller's prices in the
market for that contingent commodity. If the spread is not wide enough
to enable the producer to earn a normal return from the marketing activity,
then he will leave this task to other marketing producers.

As an example of the costs involved in marketing activities, Foley
cites, "... the effort required to inform buyers or sellers of the
existence of a supply or demand for a commodity, and of the price. This
[effect] may include advertising, costs of holding stocks for wide
distribution, spoilage, breaking down commodities for retail sale, and
product standardization and certification" (Foley, 1970, p. 282). In
each case, however, "[the] important feature of these costs is that they
expend real resources without altering the characteristics of the
delivered product" (Foley, 1970, p. 282).
Each of the I consumers has a consumption set $X^i \subseteq HS$ (since there are HS contingent commodities) which defines the consumer's "biologically and technically feasible consumption plans" (Foley, 1970, p. 277). A point $x^i \in X^i$ specifies consumer i's consumption net of endowments. In other words, such a point provides a complete specification of consumer i's prospective purchases and sales of the H goods in the various states of Nature. The set $X^i$ is ordered by the preference relation $(\succeq)^i$, and the set $X = \bigcup_{i=1}^I X^i$ is the aggregate consumption set. $\hat{X}^i$ is the attainable consumption set for each consumer, "... the set of consumption plans for the consumer that the whole economy has resources and technical knowledge to provide" (Foley, 1970, p. 277).

Following Foley, we make several assumptions about the $X^i$ and $(\succeq)^i$:

(i) the aggregate consumption set $X$ has a lower bound (which in turn implies that each $X^i$ has a lower bound);

(ii) the set $X^i$ is closed and convex for each $i$;

(iii) for every attainable consumption plan $\hat{x}^i \in X^i$ there exists a feasible consumption plan $x^i \in X^i$ such that $x^i (\succeq)^i \hat{x}^i$ (the consumer is not satiated within his attainable consumption set);

(iv) for every $x^i \in X^i$ the sets $\{x^i \in X^i | x^i (\succeq)^i \hat{x}^i\}$ and $\{\hat{x}^i \in X^i | x^i (\succeq)^i \hat{x}^i\}$ are closed in $X^i$;

(v) for every $x^i \in X^i$ the set $\{x^i \in X^i | x^i (\succeq)^i \hat{x}^i\}$ is convex; and

(vi) $0 \in X^i$ for all $i$.

The consumer faces two prices in each market, $p_{hs}^B$, the seller's price, and $p_{hs}^S$, the buyer's price ($h:1,2,\ldots,H; s:1,2,\ldots,S$). The value
of a consumption plan \( x^i \) depends upon the two vectors, \( x^{iB} \), the vector of purchases, and \( x^{iS} \), the vector of sales, which are defined as follows:

\[
x^{iB} = \max[x^i_{hs}, 0]; \quad x^{iS} = \min[x^i_{hs}, 0].
\]

The value of a given \( x^i \) is then computed as \( p^B . x^{iB} + p^S . x^{iS} \).

Since consumption is viewed net of endowments, the consumer is restricted to the budget set,

\[
B^i(p^B, p^S, 0) = \{ x^i | x^i . x^i = x^{iB} + x^{iS} \text{ and } p^B . x^{iB} + p^S . x^{iS} \leq 0 \}.
\]

Clearly, if \( p^B_{hs} < p^S_{hs} \) for any contingent commodity, \( hs \), the set \( B^i \) would be unbounded; since consumer \( i \) could fund unlimited consumption beyond the value of his endowment out of profits from arbitrage in the market for that contingent commodity. To avoid this possibility, it is assumed throughout that \( \theta = p^B - p^S \geq 0 \).

To derive the essential characteristics of his two-price economy, Foley adopts the following line of argument: he initially establishes the mathematical equivalence of the two-price economy to a suitably defined one-price economy; and subsequently, applies known existence and optimality theorems to the one-price economy. The one-price economy is constructed by simply doubling the dimension of the two-price economy. Thus, instead of there being \( HS \) contingent commodities, each with two prices (buyer's and seller's), there are in this new economy \( 2HS \) contingent commodities, each with a single price. This leads to the definition of
new consumption sets, $X^i \in \mathbb{E}^{2HS}$ and new preference orderings on these sets, $(\succeq)_i$, as follows:

$$(i') \quad X^i = \{(x^i, z^i) | x^i \in x^i_h, z^i_h \geq \max[x^i_h, 0] \text{ for } h:1,2,\ldots,H; s:1,2,\ldots,S\};$$

$$(ii') \quad \text{if } (x^i_0, z^i_0) \text{ and } (x^i_1, z^i_1) \in X^i, \text{ then } (x^i_0, z^i_0) (\succeq)_i (x^i_1, z^i_1) \text{ if } x^i_0 (\succeq)_i x^i_1 \text{ in } X^i.$$

Foley verifies that $X^i$ and $(\succeq)_i$ satisfying assumptions (i) through (vi) is sufficient for $X^i$ and $(\succeq)_i$ to satisfy them as well. He also points out (as is clear from (ii')) that the preferences, $(\succeq)_i$, do not exhibit strong monotonicity: consumer $i$ is indifferent to the $H$-vectors of goods, $z^i_s$, which he plans to consume in the various states, $s$, since consumption of the $z^i_s$ does not yield him any gain in utility. The elements of the vectors, $z^i_s$, may be thought of as quantities of marketing services, the typical element, $z^i_{hs}$, representing the quantity of marketing services consumed (both ex ante and ex post) in arranging a contract for the delivery of $x^i_{hs}$ units of good $h$ in state $s$. The units in which marketing services are measured are so defined that, as a minimum, exactly as many units of marketing services are required as there are units of good $h$ to be contracted for delivery in state $s$. This minimum amount cannot be avoided; the marketing of a unit contingent claim consumes at least one unit of marketing services. Of course, the consumer need not adhere to these minimum requirements, and may choose to spend more than is strictly necessary on the marketing of contingent claims. Unless the price of the particular $z^i_{hs}$ is zero, however, a consumer who did so would not achieve equilibrium; since substitution of some of the excess $z^i_{hs}$ (to which he is indifferent) for extra units of the $x^i_{hs}$ would always leave him better off. Thus,
equilibrium, the weak inequality in the definition of \( x^i \) will hold with equality for all \( z_{hs} \) with a positive price.

Notice also from (i') that, in equilibrium, zero units of (positively-priced) marketing services are associated with the sale of contingent commodities. This is simply to say that responsibility for the purchase of marketing services rests with the buyer in this model. Such an assignment of responsibility is completely arbitrary, and indeed, has no effect whatever on the equilibrium levels of buyer's and seller's prices in the different contingent commodity markets. This conclusion is entirely equivalent to the irrelevance of the imposition of a sales tax in the conventional analysis of one-price markets.

A consumer in Foley's one-price economy chooses his most preferred consumption plan subject to his wealth constraint, i.e., selects a unique consumption plan \( (x^i, z^i) \) such that

\[
(x^i, z^i)(x^i, z^i) \text{ for all } (x^i, z^i) \in X^i \text{ with } p^S_x x^i + \theta^i z^i \leq 0
\]

(where \( (p^S_x, \theta^i) \) is the 2HS-vector of equilibrium prices for the HS contingent commodities and their associated marketing services). Foley demonstrates that a consumer who chooses consumption plan \( (x^i, z^i) \) at prices \( (p^S_x, \theta^i) \) in the one-price economy would choose consumption plan \( x^i \) at prices \( p^S_x \) and \( p^B = p^S_x + \theta^i \) in the two-price economy. This forges the link, for the theory of the consumer, between the two economies. It follows from this link that, "[all] the usual results of demand theory based on assumptions [(i) through (vi)] can be applied to the consumer with
consumption set $\tilde{X}_i$ and preferences $(\tilde{Z})_i$ and through him to an ordinary consumer in a two-price environment" (Foley, 1970, p. 280).

Producers in Foley's model, as noted above, may specialize in marketing activities, in transformation, or may mix the two. The production plan of a producer is written $(y^j, y^{jB})$, where $y^j$ is the total net transaction the producer makes, and $y^{jB}$ is the vector of purchases and sales subject to the premium buying price. The vector $y^{jB}$ may include both inputs and outputs. For instance, a firm may arrange with an employment agency for the hire of executive talent in the event of its own management being temporarily incapacitated; such a contingent input would appear in $y^{jB}$. Profit arising from a production plan is computed, given prices $(p^S, \theta)$, as:

$$\Pi^j(p^S, \theta) = p^S y^j + \theta y^{jB}.$$  

Clearly, since $\theta = p^B - p^S$, a firm which maximizes $\Pi^j$ in the one-price economy also maximizes profit, viz., $\Pi^j = p^S y^{jS} + p^B y^{jB}$, in the two-price economy. The link between the two economies on the producer's side follows directly from definitions.

Foley places the following restrictions on $\bar{Y}_j$, the individual producer's set of feasible production plans:

(vii) $0 \in \bar{Y}_j$ for all $j$ (this assumption together with (vi) assures that there are feasible allocations for the economy);

(viii) there is no $(y^j, y^{jB}) \in \bar{Y}_j$ with $(y^j, y^{jB}) > 0$ (this rules out the possibility of free production or free marketing);

(ix) $\bar{Y}_j$ is a convex cone for all $j$ (this rules out set-up costs or indivisibilities in marketing activities); and
(x) \[ Y = \sum_{j=1}^{J} Y_j \] is closed.

The notion of general equilibrium extends in a straightforward manner to an economy with markets for contingent claims and proportional transaction costs. We have the following definition:

Definition: A competitive market equilibrium is a vector of prices \((p^*, \theta^*)\), a vector \(x^i \in X^i\) (consumption plan) for each consumer, and a vector \((y^j, y^{jB}) \in Y^j\) (production plan) for each producer such that:

(a) \( x^i_\ast \) is maximal with respect to \((\succeq)_i\) in \(B^i(p^\ast, \theta^\ast, 0)\) for every \(i\);
(b) \( p^S_i \cdot y^i_\ast + \theta^i_\ast \cdot y^{jB} \geq p^S_i \cdot y^j + \theta^i_\ast \cdot y^{jB} \) for all \((y^i, y^{jB}) \in Y^j\) and \(i = 1, \ldots, S\);
(c) \( \sum_{i=1}^{S} (x^i_\ast, x^{iB}_\ast) = \sum_{j=1}^{J} (y^j_\ast, y^{jB}_\ast) \); and
(d) \( p^S_\ast \neq 0, \theta^\ast \geq 0 \).

The existence of such an equilibrium can be established by appealing to the theorem of Debreu (1962), and invoking the additional assumption that every consumer is indirectly resource-related to every other consumer. Debreu's theorem ensures the existence of a quasiequilibrium, given assumptions (i) through (x); the additional assumption of indirect resource-relatedness ensures that a quasiequilibrium is a competitive equilibrium.

At this point, Foley notes that, "[in] a formal sense the traditional analysis of Pareto optima and the core can be applied to the extended economy..."
used above to study the existence problem" (Foley, 1970, p.285). Thus, an equilibrium allocation for the Foley economy is Pareto optimal. Foley has reservations about such a formalistic approach to the issue of optimality, however (Foley, 1970, p.285). This particular question is not pursued here.

3.2 The Special Case of the Insurance Firm

Recall that Marshall views insurance firms as "brokers" of contingent claims; they buy and sell contingent claims on behalf of other economic agents, and survive because of their superior transaction technology. On this view, insurance firms do not create insurance (i.e., do not assume risks themselves); they merely facilitate its creation, by assisting in the process whereby risks are transferred to their ultimate bearers. Insurance is trade in contingent claims - a process of mutual exchange and acceptance of risk - and insurance firms act only as intermediaries in this process. But while all insurance is trade in contingent claims, not all trade in contingent claims is insurance. Generally speaking, the term is restricted to trade in claims to the numeraire good which are contingent upon events involving some form of loss to the insuring parties. Thus, share trading is not insurance; the claims traded are just as often contingent upon favourable events as upon unfavourable ones.

In terms of the general equilibrium model developed above, insurance firms are specialist marketing firms: they buy contingent claims to the numeraire good at the seller's price and sell them at the buyer's price, earning a return which is sufficient (in equilibrium) to compensate factors employed in the exchange process. Like all other firms in this model, insurance firms are profit maximizers. Each maximizes an objective function of the form:
\[ \pi^j(p^S, \theta) = p^S \cdot y^j + \theta \cdot y^j \]

over its production set \( Y^j \). For an insurance firm this set is a convex cone containing vectors of the form: \(^4\)

\[
\begin{bmatrix}
-1 & -1 & \ldots & -1 & 0 & 0 & \ldots & 0 \\
S & HS & & & 0 & 0 & \ldots & 0 & 1 & 0 & \ldots & 0
\end{bmatrix};
\]

where we have assumed for illustrative purposes that one unit of good 1 (purchased wholesale) is consumed with certainty in the process of marketing one claim to a unit of the numeraire (good 2) contingent upon state 1.

While the model developed in this chapter ultimately presents the same picture of the operations of an insurance firm as does Marshall's own model, it does so in a way which overcomes the two principal deficiencies of the Marshall model outlined above. Specifically, separate markets for contingent claims are not required, i.e., the present model makes no distinction between the market in which consumers sell and brokerage firms buy and the market in which brokerage firms sell and consumers buy. Each contingent claim has its own market in which rule two prices, a buyer's price and a seller's price. Furthermore, the device of a "reinsurance" market in which contingent claims trade amongst brokerage firms without cost, at their shadow prices, is not required. In addition, the introduction of production (i.e., transformation) implies that producers as well as consumers trade in the various markets for contingent claims.
These properties of the present model derive from the fact that it is constructed firmly on an Arrow-Debreu foundation. This fact also makes it clear how the existence and Pareto optimality of equilibrium in an economy with costly trade in contingent claims can be proved: one simply appeals to the theorems of Debreu (1959, 1962). In equilibrium each consumer possesses his utility-maximizing and each producer his profit-maximizing bundle of contingent claims. This includes insurance firms which maximize profit over the set of contingent claims they trade. In addition, an equilibrium allocation for the Foley economy is Pareto optimal. Thus, as in the Complete Contingent Markets model without transaction costs, the equilibrium allocation of contingent claims across consumers and producers represents an arrangement under which risk is optimally shared amongst economic agents.\textsuperscript{5}
CHAPTER 4

THE SPECIAL CASE OF LIFE INSURANCE

In this chapter, the general model of insurance and of the insurance firm developed in Chapter 3 is specialized to the case of life insurance. Indeed, life insurance is particularly well suited to a demonstration of the richness of the contingent claims view of insurance. The great variety of contracts written by the industry is easily represented within the framework provided by this approach. The fundamental insight is that life insurance contracts may be regarded merely as bundles of contingent claims, much as Lancaster regards commodities in general as bundles of "characteristics" (Lancaster, 1966).

4.1 A Model of Life Insurance

Assume that time consists of $T$ elementary periods, and consider a group of $n$ households, each with a single income-provider who is alive at the beginning of period 0 (the "current" period). Each household faces the certain prospect that its income-provider will die in some time period $t$, where $0 \leq t \leq (T-1)$, but it is uncertain which one. The situation is illustrated schematically for the case of $T=3$ and $n=2$ in Figure 3. At the beginning of period 0 (date 0), the two households are faced with nine alternative histories of Nature. They are both certain that their respective income-providers will be dead by the end of period 2 (date 3); but they may be dead by the end of period 1 (date 2), or even the end of period 0 (date 1). The nine alternative histories of Nature are referred to as "events at date $T$" (Debreu, 1959). Events at
Figure 3
date $T$ are conditional upon events at date $t < T$. For example, consider the event at date $T$ defined as: "Both households' providers are dead at date 3 given that they are alive at dates 2, 1, and 0". This event corresponds to the history of Nature: "Both providers die in period 2". Moreover, this event at date 3 is conditional upon the event at date 2: "Both providers are alive at date 2 given that they are alive at dates 1 and 0".

As $n$ becomes large, the number of possible histories of Nature approaches infinity. At the same time, however, the (conditional) probability distribution defined over events at date $T$ concentrates upon a particular sub-set of these events. This reflects the fact that the risk of death is an individual risk, i.e., it obeys a law of large numbers. The elements of the sub-set possess the common feature that exactly $p_t$ per cent of those alive at date 0 are alive at date $t$ ($1 \leq t \leq T$), where $p_t$ approaches $\pi_t$, the true probability of being alive at date $t$, as $n$ approaches infinity, and $\sum_{t=1}^{T} \pi_t = 1$. In the limit, the actual history of Nature is an element of this sub-set with probability one.

Thus, when $n$ is large, the proportion of those alive at date 0 who will be alive at each date $t$, $1 \leq t \leq T$, is almost certain. What remains uncertain, however, is the identity of those individuals. To return to the example: if it is known with certainty that exactly half of those alive at date 0 will be dead at date 1, and the other half at date 2, the number of possible histories of Nature is reduced from nine to two. The remaining uncertainty surrounds which half of the population will die first.
Each household is endowed with wealth at the beginning of period 0, and knows what wealth it will possess in each event at date \( t \), \((1 \leq t \leq T)\). When a household's provider dies, it suffers a loss: part of the loss represents the capitalized value of the provider's expected future earnings stream; the remainder represents the pure psychic loss occasioned by the death itself. In order to mitigate either or both of these components of the loss, a household might seek to augment the wealth it will possess at date \( t \) in the event of its provider dying during period \((t-1)\). To do this, it must sacrifice some of the wealth it will possess at date \( t \) if its provider does not die during period \((t-1)\). This process of redistributing wealth so that more or less is obtained in each event at date \( t \) than initially endowed is the essence of the contingent claims approach to insurance.

The wealth which each household possesses at the beginning of period 0 takes the form of an endowment of contingent claims. In the present context, these are claims to consumption which are contingent upon a particular event occurring at date \( t \) \((0 \leq t \leq T)\). The stock of each type of claim which a household possesses represents the wealth it will enjoy at the particular date if the particular event occurs. Households can rearrange the wealth they will possess in different events at date \( t \) by trading in claims contingent upon those events. Specifically, households desiring life insurance trade claims contingent upon events in which their providers survive for claims contingent upon events in which their providers die. Such trades take place in markets which arise for the purpose and at relative prices which, in equilibrium, clear all markets simultaneously.
Trade does not take place directly between households, however. As in the more general model of Chapter 3, transactions are costly to produce and trade takes place through intermediaries. In the context of life insurance, these intermediaries are the life insurance firms. Life insurance firms charge for their services by raising the price they ask of a buyer of contingent claims, and lowering the price they offer a seller. In equilibrium, the difference between the buyer's price and the lower seller's price of a contingent claim exactly equals the constant average cost of transacting such a claim. In other words, profit-maximizing life insurance firms earn zero economic profit in equilibrium.

4.2 Life Insurance Policies as Bundles of Contingent Claims

The view of life insurance as a process of trade in contingent claims may be developed to incorporate the wide range of products associated with the real-world life insurance industry. Once the various different policies are broken down into their essential elements, it becomes clear that they are nothing more than bundles of different types of contingent claims.

The simplest form of life insurance contract marketed in the real world is the single-period term insurance policy. Such a policy promises to pay a certain sum of money at the end of one period if and only if the insured dies during the period. Using the example depicted in Figure 3, a single-period term insurance policy for individual 1 purchased at date 0 is equivalent to a bundle of two contingent claims: one contingent upon event 3 at date 1, and one contingent upon event 4 at date 1. These are the only two events at date 1 which involve the death
of individual 1. A similar statement may be made with regard to
individual 2, although in this case the two claims are contingent upon
events 2 and 4 at date 1, respectively.

A slightly more complex form of contract is the multi-period term
insurance policy. This policy promises to pay a certain sum of money if
and only if the death of the insured occurs within a stipulated number
of periods from the date of contract. For example, a two-period term
insurance policy would pay off if death occurred in the first period or
the second period, but not otherwise. Since such a policy covers a
wider range of contingencies, it represents a larger bundle of contingent
claims. In terms of Figure 3, a two-period term insurance policy for
individual 1 purchased at date 0 represents a bundle of five separate
contingent claims: two contingent upon events 3 and 4 at date 1,
respectively, and three contingent upon events 3, 4 and 6 at date 2,
respectively.

Viewed in this way, it is clear that a multi-period term insurance
policy is simply a linear combination of single-period term insurance
policies, each referring to successively more distant periods into the
future. Term insurance for periods later than the first is "pre-purchased",
with the price discounted to reflect the fact that insurance to cover
these later periods may turn out to be unnecessary.

A still more complex form of contract is the multi-period endowment
insurance policy. This policy introduces a new dimension: the insured
or his dependants are assured of receiving the face value of the policy
at some time during its currency. Specifically, the policy promises to
pay a certain sum of money at a specified future date or upon prior
death of the insured. Thus, under a t-period endowment insurance
policy, if the insured is still living at date (t-1), he or his dependants
are certain to receive the face value of the policy at date t. This
assurance is reflected in the bundle of contingent claims which goes to
make up a multi-period endowment insurance contract. The terminal-date
claims included in the bundle must be such that the policy matures
with certainty at the end of the terminal period if the insured survives
to the beginning of that period. In terms of Figure 3, a two-period
endowment insurance policy for individual 1 represents a bundle of eight
contingent claims: claims 3 and 4 at date 1, and claims 1 through 6 at
date 2.

Clearly, a t-period endowment insurance policy may be split into a
t-period term insurance policy and a policy which matures if and only
if the insured survives to the terminal date t. Such a policy is known
as a t-period pure endowment. In the example given above, it represents
a bundle of three contingent claims: claims 1, 2 and 5 at date 2. Thus,
a t-period endowment insurance policy represents the linear combination of
a t-period term insurance policy and a t-period pure endowment. 3

A variant of the multi-period endowment insurance contract is the
whole-of-life insurance policy. Such a policy promises to pay a certain
sum of money upon the death of the insured no matter when it occurs.
Again the dependants of the insured are assured of receiving money at
some time in the future. The certainty of payment in this case, however,
stems not from the inclusion of a pure endowment, but from the certainty
of death itself. In the example depicted in Figure 3, neither individual
lives beyond period 2. A whole-of-life insurance policy for individual 1 purchased at date 0 therefore consists of eight contingent claims: claims 3 and 4 at date 1, claims 3, 4 and 6 at date 2, the claims 1, 2 and 5 at date 3. When the ultimate time period is known with certainty, a whole-of-life insurance policy is equivalent to a T-period term insurance policy.4

Policies are also marketed which build upon the basic unit of the single-period pure endowment. Such policies are known as life annuities, and are either of the immediate or deferred variety. Immediate annuities, as the name suggests, commence with the current period and pay a sum of money at the end of each period if and only if the annuitant is still alive at that date. An immediate annuity for individual 1 in the above example is represented by a bundle of five contingent claims: claims 1 and 2 at date 1, and claims 1, 2 and 5 at date 2. Deferred annuities do not commence until some nominated future period, usually the insured's year of retirement. For this reason, deferred annuities are sometimes known as "pension plans". Again using the above example, a deferred annuity for individual 1 purchased at date 0 and commencing at date 1 consists of three contingent claims: claims 1, 2 and 5 at date 2.5

4.3 The Pricing of Life Insurance Policies

Households arrange life insurance contracts through life insurance firms. As noted above, these act as intermediaries in each of the separate markets for contingent claims, buying claims at the seller's ("wholesale") price and selling them at the higher buyer's ("retail") price. In order to purchase a particular life insurance policy, a
household instructs a life insurance firm to buy the appropriate contingent claims in the relevant markets. Alternatively, a life insurance firm may assemble its own bundle of contingent claims and market the resulting policy directly to consumers.

Competition amongst life insurance firms ensures that, in equilibrium, the price attaching to any bundle of contingent claims is precisely equal to the sum of the separate prices of the constituent contingent claims. Thus, to return to the example depicted in Figure 3, the buying price of a single-period term insurance policy for individual 1 is given by:

\[ p_{T,1,1}^B = p_{3,1}^B + p_{4,1}^B \]  

(1)

where the double index on the prices of the individual contingent claims signifies the event and date to which they refer. Similarly, the buying price of a whole-of-life insurance policy for individual 1 can be written as:

\[ p_{W,3,1}^B = p_{3,1}^B + p_{4,1}^B + p_{3,2}^B + p_{4,2}^B + p_{6,2}^B + p_{1,3}^B + p_{2,3}^B + p_{5,3}^B \]  

(2)

The prices of the individual contingent claims may be simplified with the help of a result due to Malinvaud. Malinvaud's work is summarized in the next section.

