



Comments on Dr. McCann’s Analysis Submitted as Part of NASAA’s Comment Letter to the SEC, Dated September 10, 2008¹

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In this report I evaluate Dr. McCann’s claims that Fixed Indexed Annuities (FIAs) are “complex contracts” whose issuers “obfuscate investment risks by repackaging what is actually a simple underlying investment in securities,” and whose performance is such that, based on Dr. McCann’s simulation exercise, “99.8% of the time [an] investor would be better off with [an alternative investment in] Treasury securities and stocks than with [an] equity indexed annuity.”² I also evaluate what I consider to be Dr. McCann’s irrelevant and erroneous calculations, and the negatively biased conclusions he bases on such calculations. Finally, I provide extensions and variations to some of Dr. McCann’s calculations to shed greater insight on FIAs, their attributes, and their performance under realistic conditions

I believe that the five serious deficiencies I analyze in depth, as well as with the many other deficiencies I comment upon in a more cursory manner, are central to Dr. McCann’s very partial and negatively biased view of the merits of FIAs. The SEC should not take Dr. McCann’s analysis at face value.

In this report I do not maintain that FIAs are appropriate for all individuals or even all seniors. Contrary to Dr. McCann’s almost universal rejection of FIAs, I submit, based on long accepted economic principles of rational choice, that a rigorous analysis of FIA

¹ Craig McCann, An Economic Analysis of Equity-Indexed Annuities, September 10, 2008, submitted to the North American Securities Administrators Association (NASAA).

² Craig McCann, An Economic Analysis of Equity-Indexed Annuities, September 10, 2008, pp. 1, 27. Following industry practice I use the term “fixed indexed annuities” (FIAs) instead of the alternative “equity-indexed annuities” (EIAs).

performance leads to the conclusion that, given a choice, many rational individuals beyond moderate degrees of risk aversion will favor FIAs over the kind of alternative investments Dr. McCann envisions. I also submit that an even larger group of individuals would benefit from having FIAs as a component of a portfolio of retirement savings vehicles.

I. Market Risk

Upside volatility does not impose risk to purchasers. FIAs, when used as intended, truly truncate or eliminate downside market risk, while keeping only a portion of the upside volatility. But Dr. McCann's naïve view of risk as identical to volatility hides an even deeper misunderstanding of who transfers market risk to whom.

Insurance companies try to avoid market risk. But, contrary to Dr. McCann's assertions, they do not do so by passing on the market risk to policyholders. Indeed, they go to great lengths to make sure that both the companies and the policyholders, especially persisting policyholders, are protected from market risk. This is the reason why an insurer's target accounting spreads (which Dr. McCann disingenuously refers to as an expense ratio) are what they are, say 2.5% per year. This is also the reason why these spreads are not anything like mutual funds' expense ratios.

Ironically, Dr. McCann's argument that insurers pass along all of the market risk to investors can be legitimately applied to his favorite purveyors of sound investments, mutual fund companies. By charging annual expense fees calculated as a percent of asset value under management, and by charging significant front- or back-end loads calculated as a percent of asset value transferred, a mutual fund company is able to truly and completely pass virtually all portfolio market risks along to fund shareholders. Arguably, the mutual fund industry as a whole is designed to pass along virtually all portfolio market risks to mutual fund shareholders. Accordingly, unlike insurance companies and banks, mutual fund companies are required to hold very little risk capital.

II. Crediting Methods and other features of FIAs

Dr. McCann discusses two basic methods used to credit interest in an FIA, the *point-to-point method* and the *averaging method*, but it is the latter method that he discusses in detail and on which he reports calculations.³ I believe that Dr. McCann's analysis concerning the averaging method is very limited in scope and, more importantly, incorrect.

According to the averaging method, the crediting rate for a given year is calculated as the greater of zero or the ratio of the average of the monthly index values to the index value at the end of the previous year, minus one. Dr. McCann is fully aware that the crediting rates obtained under both the point-to-point and the averaging method cannot be negative. First, he states that “[a]s with the point-to-point method, the percentage difference in the month-end average level during the contract year from the level at the beginning of the year is reduced by one or more gimmicks and the resulting credit, *if positive*, is applied to the prior anniversary's scrip value.” (Italics added) Second, the formula he reproduces in Equation 1 of his report clearly shows that the crediting rate cannot be negative.⁴

In spite of his awareness of non-negative crediting rates, Dr. McCann has chosen to illustrate the averaging method by ignoring the impossibility of negative crediting rates. Figure 1 of his report shows a December 31, 2004 value of 544 for the monthly averaging index he constructs. This figure also shows the monthly averaging index declining after it peaks in the year 2000.

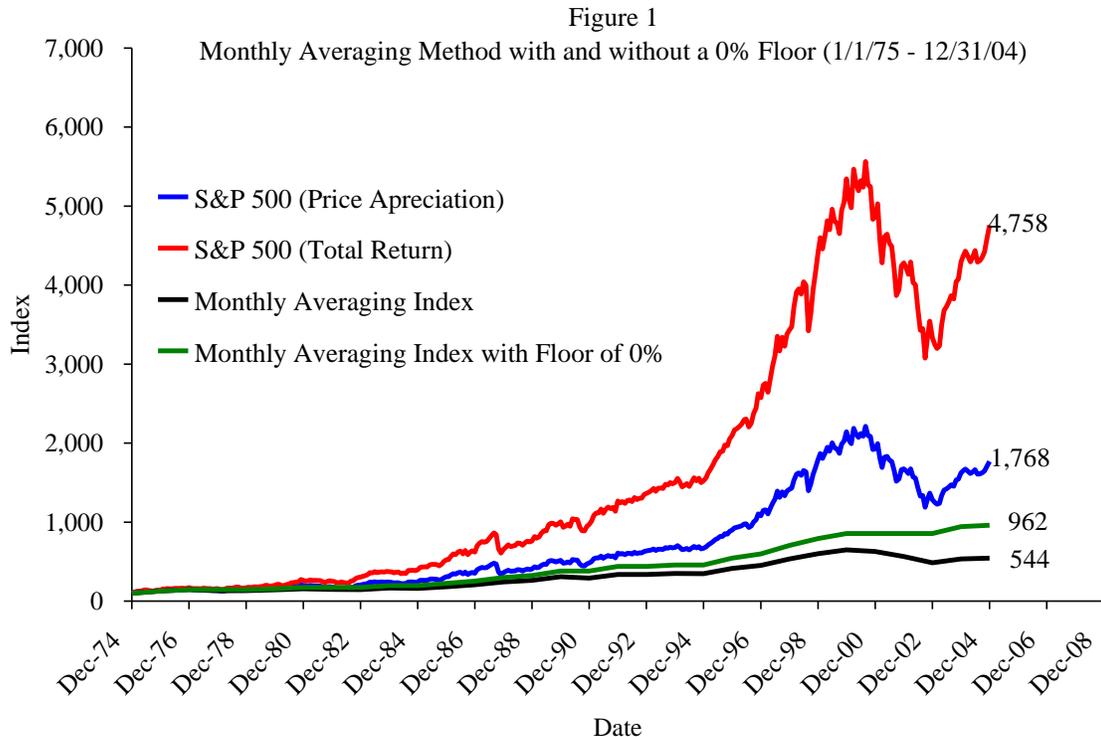
I have replicated the calculations in Figure 1 of Dr. McCann's report and included a monthly averaging index which, consistent with non-negative crediting rates and Dr. McCann's awareness of them, has a floor of zero percent.⁵ This index also has a value of 100 at the start of 1975 and grows to 962 by December 31, 2004, which is 77% higher than the errant figure of 544 calculated by Dr. McCann. In Figure 1 below I show the various indices considered by Dr. McCann as well as the monthly averaging index with a zero percent floor. Figure 2 shows the same indices on a logarithmic scale to illustrate more clearly the periods

³ Craig McCann, *An Economic Analysis of Equity-Indexed Annuities*, September 10, 2008, Section III.D., and Figures 1 and 2. Note that the point-to-point method is more widely used.

⁴ Craig McCann, *An Economic Analysis of Equity-Indexed Annuities*, September 10, 2008, pp. 9,10.

