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John and Mary Smith

Life Insurance Analysis

Overview

You have an **I**rrevocable **L**ife **I**nsurance **T**rust (ILIT) that purchased a joint life (second-to-die) life insurance policy on 5/25/2007 for $15,000,000 from Provident Life. At that time you made a 1035 tax free exchange of cash value from a previous policy in the amount of $689,866. In addition, you committed to pay $125,544 in annual premiums to fund the policy. "Mary" was 62 and had a health classification of Standard Non-Tobacco and "John" was 68 with a health classification of a Non-Tobacco Table 12 which, as you know, is an extremely high rating.

The Provident policy is a Universal Life (UL) policy with a provision that allows the insured to protect the death benefit from lapsing based on how much premium is paid and if other conditions are met per the policy. A UL policy build up a cash value which is invested in short to intermediate term bonds. In reviewing the original illustration dated 9/24/07 (***Exhibit A***) the crediting rate at the time was 4% and the guaranteed crediting rate was 3%. You will see on page 6 of 8 that there are two sets of assumptions; one named "Guaranteed Assumptions" and the other "Non-Guaranteed Assumptions". The "Guaranteed Assumptions" assumes that the crediting rate on the cash value is at the minimum (3%) and that the insurance cost factors and expenses are charged to the policy at their highest amount allowed stated in the contract. The "Non-Guaranteed Assumptions" assumes that the crediting rate is whatever the insurance company is crediting at the time (4%) and that the expense and insurance costs are being charged at their current level set by the insurance company. Based on the funding arrangement you agreed to, an annual premium of $125,544 + $689,866 contributed from another policy, the policy would not terminate under either set of assumptions until "Mary" was age 98 and "John" was 104 (the 36th policy year).

Based the most current annual statement (***Exhibit B which "John" originally sent me***) you will see that on 2/25/13 the policy death benefit was reduced from $15,000,000 to $6,500,000. On July 24, 2012 the trustees purchased a policy from John Hancock in the amount of $9,696,565 for an annual premium of $200,000. It did take seven months to make the change to the policy at that time the premiums ceased being paid on the Provident $6.5mm policy but why did it take seven months to reduce the face amount? There may have been a very good reason, but the possible importance of this question relates to when the death benefit may lapse. Based on an in force ledger statement of the current status of the policy (*Exhibit C*) the policy will terminate under either set of assumptions (Guaranteed or Non-Guaranteed) **earlier by 3 years** than the original policy, when "Mary" is 95 and "John" is 101 vs. 98/104 (the 33rd policy year). By waiting 7 months the cost of insurance charges were based on $15mm of death benefit and not $6.5mm. The approximate cost of the insurance over those 7 months was about $25,000. By keeping the $25,000 in the policy the actual lapse date would have been extended even if just by a month.

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As mentioned above, on July 24, 2012 you purchased a single life policy on "Mary" from John Hancock for $9,696,565. The annual premium you committed to paying for a period of 29 yrs. was $200,000. I do not have the original illustration but based on my experience the policy would most likely have shown to terminate when "Mary" turned 96/97.

You now have the following:

1. Provident Life
    a. Premium: $0
    b. Death Benefit: $6,500,000
2. John Hancock
    a. Premium: $200,000
    b. Death Benefit: $9,696,565
3. Totals:
    a. Premium: $200,000
    b. Death Benefit: $16,196,565

A few observations:

1. What were you told was the reason to change the original policy and purchase another?
2. You had $15mm of coverage based on 2 lives for a reasonable rate of $125,544 (I will examine rates of return later in my report). After the change you picked up an extra $1,196,565 ($6.5mm + $9,696,565 = $16,196,565) of death benefit for $75,000 of extra premium annually. The following are the rates of return on death at various lengths of time based on paying $75,000 annually for $1,196,565 of death benefit:
    a. 10 yrs. (Mary age 78): 8.34%
    b. 12 yrs. (Mary age 80): 4.31% (reasonable rate of return)
    c. 13 yrs. (Mary age 81): 2.89%
    d. 15 yrs. (Mary age 83): .77%
    e. 20 yrs. (Mary age 88): -2.21%
    f. If Mary lives longer than 15 yrs. you lose money!
3. You shortened the guaranteed death benefit period on the original policy from the 36th policy year (age 98) to the 33rd policy year (age 95).
4. The "new policy" does not have nearly the guarantees and with lower crediting rates will require more premiums to have the policy last as long as most likely projected originally *(more detail to follow).*
5. In general a joint life policy is less expensive than a single life policy. At the time of the transaction did the agent talk about or analyze the difference between joint life and single life insurance before recommending the change?
6. I am trying to understand why the agent would recommend this transaction?

