Designing Life Insurance Products – A Broad Overview

Prepared by Craig Falconer

and Presented by Mr. Robert Williams
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ABOUT THE AUTHOR
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1. Introduction
This paper provides a broad overview of the factors to consider when designing life insurance products. It also briefly covers the main categories of products being sold and the main methods used to arrive at premium rates. An increasingly popular and essential modeling tool is a new business projection or business plan. The paper looks at the uses of this tool and includes sample output.

I have tried where possible to incorporate practical examples and illustrations to avoid making the paper too technical in content. The paper is aimed at executives and senior managers of life insurance companies. But the content may have relevance to wider audiences.

Insurance companies are in the business of meeting the insurance related needs of its clients and the area of product development is therefore very important. I hope that the contents will therefore be of some use and relevance to the readers of this paper.

2. Factors to consider when Developing a New Product

2.1 Marketability
A new product must be marketable so that the distribution force can sell it. Normally a product can be sold if it meets a particular need of the buyer. What makes a product marketable depends on the product features, who it is going to be marketed to and how it is going to be marketed. Features that can make a product marketable include having lots of 'bells and whistles', good illustrative maturity values (IMV’s), competitive rates, high levels of guarantees, low levels of underwriting etc. However these features would not necessarily be attractive to all markets. For example policyholders requiring life cover to back a bond would not be interested in the product having good illustrative maturity values as the main reason for the cover is protection. In addition, not all selling methods would be appropriate. For example, direct marketing normally implies the need for a simple product with little underwriting requirements.

So one needs to therefore consider the target market and ensure the product meets the specific needs of that market. Since there may be a number of products out there that do this one would try to add some innovation such as ‘bells and whistles’, additional guarantees, attractive IMV’s in order to differentiate from the other offerings. In certain markets this may be less important e.g. if the market is not well developed.

2.2 Distribution Channel
This refers to the sales force or method used to sell / market the product. There are various types as follows:

2.2.1 Tied agents employed by the insurer
- Independent brokers
- Other agents e.g. banks, retailers where insurance is incidental

2.2.2 Direct Marketing
- Mailshots
- Internet
- Television

The distribution channel is possibly one of the most important factors to consider. Without an effective distribution network the likelihood of a product being successful is severely limited. Developing the distribution channel is therefore critical.

The distribution channel must be suited to the target market. For example, if the upper income market is being targeted independent brokers may be more effective than mailshots. It would therefore be important to secure the support of these brokers.

The distribution channel affects the demographic profile of the market. For example, using direct marketing normally implies minimal underwriting which will result in the mortality experience on that book reflecting non-underwritten lives. This would need to be reflected in the rates charged.

The distribution channel also affects the complexity of the product, level of underwriting and required competitiveness. For products sold through independent brokers, competitiveness may be critical. Generally different distribution networks are required for the upper vs lower income markets.

2.3 Competitiveness
The importance of the factor depends on the price sensitivity of the relevant target market.

Certain products are also easier to compare on price e.g. term assurance. Other products such as with-profits endowments are not as easy to compare, as the competitiveness will also depend on bonus declarations.

New types of products are generally less price sensitive.

Certain investment products may be compared to banks saving products and so must compete with these institutions. Tax treatments may be an important factor here.

The commission structure should also be competitive. Often this is the most important factor!

In a very competitive market, product differentiation and service becomes an increasingly decisive factor. Service includes service to the client and to the sales force.

2.4 Profitability
The product must have sufficient margins to meet expected obligations under the policy including claims and expenses. In addition, there should be a loading for profit. The degree of profit that should be allowed for will depend on other factors such as the price sensitiveness of the product, shareholder requirements and the perceived risk associated with the product.
Profit loadings can be allowed for explicitly or implicitly in the assumptions. An example of an explicit loading would be to specify the required internal rate of return. One could price a product to be profitable overall with inherent cross subsidiaries e.g. mortality profits could subsidise expense losses; or each item of the basis could be priced to be profitable individually.