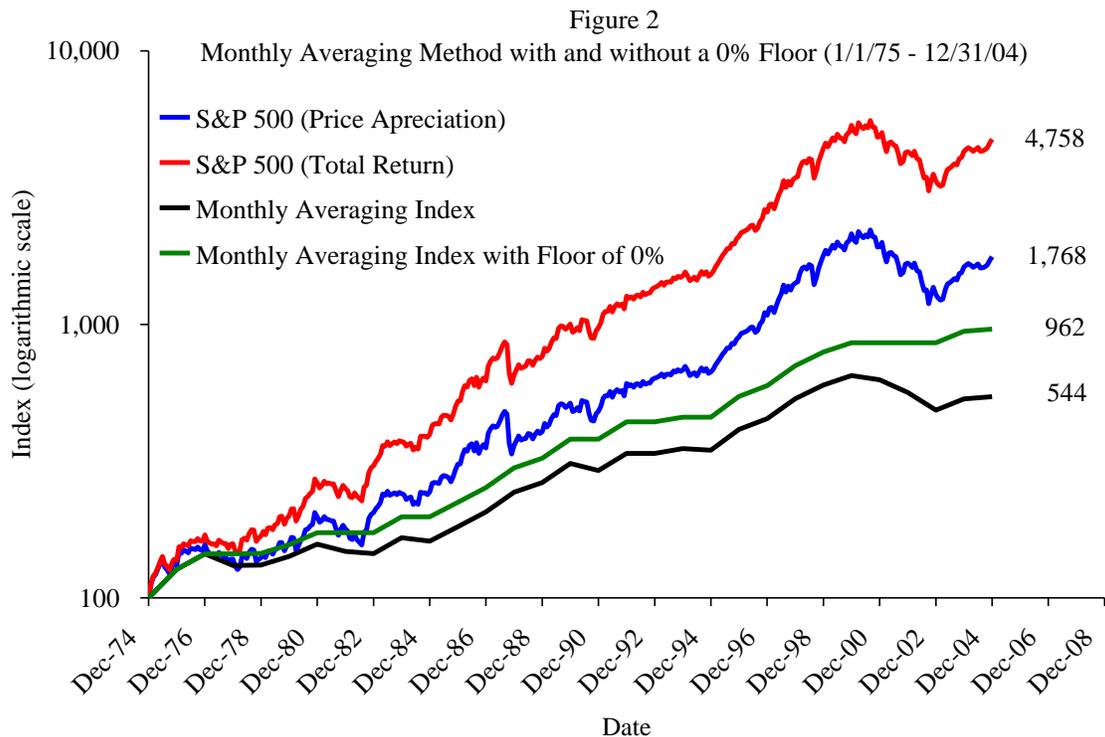
⁵ While I am able to replicate Dr. McCann's values of 1,768 and 544 for the S&P 500 index without dividends and his version of the monthly averaging index, Dr. McCann reports a value of 4,921 for the S&P 500 index with dividends as of 12/31/04. This is 3.4% higher than the value of 4,758 I obtained using monthly return data from Morningstar's SBBI 2008 Yearbook and Bloomberg.

where the monthly averaging index falls but the monthly averaging index with a floor of zero percent stays constant. I conclude, and I believe Dr. McCann would agree with me, that the value of 544 and the monthly averaging index he constructs are irrelevant for any informed analysis of an FIA's crediting method.



Dr. McCann's calculations over the period 1975 – 2004 imply annualized rates of return of 10.0%, 13.7% and 5.8%, respectively, for the S&P 500 index with no dividends, the S&P 500 index with dividends, and Dr. McCann's Monthly Averaging Index with no floor.⁶ My calculations for the Monthly Averaging Index with a zero percent floor imply an annualized return of 7.8% over the same period. This is a respectable return for an index that is guaranteed never to decline in value and many moderately risk-averse, rational individuals would consider an FIA based on such an index to be quite appealing.

⁶ Note that in practice, index mutual funds would incur loads, fees, taxes, and tracking error over time whereas the stock index itself to which the crediting rates are tied, is not affected by any of these drains; moreover, money grows tax deferred in an annuity. To see the impact of tax deferral on after-tax annuity accumulation values, see "Measuring the Tax Benefit of a Tax-Deferred Annuity," David F. Babbal and Ravi Reddy, October 4, 2008, Wharton Financial Institutions Center Policy Brief. This can be downloaded at: <http://fic.wharton.upenn.edu/fic/Policy%20page/AnnuityTaxation1.pdf>



As telling as constructing an appropriate monthly average index is, it is also useful to consider the implications for retirement savings of recent financial events. The US and international stock markets are sharply down from what they were a year ago. Many record-breaking daily declines in stock prices observed during September and October of this year are among the largest since 1926 and many experts believe that stocks will perform modestly over the next few years. Indeed, over the past ten years (from October 31, 1998 through October 31, 2008) the S&P500 index *with dividends* has returned an average of only 0.40% per year.

The implications of events over this decade and, in particular, the 2000 – 2002 period and the past year in US and international stock (and bond) markets for retirement savings, an area where FIAs play an important role, are staggering. In light of this it is therefore striking that, for his report to the SEC as part of NASAA’s comment letter of September 10, 2008, Dr. McCann has chosen to recycle two charts based on data through the end of 2004, from



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previous work he did up to January 2006, without bothering to update and correct such work.⁷

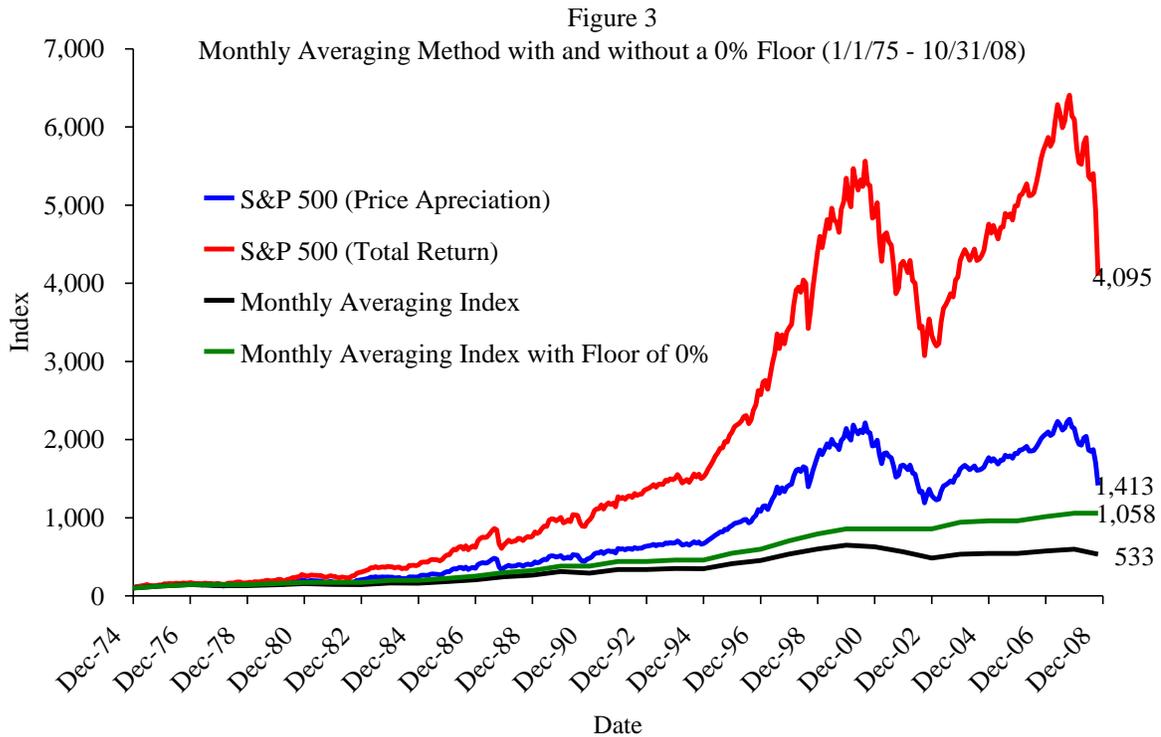
Consistent with the preceding discussion, I have extended Dr. McCann's indices, as well as the monthly average index with a floor of zero percent, through the end of October 2008. I report my findings in Figure 3 below.⁸

The value of 4,095 for the S&P 500 index with dividends and the value of 1,058 for the monthly averaging index with a zero percent floor imply annualized rates of return over the 1/1/75 – 10/31/08 period of 11.6%, and 7.2%, respectively.⁹

⁷ Figures 1 and 2 in Dr. McCann's report to the SEC are exact reproductions of Figures 1 and 2 in his working paper, with Dengpan Luo, PhD, An Overview of Equity-Indexed Annuities, 2006, downloadable from slcg's webpage www.slcg.com. Dr. McCann's report to the SEC as part of NASAA's Comment letter is dated September 10, 2008. Although the US financial markets have experienced their most dramatic declines in September and October of 2008, these markets have been declining steadily since October of 2007.

⁸ The value of 533 for the monthly average index with no floor is based on an average of monthly S&P 500 levels from November 2007 through October 2008, used as an estimate of what the average for the months of January through December 2008 would be. Using the January through October 2008 monthly average results in a monthly averaging index value of 519.82. In any case, the monthly average index return for 2008 will most likely be negative and so the contribution to the monthly averaging index with a floor of zero percent will most likely be zero as reflected in a value of at least 1,058.

⁹ The tax advantage accorded to annuities through tax deferral can actually be quite substantial over periods as long as the 30-year period considered by Dr. McCann, as well as for shorter periods. If a more suitable benchmark portfolio of CDs or bonds, or even a mixed portfolio of stocks and bonds is used, this tax advantage for consumers becomes even more apparent. A portfolio producing ordinary income would have to earn 100-350 basis points more per year to keep pace with the after-tax earnings produced by an annuity. See Babbal and Reddy, *op cit*.



As indicated above, an appropriate monthly averaging index with a floor of zero percent has an appealing property that insulates it from the severe downturns that stocks experience. And while Figure 3 shows that over close to 34 years the S&P 500 index with dividends is almost four times the size of the monthly averaging index with a zero percent floor, this comparison is misleading for the reason that no FIA has a surrender charge period of 34 years, typical periods being 10 to 15 years.

I have shown that extending Dr. McCann's period through October 31, 2008 significantly reduces the annualized returns on the S&P indices but does not reduce the return on the monthly averaging index as much. I have also considered other periods ending on October 31, 2008, either because their length is more consistent with the surrender charge period of a typical FIA or due to the relevance of recent events. Table 1 below reports annualized returns for the indices of interest over these other periods.

