Variable Universal Life: Worth Buying Now? And Other Types of Life Insurance James H Hunt, F.S.A November 2007

I. Current Tax Laws Disfavor Variable Universal Life.

The writer has been pleased to hear from several of his Rate of Return Service (www.evaluatelifeinsurance.org) customers that his 2003 paper, Variable Universal Life Insurance: Is it Worth it?, has been useful. One intrepid medical doctor allowed that he had read all 22 pages! Others were kind enough gently to remark in passing that it was not easy reading. Is there a lesson here: If you are not willing to learn how these complex financial instruments work, should you buy one? (Whether you should hold one you've already bought is a different matter, the answers ranging from definitely to definitely not, with most clustering around the middle of that range.) It may be instructive to ask: Why are there so many life insurance companies in the U.S. compared to, say, auto manufacturers? The answer is that these hundreds of life insurance policies – whole life (WL), universal life (UL) and variable universal life (VUL) -- as they do when, for example, they buy gas for their cars. (Universal life is technically flexible premium whole life.) By contrast, the market for term life insurance is highly competitive, and relative price comparisons are quite easily made. Inefficient insurers selling cash value life insurance continue to sell their inefficient policies. This inefficiency is perhaps best illustrated by the contrast between Northwestern Mutual Life, which is crediting a remarkable 7.5% to its WL cash value policies in 2008 while dozens (hundreds?) of UL companies remain in the market crediting less than 5%.

This document is provided as a supplement to the 2003 paper; the reader who wishes to learn the ins and outs of variable life insurance needs to consult the earlier work. In the last year or so, we have noticed somewhat lower charges by some of the VUL life insurers; the reductions have been largely in the Mortality & Expense (M&E) asset charges, or profit charges. One reason could be that with more assets under management (mostly from continued premiums on older policies), these insurers have reached a scale that does not require the prior levels of M&E.

Prospective purchasers of VULs who are given pause by what follows are encouraged to hedge their bets by buying a term policy from TIAA – either one-year renewable or 10-year term – that may later be converted to a VUL without evidence of insurability should tax laws change and VULs become more attractive. We believe, based on our evaluations of hundreds of VULs, that TIAA's Intelligent Life VUL is the low cost leader. TIAA (tiaa-cref.org or 800-223-1200) is also unsurpassed in financial strength.

In our 2003 paper on variable universal life (VUL), we ended with ten guidelines, most of which remain sound in late-2007 followed by a conclusion that we now wish to alter. (There are forms of and descriptions of variable life insurance such as: variable appreciable life, variable adjustable life, variable complife, and variable whole life; the VUL remarks herein generally apply to them as well.) We said then that purchase of a VUL could be worth it "if one takes the time to understand how the policy works and is confident of his or her ability to hold the policy until death." Later in 2003, federal tax laws were changed to make "qualified dividends" and long-term capital gains taxed at a maximum rate of 15%. (For those whose marginal tax bracket - the rate at which one's last dollars of income is taxed – is 15% or 10%, the tax rate applied to these items is just 5%.) If you are subject to the Alternative Minimum Tax or phase-outs of deductions and exemptions by reason of high income, which themselves are being phased out, the effective tax rate can exceed 20%. The net effect of any state income tax must be factored into the mix. Virtually all corporate dividends and dividends from equity mutual funds, including international equity funds, are "qualified." Dividends from Real Estate Investment Trusts, or REITs, and bond and mortgage mutual funds are not qualified. The 2003 law was scheduled to terminate after 2006, but the 2006 Congress extended it through 2010. The advent of this law made VULs less attractive relative to direct investments in mutual funds. Studies we have performed suggest that for as long as these tax breaks remain in effect, it makes financial sense to buy VULs only in limited circumstances, as explained in the Appendix.

The rationale for buying a VUL is the hope that one's selection of common stock investment accounts within a VUL will provide better results over time than are likely to be obtained from whole life or universal life cash value

policies, whose investment portfolios are predominantly in corporate bonds and mortgages. To make this work, one must allocate a large percentage of one's account values to stock investment accounts. The illustrations of existing policies we see suggest that this is what virtually all buyers do. But our studies – those in the Appendix and others of the same kind -- show that under the 2003 law it is generally better to shop for low cost term life insurance and invest in equities externally, whether in mutual funds or directly. The costs in typical VULs are so high that paying taxes on qualified dividends and any capital gains is less costly. This is especially so if one chooses low cost Vanguard mutual funds. Any reader who is funding a VUL and not maximizing contributions to available, tax-reducing retirement accounts or Roth IRAs should rethink his priorities and demand a demonstration that a VUL is a better choice. We will examine any such demonstration without charge.

VUL life insurers point out (1) that within a VUL one may change allocations among accounts without current taxation, which is not possible in mutual funds that have gains, and (2) that one may manage a changing mix between bonds and stocks, or have the insurer manage such changes, without tax implications. These are important advantages, to be sure, but each may imply market timing, which is often thought to be a "no-no" by investment gurus; also, losses in a VUL account are not tax deductions, unlike losses in a mutual fund. And there are substantial costs to such management. Regarding the second point, one planning a substantial life insurance investment could have a high-yielding whole life policy and a VUL policy, if the latter made sense otherwise. In other words, if one feels that his investments should be allocated between equities and fixed income investments, should not the fixed income part be within a non-VUL life policy, where the income is not taxed annually as it would be in direct investments in corporate bonds and mortgages, and the equity part be directly invested in mutual funds or in one's brokerage account? It seems likely that if the favorable tax breaks noted above are altered, it will be the treatment of qualified dividends that is reduced or withdrawn. At virtually all times in the last fifty years, capital gains have received favorable tax treatment.

Given current investment alternatives, we think the costs built into VULs too often exceed the tax advantages. We urge readers to avoid them. One possible exception comes to mind. As noted above, REITs do not receive qualified dividend tax treatment, so a buyer, preferably one in a high tax bracket, wishing a high percentage of his VUL assets in REITs, could find the VUL costs worth incurring. The same might be said for high-yield corporate bonds (so-called "junk bonds"), although the writer's 20-years' experience with such a mutual fund – Vanguard's high quality junk! -- is that the excess yield (over investment grade bond yields) gets offset by defaults. As a result, the net asset value falls, and within a VUL the "taxable loss" has no value when the intention is to hold the VUL until death.

It should be remembered that while VULs have tax advantages, including the right to take tax-free withdrawals for college expenses or for retirement years, it is necessary for most buyers to hold the policies until death to avoid taxable gains on prior surrender, gains that are taxed at ordinary tax rates, not capital gains rates. The most frequent reason for buying a VUL that we observe is the right to take tax-free distributions in retirement, generally by withdrawals up to tax basis (often total premiums paid) and thereafter by loans (often no-net-cost loans – the loan rate is the same as the rate credited to the asset backing loan). This sales point is persuasive, but those who buy into it may be focussing on an advantage decades in the future that may or may not have worth then, and it surely has a low present value. Is it the "sizzle, not the steak?"

In summary, stay away from VULs until the tax laws referred to – not to speak of estate tax laws -- are clarified. (Although not the focus of this update, VULs are disproportionately expensive for low premium commitments, under \$200 a month, say.) If you must buy one, limit the costs by choosing a no-agents-commission VUL from TIAA (800-223-1200 or tiaa-cref.org). Ameritas (800-552-3553 or ameritasdirect.com) also sells an attractive VUL. Fans of Fidelity Investments mutual funds may wish to explore its VUL; we have not had requests to evaluate it.

TIAA's new Intelligent Life VUL has some attractive features, the combination of which is not found elsewhere to our knowledge: (1) the premium load (deduction) is keyed to the state premium tax rate, which should be around 2% -- an illustration from Texas was 1.75% -- a load that is very low compared to the typical 5% rate; (2) cost of insurance rates equal to TIAA's low cost, one-year renewable (YRT) monthly rates; (3) no monthly administrative charge; (4) the availability of TIAA-CREF own investment accounts that have very low investment management charges, including the Stock Index Fund at just 0.06% per year, the lowest we know of. That's the very good news; the less good news lies in TIAA's Mortality & Expense (M&E) charge of 0.95% per year for years 1-20, the highest we have seen. The M&E charge is essentially any VUL insurer's profit charge, which in the case of non-profit TIAA would cover certain expenses (including some from the investment accounts) and safety margins, that is,

contributions to surplus held on behalf of policyowners. But if the total invested VUL assets reach \$100,000, the M&E charge decreases to 0.65%, even on the amounts below \$100,000; at \$500,000, the M&E charge drops to 0.35%, again on all assets. The reader should be warned that many VUL insurers have manipulated their VUL designs to make their policies more competitive, usually after ten or more years and usually by M&E reductions, but the price is usually substantially higher initial charges and/or other charges.

We do not have TIAA software, and to date we have seen only a limited number of TIAA VUL illustrations based on the new design, so it is difficult to say if one should buy a TIAA VUL now. For someone with an initial \$100,000 to invest, or whose total invested assets would quickly reach \$100,000, the spreadsheet analyses in the Appendix suggest that a TIAA VUL would not work very well, due to the favorable tax laws that apply to owning common stocks that generate qualified dividends, unless one is sure that he or she will take tax-free distributions later and, preferably, that the qualified dividends tax break is removed. But a VUL will work only *if the policy is held until death*.

We have analyzed hundreds of existing VULs in recent years, and the terms of TIAA's new product suggest that many VUL policyholders would do well to transfer to TIAA, even in some cases where they face a surrender charge. But this is almost always a difficult decision, and it needs careful analysis.

II. Updates to the Original VUL Study.

A rereading of the earlier VUL document (which took its author quite a while!) showed that it holds up pretty well four years later. The corrections, additions and comments that follow may have limited utility for readers who have better things to do than become "experts" about variable life insurance.

I. Introduction

The second paragraph indicated that VUL sales (including its competitors with similar names) had tumbled in the wake of the stock market "crash" that began in late 2000. Sales in 2002 were off 35% from sales in 2000, but were predicted by a major actuarial consulting firm to recover by 2005. That has not happened. The source we are looking at now indicates that variable life's market share, measured by new premiums, peaked at nearly 40% in early 2001; toward the end of 2005, that share had fallen to 14%. Data into 2006 suggest a pickup in market share by premiums but a continued decline in number of variable policies sold. The S&P index bottomed out toward the end of 2003 at about 800; since that time, it has risen to more than 1400, an increase of more than 75% off the bottom. Conditions have been favorable for a robust recovery in VUL sales, but it hasn't happened. A lot of this business appears to have moved to sales of universal life with secondary guarantees, meaning guaranteed premium policies that carry to age 100, often to age 120, as long as premiums are paid faithfully. We'll comment on these later.

A recent study of lapse rates (annual policy termination rates) by the Society of Actuaries and LIMRA, a research arm of life insurers, showed that in the years 2001 and 2002, lapse rates of VULs were so high that if they continued at that pace less than 40% of contracts would be in force after ten years. That period was of course a time of stock market turmoil. The comparable figure for 1994-1996, a favorable period for VULs, showed that 60% of contracts would still be on the books after ten years. One guesses that current VUL lapse rates are somewhere in between. It's not hard to see how much can be gained in pricing VULs over the long term by high front-end charges in excess of costs in the early years that can be improved with interest earnings and spread out over the maybe 50% of owners who carry their contracts at least 20 years.

VULs are securities, sold only with prospectuses. While all charges are spelled out in the prospectus (except current cost of insurance charges, which are given in ranges rather than particularized to the reader's age and classification), it is not easy to read these thick documents. Some illustrations we see include a supplemental exhibit that breaks down the array of charges year by year. That supplement is worth seeking when thinking about buying a VUL, but it usually takes some learning to evaluate in the context of what is typical. Earlier, we referred to manipulation of VUL designs to favor long-term policyholders. We would have less trouble with this sort of manipulation if the prospectus had a prominent warning on its face that said something like: *This*

contract has high extra charges in the first ten years; do not buy it unless you are 100% sure of keeping the policy indefinitely.

III. How a Variable Universal Life Policy Works

The sixth bullet implies that surrender charges always apply except, as noted at top of page 4, in the case of low-load VULs. Some full-commission VUL contracts – Minnesota Life's, for example – have high premium loads -- in the first year, especially -- but no explicit surrender charge.

VI. Choice of Investment Accounts

Toward the bottom of page 1 in our original paper we noted that VULs typically have "ten to twenty choices" of investment accounts. The record so far in what we have seen is 84 at John Hancock. What is a life insurance buyer to do with so many choices? A recent article in the Wall Street Journal was entitled, "Limited Menu: Choose Only 3." It recommended a U.S. stock index fund, an international stock index fund, and a U.S. bond index fund. John Bogle, founder of the Vanguard Group, was quoted as saying, "There may be better investment strategies but the number of strategies that is worse is infinite." Within a VUL, stock index accounts have the lowest fees, but they may not be low. The American Express S&P 500 Index account in its VUL has an annual charge of 0.50%, while the similar Vanguard Index 500 mutual fund costs 0.18%, 0.09% if \$100,000 or more. The costs of account management take a large and poorly appreciated toll in VUL performance.

Manipulation of VUL policy designs has increased since we wrote in 2003. Perhaps the most prevalent form is to front load the policy during the first ten years with extra charges – so many dollars per thousand of face amount – in lieu of the M&E charge so that lower M&E charges may apply in later years. A Pacific Life design showed this picture for a 35-year old female with a level \$1.8 million death benefit and annual premiums of \$20,400. During the first ten years, in addition to \$998/year expense charges, a total of \$36,000 would have been collected in Mortality and Expense (M&E) Risk Charges plus cost of insurance charges about double what term life would have cost. What did the \$36,000 buy? The right to nominal M&E charges after ten years, starting at \$225 and rising thereafter. As the illustration was run at 10%, let's say that money is worth 6% after taxes. In the first ten years our client would have paid \$285,022 in accumulated premiums for death protection with an accumulated value of \$10,540 in life insurance protection and a surrender value (no surrender charge after ten years in this example) of \$235,849. She would have been more than \$38,000 behind. And that's at the modest rate of 6% in the context of her investments earning 10% before charges. The reality is that to earn 10% one has to invest in stocks, and with the 2003 tax breaks the effective tax rate would have been far lower than 40% -- 10% reduced to 6% in this example.