One should be aware of the timing of the expense of profits. Often losses may occur followed by profits which more than make up for the earlier losses. This is best examined in a business plan (see below).

The product should be priced (if possible) so that it remains profitable under changing conditions e.g. higher interest rate environment. This can be achieved by including margins or by making product terms reviewable for example.

2.5 Financing Requirements
As touched on above, insurance products often show an initial loss followed by profits. This phenomenon is known as new business strain. As a result up front capital is required. The product can be designed to minimise the financing requirements where possible. For example with unit-linked products, charges can be structured to coincide with new business expenses. This is known as front end loading. A further option is to set reserves to minimise new business strain e.g. by setting up negative reserves. However, in many countries negative reserves are not permitted in terms of local legislature requirements. The best way to assess the financing requirements is by way of a new business plan – see below.

2.6 Risk Characteristics
Depending on the product there will be varying levels of risk associated with it. Some risks may be passed back to the policyholder e.g. investment risk where the product is unit-linked. Other products have high levels of guarantees, which may span the life of the policyholder e.g. 20 years. Areas of risk that may be guaranteed by the insurer include:

- mortality and morbidity risk
- expense risks
- investment risks
- tax risk
- inflation risk
- lapse / surrender risk

Generally the more onerous the guarantees provided, the larger the required margins in the pricing assumptions. Reinsurance can be used to reduce some of the risks.

2.7 Underwriting
When setting underwriting requirements, the reinsurers should be consulted as they may provide technical expertise and may have underwriting conditions in the treaty.

When designing a new product the degree of underwriting to be undertaken needs to be considered as it will have an impact on the underlying mortality experience and hence mortality assumptions are used in deriving the rates. The costs of underwriting also need to be loaded in the rates.

The degree of underwriting required will depend on the amount of risk benefits incorporated in the product concerned and on the levels of cover being
provided. Generally if there are high levels of cover then more underwriting can be justified because the mortality savings as a result of the underwriting will outweigh the costs thereof e.g. cost of medical examinations.

Note that underwriting can take place at inception in the form of medical questions on the proposal form, reports from medical practitioners, medical examinations etc. The degree of underwriting will depend on the perceived risks. Alternatively, underwriting can take place at claims stage e.g. checking for pre-existing conditions and other exclusions, enforcing waiting periods. Which approach to use will depend on the target market.

2.8 Extent of Cross – Subsidies
Cross subsidiaries are often incorporated for various reasons but often to simplify the product and/or for marketing reasons. For example, credit life products may have a uniform rate for all ages. Other examples of cross–subsidies include large policies subsidising small policies (this one is common), the risk component subsidising the investment component of a unit–linked product so that favourable illustrative maturity values are produced.

2.9 Administration
When designing a product one needs to ensure that the relevant staff and systems will be in place. It should be noted that there are many ways to price a product and it may therefore be relatively easy to incorporate current administrative capabilities with the design. In addition, products could be designed to be similar to existing products to minimise customisation and training costs.

The costs of systems and training should be amortised and allowed for in the product rates. Administration is a key area to ensure service levels are competitive. Otherwise business will often suffer in the long term. Life office software is normally a significant expense but money well spent in the long run – provided the system is a good one.

2.10 Public Interest
One should not forget that insurance products are provided to meet people’s needs and as such serve the public interest. Not only is the public interest served by meeting policyholder claims, but insurance companies normally invest significant amounts of monies in government securities and other asset classes which stimulates the economy. It is important that insurance companies are perceived as trustworthy institutions by the general public in order to attract business. In the area of product design one must consider the long term relationships between the insurer and the public. It is important that products generate profits to ensure the insurance company remains in existence with the support of shareholders and/or participating policyholders. However, profits should not be excessive as this would not be a sustainable model and could result in the insurance company receiving poor publicity and a bad name for the industry.