4.3.1 The Malinvaud Result

Malinvaud has written two papers (1972, 1973) which study the nature of markets for contingent claims under the special conditions of individual
risk and large numbers of traders. Clearly these two conditions will generally apply in the case of life insurance. The particular result of interest here is the special form assumed by the contingent price system under the conditions laid down by Malinvaud. The result will be presented from the perspective of the theory of Pareto optimum. This approach is developed in Malinvaud (1972) and is easier than the approach taken in Malinvaud (1973) which develops the theory of equilibrium.

The model constructed by Malinvaud is another modified version of the Arrow-Debreu Complete Contingent Markets model. The modification, which derives from the exclusive individuality of risk in the model, concerns the definition of the feasibility of an allocation. Specifically, the balance between supply and demand is required to hold no longer for each single state of Nature, but only in expected value across states of Nature. Underpinning this modification is a law of large numbers which permits the conclusion that, when the economy is large and involves only individual risks, the excess demand for each commodity almost never deviates significantly from its expected value.

It is assumed that there are $I$ types of consumers ($i=1,2,\ldots,I$) and $J$ types of producers ($j=1,2,\ldots,J$), with precisely $N$ (a large number) of each type. Broadly speaking, two agents of the same type have the same set of feasible acts, the same endowments, and the same preferences. There are $H$ commodities ($h=1,2,\ldots,H$), the definition of which would, in a complete model, account for the states with respect to social risk in which they were available. Malinvaud pays no special attention to this point in his treatment of the problem, but does note explicitly that individual risks are not taken into account in the definition of commodities.
For a consumer of type i, the individual risk comes from the fact that he will find himself in one of several possible states with respect to his resources, needs, and preferences. There are \( S_i \) states facing an individual consumer of type i (\( s=1,2,\ldots,S_i \)), each state occurring with an objective probability of \( \pi_{is} \), and \( \sum_{s=1}^{S_i} \pi_{is} = 1 \). Similarly, a producer of type j may find himself in one of \( S_j \) possible states concerning what he can technically do. These states occur with probabilities, \( \pi_{js} \), summing to one (\( s=1,2,\ldots,S_j \)). Although Malinvaud makes no use of the concept in the 1972 paper, it is possible to define a "state e for the economy", which is a complete specification of the \((I+J)N\) states occurring simultaneously, each one affecting only one of the individual agents (there being no social risk).

Letting \( m_is \) and \( q_js \) designate the (random) numbers of type-i consumers and type-j producers who find themselves in respective states, \( s \), the notion of individual risks is formalized as follows: for \( N \) arbitrarily large, the proportions, \( \frac{m_is}{N} \) and \( \frac{q_js}{N} \), lie within arbitrary neighbourhoods of the probabilities, \( \pi_{is} \) and \( \pi_{js} \) respectively. Clearly, conditions under which a law of large numbers applies will be sufficient to generate individuality of risk. For example, the various replicas constituting the economy may be taken as stochastically independent of one another; or more generally, it may be assumed that, while strongly affecting 'neighbours', i.e., agents with indices \( n \) and \( n' \) differing little from one another, stochastic dependence disappears as \( n-n' \) increases.
In this economy, a "program" is a complete specification of the activities of all individual agents in the various situations that they may (individually) face. For consumer \( n \) of type \( i \), the program gives the HS numbers, \( x_{insh} \), defining his consumption of the various commodities in the various states that are relevant for him. Similarly, the number \( y_{jns} \) is the net output of good \( h \) that producer \( n \) of type \( j \) obtains if state \( s \) occurs for him. Of prime concern is the particular form of the price system which sustains a Pareto optimal program.

Since the definition of types is flexible, it is assumed (without loss of generality) that, in the Pareto optimal program, individuals belonging to the same type behave in exactly the same way. The index \( n \) may thus be dropped, and the consumptions of any consumer of type \( i \) in state \( s \) and the net outputs of any producer of type \( j \) in state \( s \), denoted by the H-vectors, \( x_{is} \) and \( y_{js} \), respectively. The Pareto optimal program is therefore defined by as many activity vectors as there are types and states. In addition, \( N \) is taken as arbitrary, i.e., the specification of the activity vectors is assumed to be such that the resulting program is Pareto optimal in each one of a sequence of economies, \( \&^N \), differing only in the number \( N \) of agents of each type (\( N=1,2,... \)).

In such a program, the vector of excess demands is given by:

\[
\sum_{i=1}^{I} \sum_{s=1}^{S_i} m_{is} (x_{is} - \omega_{is}) - \sum_{j=1}^{J} \sum_{s=1}^{S_j} q_{js} y_{js} = (3)
\]
where \( \omega_{is} \) represents the (common) vector of initial endowments for a consumer of type \( i \) finding himself in state \( s \). The vector of "per capita excess demands" is given by:

\[
\frac{1}{I} \left[ \sum_{i=1}^{I} \sum_{s=1}^{S_i} \frac{m_{is}}{N} (x_{is} - \omega_{is}) - J \sum_{j=1}^{J} \frac{q_{js}}{N} y_{js} \right]
\]

(4)

On the other hand, the vector of "per capita expected excess demands" is given by:

\[
\frac{1}{I} \left[ \sum_{i=1}^{I} \sum_{s=1}^{S_i} \pi_{is} (x_{is} - \omega_{is}) - J \sum_{j=1}^{J} \pi_{js} y_{js} \right]
\]

(5)

The assumption of individual risks implies that the random vector (4) tends to the sure (i.e. deterministic) vector (5) as the number \( N \) increases indefinitely. Hence, when the economy is large, an appropriate form of the excess demand requirement for feasibility is that:

\[
\sum_{i=1}^{I} \sum_{s=1}^{S_i} \pi_{is} (x_{is} - \omega_{is}) = \sum_{j=1}^{J} \pi_{js} y_{js}
\]

(6)

Malinvaud remarks at this point:

"It should be emphasized here that this constraint [i.e., (6)] is intended as a representation of the requirement for overall balance between supplies and demands. It does not mean that agents are satisfied with a state of affairs in which their demands are fulfilled 'on the average'. It rather means that we neglect the discrepancies that will remain between supplies and demands in the same way as we neglect transaction costs. Such discrepancies may be viewed as being put to or met from inventories. In any case they are negligible when the economy is large" (Malinvaud, 1972, p. 316).

Note that use of the constraint (6) enables reference to the number \( N \), of individuals within each type to be omitted. In fact, in most of Malinvaud's discussion he deals exclusively with the case where
N=1. This is perfectly permissible for the derivation of formal results that are independent of N. When applying the results to reality, however, it must not be overlooked that their validity is strictly conditional on N being large.

Now the activity or "strategy" of an agent assigns definite values to his demands and supplies of the various goods in the various states concerning him. For instance, the activity of a consumer of type i determines his HS, demands, \( x_i \), which are written for convenience in the form of the HS, -vector, \( x_i \). Similarly, the net outputs of a producer of type j in the various states that he may face are written in the form of the HS, -vector, \( y_j \), having components \( y_{jsh} \). The needs of a consumer of type i require that \( x_i \) belong to some set \( X_i \) of the HS, -space, this set being the same for all consumers of the same type. In general, the consumer's needs will concern the \( S_i \) separate \( H \)-subvectors, \( x_{is} \), each one of them defining which consumptions will be made by an individual of type i when state s obtains. The subvector \( x_{is} \) is accordingly required to belong to some set, \( X_{is} \). The set \( X_i \) is then simply the Cartesian product of the \( S_i \) sets \( X_{is} \).

The preferences of a consumer of type i define a pre-ordering on the set \( X_i \) which is again the same for all consumers of the same type (but which may vary, of course, from one type of consumer to another). The expression:

\[
x_1^1 \geq x_1^2
\]
is used to indicate that the consumers of type $i$ consider $x_1^i$ at least as good as $x_2^i$. Comparing $x_1^i$ and $x_2^i$ the consumers of type $i$ evaluate simultaneously how well the vectors $x_{1s}^i$ and $x_{2s}^i$ satisfy them in the various possible states that they face. While it would not reduce the generality of Malinvaud's results to assume that the pre-ordering derives from an additively separable utility function,

$$u_i(x_i) = \sum_{s=1}^{S_i} \pi_{is} u_{is}(x_{is}),$$

he chooses in the 1972 paper to remain within the general choice-theoretic framework, and not to assume the existence of any such function. Thus, the objective probabilities, $\pi_{is}$, attached to the various states need neither be known nor accepted by the consumers. It is both admissible and sufficient for the development of the theory that the consumers of a given type use their own subjective probability-weights when valuing the advantages derived from the various $x_{is}$.

The net output vector, $y_j$, of a producer of type $j$ is subject to some technical constraints, which take into account, in particular, the information held by the producer at each stage of his decision. These constraints limit $y_j$ to a set $Y_j$, which is the same for all producers of the same type.

The definition of Pareto optimality follows directly. A program, $P^0$, in which agents of the same type behave in the same way is said to be feasible if each $x_i$ belongs to the corresponding $X_i$, if each $y_j$ belongs to the corresponding $Y_j$, and if equation (6) holds. Such a program is Pareto optimal if there is no feasible $P^1$ in which agents of the same type behave in the same way and for which
holds for all types \( i \), with strict preference holding for at least one type.

In order to study the price system sustaining such a Pareto optimal program, Malinvaud proceeds by mapping the economy \( \mathcal{E} \) under discussion into another simpler economy \( \mathcal{E}' \) in which risk disappears, all random variables being replaced by their expected values. He demonstrates that this mapping, \( E \), transforms a program, \( P' \), that is optimal in \( \mathcal{E}' \) into a program, \( P' \), that is optimal in \( \mathcal{E} \). Moreover, he shows that the price system sustaining \( P' \) is applicable in a sense to \( P' \).

With the \( H \)-dimensional vector \( x_i \) is associated the \( H \)-dimensional vector \( \tilde{x}_i \) whose components are the expected demands of a consumer of type \( i \) for the various goods:

\[
\tilde{x}_{ih} = \sum_{s=1}^{L_i} \pi_{is} x_{ish}.
\]  

Similarly, with the vectors \( y_j \) and \( \omega_i \) are associated vectors giving, respectively, expected net supplies and expected endowments:

\[
\tilde{y}_{jh} = \sum_{s=1}^{S_j} \pi_{js} y_{jsh}; \quad \tilde{\omega}_{ih} = \sum_{s=1}^{S_i} \pi_{is} \omega_{ish}.
\]  

This transformation maps the sets \( X_i \) and \( Y_j \) into the sets \( \tilde{X}_i \) and \( \tilde{Y}_j \), respectively; a particular \( H \)-dimensional vector \( \tilde{x}_i \) belongs to \( \tilde{X}_i \) if there is in \( X_i \) a vector \( x_i \) such that (7) holds for all \( h \). In addition,
the pre-ordering on \( X_i \) induces a pre-ordering on \( \tilde{X}_i \) defined as follows. Given any \( \tilde{x}_i \) in \( \tilde{X}_i \), let \( E^{-1}(\tilde{x}_i) \) be the set of all vectors, \( x_i \), that are mapped by \( E \) into \( \tilde{x}_i \). Let \( g(\tilde{x}_i) \) be a maximizing vector of \( E^{-1}(\tilde{x}_i) \), i.e.:

\[
g(\tilde{x}_i) \geq x_i \text{ for all } x_i \text{ in } E^{-1}(\tilde{x}_i).
\]

(The function \( g \) depends on \( i \), but for simplicity this is not made explicit.) Then the following relation may be defined:

\[
\tilde{x}_i \preceq \tilde{x}_j \iff g(\tilde{x}_i) \geq g(\tilde{x}_j)
\]

This relation is a pre-ordering.

Thus, the economy \( \tilde{e} \) is defined by the sets \( \tilde{x}_i \), \( \tilde{y}_j \), the endowments \( \tilde{w}_i \), and the preference pre-ordering, \( (9) \). A program for this economy is given by \( (I+J) \) vectors, \( \tilde{x}_i \), and \( \tilde{y}_j \). It is feasible if \( \tilde{x}_i \in \tilde{X}_i \), \( \tilde{y}_j \in \tilde{Y}_j \) for all \( i \) and \( j \), and if

\[
\sum_{i=1}^{I} (\tilde{x}_i - \tilde{w}_i) = \sum_{j=1}^{J} \tilde{y}_j.
\]

The definition of Pareto optimality is the usual one.

Malinvaud then proves the following proposition:

**Proposition 1**: If \( P^0 \) is Pareto optimal in \( e \), then the associated program, \( \tilde{P}^0 \), is Pareto optimal in \( \tilde{e} \).
Using the fact that convexity of $X_i$ (or $Y_j$) implies convexity of $\bar{X}_i$ (or $\bar{Y}_j$), and that convexity of the individual preference relations in $\mathcal{E}$ implies convexity of the corresponding relations in $\bar{\mathcal{E}}$, he proves a second proposition:

**Proposition 2:** Associated with the Pareto optimal program, $\bar{P}^0$, there is in $\bar{\mathcal{E}}$ a price vector $\bar{p}$ such that:

(i) $\bar{x}_i^0$ is a greatest element of $\{\bar{x}_i \in \bar{X}_i \mid \bar{p}_{\bar{x}_i} \leq \bar{p}_{\bar{x}_i}^0\}$

for $(\bar{\mathcal{E}})_i$, for every $i$;

and

(ii) $\bar{y}_j^0$ maximizes $p_{\bar{y}_j}$ on $\bar{Y}_j$, for every $j$.

This proposition is simply a re-statement of Debreu's theorem 6.4 that:

"An optimum is an equilibrium relative to a price system" (Debreu, 1959, p.95); or in other words that, given an optimum, there is a price system relative to which that optimum is an equilibrium.

From Proposition 2, Malinvaud draws direct implications for the original economy, $\mathcal{E}$, which are stated as a third proposition:

**Proposition 3:** Conditions (i) and (ii) of Proposition 2 imply, respectively:

(i') $x_i^0$ is a greatest element of $\{x_i \in X_i \mid Ep_{x_i} \leq Ep_{x_i}^0\}$

for $(\mathcal{E})_i$, for every $i$;
and

\[(ii') \quad y_j^0 \text{ maximizes } \text{Epy}_j \text{ on } Y_j, \text{ for every } j;\]

where E is the common expectation operator (e.g. \( \text{Epy}_j = \sum_{s=1}^{S_j} \pi_{js} p_{yjs} \)).

Conditions \((i')\) and \((ii')\) of Proposition 3 demonstrate the special form of the contingent price system which supports a Pareto optimum in the presence of individual risks and large markets. In order to compute the value of consumption by an individual of type \(i\), each component, \(x_{ish}'\) of \(x_i\) must be multiplied by the contingent price, \(\pi_{ish} p_h\) (where we note that \(\text{Epx}_{ish} = \sum_{s=1}^{S_j} \sum_{h=1}^{H} \pi_{is} p_h x_{ish} \)). Similarly, in order to compute the value of the net output of a producer of type \(j\), each component, \(y_{jsh}'\) of \(y_j\) must be multiplied by the contingent price, \(\pi_{js} p_h\). Thus, the price (in terms of the numeraire commodity) of a contract to deliver one unit of commodity \(h\) to an individual of type \(i\) contingent upon that individual finding himself in state \(s\) is given by the product of the probability of state \(s\) occurring for an individual of type \(i\) and the price of a contract for the sure (i.e., unconditional) delivery of one unit of commodity \(h\). More succinctly (Malinvaud, 1973, p.401):

**Proposition 4:** When the number of agents is large and only individual risks occur, the contingent price of a commodity subject to a particular event is equal to the product of the sure price of the commodity and the probability of the event.

Of course Malinvaud's model is constructed in a world without transaction costs. It is a simple matter, however, to introduce proportional
transaction costs, again following the line adopted by Foley (1970). The procedure is identical to that set down in Chapter 3: the dimension of the model is doubled by the addition of an extra \( H \) commodities, "marketing services for commodity \( h \)." Consumers derive no utility from these additional commodities, but each must be consumed jointly with the corresponding commodity in the original commodity set. A consumer of type \( i \) (\( i = 1, 2, \ldots, I \)) thus chooses amongst consumption plans \((x_i, z_i)\) which consist of his prospective purchases and sales of commodities, and consumption of associated marketing services, in each of the various states facing him. Similarly, a producer of type \( j \) (\( j = 1, 2, \ldots, J \)) chooses amongst production plans \((y_j, B_j)\) which consist of his prospective net outputs of commodities and marketing services in the various states relevant to him. For an allocation to be feasible, the consumption plans of consumers and the production plans of producers must together satisfy the market-clearing (or excess demand) condition:

\[
\sum_{i=1}^{I} \sum_{s=1}^{S_i} \pi_{is} (x_{is}, z_{is}) = \sum_{j=1}^{J} \sum_{s=1}^{S_j} \pi_{js} (y_{js}, B_{js})
\]

which is an adaptation of (6). The requirement is that, on average, the quantities of commodities and marketing services demanded by consumers equal the quantities supplied by producers.

Addition of the \( H \) commodities, "marketing services for commodity \( h \)" and the re-definition of the preference pre-orderings, does not alter the character of the Malinvaud model in any fundamental way. The Malinvaud model is ultimately a special case of the Arrow-Debreu Complete Contingent Markets model, and as such is fully amenable to modification.
along the lines of Foley. Hence the results cited above which Malinvaud derives for his economy, G, may be re-interpreted directly for the extended economy, G. In particular, the special form of the contingent price system which supports a Pareto optimal, P^0, in G may be deduced. This result is expressed as:

Proposition 5: Associated with the Pareto optimal program, P^0, there is in G a price vector, (p^S, \theta), such that:

(i) \( (x^0_i, z^0_i) \) is a greatest element of \( \{ (x_i, z_i) \in X_i \mid E(p^S, \theta). (x_i, z_i) \leq E(p^S, \theta). (x^0_i, z^0_i) \} \) for every \( i \), and

(ii) \( (y^0_j, y^B_j) \) maximizes \( E(p^S, \theta). (y_j, y^B_j) \) on \( Y_j \), for every \( j \).

Thus, in this extended Malinvaud economy, a contract for the delivery of one unit of commodity \( h \) to an individual of type \( i \) conditional upon that individual finding himself in state \( s \) has value, \( \pi_{is}^S \); one unit of the services required to market such a contract has value, \( \pi_{is}^\theta \).

These results refer to the artificial one-price, 2H-commodity economy, G. Their translation in terms of the underlying two-price, H-commodity economy is effected by recognizing that \( \theta_h = p^B_h - p^S_h \), the "spread" between the buying and selling prices of commodity \( h \). It is then straightforward to demonstrate:

Proposition 6: Associated with the Pareto optimal program, P^0, there is in G a pair of price vectors, \( (p^B, p^S) \), such that:
(i) \( x_1^0 \) is a greatest element of \( \{ x_1^0 | \text{Ep}^S x_1^0 + \text{Ep}^B x_1^0 \leq \text{Ep}^S x_1^0 + \text{Ep}^B x_1^0 \} \) for \( (\geq)_1 \), for every \( i \); and

(ii) \( y_j^0 \) maximizes \( \text{Ep}^S y_j^0 + \text{Ep}^B y_j^0 \) on \( Y_j \), for every \( j \),

where \( y_j^S (y_j^B) \) is the vector of inputs and outputs bought and sold wholesale (retail).

Thus, in a world of individual risk, large markets and costly transaction, there are two contingent prices attaching to a contract to deliver one unit of commodity \( h \) to an individual of type \( i \) conditional upon that individual finding himself in state \( s \). They are, respectively, a contingent buying price of the form, \( \pi^B_{ish} \), and a contingent selling price of the form, \( \pi^S_{ish} \). The difference between these two prices represents the value in terms of the numeraire commodity of the resources consumed in the process of marketing such a contingent contract.

4.3.2 Incorporating the Malinvaud Result

The "individual" states faced by consumers in the Malinvaud model are clearly applicable to the case of life insurance. Returning to the example depicted in Figure 3, individual \( 1 \) is faced at date \( 0 \) with three "individual" events at date \( T \), viz:

(i) he is dead at date 3 given that he is alive at dates 2 and 1;

(ii) he is dead at date 3 given that he is dead at date 2 but alive at date 1; and

(iii) he is dead at date 3 given that he is dead at dates 2 and 1.

These three "individual" events at date \( T \) correspond to the three "individual" histories of Nature:
(i) individual 1 dies in period 3;
(ii) individual 1 dies in period 2;
(iii) individual 1 dies in period 1.

Furthermore, the three "individual" events at date T are each conditional upon "individual" events at dates t<T.

It follows from the Malinvaud result that the price of a claim which is contingent upon an "individual" event at date t (t=1,2,\ldots,T) is equal to the product of the probability of the event and the price of a sure claim for the same date, t. As is clear from Figure 3, however, "individual" events at date t represent the union of particular "collective" events at date t. For instance, the "individual" event defined as, "individual 1 is alive at date 2" represents the union of three "collective" events at date 2, viz., 1, 2 and 5. The Malinvaud result therefore implies that the price of a claim which is contingent upon a "collective" event at date t also reflects the probability of that event.

Returning to equation (1), the buyer's prices of the separate contingent claims may be re-expressed to give:

\[
P_{T,1,1}^B = \pi_{3,1}^1 P_1^B + \pi_{4,1}^1 P_1^B = (\pi_{3,1}^1 + \pi_{4,1}^1)P_1^B
\]  

(11)

where \(\pi_{e,1}^1\) (e = 3,4) equals the probability of event e at date 1 and \(P_1^B\) equals the buyer's price of a contract to deliver the face value of the term insurance policy at date 1 unconditionally. When added together, the probabilities of the two "collective" events at date 1 become the
probability of the "individual" event, "individual 1 is dead at date 1". This is of course the event against which individual 1 seeks to insure when he purchases a one-period term insurance policy at date 0. That the price of such a policy is equal to the sum of the prices of the constituent ("collective") contingent claims is assured by competition amongst life insurance firms. The Malinvaud result enables the particular form of the various contingent prices to be written more explicitly. A similar expansion may be performed for equation (2) above.

A further simplification is possible when one evaluates the probabilities, $\pi_{e,t}$. In the example of Figure 3, assume again that the probability density is concentrated on events 6 and 8 at date 3, i.e., it is certain that exactly half of the population alive at date 0 is dead at date 1, and the other half at date 2. As far as individual 1 is concerned, the probabilities of events 1 and 4 at date 1 are both zero. Thus, the buyer's price of this single-period term insurance policy reflects only the probability of event 3 at date 1:

$$P_B^{t,1,1} = \pi_{3,1}^B$$  \hspace{1cm} (12)

Similarly, his whole-of-life insurance policy reflects the fact that he is faced with only two mutually-exclusive alternatives: he either dies in period 0 or in period 1.

Thus:

$$P_W^{3,1} = \pi_{3,1}^B \cdot P_1^B + \pi_{6,2}^B \cdot P_2^B$$  \hspace{1cm} (13)
The term, \( P_{2}^{B} \), represents the buyer's price of a contract for the unconditional delivery of the face value of the policy at date 2. If the discount factor required to render a period-1 claim into a period-0 claim of equivalent value is given as \( \frac{1}{(1+r_{0,1})} \), then equation (13) may be re-expressed as:

\[
P_{W,3,1}^{B} = \pi_{3,1} \cdot P_{1}^{B} + \pi_{6,2} \cdot \frac{P_{1}^{B}}{(1+r_{0,1})}
\]

(14)

In order to purchase claims contingent upon the death of its provider, a household sells claims contingent upon his or her survival. These sales are again arranged per medium of the life insurance firm, which purchases the claims at their respective seller's prices. In the case of a single-period term insurance policy on the life of individual 1, the household must sell claims contingent upon events 1 and 2 at date 1. If the probabilities are as before, the seller's price for claims contingent upon event 1 at date 1 is zero. Thus, the household must sell a claim contingent upon event 2 at date 1 whose value at the contingent seller's price is just equal to the buyer's price of the term insurance policy. Naturally, since the buyer's and seller's prices of the underlying claims to consumption differ, as will the probabilities in general, the face value of the claims sold by the household will differ from the face value of the term insurance policy it purchases.