IX. What to do With an Unwanted VUL

On page 10 we indicated that we "always" compare existing VULs to Ameritas's VUL to see if a tax-free transfer would be in order. Given the new TIAA VUL, for which we do not have software, circumstances may make it plain that the comparison should be with that insurer.

Toward the middle of page 10 we discussed transferring one's tax loss in a VUL – typically the excess of premiums paid (ex riders not supplying more life insurance on the insured person) over the surrender value – to an annuity with the result that future annuity gains up to the loss transferred are income tax-free. Life insurance tax losses are not deductible on one's tax return. We failed to make the following important observation. When one transfers his surrender value during the surrender charge period, the amount invested in the annuity is net of the VUL surrender charge, but if the VUL is held the amount invested is the higher Account Value (or whatever name). A transfer in a rising market could be a mistake, and vice versa. Gains within the VUL are also tax-free up to tax basis, so it may be prudent to stay with the VUL. We try to assess these choices in our reports to Rate-of-Return clients, but it is not an easy judgment to make – Flip a coin is not an unheard-of comment by us.

Since the 2003 tax laws became effective, we have included this paragraph in our reports:

When federal tax laws changed to make qualified dividends and long-term capital gains taxed at a 15% maximum rate, VULs became less attractive. (If you are subject to the Alternative Minimum

Tax or phase-outs of deductions and exemptions by reason of high income, the effective tax rate can exceed 20%. These tax breaks have been extended through 2010. Any net state income tax must be factored in.) E.g., one can invest in a Vanguard 500 stock index fund at an annual asset charge of 0.18% 0.09% if \$100,000 or more). Qualified dividends can be as low as 1.75% at present, so the annual tax cost could be 0.26% or, say, 0.30% if there is a 5% state tax deductible on the federal tax. The total annual cost as a percentage of invested assets could be 0.50% per year or less. (There are lower cost Vanguard choices.)

Quite frequently, that paragraph includes this: "If this were my policy, I'd stop premiums and use them to set up a Vanguard index fund. If the 2003 tax breaks are withdrawn, the fund could be liquidated, any capital gains taxes paid, and the money put back in the policy if that then makes sense." The reason this can work is (a) that stock index fund dividends are low – often less than 2% -- and taxed at a low 15% maximum rate and (b) Vanguard's asset charges are very low compared to VUL asset charges. We have made such calculations.

An associated strategy for those who definitely want out of their policies but must keep them to recover the surrender charge is to take a partial withdrawal of a portion of the *surrender value*, leaving enough in the policy to carry it to the end of the surrender charge period. The policy death benefit will go down by the amount withdrawn, but if it is reinvested the total "death benefit" – policy + investment -- remains unchanged. A collateral advantage should be lower asset charges on the reinvested proceeds, much lower if a Vanguard fund is selected. Another way to view the strategy is that by a withdrawal one may collect the same dollar amount of surrender charge in future years at a lower investment – the remaining cash surrender value. One must be careful not to withdraw more than the tax basis; also, if later it becomes necessary to make premium payments to keep the policy from terminating, perhaps because of a drop in the market, such payments will be subject to a premium load, typically about 5%. If there is a gain in the contract, make sure there is no tax implication if the policy is surrendered shortly after the withdrawal.

A few VUL insurers – American Express (Riversource) is one – allow one to reduce the face amount during the surrender charge period without a pro rata surrender charge being assessed. This is rare and subject to rules. A \$1 million policy might permit a reduction to \$750,000 after 1 year and to \$500,000 after 5 years. Doing so can make the policy more efficient because it removes risk amounts to which cost of insurance rates apply that can often far exceed term life rates. Combining this strategy with premium cessation can make an unwanted VUL a mandatory "keeper."

An associated point in thinking about transferring a costly VUL to an annuity after the surrender charge becomes zero is that if you definitely intend to switch later and your health worsens, a new policy may have become prohibitively expensive. One hedge: buy a 10-year term policy from either Ameritas or TIAA that can be converted to a VUL without evidence of insurability within the 10 years – at issue ages over 55, check the convertibility period.

Due to its very low costs, Vanguard is our recommended source of variable annuities. It will no longer allow a transferor to supplement a below \$5,000 transfer with cash unless that cash is sitting in a Vanguard account. The workaround is to establish a Vanguard money market account before the transfer.

XI. How to Buy a VUL Efficiently

USAA no longer sells life insurance to those outside its military family and their relations. Call if uncertain. USAA's whole life policy performance has disappointed in recent years.

The second bullet mentions switching to Option A in policy year 8; we should have said policy year 8 or later, as soon as possible, because the switch is dependent on complex rules and may not be available in year 8.

On page 13 in discussing MECs we said, "There is a higher premium limit for MECs that defines what qualifies [for the favorable withdrawal advantages of life insurance]." We should have said something like: For a given face amount, premiums can be higher for a MEC than for a non-MEC. That is, if you don't care about withdrawing money later, you can salt away more money in a MEC. It should be understood that money may

be withdrawn from a MEC without taxation if there is no taxable gain in the contract. This can happen, particularly at higher issues ages or for smokers or those rated up for health impairments, because expense charges, including cost of insurance risk charges, may amount to more than net (after asset charges) investment earnings credited to the policy.

XII. CFA's Rate of Return Program

It may be self-evident, but we should have labeled the table, Average Annual Rates of Return.

On page 15, we observed that MET Life's VUL had lower-than-average charges. Based on the most recent one we've seen, we'd now have to figure out whether we would say average (i.e., relatively high) or higher-thanaverage. In transitioning from a mutual life insurer that serves its policyowners to a shareholder-owned insurer serving its shareholders, one is not surprised to see higher costs.

XIII. Case Studies

Item 16. The "\$28,000 invested in stocks . . . " should have been \$21,000.

XIV. Conclusion and Recommendations

Bullet 4 stating that "when held for life . . . a VUL can be a successful investment" is now "iffier" advice.

Bullet 6 unfortunately omitted "stock index" between "especially" and "funds."

Bullet 7 saying "a VUL that is more than one year old is usually worth keeping" may err in the word "usually." Perhaps we should have used "often."

Bullet 8 should read, "A VUL held until death should be better than term life insurance plus a variable annuity."

III. Equity-indexed Universal Life Policies

EIULs are relatively new vehicles; they are often sold by life insurers we prefer to avoid. The "universal life" aspect works like a VUL, with premium flexibility and an annual accounting of monthly activity. Internal investment earnings, however, are linked to (usually) the S&P 500 stock index with a guarantee that the account value (before surrender charge) will earn at least a minimum guaranteed minimum rate, which has been either 1% or 2% in what we have seen. The reader can sense the powerful sales pitch: the benefits of stock market gains but not losses – you can eat your cake and have it as well. There are hedging costs for this protection that are not identified in the half dozen or so illustrations that have been sent to us for review. EIULs aren't quite as complex as Equity-indexed Annuities, referred to below, at least the EIULs we have seen, but we may not fully understand them. They also escape securities regulation, leaving you at the mercy of state insurance regulators, who are permitted by the life insurance industry only to issue regulations that the business agrees with and generally writes.

With a normal UL contract, interest at the current contract rate, perhaps typically 4.75% in late 2007, is credited monthly on the policy values (before surrender charge). An EIUL allows one to select a percentage that will receive the current (fixed) rate and its complement (100% is often illustrated) that will be indexed, subject to the minimum guaranteed rate. A sort of bonus is added once every 12 to 60 months, depending on complex choices, if the index has increased more than the guaranteed rate. But that increment is often capped at some fairly high level; thus if the index moves up 20%, the increment will be capped at, say, 12%, less the guarantee. The cap is usually set each year by the insurer, at its discretion as far as we can tell, leaving one to infer that if the insurer has not achieved its targeted profit, it can lower the cap. One would not wish to leave anything this critical to the discretion of EIUL sellers.

EIUL sales illustrations look just like UL illustrations, but most do not explain adequately exactly how the indexing works, including examples. The illustrations use optimistic past performance histories of the S&P 500 to illustrate future values, and the exclusion of corporate dividends from the S&P 500 index is only mentioned in passing.

- Use of historical S&P 500 growth is of course appropriate, but to use the last 20 to 30 years, the greatest bull market in U.S. history, is inappropriate without qualification. How about using an average of, say, 20-year histories measured every ten years from commencement of the S&P 500? Or, more informative and conservative, growth rates of the S&P 500 measured from starting points when price/earnings ratios were as high as they are now, which is above historical averages.
- It is not the exclusion of dividends (that in recent years are rising as a percentage of corporate earnings) that is inappropriate but rather the failure to discuss the implications. The public may have heard that returns from stock investments have averaged 10%, say, over history, but these anecdotal comments normally include reinvestment of dividends. If you buy a stock index mutual fund, you get the benefit of reinvested dividends, but that is not the case with an EIUL. In one typical illustration, the only reference to the dividend exclusion is found in the 7th paragraph of small text on page 9: "The term 'S&P 500 Index' refers to Standard & Poor's 500 Composite Stock Price Index (which excludes dividends)."

The following table may illustrate the points made above.

Standard & Poors 500 Stock Ind	lex Annual Rates of Return
Period of Years	Rates of Return
1950 to 2005	7.76 %
1955 to 2005	6.85
1960 to 2005	7.05
1965 to 2005	6.72
1970 to 2005	7.64
1975 to 2005	9.15
1980 to 2005	9.28
1985 to 2005	9.28
1990 to 2005	9.05
1995 to 2005	7.32
2000 to 2005	-1.12

Dividends during the 55 years shown as a percentage of the S&P 500 index averaged 3% or so through the early '70s, close to 5% through 1974, then drifted down from about 3.7% in the mid-80s to a low of 1.14% in 1999, when the market was sky-high. The ratio has risen from 1.60% in 2004 to about 1.75% in mid-November, 2007, despite a nearly 23% rise in the index during that 3-year period.

Sales illustration regulations governing whole life and universal life haven't caught up with EIULs. Recently we evaluated an EIUL illustration from Indianapolis Life (owned by Aviva, a large British life insurer) for a 61-year old. It showed five annual premiums of \$40,000 followed by annual withdrawals of \$33,781 beginning in year 11 and continuing potentially until age 115, at which time the cash value had grown to \$2.94 million. The illustration assumed S&P growth of 8% with a bonus of 0.5% after year 10. If the reader thinks such growth is impossible, he will join the writer in his initial impression. After close scrutiny, it turns out that the withdrawals are loans from the start despite the usual VUL illustration practice of taking tax-free partial withdrawals up to the tax basis (total premiums paid typically), then starting loans. The loan rate is given on page 5 of 17 as "5.5% in advance," which is equivalent to 5.82% in arrears; it is a variable rate (VLR), one that tracks a long term corporate bond index. It is abnormally low at the moment, having been forced down by the very low interest rates following the 2001-2002 stock market "crash." The illustration assumes that one can borrow indefinitely at 5.82% while earning 8.5% in definitely, thus creating a leverage effect that increases exponentially the more that's borrowed. There is nothing in 11 pages of text that alerts the recipient to what is going on; it has to be ferreted out by studying the numbers. Trial attorneys, start your engines.

As with fully-commissioned cash value policies – WL, VUL and UL -- front-end charges in EIULs range from high to sky-high. A 38-year old male nonsmoker in best health buying a EIUL with an 8.4% assumed earnings rate, paying premiums of \$377.50 per month, would have been more than \$14,000 "in the hole" after 4 years: premiums

accumulated at 6.3% (8.4% reduced by a 25% tax rate) less the 4th surrender value less the value of the death protection accumulated at 6.3%. A \$3.3 million face amount illustration in a different life insurer with premiums of \$133,000 for three years would have found the owner \$100,000 out-of-pocket after 3 years. In either case, surrender charge reductions in subsequent years would have limited the damage; typically, however, such reductions are partially or wholly offset by cost of insurance charges that are often much higher than market term rates.

We recommend consumers stay away from EIULs. Low-cost term life insurance plus low-cost mutual funds should work out better, especially if tax laws continue to favor direct investments in stock mutual funds. Another concern is that UL life insurers in general in the early days of universal life in the 1980s illustrated high UL current interest rates longer than was justified by the market in order to gain business; since they had few UL assets under management, higher credited rates cost less than their view of the profitability of new business. Current interest rates actually credited in subsequent years dropped faster than market rates as time passed. Today many UL insurers are crediting less than 5% while the whole life insurers that pay dividends are at 5.5% to 6.5% generally, with the best life insurer, Northwestern Mutual Life, at 7.5% for 2007 and 2008. Also, dividend-paying whole life insurers, at least the mutual companies, pass through improvements in mortality, which have been steady, in higher dividends. UL companies, in the experience of the writer, have not done this. The performance history of EIULs remains to be written.

IV. Secondary Guaranteed Universal Life (SGUL)

It is likely that a portion of the shrinking market for VULs has been caused by the popularity of these relativity new policies. An SGUL, also known as no-lapse UL, is a garden variety UL with an implicit or explicit rider that guarantees the death benefit to a high age if a certain level of quite low premiums is paid. Years ago, that age tended to be an inadequate 95, but in recent years the guarantee has become complete, "ironclad" we like to call it, if age 120 is complete. We digress a moment:

In 1965, Jeanne Calment, age 90 with no living heirs, sold her Paris condominium to a French lawyer, age 47, reserving the right to the apartment as long as she lived. The lawyer made monthly payments to her in a kind of reverse mortgage. More than thirty years later, about one year after the lawyer had died at age 77, Jeanne Calment died at age 122. The value of the apartment was worth about ten years of payments at the time of the transaction; the lawyer's widow had to continue payments after his death. Jeanne Calment is the only undisputed person to have lived at least 120 years.

The new actuarial tables underlying all life insurance stop at 120. Should you make sure the current guarantees don't? More to the point, be cautious about banking on any guarantees that stop at age 100.

SGULs could be called Term Life to Death, but unlike term life insurance there are cash surrender values. The major selling point is of course the guarantee, which is a lot easier to understand than the "black box" of other cash value policies. And, the sales pitch fits well with those doing estate planning who believe they will never need to cash in the policies or borrow from them. Often, SGULs cover husband and wife, the death benefit payable on the last death.