Products must be fair and provide good value. In Africa there is the problem of inflation which results in erosion of the value of benefits which should be taken into account in terms of providing meaningful benefits. Policy wording must not be misleading and policyholder reasonable benefits expectations (RBE) must be taken into account. Where the contrary takes place, short-term profits may result but the long term effect could be devastating to the insurer and insurance industry.

2.11 Interaction of Above Factors
The above factors often conflict and makes the design of products a delicate balance of these conflicting factors. For example profitability conflicts with competitiveness and public interest. Marketability may conflict with financing requirements or administrative limitations. Product design involves a delicate balance between these conflicting factors.

2.12 Pitfalls to avoid
In working with insurance companies in the design and development of life insurance products, one learns from experience what possible pitfalls to be aware of. Some of these are briefly covered below.

2.12.1 Avoid launching too many products simultaneously. The process of introducing a new product is a significant project. If done properly it involves a significant amount of time and resources. One should avoid launching too many products at once – especially if the products are quite different to each other. Rather focus on the most marketable product first (for example) and once that project is bedded down use the experience to improve the next product launch.

2.12.2 Do not under estimate administration system costs, requirements, training and implementation time.

2.12.3 Do your homework – in particular market research and discussion with sales force leaders – to ensure the product design will be effective and marketable.

2.12.4 Involve marketing, administration, finance, IT and actuarial resources in the development process and prior to finalisation. This will help ensure that, for example, the product design takes into account administrative limitations.

2.12.5 Avoid over complicated products – they will imply the need for higher levels of training and normally will not sell if they are not understood or trusted by the target market.

2.12.6 Undertake a new business projection and business plan incorporating actuarial input. This is discussed further below.

2.12.7 Avoid long term guarantees such as minimum investment returns or long term mortality guarantees unless absolutely necessary for marketing reasons.

2.12.8 On the other side of the coin, it is preferable not to price a reviewable individual life product too lean. If charges
or premiums do need to be reviewed it involves more administration and will have RBE implications.

2.12.9 Train sales force from the start so that they fully understand the products and the legislative environment. Incentivise the sales force to encourage production but persistency as well. Provide training as to how persistency can be improved during the selling process. The development of an effective distribution network cannot be over emphasised.

2.12.10 Focus on upper income or lower income market – not both. There are exceptions but generally it is difficult for one company to make a success in both markets. Branding is very important. Once a company has an established brand it should sell products consistently with its branding.

2.12.11 Capitalise on synergies of opportunities with the group structure. Consider the shareholding of the company and who they own and maximise these opportunities.

2.12.12 Monitor experience once business is on the books. The insurance company’s actuaries should undertake regular experience reviews e.g. mortality, lapse and expense investigations. This will require reasonable volumes of data, to be credible. The results should be used to refine the pricing assumptions and premium rates on an on-going basis.

2.12.13 Secure favourable reinsurance support during the development process or at least prior to finalisation of the product. It is possible that reinsurance support will not be available which could result in the product not being launched. In addition, the reinsurance terms could affect the profitability of the product.

2.12.14 Establish and entrench sound business practices from the start. It is easier than trying to change a particular unsatisfactory practice, which may have become firmly entrenched. An example of this is having lax group life premiums collection procedures, which results in arrear premiums becoming problematic.

3. Types of products
One of the decisions to be made when designing products is the type of product. There are some useful ways to categorise the products as summarised briefly below. I have not attempted in this paper to discuss the comparative
merits of each category e.g. is unit-linked “better” than with profits. This could be a paper all on its own.

3.1 Savings vs Protection
The heading is probably self explanatory. Savings products have a significant element of savings – normally a maturity value or perhaps favourable partial surrender value payouts. The main purpose of the product is to enable the policyholder to save for an event although the event may not necessarily be specific. Examples include retirement annuities, pure endowments and educational endowments.

Protection policies are taken out to cover contingencies such as death or permanent disability. That is their main purpose. Examples include term assurance, whole life and permanent health insurance (PHI) policies.