Table 1. Monthly Averaging Method – Annualized Return for Selected Periods

Period	S&P 500 with no	S&P 500 with	Monthly Averaging	Monthly Averaging
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	Dividends	Dividends	index (no floor)	Index (0% floor)
01/01/75 – 12/31/04	10.0%	13.7%	5.8%	7.8%
01/01/75 – 10/31/08	8.1%	11.6%	5.1%	7.2%
01/01/95 – 10/31/08	5.5%	7.4%	3.2%	6.2%
01/01/98 – 10/31/08	-0.02%	1.6%	-0.03%	3.8%
12/31/99 – 10/31/08	-4.6%	-3.0%	-2.2%	2.4%
10/31/07 – 10/31/08	-37.5%	-36.1%	-15.4%	0.0%

Inspection of Table 1 shows that considering periods such as 1995 – 2008 and 1998 – 2008 results in the monthly averaging index exceeding the S&P index with no dividends in the former period, and beating both indices over the last ten years. If, in addition, we note that FIAs often enjoy a premium bonus, say 5% to 10%, and that a mutual fund which tracks the S&P 500 total return index is subject to annual fees and other expenses, we begin to understand that an FIA’s crediting rate based on the monthly averaging method is much higher in actuality than Dr. McCann erroneously illustrates.

I also look at the impact, as of October 31, 2008, of investing in stocks or purchasing an FIA whose crediting rate is based on the monthly averaging index with a floor of zero percent around the two recent peaks, December 31, 1999 and October 31, 2007. If there is any need to comment on the last two rows of Table 1 above it is to note that the odds of observing an annual return of negative 36.1% or lower are about two in one hundred, based on monthly returns since January 1926.¹⁰

Dr. McCann is aware that considering just a single 30-year path, or even considering a few paths as shown in Table 1 above, does not provide a complete description of the relative performance of the monthly averaging method. For this reason, Dr. McCann “constructed 241 10-year periods by rolling 10 years of data forward one month at a time from 1975 to 2004.” This exercise allows him to report that, over a horizon of 10 years and starting with a base value of 100, average values of the S&P 500 index with dividends, the S&P 500 index with no dividends, and the S&P monthly averaging index were 463, 327, and 183,

¹⁰ Using monthly return data, there are 983 12-month periods starting on January 1926 through October 2008, for which an annual return can be calculated. Annual returns of negative 36.1% or worse have occurred 18 times during this interval.

respectively. Dr. McCann then concludes that “[u]nsophisticated investors might believe that they will get 100% of the increase from 100 to 463 when in fact they receive only 23% of this increase.”¹¹

But Dr. McCann repeats the same error of ignoring the fact that an FIA’s crediting rate provides a floor of zero percent each year, and his argument that the monthly averaging method with no floor of zero percent continues to generally perform so poorly when compared to the S&P 500 index with dividends is just as irrelevant as in the case of his analysis of the 30-year period from 1975 to 2004, and for the same reason.

I have shown in Table 1 above that when a floor of zero percent is combined with the monthly averaging method, the resulting annualized rates of return are significantly higher than what Dr. McCann’s calculations imply.

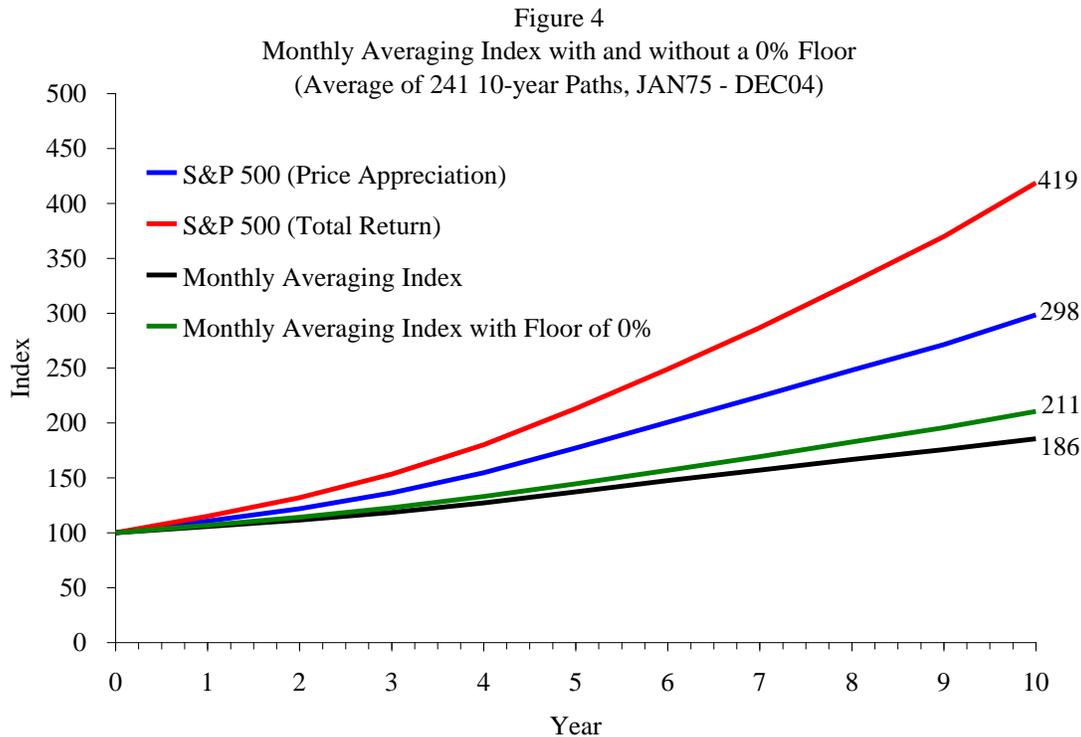
Next, I show that when all possible 10-year paths constructed for each month in Dr. McCann’s period of 1975-2004 are properly analyzed, his values of 463, 327, and 183, and his conclusion that “[u]nsophisticated investors might believe that they will get 100% of the increase from 100 to 463 when in fact they receive only 23% of this increase,” continue to be irrelevant in an informed analysis of the monthly averaging method.

I revise the calculations Dr. McCann illustrates in Figure 2 of his report in two ways. First, I construct 241 10-year paths for each of the indices of interest. Each path starts with a value of 100 and grows at the annual rate implied by the corresponding index for each of the ten years in the path. For instance, the S&P 500 index with dividends returned 37.21% in 1975 and so the index changed from 100 to 137.21 at the end of 1975. Over the ten years 1975 – 2004 this index grew from 100 to 396.27 returning an average of 14.8% per year. I construct a new path at the beginning of each month in the period so that I have a full ten-year path in each case. I then average all 241 paths for each of the indices of interest.

Second, I also construct a monthly averaging index with a zero percent floor, using the same methodology I have just described. Figure 4 below shows these average paths for the three

¹¹ See pp. 11 and 12 of Dr. McCann’s report. The figure of 23% is calculated as the ratio of the increase in the monthly averaging index to the increase the S&P 500 index with dividends ($83 \div 363 = 0.23$)

indices Dr. McCann considers and for the monthly averaging index with a zero percent floor.¹²



The annualized returns for the S&P total return index, the monthly averaging index with no floor and the monthly averaging index with a floor of zero percent are, respectively, 15.4%, 6.4% and 7.7%.

I have also considered periods other than the 30 years from 1975 to 2004. In Table 2, I report the annualized rates of return for all these periods, for each of the four indices I construct.

Table 2. Monthly Averaging Method – Annualized Return over 10-Year Periods

Period	S&P 500 with no Dividends	S&P 500 with Dividends	Monthly Averaging index	Monthly Averaging Index
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¹² My method of constructing the average paths is consistent with the notion of an average path and differs from the one considered by Dr. McCann. It is still the case, however, that Dr. McCann's monthly averaging index in Figure 2 of his report ignores the effect of a zero percent floor.

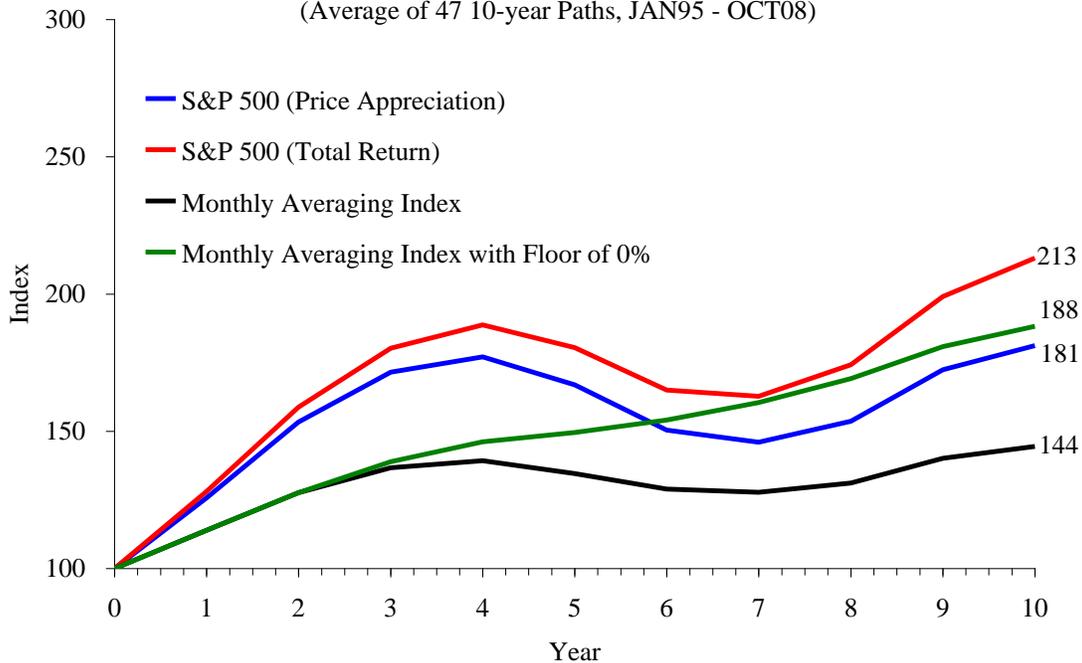
			(no floor)	(0% floor)
JAN75 – OCT04	11.6%	15.4%	6.4%	7.7%
JAN/75 – OCT08	10.8%	14.4%	6.0%	7.5%
JAN/26 – OCT08	7.6%	12.1%	4.2%	7.0%
JAN/95 – OCT08	6.1%	7.9%	3.7%	6.5%

As is the case with Table 1 above, Table 2 shows that ignoring the floor of zero percent is misleading and irrelevant for a discussion of the contribution of the monthly averaging method to an FIA crediting rate.