Premium patterns are more or less infinite. Level premiums to age 100 may be most common, but it is possible to pay one premium that will guarantee coverage until death, or most any combination of premiums in between. We understand that one life insurer may have the lowest rates for Pattern A, say, but another would be lowest for pattern B, the later perhaps involving a large sum transferred from another life insurer. You can imagine the field day that life agents are having persuading owners of policies they don't understand very well, which is everything but term life, to move to guaranteed policies. This is a bit like a shell game, however: there are three components in a cash value life policy – death benefits, cash values and premiums. The shell game analogy occurs when guaranteed death benefits and premiums are proposed with the cash value "disappearing." It is very difficult for policyowners to know if the cash value policies they hold are good, bad or indifferent.

SGULs are designed with extremely large front-end charges, a significant portion of which is not paid out in commissions and other startup expenses. That excess is invested at much higher rates than the SGUL is credited with -3.95% on a recent one – and the "shadow account" created is used to subsidize the long-term guarantee of

lower-than-normal UL premiums. While no buyer intends to cancel his SGUL, some of course do – things change. That the shadow account needs to be paid to fewer policyowners than originally started is a substantial source of subsidy. If just 2% drop out each year, for example, after 20 years only 2/3rds remain, fewer if deaths are removed. Here is a paragraph we wrote to a client recently; he and his wife were in their mid-sixties:

The AXA proposal would involve a premium, mainly from transfers from Northwestern Mutual, Guardian and Mass Mutual . . . of \$982,551 in the first year; at the year end, the cash surrender value would be \$676,825. Not counting loss of interest, you'd be out of pocket \$305,726. This is not an investment I'd make; indeed it's not an investment, it's a gamble that the last of you would die in time to make a decent return of your nearly million dollar investment. And you must be 100% sure you'd never drop the policy.

The existing policies were in high quality, mutual life insurers; they had been in force long enough to be beyond the typical ten-year commission period. Given the couple's excellent health, it was likely that holding the existing policies would have a higher death benefit at the last death for the same premium payments. And holding their policies posed no risk of financial loss if later they wished to change course.

The nature of the SGUL market is such that life insurers must compete on the guaranteed price, which is a relatively new phenomenon except for the highly competitive term life market. Buyers then should scour the market for the best price. But what if the best price is in an unfamiliar life insurer? How financially sound is that life insurer? Second-to-die contracts can stretch over 30 or 40 years. SGUL insurers not only take on a risk that forecast rates of policy terminations (lapses) won't occur in sufficient numbers but also an interest-rate risk. Consider what we call the "Japan Scenario," persistently low (even negative) interest rates over a long period of time. Major Japanese life companies failed as a result; they couldn't meet 4% guarantees of the 1980s and earlier. It's hard to imagine that happening here, but there have been several failures of major companies in the U.S. due to investment problems, although those did not involve low interest rates.

Buyers of SGULs must be 100% sure they will be able to continue the policy until death or they will take a financial bath. It is for this reason that in our analyses of SGULs we strenuously urge people to stay away from them. If you insist on buying one, however, it would be wise to consult our longtime colleague, Glenn Daily, a fee- only life insurance advisor in New York City – see www.glenndaily.com.

V. Equity-indexed Annuities and Life Settlements

Equity-indexed annuities (EIAs) represent a huge business. They preceded EIULs discussed above, and the many variations on the basic theme – one participates in the upside of the equity markets but is protected from the downside effects – make them highly complex. Our advice echoes that of prominent financial columnists who have ridiculed EIAs for their high costs and complexity. EIAs have also caught the attention of securities regulators who believe these complex financial contracts should be sold as securities with the full disclosure found in VUL prospectuses. Here are some comments by the head of the self-regulatory body, National Association of Securities Dealers (NASD), in November 2005 at the NASD Annual Meeting:

There are . . . equity-indexed annuities which are subject to utterly ambiguous regulation because it isn't entirely clear to anyone whether they're insurance products or securities. Yet all these products look pretty much the same to investors.

EIAs are particularly complex. They are often marketed as risk-free, which they most certainly are not. And they are marketed disproportionately to elderly people, often without suitability analyses having been made. And sales commissions are as high as 10%.

We've proposed a set of rules to put a stop to this sort of irresponsible behavior in the sales of variable annuities . . . But we can't touch all equity-indexed annuities . . . because they aren't registered as securities and are often sold by non-broker-dealers.

Life Settlements occur when someone whose health has worsened sells his (usually) very large policy to a third party for a payment larger than could be obtained by cashing in the policy. There are potential tax traps involved

in doing so and huge fees. It is invariably far better to hold the policy until death if the owner has any regard for the beneficiary. Withdrawal and loan values can be used to access money in the policy; due to the growth of the life settlement business, life insurers are now looking at ways to expand loan values beyond what the cash surrender value provides for those whose health has changed for the worse.

Glenn Daily, referred to just above, has started a new service evaluating both EIAs and Life Settlements. See www.whatsmypolicyworth.com.

VI. A Request for Whole Life Help

Over the last two or three years we have heard from several of Rate-of-Return clients to whom Guardian Life agents had proposed whole life policies. Guardian is one of the better life insurers, but the feature that was common to each proposed buyer was a recommendation that 401-k (or 403-b or 457-b) contributions be suspended and the freed-up premiums be used to fund whole life policies. Evidently the idea is that while 401-k contributions reduce current taxes, a life insurance policy if kept until death can be used in retirement as a source of tax-free distributions in contrast to 401-ks, from which taxable distributions – minimum required distributions -- must be taken after age 70.5.

We don't think this scheme works mathematically, but so far we have struck out in our requests to those whose Guardian illustrations we've reviewed to provide us with demonstrations that our supposition is wrong. The Guardian agents, from what we can gather, keep such demonstrations, if they exist, to themselves. Accordingly, any reader who has been involved in such a sales pitch will do us a great favor by supplying any relevant sales material that purports to show the scheme works. We will comment on it without charge.

VII. Comparing Variable Universal Life to Term Life Insurance and Low-cost Mutual Funds.

The eternal question in life insurance is: Which is better, term or whole life? Or in this case, a VUL. One answer to the question, by the way, is: If you don't know what you're doing, stick to term. A more helpful comment might be to point out all the tax-favored investment choices that may be combined with term life insurance: 401-Ks and the like and tax-deductible IRAs that reduce taxes now, Roth IRAs that when held five years (or until age 59.5 if longer) produce the same tax-free distributions that are a major selling point of cash value life insurance, 529 plans for college savings, and perhaps others. For those who have maximized contributions to such accounts, a carefully bought cash value policy can make be a good investment when held for the long term – until death for most buyers in order to avoid taxable gains at ordinary tax rates on prior surrender.

The Rate-of-Return offered by the writer under the aegis of the Consumer Federation of America (CFA) is a "buyterm-and-invest-the-difference" comparison. See www.evaluatelifeinsurance.org for details. But the span of years studied is usually limited to twenty. That is a long time, forty percent of one's working lifetime. Life insurance actuaries work in present values, and the present value of what happens beyond twenty years isn't much, especially when one factors in the high percentage of cash value buyers who drop their policies. Nonetheless, it is more satisfying to see longer comparisons, and the examples included in the analyses that follow are over a sufficiently longer span of years.

> James H Hunt, F.S.A. November 2007

Appendix

The exhibits that follow represent an attempt to demonstrate the main point on page 1: "... that for as long as the tax breaks remain in effect, it makes financial sense to buy VULs only in limited circumstances." We say "an attempt" because there are a more or less unlimited number of scenarios that one could posit for such studies, and the exhibits are severely limited in number. Accordingly, the reader will treat the results not as gospel but as our method of urging caution in the purchase of VULs.

The exhibits suggest three main principles for investing in a VUL:

- It is largely the right to take tax-free distributions later on in the life of the policy, not so much the tax-free build-up of cash values within a VUL, that can make a VUL a sound investment.
- The shorter the period of time between the funding of the VUL and the distributions, the greater the advantage.
- If the qualified dividends tax law is removed, the higher the marginal tax bracket, the more attractive is a VUL.

Accordingly, if one is uncertain about needing to take distributions, one should be uncertain about buying a VUL

We observe a large fraction of VUL sales that use illustrations showing distributions in retirement. The writer retired nearly ten years ago, and if he had a VUL he would not want to take distributions from it, even if at no net cost. The reason is that his pension income is supplemented by Social Security, including his wife's, by investment income, by minimum required distributions from 401-ks and traditional IRAs, and by modest earnings from the Rate-of-Return service. To add distributions from his whole life policies would create a need to reinvest the money; also, the cash values are being held as a partial hedge against nursing home expenses. The reader may find himself or herself in a similar position later on. Young adults may find that great retirement dreams to spend lots of money enjoying retirement may change when they become old adults. On the other hand, the right to take such distributions is worth something even if they are not taken.

There is also a potential cost to distributions, even if taken as partial withdrawals and no-net-cost loans. (No life insurer we've seen guarantees wash loans, perhaps for fear of drawing IRS attention. TIAA's VUL guarantees a net cost loan of 0.65% and illustrates a non-guaranteed net cost loan after ten years of 0.2%. Those life insurers that illustrate wash loans will recover loan expenses in other ways.) The cost of a loan also includes the forgone earnings on the investment account(s) liquidated to secure the loan. One can borrow only against the fixed account. If, for example, you have \$200,000 in a stock index account (100%) and borrow \$100,000, you have just "sold" \$100,000 of your "mutual fund." If stocks go down, you gain; of they go up you lose, i.e., have an effective loan cost higher than the loan's interest rate.

As noted several times, a VUL (or most any cash value policy) must be held until death to gain the vaunted tax advantages. We don't see older persons – say, those approaching retirement age -- buying VULs; if they did, and depending on health classification, a VUL might not generate taxable gains on later surrender. Mediocre investment results combined with high costs of insurance, perhaps for a smoker or someone with a medical impairment, might mean later surrender values will never reach the tax basis, usually total premiums paid.

The exhibits that follow compare a TIAA VUL investment to the alternative of buying term life insurance from TIAA and investing the savings in a low-cost mutual fund from Vanguard. (We might have used TIAA's mutual funds with the same effect, but the writer plugs Vanguard whenever he can; it is the low cost mutual fund leader.) We believe, but can't easily demonstrate, that TIAA's VUL is superior to all others that are available in U.S, markets to ordinary buyers. We use TIAA's annual renewable term (ART) life policy as a means of valuing the risk amounts in the VUL; its rates are also very low in cost, especially when discounted future values are compared to others over 20 years or more. (We do not use guaranteed, level premium term policies – twenty-year term, for example – because they, unlike VULs, are not renewable after the term period except at astronomical cost.) In short, we compare the lowest cost investment account in each alternative. The conditions imposed should produce reasonably consistent "apples-to-apples" comparisons.

We recognize the limitations of these hypothetical comparisons. Here are some obvious ones:

- One may change allocations to investment accounts within a VUL without transaction costs or capital gains taxes, which is not possible in a mutual fund that has gains. To us, this VUL advantage is more theoretical than real because it implies market timing; the reader may disagree.
- The assumption that 100% of the VUL investment will be allocated to a common stock account indefinitely will not find favor with those who value the right to allocate a portion of their VUL assets to non-equities. Our response that one may instead buy two policies a whole life and a VUL may not satisfy the reader.
- One may easily borrow from a VUL (providing there is a cash *surrender* value, which is not a given in early policy years due to high surrender charges typical in agent-sold, commissioned VULs) while using mutual fund shares (unless in a brokerage firm's margin account) as collateral for a bank loan may be more troublesome. The writer has a checkbook from his broker that makes borrowing from his margin account that holds some mutual funds much more convenient and faster than a life insurance loan.

Turning now to the exhibits that follow:

- Exhibit A shows a one-time premium payment into a TIAA VUL for a woman age 52 in best health. Please note the important advantage of a no-commission contract: the end-of-first year surrender value exceeds the premium by a significant margin; unlike agent-sold policies with typically large surrender charges, the buyer keeps her options open to change her mind about her investment at little cost. The comparison assumes that both qualified dividends and long-term capital gains will be taxed at the federal maximum rates of 15% indefinitely; an extra 5% is tacked on for any state taxes on these items. The columns are not easy to follow, but what they show Col. (22) compared to Col. (4) -- is that under these assumptions the advantage to buying term and investing separately is permanent, with the edge expanding at the end of the 30 years studied, which is age 81. It is obvious that if there were no state taxes on income of this kind, the advantages would be greater. Finally, comparing Col. (25) to (26) demonstrates the need never to surrender the VUL. The 40% marginal tax bracket noted at bottom of Exhibit A applies only to the Col. (25) calculation; a 25% tax rate would give \$229,382 for the last year shown.
- Exhibit B is the same as Exhibit A except that it assumes the qualified dividends tax break is removed permanently while the capital gains tax remains at 20% (whether just federal or a combination of the two). It may be noted that the federal long term capital gains tax was 20% prior to the 2003 tax reductions. Under these assumptions, the TIAA VUL becomes the better choice but only after 30 years (age 80) and providing it is held until death. If the marginal capital gains tax is increased to 25% (20% federal and net 5% state), the number of years it takes the VUL to catch up is shortened to 28 years (age 78).
- Exhibit C is a heavily funded illustration for a 37-year old female in best health. The comparison assumes (a) that there are no state taxes on investment income and capital gains and (b) that the 15% maximum tax rate on both qualified dividends and long term capital gains lasts indefinitely. The 9-year hiatus between last premium and first distribution should maximize the advantages for a VUL over the alternative of term + mutual fund. Still, we find that it takes 37 years, to age 74, for that to happen. The illustration is one that shouldn't be used as is; given the \$30,000 annual distributions without end, the policy terminates under the 8% gross earnings assumption at age 90 with a taxable gain of just under \$2 million, which of course would be taxed in the maximum tax bracket of 35% (or whatever then), generating an increased tax bill approaching \$700,000. Col. (25) is calculated with a 31% tax rate, and the differences with Col. (26) illustrate again the absolute necessity to keep the policy until death.
- **Exhibit D** is the same as Exhibit C except it is assumed taxes on qualified dividends and long term capital gains increase to 20%. This rather modest increase shortens the time needed for the VUL to catch up to the alternative scheme quite dramatically from 37 years in Exhibit C to 23 years in Exhibit D.

It is obvious that if the tax laws revert back to those prevailing before the 2003 reductions, VULs will once again become attractive to higher tax bracket investors who are certain they will keep their policies for their lifetimes.

A comparison of a variable universal life (VUL) policy with a mutual fund invested 100% in stocks (SMF), adjusted for differences in death benefits.