Current Life Insurance

You have 2 Universal Life policies. One with a death benefit guarantee provision and one with a limited guarantee. I have defined UL later in the report for you to review. We will discuss how these policies operate and function.

Protective Policy

The **original** policy (***$15mm, Exhibit A***) is a *Universal Life with a Death Benefit Guarantee provision*, as long as certain conditions are met and the premiums are paid **on time each year** then the death benefit was guaranteed not to lapse even if there is $0 cash value until "Mary's" age 98.

The original $15mm had the following rates of return on death ("Mary" was 62 at the time of purchase):

- 20 yrs. (age 82): 11.23%
- 25 yrs. (age 87): 8.14%
- 30 yrs. (age 92): 6.17%
- 35 yrs. (age 97): 4.81%
- 36th yr. the policy has lapsed, Angelina's age 98

The rates of return on the policy after reducing it to $6,500,000 and based on the premium payments made to date are the following:

- 20 yrs. (age 82): 8.33%
- 25 yrs. (age 87): 6.53%
- 30 yrs. (age 92): 5.37%
- 32 yrs. (age 94): 5.01%
- 33rd yr. the policy has lapsed, Angelina's age 95

The policy is now projected to lapse in the 33rd year (age 95). Based on my proprietary life expectancy (LE) tables, "Mary" has the following probabilities (*for further details please refer to my Life Expectancy exhibit included below*):

- 50% (normal LE): 90.5
- 75%: 95.2
- 85%: 97.6
- 95%: 101.7

Current condition of the Protective policy (Exhibit C) shows that the cash surrender value is $0 and will remain $0 until the policy lapses in the 33rd year or her age 95. Your contributions to date have been $1,509,171 (premiums paid + rollover of cash value from a previous policy).

Recommendation

Retain this policy. You may consider contributing additional premium to continue the policy to an older age (***Exhibit C***).

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John Hancock

This policy is what we call a Current Assumption Universal Life policy. It has a limited guarantee of the death benefit. As explained below in more detail, the costs of the policy (internal expenses and cost of insurance) are paid for over the long term by the premium payments and the interested credited. There is an increasing cost of insurance factor that increase each year which is applied to the Net Amount At Risk (NAR) which is defined as the cash value – death benefit. The premium that is calculated to be paid is the suggested amount that will help fund all the future costs based on an assumed linear or constant rate of return and constant expenses and cost of insurance factors. Please note that the expenses and cost of insurance factors are not guaranteed. If the crediting rate declines premiums will most likely have to increase as a result in order to meet the original expectations.

Options

Option #1 (Various options at differing crediting rates)

Your current policy most likely had an original assumed interest crediting rate of 5.2% when you purchased the policy. The crediting rate has declined to a current level of 5.05%. Based on new projections at differing crediting rates the following has happened (***refer to Exhibit D***):

- 5.05% (Current Crediting Rate)
  - If you continue to pay the premium of $200k the policy will now lapse at age 93 non-guaranteed and age 84 on a guaranteed basis
  - The premium you have to pay in order to get the death benefit duration to age 97 (lapse occurs age 98) is $218,725. This pushes out the guarantee to age 87.
  - If you want the death benefit to be extended to age 100 the annual premium will be $226,471. This pushes out the guarantee to age 88.
  - You would need to dump-in approximately $322,600 and continue to pay $200k in order to get the death benefit to age 100. This pushes out the guarantee to age 88.

- 4.5%
  - If you continue to pay the premium of $200k the policy will now lapse at age 92 non-guaranteed and age 84 on a guaranteed basis
  - The premium you have to pay in order to get the death benefit duration to age 97 (lapse occurs age 98) is $226,559. This pushes out the guarantee to age 88.
  - If you want the death benefit to be extended to age 100 the annual premium will be $235,181. This pushes out the guarantee to age 90.