Insomuch as some of the contingent claims purchased by a household may refer to dates in the future, some of the claims it sells may also refer to dates in the future. Thus, in exchange for the bundle of contingent claims represented by a whole-of-life insurance policy, a household may offer its own bundle of contingent claims. As long as the
value of this latter bundle of claims as measured in period 0 is the same as the period-0 buyer's price of the life insurance policy, the exchange will take place. Such an exchange is embodied in the familiar "level premium" system of purchasing multi-period life insurance policies. In effect, the insured sells the insurance firm a series of claims, each of which has the same face value, and each of which is contingent upon the insured surviving to a more distant future date. The "level" face value is determined so that the period-0 seller's price of the bundle equals the period-0 buyer's price of the multi-period life insurance policy. Level premium life insurance is discussed in greater detail below.

4.3.3 Relation to the Actuarial Approach

The introduction of the Malinvaud result enables an alternative and perhaps more familiar interpretation of the pricing formulae for life insurance policies developed above. In the case of the single-period term insurance policy, the price is equal to the expected loss under the policy. In the case of the whole-of-life insurance policy, the price is equal to the discounted present value of the stream of expected losses under the policy. This interpretation is associated with the traditional actuarial approach to the pricing (or "rating") of life insurance policies. The actuarial approach is based firmly on the reserves view of insurance. As such, it is concerned with calculating premiums which enable sufficient reserves to be accumulated to indemnify losses under policies issued by the insurer. Because the risk of death obeys a law of large numbers, the behaviour of the average loss is virtually certain, and calculations of necessary reserves can be made with considerable accuracy.
Underlying most actuarial "rating" of life insurance policies is the so-called "principle of equivalence" which states that, "... the premium must be equal to the present value of the benefits payable" (Moffet, 1979, p.88). It is the application of this maxim which enables the derivation of pricing formulae for life insurance policies identical in principle to those developed above. For an economist, however, blind application of the principle of equivalence is not particularly satisfactory. It is true that premiums set on this basis will be the minimum required to ensure that the insurer meets his obligations under policies assuming that mortality and interest assumptions hold good. But if the insurer is a profit-maximizing entrepreneur, why should he not strive to set premiums considerably in excess of this minimum level?

The answer of course is that he will seek to raise his premiums; but that competition amongst large numbers of similarly placed insurers will ensure that he does not succeed. Thus, rather than the deus ex machina it seems to be in actuarial science, the principle of equivalence in economics is the natural outcome of a process of competition amongst life insurers. The fact that the actuarial approach and the contingent claims approach to the pricing of life insurance policies both arrive at the same formulae is again a reflection of the individuality (i.e., "insurability") of the risk of death. The contingent claims approach, however, provides an economic explanation for why the pricing formulae are as they are.

4.3.4 Level Premium Life Insurance

Nowhere is the relation between the contingent claims and actuarial approaches to the pricing of life insurance policies more obvious than
in the case of level premium life insurance. As was noted above, under the level premium system of purchasing multi-period life insurance policies, the insured in effect sells the insurance firm a series of claims, each of which has the same face value, and each of which is contingent upon the insured surviving to a more distant future date. The level face value is determined so that the period-0 seller's price of the bundle equals the period-0 buyer's price of the multi-period life insurance policy.

By way of illustration, consider again the example depicted in Figure 3. Assume now, instead of half the population dying in period 0 and the other half in period 1, that half the population dies in period 1 and the other half in period 2. Thus, Nature exercises a choice between events 2 and 3 at date 3. Under these circumstances, the equilibrium buyer's price of a whole-of-life insurance policy on the life of individual 1 is written as:

\[ p_{B}^{B, 3, 1} = \pi_{3, 2}^{B} p_{2}^{B} + \pi_{2, 3}^{B} p_{3}^{B} = \frac{\pi_{3, 2}^{B} p_{1}^{B}}{(1 + r_{0, 1})} + \frac{\pi_{2, 3}^{B} p_{1}^{B}}{(1 + r_{0, 2})} \]  

(15)

where \( \frac{1}{(1 + r_{0, 2})} \) is the discount factor required to render a period-2 claim into a period-0 claim of equivalent value. The face value of the policy can be made explicit by letting \( p_{1}^{B} \) represent the buyer's price at date 1 of a unit claim to the numeraire commodity, and \( V \) represent the face value of the policy in units of the numeraire commodity. Equation (15) then becomes:
To purchase such a policy, individual 1 must sell claims which, when valued at their respective seller's prices, are equal in value to the buyer's price of the policy. Under the level premium system, there is the added restriction that the face values of the claims he sells must be equal. Thus, if $x$ represents the value of the level premium in units of the numeraire commodity, the following equation must hold in equilibrium:

$$\pi_{1,1} \cdot \bar{P}_1^S \cdot x + \frac{\pi_{2,2} \cdot \bar{P}_1^B \cdot V}{(1+r_{0,1})} = \frac{\pi_{3,2} \cdot \bar{P}_1^B \cdot V}{(1+r_{0,1})} + \frac{\pi_{2,3} \cdot \bar{P}_1^B \cdot V}{(1+r_{0,2})}$$

(17)

Since $\bar{P}_1^B - \bar{P}_1^S = b_1 > 0$, it follows that $\bar{P}_1^S = \alpha \bar{P}_1^B$ for some $\alpha < 1$.

Then equation (17) may be re-written as:

$$\alpha \cdot x \cdot \left[ \pi_{1,1} \cdot \bar{P}_1^B + \frac{\pi_{2,2} \cdot \bar{P}_1^B}{(1+r_{0,1})} \right] = v \cdot \left[ \frac{\pi_{3,2} \cdot \bar{P}_1^B}{(1+r_{0,1})} + \frac{\pi_{2,3} \cdot \bar{P}_1^B}{(1+r_{0,2})} \right]$$

(18)

The term $\alpha \cdot x$ represents the net level premium; it is what remains of the gross level premium once transaction costs ("expenses") of $(1-\alpha) \cdot x$ have been subtracted.

Equations (17) and (18) are relationships amongst the prices of bundles of contingent claims. They emerge from a model which views life insurance as a process of trade in contingent claims. These same relationships, however, may be re-interpreted to give the standard actuarial view of level premium life insurance based on the accumulation of reserves.
Multiplying both sides of equation (18) by \( \frac{(1+r_{0,2})}{B_F} \), we obtain:

\[
\alpha \cdot x \cdot \pi_{1,1} + (1+r_{1,2}) \cdot \pi_{2,2} = V \cdot \left[ \pi_{3,2} + \pi_{2,3} \right] \tag{19}
\]

when it is recalled that \( (1+r_{0,2}) \equiv (1+r_{0,1}) \cdot (1+r_{1,2}) \). Equation (19) may be re-arranged to obtain:

\[
(1+r_{0,2}) \cdot \pi_{1,1} \cdot \alpha \cdot x + (1+r_{1,2}) \left[ \pi_{2,2} \cdot \alpha \cdot x - \pi_{3,2} \cdot V \right] = \pi_{2,3} \cdot V \tag{20}
\]

The term, \( \pi_{1,1} \), which strictly speaking represents the probability that both individuals are alive at date 1, may be interpreted more generally as the proportion of the population alive at date 0 who survive to date 1. Similarly, the probability \( \pi_{2,2} \) (respectively, \( \pi_{3,2} \)) may be interpreted as the proportion of the population alive at date 0 who survive to date 2 (respectively, to date 1 but not to date 2), and \( \pi_{2,3} \) as the proportion of the population who survive to date 2 but not to date 3. Interpreting probabilities in this way, equation (20) shows that, if the level premium payments received from surviving members of the population are placed in a reserve earning interest, there will be sufficient funds in the reserve at the end of each period to honour the promised payment of \( V \) to each member of the original population who dies during the period.

In the specific example of Figure 3, both members of the original population survive to date 1 and so make the first level premium payment. These funds are placed in a reserve which by date 2 has grown on account of interest earned. Only one member of the original population is still
alive at date 2 and hence obliged to make the second level premium payment. This amount together with the funds set aside in the reserve are more than sufficient, however, to pay the promised indemnity of V to the heirs of the deceased member of the population. The remaining funds in the reserve continue to earn interest so that by date 3, there is precisely enough to pay the outstanding claim of V to the heirs of the other member of the original population.
CHAPTER 5

TAXATION OF LIFE INSURANCE IN AUSTRALIA

The previous three chapters have been devoted to the development of a theoretical framework. This chapter is the first of three which attempt to use this framework to analyse the taxation of income generated through life insurance. This chapter begins the analysis by describing the system of taxing life insurance companies and their policyholders as it currently operates in Australia.

5.1 Taxation of Life Insurance Companies

In Australia, taxation of income generated by life insurance companies is governed by the Income Tax Assessment Act 1936 (as amended). The major provisions concerning the taxation of life insurance companies are contained in Division 8 of Part III of the Act. This Division details those respects in which the taxation of life insurance companies differs from that of other forms of incorporated and unincorporated enterprise. As such, it is not an exclusive code. Inasmuch as certain provisions of the Act apply to all taxpayers, they apply to life insurance companies as well.¹

For the purposes of Division 8,² a life insurance company is defined as a company which is registered under the Life Insurance Act 1945 and is engaged in life insurance business. This definition holds whether or not life insurance is the sole or principal business of the company concerned. Division 8 therefore applies to, "... resident companies,
non-resident companies which carry on business in Australia and non-resident companies which invest a portion of their funds in Australia but do not carry on business here" (CCH Australia Ltd., 1979, p.14,001).

One of the most important aspects of the taxation of life insurance companies in Australia is the operation of the so-called "30/20" rule. The "30/20" rule formally became a part of Australian income tax law in 1961, having grown out of the concern felt by the government of the day at the declining rate of subscription by life insurance companies to public loan raisings. The original proposal was to legislate outright to require life insurance companies (and private superannuation funds) to adhere to the "30/20" ratio. However, objections raised by the life insurance companies to the notion of compulsion resulted in the ultimate legislation taking the form of strong tax incentives directed towards compliance with the "30/20" rule (Gray, 1977, pp. 275-276).

The rule itself has been neatly summarized as follows (CCH Australia Ltd., 1979, p. 14,002):

"The 30/20 rule requires that the assets of each Australian statutory fund of a life company include public securities costing not less than 30% of the total cost of the assets of the fund, those public securities including Commonwealth securities costing not less than 20% of the total cost of the assets of the fund".

For the purposes of the rule (CCH Australia Ltd., 1979, pp. 14,002-14,003):

(i) an Australian statutory fund is one maintained under the Life Insurance Act 1945, and which is either in part or exclusively referable to Australian life insurance business;
(ii) Commonwealth securities include bonds, debentures, stock or other securities issued under Commonwealth law; and

(iii) neither public securities nor Commonwealth securities include:

(a) securities issued after 12 April 1976 by Government-owned banks;

(b) securities issued in respect of a loan raised outside Australia or the Territories, unless the contrary is expressly declared by the Treasurer in the Gazette.

The importance of the 30/20 rule for the taxation of life insurance companies derives from the fact that a company's tax liability in a given year of income depends directly upon the degree of its compliance with the 30/20 rule. Specifically, the income tax law identifies three separate classes of life insurance company:

(i) companies in Class 1 are those which at the least exactly satisfy the 30/20 rule at all times during a given year of income and which, in addition, more than satisfy the 30/20 rule at the end of that year; while

(ii) companies in Class 2 are those which exactly satisfy the 30/20 rule at all times during a given year of income; and

(iii) companies in Class 3 are those which fail to satisfy the 30/20 rule at any time during a given year of income, i.e., the cost of whose holdings of either public or Commonwealth securities in any Australian statutory fund falls short of the respective lower limits of 30% and 20% of the total cost of the assets of the fund at any time during the given year of income.

The different tax treatment accorded companies in different classes will be described in detail below. Briefly, however, basic tax concessions are available to companies in Class 2 which are increased on a sliding scale for companies in Class 1 and decreased on a sliding scale or removed altogether for companies in Class 3.
A life insurance company's net tax liability in a given year of income is determined in four stages as follows:

(i) total income - tax-exempt income = assessable income;
(ii) assessable income - deductions = taxable income;
(iii) taxable income x rate of taxation = gross tax liability;
(iv) gross tax liability - rebates = net tax liability.

5.1.1 Assessable Income

The total income of a life insurance company consists of premium payments received in respect of life insurance policies outstanding, considerations received in respect of annuities granted, and investment income attributable to the various statutory funds maintained by the company in respect of its life insurance business. This latter category, viz., investment income, comprises interest monies earned by assets of a company's statutory funds, capital gains realized upon the sale of assets of statutory funds, and payments received by way of rent and dividends.

Only a portion of total income is assessable for tax purposes, the remainder being specifically exempt from tax. For companies in Classes 1 and 2, tax-exempt income consists of:

(i) premiums on life policies and considerations for the purchase of annuities (by virtue of Section 111 of the ITAA\(^4\)); and
(ii) that portion of investment income specifically attributable to superannuation business (by virtue of Section 112A).
For companies in Class 3, tax-exempt income consists of premiums on life policies and considerations for annuities only. The disallowance of the exemption from tax on superannuation investment income represents one of the penalties paid by Class 3 companies for failing to satisfy the 30/20 rule.

Thus, the assessable income of a life insurance company consists at most of the investment income attributable to all of its life insurance business. Note that investment income is defined to include capital gains realized on the sale of company assets. This is not a specific provision of Division 8 or of the ITAA for that matter. Rather it is the result of several High Court decisions in which the principle was established that, since the investment of its funds is part of the business of a life insurance company, gains realized on the sale of such investments should be regarded as "income" for taxation purposes.

5.1.2 Taxable Income

In determining that part of its assessable income which is taxable, a life insurance company may avail itself of certain deductions. Firstly, in common with all other taxpayers by virtue of Section 51(1) of the ITAA, a life insurance company may deduct all expenses exclusively incurred in gaining assessable income. Note that since premiums on life policies and considerations for annuities are specifically exempt from assessment under Section 111, expenses exclusively incurred in gaining such non-assessable income (e.g., agents' commissions) are correspondingly non-deductible.

A second deduction which is allowable concerns expenses of general management. Section 113 of the ITAA provides that:
(i) a company which is engaged in life insurance business only as a subsidiary activity may deduct expenses of general management to the extent to which they are incurred in producing assessable income (the actual deduction being determined according to the facts of each individual case); and

(ii) a company which is engaged in life insurance as its sole or principal activity may either elect to be treated as described in (i) above or deduct its general management expenses according to the formula:

\[ \text{expenses of general management} \times \frac{\text{assessable income}}{\text{total income}} \]

Section 113 specifically lays down those expenditures which may not be regarded as expenses of general management for purposes of deduction against tax. These include expenditures which are:

(i) of a capital nature (including claims paid under life insurance policies);

(ii) exclusively incurred in gaining or producing assessable income; or

(iii) exclusively incurred in gaining or producing non-assessable income.

Expenditures which may be regarded as general management expenses are not explicitly identified, however. Thus, the tax deductibility of a given expense cannot be determined without reference to the relevant case law.

A further deduction available to life insurance companies centres on the notion of "calculated liabilities". As noted in Chapter 4, the actuarial approach to pricing a life insurance policy involves calculating
the discounted present value of the stream of expected future liabilities under the policy in question. If the resulting premium is paid in a lump sum, this lump sum becomes the reserve which is established to meet expected future liabilities under the policy in question. If the premium is not paid in a lump sum, the reserve must be built up over a number of years as annual premiums are received and interest on existing reserves accrues. At any point over the life of a policy, the reserve must at least equal the discounted present value of the stream of expected net future liabilities under the policy. In other words, the reserve must at least equal the amount which, together with expected future premium receipts, when accumulated at an appropriate rate of interest, is sufficient to cover expected future liabilities under the policy. The calculation of the minimum reserve required to be held by a company against all of its expected future liabilities under policies is known as an "actuarial valuation" of its policy liabilities. If the actual reserve held by a company exceeds this minimum amount, it is said to enjoy an "actuarial surplus".

Clearly, an actuarial valuation of a company's policy liabilities is highly sensitive to the rate of discount used in the calculation. This rate of discount ultimately reflects the rate of return a company expects to earn on its assets. If the actual rate of return it earns over a period of time is substantially lower than that assumed in the actuarial valuation of its policy liabilities (and hence in the setting of its premiums), then it is not hard to see that a company may be forced into insolvency. It was the fear that this situation might be engendered by the excessive taxation of life insurance companies which
underlay the original decision to allow a deduction closely linked to the level of a company's "calculated liabilities".

The legislation was introduced by the then Treasurer, Joseph Lyons, in October 1933 and provided that a life insurance company may deduct from its assessable income an amount equal to 4% of its "calculated liabilities" under existing policies. The figure of 4% was chosen on the basis of submissions by various company actuaries to the Royal Commission on Taxation (Ferguson Commission) being conducted at that time. These submissions established that some life companies had already used an interest rate assumption of 4% in their actuarial valuations and, moreover, that this was not an unreasonable figure for the time. However, not all companies had employed the figure of 4% in their valuations. Thus, any legislation which aimed to be non-discriminatory needed to include an adjustment mechanism whereby actuarial valuations incorporating different interest rate assumptions could be adjusted to achieve comparability with a 4% basis. It was for this purpose that the notion of "calculated liabilities" was developed and included in the 1933 legislation.9

A life insurance company's "calculated liabilities" are defined by Section 114 of the ITAA as follows:

where the basis of actuarial valuation is compound interest at the rate of

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<th>&quot;calculated liabilities&quot; are</th>
<th>100% of actuarial valuation of liabilities</th>
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<td>4% and over</td>
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<td>3½% and less than 4%</td>
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<td>3% and less than 3½%</td>
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By adjusting in this way for different rates of interest assumed in the process of actuarial valuation, Section 114 is designed to remove the incentive which would otherwise exist for a company to be overly conservative in estimating its earned rate of return for the purpose of liability valuation; thus artificially inflating that valuation and increasing the extent of its allowable deduction against tax. At the time, the adjustment probably achieved its stated aim. Now, however, the scale of assumed interest rates is totally unrealistic. With earned rates of interest in the region of 9% p.a., Section 114 has the opposite effect to that intended: it gives companies every incentive to choose a 4% valuation basis or lower, thereby enabling larger deductions against assessable income.

The original logic underlying the deduction was that by freeing from tax an amount equal to 4% of a company's "calculated liabilities", the tax system at least would not be responsible for that company being unable to set aside enough of its current investment income to service its future liabilities. Only that much of its investment income as remained after this and other deductions was to attract tax. Presumably, this remainder was regarded as surplus income resulting from experience more favourable than that assumed in writing policies.

Over the years, the deduction for "calculated liabilities" has been the subject of much criticism from outside the industry. Many have argued that expected future tax treatment of investment income can always be accounted for in the setting of policy premiums, and that special transitional arrangements can be invoked for policies in force.
at times of major change in the tax legislation. Evidence of the
disrepute in which this deduction has been held at various points
throughout its history is provided by the fact that it has been reduced
in extent on three separate occasions since inception. Each change
has of course further compromised the logic which underlay its original
introduction. But the tax savings which life insurance companies have
enjoyed over the years as a direct result of its operation have been too
much for some revenue-conscious governments to ignore.

The operation of the current form of the deduction in respect of
calculated liabilities is governed by the provisions of Section 115 of
the ITAA. Since 1961, this operation has been closely linked to degrees
of compliance with the 30/20 rule. In fact, it is via the operation of
this Section that the tax concessions and penalties which surround
compliance with the 30/20 rule take on their sliding-scale characteristics.

A company in Class 2 is entitled to a deduction from its assessable
income according to the formula:

\[ 1\% \times \frac{\text{value of assets producing assessable income}}{\text{total value of assets}} \times \frac{\text{calculated}}{\text{liabilities}}. \]

For a Class 2 company, the most important category of assets not producing
assessable income is that which relates to its superannuation business.
Thus, for a company in this Class, the deduction is effectively equal to
1% of non-superannuation calculated liabilities. This deduction plus
the tax exemption of superannuation investment income represent the
basic concessions available to companies which satisfy the 30/20 rule.
For the purposes of the Section 115 deduction, Class 1 companies are divided into two groups. The first group comprises those companies which not only more than satisfy the 30/20 rule at the end of a given income year (having at least strictly satisfied the rule throughout the year) but have also during the year maintained the level\textsuperscript{15} of their investments in public securities (other than Commonwealth securities) at their 1 March 1961 level in either their Australian statutory funds or all their life insurance funds.

For Class 1 companies in this first group, the amount of the basic 1% deduction for non-superannuation calculated liabilities is (CCH Australia Ltd., 1979, p. 14,015):

\begin{enumerate}
  \item[(i)] increased by 1% for each 1% by which the company's holding of public securities (including Commonwealth securities) in its Australian statutory funds, other than those relating exclusively to superannuation business, exceeds 30% at the end of the income year;
  \item[(ii)] increased by $\frac{1}{2}$% for each 1% by which the company's holding of Commonwealth securities in such funds exceeds 20% at the end of the income year; and
  \item[(iii)] reduced by $\frac{1}{4}$% for each 1% by which the company's holding of public securities (other than Commonwealth securities) in such funds is less than 10% at the end of the income year.
\end{enumerate}

The remaining companies in Class 1 are those which, while more than satisfying 30/20 at the end of a given income year, have allowed the level of their investments in public securities (other than Commonwealth securities) in both their Australian statutory funds and all their life insurance funds to fall below their 1 March 1961 level at some time during that year. For this second group of Class 1 companies, the
amount of the basic 1% deduction for calculated liabilities is increased by 1% for every 1% by which the company's holding of public securities (including Commonwealth securities) in its Australian statutory funds, other than those which relate exclusively to superannuation business, exceeds 30% at the end of the income year (CCH Australia Ltd., 1979, p. 14,016).

Turning to the treatment of Class 3 companies, the first point to note is that for companies in this Class the deduction is an amount effectively equal to 1% of calculated liabilities relating to all of a company's life insurance business. This change reflects the fact that the superannuation investment income of a Class 3 company is not tax-exempt. Assets held in respect of a Class 3 company's superannuation business therefore produce assessable income, and the ratio of assets producing assessable income to total assets is approximately equal to one. Bearing in mind this change in the definition of the basic deduction, its amount for a Class 3 company is (CCH Australia Ltd., 1979, p. 14,016):

(i) reduced by 1% for each 1% by which the company's holding of public securities (including Commonwealth securities) in its Australian statutory funds is less than 30% at the end of the income year; and

(ii) reduced by ½% for every 1% by which the holding of Commonwealth securities in such funds is less than 20% at the end of the income year.

The deduction cannot, however, be reduced below 75% of the basic 1% deduction.

Thus, it is via manipulation of a company's eligibility for the Section 115 deduction that the tax system effects concessions or penalties
on a sliding scale over and above the basic tax exemption or non-exemption of superannuation investment income according to the degree of its compliance with the 30/20 rule. However, it is doubtful that the system of incentives is taken as seriously now as when the basic deduction was set at the 3% level.16

The only other deductions available to life insurance companies are those under the general provisions of the ITAA (specifically, Sections 72, 73, 78(1) and 82 AAC) which are available to companies generally. These provisions allow deductions in respect of municipal rates and taxes paid, subscriptions to professional or industry associations, gifts to charitable institutions and/or bodies engaged in scientific research, and contributions to superannuation funds on behalf of company employees.

5.1.3 Gross Tax Liability

Once a life insurance company's taxable income has been determined by deducting from its assessable income the various deductions to which it is entitled, its gross tax liability is calculated directly by applying to that taxable income the corporate rate of income tax.17 This rate is currently set at 46%.

5.1.4 Net Tax Liability

The ultimate or net tax liability of a life insurance company is determined by taking the various rebates to which it is entitled into account. Under Sections 46 and 46A of the ITAA, a resident life insurance company like all other resident companies is entitled to a rebate of tax
paid on the dividend income from its shareholdings in other companies. The amount of the rebate is modified in the case of resident Class 3 companies by Section 116A which is one of the specific provisions contained in Division 8. In such a case, the maximum allowable rebate, "... is limited to the rebate that would have been allowable if the company's assessable dividends [in the particular year of income] did not exceed its assessable dividends in the year ended 30 June 1961" (CCH Australia Ltd., 1979, p. 14,017). The actual rebate allowed may well fall below this maximum depending upon the outcome of a somewhat complex computation required by Section 116A(1).