		Vai	riable Lif	e Policy		Buy Term and Invest the Premium Savings in a Mutual Fund																			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
		BOY	EOY			BOY	BOY		BOY	BOY	BOY	Average			BOY		EOY	EOY	EOY				EOY	Net	Net
		Prems/	Policy	EOY		Tax on	Tax on	Term	Term	Amt of	Invest.	Total	BOY	BOY	Basis on		Div'd	Share	Div'd		EOY	EOY	Avg	After-tax	After-tax
	BOY	(With-	Surr.	Death	BOY	Div'd	Sale	Rate/	Ins.	Term	(6) - (7)	Death	Funds	Shares	Shares	BOY	Income	Price	Shares	EOY	Value	Basis	Share	Surr Val	Surr Val
Yr	Age	drawal)	Value	Benefit	Cash	20%	20%	1000	Cost	Insur	- (10)	Benefit	Sold	Sold	Sold	SMF	1.75%	5.84%	Bought	# Shares	SMF	SMF	Cost	Life Ins	SMF
																		[10.00]							
1	52	44962	46055	250000	44962	0	0	1.21	247	204111	44715	249994	0	0	0	44715	783	10.62	73.68	4,545.19	48270	45498	10.01		
2	53	-38	48824	250000	-38	157	0	1.25	251	200921	-446	249993	446	41.964	420.058	47824	837	11.24	74.46	4,577.68	51454	45889	10.02		
3	54	-37	51784	250000	-37	167	5	1.30	257	197674	-466	249993	466	41.501	416.026	50988	892	11.90	75.00	4,611.18	54858	46315	10.04		
4	55	-37	54950	250000	-37	178	10	1.34	260	194202	-486	249993	486	40.833	410.128	54372	952	12.59	75.57	4,645.92	58499	46780	10.07		
5	56	-36	58336	250000	-36	190	15	1.46	278	190500	-520	249993	520	41.263	415.484	57979	1015	13.33	76.14	4,680.79	62380	47275	10.10		
6	57	-36	61956	250000	-36	203	21	1.58	295	186553	-554	249992	554	41.608	420.233	61825	1082	14.11	76.71	4,715.89	66518	47803	10.14		
7	58	-35	65827	250000	-35	216	27	1.72	314	182345	-592	249992	592	41.962	425.349	65926	1154	14.93	77.28	4,751.21	70930	48365	10.18		
8	59	-34	69967	250000	-34	231	33	1.86	331	177855	-629	249991	629	42.124	428.797	70301	1230	15.80	77.86	4,786.94	75637	48966	10.23		
9	60	-33	74396	250000	-33	246	40	2.02	350	173066	-669	249991	669	42.318	432.880	74968	1312	16.72	78.45	4,823.07	80658	49609	10.29	05004	
10	61	-32	79128	250000	-32	262	47	2.22	373	167959	-/14	249990	/14	42.720	439.406	79944	1399	17.70	79.04	4,859.40	86011	50294	10.35	65334	78533
11	62	-73	83956	250000	-73	280	55	2.44	397	162558	-804	249990	804	45.449	470.389	85207	1491	18.73	79.60	4,893.54	91674	50981	10.42		
12	63	-90	89073	250000	-90	298	6/	2.68	420	156820	-875	249989	8/5	46.724	486.768	90799	1589	19.83	80.14	4,926.96	97690	51694	10.49		
13	64 65	0	94496	250000	0	318	78	2.94	443	150608	-838	249988	838	42.279	443.594	96852	1695	20.99	80.77	4,965.44	104203	52551	10.58		
14	65	0	100349	250000	0	339	79	3.23	465	143970	-883	249988	883	42.074	445.280	103320	1808	22.21	81.40	5,004.77	111162	53476	10.69	04044	405007
10	67	0	100070	250000	0	302	00	3.54	460	130001	-934	249907	934	42.038	449.175	110220	1929	23.53	01.99	5,044.72	110094	54471 55547	10.60	81914	105367
10	60	0	101046	250000	0	300	97	3.00	501	129204	-964	249907	964	41.623	451.566	105746	2060	24.92	02.00	5,065.55	120700	55547	10.92		
17	60	0	121240	250000	0	412	100	4.20	515	120900	-1034	249907	1034	41.462	453.090	120/10	2200	20.40	03.33	5,127.40	130371	57092	11.00		
10	70	0	129171	250000	0	440	10	4.00	525	102750	11001	249900	11001	40.905	452.972	134290	2550	21.91	04.03	5,170.47	144003	57902	11.21		
20	70	0	13/039	250000	0	470 502	120	5.15	521	02655	1170	249900	1123	40.140	400.222	140401	2011	29.03	04.70	5,215.00	104000	09070 60001	11.30	105700	112570
20	72	0	140070	250000	0	537	1/1/	6.52	533	92000	-171/	249900	121/	38,600	430.403	163880	2003	33.24	86.27	5 308 50	176475	62535	11.57	105799	143376
21	73	0	167610	250000	0	574	153	7 35	516	70179	-12/4	249900	1214	37 383	440 375	175233	2000	35 21	87.08	5 358 20	188601	64359	12.01		
22	74	0	170253	250000	0	613	160	8.28	477	57654	-1251	240088	1251	35 530	426 749	187430	3280	37 30	87.00	5 410 69	201835	66388	12.01		
24	75	0	191789	250000	0	656	165	9.20	412	44150	-1233	240000	1233	33.061	405 654	200601	3511	39.52	88 84	5 466 47	216008	68665	12.27		
25	76	0	205308	250000	0	702	166	10.60	313	29556	-1181	240000	1181	29 886	375 396	214827	3759	41.86	89.81	5 526 40	231325	71244	12.00	140977	198396
26	77	0	219926	250000	0	752	161	12.00	165	13737	-1078	249996	1078	25 750	331 952	230248	4029	44 34	90.87	5 617 27	249072	74092	13.19	140011	100000
27	78	0	235782	265585	0	806	149	13 60	152	11141	-1107	265581	1107	24 956	329 171	247966	4339	46.97	92.39	5 683 91	266972	77354	13.61		
28	79	0	252938	268835	0	868	155	15.50	-64	-4122	-959	268837	959	20.427	278.002	266013	4655	49.76	93.56	5,752.52	286217	80902	14.06		
29	80	0	271324	284890	0	931	136	17.60	-138	-7843	-929	284894	929	18.678	262.677	285288	4993	52.71	94.73	5.826.81	307106	84935	14.58		
30	81	0	291015	305566	Ő	999	133	20.40	-175	-8572	-957	305571	957	18.157	264.667	306149	5358	55.83	95.96	5.904.10	329632	89364	15.14	192401	281578
	υ.	0	_2.0.0		Ŭ		. 50			00.L	001	200071	001		_001		0000	00.00	00.00	2,0010		50001			_0.070

Cols (3)-(5) are taken from a TIAA-CREF Life VUL illustration based on a hypothetical gross 8% investment return (before asset charges); the illustration included a disability rider whose charges are rem as negative premiums in Col. (1). The question explored in Cols. (6)-(24) is whether an alternative plan of investing in a stock mutual fund (SMF) would be better than buying the policy. To make the alternatives comparable, it is assumed each year that funds are withdrawn from the investment account, Col. (12) and/or Col. (22), and used to buy term life insurance sufficient to supply the difference between the death benefit of the life policy and value of the SMF, whose death benefit (fund value) would also be free of income tax at death. Each year funds are also deducted to pay taxes on dividend income and on long-term capital gains (average cost method) realized on necessary share liquidations at a 20% tax rate (15% federal + 7.7% state, deductible in 35% maximum federal tax bracket, net 5%). TIAA-CREF's illustration includes a 0.29% annual asset charges of 0.18% (.09% at \$100,000 and up). To equalize asset charges, 0.29% - 0.06%, or 0.23%, is deducted in Col. (19). The current dividend rate on Vanguard's Index 500 is 1.73%, so 1.75% is used in Col. (18). It is assumed that the capital gains tax on any shares sold is paid one year after sale. The annual renewable term life insurance term co Col. (9) are TIAA's at the \$250,000 level in its preferred plus nonsmoker class, the same class illustrated in Cols. (3) to (5). Col (25) uses a marginal tax rate of 40% for calculating the tax on surrender of the VUL -- 35% federal plus 7.7% state deductible on federal tax. At age 7 SMF in Col. (22) has a higher value than the TIAA death benefit, eliminating the need for life insurance; that is why Col. (10) turns negative. Cols. (25) and (26) show the effect of the VUL contingent tax liability; if the life policy is not held until death, the tax at 36% on the gain at surrender, as opposed to cashing in the mutual fund at

A comparison of a variable universal life (VUL) policy with a mutual fund invested 100% in stocks (SMF), adjusted for differences in death benefits.

		Va	riable Lif	e Policy		Buy Term and Invest the Premium Savings in a Mutual Fund																			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
		BOY	EOY			BOY	BOY		BOY	BOY	BOY	Average			BOY		EOY	EOY	EOY				EOY	Net	Net
		Prems/	Policy	EOY		Tax on	Tax on	Term	Term	Amt of	Invest.	Total	BOY	BOY	Basis on		Div'd	Share	Div'd		EOY	EOY	Avg	After-tax	After-tax
	BOY	(With-	Surr.	Death	BOY	Div'd	Sale	Rate/	Ins.	Term	(6) - (7)	Death	Funds	Shares	Shares	BOY	Income	Price	Shares	EOY	Value	Basis	Share	Surr Val	Surr Val
Yr	Age	drawal)	Value	Benefit	Cash	40%	20%	1000	Cost	Insur	- (10)	Benefit	Sold	Sold	Sold	SMF	1.75%	5.84%	Bought	# Shares	SMF	SMF	Cost	Life Ins	SMF
																		[10.00]							
1	52	44962	46055	250000	44962	0	0	1.21	247	204111	44715	249994	0	0	0	44715	783	10.62	73.68	4,545.19	48270	45498	10.01		
2	53	-38	48824	250000	-38	313	0	1.25	251	201081	-602	249993	602	56.719	567.761	47668	834	11.24	74.21	4,562.68	51285	45729	10.02		
3	54	-37	51784	250000	-37	334	7	1.30	257	198020	-635	249993	635	56.495	566.222	50650	886	11.90	74.51	4,580.69	54495	45981	10.04		
4	55	-37	54950	250000	-37	355	14	1.34	261	194759	-666	249993	666	56.007	562.191	53829	942	12.59	74.81	4,599.50	57914	46256	10.06		
5	56	-36	58336	250000	-36	377	21	1.46	279	191298	-713	249993	713	56.619	569.410	57201	1001	13.33	75.11	4,617.99	61543	46545	10.08	52927	58114
6	57	-36	61956	250000	-36	400	29	1.58	296	187624	-762	249992	762	57.145	575.961	60781	1064	14.11	75.41	4,636.26	65395	46847	10.10		
7	58	-35	65827	250000	-35	425	37	1.72	316	183725	-814	249992	814	57.681	582.834	64581	1130	14.93	75.70	4,654.28	69483	47163	10.13		
8	59	-34	69967	250000	-34	452	46	1.86	334	179583	-866	249991	866	58.025	587.987	68616	1201	15.80	76.00	4,672.25	73824	47498	10.17		
9	60	-33	74396	250000	-33	480	56	2.02	354	175186	-923	249991	923	58.406	593.746	72902	1276	16.72	76.29	4,690.13	78435	47851	10.20		
10	61	-32	79128	250000	-32	510	66	2.22	379	170520	-987	249990	987	59.000	601.947	77448	1355	17.70	76.57	4,707.71	83326	48219	10.24	65334	75686
11	62	-73	83956	250000	-73	542	77	2.44	404	165612	-1096	249989	1096	61.931	634.337	82230	1439	18.73	76.82	4,722.59	88471	48562	10.28		
12	63	-90	89073	250000	-90	576	92	2.68	430	160426	-1188	249989	1188	63.411	652.054	87284	1527	19.83	77.04	4,736.22	93908	48902	10.33		
13	64	0	94496	250000	0	611	107	2.94	455	154832	-1173	249988	1173	59.178	611.017	92735	1623	20.99	77.33	4,754.37	99774	49351	10.38		
14	65	0	100349	250000	0	649	112	3.23	481	148884	-1243	249987	1243	59.208	614.585	98531	1724	22.21	77.63	4,772.80	106010	49833	10.44		
15	66	0	106870	250000	0	690	126	3.54	505	142564	-1320	249987	1320	59.428	620.496	104690	1832	23.53	77.87	4,791.23	112730	50345	10.51	81914	99380
16	67	0	113824	250000	0	733	140	3.88	527	135749	-1399	249986	1399	59.479	624.986	111330	1948	24.92	78.17	4,809.92	119881	50894	10.58		
17	68	0	121246	250000	0	779	155	4.26	547	128496	-1482	249986	1482	59.445	628.994	118399	2072	26.40	78.48	4,828.96	127492	51484	10.66		
18	69	0	129171	250000	0	829	171	4.68	565	120770	-1565	249985	1565	59.258	631.790	125927	2204	27.97	78.80	4,848.50	135599	52124	10.75		
19	70	0	137639	250000	0	881	187	5.13	577	112534	-1645	249985	1645	58.831	632.461	133953	2344	29.63	79.13	4,868.79	144241	52822	10.85		
20	71	0	146678	250000	0	938	203	5.78	600	103763	-1740	249984	1740	58.733	637.204	142501	2494	31.38	79.46	4,889.52	153445	53576	10.96	105799	132253
21	72	0	156775	250000	0	998	221	6.52	616	94414	-1834	249984	1834	58.429	640.228	151611	2653	33.24	79.81	4,910.91	163255	54396	11.08		
22	73	0	167610	250000	0	1061	239	7.35	621	84437	-1921	249984	1921	57.773	639.925	161335	2823	35.21	80.18	4,933.31	173725	55299	11.21		
23	74	0	179253	250000	0	1129	256	8.28	611	73772	-1996	249984	1996	56.689	635.444	171729	3005	37.30	80.56	4,957.18	184918	56307	11.36		
24	75	0	191789	250000	0	1202	272	9.34	582	62350	-2057	249985	2057	55.133	626.241	182861	3200	39.52	80.98	4,983.03	196905	57451	11.53		
25	76	0	205308	250000	0	1280	286	10.60	531	50092	-2097	249986	2097	53.070	611.866	194808	3409	41.86	81.44	5,011.41	209769	58763	11.73	140977	177907
26	77	0	219926	250000	0	1364	297	12.00	443	36901	-2104	249988	2104	50.253	589.261	207665	3634	44.34	81.96	5,093.37	225842	60300	11.84		
27	78	0	235782	265585	0	1454	303	13.60	492	36140	-2248	265572	2248	50.699	600.221	223594	3913	46.97	83.31	5,126.42	240787	62109	12.12		
28	79	0	252938	268835	0	1565	330	15.50	373	24079	-2268	268825	2268	48.285	584.999	238519	4174	49.76	83.89	5,159.61	256717	64036	12.41		
29	80	0	271324	284890	0	1670	337	17.60	422	23950	-2428	284879	2428	48.794	605.576	254290	4450	52.71	84.43	5,195.76	273846	66218	12.74		o (=o (-
30	81	0	291015	305566	0	1780	364	20.40	557	27328	-2702	305551	2702	51.265	653.350	2/1144	4745	55.83	84.99	5,231.96	292106	68535	13.10	192401	247392