3.2 Unit-linked vs Conventional
A unit-linked product has a savings element, the value of which is directly linked to the performance of the underlying assets. The essential point to note is that the investment risk therefore lies with the policyholder and not the insurance company. A unit-linked product operates similarly to a bank account. Monies (premiums) are paid in, charges are deducted and interest is credited based on the underlying asset performance. The charges are deducted to cover expenses as well as any risk (protection) benefits added on to the policy e.g. life cover or disability cover. These charges may also be reviewable which then passes the associated risks back to the policyholder - although one must always consider RBE and the enforceability of reviewing premiums in the light of marketing constraints. The advantages to the insurance company relate mainly to the reduced risks. The main advantages to the policyholder is the greater flexibility associated with these products e.g. one can increase premiums, change retirement dates etc. A further advantage is that given the lower guarantees, the insurance company can price more aggressively and pass on lower premiums to the market. Policyholders can also benefit from favourable investment performance assuming it is favourable.

Conventional business includes the standard endowments, annuities, etc where all risks are normally borne by the insurer and benefits are fixed and guaranteed. The concept of a unit-linked “savings” account does not really feature. The difference between unit-linked and conventional is similar to comparing defined contributions and defined benefit pensions business. Conventional as the name implies has been around longer than unit-linked business and in many African countries is generally more popular and established than unit-linked business.

3.3 With-profits vs non-profits
Within conventional business with the associated fixed business – there are two common variants. Non-profits policies have fixed premiums and benefits over the policy term. Policyholders do not take any risks and do not share in any investment, mortality, expense or surrender profits.

With-profits business has a fixed guaranteed element but also allows the policyholder to participate in the profits normally in a defined way.

3.4 Hybrids
Many products today are a mix of the above classifications. I have provided a few examples below.
3.4.1 Non-profit conventional products may have reviewable premiums. This implies they have elements of with-profits business.

3.4.2 Unit-linked policies may have only an indirect link to the performance of the underlying asset making them similar in this respect to with-profits business.

3.4.3 A protection policy such as a unit-linked whole life product may have a significant unit-linked component enabling drawings against this account - similar to a savings product.

3.5 Examples of Innovative Products

The term “innovative” is subjective. In addition an innovative product in one country may be old news in another one. However, I have briefly summarised some recent products and some not so recent ones that I feel may fit this description in some circumstances.

3.5.1 Protection riders can be designed to cross-subsidise unit-linked savings components. This product is normally written on a unit-linked platform. Favourable IMV’s are provided because expenses may be covered by a rider e.g. accidental death cover. This product may be marketed to compete with bank products. Tax considerations are also important.

3.5.2 Products may be designed to provide gross of tax returns by making use of an “excess E” tax position. For example, if an insurance company is taxed on Investment Income (I), less Expenses (E) and it has a large ‘E’ relative to ‘I’ then a savings product could be launched to absorb this “excess E”. The company may then be able to pass on gross returns to the policyholder. The policyholder may otherwise have to pay tax if investing elsewhere e.g. in a bank.

3.5.3 Accelerated death benefits include terminal illness benefits (including AIDS) as well as disability and critical illness benefits. The death benefit is payable earlier than on death if death is deemed likely to occur soon thereafter anyway. This option can enhance the marketability of standard death benefits with little additional cost.

3.5.4 Group individual hybrids are a mix between a group and an individual product. An individual protection product may therefore be priced more competitively than a standard term assurance for example because it is actually a group product with little allowance for ageing and
regular reviews. In addition there may be less underwriting and a free cover limit. Commission will often resemble individual life commission i.e. based on a longer term (say 20 years if it is mortgage protection term business).

3.5.5 Increasing cover products incorporate the “lien” underwriting concept within the standard rates. Instead of full underwriting the policyholder has the option of reduced cover, which gradually increases over (say) ten years to the full sum assured. Over that period the policy will have built up a reasonable sized reserve relative to the sum assured which presents less risk.