Since 1973-74, all three classes of life insurance company have had their rebates under Section 46 reduced by a portion of their Section 113 and Section 115 deductions. These reductions were incorporated in the 1973-74 Federal Budget following the report of the Coombs Task Force (Commonwealth of Australia, 1973). In relation to the Section 113 deduction, the amount of the reduction in the rebate otherwise allowable may be expressed as (CCH Australia Ltd., 1979, p. 14,017):

\[ \text{general management expenses} \times \frac{\text{dividends included in assessable income}}{\text{total income}} \]

In relation to the Section 115 deduction, the amount of the reduction may be expressed as (CCH Australia Ltd., 1979, p. 14,017):

\[ \text{Section 115 deduction} \times \frac{\text{value of shares held as income-earning assets}}{\text{value of all assets}} \]

The effect of these reductions is to compensate for the fact that dividends qualify as assessable income for the purposes of the Section 113 deduction and shares qualify as assets earning assessable income for
the purposes of the Section 115 deduction. Prior to the advent of the reductions, life insurance companies in Classes 1 and 2 effectively enjoyed a negative rate of tax on dividend income (Nottle, 1978, p.236). For not only was dividend income fully rebateable under Sections 46 and 46A, but also general management expenses incurred in earning dividend income were deductible under Section 113. In addition, the Section 115 deduction was increased through treating shares as assets producing assessable income.

The only other rebate to which life companies are entitled (and which is again available to companies generally) is that under Section 160AB in respect of interest earned on a company's holdings of certain public securities issued prior to 1 November 1968. Specifically, a rebate of ten cents is allowed for every dollar of interest income from such securities included in a company's taxable income.

Finally, there is provision for a life insurance company not to pay any income tax in a particular year of income. Under Section 116 of the ITAA, if at the end of any year of income the value of a company's calculated liabilities exceeds the total value of all its assets, then it will not be liable to pay any income tax on its life insurance business income for that year.

Figure 4 summarizes the main steps involved in the calculation of the net tax liability of each class of life insurance company in the form of a flow-diagram.
For companies in:

Class 1:
- Total income = Premium income + Investment income
- From which subtract:
  - Premium income + Superannuation investment income
  - To obtain:
    - Assesable income
    - From which subtract:
      - Expenses incurred in gaining assessable income plus a proportion of the expenses of general management
      - Together with:
        - Some % of non-superannuation "calculated liabilities" which is greater than 1%
        - And
        - Other deductions available to companies generally
        - To obtain:
          - Taxable income
          - Which is multiplied by:
            - The company rate of taxation
            - To obtain:
              - Gross tax liability
              - From which subtract:
                - Full net rebates under Sections 46, 46A and 160AB
                - To obtain:
                  - Net tax liability

Class 2:
- Total income = Premium income
- From which subtract:
  - Premium income only
  - To obtain:
    - Assesable income
    - From which subtract:
      - Expenses incurred in gaining assessable income plus a proportion of the expenses of general management
      - Together with:
        - Exactly 1% of non-superannuation "calculated liabilities"
        - And
        - Other deductions available to companies generally
        - To obtain:
          - Taxable income
          - Which is multiplied by:
            - The company rate of taxation
            - To obtain:
              - Gross tax liability
              - From which subtract:
                - A limited net rebate under Sections 46 and 46A plus the full net rebate under 5.160AB
                - To obtain:
                  - Net tax liability

Class 3:
- Total income = Income
- From which subtract:
  - Income
  - To obtain:
    - Assesable income
    - From which subtract:
      - Expenses incurred in gaining assessable income plus a proportion of the expenses of general management
      - Together with:
        - Some % of total "calculated liabilities" which is less than 1%
        - And
        - Other deductions available to companies generally
        - To obtain:
          - Taxable income
          - Which is multiplied by:
            - The company rate of taxation
            - To obtain:
              - Gross tax liability
              - From which subtract:
                - Full net rebates under Sections 46, 46A and 160AB
                - To obtain:
                  - Net tax liability

Figure 4
5.2 Taxation of Life Insurance Policyholders

Since the 1975-76 income year, premiums paid on life insurance policies (including deferred annuities) which amount to $1,200 or less over the course of the year have been rebateable within the terms of Section 159N of the ITAA. This Section allows for a general concessional rebate of $1,590 and for a further rebate of 32 cents for every dollar of rebateable expenditure in excess of $1,590 included in a taxpayer's assessable income. The operation of the general concessional rebate represents a significant break with past arrangements whereby life insurance premiums paid were fully deductible against a taxpayer's assessable income under Section 82H (now repealed). The change has significantly weakened the incentive which existed under the previous scheme for a taxpayer to take out a life insurance policy on either his own life or those of his dependants. Indeed, the virtual removal of what was a substantial subsidy has been a source of considerable concern to the industry.

A general qualification to the operation of this rebate has existed since 1973 (at which time it applied to the provisions of the then operative Section 82H). It is embodied in Section 159R (which specifically defines life insurance premium payments, amongst certain other like payments, to be rebateable expenditures within the general terms of Section 159N) and is designed to prevent certain abuses of those provisions aimed at tax avoidance. The qualification has the effect of disallowing the rebate, "... to premiums on policies under which the first premium was paid on or after 1 January 1973, and which provide for
the payment of benefits, other than death benefits, before the expiration of 10 years from the date of commencement of risk" (CCH Australia Ltd., 1979, pp. 4,722-4,723).

Furthermore, where any policy the first premium under which was paid on or after 1 January 1973 is forfeited or surrendered within five years of its commencement any rebate allowed over that period will be withdrawn. In the case of a policy forfeited or surrendered after five years but before ten years of its commencement and under which premiums were payable by way of equal annual or other periodic amounts rebates allowed in respect of the preceding five years' premiums will be withdrawn.

An "escape" provision does exist to allow the rebate in cases where forfeiture or surrender is the result of serious financial difficulty. However, even in such a case, it must first be established that the policy was in fact taken out for bona fide life insurance purposes and not with the prospect in mind of realizing an early return on premiums paid.

The other important aspect of the taxation of life insurance policyholders concerns the tax treatment of their policy proceeds. In Australia, the definition of "income" for taxation purposes for the most part excludes receipts of a capital nature. Surrender or maturity values (including reversionary bonuses by virtue of Section 26(i)) of life insurance policies are generally regarded as capital (i.e. non-income) receipts, and therefore form no part of a policyholder's assessable income.
This much is true of life insurance benefits which are paid in lump-sum form. Benefits paid in the form of an annuity (i.e., an annual pension) do attract personal income tax, however. Specifically, under Section 26AA of the ITAA so much of an annuity is taxable as remains after deduction of an amount relating to the "undeducted purchase price" of the annuity. The "undeducted purchase price" of an annuity is defined in Section 26AA(4) and refers to that part of the purchase price of the annuity as was not rebateable under Section 159R at the time of purchase. The total deduction in respect of the "undeducted purchase price" of an annuity is apportioned equally across income years for the term (or expected term in the case of an annuity payable until the death of the annuitant) of the annuity. The assessability of annuity income in the hands of the taxpayers receiving it is the principal factor underlying the low levels of annuity business transacted in Australia.
A THEORETICAL APPROACH TO THE TAXATION OF LIFE INSURANCE*

As noted in Chapter 1, it is widely believed both inside and outside the life insurance industry that the taxation of life insurance raises special problems which require special solutions. The aim of this chapter is to demonstrate that there is nothing inherent in the economics of life insurance which warrants special tax treatment either of life insurance companies or of their policyholders. This is not to say that valid economic arguments cannot be made for the provision of a tax subsidy to life insurance. For example, one may wish to argue that in the absence of an explicit subsidy to life insurance individuals make inadequate provision for their own retirement or for the well-being of their dependents in the event of premature death. Rather, the focus of this chapter is a narrower one; its aim is to demonstrate that whatever arguments are made for the special tax treatment of life insurance, they cannot rest on the alleged "special nature" of life insurance as an economic activity.¹

In order to establish this conclusion, it suffices to analyse the treatment of life insurance under a simple and straightforward tax regime. Indeed, use of a simple tax system provides the greatest scope for alleged special features of life insurance to show through. The risk is minimized that the perceived special nature of life insurance is a mere reflection of the complexity of the tax system. If life insurance

*This chapter contains material presented originally in Harper (1981b).
is shown to possess no inherent features which warrant its special
treatment under a simple tax regime, then this conclusion will apply
with equal strength under more complicated tax systems. It will then be
evident that the difficulties experienced by tax authorities in incorporating
life insurance within real-world tax systems derive not from the special
nature of life insurance, as so often alleged, but from the complex
nature of the real-world tax systems themselves.\(^2\)

The simple tax system adopted in this discussion is that based upon a
proportional tax on factor income.

6.1 Taxing the Income of the Theoretical Life Insurance Firm and its
Policyholders

In Chapter 4, a theoretical model of life insurance was developed
which explained life insurance as a process of trade in contingent
claims and the role of the life insurance firm as that of broker in the
markets for contingent claims. This view of life insurance and of the
life insurance firm forms the basis of the present discussion.

As a producer of broking services, the theoretical life insurance
firm transacts contingent claims on behalf of ultimate buyers and sellers.
It buys claims from sellers at the lower seller's price and sells them
to buyers at the higher buyer's price earning the difference between the
two prices for each contingent claim transacted. The value of its
output during a given period is therefore equal to the number of
transactions it performs during that period times the difference between
the buyer's and seller's prices of each contingent claim transacted.
This flow of sales revenue equals the factor income generated by the theoretical life insurance firm.

Factor income generated by the life insurance firm ultimately accrues to the owners of productive factors whose services are employed by the firm. For this reason, the firm may be viewed merely as a conduit through which income passes to its ultimate recipients, namely the owners of productive factors. A proportional tax on factor income may be imposed either at the level of the firm upon generation or at the level of the factor supplier upon distribution. The result is the same provided that tax paid at the level of the firm is credited at the level of the individual factor supplier and vice versa. An example of such a tax system might be:

- regard revenue generated from the sale of its output as assessable income to the firm;
- allow wages, rent and interest as deductions against the assessable income of the firm, taxing these flows in the hands of their ultimate recipients (the suppliers of labour, land and capital, respectively);
- tax the remainder (economic profit) at the level of the firm;
- recognize distributions of economic profit to the suppliers of entrepreneurship (the owners of the firm) as tax-free in their hands.

Clearly, there is nothing particular about the business of broking contingent claims which warrants special treatment under this simple tax
Revenue from the sale of broking services is assessable and payments to factors employed in the broking process deductible. This treatment is the same as that afforded any other producer of factor income. When the essential economic nature of the life insurance firm is exposed - that it is a producer of broking services in the markets for contingent claims - it is immediately clear that there are no grounds for its special tax treatment, and that a simple proportional tax on factor income does not distinguish the life insurance firm from any other producer of factor income.

This conclusion remains true regardless of the form of ownership of the particular life insurance firm. In a mutual life insurance firm, the productive technology is owned by consumers of its output. In a proprietary life insurance firm, on the other hand, the owners of the firm and the consumers of its output are largely distinct groups of individuals. The tax treatment is the same in each case, however: the firm is assessed on revenue generated from the sale of broking services and taxed on any part of that revenue which is not distributed to (and taxed in the hands of) factor suppliers.

Returns to the sale of broking services are not the only resource flows which pass through the hands of the theoretical life insurance firm. In its role as broker, the life insurance firm not only arranges the exchange of contingent contracts ex ante but also clears outstanding claims under contracts ex post. Both services are allowed for in computing the margin between the buyer's and seller's prices of contingent claims. These additional flows are generated by the process of insurance
proper and are not related to the production of broking services. They simply pass from one customer of the theoretical life insurance firm to another through its offices; they never accrue to the firm itself.

Inasmuch as these additional flows do not accrue to the theoretical life insurance firm, they do not affect its tax liability. To the extent that they are flows of factor income, however, they do affect the tax liability of their recipients. Whether or not a particular flow represents factor income depends upon the nature of the contingent contract responsible for its generation.

The contingent claims traded by the theoretical life insurance firm are basically of two types: those which are contingent upon a provider dying in the current time period; and those which are contingent upon a provider dying in some future time period. In the case of the former, the parties to an exchange of contingent claims agree to transfer current-period wealth between themselves according to the outcome of a game they each play with Nature. The most likely aggregate outcome of the game is that some providers die while others survive. The resulting "event at date 1" determines which of the many contingent claims traded ex ante require settlement ex post. This settlement involves the transfer of wealth (through a broking firm) from the issuers of claims contingent upon the realized event to the holders of those claims. The former group consists of households whose providers survive, while the latter consists of households whose providers die.

Thus, resource flows associated with trade in current-period contingent claims represent the pure transfer of wealth amongst households.
Such flows do not represent factor income in the hands of their recipients since they do not represent revenue from the sale of newly-produced factor services. For precisely the same reason, such flows are not deductible from the assessable incomes of transferor households. In short, resource flows associated with trade in current-period contingent claims do not affect the tax liabilities of insuring households.

The same cannot be said of resource flows associated with trade in future-period contingent claims. Trade across events at any date $t$ represents agreement amongst the traders to redistribute existing wealth in accordance with the outcome of a game with Nature. If $t > 1$, the wealth to which trade across events refers is future wealth. Future wealth must be created. To do this, individuals trade through time, i.e., they sell claims to current consumption in exchange for claims to future consumption. In general, the terms of this exchange are such that individuals obtain more claims to future consumption than they give up of current consumption. This additional amount represents interest and is the reward for postponing consumption. Interest is a form of factor income; it represents a share in the output of new goods and services made possible by the postponement of current consumption. As such, it is assessable under a tax on factor income.

Thus, trade in future-period contingent claims involves the additional resource flow of interest income which is subject to tax in the hands of its recipient. Of course, it is not necessary for the recipient of interest income to pay the tax himself. The broker may be asked to withhold an appropriate amount and pay this as tax on behalf of the
ultimate recipient. In general, the effect will be the same regardless of who actually pays the tax. In the present case, with interest income subject to a proportional tax, the effect will be to widen the margin between the equilibrium buyer's and seller's prices of future-period contingent claims compared with that of their current period counterparts.

6.2 Implications for the Taxation of Real-World Life Insurance Firms and their Policyholders

The previous section has identified resource flows associated with the conceptual model of life insurance which represent flows of factor income. They are:

(i) the revenue earned by the theoretical life insurance firm in return for the supply of broking services; and
(ii) the interest income earned by households in return for postponing current consumption.

To be consistent with the conceptual model of life insurance developed in Chapter 4, a system designed to tax factor income generated through real-world life insurance must tax these flows and these flows alone. The problem is to identify these flows in the operations of the real-world (as opposed to theoretical) life insurance process.

In the real world, trade does not take place as conceptualized in the model of Chapter 4. Real-world life insurance is based almost exclusively on the accumulation of reserves. An individual purchasing a life insurance policy pays a sum of money (the "premium") ex ante. This
sum is used by the life insurance firm to build up a reserve out of which current and future liabilities under policies are met. The premium is also used to cover expenses incurred by the life insurance firm in managing the reserve. Thus, the premium consists of a number of distinct elements:

(i) a "capital" deposit intended for transfer to the dependents of policyholders who die in the current period should the policyholder himself survive the current period (and to be returned to the dependents of the issuing policyholder should he not survive the current period);

(ii) a "savings" deposit intended (upon investment by the life insurance firm) to accumulate to provide similar transferable "capital" deposits for future time-periods; and

(iii) a fee to cover the cost incurred by the life insurance firm in managing both the "capital" and the "savings" deposits.

Management of the capital deposit is referred to as the "underwriting" function of a life insurance firm. It corresponds to broking trade in current-period contingent claims. The capital deposit itself corresponds to each household's share of the aggregate loss. This reflects the fundamental difference between the operations of a real-world life insurance firm and those of the model firm developed in Chapter 4: the sharing of the aggregate loss occurs ex ante rather than ex post. Instead of apportioning the realized aggregate loss ex post, the real-world life insurance firm apportions the actuarially-determined expected aggregate loss ex ante. Of course, this does not alter the fact that, ex ante, no-one knows exactly what the realized aggregate loss will turn
out to be. It does mean, however, that the burden of the uncertainty surrounding the aggregate loss no longer rests with the households whose providers' lives are insured; it rests with the owners of the life insurance firm. If these two sets of individuals are identical, the result is as if the aggregate loss had been apportioned ex post. If not, we are firmly in the world of Willett where individual risks are transferred rather than shared. In either case, the uncertainty surrounding the aggregate loss is borne by the owners of the life insurance firm.

Being generally risk-averse, however, the owners of the life insurance firm will not willingly bear risk without compensation. They demand a rate of return to their equity capital which is at least as great as that available in alternative opportunities of equivalent riskiness elsewhere in the economy. This rate of return represents the opportunity cost of their equity capital, and is recouped (along with the hire-costs of other productive factors employed in the process of managing policyholders' capital deposits) by levying a fee on insuring households. It is possible that the owners of the life insurance firm may earn a rate of return which exceeds the opportunity cost of their equity capital. This would occur in the context of the firm's underwriting operation if the aggregate loss were lower than expected. Such a surplus constitutes pure economic profit and may be regarded as the reward for the entrepreneurship supplied by the owners of the life insurance firm. In practice, the return to risky capital and pure economic profit are lumped together to become what the industry calls "underwriting profit".
Management of the savings deposit constitutes the so-called "investment" function of a life insurance firm. It corresponds to broking trade in future-period contingent claims. In this role, the life insurance firm faces competition from a much broader class of financial intermediary, namely those broking trade through time rather than across states. Indeed, the separability of trade through time from that across states implies that households may choose to effect the former through a broker quite independent of the life insurance firm, whose services are then employed only to effect the latter. Again, a life insurance firm performing this function must compensate factors employed in the process. It therefore charges a fee as in the case of its underwriting function. Moreover, if the firm bears uncertainty on account of its investment function - say, by contracting to deliver a sure rate of return to its policyholders while facing an uncertain market rate of return itself - this fee will contain an element to compensate for risk-bearing. In addition, any surplus over the contractual rate of return to policyholders which the firm happens to earn in the market will accrue to its owners as the reward for entrepreneurship.

According to the analysis of the previous section, the assessable income of a life insurance firm equals the revenue it earns from the sale of broking services. Assuming that the income-shares of the various factors employed in the production of new goods and services are deductible from the assessable income of the firm, the appropriate tax base for a life insurance firm is as follows:

\[
(F_c + F_s) - (E_c + E_s) + (\Pi_m + \Pi_r)
\] (1)
where

\[ F_c = \text{fees charged for managing policyholders' capital deposits} \]
\[ F_s = \text{fees charged for managing policyholders' savings deposits} \]
\[ E_c = \text{expenses incurred in managing policyholders' capital deposits} \]
\[ E_s = \text{expenses incurred in managing policyholders' savings deposits} \]
\[ \Pi_m = \text{pure profit arising from favourable mortality experience} \]
\[ \text{(i.e., a smaller aggregate loss than anticipated)} \]
\[ \Pi_r = \text{pure profit arising from favourable earnings experience (i.e., a higher earned rate of return on policyholders' savings deposits than that assumed in the setting of premiums).} \]

The difference between the first two bracketed terms in (1) represents the risk-adjusted return to the equity capital supplied by the owners of the firm. It may also include an element of pure profit on account of favourable expense experience (i.e., lower expenses ex post than those anticipated in the setting of the management fees). The final bracketed term represents actuarial surplus.

The appropriate tax base for policyholders is:

\[ R_p - F_s \quad (2) \]

where

\[ R_p = \text{that part of the investment income earned by the life insurance firm which is credited to policyholders on account of their savings deposits} \]
and \( F \) is as defined above.

It is not appropriate in (2) to deduct the life insurance firm's fees for managing policyholders' capital deposits, \( F_c \), since they do not represent a cost of producing new goods and services. Rather, they represent the cost of transferring claims to the existing stock of productive assets amongst the group of insured households; they represent a consumption expense as opposed to a production expense. Of course, it is quite appropriate for the life insurance firm to include these fees in its assessable income since they represent revenue from the sale of newly-produced management services.

The two tax bases, (1) and (2), apply regardless of the form of ownership of the particular life insurance firm. Thus, in the case of a purely proprietary life insurance firm where the owners of the firm are distinct from its policyholders, the two bases apply separately to each group of individuals. In the case of a purely mutual life insurance firm, on the other hand, where the owners of the firm and its policyholders are one and the same, the two bases apply simultaneously to the one set of individuals. When taken together, the two bases combine to form a third base:

\[
(R_p + II_r - E_s) + (F_c - E_c) + II_m
\]

Investment income, previously split between policyholders and owners of the firm, now appears in undivided form, \( R_p + II_r \). The first bracketed term therefore represents the return which the owner/policyholders earn in their twin roles of debt-capital suppliers and residual-income
beneficiaries. The second bracketed term captures the value of the services of managing the capital deposits which the owners provide for themselves. The final term captures the remaining source of pure profit for the owners of the firm.

In practice, purely mutual or purely proprietary life insurance firms are rarely encountered. There are firms which, while legally owned by all of their policyholders, allow only some of their policyholders to share in residual income. There are also firms which, while legally owned by shareholders (i.e., non-policyholders), allow some of their policyholders to share in actuarial surplus. For convenience, the former are referred to as "mutual" and the latter as "proprietary" life insurance firms. Their existence, however, has necessitated policyholders being classified as either "participating" or "non-participating". The participating policyholders of a "mutual" life insurance firm enjoy full residual-income sharing rights; the non-participating policyholders receive only contractual payments. The participating policyholders of a "proprietary" life insurance firm share in actuarial surplus; the non-participating policyholders again receive only contractual payments. In both cases, participating policyholders supply equity capital to the firm in the form of a higher capital deposit component of policy premiums than that contained in the premiums of non-participating policyholders.

The framework developed above is sufficiently general to cover these hybrid forms of corporate organisation and the two types of policyholder. The appropriate tax base for a life insurance firm given by (1) refers to the income of policyholders and shareholders (if any) in their role as residual-income beneficiaries. In the case of a "mutual" company, this income is payable in total to participating
policyholders; in the case of a "proprietary" company, it is divided between participating policyholders and shareholders. The appropriate tax base for policyholders given by (2) refers to the income of policyholders in their role as policyholders; it therefore refers to the income of participating and non-participating policyholders alike.

6.3 A Comparison of the Treatment of Life Insurance under a Factor Income Tax with that under Current Income Tax Law in Australia

In this section, the treatment of life insurance under a simple proportional tax on factor income is used as a benchmark against which its treatment under the current income tax law in Australia is assessed. Use of the proportional factor income tax in this way does not imply that a system based on this tax should apply in Australia rather than the current system. The question of reforming the Australian income tax law as it relates to life insurance is taken up in Chapter 7. Rather, the purpose of this comparison is simply to highlight those aspects of the present taxation arrangements for life insurance which are inconsistent with the "pure" or "ideal" tax system based on a proportional tax on factor income.

The first difference to be noted in a comparison of the factor income tax base for life insurance with that currently applying in Australia concerns the tax treatment of life insurance company premium income. As noted in Chapter 5, the present tax law in Australia exempts life office premium income. Presumably, the view is taken that the whole of such income represents "receipts of a capital nature" (like the deposit income of a savings bank or building society). The analysis of
Section 6.2, however, suggests that only the capital and savings deposit elements of premium income can be regarded as being "of a capital nature". The management fee element represents revenue from the sale of broking services and so constitutes a source of factor income. A tax on factor income therefore includes the management fee element of premium income in the tax base. As a consequence of this, expenses exclusively incurred in gaining premium income are allowed as deductions. By contrast with the current law, there is no need under a factor income tax to apportion expenses between exempt and assessable income.

By neglecting to include the management fee or "expense loading" element of premium income in the tax base, the current law allows at least a significant part of the return to life insurance companies for the provision of broking services to escape tax. A related inconsistency is the omission from the tax base of pure profit arising out of favourable mortality experience. Taken together, these two inconsistencies amount to the failure of the current system to tax "underwriting profit".