Cols (3)-(5) are taken from a TIAA-CREF Life VUL illustration based on a hypothetical gross 8% investment return (before asset charges); the illustration included a disability rider whose charges are removed as negative premiums in Col. (1). The question explored in Cols. (6)-(24) is whether an alternative plan of investing in a stock mutual fund (SMF) would be better than buying the policy. To make the alternatives comparable, it is assumed each year that funds are withdrawn from the investment account, Col. (12) and/or Col. (22), and used to buy term life insurance sufficient to supply the difference between the death benefit of the life policy and value of the SMF, whose death benefit (fund value) would also be free of income tax at death. Each year funds are also deducted to pay taxes on dividend i and on long-term capital gains (average cost method) realized on necessary share liquidations at a 40% tax rate (35% federal maximum + 7.7% state, deductible in 35% maximum federal tax bracket, net 5%). TIAA-CREF's illustration includes a 0.29% annual asset charge for investment management and related expenses, but this could be 0.06% with its own stock fund. It is assumed that the mutual fund is invested in a Vanguard index fund with annual asset charges of 0.18% (.09% at \$100,000 and up). To equalize asset charges, 0.29% - 0.06%, or 0.23%, is deducted in Col. (19). The current dividend ra Vanguard's Index 500 is 1.73%, so 1.75% is used in Col. (18). It is assumed that the capital gains tax on any shares sold is paid one year after sale. The annual renewable term life insurance term costs in Col. (9) are TIAA's at the \$250,000 level in its preferred plus nonsmoker class, the same class illustrated in Cols. (3) to (5). Col (25) uses a marginal tax rate of 40% for calculating the tax on surrender of the VUL - 35% federal plus 7.7% state deductible on federal. The rate assumed for surrender of the SMF is 20%, the federal LTCG rate of 15% + 7.25% state income tax deductible on federal tax. At age 82, not shown, the

Exhibit C

A comparison of a variable universal life (VUL) policy with a mutual fund invested 100% in stocks (SMF), adjusted for differences in death benefits.