The period from January 1926 through October 2008 is relevant because of its length. It allows researchers to get a better sense of what the distribution of monthly stock returns actually is, rather than making distributional assumptions, such as log-normality, which are not supported by the available data. The extraordinary stock market volatility of the recent months indicates that rare events are not so rare after all. And in light of these events, it is perhaps unrealistic to expect that an S&P 500 total return fund may yield an average annual return of 15.4% (minus expenses, loads, taxes, and tracking error) over a period of ten years.

The last row in Table 2, showing annualized rates over the period from January 1995 to October 2008, is also of particular interest. Mutual fund companies usually report ex-post annualized returns for the funds they sell, including annualized returns “since inception.” FIAs begun to be sold in the US in 1995 and therefore, in the spirit of the “since inception” information that mutual fund companies provide, it may be of interest to know what the average annualized rate of return is, over a ten-year period, for the indices of interest. Table 2 shows that this return is 6.5% for the monthly averaging index with a zero percent floor, not far from the 7.9% for the S&P 500 index with dividends. Note that if we add a 5% to 10% premium bonus to an FIA based on the monthly averaging index, and if fees and expenses (as well as other factors such as load, taxes, and tracking error) are deducted from the return on the S&P 500 index with dividends in order to approximate realistic index fund returns, the difference between a 6.5% return and a 7.9% return may well get reduced to zero. Figure 5 shows the evolution of the four average indices for the period of January 1995 through October 2008.

Figure 5
Monthly Averaging Index with and without a 0% Floor
(Average of 47 10-year Paths, JAN95 - OCT08)



Although Dr. McCann mentions the more popular point-to-point method that is also used to credit interest in an FIA, he does not present any calculations on the performance of a point-to-point index, subject to a cap, relative to the S&P 500 index with reinvested dividends. However, he does address this issue in the working paper he coauthored with Dr. Dengpan Luo, from where Figures 1 and 2 of Dr. McCann’s report to the SEC came, and where he states that “[t]he effect of annual caps is dramatic because the average long run return to stocks is heavily influenced by years with unusually high returns. For example, the annualized price appreciation in the S&P 500 from 1975 to 2004 was 10.0%. If we cap the yearly increase at 14%, the resulting series has an annualized appreciation of only 5.5%.”¹³ As in the case of Dr. McCann’s monthly averaging index calculations, this comparison of 10.0% versus 5.5% is flawed by failing to understand that an FIA’s crediting rate based on the point-to-point method with a cap must also include a floor. When I correct Dr. McCann’s calculation and include a floor of zero percent on the annual point-to-point return with an annual cap of 14%, the resulting annualized rate over the 30 years from 1975 to 2004 is

¹³ Craig McCann, PhD and Dengpan Luo, PhD, An Overview of Equity-Indexed Annuities, 2006, downloadable from slcg’s webpage www.slcg.com, Section III.G., pp. 8-9.

8.5%, not 5.5%. Table 3 below reports annualized rates for the capped point-to-point index, with and without a floor, for the same periods shown in Table 1.

Table 3. Point-to-Point Method – Annualized Return for Selected Periods

Period	S&P 500 with no Dividends	S&P 500 with Dividends	PtP Index with 14% Cap (no floor)	PtP Index with 14% Cap (0% floor)
01/01/75 – 12/31/04	10.0%	13.7%	5.5%	8.5%
01/01/75 – 10/31/08	8.1%	11.6%	4.2%	8.1%
01/01/95 – 10/31/08	5.5%	7.4%	1.0%	8.0%
01/01/98 – 10/31/08	-0.02%	1.6%	-2.3%	6.4%
12/31/99 – 10/31/08	-4.6%	-3.0%	-5.7%	4.7%
10/31/07 – 10/31/08	-37.5%	-36.1%	-36.1%	0.0%

Table 3 shows that ignoring a floor of zero percent when discussing a capped point-to-point method for crediting interest to an FIA is an egregious distortion and has dramatic consequences indeed.

In this Section of my report I have shown that Dr. McCann’s analysis of an FIA’s basic crediting methods is incorrect and irrelevant when his calculations ignore the basic feature of a zero percent floor in spite of Dr. McCann’s awareness that crediting rates based on either the point-to-point or the monthly averaging methods cannot be negative. Consequently the conclusions that Dr. McCann derives from his analysis related to Figures 1 and 2 in Sections II and III of his report are irrelevant for the purpose of judging the merits of FIAs.

In the next two Sections I discuss Dr. McCann’s claims that “99.8% of the time the investor would be better off with [a portfolio of] Treasury securities and stocks than with [an] equity-indexed annuity,” and that the value of an FIA on the day of purchase can be as low as 70 cents per dollar.¹⁴

III. FIA Performance Compared to Stocks and Bonds

¹⁴ Craig McCann, *An Economic Analysis of Equity-Indexed Annuities*, September 10, 2008, Section VI.

In his report, Dr. McCann describes a simulation exercise he has conducted where he compares the performance of an FIA to a portfolio of stocks and Treasury securities, which I will refer to as Dr. McCann's 30/70 portfolio, where 30% of the initial amount is invested in a simulated S&P 500 Total Return fund and the remaining 70% is invested in a 14-year zero-coupon Treasury strip.¹⁵ He concludes, presumably based on a large number of simulated 14-year paths for the values of the FIA and the 30/70 portfolio, that "99.8% of the time the investor would be better off with the Treasury securities and stocks than with the equity-indexed annuity."¹⁶

I have not been able to replicate Dr. McCann's simulation experiment since the information he provides is incomplete and some of it appears to be contradictory (is there an "index margin of 4%," or is it a "4% monthly cap" – see pp. 26, 27), but I have been able to replicate similar experiments Dr. McCann has conducted elsewhere where he has similarly claimed that various versions of his mixed portfolio of stocks and a Treasury security beat a 14-year monthly point-to-point FIA "98, 98.5, almost 99 percent of the time," depending on the initial allocation between stocks and bonds.

Central to Dr. McCann's various simulation experiments is the assumption that index returns are identically, independently, and log-normally distributed with a certain mean and variance.¹⁷ This assumption turns out to be far from realistic. A Jarque-Bera test for normality of a random time series, applied to continuously compounded monthly S&P 500 capital gains returns from January 1926 to October 2008 yields a test-statistic value of 2706.¹⁸ The corresponding value for continuously compounded monthly S&P 500 total returns is 2722. These values are so large, compared to a 5% critical value of 5.99, or a 0.0001% critical value of 27.63 (representing odds of one in one million), that one has to conclude that monthly S&P 500 returns are not log-normally distributed. Similar conclusions are affirmed for shorter subperiods.

¹⁵ Craig McCann, *An Economic Analysis of Equity-Indexed Annuities*, September 10, 2008, pp. 26-28.

¹⁶ Craig McCann, *An Economic Analysis of Equity-Indexed Annuities*, September 10, 2008, p. 27.

¹⁷ See p. 9 and footnote 8 of Drs. McCann and Luo's sleg working paper of 2006 cited above. This log-normal distribution assumption implies a normal distribution of continuously compounded rates of return.

¹⁸ Jarque, Carlos M. and Anil K. Bera (1980). Efficient tests for normality, homoskedasticity and serial independence of regression residuals, *Economics Letters* 6 (3): 255–259.

Based on the strong rejection of the log-normality assumption, Dr. McCann's success rates of 98% or 99% for his portfolios of stocks and Treasury securities need to be reevaluated. In order to do so, I approximate the actual distribution of monthly S&P Index returns with the empirical distribution of historical monthly returns from January 1926 through the present. More specifically, when looking at an n -year FIA, I consider all possible n -year paths beginning on January 1926. Each path has $12 \times n$ consecutive months and this allows me to preserve the distributional features, including short-term dependencies, contained in the actual data. For each path I construct an n -year value of the annuity and any alternative investment. It is then possible to calculate the fraction of the time that the n -year annuity beats the alternative investment in a realistic setting.