The third major difference between the two tax bases concerns the 30/20 rule. Under current law in Australia, life insurance companies enjoy exemption from tax on their superannuation investment income provided they adhere to the requirements of the 30/20 legislation. Satisfaction of the 30/20 rule is also a necessary condition for allowance in full of deductions under Sections 46 and 115 of the ITAA. There is, of course, no provision of this nature under a pure factor income tax system. While the tax exemption represents a substantial concession to life insurance companies relative to the benchmark tax system, it cannot be taken in isolation of the requirements of the 30/20 rule.
offices adhere to the 30/20 rule at the cost of flexibility in their portfolio investment decisions and very often also at the expense of higher average investment yields. Thus, the tax exemption is very much the quid pro quo for life insurance companies maintaining their subscriptions to public security issues at the prescribed levels. Nevertheless, the fact that compliance with the regulation has been (and continues to be) virtually complete would seem to indicate that the rewards of satisfying the 30/20 rule outweigh the penalty of forgone investment opportunities.

A fourth inconsistency concerns the Section 115 deduction for "calculated liabilities". As noted in Chapter 5, this provision releases from tax at the company level an amount equal to 1% of a life offices' "calculated liabilities" under non-superannuation policies. The deduction itself is not the source of the inconsistency. As explained in Section 6.1, the overall impact of a tax system is not altered if responsibility for paying the tax is shifted from the firm onto individuals. Problems arise, however, if amounts deducted at the level of the firm are not subsequently taxed upon receipt by individuals. Such amounts escape tax altogether en route to their ultimate beneficiaries. Since distributions to policyholders in the form of surrender and maturity values on policies are tax-free in their hands under Australian income tax law, this is precisely the effect of the Section 115 deduction. Amounts deducted under Section 115 are credited to reserves held on behalf of policyholders and eventually distributed to them in tax-free form. Under the factor income tax system, on the other hand, any amounts deducted at the level of the firm are taxed at the level of the individual factor supplier. Conversely, distributions to factor suppliers are only tax-free in their hands if the relevant amounts have already been taxed at the level of
the firm. Thus, individually, the Section 115 deduction and the tax-free status of policyholder benefits are not inconsistent with the pure factor income tax system. Taken together, however, they enable certain amounts of factor income to escape tax, and this is inconsistent with the benchmark tax system.

The only other major inconsistency concerns the provision under the ITAA for a concessional tax rebate to policyholders for life insurance policy premiums paid. Such explicit concessional treatment does not form part of the pure factor income tax system since broader issues of social policy are not taken into account.

The one major aspect of the current tax treatment of life insurance companies which has not featured in this discussion has been the Section 46 rebate on receipts of inter-company dividend income. There is a good reason for this: the application of the Section 46 rebate to life offices is consistent with the benchmark tax system. The Section 46 tax rebate forms part of the so-called "classical" system of company taxation currently operating in Australia. Under such a system, dividend income is taxed twice: once upon generation, and once again upon distribution. Naturally, if other companies are interposed between the company generating the income and the ultimate shareholder recipient of the income, there will be an unintentional accumulation of tax on dividend income. It is this accumulation which Section 46 is designed to prevent. Under a factor income tax, however, dividend income is taxed only once; there is no separate and additional tax on distributions of corporate-source income. If dividend income is taxed upon generation, it is tax-free
upon distribution regardless of who receives it. If dividend income is not taxed upon generation, it is taxed upon distribution to ultimate shareholder recipients, being tax-free in the hands of all interposed companies. Thus, the "classical" system of company taxation is inconsistent with the benchmark tax system. Accordingly, the granting of the Section 46 rebate to life offices which, together with the tax-free status of distributions to policyholders, effectively eliminates the "double tax" on dividend income, is fully consistent with the pure factor income tax system.
CHAPTER 7

THE QUESTION OF TAX REFORM

The aim of Chapter 6 was to demonstrate that there is nothing inherent in the economics of life insurance which warrants its special treatment under a tax system. The question addressed in this chapter concerns the relevance of this proposition for the reform of the current system of taxing life insurance companies in Australia.

In Chapter 6, attention was drawn to the major respects in which the treatment of life insurance under current income tax law in Australia differs from that under the hypothetical factor income tax system. The pure factor income tax system was used as a benchmark against which the current system was assessed for conformity. When considering the reform of a sub-set of the tax system, its internal consistency is undoubtedly important. Of greater importance, however, is the relationship between the sub-set in question and the system as a whole. In discussing this relationship, the use of a benchmark is once again of value. The benchmark becomes the common reference point against which the particular sub-set of the tax system and the system as a whole may be assessed.

The criterion of consistency with the pure factor income tax system takes on greater significance in this chapter than the last. This reflects a shift in emphasis from the positive to the normative. In this chapter, consistency with the benchmark tax system becomes a desideratum. The reason for elevating the status of the pure factor income tax system in this way is that it possesses certain properties
which are desirable from the viewpoint of normative economics. A tax system based on a pure proportional tax on factor income does not distort the pattern of resource allocation which emerges from voluntary exchange in competitive markets.\(^1\) The reason is simply that relative factor rewards remain unchanged after the imposition of the tax. Of course, absolute factor rewards will in general be lower as a result of the tax. However, it is the reward offered a factor in one activity relative to that offered in another which determines which of the two is chosen by the factor supplier.

A tax system which does not distort the allocation of resources is said to be neutral. A non-neutral tax system lowers the efficiency with which an economy's resources are utilized. Productive resources are attracted away from their socially most highly valued uses into alternative employments by the prospect of advantage under the tax system. The resultant waste of resources represents a pure or "deadweight" loss of economic welfare; society can achieve a Pareto welfare improvement (i.e., make at least one person better off and no-one else worse off) by removing the non-neutrality.

Of course, economic efficiency is not the only criterion by which a tax system might be judged. The equity or fairness of the system is another commonly advanced criterion. For instance, a proportional tax on factor income might be thought a fair tax in that it treats the owners of productive factors equally regardless of the particular factor(s) they happen to own. It may be thought an unfair tax for the same reason. In general, equity, like beauty, lies in the eyes of the beholder; the only statements an economist can legitimately make in his role as economist
concern questions of efficiency. For this reason, questions of equity are ignored in the discussion which follows. Reform of the tax system will be discussed purely from the perspective of tax neutrality.

This approach to the question of reform is entirely consistent with that adopted by the (Campbell) Committee of Inquiry into the Australian Financial System. In discussing its general approach to taxation policy, the Committee comments in its Final Report (Commonwealth of Australia, 1981, para. 13.13, pp. 207-208):

"The chapters [on taxation policy] are generally not concerned with the use of [such] policy for sectoral or distributional objectives. They focus principally on ways of removing apparent unintended or unnecessary 'bias' in the pattern of funds flows arising from the tax system; in other words they are concerned specifically with tax reform directed at achieving greater 'neutrality' - in the broad sense of the word".

Even ignoring questions of equity, there are still obstacles in the path of a rational discussion of tax reform. Perhaps the most intractable is the problem raised by the "theory of the second best" (Lipsey and Lancaster, 1956-57). The main implication of the theory is that piecemeal attempts to improve the efficiency of an economic system do not necessarily raise the overall level of economic welfare. Put another way, attempts to remove distortions from some parts of an economic system need not result in a general (Pareto) welfare improvement so long as other parts of the system remain distorted. The theory impacts on the question of tax reform at two levels. Firstly, if the tax system as a whole is non-neutral, it is not necessarily true that a move towards neutrality in a sub-set of the system will improve the efficiency of the system as a
whole. Secondly, if the economy is already distorted by elements of monopoly and/or externality, it is not necessarily true that a move towards a neutral tax system will improve the general level of economic welfare.

The theory of the second best has often been used to defend a conservative position on tax reform. This is a misinterpretation of its fundamental import. The theory merely denies a strict link between piecemeal attempts to remove distortions and improvements in general economic welfare; it does not imply that all change is either ineffective or likely to reduce the general level of economic welfare.

Despite the requirement of the theory that the benefits and costs of each proposed reform be assessed to determine its potential for welfare improvement, there has been a general presumption in the Australian literature on tax reform in favour of tax neutrality. For instance, in the first of its Taxation Papers prepared for the Taxation Review (Asprey) Committee, the Commonwealth Treasury states (Commonwealth of Australia, 1974, p. 6):

"The importance of 'neutrality' as the basis for an efficient and equitable tax system, with minimum scope for abuse, can hardly be stressed enough. The search for it obliges looking not merely at the elements of each form of tax, but at the whole taxation structure and the interconnections of different taxes".

Furthermore, in its Full Report, the Asprey Committee itself comments (Commonwealth of Australia, 1975, para. 3.26, p. 16):

"The Committee is persuaded that neutrality should be the general aim when efficiency is under consideration. Departures should be made only in a deliberate and explicit way for proven, explicit and quantified purposes and after it had been shown that other approaches (such as regulation and subsidy) are likely to be less effective for the end chosen".
The support of the Campbell Committee for the general aim of tax neutrality has been documented above.³

Thus, the prominence given neutrality in the discussion which follows reflects both an unwillingness to express a view on issues of equity or broader social policy and an acceptance of tax neutrality as a desirable end of tax reform.

7.1 Tax Neutrality and Life Insurance

Tax neutrality requires that the tax system should not discriminate in favour of or against different types of economic activity. In the words of the Asprey Committee (Commonwealth of Australia, 1975, para. 3.24, p. 16), the tax system:

"... should not interfere with the manner in which an individual spends his income by changing the relative prices of the goods he buys; it should not alter the relative rewards of the different types of work between which he has to choose, or the relative attractions of work and leisure, or the relative returns from different modes of investment; it should not alter the relative attractiveness of different types of business organization, or the relative prices of productive resources; and it should not discriminate between different types of production".

Of course, while there is a general presumption in favour of tax neutrality, departures from neutrality may be justified. In general, such departures must produce demonstrable net social benefits. It must also be clear that the net social benefit would not be greater were alternative means of government intervention employed, such as direct regulation and/or subsidy.
In the case of life insurance, the analysis of Chapter 6 has established that there is nothing inherent in life insurance as an economic activity which warrants its special tax treatment. It follows that, in the absence of arguments on equity or other social grounds, life insurance should be treated in such a way as to preserve tax neutrality between it and other forms of economic activity.

The major problem facing reform of life insurance taxation is that the current Australian income tax system is non-neutral in its impact on various types of business organization. This in turn imparts a bias to its treatment of different types of economic activity. Specifically, while the taxation of income generated through trusts and partnerships is largely integrated with the taxation of personal income, the taxation of income generated through private and public companies is not. Moreover, income earned through mutual organizations in many cases escapes tax altogether. The fact that different types of business organization are treated non-neutrally by the tax system implies that productive activities which for various reasons are best conducted through particular types of business organization are treated non-neutrally also. Thus, the only way to achieve complete neutrality between the tax treatment of life insurance and that of other economic activities is to reform the entire taxation structure.

A more limited objective might be to achieve neutrality between the taxation of life insurance and that of other activities producing similar outputs and/or adopting similar forms of business organization.

Complete neutrality could be achieved by reforming the tax system in such a way as to obtain consistency in all respects with the pure
factor income tax system. This would require, as a minimum:

(i) the removal of those aspects of the current tax treatment of life insurance which are inconsistent with the factor income tax benchmark (see Section 6.3 above);

(ii) the full integration of the taxation of company income with that of personal income; and

(iii) the removal of the tax exemption of imputed profit earned through mutual organizations.

If it is not possible to achieve either (ii) or (iii), then it is not immediately clear which course the reform of life insurance taxation should take. Certainly the purely concessional aspects of the current treatment of life insurance companies, i.e., the exemption of superannuation investment income and the Section 115 deduction for "calculated liabilities", should be removed. These concessions grant life insurance companies a favoured position relative to other companies and distort the allocation of resources in their favour. As a result, the life insurance industry is larger than it otherwise would be, and life insurance companies are able to perform tasks (e.g., investment management) which might be more efficiently provided by other institutions.

The concessional treatment of life insurance policyholders via the tax rebateability of policy premiums is also a departure from strict neutrality. One may wish to grant an explicit subsidy to life insurance, however, in which case such a departure could be justified; although one must recognize that, under the current system, the subsidy is
restricted to those whose total rebateable expenditure exceeds $1,590 per annum (currently about 6% of taxpayers (Commonwealth of Australia, 1980a, p. 45)), and even then applies only to the first $1,200 of life insurance premiums paid.

The problem comes with the treatment of "profits" earned by life insurance companies and the question of whether or not to allow the Section 46 rebate on receipts of inter-company dividend income.

The return to the equity capital and entrepreneurship supplied by the owners of a life insurance firm is captured in expression (1) of Chapter 6. Under a tax on factor income, this amount is subject to tax either at the level of the firm upon generation or in the hands of individuals upon distribution, but not both. Under the "classical" system of company taxation currently operating in Australia, income accruing to the owners of a company is taxed once upon generation and once again upon distribution. In the case of companies whose shares are listed on a stock exchange, the second stage of tax can be avoided by the device of retaining income within the company structure. The share-valuation of the firm is thereby increased and the corresponding "capital gains" enjoyed by its shareholders are largely exempt from tax in their hands. The "classical" system therefore imparts a bias to company dividend policy in favour of profit retention. It also creates a non-neutrality between the taxation of the corporate form of business organization and that of other forms such as the trust, partnership and sole proprietorship; the taxation of income generated through these forms of business organization is largely integrated with the taxation of personal income. Insomuch as the "classical" company tax system
penalizes incorporation, it discriminates against those productive activities to which the corporate form of organization is particularly suited (e.g. large scale and/or high risk ventures).

Life insurance companies are corporate enterprises. Some are "mutual" companies, owned by their policyholders, and some are "proprietary" companies, owned by shareholders. Under current Australian income tax law, only that part of the profit of a proprietary life insurance company which refers to its investment function and which is distributed to its shareholders bears both levels of the "classical" company income tax. That part of its "investment profit" which is distributed to participating policyholders bears tax only once since distributions to policyholders are tax-free in their hands. Similarly, the "investment profit" of a mutual life insurance company is taxed once at the level of the company and distributed tax-free to participating policyholders. "Underwriting profit" is not taxed at the level of the company in either case since premium income is not assessable. It therefore accrues to the participating policyholders of both types of life insurance company without ever having borne income tax. That part of the "underwriting profit" of a proprietary company which is distributed to its shareholders bears tax once in their hands.

If life insurance companies are to be treated neutrally compared with "ordinary" companies, both their underwriting and investment profit should bear tax twice: once at the level of the company and once again at the level of the participating policyholder or shareholder. To neglect this is to discriminate in favour of life insurance as a means by which individuals may generate satisfactions. Not only would this
tax treatment achieve neutrality between life insurance companies and ordinary companies, it would also achieve neutrality between life insurance companies and general insurance companies. At present general insurance companies (excluding mutual insurance associations) are treated as ordinary companies for taxation purposes. They are taxed on a basis which includes underwriting and investment profit. If life insurance companies are taxed twice on investment profit distributed to residual income beneficiaries, then it is appropriate that they be allowed the Section 46 rebate on receipts of inter-company dividend income.

While such a tax reform achieves neutrality between the treatment of life insurance companies and that of ordinary companies, it increases the proportion of gross taxable income which is subject to "double taxation". It therefore widens the extent of non-neutrality between the treatment of companies and that of other forms of business organization. In particular, it creates a non-neutrality between the treatment of mutual life insurance companies and that of other mutual organizations.

In Australia, the taxation of mutual organizations reflects the strong influence of the common law principle of "mutuality". This principle asserts that, "... a person cannot derive income from dealings with himself" (Taxation Review Committee, Full Report, Commonwealth of Australia, 1975, para. 20.25, p. 343). Accordingly, the income of "non-profit" organizations such as trade unions, employer associations, friendly societies, sporting clubs, etc. is exempt from tax. In addition, co-operative companies are taxed on a basis which allows them to deduct
amounts distributed to members by way of rebates or bonuses on business done with the company and by way of interest or dividends on shares (Taxation Review Committee, Full Report, para. 20.30, p. 345). The latter amounts are assessable in the hands of members of the company whilst rebates or bonuses on business done with the company are exempt. Thus, the impact of the law is to allow imputed profit earned through mutual organizations largely if not totally to escape tax.

The current tax exemption of underwriting profit accruing to the participating policyholders of both mutual and proprietary life insurance companies is no doubt a reflection of the mutuality principle. While this principle may seem quite justifiable to the lawyer, to the economist it appears as yet another device for favouring certain means of producing satisfactions over others. If one is concerned to preserve strict neutrality amongst mutual organizations, one certainly wishes to maintain the tax exemption of life insurance company underwriting profit; one may even wish to exempt life insurance companies altogether. Assuming they are still to be taxed on investment income, however, the Section 46 rebate is no longer appropriate in view of the tax-free status of policyholder distributions.

It is doubtful that neutrality with other mutual organizations is to be preferred to neutrality with ordinary companies. Most mutual organizations produce outputs which bear little relation to life insurance. As a result, it is unlikely that the allocation of resources amongst mutual organizations would be greatly affected by the heavier taxation of life insurance. Moreover, if mutual life insurance companies are treated
like other mutual organizations, there is the problem of how to treat proprietary companies. Both types of life insurance company sell essentially the same product. If proprietary companies are treated like ordinary companies and mutual companies like other mutual organizations, there is a strong tax distortion in favour of the mutual companies and the mutual form of organization. This distortion exists currently to some extent since certain mutual organizations (notably, friendly societies) sell life insurance. If a heavier tax burden is imposed on life insurance companies, the tax treatment of the life insurance business of these organizations needs to be reviewed; or access to the status of exempt organization' carefully controlled.

Even if some distortion is created within the class of mutual organizations, treating life insurance companies like ordinary companies removes a more significant distortion from the corporate sector. Life insurance companies provide investment services which are very close substitutes for those provided by other corporate financial intermediaries such as banks, finance companies and investment companies. The flow of funds to these intermediaries is therefore easily distorted by the favourable tax treatment of life insurance.

The favourable tax treatment of life insurance may also make it more difficult for ordinary companies to raise debt capital. The Treasury has calculated that, in the 1976-77 income year, the effective rate of tax on income generated through life insurance companies (ignoring the rebate of tax on policyholder contributions) was 24.6% (Commonwealth of Australia, 1980a, p. 42). This is considerably lower than the lowest
marginal rate of personal income tax (currently 32%) applying to the interest income earned on holdings of corporate debt.

The difficulty with taxing life insurance companies like ordinary companies, however, is that it increases the distortion arising out of the differential tax treatment of companies vis a vis trusts and partnerships. Trusts and partnerships also provide investment management and financial intermediation services (unit trusts and stockbrokers, for example) which are close substitutes for those provided by life insurance companies. Treating life insurance companies like ordinary companies simply increases the tax distortion in favour of such institutions.

Thus, it is not clear whether life insurance should be taxed on an integrated basis like trusts and partnerships, or treated like ordinary companies. In either case, however, the concessional aspects of the current tax treatment of life insurance should be removed and underwriting profit taxed at least once. If life insurance is taxed on an integrated basis, the Section 46 rebate is inappropriate since trusts and partnerships, like individuals, cannot claim a rebate of tax paid on receipts of dividend income.

7.2 The Recommendations of the Campbell Committee - A Critique

The recommendations of the Campbell Committee as they relate to the taxation of life insurance are contained in Part I of Chapter 15 of its Final Report (Commonwealth of Australia, 1981, pp. 235-242). The Committee begins by recognizing that life insurance firms act in two capacities (para. 15.2, p. 235):
as insurance underwriters: pooling risks and redistributing funds from one group of policyholders to another; and

as financial intermediaries: receiving premiums from policyholders and investing them on the policyholders' behalf.

It goes on to cite the, "... need to consider how the underwriting profit and the investment income associated with these two functions should be treated for tax purposes" (para. 15.3, p. 235).

The Committee accepts the view expressed in the submissions of individual life offices and in a submission on this topic by the Commonwealth Treasury (Commonwealth of Australia, 1980a) that life offices should be taxed on a "policyholder gain" or "trustee" basis. This approach to the taxation of life insurance has its origins in the recommendations of the Commission of Inquiry into the Long-Term Insurance Industry in South Africa (Republic of South Africa, 1976). Its essential features are that (Commonwealth of Australia, 1981, paras. 15.9 and 15.7, pp. 236-237):

1. life offices are viewed as "trustees" for their policyholders in the management of collective funds; and that

2. the amount of tax deemed payable by a life office is equivalent to that which policyholders in aggregate would have paid had it been practicable to tax them directly on the total earnings of the life office.
Under the "trustee" approach, therefore, the taxation of life insurance companies is fully integrated with that of their policyholders. A life office is regarded as a conduit through which income passes to its policyholders and tax is taken from the conduit rather than the policyholders.

It is a great virtue of the "trustee" approach to the taxation of life insurance that it is an integrated approach. As a benchmark against which to assess the current tax treatment of life insurance, however, it suffers a major defect: it seeks to treat life offices in the same way that individuals who conduct similar activities are treated under the current income tax law. Thus, non-neutralities inherent in the personal income tax system are imported into the benchmark against which the taxation of life insurance is assessed.

Were the personal income tax system fully neutral, the "trustee" approach would produce recommendations for tax reform identical to those which emerge from the use of the pure factor income tax as benchmark. The personal income tax is not fully neutral, however; hence the "trustee" approach produces recommendations which perpetuate existing non-neutralities in the tax system.

The impact of this effect is evident in at least three of the Committee's six recommendations concerning the taxation of life insurance. Those recommendations not affected by implicit non-neutralities in the "trustee" approach will be considered first.

As a general rule, investment income is assessable in the hands of the individuals who earn it. The tax-exemption of superannuation
investment income is therefore clearly inconsistent with the "trustee" approach. Accordingly, the Committee recommends that the investment income of superannuation funds in general, and that earned on the superannuation business of life insurance companies in particular, be subject to tax in the hands of the funds and the life offices and exempt from tax in the hands of ultimate beneficiaries. In conjunction with this recommendation, the Committee recommends the immediate abolition of the 30/20 rule.

The Section 115 deduction for "calculated liabilities" is another aspect of the current tax treatment of life insurance which is clearly inconsistent with the "trustee" approach. Again, the inconsistency concerns the assessability of investment income in the hands of individuals. The Committee recognizes that, so long as distributions to policyholders are tax-exempt, the Section 115 deduction merely serves to free from tax certain amounts of investment income which ultimately accrue to the benefit of policyholders.

As noted in Chapter 5, gains realized by life insurance companies on the sale of investments count as assessable income, and losses arising from the same source as allowable deductions. The Committee points out that, at least as far as gains derived from trading in investments for profit are concerned, this treatment is quite consistent with that afforded individuals under the personal income tax provisions (specifically, Sections 25(1), 26(a), 51(1) and 52 of the ITAA) (para. 15.30, pp. 239-240):

"Under the present tax provisions, where an individual undertakes, as part of his normal income-earning activity, the regular and frequent review of his investment portfolio, with consequent disposals and acquisitions, it is generally held that profits arising therefrom
are assessable and losses deductible. He is taxed on gains arising from the carrying on of a business in buying and selling investment type securities and from investments acquired for the purpose of profit making by sale".

The Committee continues (para. 15.31, p. 240):

"On the other hand, where investments are acquired as a long-term addition to an individual's portfolio as a means of producing dividend income, any profit arising out of the eventual realization of the investment (not being a normal part of his income-producing activities) is generally treated as being of a capital nature. In this case profits are not assessable; nor are losses deductible".

The Committee recognizes that life offices are generally both traders and long-term investors. It refrains from making a specific recommendation on this issue, however, preferring simply to call for (para. 15.33, p. 240):

"... greater consistency in the treatment of realized gains and losses as between life offices and individual investors so that the effects of taxation on investment choices are similar for both groups".

Unfortunately, the pure factor income tax system offers less than complete guidance on this question. Certainly, gains arising, "... from the carrying on of a business in buying and selling investment type securities and from investments acquired for the purpose of profit making by sale", would be assessable under a tax on factor income, since such gains clearly represent returns to the various factors employed in this type of economic activity. To this extent, the personal income tax system and the provisions for taxing life insurance companies are consistent with the pure factor income tax benchmark. It is not clear, however,
whether or not long-term gains can be regarded as factor income. If the long-term gains are purely nominal (i.e., solely the result of price inflation), there is no problem since the "gains" disappear when the income tax base is properly indexed. Real long-term gains remain. A "comprehensive" income tax (Haig (1921), Simons (1938)) would include such gains in the tax base without question. If this tax system was adopted as a benchmark, the current personal income tax would be deemed non-neutral between the two types of realized gains. Use of the "trustee" approach to life insurance taxation would then impart this non-neutrality into the taxation of life offices by similarly exempting long-term gains. So long as the factor income tax system is used as a benchmark, however, it is not possible to draw any firm conclusion as to the neutrality or otherwise of the current tax treatment of capital gains.