3.5.6 The “basket of products” concept has a core element e.g. funeral or savings with other rider benefits as standard or optional e.g. accidental cover, income protection (disability), retrenchment, hospital cash plan, additional dependants on funeral cover, etc. This “one stop shop” product is popular with tied agents as they have a product to meet all their clients’ needs.

4. Methods of Setting Premium Rates
When developing new products, there are two main methods of setting premium rates. The decision on which method to use is generally more of a technical issue for the pricing actuary to tackle. I have therefore not focused on this topic in much detail except to provide a brief description of each method and a list of the main assumptions required in product pricing.

4.1 Present Value vs Emerging Cash flow
The present value approach has been used for decades and involves equating the present value of premiums to the present value of benefits and expenses / commission. Normally commutation functions were used to simplify the calculations. Certain items of experience were ignored or not explicitly allowed for e.g. lapses, surrenders, reserve costs, cost of capital, new business strain.

With the advent of computers the emerging cash flow method evolved. This involved projecting all expected cash flows (normally monthly) including premiums, investment income on reserves, expenses, commission, death claims, surrenders, future reserving and capital requirements etc. All cash flows are then discounted at the rate of return required by shareholders. The method represents a significant improvement on the former method. It is however significantly more complex and for certain products the former approach may be preferable. However, for certain products such as unit-linked products, the present value approach cannot be used.

4.2 List of Assumptions Required when Setting Rates
The following assumptions will normally be covered when using the emerging cash flow (profits – testing) method.

<table>
<thead>
<tr>
<th>Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
</tr>
<tr>
<td>Morbidity</td>
</tr>
<tr>
<td>Interest on Reserves</td>
</tr>
<tr>
<td>Inflation</td>
</tr>
</tbody>
</table>
Other benefits Risk discount rate
Lapses Reversionary bonuses (if relevant)
Surrenders Terminal bonuses (if relevant)
Paid ups Taxation
Initial / Up Front Expenses Reserving basis
Renewal Expenses Reinsurance
Commission Expenses Profit Criterion
Claw back of commission
Average Premium
Average Sum Assured

Assumptions should ideally be based on recent experience investigations. Normally rates would be tested by assuming adverse experience to see if they remain robust.

5. Business Plan / New Business Projection

Based on an assumed volume and mix of business one can project the expected cash flows for the next five years or so. Certain of the assumptions would be variable and a spreadsheet could therefore be provided where these assumptions could be varied e.g. projected volumes each year and projected expenses each year. The cash flows would be sufficient to derive a full revenue account and balance sheet. All the assumptions mentioned in 4.3 above would be incorporated. The main uses of the business plan are as follows:

- can investigate what volumes are required to cover expenses
- can derive optimistic, pessimistic and realistic projections
- can assess the timing of profit emergence and use these results to manage shareholders expectations
- often profits may only emerge after three years or more but shareholders may have a shorter term expectation
- can investigate the capital requirements due to new business strain
- can assist in assessing the viability of the product
- can assist in budget setting when combined with a projection of the current in force business as well

A business plan is an essential tool which should be utilised when developing a significant line of business. A simplified business plan is provided below. It is based on an individual funeral product (whole life cover).