(1) (2) (3) (4) (5) (6) (7) (8) (9) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (22) (22) (23) (24) (25) (25) Net Perms Parice Sur Death National Network National Network National Network National National <t< th=""><th></th><th></th><th>Va</th><th>riable Life</th><th>Policy</th><th></th><th colspan="14">Buy Term and Invest the Premium Savings in a Mutual Fund</th><th></th><th></th></t<>			Va	riable Life	Policy		Buy Term and Invest the Premium Savings in a Mutual Fund																			
BOY EOY EOY BOY BOY Mer Mer <td>(1)</td> <td>(2)</td> <td>(3)</td> <td>(4)</td> <td>(5)</td> <td>(6)</td> <td>(7)</td> <td>(8)</td> <td>(9)</td> <td>(10)</td> <td>(11)</td> <td>(12)</td> <td>(13)</td> <td>(14)</td> <td>(15)</td> <td>(16)</td> <td>(17)</td> <td>(18)</td> <td>(19)</td> <td>(20)</td> <td>(21)</td> <td>(22)</td> <td>(23)</td> <td>(24)</td> <td>(25)</td> <td>(26)</td>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
Perms Perms <th< td=""><td></td><td></td><td>BOY</td><td>EOY</td><td></td><td></td><td>BOY</td><td>BOY</td><td></td><td>BOY</td><td>BOY</td><td>BOY</td><td>Average</td><td></td><td></td><td>BOY</td><td></td><td>EOY</td><td>EOY</td><td>EOY</td><td></td><td></td><td></td><td>EOY</td><td>Net</td><td>Net</td></th<>			BOY	EOY			BOY	BOY		BOY	BOY	BOY	Average			BOY		EOY	EOY	EOY				EOY	Net	Net
BOY With Start BOY Inclus Sharts SUV None Photo Sharts SUV None Photo SME SME Cost Uits Cost Uits SME SME <td></td> <td></td> <td>Prems/</td> <td>Policy</td> <td>EOY</td> <td>501</td> <td>Tax on</td> <td>Tax on</td> <td>Term</td> <td>Term</td> <td>Amt of</td> <td>Invest.</td> <td>Total</td> <td>BOY</td> <td>BOY</td> <td>Basis on</td> <td>5.01/</td> <td>Div'd</td> <td>Share</td> <td>Div'd</td> <td></td> <td>EOY</td> <td>EOY</td> <td>Avg</td> <td>After-tax</td> <td>After-tax</td>			Prems/	Policy	EOY	501	Tax on	Tax on	Term	Term	Amt of	Invest.	Total	BOY	BOY	Basis on	5.01/	Div'd	Share	Div'd		EOY	EOY	Avg	After-tax	After-tax
TAGE orawal Value benefit Cash Toy Toy </td <td></td> <td>BOY</td> <td>With-</td> <td>Surr.</td> <td>Death</td> <td>BOY</td> <td>Div'd</td> <td>Sale</td> <td>Rate/</td> <td>Ins.</td> <td>Term</td> <td>(6) - (7)</td> <td>Death</td> <td>Funds</td> <td>Shares</td> <td>Shares</td> <td>BOY</td> <td>Income</td> <td>Price</td> <td>Shares</td> <td>EOY</td> <td>Value</td> <td>Basis</td> <td>Share</td> <td>Surr Val</td> <td>Surr Val</td>		BOY	With-	Surr.	Death	BOY	Div'd	Sale	Rate/	Ins.	Term	(6) - (7)	Death	Funds	Shares	Shares	BOY	Income	Price	Shares	EOY	Value	Basis	Share	Surr Val	Surr Val
1 37 32461 32481 0 0 0 31861 531 10000 22.2 32.32.97 34126 32419 10.01 2 38 32491 107200 34381 147 0 0.65 100070 11667 116881 0 0 0 000241 1170 112.28 535.58 1057.99 757.99 757.99 757.99 757.77 753.00 11.27 12.32 20.18 12.227 13.11 147.44 11.27 12.32 11.37 12.228 11.67.44 11.27 12.32 13.11 147.75 15.056.24 198.11 14.67.44 11.47 14.43 12.282 13.283 17.75 14.46 32.489 12.82 13.28.89 17.75 14.46 32.489 12.83 11.67 11.67.44 <td>۲r</td> <td>Age</td> <td>drawal</td> <td>value</td> <td>Benefit</td> <td>Cash</td> <td>15%</td> <td>15%</td> <td>1000</td> <td>Cost</td> <td>Insur</td> <td>- (10)</td> <td>Benefit</td> <td>Sold</td> <td>Sold</td> <td>Sold</td> <td>SMF</td> <td>1.75%</td> <td>5.36%</td> <td>Bought</td> <td># Shares</td> <td>SMF</td> <td>SMF</td> <td>Cost</td> <td>Life Ins</td> <td>SMF</td>	۲r	Age	drawal	value	Benefit	Cash	15%	15%	1000	Cost	Insur	- (10)	Benefit	Sold	Sold	Sold	SMF	1.75%	5.36%	Bought	# Shares	SMF	SMF	Cost	Life Ins	SMF
1 3 1	1	27	22/01	22402	1022500	22404	0	0	0.62	620	1000701	21061	1022404	0	0	0	21061	550	10.00	52.02	2 220 07	24126	22/10	10.01		
3 3 3241 10720 32481 10724 170 10.05 40 32481 10751 9289 328.5 10851 9794 10.55 4 32481 191168 114768 1460 32401 1228.28 18131 11228.28 18131 11228.28 18131 11228.18 18128.28 18134 1122.28 18134 11228.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18 1128.18	2	38	32491	55495 60080	1055500	32491	84	0	0.03	6/1	1000791	31766	1068083	0	0	0	65802	1153	11 10	103.82	5,230.97 6 357 80	70577	65338	10.01		
4 4 9 92491 14788 114900 32491 28 0 0 1417474 2469 12.32 10.31 12.222 10.33 6 4 32491 13785 131900 3249 12.921 134281 10907 10.12559 13710 10.5624 105826 23456 13768 138682 23687 1371 14.2 12.8281 11.71 14.8288 11.71 14.842 22.8291 22.9358 30.616 23737 11.75 11.82 14.8 14.8388.3 28.990 20.438.08 30.6682 233530 11.82 14.8 14.813 14.812 14.813 14.812 14.813 14.812 14.813 14.813 14.813 14.813 14.813 14.813 14.813 14.813 14.813 14.813 14.813 14.814 14.813 14.81	23	30	32491	107224	1107000	32491	173	0	0.04	651	1001371	31667	1106983	0	0	0	102244	1789	11.10	152.00	9 363 54	109513	98794	10.20		
5 41 22491 191188 191000 32491 370 0 0.05353 31428 1109382 0 0 0 022719 15301 246.70 15,085.24 195811 1167448 11122 182279 191077 7 42 24737 227355 1237000 32414 7771 1003892 226819 120014 144 326201 198813 228897 238916 237301 1775 1038777 1771 1003897 1481 1102.2861 1166523 27473 14.46 326.01 9.048.03 328860 241503 11.85 339168 237301 1771 1038977 1771 1018977 1101 122.45 106633 22721 16.06 336.41 20.48.08 328860 241503 11.85 422.06.09 637899 20.691 10.44 11.90 31427 10.900 334753 31427 20.691.68 64.61 14.45 20.693 37899 33616 23.493.01 21.55 11.10 10.55 11.11 10.55 11.11 10.55 11.11 10.55 <td>4</td> <td>40</td> <td>32491</td> <td>147868</td> <td>1148000</td> <td>32491</td> <td>268</td> <td>0</td> <td>0.66</td> <td>662</td> <td>1002070</td> <td>31560</td> <td>1147983</td> <td>0</td> <td>0</td> <td>0</td> <td>141074</td> <td>2469</td> <td>12.33</td> <td>200 18</td> <td>12 262 18</td> <td>151231</td> <td>132823</td> <td>10.83</td> <td></td> <td></td>	4	40	32491	147868	1148000	32491	268	0	0.66	662	1002070	31560	1147983	0	0	0	141074	2469	12.33	200 18	12 262 18	151231	132823	10.83		
6 42 24241 23725 12370 0	5	41	32491	191186	1191000	32491	370	Ő	0.69	692	1003553	31428	1190982	0	0	0	182659	3197	13.01	245.79	15,056,24	195811	167448	11.12	182279	191077
7 3 27437 281202 221000 27437 68 0 0.7 73 1003833 280981 1200813 1298134 28897 233351 11.69 8 4 0.37686 138000 0 0.7 73 10387 11.79 160 11.693 2572 16.8 33742 26.86 35048 23742 26.86 35049 23742 26.86 35049 23737 11.75 34753 34753 34753 34753 34753 34753 34753 34742 26.86 35049 24.8747 11.39 48 0.35021 317563 317643 3450 21.4342 347533 347533 347533	6	42	32491	237355	1237000	32491	479	0	0.71	713	1003942	31299	1236981	Ő	0	0	227110	3974	13.71	289.81	17.752.66	243462	202721	11.42		
8 4 0 298839 129900 0 77 73 100387 141 12980 110238 11255 2291 20.203.5 301486 23767 11.75 0 4 0 31765 13800 0 0 05 55 0.84 0.81 102385 112232 200585 55 11.8 31735 1175 110238 1123 221 0.83364 20.203.55 304180 226815 12.00 12 4 0 350021 15800 0 95 96 99 99 99 99 99 91 107.03 1296.67 3660 219 11.75 43.352 20045 25.54 25.202 16.55 12.23 14.51 129.55 129.55 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31 12.31	7	43	27437	281202	1281000	27437	596	0	0.74	743	1004383	26098	1280981	0	0	0	269559	4717	14.46	326.20	19.981.83	288967	233536	11.69		
9 45 0 31765 138000 0 755 43 0.80 80.3 100389 120 10.497 120.33365 120.3365 120.33765 138200 0 755 43 0.20 55.5 0.81 22 0.83 22 0.83 22 0.83 22 0.83 22 0.83 22 0.93 22 0.93 22 0.93 22 0.93 22 0.93 22.857 32.866 63.44 22 0.90 25.657 22.767 10.93 12.857.1 22.987.1 23.857.1 2	8	44	0	298839	1299000	0	708	0	0.77	773	1003987	-1481	1298980	1481	102.386	1196.632	287487	5031	15.25	329.91	20,209.35	308186	237370	11.75		
10 46 0 33768 133800 0 805 5 0.84 12 102483 1702 133783 1702 1053743 220663 337.42 20,0646 337.42 20,0649 337.83 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 337.42 20,0645 42,052 740 20,37 337.42 21,631.16 635.44 425.70 336.34 425.70 336.34 425.70 336.34 425.70 300.00 45.44 437.07 137.84 433.103.85 21,71 138.54 433.103 433.103.85 21,71 138.54 433.000 137.33 24.73 138.74 138.74 138.54 443.000 130.70 138.54 443.000 20.75 23.33.83 26.83 27.83 138.85 </td <td>9</td> <td>45</td> <td>0</td> <td>317635</td> <td>1318000</td> <td>0</td> <td>755</td> <td>43</td> <td>0.80</td> <td>803</td> <td>1003389</td> <td>-1600</td> <td>1317979</td> <td>1600</td> <td>104.918</td> <td>1232.323</td> <td>306586</td> <td>5365</td> <td>16.08</td> <td>333.64</td> <td>20,438.08</td> <td>328660</td> <td>241503</td> <td>11.82</td> <td></td> <td></td>	9	45	0	317635	1318000	0	755	43	0.80	803	1003389	-1600	1317979	1600	104.918	1232.323	306586	5365	16.08	333.64	20,438.08	328660	241503	11.82		
11 47 0 0 85800 0 868 0.87 871 101171 136897 1261.09 34876 32602 23667 25606 12.11 348 34172 328072 26102 37880 250815 12.01 127 32867 25668 12.11 335.54 425202 26169 12.24 14 50 0 48188 144500 0 111 12 105 146597 2211 37167 318574 427571 2.13357.18 21.837.18 48376 274329 12.54 355948 1717 35 3000 45041 45700 -30000 118 10 1.12 113 93870 32438 146591 32438 146591 32438 145914 144944 43908 73444 145990 34714 145990 34731 145990 34731 145990 34731 145990 34731 145990 34731 145990 34731 145990 34731 145900 3491 34591 34731 34791 447017 144990 34991 145999 3	10	46	0	337669	1338000	0	805	55	0.84	842	1002483	-1702	1337978	1702	105.842	1250.663	326958	5722	16.96	337.42	20,669.66	350499	245974	11.90	301930	334753
12 48 0 0.81778 132000 0.915 80 0.91 100036 1906 100703 126876 36606 12.11 455.4 22.11 355.4 4252.0 21.635.4 4272.0 12.887.6 4381.1 21.385.4 4252.0 12.879.6 4835.4 4277.8 12.38 3859.4 457.0 32.00 458.475 457.00 10.00 111 12 10.0 995.926 22.20 10.872.3 134.51.01 450.751.8 483.756 27.323 12.4 385.94 451.071 11.5 14.10 12.0 11.0 12.1 11.0 12.2 13.88 145.071 147.857 147.865.7 147.865.7 147.856.7 147.857.7 147.856.7 147.856.7 147.857.7 158.8 147.97.7	11	47	0	350021	1359000	0	858	68	0.87	871	1001171	-1797	1358977	1797	105.972	1261.094	348702	6102	17.88	341.27	20,904.96	373809	250815	12.00		
13 49 0 0 0 96 94 998959 -2019 107.093 1268.876 366660 6442 19.88 349.11 21.385.54 425220 261689 12.24 15 51 0 459434 145900 0 111 123 1.04 99896 -2137 143197 2137 1345.913 45164 7897 22.11 351.2 21.61 48375 27432 12.54 38598 451017 15 5 30000 45044 145000 30000 1185 140 1.12 113 99297 34731 1478571 1787851 187861 478400 772 2734 24271 741.80 470078 242425 1.31 12.91 31.81 159.30 41.935 481.91 1.300 41.92 1.31 32.9180 1.325 44794 440817 7772 2.34 47.71 46.9307 47258 2.3202 1.361 32.9180 1.325 32.9180 1.325 32.9180 1.325 32.9180 1.361 32.9180 1.361 <t< td=""><td>12</td><td>48</td><td>0</td><td>381778</td><td>1382000</td><td>0</td><td>915</td><td>80</td><td>0.91</td><td>910</td><td>1000364</td><td>-1906</td><td>1381976</td><td>1906</td><td>106.595</td><td>1278.912</td><td>371902</td><td>6508</td><td>18.86</td><td>345.16</td><td>21,143.52</td><td>398679</td><td>256045</td><td>12.11</td><td></td><td></td></t<>	12	48	0	381778	1382000	0	915	80	0.91	910	1000364	-1906	1381976	1906	106.595	1278.912	371902	6508	18.86	345.16	21,143.52	398679	256045	12.11		
14 50 0 41883 142000 0 104 108 0.9 988 9784 -217 1277 127 107.499 1315.444 42002 707 35.12 21.631.16 453244 4267778 12.38 16 52 -30000 456434 145700 -30000 1185 140 1.12 112 992897 -2280 1458973 2280 1458914 51247 1878 21.337.18 72.33 33.67 0.751.25 481692 25289 1.12 12.6 992897 -34791 145.106 1456.637 4449340 7861 24.59 31.6 18.479.09 470078 24.245 1.12 1.2 1.2 992897 -34791 145.106 7266.637 449300 7821 25.83 301.66 18.479.09 470078 24.245 1.3.15 1.3.5 3.2 3.3.6 74.473 440807 7722 2.3.4 24.57 1.4.14305 3.2.16 1.3.57 3.0.9 7555 2.0.52 2.3.23 1.4.14305 3.2.8 2.4.148 3.3.8 2.4.14 1	13	49	0	406033	1406000	0	976	94	0.95	949	998959	-2019	1405975	2019	107.093	1296.876	396660	6942	19.88	349.11	21,385.54	425220	261689	12.24		
15 1 0 45434 145900 0 111 123 1.05 104 992926 -2200 108.723 134.6134 7697 22.11 37.16 21.87.16 43776 274329 12.54 385048 451017 17 53 -30000 454044 1454000 -3000 1185 104 1.12 113 93870 -34473 1453969 34473 1478.571 18394.69 47401 7621 25.93 301.66 18.47.90 479072 242452 13.13 5 30000 44400 -30000 1173 717 1.55 349491 1447965 34991 1447963 771 72.1 72.1 7.17.1 <td< td=""><td>14</td><td>50</td><td>0</td><td>431883</td><td>1432000</td><td>0</td><td>1041</td><td>108</td><td>0.99</td><td>988</td><td>997846</td><td>-2137</td><td>1431974</td><td>2137</td><td>107.499</td><td>1315.444</td><td>423082</td><td>7404</td><td>20.97</td><td>353.12</td><td>21,631.16</td><td>453544</td><td>267778</td><td>12.38</td><td></td><td></td></td<>	14	50	0	431883	1432000	0	1041	108	0.99	988	997846	-2137	1431974	2137	107.499	1315.444	423082	7404	20.97	353.12	21,631.16	453544	267778	12.38		
16 52 -30000 45404 45700 -30000 1185 140 1.12 1113 93870 -32483 1467.116 1838.489 451318 7898 23.133.76 20.751.25 483813 263323 12.71 18 54 -30000 45107 1451000 -30000 1182 2257 1233 44622 25.93 301.66 18,47.909 47978 242452 13.12 19 55 -30000 444500 -30000 1162 2521 17 144965 34991 144965 3217 1240.8473 1478.06 444084 7762 28.3 26.71 1.63300 47754 1.63900 47754 1.43950 1.388 431292 1.25 33.00 43243 1.444055 35481 122.911 720.61 1.541.11 46087 20529 1.43 32.80 21.65 1.541.11 46087 20529 1.43 431292 1.414.94 4477.27 46408 7052.92 1.41.84 431292 1.41.41 431292 1.41.41 431292 1.41.41 431491 1.42.41 431292 1.	15	51	0	459434	1459000	0	1111	123	1.05	1046	995926	-2280	1458973	2280	108.723	1345.913	451264	7897	22.11	357.18	21,879.61	483756	274329	12.54	385948	451017
17 53 -30000 45404 1454000 -30000 1185 2106 1.19 112 992897 -34791 1453969 34471 1478571 18798.614 449400 7683 24.59 319.84 19,592.52 481692 252897 12.91 19 55 -30000 4415000 -30000 118 2479 1.45 93283 -34791 145066 71708.479 444087 7772 27.34 284.27 17,413.66 470661 232215 13.81 329180 3129180 <t< td=""><td>16</td><td>52</td><td>-30000</td><td>456825</td><td>1457000</td><td>-30000</td><td>1185</td><td>140</td><td>1.12</td><td>1113</td><td>993870</td><td>-32438</td><td>1456971</td><td>32438</td><td>1467.116</td><td>18394.869</td><td>451318</td><td>7898</td><td>23.31</td><td>338.76</td><td>20,751.25</td><td>483813</td><td>263832</td><td>12.71</td><td></td><td></td></t<>	16	52	-30000	456825	1457000	-30000	1185	140	1.12	1113	993870	-32438	1456971	32438	1467.116	18394.869	451318	7898	23.31	338.76	20,751.25	483813	263832	12.71		
18 54 -30000 145100 -30000 1180 2351 1.27 1260 992397 -34791 145100 18265.879 448001 7772 27.33 20.301.6 18,479.09 4790.72 242422 13.35 20 56 -30000 444502 144600 -30000 116 259 1.47 1459 992608 -35217 1449696 1770.8474 48427 17.413.66 476061 232551 1.4800 3000 1157 2703 1.60 158 992408 -35244 14271.71 1450.86 170487 245.87 1447127 44687 20522 1.41 4400 30000 1177 2703 1.60 158 992408 35484 141716 1256.81 42917 756 32.06 23.051 1.477.27 44607 20528 1.477.27 44607 20528 1.477.27 44607 20528 1.477.27 44607 20528 1.477.27 446076 20875 1.471.86 4760.80 477.27 476.73 3.80 21.75 3.759 1.471.86 476.04 <td< td=""><td>17</td><td>53</td><td>-30000</td><td>454044</td><td>1454000</td><td>-30000</td><td>1185</td><td>2106</td><td>1.19</td><td>1182</td><td>992897</td><td>-34473</td><td>1453969</td><td>34473</td><td>1478.571</td><td>18798.614</td><td>449340</td><td>7863</td><td>24.59</td><td>319.84</td><td>19,592.52</td><td>481692</td><td>252897</td><td>12.91</td><td></td><td></td></td<>	17	53	-30000	454044	1454000	-30000	1185	2106	1.19	1182	992897	-34473	1453969	34473	1478.571	18798.614	449340	7863	24.59	319.84	19,592.52	481692	252897	12.91		
19 55 -30000 1447320 1448000 -30000 1173 2479 1.35 1340 992283 34991 1439e66 1772 27.34 284.27 17,413.66 476061 232515 13.35 21 57 -30000 444135 1444000 -30000 1167 2703 1.60 158 992408 -35217 144962 35217 1288.20 1700.033 404404 7715 23.06 23.634 14,477.27 464087 205229 1.41 25 -30000 43373 144000 -30000 110 101 109 994208 3593 3109 107.018 1520.101 422787 739 35.65 207.57 12,11.44 453228 18870 14.447 17.35 14.44075 17.34 14.35 14.4475 17.35 14.30 14.84 14.35 14.34 14.35 14.34 14.35 14.34 14.35 14.34 14.35 14.34 14.347 13.38 14.34 <td>18</td> <td>54</td> <td>-30000</td> <td>451079</td> <td>1451000</td> <td>-30000</td> <td>1180</td> <td>2351</td> <td>1.27</td> <td>1260</td> <td>992397</td> <td>-34791</td> <td>1450967</td> <td>34791</td> <td>1415.100</td> <td>18265.879</td> <td>446901</td> <td>7821</td> <td>25.93</td> <td>301.66</td> <td>18,479.09</td> <td>479078</td> <td>242452</td> <td>13.12</td> <td></td> <td></td>	18	54	-30000	451079	1451000	-30000	1180	2351	1.27	1260	992397	-34791	1450967	34791	1415.100	18265.879	446901	7821	25.93	301.66	18,479.09	479078	242452	13.12		
20 56 -30000 444552 1444000 -30000 116 2592 1.47 149 992608 35217 1444962 35217 1248201 177 2883 267.61 16,313.07 472585 2303.07 172585 230.07 172585 230.07 172585 230.07 172585 230.07 172585 230.07 172585 230.07 172585 230.07 172585 230.07 172585 230.07 172715 183 143 143 167.0 144965 3444818 129.61 16,413.17 166.08 14,477.27 464087 25229 14.18 25 61 -30000 43365 143000 -30000 110 101 207 200 995120 -36190 1428946 3101 1242787 33.80 27.1 14.84 428163 1428946 143062 7629 37.59 14.84 431261 142814 141841 15520.101 4101 11.845.69 446762 18871 15.61 14.81 14.84 14.84 14.84 14.84 14.84 14.84 14.84<	19	55	-30000	447920	1448000	-30000	1173	2479	1.35	1340	992283	-34991	1447965	34991	1349.696	17708.479	444087	7772	27.34	284.27	17,413.66	476061	232515	13.35		
21 57 -30000 441335 1441000 -30000 1157 2703 1.60 1588 992408 53448 14292.610 16/28.944 437137 7650 3.040 251.65 15,415.11 468611 233950 13.88 23 59 -30000 433695 1434000 -30000 1147 200 1.70 750 3.06 23.63 14,477.27 46087 255229 14.18 24 60 -30000 429124 1429000 -30000 110 101 2.07 2.06 995103 36596 1174.17 1484 453228 188709 14.84 26 62 -30000 429124 142900 -30000 1104 3193 2.86 56090 34622 22.683 14036.75 1721 3.64 181.94 11,144.94 441750 173991 15.61 26 64 -30000 11623 54600 3007 3.11 424 13621 43447 734.847 140.91 19,13.44 44063 141750 13991 15.61	20	56	-30000	444552	1445000	-30000	1166	2592	1.47	1459	992608	-35217	1444962	35217	1288.201	17200.633	440844	7715	28.83	267.61	16,393.07	472585	223029	13.61	329180	431292
22 58 -30000 43/741 1438000 -30000 1147 2808 1.7.5 17.39 93735 -35094 143795 3595 439491 7.5/6 32.06 23.63 1.4.77.27 464087 205229 14.18 24 60 -30000 423955 1424000 -30000 1110 3101 2.27 226 996304 -36472 1423941 54521 7433 33.80 21.685 1.7.44.84 453228 188709 14.84 25 61 -30000 423955 142400 -30000 110 3101 2.27 226 996304 -36472 1223184 15185.729 416756 7293 37.59 194.03 11.8459 44762 180817 15.21 268468 402584 26 -30000 416523 554000 -30000 1062 3177 1.11 424 136211 34667 67407148 7125 41.80 70.442.43 436463 167488 16.04 26 -30000 40717 53700 -30000 1053 3205	21	57	-30000	441335	1441000	-30000	1157	2703	1.60	1588	992408	-35448	1440959	35448	1229.610	16/28.944	43/13/	7650	30.40	251.65	15,415.11	468611	213950	13.88		
23 59 -30000 433655 1434000 -30000 1136 2910 1.30 1290 1433951 353956 1121.025 15931.628 1221.55 13,377.90 450878 148300 14.84 25 61 -30000 423555 1424000 -30000 1110 3101 2.27 260 995120 -36190 4284946 66190 107.618 1552.0101 420787 7399 35.65 27.0757 12,714.84 453228 188709 14.84 26 62 -30000 420410 56100 -30000 1094 3193 2.86 560990 34682 922.683 14306.745 142080 7211 39.64 141.44.94 441750 173991 15.61 27 63 -30000 41523 554000 -30000 1069 3146 3.84 213161 -34825 53898 34627 782.979 1362.875 40179 7031 44.07 10.44.243 346451 16.50 44848 16.04 457.97 14.977.90 14.927 17.17.50 16.50	22	58	-30000	437741	1438000	-30000	114/	2808	1.75	1/39	993735	-35694	143/955	35694	11/4.1/6	16296.681	432917	7576	32.06	236.34	14,4/7.27	464087	205229	14.18		
24 60 -30000 429124 142900 -30000 1214 3007 2.07 200 -3010 423913 3615 1001616 15302 12.174.4 43528 18570 14.44 443528 18570 14.44 443528 18570 15.21 14.44 443528 18570 15.21 14.44 441750 17399 15.61 13.885.6 446762 18017 15.21 268468 402584 26 62 -30000 429124 142940 36412 15185.79 14.61 7293 37.59 14.03 11.885.69 446762 18017 15.21 14.8616 14748 16.04 26 62 -30000 412627 54000 -30000 1052 3.08 452 13302 54598 34667 74974 7899 30.82 617.48 16.04 16.50 900 44496 15143 16.99 91.33.46 42496 15143 16.99 91.33.46 42496 15143 16.99 91.33.46 42496 15143 16.99 91.33.46 42496 15143 </td <td>23</td> <td>59</td> <td>-30000</td> <td>433095</td> <td>1434000</td> <td>-30000</td> <td>1130</td> <td>2910</td> <td>1.90</td> <td>1890</td> <td>994621</td> <td>-35930</td> <td>1433951</td> <td>35930</td> <td>1070.619</td> <td>15891.628</td> <td>420101</td> <td>7493</td> <td>33.80</td> <td>221.00</td> <td>13,577.90</td> <td>458978</td> <td>196830</td> <td>14.50</td> <td></td> <td></td>	23	59	-30000	433095	1434000	-30000	1130	2910	1.90	1890	994621	-35930	1433951	35930	1070.619	15891.628	420101	7493	33.80	221.00	13,577.90	458978	196830	14.50		
23 01 -30000 42393 142400 -30000 102 310 2.27 202 99034 50472 142394 10372 1023 37.39 19.4.03 11,04.94 441750 17391 1.2.1 206408 402364 26 2-30000 420410 561000 -30000 1094 3193 2.86 3150 -34862 922.683 14036.745 41070 10,442.43 441750 17391 1.61 28 64 -30000 416523 554000 -30000 1069 3146 3.8 452 133702 -34667 545988 34667 829.406 13302.962 40179 7031 44.07 159.53 9,772.56 430725 161216 16.50 29 66 -30000 40257 53300 -30000 1055 3205 3.66 481 13064 34740 536987 34740 788.205 13002.882 395856 6830 46.48 149.10 9,133.46 424496 15143 16.99 30 66 -30000 40253	24	61	-30000	429124	1429000	-30000	1124	2101	2.07	2000	995120	-30190	1420940	26472	1070.010	15520.101	422101	7399	35.05	207.57	12,714.04	400220	100/09	14.04	260160	102501
20 20 0.0000 442.4 0.000 10.94 0.094 0.094 0.094 0.094 0.094 0.094 0.094 0.094 0.000 0.094 0.094 0.000 0.094 0.094 0.000 0.094 0.094 0.000 0.094 0.097 0.000 0.094 0.000 0.003 0.000 0.003 0.000 0.003 0.000 0.003 0.004 0.000 0.005 0.000 0.003 0.000 0.003 0.004 0.000 0.005 0.000 0.005 0.000 0.003 0.004 0.004 0.00	20	62	-30000	423955	561000	-30000	100/	3101	2.27	2202	138150	-3/682	560000	3/682	022.104	1/036 7/5	410750	7293	30.64	194.03	11 1// 0/	440702	172001	15.21	200400	402304
27 63 -50000 412267 546000 -50000 1062 3.33 4.24 133702 54677 545983 34667 829.406 13302.962 301 4.140 159.53 9.772.56 430725 16140 1642 15543 16.99 28 64 -30000 407617 537000 -30000 1055 3205 3.68 481 130664 -34740 536987 34740 788.205 13002.882 395985 6930 46.48 149.10 9.133.46 424496 155143 16.99 30 66 -30000 402507 533000 -1000 1023 3316 4.54 609 134233 -34949 526984 34949 713.093 12485.557 382758 6698 51.88 129.61 7,939.39 410316 143440 18.07 32 68 -30000 390738 521000 -30000 1005 3369 5.05 686 135929 35061 678.404 12266.629 375255 6567 54.50 120.50 7,381.48 402274 1	20	63	-30000	420410	554000	-30000	1094	3097	2.00	124	136211	-34602	553080	34602	872.003	13628 675	412000	7125	/1 80	170 /7	10 //2 /3	441750	167/88	16.04		
29 65 -30000 407617 537000 -30000 1055 32.68 481 130664 -34740 536987 34740 788.205 13002.882 395985 6830 46.48 149.01 9,133.46 424496 155143 16.99 30 66 -30000 402507 53300 -30000 1023 3316 4.54 609 134233 -34949 526984 34949 713.093 12485.557 382758 6698 51.68 129.61 7,939.39 410316 143440 18.07 32 68 -30000 30738 521000 -30000 1005 3369 5.05 686 135929 -35016 678.404 12256.629 375255 6567 54.50 120.50 7,81.48 402274 137750 18.66 33 69 -30000 38900 51400 -30000 964 3470 6.23 856 137384 35289 614.068 11848.482 358240 626 60.60 103.45 6,337.20 384033 126550 19.97 137249 3	28	64	-30000	412267	546000	-30000	1062	3146	3.38	452	133702	-34667	545988	34667	829 406	13302 962	401796	7031	44.07	159 53	9 772 56	430725	161216	16.50		
30 66 -30000 402507 533000 -30000 1039 3261 4.09 545 133161 -34845 532986 34845 749.718 12734.887 389651 6819 49.01 139.13 8,522.87 417706 149227 1.751 207169 373095 31 67 -30000 396895 527000 -30000 1023 3316 4.54 609 134233 -34949 526984 34949 713.093 12485.557 382758 6698 51.68 129.61 7,939.39 410316 143440 18.07 32 68 -30000 390738 521000 -30000 1005 3369 5.05 686 135929 -35061 520982 35016 678.404 12256.629 375255 6567 54.50 120.50 7,381.48 402274 137750 18.66 33 69 -30000 38560 -30000 964 3470 6.23 856 137384 -35289 504978 35289 614.068 11848.482 358240 6269 60.60 10	29	65	-30000	407617	537000	-30000	1055	3205	3.68	481	130664	-34740	536987	34740	788,205	13002.882	395985	6930	46.48	149.10	9,133,46	424496	155143	16.99		
31 67 -30000 396895 527000 -30000 1023 3316 4.54 609 134233 -34949 526984 34949 713.093 12485.557 382758 6698 51.68 129.61 7,939.39 410316 143440 18.07 32 68 -30000 390738 521000 -30000 1005 3369 5.05 686 135929 -35061 520982 3501 678.404 12256.629 375255 6567 54.50 120.50 7,381.48 402274 137750 18.66 33 69 -30000 383900 514000 -30000 985 3421 5.61 70 137297 -5176 513980 35176 645.456 12045.234 367098 6424 57.47 111.79 6,847.81 393529 132129 19.30 34 70 -30000 368566 486000 -30000 940 3516 7.31 937 128234<-35394	30	66	-30000	402507	533000	-30000	1039	3261	4.09	545	133161	-34845	532986	34845	749.718	12734.887	389651	6819	49.01	139.13	8.522.87	417706	149227	17.51	207169	373095
32 68 -3000 390738 52100 -3000 1005 3369 5.05 686 135929 -35061 520982 35061 678.404 12256.629 375255 6567 54.50 120.50 7,381.48 402274 137750 18.66 33 69 -30000 383900 514000 -3000 985 3421 5.61 70 137297 -5176 513980 35176 645.456 12045.234 367098 6424 57.47 111.79 6,847.81 393529 132129 19.30 34 70 -30000 368566 486000 -30000 964 3470 6.23 856 137384 -35289 504978 35289 614.068 11848.482 358240 6269 60.60 103.45 6,337.20 384033 126550 19.97 35 71 -30000 359852 465000 -30000 915 3560 8.34 983 117858 35394 485976 51.872 11478.385 338284 5920 67.39 87.85 5,84.62 373741 <td>31</td> <td>67</td> <td>-30000</td> <td>396895</td> <td>527000</td> <td>-30000</td> <td>1023</td> <td>3316</td> <td>4.54</td> <td>609</td> <td>134233</td> <td>-34949</td> <td>526984</td> <td>34949</td> <td>713.093</td> <td>12485.557</td> <td>382758</td> <td>6698</td> <td>51.68</td> <td>129.61</td> <td>7,939.39</td> <td>410316</td> <td>143440</td> <td>18.07</td> <td></td> <td></td>	31	67	-30000	396895	527000	-30000	1023	3316	4.54	609	134233	-34949	526984	34949	713.093	12485.557	382758	6698	51.68	129.61	7,939.39	410316	143440	18.07		
33 69 -30000 383900 514000 -30000 985 3421 5.61 770 137297 -5176 513980 35176 645.456 12045.234 367098 6424 57.47 111.79 6,847.81 393529 132129 19.30 34 70 -30000 376602 505000 -30000 964 3470 6.23 856 137384<-35289	32	68	-30000	390738	521000	-30000	1005	3369	5.05	686	135929	-35061	520982	35061	678.404	12256.629	375255	6567	54.50	120.50	7,381.48	402274	137750	18.66		
34 70 -30000 376602 505000 -30000 964 3470 6.23 856 137384 35289 614.068 11848.482 358240 6269 60.60 103.45 6,337.20 384033 126550 19.97 35 71 -30000 368566 486000 -30000 940 3516 7.31 937 128234 -35394 485976 35394 584.059 11663.282 34803 6101 63.90 95.48 5,848.62 373741 120988 20.69 137249 335828 36 72 -30000 359852 465000 -30000 915 3560 8.34 983 117858 -35458 464974 35458 554.872 11478.385 338284 592 67.39 87.85 5,381.60 362640 115429 21.45 37 73 -30000 340319 414000 -30000 888 3597 9.51 1001 105278 -35486 440974 35486 526.615 11295.317 327154 5725 71.06 80.57 4,935.5	33	69	-30000	383900	514000	-30000	985	3421	5.61	770	137297	-35176	513980	35176	645.456	12045.234	367098	6424	57.47	111.79	6,847.81	393529	132129	19.30		
35 71 -30000 368566 486000 -30000 940 3516 7.31 937 128234 -35394 485976 35394 584.059 11663.282 34839 610 63.09 95.48 5,848.62 373741 120988 20.69 137249 335828 36 72 -30000 359852 465000 -30000 915 3560 8.34 983 117858 -35458 464974 35458 554.872 11478.385 338284 590 67.39 87.85 5,381.60 362640 115429 21.45 37 73 -30000 350440 441000 -30000 888 3597 9.51 1001 105278 -35486 440974 35486 526.615 11295.317 327154 5725 71.06 80.57 4,935.55 350709 109859 22.26 38 74 -30000 32497 38500 -30000 859 3629 10.84 981 90503 -35468 499.150 11110.448 315241 5517 74.93 73.62 4,510.03 </td <td>34</td> <td>70</td> <td>-30000</td> <td>376602</td> <td>505000</td> <td>-30000</td> <td>964</td> <td>3470</td> <td>6.23</td> <td>856</td> <td>137384</td> <td>-35289</td> <td>504978</td> <td>35289</td> <td>614.068</td> <td>11848.482</td> <td>358240</td> <td>6269</td> <td>60.60</td> <td>103.45</td> <td>6,337.20</td> <td>384033</td> <td>126550</td> <td>19.97</td> <td></td> <td></td>	34	70	-30000	376602	505000	-30000	964	3470	6.23	856	137384	-35289	504978	35289	614.068	11848.482	358240	6269	60.60	103.45	6,337.20	384033	126550	19.97		
36 72 -30000 359852 465000 -30000 915 3560 8.34 983 117858 -35458 464974 35458 554.872 11478.385 338284 592 67.39 87.85 5,381.60 362640 115429 21.45 37 73 -30000 350440 441000 -30000 888 3597 9.51 1001 105278 -35486 440974 35486 526.615 11295.317 327154 572 71.06 80.57 4,935.55 350709 109859 22.26 38 74 -30000 340319 414000 -30000 859 3629 10.84 981 90503 -35468 413974 35468 499.150 11110.448 315241 5517 74.93 73.62 4,510.03 337938 104265 23.12 39 75 -30000 329497 385000 -30000 828 3654 12.36 921 74542 -35403 384976 35403 472.473 10922.899 302535 5294 79.01 67.01 4,104.56	35	71	-30000	368566	486000	-30000	940	3516	7.31	937	128234	-35394	485976	35394	584.059	11663.282	348639	6101	63.90	95.48	5,848.62	373741	120988	20.69	137249	335828
37 73 -30000 350440 441000 -30000 888 3597 9.51 1001 105278 -35486 440974 35486 526.615 11295.317 327154 5725 71.06 80.57 4,935.55 350709 109859 22.26 38 74 -30000 340319 414000 -30000 859 3629 10.84 981 90503 -35468 413974 35468 499.150 11110.448 315241 5517 74.93 73.62 4,510.03 337938 104265 23.12 39 75 -30000 329497 385000 -30000 828 3654 12.36 921 74542 -35403 384976 35403 472.473 10922.899 302535 5294 79.01 67.01 4,104.56 324318 98637 24.03	36	72	-30000	359852	465000	-30000	915	3560	8.34	983	117858	-35458	464974	35458	554.872	11478.385	338284	5920	67.39	87.85	5,381.60	362640	115429	21.45		
38 74 -30000 340319 414000 -30000 859 3629 10.84 981 90503 -35468 413974 35468 499.150 11110.448 315241 5517 74.93 73.62 4,510.03 337938 104265 23.12 39 75 -30000 329497 385000 -30000 828 3654 12.36 921 74542 -35403 384976 35403 472.473 10922.899 302535 5294 79.01 67.01 4,104.56 324318 98637 24.03	37	73	-30000	350440	441000	-30000	888	3597	9.51	1001	105278	-35486	440974	35486	526.615	11295.317	327154	5725	71.06	80.57	4,935.55	350709	109859	22.26		
39 75 -30000 329497 385000 -30000 828 3654 12.36 921 74542 -35403 384976 35403 472.473 10922.899 302535 5294 79.01 67.01 4,104.56 324318 98637 24.03	38	74	-30000	340319	414000	-30000	859	3629	10.84	981	90503	-35468	413974	35468	499.150	11110.448	315241	5517	74.93	73.62	4,510.03	337938	104265	23.12		
	39	75	-30000	329497	385000	-30000	828	3654	12.36	921	74542	-35403	384976	35403	472.473	10922.899	302535	5294	79.01	67.01	4,104.56	324318	98637	24.03		
<u>40 76 -30000 317681 376000 -30000 794 3672 13.97 1113 79694 -35579 375971 35579 450.292 10821.001 288738 5053 83.32 60.64 3,714.91 309528 92869 25.00 55639 277028</u>	40	76	-30000	317681	376000	-30000	794	3672	13.97	1113	79694	-35579	375971	35579	450.292	10821.001	288738	5053	83.32	60.64	3,714.91	309528	92869	25.00	55639	277028