I consider a monthly point-to-point FIA with a monthly cap of 3.5%, a 0.0% annual floor, a premium bonus of 6%, a minimum guarantee of 1.5% per year and a surrender charge period of 14 years. This is the annuity Dr. McCann claims a simulation exercise shows being worse than his portfolio 98%, 98.5% or even 99% of the time. I also consider another monthly point-to-point FIA with a monthly cap of 4.25%, a 0.0% annual floor, a premium bonus of 3%, a minimum guarantee of 2.15% per year and a surrender charge period of 9 years. These two annuities are actual annuities that have been sold by issuers in recent years.

I compare the 14- or 9-year annuity value to 14- or 9-year values of three alternative investments. First I look at an S&P 500 total return "fund" constructed from the historical S&P 500 index with no dividends, plus a 2.25% annual dividend yield and minus a 0.20% annual expense fee.¹⁹ Next I consider a "50/50-Z" portfolio where half of the initial amount is invested in the total return fund just described and the other half is invested in an n -year zero-coupon bond. My third portfolio also has half of the initial amount invested in the total return fund and the other half invested in a "bond fund" whose return is the historical Intermediate Term Government Bond return (from the SBBI database) minus annual fees of 0.26%. I refer to this portfolio as the 50/50 portfolio. To aid comparison with Dr. McCann's approach, none of these portfolios are ever rebalanced. Historical data are monthly returns on the S&P 500 Index with no dividends and on Intermediate Term Government Bonds from

¹⁹ Note that loads, tracking error and tax treatment are not included in my comparison. Including these factors would result in better FIA performance.

January 1926 through February 2008. This period results in 819 14-year paths and 879 9-year paths.

Table 4 reports the percent of times that the 14- and the 9-year annuities beat the alternative investments.

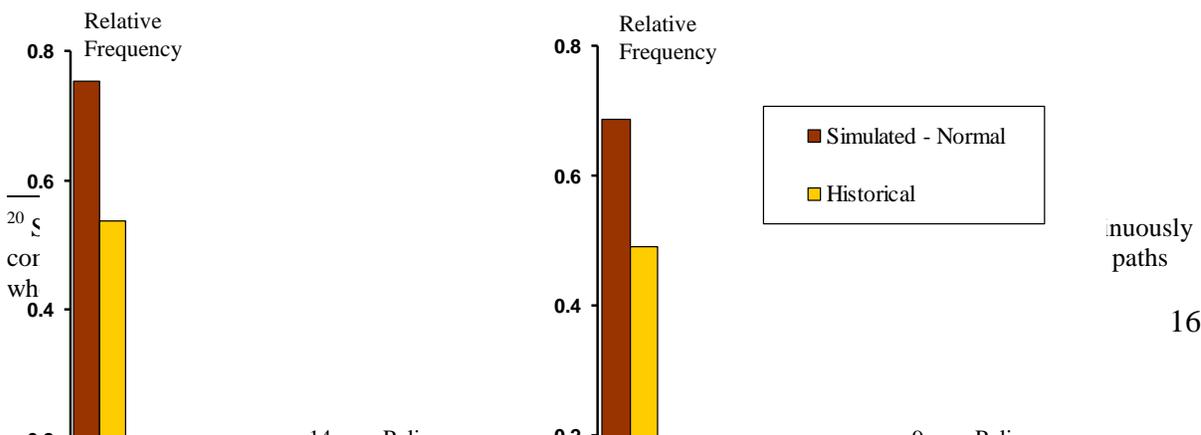
Table 4. Percent of times FIA Beats Alternative Investments

Alternative Investment	14-Year FIA	9-Year FIA
S&P 500 Total Return Fund	21.5%	37.1%
50/50-Z Portfolio	25.0%	56.3%
50/50 Portfolio	33.8%	63.3%

The percent of times the FIAs of interest beat alternative investments reported in Table 1 are much higher than the 2% or 1% that Dr. McCann seems to obtain in his simulation experiments. These rates are surely better in reality since mutual funds investors often buy high and sell low. I believe that his unrealistic assumption that index returns are log-normally and independently distributed is the main reason why success rates differ so much. Figure 6 shows histograms of annual crediting rates for the 14- and the 9-year annuities calculated under both the normal distribution assumption and the actual empirical distribution of historical monthly returns.

The distribution of crediting rates based on actual returns assigns considerably less probability mass to crediting rates below 5% per year than the simulated distribution does. Consequently, significantly more probability mass is assigned to crediting rates higher than 5% under the historical return distribution, especially in the range 10% to 30%.²⁰

Figure 6. Distribution of Empirical and Simulated Crediting Rates



The results I report in Table 4 indicate that none of the FIAs I consider systematically beats any given alternative investment and that no alternative investment systematically beats any of the FIAs. There is, however, a well accepted framework of rational choice which I can use to illustrate the fact that many rational individuals will prefer an FIA to any of the alternative portfolios considered. This is the framework of expected utility which can be used to rank investment alternatives based on the full distribution of returns as a function of an individual's risk tolerance. Using the familiar power utility function

$$(1) \quad U(1+r) = \frac{1}{1-\rho} [(1+r)^\rho - \rho], \quad \rho = 0, 1, 2, \dots,$$

where ρ is the coefficient of risk aversion I calculate the expected utility of wealth, $1 + r$, for the various instruments considered, where r is an annual crediting rate in the case of an FIA, and an annual return in the case of one of the portfolios considered. I also consider an investment on 3-month US Treasury bills. Since returns are random I calculate the expected utility associated with each alternative as a function of the risk aversion coefficient, as the average utility over the empirical distribution of crediting rates and returns for the various alternatives I consider (there are 82 annual return observations, from 1926 to 2007, for each alternative I consider. I do not include the 50/50-Z portfolio due to the presence of the 14- or 9-year zero-coupon bond). Figure 7 ranks each alternative for risk aversion coefficients between zero and 25.

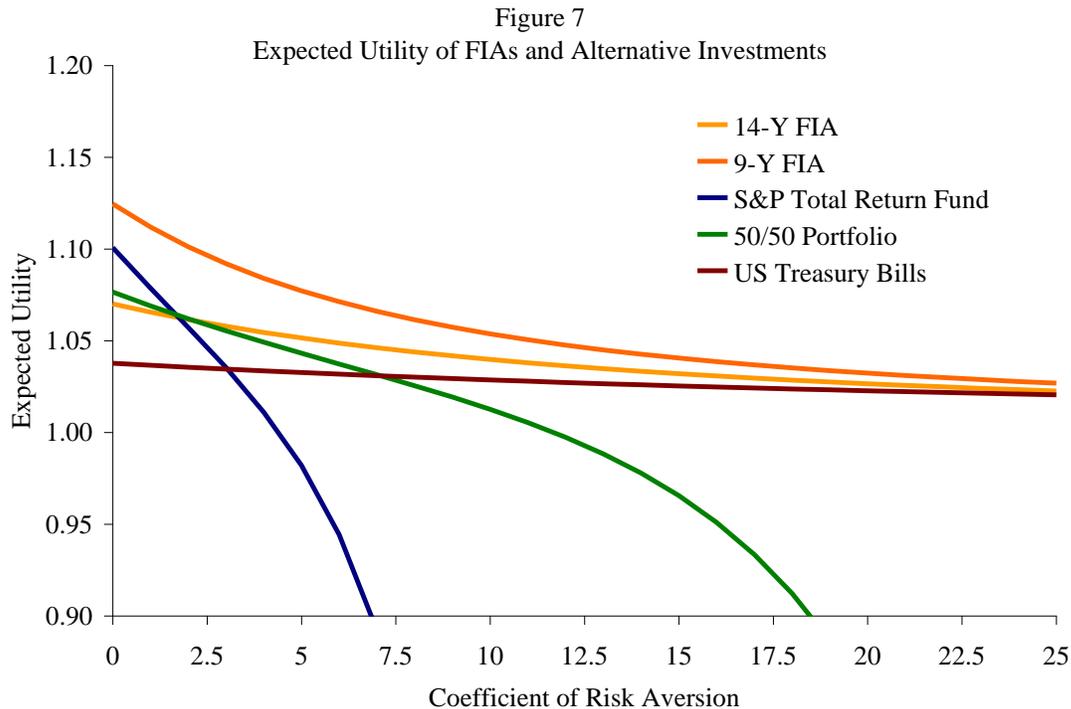


Figure 7 shows that rational individuals with risk aversion coefficients 2.5 or higher, a fairly moderate level, rank the 14 year annuity higher than any investment alternative and that rational individuals, no matter what their degree of risk aversion would prefer the 9 year annuity to any investment alternative. Based on my expected utility analysis I conclude that while rational individuals with a high tolerance for risk may prefer a portfolio of stocks and bonds to certain FIAs, even moderately risk-averse individuals will rationally prefer FIAs to stocks and bonds. From the point of view of diversification, an even larger number of rational individuals will consider FAIs as part of a prudent investment strategy.

IV. Valuation of FIA Features

Dr. McCann claims that the “value of the death benefit is less than 10 basis points per year.” (p. 16) He claims to be valuing them from the consumer’s perspective, yet this is clearly an allusion to what he purports to be an insurer’s actuarial cost and has very little to do with an individual consumer’s valuation of such benefit. In this section I present evidence to show that, even when using his valuation model, his calculation is incorrect, and that the death benefit for seniors is worth far more than he discloses.

Dr. McCann calculates the purchase day value of an FIA using a statistical version of a simple FIA valuation model that ignores many of the features which make FIAs attractive and distinct from the kind of investment products he compares them to.²¹ This valuation approach is based on his assumptions that index returns are identically, independently log-normally distributed and that it is possible to replicate all contingent payoffs under the FIA.²² These assumptions are simply not applicable to either index returns or to long-term, age-dependent products such as FIAs.