5.1 One Year’s New Business

<table>
<thead>
<tr>
<th>New Business</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premiums</td>
<td>6,439</td>
<td>10,222</td>
<td>8,225</td>
<td>7,284</td>
<td>6,546</td>
</tr>
<tr>
<td>Interest on Reserves</td>
<td>-14</td>
<td>272</td>
<td>317</td>
<td>412</td>
<td>498</td>
</tr>
<tr>
<td>Total Income</td>
<td>6,424</td>
<td>10,494</td>
<td>8,542</td>
<td>7,695</td>
<td>7,044</td>
</tr>
<tr>
<td>Commission</td>
<td>8,613</td>
<td>1,562</td>
<td>139</td>
<td>61</td>
<td>55</td>
</tr>
<tr>
<td>Claims</td>
<td>1,636</td>
<td>2,794</td>
<td>2,599</td>
<td>2,613</td>
<td>2,686</td>
</tr>
<tr>
<td>Expenses</td>
<td>7,323</td>
<td>2,057</td>
<td>1,285</td>
<td>1,086</td>
<td>1,002</td>
</tr>
<tr>
<td>Total Outgo</td>
<td>17,572</td>
<td>6,412</td>
<td>4,023</td>
<td>3,760</td>
<td>3,743</td>
</tr>
<tr>
<td>Income Less Outgo</td>
<td>-11,148</td>
<td>4,083</td>
<td>4,518</td>
<td>3,935</td>
<td>3,301</td>
</tr>
<tr>
<td>Change in reserve</td>
<td>-</td>
<td>-424</td>
<td>-1,331</td>
<td>-1,203</td>
<td>-1,123</td>
</tr>
<tr>
<td>Profit</td>
<td>11,148</td>
<td>3,659</td>
<td>3,187</td>
<td>2,732</td>
<td>2,178</td>
</tr>
</tbody>
</table>
The above represents expected cash flows from annualised new business premium income of 12,000 in Year 1 only. Note the initial large loss due to up front commission costs. Only the first five years’ cash flows are shown.

5.2 Five Years’ New Business

<table>
<thead>
<tr>
<th>New Business</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premiums</td>
<td>6,439</td>
<td>16,661</td>
<td>24,886</td>
<td>32,169</td>
<td>38,715</td>
</tr>
<tr>
<td>Interest on Reserves</td>
<td>-14</td>
<td>258</td>
<td>575</td>
<td>986</td>
<td>1,484</td>
</tr>
<tr>
<td>Total Income</td>
<td>6,424</td>
<td>16,919</td>
<td>25,460</td>
<td>33,156</td>
<td>40,199</td>
</tr>
<tr>
<td>Commission</td>
<td>8,613</td>
<td>10,175</td>
<td>10,314</td>
<td>10,375</td>
<td>10,430</td>
</tr>
<tr>
<td>Claims</td>
<td>1,636</td>
<td>4,430</td>
<td>7,029</td>
<td>9,642</td>
<td>12,328</td>
</tr>
<tr>
<td>Expenses</td>
<td>7,323</td>
<td>9,380</td>
<td>10,664</td>
<td>11,750</td>
<td>12,752</td>
</tr>
<tr>
<td>Total Outgo</td>
<td>17,572</td>
<td>23,984</td>
<td>28,007</td>
<td>31,768</td>
<td>35,510</td>
</tr>
<tr>
<td>Income Less Outgo</td>
<td>-11,148</td>
<td>-7,065</td>
<td>-2,547</td>
<td>1,388</td>
<td>4,689</td>
</tr>
<tr>
<td>Change in reserve</td>
<td>-</td>
<td>-424</td>
<td>-1,755</td>
<td>-2,958</td>
<td>-4,081</td>
</tr>
<tr>
<td>Profit</td>
<td>-11,148</td>
<td>-7,489</td>
<td>-4,302</td>
<td>-1,570</td>
<td>608</td>
</tr>
</tbody>
</table>

The above represents 5 years of 12,000 new business premium income each year. Note how new business strain also results in negative cash flows in the first four years for this particular product. Only the first five years’ cash flows are shown.

6. Conclusion

The design and development of life insurance products is a critical component of the success of a life insurance company. In the paper I have considered some of the important factors one should take into account when developing new products. I have touched briefly on the types of products currently being marketed in Africa and at the main methods used to derive premium rates. I have further discussed a useful tool for assessing the viability and expected cash flows from a new business line, namely a new business plan or projection.

Assuming all these factors are taken into account success cannot be guaranteed. Insurance is by its nature a risky business and there are other factors that need to be taken into account. Such things include having an effective distribution network and running the business in a sound manner, taking into account things like risk management and corporate governance, regular monitoring and experience investigations. However, allowing for all the factors discussed in this paper will go a long way to improving the probability of success.