Cols (3)-(5) are taken from a TIAA-CREF Life VUL illustration based on a hypothetical gross 8% investment return (before asset charges). The question explored in Cols. (6)-(24) is whether an alternative plan of investing in a stock mutual fund (SMF) would be better than buying the policy. To make the alternatives comparable, it is assumed each year that funds are withdrawn from the investment account, Col. (12) and/or Col. (22), and used to buy term life insurance sufficient to supply the difference between the death benefit of the life policy and value of the SMF, whose death benefit (fund value) would also be free of income tax at death. Each year funds are also deducted to pay taxes on dividend income and on long-term capital gains (average cost method) realized on necessary share liquidations at a 15% federal tax rate, no state income tax . TIAA-CREF's illustration includes a 0.77% annual asset charge for investment management and related expenses, but this could be 0.06% with its own stock fund. It is assumed that the mutual fund is invested a Vanguard index fund with annual asset charges of 0.18% (.09% at \$100,000 and up). To equalize asset charges, 0.77% - 0.06%, or 0.71%, is deducted in Col. (19). The current dividend rate on Vanguard's Inc 500 is 1.73%, so 1.75% is used in Col. (18). For ease of calculation it is assumed that the capital gains tax on any shares sold is paid one year after sale. The annual renewable term life insurance term costs in Col. (9) are TIAA's at the \$250,000 level in its preferred plus female nonsmoker class, the same class illustrated in Cols. (3) to (5). Col (25) uses a marginal tax rate of 31% for calculating the tax on surrender of the VI The rate assumed for surrender of the SMF is 15%.. Note that at age 74, the TIAA cash value exceeds the mutual fund value, but the VUL always has a larger contingent tax liability if surrendered before death. In this illustration, the policy terminates at age 90 with a huge taxable gain if continued distributions are taken.