Dr. McCann's purchase day valuation models do not provide any meaningful guide to FIA valuation, not only because of his unrealistic assumptions on which they are based, but also because they attempt to value just one of the many features of an FIA.

To illustrate the shortcomings of the valuations Dr. McCann obtains I use his model to incorporate two of these features, mortality risk (the beneficiary receives the full annuity value should the policyholder die before the annuity's term) and penalty-free withdrawals (10% of account value). I consider an actual 17-year annual point-to-point annuity with a premium bonus of 10%, an annual cap of 7%, a 0.0% annual floor, a minimum guaranteed rate of 2.25% per year, and a participation rate of 100%, which Dr. McCann incorrectly believes is 50%. This annuity was sold in August 2005.

Table 5 reports the purchase day value that Dr. McCann estimates for this annuity, 69 cents per dollar of premium. I also report the corrected estimate when the participation rate is set at the correct level of 100%, 76 cents per dollar.

Finally, I report the impact on Dr. McCann's value estimates of incorporating mortality risk and penalty-free withdrawals. Depending on the age of the policyholder and the discount rate used in Dr. McCann's model, purchase day value estimates, even according to a simple model relying on unrealistic and wrong assumptions, actually range from 100 to 103 cents per dollar when the correct discount rate is used. Given the difference that using realistic distributional assumptions makes, as I have shown in the previous Section, and given that

²¹ See p. 11 of Dr. McCann slcg working paper with Dr. Luo, An Overview of Equity-Indexed Annuities, 2006.

²² See Serena Tiong, 2000, Valuation of Equity-Indexed Annuities, *North American Actuarial Journal*, 4, pp. 49-170.



one would have to incorporate a number of other annuity features to properly assess an FIA's value, I conclude that it is simply not credible to maintain that the purchase day value of an FIA is 69 cents per dollar of premium.

Table 5 - The Relevance of Mortality Risk and Penalty-Free Withdrawals
(Purchase Day Value Estimate per Dollar of Premium)

Dr. McCann's Estimated FIA Value: \$0.69
 Estimated FIA Value Using Correct 100% Participation Rate: \$0.76

Panel A: Incorporating Mortality Risk

Discount Rate	Purchase at Age 65		Purchase at Age 75		Purchase at Age 80	
	Female	Male	Female	Male	Female	Male
AA Insurer's Rate	\$0.79	\$0.81	\$0.83	\$0.86	\$0.88	\$0.90
Risk-Free Rate	\$0.88	\$0.90	\$0.92	\$0.94	\$0.95	\$0.97

Panel B: Incorporating Mortality Risk and Penalty-Free Withdrawals (at 10% per year)

Discount Rate	Purchase at Age 65		Purchase at Age 75		Purchase at Age 80	
	Female	Male	Female	Male	Female	Male
AA Insurer's Rate	\$0.95	\$0.96	\$0.96	\$0.98	\$0.98	\$0.99
Risk-Free Rate	\$1.00	\$1.00	\$1.01	\$1.02	\$1.02	\$1.03

V. Target Investment Spreads

Dr. McCann is operating under a serious misunderstanding when he equates target investment spreads to mutual fund loads and fees (pp. 16-22). He characterizes these spreads as ranging from “275 to 300 basis points implied annual cost of equity-indexed annuities (p. 16).” Later, in referring specifically to American Equity, he uses an average annual spread figure of 281 basis points (p. 19). This leads him to make statements that are entirely erroneous and misleading.²³ First, Dr. McCann must understand that there is a difference between a stated yield spread and an economic spread. Stated yields on assets are not their expected returns. Neither are stated crediting rates the expected cost of liabilities.

²³ See, for example, David F. Babbel and Stavros Zenios, “Pitfalls in the Analysis of Option-Adjusted Spreads.” *Financial Analysts Journal* 48:4 (1992): 65-69.



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Sophisticated financial institutions often speak in a “shorthand” manner by referring to stated yields and target earnings spreads instead of actual expected economic returns. People understand in these institutions that a targeted accounting earnings spread is sufficiently higher than the actual expected economic earnings spread to account for the cost of various risks. Were this not the case, nobody would invest in Treasuries or top-rated bonds. Of course, it is the economic returns that ultimately matter to an economic enterprise, not the accounting spreads. A typical insurer will have a target yield *together with a target credit quality, market sector, and maturity range*. That target yield will be set high enough to compensate for the portfolio losses that are likely to occur over long periods of time, including those stemming from debtor insolvency, default, delay, maturity extensions, sinking fund options, doubling-up provisions, call options, prepayment options, illiquidity, and other more arcane debt features. An insurer may have different portfolio yield targets for different instruments of the same credit rating – for example, the insurer may require yields on AA-rated mortgage-backed securities to be 50 to 100 basis points higher than those on AA-rated corporate debt, owing to the uncertainty of debtor prepayment speed on mortgages. This is what financial experts refer to as the premium required for “negative convexity.”

Yields on almost all non-Treasury financial assets are higher than their expected returns, owing to such factors as possible default, sinking fund provisions, call features, and prepayment (or delayed payment) behavior on the part of borrowers, negative convexity, duration mis-match, foreign currency exposure, and so forth. These same institutions understand that the “certainty-equivalent” yield of a financial instrument is approximated by the yield of a Treasury bond of similar duration characteristics.²⁴ The stated asset yield (or portfolio yield, in the case of an insurer’s general account) may be several percent higher than its expected return. For example, over the past 12 years the yield spreads on financial instruments of varying credit quality vs. Treasury bonds of similar duration have been as reported in Table 6:

²⁴ This is a simplification, of course. There are other complexities involved in fixed income security valuation that are not discussed here, but treated in the vast fixed income valuation literature. Basic treatments of some of these issues are provided in David F. Babbel and Craig Merrill, *Valuation of Interest-Sensitive Financial Instruments*. John Wiley, 1999; and Anthony M. Santomero and David F. Babbel, *Financial Markets, Instruments and Institutions*. McGraw-Hill, 2nd ed. 2001. More advanced treatments are available in an extensive literature, particularly in many recent issues of the *Journal of Finance*, *Review of Economic Studies*, *Journal of Financial and Quantitative Analysis*, *Journal of Fixed Income*, and elsewhere.

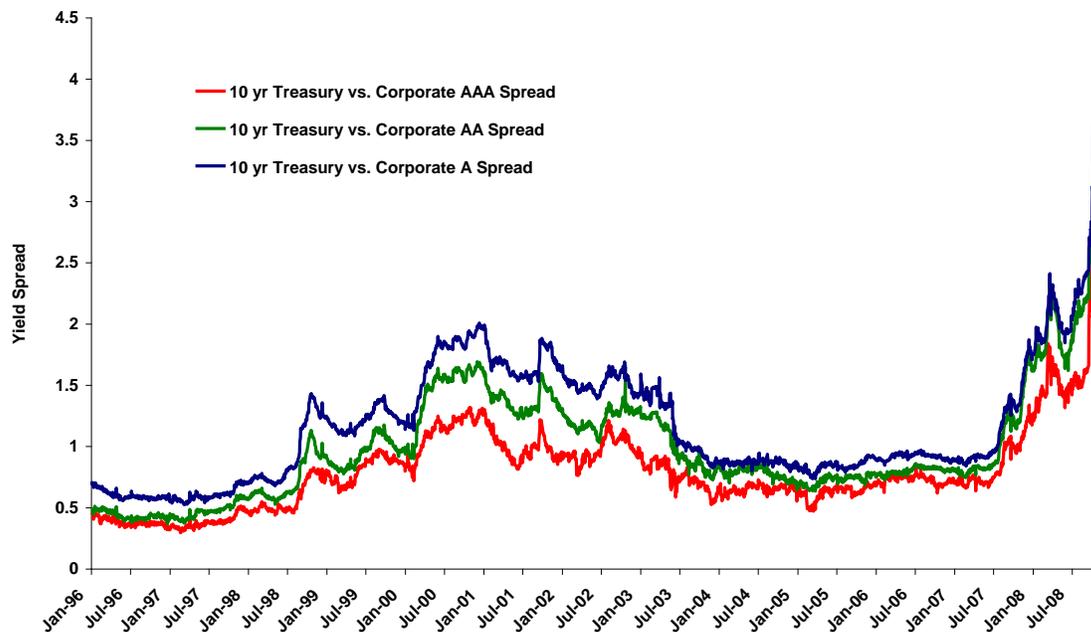
Table 6. Daily Yield Spreads over 10-Year Treasury Notes, Jan. 1996- Oct. 2008

Instrument	Low spread, in percent	High spread, in percent	Average spread, in percent
10-yr AAA-rated corp. bond	0.46	2.81	0.81
10-yr AA-rated corp. bond	0.48	3.83	1.00
10-yr A-rated corp. bond	0.70	4.11	1.18
10-yr BBB-rated corp. bond	0.74	4.86	1.62
10-yr BB-rated corp. bond	1.47	7.59	2.99
10-yr B-rated corp. bond	2.23	10.29	4.38
30-yr mortgage-backed security	0.61	3.91	1.57