- 3.5%
  - If you continue to pay the premium of $200k the policy will now lapse at age 90 non-guaranteed and age 84 on a guaranteed basis
  - The premium you have to pay in order to get the death benefit duration to age 97 (lapse occurs age 98) is $241,909. This pushes out the guarantee to age 92.
  - If you want the death benefit to be extended to age 100 the annual premium will be $252,371. This pushes out the guarantee to age 92.
  - You would need to dump-in approximately $322,600 and continue to pay $200k in order to get the death benefit to age 100. This pushes out the guarantee to age 92.

- 2.5% (minimum guaranteed rate)
  - If you continue to pay the premium of $200k the policy will now lapse at age 87 non-guaranteed and age 84 on a guaranteed basis
  - The premium you have to pay in order to get the death benefit duration to age 97 (lapse occurs age 98) is $293,444. This pushes out the guarantee to age 92.
  - If you want the death benefit to be extended to age 100 the annual premium will be $311,723. This pushes out the guarantee to age 93.

Option #2

Let's consider reducing the death benefit to **$8,500,000** in order to retain total coverage in the amount of the original $15,000,000 (***Exhibit E***)

- 5.05%
  - Death benefit will lapse at age 100
  - Guaranteed lapses at 88
- 4.5%
  - Death benefit lapses at 98
  - Guaranteed lapses at 88
- 3.5%
  - Death benefit lapses at 94
  - Guaranteed lapses at 88
- 2.5%
  - Death benefit lapses at 88
  - Guaranteed lapses at 88

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Option #3

We considered guaranteed death benefit policies from various insurance companies at her current health class. As long as the premium is paid on-time (within the grace period) the death benefit is guaranteed to the stated age (***Exhibit F***). This gets you back to $15mm with a guarantee of the death benefit to your desired age.

- Single life policy of $8,500,000 (based on our research, Provident)
  - Lapse age 99: $195,767
  - Lapse age 101: $205,155
  - Lapse age 98: Between $190,000 and $194,000
- Joint life policy of $8,500,000assuming Noel is uninsurable (based on our initial market research) with a lapse age of 99 (not shown due to non-competitiveness)
  - Premiums were in between $206,000 and $225,000

Option #4

We considered a single life policy for "Mary" with a guaranteed death benefit of $9,696,565 but the premium was slightly higher at $205,000/yr.

Conclusion/Recommendation

Current Policy from John Hancock: As the interest crediting rates decline the premium has to increase to fund the policy to the expected age. Since the crediting rate is currently at 5.05% this has reduced the age at which the policy will lapse to age 93 assuming there are no changes in the internal charges applied to the policy. Based on our report if crediting rates stay where they are at or continue to decrease our options we can conclude the following:

- You will need to pay additional premium beyond $200,000
- If we keep the premium at $200,000 then we accept the lower age of policy lapse
- We can adjust the death benefit
- The longer the rate stays below the original crediting rate of 5.2% and the longer we wait to make any adjustments in the premium or death benefit the adjustments in the future will only become increasingly worse
- The longer the rate stays below the original assumption the less of an impact that an increase in the rate will have, based on my experience it will be very difficult to get the policy back on its original track if not impossible.

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- One possible way to manage the policy would to pick a rate that you believe is a reasonable rate, for example 4.5% or 4% and pay the premium that will fund the policy to the desired age. Then in a few years do another analysis and make any adjustments deemed wise.
- Reduce the death benefit to $8,500,000
    - The risk here is that if the cost of insurance factors or expense factors increase then the policy will most likely lapse at an undesirable age

New insurance:

We would consider a death benefit guarantee policy to an age that can be agreed upon in order to minimize risk. It will be difficult to match the $9,696,565 of death benefit for the current premium of $200,000 unless we can obtain a better health class for "Mary".

Based on her current health class you can save a little money at a death benefit of $8,500,000 and have a guaranteed lapse age more in line with her 85% probability of life expectancy or age 98.

A joint life policy is not competitive unless "John" is better than a health class of uninsurable.