Under the personal income tax system, individuals are generally assessed on receipts of dividend income. This is despite the fact that such income has already borne tax in the hands of the generating company (the so-called "classical" system of company taxation). The "trustee" approach to the taxation of life insurance therefore implies that life offices also should pay tax on dividend income, i.e., the Section 46 rebate should be disallowed. By itself, the "trustee" approach gives no indication that by removing one "non-neutrality" (that between life offices and other recipients of dividend income) it creates another (that between life offices' receipts of dividend income and receipts of other investment income). It is only upon reference to a more general benchmark that the existence of this "trade-off" emerges; and that the route to genuine neutrality, i.e., full integration, becomes evident.
The Committee demonstrates an awareness of this problem in its discussion of the Section 46 rebate. After declaring that (para. 15.35, p. 240):

"Under the 'trustee' approach, life offices would be treated like individual shareholders and the Section 46 rebate would no longer have relevance",

it goes on to say (para. 15.36, p. 240):

"In Chapter 14 the Committee has recommended a change in the method of taxing corporate shareholders from the classical to an integrated system ... The adoption of that change would need to flow through to life offices under the trustee principle - totally negating in these circumstances the effect of the disallowance of the s.46 rebate".

The Committee nevertheless claims that (para. 15.36, p. 240):

"Removal of the s.46 rebate would represent a further move towards tax 'neutrality' in the treatment of given income flows",

adding the rider that (para. 15.37, p. 240):

"The Committee recognizes that, in the absence of an integrated tax system, the relative attractiveness of share investment for some life offices could alter".

However, in the absence of integration, it is not at all clear that removal of the Section 46 rebate for life offices would represent a move towards greater tax neutrality. One distortion is removed at the expense of another's creation. While this does not emerge from the "trustee"
approach to the problem, it is quite evident when the pure factor income tax system is adopted as benchmark.

Perhaps the most significant areas in which the Committee is led astray by the "trustee" approach are the treatment of life office expenses and underwriting profits. The Committee notes that (para. 15.9, p. 238):

"There is broad agreement that the 'trustee' concept implies taxing life office investment income net of applicable expenses; payments to policyholders exceed the total premiums paid only by an amount equal to the investment income less the operating expenses incurred. There is, however, disagreement about the scope of the expenses which should be deducted. Specifically:

- the life offices have suggested that under the trustee concept the net income base should be investment income less total expenses, including expenses incurred in gaining premiums;
- the authorities, on the other hand, consider that the deduction should encompass only those expenses incurred in gaining taxable investment income".

The Committee rejects the life office view. It believes that the expenses of a life office should be treated for taxation purposes as follows (para. 15.23, p. 238):

- "Non-deductible - that part of expenses applicable to the writing of the insurance contract in the first place, its continuing management and that part of expenses which initiated the investment contract.
- Deductible - those expenses which are directly attributable to the collection of the investment income together with those expenses reasonably attributable to the continuing management of the investments".

It recognizes that some expenses will need to be apportioned between these two categories.
Since this treatment of expenses is broadly comparable with that under the current law, the Committee sees little need for change in the present treatment of life office expenses.

This view is based on the Committee's belief that, "... for taxation purposes the expenses incurred by a life office as a trustee for its policyholders must be categorized into those expenses which are of a 'capital' nature and those which are of a 'revenue' nature" (para. 15.22, p. 238). The Committee uses this distinction to determine the tax deductibility of expenses incurred in what it sees as the two components of a life insurance transaction. These two components are (para. 15.22, p. 238):

- "A contract of insurance - The contract and the expenses incidental to its initiation and maintenance being (from the policyholder's point of view) of a 'capital' nature. Accordingly profits or losses arising from that contract would be neither taxable nor deductible.

- An investment contract - The contract and expenses incidental to its initiation being (again from the policyholder's point of view) also of a 'capital' nature. The continuing expenses of servicing that investment contract however might be reasonably regarded as of a revenue nature - akin to continuing investment management services paid and allowed in respect of alternative investments".

The difficulty does not lie with this characterization of a life insurance transaction; after all, precisely this view emerges from the theoretical discussion of Chapter 4. Rather, the problem arises with the implications drawn for the tax treatment of life office expenses. Implicit within the Committee's view is the notion that the establishment and maintenance of a "contract of insurance" and the establishment of an
"investment contract" are unproductive activities. But they are services for which policyholders are prepared to pay. Indeed, the "expense loading" element of policy premiums is explicitly designed to defray expenses associated with the establishment and management of life insurance policies. Under the present tax law, however, life office premium income is non-assessable; it is for this reason that expenses incurred in gaining such income are non-deductible.

The tax exemption of premium income no doubt reflects the view (shared by the Campbell Committee) that the premium payment, establishing as it does both the contract of insurance and the investment contract, represents a receipt of a 'capital' nature. More fundamentally, however, it reflects the sympathy of the statutory tax law with the principle of mutuality. The mutual companies are amongst the oldest and certainly the largest life insurance companies in Australia. Moreover, Australian proprietary companies have tended to issue mainly participating policies (Gray, 1977, p. 5). Thus, it should be no surprise that the tax law is written, if anything, with the mutual company in mind.

The influence of the mutuality principle is also evident in the personal income tax system (e.g., the tax exemption of imputed rent earned on owner-occupied dwellings). It is for this reason that application of the "trustee" approach leads the Committee to recommend the continuation of the present treatment of life office expenses - individuals are not taxed on imputed income so life offices should not be taxed either. Thus, the non-neutrality generated by the failure to treat imputed income in the same way as ordinary income is imported into the benchmark against which the taxation of life insurance is assessed; and the Committee is
led to recommend the continuation of a system which fails to tax the
imputed profit earned by life offices for the establishment and management
of life insurance policies. Had it adopted the pure factor income tax
system as a benchmark, the Committee would have seen the correct path to
tax neutrality: reform of the tax system to include the expense loading
element of premium income. Under these circumstances, it would be quite
consistent within the terms of the ITAA to allow total expenses as a tax
deduction.

Closely related to this issue is the Committee's recommendation on
the tax treatment of underwriting profits. Once again, the 'trustee'
approach (ultimately reflecting the principle of mutuality) leads it to
view, "... the insurance transaction as a transaction of a 'capital'
nature - the profits and losses on which are exempt from taxation"
(para. 15.45, p. 241). Somewhat surprisingly, it adopts this position
while at the same time stating that (para. 15.45, p. 241):

"... underwriting 'profits' in the life insurance business are
conceptually no different from the operating profits of other
incorporated businesses".

The Committee is content to recommend the continued tax exemption
of the underwriting profits of mutual life offices as this is, "...
clearly the correct treatment ..." (para. 15.45, p. 241). It is convinced,
however, that tax exemption, "... is not correct for that part of any
underwriting profit earned by a proprietary life office (for the benefit
of its shareholders)" (para. 15.45, p. 241). It goes on to say (para.
15.47, p. 241):
"With a proprietary life office, the Committee considers that the underwriting 'profits' earned by these companies and belonging to their shareholders (as distinct from policyholders) should be taxed at full company rates".

There could be no clearer evidence of the influence of the principle of mutuality on the Committee's thinking. Certainly, it cannot appeal to the principles of economics to defend a distinction between the underwriting profits earned by a mutual company and those earned by a proprietary company. At best, the Committee's proposal represents a defence of the existing non-neutrality in the tax treatment of the two sources of underwriting profits: the underwriting profits of a proprietary company are currently taxed once upon distribution to its shareholders whereas the underwriting profits of a mutual company are not taxed at all. Against the background of an integrated company tax system, the Committee's proposal would have no effect on this non-neutrality: the tax on the underwriting profits of proprietary companies would be collected from the companies themselves rather than their shareholders. At worst, however, the Committee's proposal represents an attempt to double-tax the underwriting profits of proprietary life insurance companies. If tax integration is not achieved, the proposal would tax underwriting profits of proprietary companies at the level of the company and at the level of the shareholder, while the underwriting profits of mutual companies would continue to go tax-free.

In either form, the Committee's proposal represents continued tax discrimination in favour of mutual companies. In view of the concerns expressed elsewhere in the Committee's report over the accountability of the mutuals to their policyholders, it is surprising that it should support such discrimination. Complete tax neutrality can only be achieved
by taxing the underwriting profits of both mutual and proprietary life insurance companies within the context of a fully integrated company tax system. To continue to tax one and not the other, particularly if tax integration cannot be achieved, is to continue to distort the life insurance market in favour of existing mutual companies and the mutual form of organization. Again, this is a conclusion which emerges clearly from an analysis based on the factor income tax benchmark, but from which the Committee has been led away through its reliance on the "trustee" approach to life insurance taxation.
The focus of attention shifts in this chapter from taxation to regulation. This chapter is the first of two which attempt to analyse the regulation of life insurance in Australia from the perspective of the theoretical framework developed in Chapters 2, 3 and 4. This chapter begins the analysis by describing in detail the major instrument of life insurance regulation in Australia.

8.1 The Life Insurance Act 1945

The conduct of life insurance business in Australia is governed by the provisions of the Life Insurance Act 1945 (as amended). This is an Act of the Commonwealth Parliament which came into force on 20 June 1946. The objects of the Act are set out in the Second Reading Speech of the then Treasurer, J.B. Chifley, as follows (Parliamentary Debates, Commonwealth of Australia, 1945, pp. 2,144-2,147):

(i) to replace all State legislation on the subject of life insurance, and to provide a uniform basis for applying the requirements of those Acts to the whole of Australia;

(ii) to incorporate existing Commonwealth Acts with minor amendments;

(iii) to appoint a Life Insurance Commissioner who shall exercise active supervision of the activities of life insurance companies, with a view to securing the greatest possible protection of policy owners; and

(iv) to set up adequate machinery for dealing with any company that fails to maintain a required minimum standard of solvency.
The original Act was in seven Parts; Part VI has since been repealed, however. Part I sets out the formal definitions of various terms appearing in the Act. In particular, three classes of life insurance business are defined for the purposes of the Act:

(i) superannuation business, which relates to policies providing benefits for employees or self-employed persons on retirement, death or disablement;

(ii) industrial business, which relates to policies in respect of which premiums are payable at intervals of less than two months and are usually taken by collectors; and

(iii) ordinary business, which is business not included in either of the other two classes.

Under Section 4(8) the distinction is drawn between life insurance business carried on by a company within Australia and that carried on outside Australia. On this basis, life insurance business carried on by a foreign company outside Australia (and any fund maintained in respect of that business) is expressly excluded from the provisions of the Act (Section 5(3)). The various State Acts overridden by the Life Insurance Act are listed in Section 8.

Part II of the Act provides for the appointment of a Life Insurance Commissioner who shall, "... subject to any directions of the Treasurer, be charged with the general administration of [the] Act" (Section 9(2)). Under Section 10, the Commissioner is entitled to the services of a qualified actuary at all times. The Life Insurance Commissioner is required to submit a report each year to the Treasurer for transmission to Parliament (Section 11). This report must canvass the working of the
Act during the year, and include copies or summaries of the various documents lodged with him over the course of the year. Under Sections 12 and 13, the Commissioner possesses power to delegate any or all of his powers and functions (except the power to delegate), and may act as arbitrator of any dispute between a policyholder and the insuring company with the agreement of both parties.

Division 1 of Part III of the Act provides for the registration of life insurance companies under the Act. No company may carry on any class of life insurance business in Australia unless it is registered under the Act (Section 15). Application for registration is quite straightforward and open, however; any company may apply to the Commissioner for registration under the Act. The company simply needs to forward a written document to the Commissioner signed by a director and by the principal officer of the company, formally requesting registration and supplying certain company details, viz. (Section 17):

(i) the situation of the head office of the company;
(ii) the names of the directors and of the auditors, and the name and address of the principal officer of the company;
(iii) the name of the actuary (if any) of the company;
(iv) in the case of a foreign company, the countries outside Australia in which the company carries on life insurance business; and
(v) the classes of life insurance business undertaken or to be undertaken by the company.

Together with the formal application, an applicant company must supply:
(i) a copy of the instruments constituting the company;
(ii) a copy of the articles of association or other rules of the company;

(iii) a copy of the latest revenue account and balance-sheet of the company and a copy of the latest valuation report on the financial position of the company; and

(iv) in the case of a company having shareholders, a statement showing the nominal, subscribed and paid-up capital of the company and the amount of capital which has been paid in cash.

Upon receipt of an application for registration from a company, the Commissioner may either register the company or, with the approval of the Treasurer, refuse to register the company (Section 19(1)). Registration of a company may only be refused if the Commissioner, after appropriate inquiry, is not satisfied (Section 19(2)):4

(i) that the application is in accordance with the provisions of the Act;

(ii) that the company is, or is likely to be, able to meet its obligations, including obligations in respect of business other than life insurance business;

(iii) that the company is likely to be able to comply with such of the provisions of the Act as would be applicable to it;

(iv) that the name of the company does not so closely resemble the name of a company already registered under the Act as to be likely to deceive; or

(v) in the case of a company which carries on, or proposes to carry on, some other form of business in addition to insurance business, that such a combination of activities is not contrary to the public interest.

Division 3 of Part III of the Act concerns the establishment and maintenance by registered life insurance companies of statutory life insurance funds. Specifically, a company is required under Section 37
to establish and maintain one or more statutory life insurance funds to secure its liabilities under life insurance policies. A company is free, however, to choose whether it will create a single statutory fund to cater for all of its life insurance business, or create several funds each to cater for a different class (or part of a class) of life insurance business; or perhaps to enable it to separate its Australian from its overseas business. Once a statutory fund has been established by a company in respect of a class of life insurance business, all amounts received by the company (premium income, interest, dividends, etc.) in respect of that class of business must be carried to, and become assets of that fund (Section 38(1)). With the exception of certain amounts of actuarial surplus which may be paid to shareholders or to other funds (Section 50), the assets of a statutory fund are in general not available to meet any liabilities or expenses of the company other than those directly referable to the class or classes of life insurance business to which that fund relates (Section 38(2)). The assets of a statutory fund may not be mortgaged or charged (except to secure a bank overdraft) (Section 38(3)), and must be kept distinct and separate from all other assets of the company (Section 38(6)).

As the Act stands at present, a company may invest the assets of its statutory fund or funds in any manner it thinks fit, subject to the sole proviso that it does not, without prior judicial approval, acquire any share or interest in any company carrying on life insurance business either within Australia or elsewhere (Section 39). An Amendment Act was passed in 1977 which provides for additional restrictions on the types
of investment permissible by life insurance companies; as yet, however, the relevant sections (Section 16A and an amended Section 39) have not been proclaimed. Section 16A provides for life insurance companies to be restricted from carrying on business other than life or general insurance business without the approval of the Life Insurance Commissioner. The amended Section 39 provides for them to be restricted from investing in (Commonwealth of Australia, 1980c, para. 16.13, p. 306):

(i) related companies or with related or associated persons;

(ii) other companies carrying on, or related to a company carrying on, life insurance business;

(iii) investment companies or undertakings; or

(iv) unit trusts;

without the prior approval of the Commissioner, except where the value of these investments does not exceed $100,000 or 2.5% of the value of the assets of the statutory fund, whichever is the greater. As currently drafted, the first two of these restrictions would apply only if the value of the investments exceeded 10% of the paid-up capital of the other company or 10% of the value of the other company's assets.

The amended provisions do not require the Commissioner's approval for investment in a bank or loans to a prescribed dealer in the short-term money market.

Under Division 4 of Part III of the Act, a registered life insurance company is required to keep separate accounts of receipts and payments in respect of each class of life insurance business (Section 41) and to
apportion receipts and payments between life insurance business and other business (Section 42), and between classes of life insurance business (Section 42A). In addition, a registered company is required (Section 44(1)) to prepare in the prescribed form, and at the end of each financial year of the company:

(i) a revenue account for the year in respect of each class of life insurance business carried on by the company;

(ii) a revenue account for the year in respect of any insurance business, other than life insurance business, carried on by the company;

(iii) except where the company does not carry on any business other than life insurance business, a profit and loss account for the year; and

(iv) a balance-sheet.

Under Section 45, each company is required to have its accounts audited annually by its auditors. The auditors must be approved by the Commissioner (Section 47(1)) and must certify in writing that (Section 45):

(i) the accounts and balance-sheet are in accordance with the provisions of the Act;

(ii) the balance-sheet truly represents the financial position of the company; and

(iii) the books of the company have been properly kept and record correctly the affairs and transactions of the company.

Division 5 of Part III relates to actuarial investigations. Under Section 48(1) each company is required to obtain from an actuary, at
intervals not exceeding five years,\textsuperscript{7} a report on its financial condition, including a valuation of its life insurance policy liabilities. An abstract of this report, along with a statement of the company's life insurance business, must also be prepared in accordance with provisions set forth in the relevant Schedules to the Act. The Fourth Schedule to the Act lays down the minimum basis upon which actuarial valuations of a company's policy liabilities may be made. The value placed on the aggregate liabilities of a company in respect of its life insurance business by an actuarial valuation on some chosen basis must not be less than the aggregate value calculated according to the minimum valuation basis (Section 49(3)).\textsuperscript{8}

When an actuarial valuation reveals that the balance of the revenue account in respect of a class of life insurance business exceeds the value of the net liabilities in respect of that class of business, the company concerned is said to enjoy an actuarial surplus in respect of that class of life insurance business. Actuarial surplus is the source of bonuses to participating policyholders and dividends to shareholders. Whatever remains after deduction of these items may be added to policy reserves within the statutory fund from which the surplus emerged, or transferred for a similar purpose to another statutory fund (Section 50(2)). Section 50(3) provides that any distribution to shareholders or to another statutory fund out of the actuarial surplus arising in respect of participating policies should not exceed 25% of the surplus allocated to the owners of those policies.\textsuperscript{9}
Division 6 of Part III requires certain documents to be furnished to the Commissioner. Specifically, Section 52(2) requires that the accounts and balance-sheets, actuarial abstracts and statements which a registered company is obliged to prepare under Sections 44 and 48, respectively, must be lodged with the Commissioner. In addition, companies are required to prepare statistical returns in accordance with prescribed Forms (Section 51) and lodge these also with the Commissioner (Section 52(2)). Under Section 52(6), accounts and balance-sheets lodged with the Commissioner must be accompanied by a copy of any annual report presented to the shareholders or policyholders of the company for the relevant financial year. Moreover, a company is required to supply to any of its shareholders or policyholders who requests it a copy of the latest account, balance-sheet, abstract, statement or return lodged by the company with the Commissioner (Section 53).

Division 7 of Part III relates to investigations by the Commissioner. Under Section 54 the Commissioner is empowered to demand in writing from any company information relating to any matter in connection with its business. Furthermore, the Commissioner has the power to call upon a company to show cause why he should not make an investigation into its business (Section 55(1)). Should the company fail to show cause to the satisfaction of the Commissioner within a specified period of time, he may go ahead with an investigation (Section 55(2)). Following an investigation, the Commissioner may issue such directions to the company as he sees fit to deal with the situation disclosed by the investigation (Section 58(1)). Alternatively, he may apply to the Federal Court for the appointment of a judicial manager or for the company to be wound up (Section 59(1)).
The procedures to be followed in either of these events are laid down in Division 8 of Part III of the Act (Sections 59-72).

Division 9 of Part III lays down the procedures to be followed in the event that the life insurance business of one company is to be transferred to, or amalgamated with, that of another company. Under Section 74, a scheme must be prepared setting out the terms of the agreement under which it is proposed to effect the transfer or amalgamation. A copy of this scheme together with the actuarial and other reports (if any) upon which it is founded must be lodged with the Commissioner (Section 75(1)). Ultimate sanction of the scheme rests with the Federal Court (Section 73), and it is to this body that application must be made for confirmation of the scheme by the companies concerned (Section 75(2)). Notice of intention to make application must be widely publicised (in the Gazette and in approved newspapers), and the scheme must be open to inspection by any shareholders or policyholders affected by it (Section 75(1)b). Unless the Federal Court otherwise directs, copies of the scheme and of every report lodged with the Commissioner (or approved summaries thereof) must be forwarded by the companies to every policyholder affected by the scheme (Section 75(1)e). The Commissioner may, if he wishes, arrange for a report on the scheme to be made by an independent actuary (Section 75(1)c).

When the matter ultimately comes before the Court, all persons who are in its opinion likely to be affected by the scheme are entitled to be heard (Section 75(3)). After due consideration, the Court may confirm the scheme, either without modification or subject to such modifications
as the companies concerned agree to; or it may refuse to confirm the scheme (Section 75(4)).

The provisions of Part IV of the Act govern life insurance policies. Under Section 77, the Commissioner may require any form of proposal or policy ordinarily used by a company in Australia, or any form of canvassing matter which describes the terms and conditions of, or the benefits to be derived from policies, to be submitted to him. If he considers it misleading or not in compliance with the Act, he may direct that it should be amended or withdrawn. A life insurance policy may not be issued unless the premium rates for that class of policy have been approved as suitable by an actuary who must have regard to the maximum rates of commission allowable under the policies (Section 78).

The remaining sections of Part IV (Sections 79-122) govern the rights and obligations of companies and policyholders in respect of life insurance policies. The more important provisions include:

(i) the provision of minimum paid-up policies and surrender values under Sections 96-99, the former to apply where not less than three years' premiums have been paid in cash, and the latter where the policy has been in force for at least six years;

(ii) the provision of rules in Sections 100 and 101 for the non-forfeiture of ordinary and industrial policies in certain cases on non-payment of premiums; and

(iii) the provision under Sections 117 and 118 that a company keep a register of policies in each State in which it issues policies, and that, unless otherwise agreed by the company and the policyholder, all moneys due under the policy be payable at the office in which the policy is registered.
Part V of the Act, (Sections 123-131) relates specifically to the conduct of industrial (collector) life insurance business. Only a very small number of companies continue to write this class of business (Commonwealth of Australia, 1980b, para. 3.17, p. 35).

Part VI of the Act, which provided for the establishment of a Commonwealth Government Insurance Office, was repealed in 1953.

Part VII of the Act, (Sections 138-150) contains miscellaneous provisions. Under Section 139, the Commissioner's approval is required before any prospectus, notice, circular, advertisement or other invitation to the public to subscribe shares or debentures in a new or existing life insurance company can be published. Under Section 140(1), all mutual life insurance companies incorporated in Australia are required to establish a postal voters' roll on which the name of any member who is entitled to vote and who applies to be enrolled must be placed. Where a member who is enrolled fails to exercise his right to vote by post on three consecutive occasions, his name may be removed from the roll, though he is eligible for re-enrolment (Section 140(2)). Under Section 141, all documents furnished to the Commissioner under Section 52(2) are available for public inspection at an office of the Commissioner. Under Section 145(1), the Commissioner is empowered to collect such statistics in relation to life insurance business as are prescribed. Statistics collected under this section may not be published in a form which discloses the particulars supplied by an individual company (Section 145(4)). Finally, Sections 148, 149 and 150, respectively, contain provisions relating to offences against the Act, their penalties
and the various matters about which the Governor-General may make regulations giving effect to the Act. Included amongst the latter are the rules for valuing policy liabilities according to the minimum valuation basis.
The primary aim of the Life Insurance Act is the protection of life insurance policyholders. It seeks to achieve this aim by regulating the conduct of life insurance business. Specifically, it:

(i) controls the entry of new firms into the industry; and

(ii) governs the day-to-day operations of those firms already in the industry.

In both cases, the regulations are designed to ensure a high standard of solvency amongst life insurers as well as the absence of fraudulent or deceptive practices in the industry.

Regulation, like taxation, is an area in which life insurance is singled out for special treatment. The very existence of a separate body of legislation is testimony to this fact. More importantly, however, the scope of this legislation differs substantively from that which regulates the activities of ordinary companies. Again like taxation, the special treatment of life insurance has been defended on the grounds of its special nature. In the words of the Campbell Committee in its Final Report (Commonwealth of Australia, 1981, paras. 20.2 and 20.3, p. 329):
"Over the years governments have shown special concern for the stability of the life insurance industry because of its role in mobilizing long-term household savings, traditionally in conjunction with the provision of death cover.