Source: U.S. Federal Reserve Board of Governors and Bloomberg

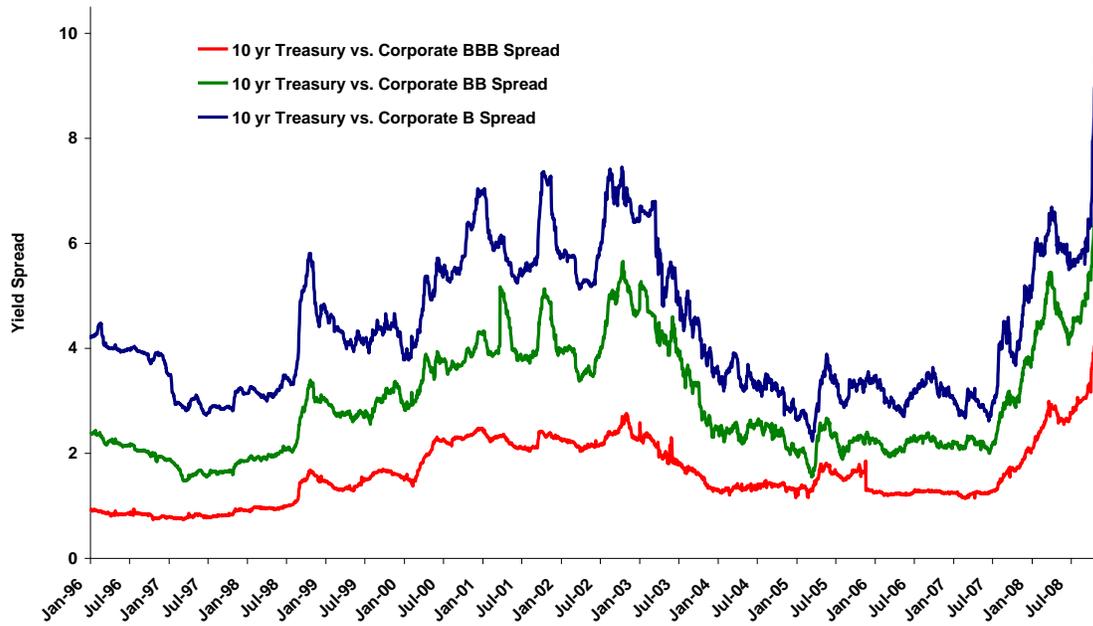
Figures 8, 9, and 10 show the daily yield spreads for the securities considered in Table 6.

Figure 8. 10 yr Treasury / Corporate Yield Spreads



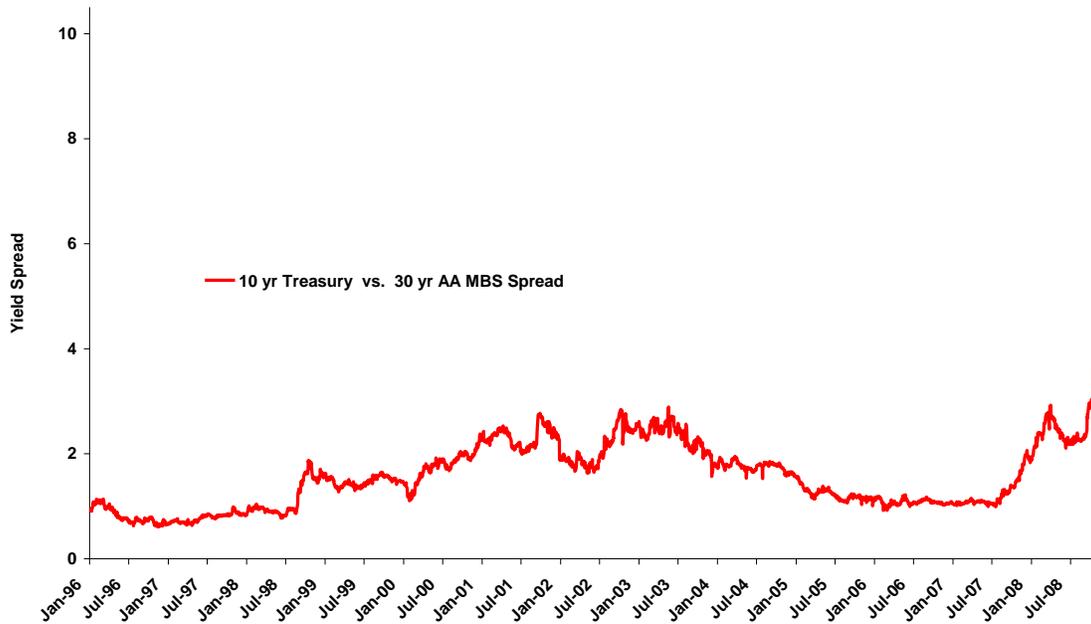
Source: Bloomberg

Figure 9. 10 yr Treasury / Corporate Yield Spreads



Source: Bloomberg

Figure 10. 10 yr Treasury / 30 yr AA Rated MBS Yield Spread



Source: Bloomberg



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Equally important, these average yield spreads will vary by sector (e.g., industrials, transportation, utilities, energy), by duration, and by individual company. Indeed, the range of yield spreads for a given maturity and a particular investment grade bond quality (e.g., A-rated) may vary by an additional 3% or more across other bonds of similar quality and tenor on any given day.²⁵ Spreads range even wider on non-investment quality bonds on any given day.

The insurer may actually earn the stated yield, but more often than not, the insurer will earn something different, and sometimes very different. The economic return of the instrument or asset portfolio can be determined only after knowing the timing and amount of any distributions, as well as the change in market price. In almost all cases, the promised yield is an upward-biased measure of the expected return, and more importantly, the certainty-equivalent yield. It is the difference between certainty-equivalent portfolio yields and liability costs that is a correct measure of business profitability; anything beyond or below that is more a function of the amount of risk taken on by the financial institution. The financial statements relied on by Dr. McCann in making his statements will not reflect the actual returns on financial assets at any point in time. Indeed, the accounting numbers on which his earnings spreads are based can show positive asset earnings at the same time that true economic earnings are very negative.

The “short-hand” of an insurer targeting a spread of, say, 3% may equate to an intrinsic profitability of 1%. Contrast this with the spread or margin charged by a mutual fund. In the case of a mutual fund, a 1% margin is the same charge in market values and in accounting entries. The market risk is absorbed by the mutual fund investor, and the margin will be earned regardless of what happens to the value of the fund. But not so for an insurer, who absorbs the major part of the risk each year and provides a guaranteed return to the policyowner based on a formula that cannot be changed until the crediting rate period concludes.

VI. Other Issues

²⁵ See, for example, Jerome Fons, “Using Default Rates to Model the Term Structure of Credit Risk.” *Financial Analysts Journal* 50:5 (1994): 25-32.

There are many other aspects of FIAs that Dr. McCann criticizes. I address them briefly in this Section.

Regarding Dr. McCann's statements on market value adjustment (MVA) factors (pp. 14-15), surely Dr. McCann is aware that such products are already regulated by the SEC, unless their possible downward adjustments are limited to be less than what would otherwise violate the nonforfeiture requirements of each state. Therefore, only the annuities with potentially more severe MVAs are those that are regulated by the SEC. Moreover, for products that do feature MVAs, the risk transfer allows the insurer to offer more attractive crediting rate terms, lower surrender charges, or otherwise more favorable terms to policyholders who will be less inclined to surrender their policies prematurely in search of higher yields as market conditions change.

Dr. McCann has stated that FIA issuers are generating extraordinary commissions to salesmen and profits to issuers, yet he has not given any evidence of either. Commissions for salesmen tend to average less than 1% per year of contract length, which is not dissimilar to other financial contracts sold at the retail level. Indeed, equity mutual funds have loads that can go as high as 8.5% (plus annual maintenance fees that generally exceed 1% per year). Moreover, investors switch from one fund to another after 3-4 years, on average, in search of better performance, and this behavior may generate new front-end or back-end loads with each switch.²⁶ The combination of these factors means that investors typically perform far worse than the market indices would suggest, generating only about half as much income over 20 years as the market indices.

Dr. McCann has pointed out that a rule proposal which exempts from SEC oversight only those equity-indexed annuity contracts whose payoffs are more likely than not to exceed the amounts guaranteed under the contract would exempt none, as all existing equity-indexed annuities would meet this criterion, requiring all to be registered under Federal securities laws (p. 2). If my interpretation of this provision is accurate, he is correct in his assessment.

²⁶ See John C. Bogle, "The relentless rules of humble arithmetic." *Financial Analysts Journal* 61:6 (2005): 22-35; Ilia D. Dichev, "What are stock investors' actual historical returns? Evidence from dollar-weighted returns." *American Economic Review* 97:1 (2007): 386-401; and DALBAR, "The Measurement of Success," *Quantitative Analysis of Investor Behavior* (2008).



However, this proposed rule is simply weird. Do consumers need the SEC to protect them from financial instruments that could return more than their guaranteed minimums?

Dr. McCann claims that “equity-indexed annuities are quite similar to equity-participation securities, which are traded on the American Stock Exchange under various brand names (p. 4).” I would point out that there are big differences. None offer the tax deferral of FIAs, none offer options that can parlay any gains during the accumulation period into continued tax deferral through annuitization, almost none lock in annual gains through ratcheting provisions, none offer guarantees backed by the general account of an insurer, and backstopped by the state insurance guaranty associations and National Organization of Life and Health Guaranty Association, almost none are traded in a liquid market, and any early dispositions are typically done with the issuing bank, none offer special early surrender provisions that allow cashing out at par value upon death, disability, or entrance into a nursing home, and none provide guaranteed cash-out provisions at each point in time throughout their lives. Moreover, equity participation securities are not being offered currently with other than very short maturities, because they are generally offered when volatility is low. It doesn’t take much more to note that some of the most popular SEC-registered equity-participation securities were backed by Lehman Brothers, Bear Stearns, and Merrill Lynch. Many of these securities may already be worthless.