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Universal Life (UL) Defined

These types of policies allow for flexible premium payments and death benefits, subject to guidelines defined by the government. The government limits the following:

- Premiums that can be contributed to the policy, which can limit the flexibility of the policy.
- There is a limit as to how much cash value can accumulate based on a defined ratio of death benefit to cash value. This means that there is a corridor that must be maintained between the cash value and the death benefit. If the cash value enters the corridor the death benefit is automatically increased.
- Annual premiums
- 7 yr. premium limits

Payments or premiums paid into life insurance are first subject to a premium tax and then the balance is deposited into the cash value which in UL policies is an interest bearing account that will fluctuate with the general level of the short to intermediate term interest rate environment. Current crediting rates are not guaranteed and are subject to change at least annually, most of the policies today allow for the rate to fluctuate on a monthly basis. A guaranteed minimum interest rate is stated within the policy. Monthly deductions are made for policy expenses and mortality charges (cost of insurance) and each month you are credited interest.

The expenses allocated to a particular policy series sold are subject to change and have a maximum amount that they can be increased. The same goes for mortality charges or cost of insurance (COI). The COI cost factors increases over time as the insured gets older.

Operationally the policy works in the following manner: The increasing COI factor (increases with age of the insured(s)) is applied to the net amount at risk (NAR). The NAR is the difference between the cash value and the death benefit. If the NAR does not converge fast enough the premium + credited interest may not be able to fund the future costs and the policy will lapse.

The premium in these types of performance based policies is only the suggested amount based on current market conditions. In essence, the premium is promulgated by assuming that the internal charges (expenses and mortality) and the crediting rate remains the same throughout the life of the policy. This linear type of illustration that is produced by the insurance company does not tell the whole story. If interest crediting rates decrease, or there are changes in the policy expenses or mortality charges this will have a significant impact on the long term viability of the policy.

Basically this means that the premium funding of a UL policy is calculated by the assumed internal charges and interest crediting rate remaining the same. But as interest crediting rates decline the net amount at risk does not converge fast enough (cash value to death benefit) so the costs of the policy are increasing and eventually the premium and interest cannot absorb all of the costs so the cash value of the policy funds the additional

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amount due to cover the balance of the internal charges. When the cash value balance reaches $0 the policy lapses.

UL with a Death Benefit Guarantee has helped limit this problem. As discussed below, if you pay enough money into the policy and meet other provisions so defined in the contract you can guarantee that the death benefit will continue even when there is no longer any cash value. There are also policies that limit the guaranteed period to certain ages based on meeting certain provisions but do not guarantee the death benefit beyond a certain age or length of time.

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The Life Expectancy (LE) Factor

In building The Efficient Edge I was concerned about life expectancy data because it plays a critical role in properly managing life insurance. It also plays an important role in retirement planning. Part of the science of life insurance is being able to more accurately judge one's life expectancy. Normal life expectancy indicates an age where 50% of a population is alive and 50% are passed. Managing life insurance to normal life expectancy means that many life insurance policies will die before the insured. So I embarked on more research.

I came to realize in my research and in my discussions with different actuarial firms a couple of important factors:

1. Using standard IRS life expectancy tables has been a standard approach for many people. Unfortunately, these tables are often inadequate in their representation of realistic probabilities and are also often misunderstood by the individuals using the tabular data. IRS tables use broad-based mortality data to determine their life expectancy (LE) data. While this is statistically accurate, these tables also take into account the broader population in general, including infant mortality, prisoner LE, and broad socio-economic classes to determine a median LE.
2. Using mortality tables supplied by insurance companies have a couple of problems:
    a. They are used to price a risk and profit from that risk. This is much different than judging life expectancy. An insurance company may say someone is "uninsurable" but they certainly have a life expectancy albeit a short one.
    b. The second discovery was that due to regulatory pricing models and to insure that proper accounting reserves are calculated there is a mortality margin built into insurance company tables, therefore, shortening life expectancy data.

In an effort to enhance our understanding of our clients' LE or longevity, our insurance and annuity analytics company, The Efficient Edge, commissioned an actuarial firm to provide us with graduated probabilities of 50%, 75%, 85% and 95% for male and female individuals, smokers and non-smokers. We asked the actuarial firm to build our LE tables that drew from a population of individuals who were affluent and owned life insurance. We also asked them to strip out the mortality margin (risk pricing vs. LE) built into mortality tables. Our LE tables help us more accurately reflect the socio-economic realities of our client base vs. the population in general. Not surprisingly, the data suggests longer life expectancies than the general population – an important factor when modeling life insurance viability or retirement income sustainability.

Based on our LE tables, a female age 72 in good health has the following LE probabilities:

Female

- **50% (normal LE): 90.5**
- **75%: 95.2**
- **85%: 97.6**
- **95%: 101.7**

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