By its very nature, most life insurance involves a long-term commitment by the policyholder. For such a commitment to be made, the policyholder must have a high degree of certainty regarding the benefits he expects to receive when the policy is terminated. Regulation has thus been considered essential for policyholder confidence”.

Special regulatory treatment of life insurance can no more be defended by appeal to its "special" nature than can special tax treatment. The central implication of the theoretical analysis of Chapter 4 is that there is nothing "special" about the economics of life insurance. Life insurance firms employ scarce resources in the production of socially-valued outputs in the same way as other firms do. They trade their outputs in organized markets and are subject to the same competitive pressures. When reduced to its essentials, as it is within the Arrow-Debreu general equilibrium framework, life insurance is no different from any other form of productive activity.

The special regulatory treatment of life insurance in Australia must therefore be subject to careful scrutiny. In analysing this question, it is not presumed that valid arguments for regulation cannot be made: markets for contingent claims, and for the services of brokers of contingent claims, may fail just as markets for other commodities fail. It is not regulation itself which cannot be justified but the presumption that special regulations must apply in the case of life insurance.
9.1 The Regulation as it now Stands

The regulations established by the Life Insurance Act are administered by the Life Insurance Commissioner. Thus it is the Commissioner who is responsible for the licensing of life insurance firms. Life insurance is not the only industry in Australia where entry is controlled by licensing provisions. Licenses have not been used to limit the number of sellers in the industry, however, and hence it is probably one of the few industries where licenses have served the interests of consumers more than the interests of the firms already licensed. Licensing can be defended as a means of excluding "fringe operators" from an industry provided the licensing procedure is straightforward and open. If the general law against fraud and deception is strong enough, however, it is not clear that such a strict (and expensive) screening device is necessary. In general, a system of certification (whereby firms meeting certain standards set down by a government or industry body are issued with a certificate) is to be preferred. Such a system achieves the objective of identifying reputable firms whilst not restricting consumer choice.

Repeal of the licensing provisions of the Life Insurance Act would enable any firm or individual to sell life insurance. Reputable sellers would then have every incentive to identify themselves by advertising the higher quality of their products - particularly if cheaper, low-quality substitutes were widely available. This scenario does not necessarily envisage the removal of the Life Insurance Commissioner. At the very least, however, his role would change from that of licensing to that of certifying life insurance companies. There is no economic justification
for the special licensing provisions currently applying to life insurance firms. Indeed, the special treatment is anomalous in view of the absence of similar licensing provisions for superannuation funds.

Having gained entry to the industry, a company must then satisfy the regulations governing the conduct of its day-to-day life insurance business. Perhaps the most basic of these regulations is the requirement that life insurance companies establish and maintain statutory funds to secure life insurance policy liabilities. The purpose of this requirement is to ensure that a company keeps its life insurance business quite separate from any other it may happen to conduct. In this way, a company is prevented from using the substantial reserves accumulated under its life insurance policies to "bail out" another arm of its operations which may have run into difficulty. However, this situation is by no means unique to life insurance. Any company may use investors' funds in a manner which increases the risk to investors beyond that perceived by them at the time of their decision to invest. Generally speaking, debtholders are protected by a trust deed which obliges companies to take their interests into account when making decisions which affect them. Shareholders, on the other hand, have the right to vote at meetings of the company to ensure that their interests are considered. There is still the possibility, however, that funds will be misdirected and failure of the company result. The relevant question is why life insurance policyholders should be given greater protection against this eventuality than investors in other companies.

One of the answers frequently given to this question is that life insurance policies are long-dated obligations. However, life insurance
policies are not the only long-term assets which individuals hold. Individuals invest in housing and in human capital, both of which may represent life-long investments; and yet there is no special government apparatus to protect the owners of these assets from a sudden decline in their value. More significantly, however, individuals invest in superannuation and apart from those schemes administered by life offices, superannuation funds are subject to no direct prudential supervision.

Other companies, in particular other non-bank financial intermediaries, manage to conduct well-organized and reputable business operations without the statutory requirement to maintain separate funds for each distinct branch of those operations. There is no reason to require life insurance companies to observe standards of accounting practice any more rigid than those required of ordinary companies under the Companies Act. Of course, this increases the likelihood of failure amongst life insurance companies. Further comments are made on this issue below.

The Life Insurance Act prohibits the issuing of any policy unless the premium rates for that class of policy have been approved as suitable by an actuary. This is another mechanism by which the Act attempts to ensure that life offices are in a position to meet their obligations. There is no doubt that the calculation of appropriate premiums requires more than the average degree of mathematical sophistication. However, it is in each company's own interest to ensure that it is in a position to meet its obligations. Even without the legislative requirement, one would expect to observe actuaries certifying life insurance premiums as appropriate. Indeed, companies would have an incentive to inform potential policyholders of the soundness of their policies in order to gain the
latter's confidence. There would also be a role for consumer organizations to test and report independently on the quality of different products being offered in the market-place. Ordinary companies are not generally obliged to employ professionals to certify the quality of their products; they do so as a means of competing for custom. Neither should life offices be obliged to employ actuaries. In the end, the general provisions of the law against fraud are available to deal with those who make promises they cannot keep.

On the question of the quality of insurance the Commonwealth Treasury has expressed a view which deserves some attention. In its submission to the Law Reform Commission's Inquiry into Insurance Contracts, the Treasury comments as follows (Commonwealth of Australia, 1979, para. 54, p. 9):

"We are not denying that insurance has some characteristics warranting special concern and, where appropriate, legislative attention. One of these characteristics ... is that consumers may often not be in a position to test the quality of the product, as it were, until a claim is made - by which time it may be too late. The amount involved in a claim may in some circumstances be very large indeed in relation to the financial resources available to the consumer".

Two points need to be made in relation to this statement. Firstly, insurance is by no means the only commodity the quality of which cannot be tested until it is "too late". Indeed, in a world of uncertainty, all commodities must suffer from this defect to some extent. One does not know the quality of an airline's aircraft maintenance programme until it is too late; one does not know the quality of a haircut until
it is too late. This poverty of information may support a case for
government intervention of a general kind, but is certainly does not
support the special treatment of insurance. The second point concerns
the largeness of the loss in relation to the financial resources available
to the consumer. Again, the failure of an insurance policy is not the
only way in which individuals can sustain large losses. Economic
redundancy in times of recession or the consequences of unwise investment
decisions may be just as devastating. One may wish to argue for some
form of government assistance to individuals who experience large losses,
but there can be no justification for confining such assistance to the
victims of a failed insurance company. There will be many who sustain
equally large losses because they are uninsured. Moreover, this group
will include those who cannot afford insurance and who are therefore
least able to sustain a large loss.

In the same publication, the Treasury draws attention to the
requirement of the Life Insurance Act that minimum values attach to the
surrender of life insurance policies. It comments as follows (para. 48, p. 9):

"The justification for [this requirement] in current circumstances
is not clear. Why should not an insurance company and an individual
be free to enter into a life insurance contract, on a basis clearly
understood or acknowledged by the individual, which provides for a
lesser (or zero) surrender value 'in exchange' either for a lower
premium level and/or for higher benefits in other respects?"

This raises a general point in respect of all minimum requirements
established by the Life Insurance Act: they restrict the range of
choice open to life offices and policyholders. The restrictions are
imposed with the best of motives. However, like all government regulations
born of a paternalistic concern for the welfare of individuals, they override individual preferences. Some individuals may be prepared to accept higher risk in return for a possible higher return on their policies. As individuals become more sophisticated in financial affairs, they will very likely demand a wider range of policy options. One of the drawbacks of minimum requirements is that they hinder the response of life insurance markets to the changing demands of policyholders.

The 30/20 rule is thought by some to serve a useful prudential function. That such a rule should apply to life offices and not to other companies (let alone other financial intermediaries) again reflects the view that the policyholders of life insurance companies are deserving of special protection. The 30/20 rule, however, is largely ineffective as a prudential regulation. The Campbell Committee cites three reasons for this ineffectiveness in its **Final Report** (Commonwealth of Australia, 1981, para. 10.32, p. 179):

(i) the requirement to hold fixed-interest government securities in times of inflation merely replaces bankruptcy risk with purchasing-power risk which may be no less substantial, certainly for long-term assets;

(ii) the 30/20 restriction does nothing to ensure appropriate matching of asset and liability structures; hence, when expectations of interest rate adjustments are strong, shifts into longer or shorter official securities (which may or may not be desirable) will occur regardless of this control; and

(iii) since the major part of captive institutions' portfolios lies outside the 30/20 ratio, there is still wide scope for imprudent practices to occur; it is even possible that the 30/20 rule may encourage captive institutions to invest in high risk, high return assets in order to raise the overall return on their asset portfolios.
The provisions contained in the (as yet) unproclaimed Section 16A and amended Section 39 of the Life Insurance Act represent additional restrictions on the investment choices of life offices. Again, the aim is the special protection of life insurance policyholders from the "undesirable" or "imprudent" investment activities of life insurance companies. The underlying presumption is that, in the absence of explicit government intervention, the private market cannot provide the discipline sufficient to ensure that the investment decisions of life offices are always in their policyholders' best interests. It is true that, in the absence of government-imposed restrictions, some life offices would make unwise investment decisions some of which would lead to failure. But far from indicating absence of discipline, this is the discipline of the market-place; careless management is penalized and policyholders are given a strong incentive to monitor the performance of both their own life office and its competitors. Nor is it true that policyholders would lose substantially in every case of financial failure; it is quite possible that the business of the failed life office would be amalgamated with that of one of its former competitors with little or no loss to policyholders. To some extent, the proposed provisions may even increase the risk of financial failure by hindering the diversification of commercial risk amongst different business ventures.

The powers of the Life Insurance Commissioner in respect of the investment decisions of life offices should not be enhanced, either in the form contemplated in the unproclaimed Section 16A and amended Section 39 or in any other form. Indeed, the prohibition contained in the present Section 39 against a registered company acquiring an interest in
another life insurance company should be repealed. The purpose of this provision is to prevent companies transferring or amalgamating their life insurance business without following the procedures laid down in Division 9 of Part III of the Act. Transfer and amalgamation are important means by which less successful business concerns can exit an industry gracefully, i.e. without causing major disruption to the market. They are therefore devices which assist the smooth working of the market in the selection of the fittest (most efficient) producers of a commodity. There should be as few impediments as possible to the processes of transfer and amalgamation. Naturally, these processes need to be conducted within the context of a legal framework to ensure that the interests of all concerned are duly taken into account. But a general legal framework is sufficient; there is no need for special arrangements to cater for life insurance business. Any concern with the emergence of monopoly power as a result of transfer or amalgamation can again be met with general provisions; although a better stratagem is to ensure that entry to the industry is as free as possible.

To argue in favour of relying upon the general provisions of the law is not to imply that the provisions as they currently stand in Australia are fully adequate. If they are inadequate, however, the remedy lies in amending those provisions, and not in constructing special bodies of legislation to deal with particular industries.

The Life Insurance Act provides for a wide range of material including revenue accounts, balance-sheets, statistical returns and actuarial reports to be prepared by individual companies at regular intervals and
submitted to the Life Insurance Commissioner. The collection and publication of this information is an essential part of the Commissioner's surveillance of the industry. It is on the basis of this information that he may order an investigation into the affairs of a company, and may subsequently apply for the appointment of a judicial manager or for the company to be wound up. An important criterion in the Commissioner's decision as to whether the affairs of a particular company warrant investigation is the statutory solvency test. The minimum valuation basis for policy liabilities to be used in this test is prescribed by the Act, and it is only recently (1977) that the conditions of the minimum valuation basis have been able to be changed by regulation rather than amendment. In times of generally rising interest rates, it is essential that the solvency test be capable of modification so as to ensure that it does not become more stringent than originally intended.

Such wide powers of surveillance are generally very effective means of protecting the interests of consumers. Indeed, they are no doubt largely responsible for the complete absence of failure amongst Australian life insurance companies since the inception of the Act. In this sense, the Act and the Commissioner have been a signal success. However, it must not be overlooked that such security is purchased at a price. The resources expended by companies in the preparation of the various documents required by the Commissioner are ultimately recovered through the expense-loading element of policy premiums. The resources expended by government in the processing of these documents and in related supervisory activities must be drawn from consolidated revenue and ultimately from the tax-paying public.
It is not immediately obvious that the public interest is best served by the enforced provision of such detailed information. Some policyholders may prefer to pay lower premiums and to remain relatively uninformed regarding the operations of their insurers; they may be prepared to trade higher risk for higher return. Other consumers who do not take out life insurance may resent the implicit subsidy to policyholders in the form of publicly-provided surveillance of life offices. The danger inherent in the public provision of information is that it is over-provided, in which case resources are simply wasted. In a free market, policyholders who desire detailed information about their insurers are forced to bear the costs of providing that information. When faced with these costs, individuals decide for themselves what is the optimal amount of information. Of course, one may still wish to subsidize the provision of information in the belief that a private market would provide less than the socially-optimal amount of information. In this case, one may wish to retain the Life Insurance Commissioner in this role, or permit the government to let tenders to private agencies to act on its behalf.

In general, the benefits of the public provision of detailed information cannot be assessed independently of its costs. Moreover, where supervision is costly, a real question arises as to whether the situation which the supervision is designed to overcome is not in fact less costly than the supervision itself. While the public provision of information can be defended, there is nothing inherent in life insurance which warrants its special treatment in this regard. The majority of companies in other industries in Australia are not subject to close
supervision of their activities. Indeed, superannuation funds, which
deal in similar if not identical long-dated obligations, are not subject
to any formal regulation or supervision of their financial standards.

As part of his surveillance role, the Commissioner oversees the forms
of proposals, policies and canvassing matter used by life offices as
well as the issue of prospectuses and advertisements for shares in a
life insurance company. Again, there are general provisions in the law
governing company fund-raising procedures and the question of truth in
advertising; there is no reason why special provisions must be
established to cater for life insurance companies.

The view put forward in this discussion is that the life insurance
industry is over-regulated. It is singled out for special regulatory
treatment when this is not warranted. The remedy for this situation is
to abandon the controls exercised over the entry of new firms into the
industry and those governing the activities of firms already in the
industry, and to abolish the separate office of Life Insurance Commissioner.
Life insurance companies would then come under the aegis of the Corporate
Affairs Commissions and the Companies Act and be treated in all respects
like ordinary companies. Such information would continue to be collected
from life insurance companies as was required by the Bureau of Statistics
and published along with data collected from other industries. Any
regulation of the affairs of the industry would come from within the
industry itself. Consumer groups would emerge generating information
about the different products available in the market (much as they do
in other industries, e.g., the motor vehicle industry). Industry
representative groups (such as the Life Insurance Federation of Australia) would also supply information and act as certifying agents, certifying those companies which adhered to agreed standards of good business conduct. While the Life Insurance Commissioner could be retained to perform the tasks of certification and information provision, it is preferable in the long run that they be performed by the industry itself, since it is in a better position to judge the value placed on these services by consumers.

9.2 The Recommendations of the Campbell Committee

The Campbell Committee's approach to prudential regulation is similar in many respects to its approach to taxation. In particular, it stresses the goals of efficiency, competitive neutrality and consistency. It believes in departing from these general aims in certain circumstances, however. To quote from the Committee's Final Report (para. 18.36, p. 289):

"... it is recognised that special protection arrangements may, in some instances, be necessary ...".

The Committee views life insurance as one instance in which special protection arrangements are warranted.

The Committee's approach to the regulation of life insurance is very much in sympathy with the view embodied in the existing legislation. As such, the Committee sees, "... no need for any fundamental change in
the approach to the regulation of life offices" (para. 20.12, p. 331).

In endorsing the existing level of government intervention in the affairs of the industry, the Committee explicitly rejects approaches taken in other countries which involve a much more active role for government. It mentions the case of the United States where life office investments, policy conditions and premium rates are subject to much closer regulation than in Australia; and the case of the United Kingdom where policyholders are protected against major loss arising from the failure of a life office through comprehensive guarantee arrangements.

Inasmuch as the Committee endorses the current approach to life insurance regulation in Australia, its major recommendations are at odds with the conclusions of the previous section. Its rejection of an extended role for government in the affairs of the industry is completely in accord with those conclusions, however.

The Committee does make some recommendations which would have the effect of reducing the restrictiveness of current regulatory arrangements. For instance, it suggests that a more flexible method of valuing assets and liabilities for the purposes of the solvency test might be adopted. As noted in the previous section, it is not obvious that a government-administered solvency test for life offices is necessary. If there is to be such a test, however, the more flexible it is, the less it imposes undue restrictions on the activities of life offices. The Committee also recommends the abolition of the 30/20 rule. Quite apart from its adverse implications for the efficiency of the capital market generally,
this restriction is very likely counterproductive as an instrument of prudential regulation.

In relation to the proposed tightening of restrictions on life office investments, the Committee makes a statement which is almost in accord with the view expressed in Section 9.1 above (para. 20.23, pp. 332-333):

"... the Committee believes that the Life Insurance Commissioner, with certain limited exceptions ..., should not have overriding powers in respect of life offices' investments or investment strategy. There is no reason to expect that the Commissioner would be any more successful than life offices in ensuring the safety of their investments."

It is the "limited exceptions" which distance the Committee's recommendation from the view taken above. The Committee believes that life insurance is still sufficiently different from other activities to warrant some form of restriction on the investments of individual companies. Specifically, it recommends that, for the purposes of actuarial solvency valuations, the value of any individual asset (including 'closely related assets') should be taken into account only up to 5% of a life office's total assets (para. 20.29, pp. 333-334). In addition, the Committee, "... acknowledges that there could be a case for imposing a further ceiling - in terms of acceptability for the solvency test - on upstream or cross-stream investments in related companies or with related or associated persons" (para. 20.31, p. 334). The Committee believes that these arrangements, "... [allow] life offices considerable flexibility in determining their asset portfolios, while protecting policyholders
against the 'fringe operator'" (para. 20.32, p. 334). The Committee offers no explanation as to why special arrangements must be made to protect life insurance policyholders against fringe operators.

The remaining recommendations of the Committee concern disclosure and accountability to policyholders. Specifically, the Committee seeks to strengthen those provisions of the Life Insurance Act which relate to the disclosure of information to potential and existing policyholders. In respect of the former, the Committee recommends provision for, "... a fourteen-day cooling-off period during which the policyholder may cancel his contract without penalty" (para. 20.54, p. 337). It also recommends that (para. 20.61, p. 338):

"... where life offices do not already do so, they should be required to issue new policyholders with a booklet providing information on past and current performance in respect of such matters as earning rates, bonuses etc. and in respect of surrender values".

In relation to existing policyholders, the Committee recommends that (para. 20.65, p. 339):

"... where life offices do not already do so, they should be required in sending their premium renewal notices or annual bonus certificates to provide policyholders with a short summary of their Annual Reports. These summaries should, at least, contain meaningful details of the investment spread of the relevant statutory fund".

It also recommends that (para. 20.69, p. 339):
"... life offices should continue to meet the special disclosure requirements laid down in the Life Insurance Act, but the requirements of the Act should be revised to ensure that life offices maintain a standard of disclosure not less than that applying under the Companies Act";

and that (para. 20.72, p. 339):

"... the provision of the Companies Act which exempts directors of life offices from presenting a Directors' Report setting out prescribed information should be repealed. However, the nature of disclosure in such reports should reflect the special nature of life insurance business".

Both the recommendations in respect of potential policyholders and those in respect of existing policyholders require life offices to disclose more information. Such information is costly to provide, and it is not clear that policyholders value the provision of additional information. Even though, in the Committee's view, policyholders should have this information, if they do not value it, society's scarce resources have been wasted. It is true that the first and third of the Committee's recommendations in respect of existing policyholders are designed to achieve greater neutrality with disclosure provisions applying to ordinary companies. In the second of those recommendations, however, the Committee's concern to maintain special provisions relating to life insurance is once again evident. This concern is even clearer in the preamble to that recommendation (para. 20.68, p. 339):

"The Committee believes that life offices should be required to provide all relevant information in their accounts that other companies are obliged to disclose under the Companies Act. However, the nature of life insurance is such that it seems appropriate that life offices should continue to meet the special disclosure requirements laid down in the Life Insurance Act".
The Committee draws particular attention to the accountability of mutual life offices to their policyholders. It views with some concern the "conspicuous absence" of policyholder participation in the affairs of the mutual companies; and accordingly recommends "some tightening" of Section 140 of the Act to facilitate greater participation by policyholders in the determination of their life offices' policies (paras. 20.77 and 20.80, pp. 340-341). There may in fact be grounds for special concern here owing to the peculiar nature of the mutual form of corporate organization. Ultimately, however, the problem of owner participation is not unique to mutual life offices. The growing separation of ownership from control is a feature common to all forms of corporate organization.

Perhaps the clearest evidence of the special status accorded life insurance in the Committee's thinking comes not from its recommendations on life insurance, but from those on superannuation. Investors with superannuation funds are in a position identical in all important respects to that of life insurance policyholders. Indeed, a good many contributors to superannuation schemes are life insurance policyholders. Yet (para. 20.101, p. 345):

"... while the Committee sees a need for greater prudential oversight of superannuation funds, it does not advocate an approach to regulation totally comparable to that of life offices".

Specifically, the Committee, "... does not see any need to increase the overall level of ongoing government regulation and supervision [of superannuation funds]" (para. 20.104, p. 346). In other words, superannuation
funds are not to come under the control of the Life Insurance Commissioner or the Life Insurance Act. Even if one has lingering sympathies with the argument that investors in long-term savings institutions need special protection, one surely cannot accept differential regulatory treatment of life offices and superannuation funds. Like so many others, the Committee is under the false impression that there is something inherently special about life insurance.
CHAPTER 10

CONCLUSION

The aim of this thesis has been to challenge the notion that there is anything inherently special about the economics of life insurance, and hence that life insurance warrants any special treatment in matters of taxation and regulation. It has sought to achieve this aim by first constructing a theoretical model of the life insurance process and of the life insurance firm. The model is predicated on Marshall's (1974a, b) view of insurance as a process of trade in contingent claims. This view contrasts with the traditional actuarial view of insurance as a process of laying-up reserves (Willett, 1901). Within the context of Marshall's view of insurance, the role of the insurance firm becomes that of broker of contingent claims. This idea was developed in Chapter 3 within the general equilibrium framework of Arrow (1953) and Debreu (1959) using a model of proportional transaction costs due to Foley (1970). In Chapter 4, the general model developed in Chapter 3 was specialized to the case of life insurance, and certain results derived with the help of a model by Malinvaud (1972, 1973).

The theoretical discussion of Chapters 2, 3 and 4 established that, when viewed within the Arrow-Debreu general equilibrium framework, life insurance is no different from any other form of productive activity. In other words, there is nothing in the essential economic nature of life insurance to justify the notion that it is in any way "special".
This theme was adapted in Chapters 5, 6 and 7 to a discussion of the taxation of life insurance in Australia. Following a summary in Chapter 5 of the current tax law as it relates to life insurance companies and policyholders, Chapter 6 discussed the taxation of life insurance, stressing that life insurance warrants no special tax treatment. Chapter 7 then discussed options for the reform of life insurance taxation in the light of this conclusion examining critically the proposals put forward by the Campbell Committee.

Chapters 8 and 9 applied the theme to the regulation of life insurance in Australia. Chapter 8 summarized the main provisions of the Life Insurance Act while Chapter 9 criticized the regulation on the grounds that it singles out life insurance for special regulatory treatment. The relevant recommendations of the Campbell Committee were also criticized in that they seek to perpetuate the special regulation of life insurance in Australia.

The primary conclusion of the thesis is that there is nothing special about the economics of life insurance, and hence, on this basis, the special taxation and regulatory treatment of life insurance in Australia is unjustified.

There is one issue which deserves a little more attention than it has received so far - this is the 30/20 rule. The 30/20 rule has a unique place in this thesis in that it appears in the discussion on taxation as well as that on regulation. For this reason, a final word on 30/20 appears in this concluding chapter.
It has long been a matter for debate whether, on balance, life insurance companies gain or lose from satisfying the 30/20 requirement. As noted in Chapter 6, the degree of compliance with the 30/20 rule is virtually complete. This constitutes *prima facie* evidence that the tax concessions granted life insurance companies upon adherence to 30/20 are worth more to them than the sacrifice of portfolio return occasioned by holding government paper in the prescribed proportions. It is a safe conclusion then that the 30/20 rule confers a net subsidy on life offices. If this net subsidy is intended, it should be made explicit; if not, it should be removed. Some would immediately respond that the 30/20 rule should nevertheless remain in place as a prudential restraint on the investment decisions of life offices. But in Chapter 9 it was argued that the 30/20 rule is, at best, ineffective and, at worst, counterproductive as an instrument of prudential regulation. On the basis of its implications for the life insurance industry, the case for abolishing the 30/20 rule is unexceptionable.