Dr. McCann seems to believe that annuities cannot be sold at prices which reflect their costs. In states where insurance prices are regulated, which occurs most often in certain property/casualty lines of business, laws are set to provide for insurer pricing that reflects their expected losses, marketing costs, administrative costs, loss adjustment expenses, and a fair rate of return on their capital. Dr. McCann’s annuity pricing equivalent eliminates all but the annuity’s analogue of “expected losses.” I would note that in his mutual fund comparisons, he typically uses Vanguard as his benchmark. Vanguard, which offers *mutual* funds in their traditional sense, has been the lowest cost provider of index funds for many

years (although Fidelity recently began marketing an S&P Index fund on a loss-leader basis that features even lower maintenance expenses).²⁷

Dr. McCann castigates annuities for linking their crediting rates to positive movements in the S&P or other stock indices (p. 7). Yet the equity participation securities he touts on p. 4 overwhelmingly link their returns to indices sans dividends, or individual stock prices. Moreover, the fact that FIAs are linked to positive returns in price indices without dividends simply means that the dividend returns are not “baked into their price.” It would be feasible (albeit less convenient from a consumer’s monitoring point of view) for an FIA to be linked to an index that includes dividends, but most options, futures, and private options that are used to hedge the risks faced by insurers who offer FIAs are based on price indices and not total return indices. Therefore, it is easier for the insurer to hedge this element of their annuity liabilities and the annuities are priced accordingly.

Dr. McCann has stated in footnote 6 that annuity “issuers obscure the simple economics of this investment by making it superficially extraordinarily complicated (p. 5).” This is an extraordinary claim. He obviously has not attempted to hedge one of these instruments. Issuers who hedge them with over-the-counter customized derivatives contracts must incur substantial basis risk, counterparty risk, and pooling risk; there are no derivative contracts available that hedge the many risks which face the issuer, and substantial amounts of capital are needed to handle the basis risk, counterparty risk, and pooling risk that remains after obtaining a derivatives contract that hedges one element of the annuity contract. An issuer may choose to purchase a counterparty credit default swap, or absorb the risk of default by putting its own capital at risk. If the insurer chooses to hedge the interest rate component, interest rate caps must be purchased and interest rate floors can be sold to lessen that hedging cost, but these also involve significant basis risk. Typically, available derivatives can hedge only one day out of every 365 days of an annual coverage period; if a death, disability, nursing home confinement, withdrawal, or surrender occurs on any other day, there is substantial basis risk involved. Insurers handle these risks through pooling, risk absorption through capital, and in the case of early surrender, the imposition of surrender charges.

²⁷ John C. Bogle, “Bringing Mutuality to Mutual Funds.” *Rotman International Journal of Pension Management* 1:1 (2008): 54-64.



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For insurers who opt to dynamically hedge the hedgeable elements of their contracts, they may need to undertake over 20,000 trades for a 15-year annuity contract, where the hedges are typically enacted by taking multiple (e.g., seven) positions in the futures market on each day, where these positions are adjusted daily or more frequently, depending on market conditions. Yes, the annuities can be pooled, exposures can be netted against each other to some extent, and hedging economies can be achieved, but a good dynamic hedging program is not a trivial exercise like it may be in a theoretical world; in the real world there are many contingencies that Dr. McCann has overlooked, and talented financial managers are necessary to secure the promises of annuities through dynamic hedging.

Dr. McCann states that “equity-indexed annuities can be valued using standard, scientific methodologies. (p. 25).” I am aware of no annuity provider that prices annuities according to the model he uses, which relies on the earliest version of the Black-Scholes-Merton option pricing model to determine what he claims to be a fair price of an FIA. Indeed, if an insurer were to price annuities according to his formula, it is unlikely that an insurance regulator would approve its sale. Regulators ask insurers to show that they can remain financially viable under realistic market conditions, and the “normal distribution of rates of return” together with the constant interest rate and constant volatility that he assumes would fail their stress test criteria. His certitude about the model’s pricing implications vis-à-vis what he purports to be a fair annuity price should be considered in light of the caution that Professor Merton gave regarding the application of option pricing models in the concluding paragraph of his Nobel Lecture of December 9, 1997: “Even this brief discourse on the application to finance practice of mathematical models in general and the option-pricing model in particular would be negligently incomplete without a strong word of caution about their use. At times we can lose sight of the ultimate purpose of the models when their mathematics become too interesting. The mathematics of financial models can be applied precisely, but the models are not at all precise in their application to the complex real world. Their accuracy as a useful approximation to that world varies significantly across time and place. The models should be applied in practice only tentatively, with careful assessment of their limitations in each application.” Rather than exercise caution, especially in light of the fact that the real world violates all 20 of the underlying assumptions of the pricing model he has put forth, Dr. McCann proceeds with reckless abandon and posits his model price as a proper basis on



which courts may determine and assess damages to annuity purchasers. He has done this in every jurisdiction in which he has testified concerning annuity pricing.

Dr. McCann states that “Other things equal, equity-indexed annuities with longer surrender periods provide less value to investors than annuities with shorter maturities (p. 8).” He bases this statement on his pricing model mentioned above. The fact that his pricing model substantially underestimates the crediting rates provided to annuity purchasers (and in the medium to higher ranges of crediting rates, underestimates their frequency by roughly 100%), combined with his use of a model-inconsistent discount rate that would render suspect the value of every other derivative security, and even all U.S. Treasury bonds, together with the fact that he ignores most of the options provided by annuities, are the factors that create this artifact. Correcting the omissions and incorrect application of his model and this pricing anomaly vanishes.

On p. 8 of his submission, Dr. McCann criticizes two-tier annuities because their surrender penalties do not completely disappear over time unless the annuity holder opts to annuitize. He claims elsewhere that the probability of annuitizing a deferred annuity is typically less than 5%. He neglects to explain that by their very design, two-tier annuities provide a disincentive to surrender prematurely, and indeed are designed to perform best when the annuity purchaser annuitizes during the decumulation stage, rather than procure a lump-sum payout. The issuers of such two-tier annuities have lower lapsation than they would have otherwise, which allows them to invest in longer-term, less liquid assets and garner the higher returns that such assets typically fetch. These higher returns can be passed through to consumers via contractual parameters. Moreover, avoiding the deadweight costs of lapsation allows the annuity issuer to offer relatively attractive annuitization terms that can be based on cohort pricing at the outset of the contract purchase. Experience of annuitization under these contracts, while still early, is in excess of 60% -- a far cry above the 5% number cited by Dr. McCann as being typical.

On p. 9 of his submission, Dr. McCann castigates FIAs for reducing annual annuity accumulation values through “one or more gimmicks,” but fails to recognize that in the absence of such contractual provisions, the annuity would be costlier to the consumer.

Dr. McCann dismisses the value of “bonus credits” (pp. 13-14), saying that they are fully offset by higher surrender charges, longer surrender periods and larger pricing spreads.” While he offers two anecdotal examples, he fails to recognize that, without such bonus credits, there would be greater uncertainty to the purchaser about what the ultimate accumulation values will attain. With bonus credits, at least part of this uncertainty is resolved, and less is left to the future evolution of the reference index. Moreover, reducing the deadweight economic drains to policyholders imposed by those who surrender their policies prior to maturity provides the insurer the flexibility to offer more attractive provisions to all policyholders. Dr. McCann exhibits a severe misunderstanding of this issue.

Dr. McCann claims (p. 14) that the surrender charges can be as high as 25%. The only annuity with which I am familiar that imposes such a high surrender charge offers a 10% bonus credit, which is not forfeited upon surrender; accordingly, the net surrender charge is 15%, which amounts to about 1% per year of the policy period, consistent with most other annuities. This amount is necessary to collect from surrendering policyholders because of distribution costs. They could be imposed at a lower level as part of the purchase price to all policyholders, but it is deemed fairer to impose them only upon those who impose the costs; this allows more attractive terms to be set that can benefit policyholders who manage their annuity in the manner that it was designed.

VII. Concluding Remarks

A rigorous evaluation of Dr. McCann’s calculations related to the merits of FIA crediting methods, the chances that FIAs perform better than investments in stocks and bonds, and the valuation of the maturity payoffs of FIA leads me to believe that his calculations are wrong, misleading, and based on assumptions not supported by the available data. Dr. McCann’s conclusions, based on his flawed calculations, are negatively biased, unsubstantiated and wrongly maintain that FIAs are, qualitatively, similar to portfolios of stocks and bonds and, from a quantitative point of view, perform much worse than portfolios of stocks and bonds. None of Dr. McCann’s conclusions should be taken at face value.

In this report I have corrected some of Dr. McCann’s main errors and shown that FIAs are not qualitatively similar to portfolios of stocks and bonds. FIAs are rather very different



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products and have many valuable features that contribute to their value. Dr. McCann's insistence in arguing that FIAs are comparable to mutual funds only reveals his lack of understanding of how FIAs work, how US financial markets work, and how competitive pressures in the insurance industry work. I have also shown that, even when compared to portfolios of stocks and bonds FIAs perform very well, especially when moderate risk-aversion levels are considered, and would be appealing to a very large class of rational individuals.



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