Exhibit D

A comparison of a variable universal life (VUL) policy with a mutual fund invested 100% in stocks (SMF), adjusted for differences in death benefits.

Variable Life Policy																									
(1)) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
		BOY	EOY	50)/		BOY	BOY	-	BOY	BOY	BOY	Average	DOV	DOV	BOY		EOY	EOY	EOY		501	501	EOY	Net	Net
	POV	Prems/	Policy	EOY	BOV	Tax on	Tax on	I erm	lerm	Amt of	Invest.	l otal Dooth	BOY	BOY	Basis on	BOV	Divid	Share	Divid	FOV	EOY	EOY	Avg	Atter-tax	After-tax
٧r		drawal	Sun. Value	Benefit	Cash	20%	20%	1000	Ins. Cost	Insur	(0) - (7)	Benefit	Sold	Sold	Sold	SME	1 75%	5 36%	Bought	# Shares	SMF	SMF	Cost	Juir vai	SMF
	/ igc		Value	Denent	ousin	2070	2070	1000	0051		(10)	Denent	oolu	Cold	0010	0.01	1.7070	[10.00]	Dougin		0.01	0.01	0030	Elle Illo	OWI
1	37	32491	33493	1033500	32491	0	0	0.63	630	1000791	31861	1033484	0	0	0	31861	558	10.54	52.92	3,238.97	34126	32418	10.01		
2	38	32491	69089	1069000	32491	112	0	0.64	641	1001399	31739	1068983	0	0	0	65864	1153	11.10	103.83	6,355.20	100420	65309	10.28		
3	40	32491	107224	1107000	32491	231	0	0.05	662	1002159	31609	11/0983	0	0	0	102150	2466	12.22	102.80	9,300.03	109420	98706	10.55		
5	· 40	32491	191186	1191000	32491	493	0	0.00	693	1003413	31305	1190982	0	0	0	182340	2400	12.00	245 36	15 029 93	195469	167130	11 12	180843	189165
6	5 42	32491	237355	1237000	32491	638	0	0.71	713	1004456	31140	1236981	0	0	0	226608	3966	13.71	289.17	17,713,48	242924	202244	11.42	100040	100100
7	43	27437	281202	1281000	27437	793	0	0.74	744	1005138	25900	1280981	0	0	0	268824	4704	14.46	325.31	19,927.36	288180	232849	11.68		
8	3 44	0	298839	1299000	0	941	0	0.77	774	1005036	-1715	1298980	1715	118.574	1385.526	286465	5013	15.25	328.74	20,137.52	307090	236476	11.74		
g	45	0	317635	1318000	0	1003	66	0.80	804	1004792	-1872	1317979	1872	122.777	1441.780	305218	5341	16.08	332.16	20,346.90	327194	240376	11.81		
10) 46	0	337669	1338000	0	1068	86	0.84	844	1004292	-1998	1337978	1998	124.246	1467.830	325196	5691	16.96	335.61	20,558.26	348610	244599	11.90	267345	327702
11	47	0	350021	1359000	0	1138	106	0.87	873	1003438	-2117	1358977	2117	124.856	1485.518	346493	6064	17.88	339.10	20,772.50	371440	249177	12.00		
12	2 48	0	381778	1382000	0	1213	126	0.91	913	1003149	-2252	1381976	2252	125.937	1510.684	369188	6461	18.86	342.64	20,989.21	395770	254127	12.11		
13	3 49	0	406033	1406000	0	1292	148	0.95	952	1002327	-2393	1405975	2393	126.890	1536.321	393377	6884	19.88	346.22	21,208.54	421700	259475	12.23		
14	50	0	431883	1432000	0	1377	1/1	0.99	992	1001870	-2540	1431974	2540	127.741	1562.836	419160	7335	20.97	349.85	21,430.65	449340	265248	12.38	074000	405504
15	51	20000	459434	1459000	20000	1467	195	1.05	1051	1000685	-2713	1458973	2713	129.402	1001.015	446627	7816	22.11	353.51	21,654.75	4/8/84	2/1462	12.54	374096	435534
17	53	-30000	450625	1457000	-30000	1561	2850	1.12	1100	1000037	-32905	1450971	32900	1526 036	10/10 205	440079	77/2	23.31	334.07	10 280 13	477902	2/80/0	12.71		
18	54	-30000	451079	1451000	-30000	1548	3238	1.13	1272	1001351	-36058	1450967	36058	1466 638	18927 994	438175	7668	25.93	295 77	18 118 27	469724	237680	13.12		
19	55	-30000	447920	1448000	-30000	1534	3426	1.35	1354	1003239	-36314	1447965	36314	1400.709	18374.846	433410	7585	27.34	277.44	16,995.00	464615	226890	13.35		
20	56	-30000	444552	1445000	-30000	1517	3588	1.47	1478	1005754	-36583	1444961	36583	1338.164	17864.999	428032	7491	28.83	259.83	15,916.66	458851	216515	13.60	310571	405142
21	57	-30000	441335	1441000	-30000	1498	3744	1.60	1613	1007944	-36854	1440958	36854	1278.412	17390.309	421996	7385	30.40	242.93	14,881.18	452380	206510	13.88		
22	2 58	-30000	437741	1438000	-30000	1477	3893	1.75	1771	1011873	-37141	1437954	37141	1221.752	16954.555	415239	7267	32.06	226.69	13,886.12	445136	196822	14.17		
23	59	-30000	433695	1434000	-30000	1453	4037	1.90	1930	1015588	-37420	1433950	37420	1167.329	16545.736	407716	7135	33.80	211.08	12,929.86	437072	187411	14.49		
24	60	-30000	429124	1429000	-30000	1427	4175	2.07	2110	1019158	-37712	1428945	37712	1115.618	16170.268	399360	6989	35.65	196.06	12,010.31	428114	178230	14.84		
25	61	-30000	423955	1424000	-30000	1398	4308	2.27	2324	1023670	-38030	1423939	38030	1066.886	15832.303	390085	6826	37.59	181.61	11,125.03	418171	169224	15.21	243389	362577
26	62	-30000	420410	561000	-30000	1365	4439	2.86	484	169135	-36289	560987	36289	965.422	14685.122	381882	6683	39.64	168.60	10,328.22	409378	161222	15.61		
27	63	-30000	416523	554000	-30000	1337	4321	3.11	532	1/1054	-36189	553986	36189	913.021	14252.111	373188	6531	41.80	156.25	9,571.45	400058	153500	16.04		
28	5 64	-30000	412267	546000	-30000	1306	4387	3.38	584	172706	-36277	545985	36277	867.941	13919.455	363781	6366	44.07	144.44	8,847.95	389973	145947	16.50		
28	000	-30000	407617	537000	-30000	1273	447Z	3.00	742	181526	-36534	532081	36534	786.050	13017.349	3/2512	5004	40.40	100.14	0,100.04 7 /01 78	379043	131161	10.90	175662	31/135
31	67	-30000	396895	527000	-30000	1199	4637	4.54	853	187865	-36688	526978	36688	748 587	13105 726	330484	5783	51 68	122.00	6 855 10	354279	123839	18.07	175002	514155
32	2 68	-30000	390738	521000	-30000	1157	4717	5.05	986	195267	-36859	520974	36859	713.207	12884.197	317420	5555	54.50	101.93	6.243.82	340274	116509	18.66		
33	69	-30000	383900	514000	-30000	1111	4795	5.61	1138	202823	-37044	513970	37044	679.732	12683.736	303230	5307	57.47	92.34	5,656.43	325063	109132	19.29		
34	70	-30000	376602	505000	-30000	1061	4872	6.23	1306	209628	-37239	504966	37239	648.003	12502.196	287823	5037	60.60	83.12	5,091.54	308547	101667	19.97		
35	5 71	-30000	368566	486000	-30000	1007	4947	7.31	1519	207810	-37474	485960	37474	618.383	12347.712	271073	4744	63.90	74.23	4,547.40	290590	94063	20.68	99940	251285
36	5 72	-30000	359852	465000	-30000	949	5025	8.34	1713	205450	-37687	464955	37687	589.765	12199.260	252903	4426	67.39	65.68	4,023.31	271112	86289	21.45		
37	73	-30000	350440	441000	-30000	885	5098	9.51	1918	201650	-37900	440950	37900	562.445	12062.947	233211	4081	71.06	57.43	3,518.30	250002	78308	22.26		
38	3 74	-30000	340319	414000	-30000	816	5168	10.84	2130	196524	-38114	413944	38114	536.382	11938.360	211888	3708	74.93	49.49	3,031.41	227144	70077	23.12		
39) 75	-30000	329497	385000	-30000	742	5235	12.36	2363	191205	-38340	384938	38340	511.676	11828.443	188804	3304	79.01	41.82	2,561.55	202398	61553	24.03	1005	
40) 76	-30000	317681	376000	-30000	661	5302	13.97	2908	208127	-38871	375924	38871	491.946	11821.257	163527	2862	83.32	34.35	2,103.95	175301	52593	25.00	13374	150759
	ols (3	-(5) are	taken fro	m a TIAA-C	JREF Lif	e VUL il	Iustratio	n base	d on a	nypothetic	cal gross	s 8% inves	stment r	eturn (befo	ore asset ch	arges). T	ne ques	tion exp	plored in	Cols. (6)-(24	4) is whet	ner an a	Iternative	plan of inve	esting

Cols (3)-(5) are taken from a TIAA-CREF Life VUL illustration based on a hypothetical gross 8% investment return (before asset charges). The question explored in Cols. (6)-(24) is whether an alternative plan of investing in a stock mutual fund (SMF) would be better than buying the policy. To make the alternatives comparable, it is assumed each year that funds are withdrawn from the investment account, Col. (12) and/or Col. (22), and used to buy term life insurance sufficient to supply the difference between the death benefit of the life policy and value of the SMF, whose death benefit (fund value) would also be free of income tax at death. Each year funds are also deducted to pay taxes on dividend income and on long-term capital gains (average cost method) realized on necessary share liquidations at a 15% federal tax rate and a 7.25% state income tax deductible on federal return. TIAA-CREF's illustration includes a 0.77% annual asset charge for investment management and related expenses, but this could be 0.06% with its own stock fund. It is assumed that the mutual fund invested in a Vanguard index fund with annual asset charges of 0.18% (.09% at \$100,000 and up). To equalize asset charges, 0.77% - 0.06%, or 0.71%, is deducted in Col. (19). The current dividend rate on Vanguar Index 500 is 1.73%, so 1.75% is used in Col. (18). For ease of calculation it is assumed that the capital gains tax on any share sold is paid one year after sale. The annual renewable term life insurance term costs in (9) are TIAA's at the \$250,000 level in its preferred plus female nonsmoker class, the same class illustrated in Cols. (3) to (5). Col (25) uses a marginal tax rate of 36% (federal and state) for calculating the tax on surrender of the VUL. The rate assumed for surrender of the SMF is 20% (including state). Note that at age 60, the TIAA cash value exceeds the mutual fund value, but the VUL always has a larger contingent tax liab if surrendered before death. In this illustration, the policy terminates at age 90 with a huge ta