However, other advantages have been claimed for the 30/20 rule, in particular that it (Commonwealth of Australia, 1981, para. 10.9, p. 174):

(i) reduces the cost of government borrowing;

(ii) has important advantages for macroeconomic policy; and

(iii) is the only way of ensuring a market for the securities of the smaller local and semi-government authorities.
A critical assessment of these claimed advantages is beyond the scope of this thesis. It is significant, however, that the Campbell Committee in its Final Report (para. 10.38, p. 181) has recommended the abolition of the 30/20 rule after examining all aspects of the question. From the point of view of a more efficient market for life insurance, and of a more efficient capital market generally, this could not help but be a move in the right direction.
1. Arguments for subsidizing life insurance are frequently made, however.

2. This is not to say that these latter issues will not gain prominence in future. Against the background of heavy rate-cutting in the industry, the Campbell Committee has recommended the strengthening of the prudential regulation of general insurance (Chapter 20, Part III).
1. For a useful discussion and summary of the literature, see Hirshleifer and Riley (1979), pages 1389-1391.


3. A sequence of random variables, \( \{X_n\} \), is said to obey the weak law of large numbers if constants, \( b_n \) (n=1,2,...), can be found such that for every \( \epsilon > 0 \):

\[
\lim_{n \to \infty} \Pr \left( \left| \frac{1}{n} \sum_{i=1}^{n} X_i - b_n \right| > \epsilon \right) = 0. \quad \text{(Heathcote, 1971, p. 172)}.
\]

In the present case of identically distributed random variables whose first moments exist, \( b_n = \mathbb{E}(X_i) = \mu \) for all n=1,2,...

4. See, for example, Mehr and Cammack (1961), Borch (1974), and the Journal of Risk and Insurance.

5. Marshall is certainly not the only writer to have re-interpreted the Arrow-Debreu contingent claims model for the case of insurance. See for example, Kihlstrom and Pauly (1971) and Brainard and Dolbear...
(1971). However, he is the first to have drawn attention explicitly to the break which the development of this theory represents with the traditional view of insurance. He is also the first to have speculated on the changes in insurance coverage which would result from a wider reflection of the contingent claims approach in real-world insurance institutions.

6. See also Hirshleifer and Riley (1979), p. 1385.


8. This assumes that neither the hunter nor the farmer is free to dictate the terms of trade.

9. The probabilities need not be known with certainty, but must at least be agreed upon by the two traders.


11. This discussion draws on Hirshleifer and Riley (1979), p. 1386.

12. \( (1-\pi) \) is of course the probability that the other individual loses.

13. This equivalence also requires the assumptions of agreed-upon probabilities and state-independent utilities which hold throughout the analysis of this chapter. See Marshall (1974b), pp. 481-482.
FOOTNOTES

CHAPTER 3

1. See also Hirshleifer and Riley (1979), pp. 1391-1392.

2. This fact is of no particular consequence, since the preferences, \((\mathcal{Z})_i\), still exhibit non-satiation within each consumer's attainable consumption set.

3. For a discussion of indirect resource-relatedness, see Arrow and Hahn (1971), Chapter 5.

4. Notice that there are no positive entries in the sub-vector, \(y^j\). This derives from the fact that the insurance function involves no transformation, i.e., no production. It is purely a marketing operation.

5. Of course equilibrium in the absence of transaction costs is Pareto superior to equilibrium in the presence of transaction costs since such costs impose a "deadweight" resource loss on the economy.
1. This model is not concerned explicitly with the household's decision to insure. It is sufficient that a household can achieve a preferred position by exchanging wealth contingent upon one event at date $t$ for wealth contingent upon another. Clearly though, the standard motives attributed to the purchaser of life insurance, viz., income-maintenance and/or the desire to make a bequest, are quite consistent with the analysis.

2. It is this additional dimension which has prompted such contracts being referred to as life assurance policies rather than life insurance policies.

3. Notice that a single-period endowment insurance policy purchased at date 0 degenerates into a contract for the sure delivery of money at date 1.

4. When time does not consist of finitely-many periods, a whole-of-life insurance policy is equivalent to a perpetual term insurance policy. However, even though this is the case in the real world, most actuarial calculations set a finite upper bound on the length of a human life.

5. Note that while the deferred annuity commences at date 1, the first payment does not occur (if at all) until date 2.
6. If the $w_i$s are positive, if $X_i$ is closed and bounded from below, and if the pre-ordering is continuous, such a maximizing vector exists; if there are several maximizing vectors, one of them is selected.

7. A contract for the unconditional delivery of a unit of commodity $h$ can be secured from any producer of commodity $h$ via the purchase of $S_j$ separate contracts, each one promising to deliver one unit of $h$ in one of the $S_j$ states, $s$. The price of such a bundle of contingent contracts would simply be equal to the sum of the prices of its elements, viz.,

$$\sum_{j=1}^{S_j} w_j p_h,$$

which equals $p_h$, since $\sum_{s=1}^{S_j} w_j = 1$.

8. The consumption set, $\tilde{X}_i$, faced by a consumer of type $i$ in $\tilde{e}$ and the preference pre-ordering, $\succeq_i$, he possesses over that set are defined, respectively, by:

(i) $\tilde{X}_i = \{(x_i^s, z_i^s) \mid x_i^s \in X_i, z_i^s \succeq_{i, h} \max [x_i^s, h, 0]\}$ for $s = 1, 2, \ldots, S_i$ and $h = 1, 2, \ldots, H$; and

(ii) for $(x_i^0, z_i^0)$ and $(x_i^1, z_i^1)$ in $\tilde{X}_i$, $(x_i^0, z_i^0) \succeq_i (x_i^1, z_i^1)$ if and only if $x_i^0 \succeq_i x_i^1$ in $X_i$.

The production set, $\tilde{Y}_j$, faced by a producer of type $j$ in $\tilde{e}$ consists of net output vectors, $(y_j^B, y_j^B)$, where $y_j^B \in Y_j$ is a vector of net outputs of the $H$ commodities, $h$, and $y_j^B$ is a vector of net outputs of the marketing services associated with each of the commodities, $h$. $\tilde{Y}_j$ satisfies the same set of requirements as does the corresponding set, $\tilde{Y}_j$, in Chapter 3.
A program, \( P^0 \), in \( \hat{\varepsilon} \) is feasible if (recalling that agents of the same type act in the same way):

(i) each consumption plan \((x_i, z_i)\) belongs to the corresponding feasible set, \(X_i\), for all \(i=1,2,\ldots,I\);

(ii) each production plan \((y_j, y^B_j)\) belongs to the corresponding feasible set, \(Y_j\), for all \(j=1,2,\ldots,J\); and

(iii) the market-clearing condition, (10), is satisfied.

Such a program is Pareto optimal if there is no feasible \( P^1 \) in which agents of the same type behave in the same way, and for which

\[
(x_{1}^{1}, z_{1}^{1}) \geq (x_{i}^{0}, z_{i}^{0})
\]

holds for all types \(i\), with strict preference holding for at least one type.

9. If condition (i) of Proposition 5 holds, then \( z_{i}^{0} = x_{i}^{B0} \), for every \(i\). Indeed, if \( z_{i}^{0} > x_{i}^{B0} \) for any \(i\), then consumers of that type can obtain a preferred bundle at most as expensive as \((x_{i}^{0}, z_{i}^{0})\) by substituting some of the excess \( z_{i} \) for extra \( x_{i} \), thus contradicting condition (i). The inequality \( E(p^S, \theta)(x_{is}, z_{is}) \leq E(p^S, \theta)(x_{is}^0, z_{is}^0) \) therefore becomes \( E_p^S x_{i}^S + E_p^B x_{i}^B \leq E_p^S x_{i}^0 + E_p^B x_{i}^{B0} \), when it is recalled that \( \theta = p^B - p^S \). The equivalence of conditions (i) of Propositions 5 and 6 is then assured by the definition of the preferences, \( \hat{\varepsilon} \). The equivalence of conditions (ii) follows immediately from the definition of \( \theta \).
10. The loss itself (i.e., the face value of the policy) is valued at the buyer's price since this is the price the insured will have to pay to secure resources equal in value to the face value of the policy should the event insured against come to pass.

11. See the comprehensive text-book treatment of the subject by Jordan (1967).

12. In a recent contribution to the Journal of Risk and Insurance, Moffet (1979) introduces "a new approach to the topic of life contingencies" based on the concept of a "life contingent contract". Moffet has clearly grasped the notion of life insurance policies as bundles of contingent claims. But again he simply appeals to the "principle of equivalence" to explain the pricing of life contingent contracts.

13. In other words, the insured sells the insurance firm an immediate annuity for the amount of the level premium.
FOOTNOTES

CHAPTER 5

1. For example, tax deductions in respect of gifts to charitable institutions.

2. In what follows, Division 8 of Part III of the Income Tax Assessment Act 1936 will be referred to simply as, "Division 8".

3. By implication, a fund not including any Australian life insurance business is not an Australian statutory fund.


6. "Expenses" here consist of "losses and outgoings". Thus, since capital gains realized on the sale of statutory fund assets are assessable income (in the case of companies in Classes 1 and 2, at least to the extent to which they relate to non-superannuation business), capital losses realized in a like manner are deductible against tax.
7. While this provision would follow in any case from Section 51(1), it is specifically laid down in Section 112.

8. As noted, expenditure of type (ii) is fully deductible under the general provisions of the ITAA, while that of types (i) and (iii) is excluded from deductibility both by those general provisions and specifically by Section 112.

9. For a more detailed discussion of the background to this legislation see Gray (1977), pp. 274-275, and references therein.


11. The first change occurred in 1942, reducing the deduction from 4% to 3% of "calculated liabilities". This change was partly a result of the transfer to the Commonwealth in that year of the taxing rights of the States and partly a result of the need to finance war-related expenditures. The second and third changes, which reduced the deduction from 3% to 2% and from 2% to 1%, respectively, of "calculated liabilities", were effected by the two successive Federal Budgets for the years 1973-74 and 1974-75. These two changes were the direct result of the recommendations of the Coombs Task Force appointed by the Whitlam Government to "review the continuing expenditure policies of the previous Government". The Task Force drew attention to the considerable proportion of the assessable income of life insurance companies which escaped tax via the deduction for "calculated liabilities", regarding this as a form of "disguised expenditure by the Federal Government" (Commonwealth...
of Australia, 1973, p. 235). It admitted that a reduction of the allowance from the then level of 3% of "calculated liabilities" would have no formal basis within the general logic of the tax system. Rather, this was seen simply as a way of increasing what was felt to be the disproportionately light tax burden enjoyed by life companies up to that time.

12. Modification of the simple "percentage of calculated liabilities" formula to include the ratio of the value of assets producing assessable income to that of total assets was one of the changes to the operation of the Section 115 deduction resulting from the introduction of the 30/20 rule. Its effect is to eliminate any "doubling-up" of the relief of tax on superannuation business in the case of companies complying strictly or otherwise, with the 30/20 rule. Were it not included, such companies would enjoy both tax exemption of their superannuation income and a further deduction against tax related to their calculated liabilities under superannuation policies.

13. Other assets not producing assessable income include premiums outstanding, interest and rent outstanding and agents' balances, but these will be considerably smaller by comparison. Note that the effect of the ratio will be substantially the same in the case of a Class 2 company conducting some of its business outside Australia as in the case of one operating wholly within Australia since assets held in respect of overseas non-superannuation business will produce assessable income.
14. This "level" is measured in historical cost terms.

15. In its submission to the Australian Financial System Inquiry, the Life Insurance Federation of Australia commented as follows (LIFA, 1979, pp. 52-53):

"... [Section 115] also provides inducements in the form of additional tax deductions to encourage holdings of government securities in excess of 30 per cent. The significance of this additional benefit which, when the deduction was based on 3 per cent of calculated liabilities, was sufficient to broadly equate the after-tax yield on investments in government loans in excess of the 30/20 requirement with that typically available on a company mortgage security, has however, been largely eliminated by the reduction in the deduction to 1 per cent".

16. Prior to the 1972-73 income year, the taxable income of a life insurance company was taxed at a special rate lower than the general company rate. This arrangement was changed in the 1973-74 Federal Budget to allow for the taxable income of a life company to be taxed at the corporate rate.

17. Non-resident companies are specifically excluded from the provisions of these Sections.

18. The reader interested in the details of this computation is referred to the legislation itself.

19. In both cases, shares held in co-operative companies and the dividends received from such shares are specifically excluded from the definitions. In addition, should abnormally low dividend receipts in one year prevent the reductions being fully offset in that year,
Section 116AA(3) provides for the excess to be carried forward and offset against dividend receipts in a future income year.

20. This treatment was established by the High Court in Federal Commissioner of Taxation v. Australian Mutual Provident Society (1953), 88 C.L.R.

21. Under the previous system, the incentive was stronger the higher a taxpayer's marginal rate of tax. In addition, eligibility for the deduction was not dependent upon any threshold value of total concessional deductions being reached. Under the present system, however, the concessional rebate is set at a flat rate of 32 cents in the dollar and moreover, only applies to that much of a taxpayer's total rebateable expenditure (which includes at most $1,200 worth of paid life insurance premiums) as exceeds the threshold value of $1,590. Thus, if inclusive of his or her life insurance premiums payable a given taxpayer's total rebateable expenditure does not exceed the threshold value of $1,590, then there is no effective tax incentive for that taxpayer to purchase life insurance.

22. In its submission to the Australian Financial System Inquiry, the Life Insurance Federation of Australia comments as follows (LIFA, 1979, p. 56):

"What its [i.e., the current tax treatment of life insurance premium payments] long-run effect on the industry and on the overall capital market may be is difficult to ascertain but, in the short-run, it has contributed to fewer policy sales and to a significantly higher level of policy surrenders with a resultant loss of funds to the life insurance industry, to a significant shift in life insurance business towards contracts involving no savings element at all, to
a resultant significant loss of annual premium income, to a much slower build-up of life office funds than would otherwise have been the case and a diversion of community savings to institutions playing a different role in the capital market).

23. The abuses referred to involve the exploitation of the tax rebateability of life insurance premium payments together with the tax exemption of policy proceeds. Specifically, by taking out an endowment policy for a short period of time, or by contributing to a superannuation policy only to surrender that policy at an early date, a very high rate of return could be obtained over a relatively short time period at the expense of the honest taxpayer.

24. Certain exceptional cases are provided for under Sections 26(a) and, more particularly, 26AAA. These deal with gains which arise from the purchase and sale of property over short periods of time (specifically, 12 months or less) or solely for the purpose of profit-making.

25. For example, consider the case of a taxpayer whose rebateable expenditure in a given income year exceeds $1,590 and the total of whose life insurance premium payments in that year (where some of these payments are in consideration of deferred annuities) exceeds $1,200. By letting the excess of premium payments over the rebateable threshold of $1,200 refer exclusively to payments in consideration of deferred annuities, such payments while not rebateable at the time of purchase will be deductible at the time of benefit.

26. As at 30 June 1981, the total of annual premiums payable on annuity policies in force in Australia was $29,587,114 or 1.4% of the total
of annual premiums payable on all life insurance policies in force in Australia at that time. (Source: Office of the Life Insurance Commissioner, Quarterly Statistical Bulletin, June 1981).
1. It may be thought that the problems of "moral hazard" and "adverse selection" somehow provide life insurance with a valid claim to special status as an economic activity, and hence to special treatment under a tax system. On the contrary, the existence of these problems simply reflects the fact that it is costly to monitor the behaviour of those insured and to determine the exact character of their risks. The costs incurred by an insurance company in its attempts to overcome the problems of moral hazard and adverse selection are simply part of its overall costs of production. They do not entitle it to any special status either as economic agent or as taxpayer. Neither do such monitoring costs entitle policyholders to special tax treatment.

2. The complexity of real-world tax systems largely reflects:

(i) the influence of accumulated case law on the interpretation of statutory provisions; and

(ii) the effects of haphazard amendment of the statute law in response to political pressure and expediency.

3. The participating policyholders of a "proprietary" life insurance firm do not share in the results of favourable expense experience. This is restricted to the suppliers of the equity capital required to produce broking services, i.e., the shareholders. The shareholders'
equity capital is also at risk, however, on account of the mortality and earnings experience of the firm. They therefore claim that part of actuarial surplus which is not distributed to participating policyholders.

4. The sum total of factor income accruing to the policyholders and owners of a life insurance firm (whether mutual or proprietary) is given by (3) above. If one ignores the Section 115 deduction and the tax-exemption of superannuation investment income, the current system may be viewed as an attempt to tax the first bracketed term of (3). Inclusion of the management fee element of premium income in the tax base captures the second bracketed term as well.

5. See Annual Reports of the Life Insurance Commissioner for details of the asset holdings of registered companies.
FOOTNOTES

CHAPTER 7

1. Note that such a tax system captures all flows of factor income including imputed flows such as leisure.

2. There are certain conditions, (e.g., separability of the objective functions and the constraints) under which it is optimal to remove distortions in some parts of an economic system while other parts remain distorted (see Ng (1979), pp. 226-228). These conditions focus attention on the degree of substitutability amongst the goods produced in the various sectors of an economy. Indeed, they underlie the comments made in Section 7.1 on the degree of substitutability between the output of life insurance companies and that of other corporate organizations.

3. See also Swan (1980) and references therein.

4. As at 30 June 1981, there were eight mutual and thirty-six proprietary companies conducting life insurance business in Australia. The mutual companies accounted for about 70% of annual premiums payable on life insurance policies in force in Australia at that time (premiums payable on policies issued by Government life offices excluded). (Source: Office of the Life Insurance Commissioner, Quarterly Statistical Bulletin, June 1981).


7. Taxation arrangements for superannuation are discussed in Part II of Chapter 15 of the Final Report.

8. The 30/20 rule is discussed in detail in Section B of Chapter 10 of the Final Report.

9. While this profit is imputed, it is not implicit, i.e., received 'in kind'. Life offices declare 'reversionary bonuses' in which the results of favourable underwriting and investment experience are credited to the benefit of participating policyholders and shareholders, if any. Under the mutuality principle, bonuses declared on the basis of business conducted solely within a group and distributed to the members of the group have the character of ex post discounts; they are therefore not assessable in the hands of members of the group. From an economic viewpoint, such bonuses represent distributions of imputed profit earned by the group on the basis of dealings with itself; they are no different in economic character from the profits earned by the group on the basis of dealings with outsiders. Indeed, the existence of alternative opportunities for the employment of capital and entrepreneurship will ensure that 'bonus rates' available to the members of a mutual organization are commensurate with profit rates available elsewhere in the economy.

1. Prior to 1973, this official went by the title of "Insurance Commissioner". With the passing of the *Insurance Act 1973*, this title was transferred to the official chosen to administer that Act (Gray, 1977, p. 183).

2. Persons other than companies are specifically prohibited from conducting life insurance business in Australia (except on behalf of a registered company) by Section 14(1).

3. State government insurance offices are exempt from this requirement and from the provisions of the *Act* generally. However, they are understood to comply voluntarily with all major restrictions imposed by the Commissioner in respect of their life insurance business (Commonwealth of Australia, 1980c, para. 16.44, pp. 309-310).

4. In practice, applicants for registration must show that they can conduct a self-contained, well-organized operation in Australia with experienced management and adequate financial resources for development (Commonwealth of Australia, 1980c, para. 16.45, p. 310).

5. The Treasurer has stated (March 1979) that Section 16A will not be proclaimed and that Section 39 will be amended prior to proclamation.
The proposed amendments to Section 39 are generally in the direction of making the provisions less restrictive (Commonwealth of Australia, 1980c, footnote to para. 16.13, p. 306).

6. Life insurance companies are permitted to lay accounts before an annual general meeting which comply with the Life Insurance Act instead of accounts which comply with the Companies Act (Section 167c of the Companies Act). Directors are also exempt from having to present a report setting out information prescribed in the latter Act. (Commonwealth of Australia, 1980c, para. 16.32, p. 308).

7. Although the Act provides that actuarial investigations need only be conducted once every five years, it is usual practice in the industry for companies to prepare actuarial reports each year (Office of the Life Insurance Commissioner, Annual Report of the Life Insurance Commissioner, 1980, p. 24).

8. The objective of this requirement is to ensure that a company retains sufficient reserves which, if invested at the interest rate prescribed in the Fourth Schedule, would enable it to meet its liabilities to policyholders under existing policies (Commonwealth of Australia, 1980c, para. 16.64, p. 313).

9. In other words, at least 80% of the actuarial surplus arising from participating policies must be distributed to the owners of these policies. In practice, the proportion is about 98% (Commonwealth
of Australia, 1980b, para. 3.30, p. 40). Note that there is no such requirement governing the distribution of the surplus arising from non-participating business.

10. Life insurance companies and companies which are wholly-owned by life insurance companies are specifically exempt from the prospectus provisions of the Companies Act, subject to an appropriate declaration by the Corporate Affairs Commission (Section 38 of the Companies Act) (Commonwealth of Australia, 1980c, para. 16.23, p. 307).
FOOTNOTES

CHAPTER 9

1. The Campbell Committee notes in its *Interim Report* (Commonwealth of Australia, 1980c, paras. 17.9, 17.10 and 17.11, p. 318):

"... the Corporate Affairs Commissions perform a rather different role to that performed by [the Life Insurance Commissioner]....

... [His role is] directed at contributing to the stability of individual [life offices] through the setting of a wide range of minimum requirements governing their day to day business operations, and close surveillance to ensure that these requirements are met. ... [He is] provided with powers to take specified action in the event that the requirements are not met and/or that failure of the ... [life office] concerned is likely or has occurred.

By contrast, the Corporate Affairs Commissions place great emphasis on the appointment of trustees and establishing minimum requirements for the disclosure of information in connection with public borrowings, both at the time of borrowing and on an on-going basis. Less emphasis is placed on the meeting of minimum requirements in respect of day to day operations or on surveillance".

2. The phenomena of "moral hazard" and "adverse selection" are often blamed for the failure of markets in contingent claims. While this proposition is generally valid, it has not been used to defend government regulation of insurance markets. Indeed, it is not clear how it could be; government is unlikely to possess more (or even as much) information about the behaviour and risk-status of insured parties than the insurers themselves. At most, this proposition has been used to defend/explain government provision of insurance in areas where an active private market does not exist (e.g., workers' compensation).
3. Concern is also expressed that life insurance policies are not easily transferred from one company to another (see, for example, Gray (1977, p. 170) as quoted in Chapter 1). However, over the past decade in Australia, there has been an almost continuous annual increase in the rates of forfeiture and surrender of life insurance policies (Annual Report of the Life Insurance Commissioner, 1980). Most companies attribute these increases to 'twisting', the term used in the industry to describe the situation where a policy owner relinquishes a policy with one company in order to effect a new policy with another company. Of course, such a change is not without cost to the policyholder; each time a change is made, the policyholder incurs the set-up or establishment costs associated with his new policy. Transaction costs are not unique to life insurance, however - it also costs money to sell a house. It is true that transaction costs widen the scope for the exercise of (limited) monopoly power. But again this is no reason to single out life insurance for special regulatory treatment.

4. Private provision of information through quality-testing agencies may still be more efficient, however.

5. This is the answer to Gray's (1977) argument quoted in Chapter 1 that, since the beneficiaries of life insurance policies are most often "widows, orphans and people whose working years have ended", the consequences of financial failure are "unusually serious". If widows, orphans and retired persons are considered deserving of special protection against financial hardship, they should be
assisted directly. Moreover, such assistance should not be related to the cause of financial hardship. Special prudential regulations imposed on life offices protect only those potential widows, orphans and retirees who are covered by life insurance. In addition, such regulations protect those who are quite capable of sustaining the loss occasioned by the collapse of a life office as well as those who would be severely disadvantaged by it.


7. It is not intended that holdings of government securities and debt claims on banks and authorized dealers should be subject to this test (footnote 9, p. 334).

8. "Upstream" investments include those with a parent or holding company. "Cross-stream" investments include those in another company related to the parent.
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