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CANNEX RESEARCH

Comparing the Performance of Annuities with Principal Guarantees: Accumulation Benefit on a VA Versus FIA

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Comparing the Performance of Annuities with Principal Guarantees: Accumulation Benefit on a VA Versus FIA

AUTHORS
TAMIKO TOLAND, HEAD OF ANNUITY RESEARCH
BRANISLAV NIKOLIĆ, SENIOR QUANTITATIVE ANALYST
DAMIAN BABOOLAL, QUANTITATIVE ANALYST

For more information about analysis and industry trends, contact Tamiko Toland, Head of Annuity Research: tamiko.toland@cannex.com, 203-826-8977

For more information about the data, contact Branislav Nikolić, Senior Quantitative Analyst: branislav.nikolic@cannex.com, 416-926-2239

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EXECUTIVE SUMMARY

There are various annuity products that offer principal protection that are available to clients. However, differences in design make it difficult to assess their performance simply by scrutinizing the contract characteristics. This CANNEX research compares a New York Life variable annuity (VA) with guaranteed minimum accumulation benefit (GMAB) against several popular fixed indexed annuity (FIA) designs.

The CANNEX research finds that a VA with GMAB can provide a competitive guarantee relative to an FIA with the added benefit of certainty of the pricing structure for the guarantee term and the possibility of higher upside. When the VA with GMAB outperformed the FIA, the average performance was at least 25% greater than the FIA in the same scenario. When the VA with GMAB underperformed the FIA, the average performance was no more than 19% less than that of the FIA.

- Compared against FIA designs with an annual point-to-point crediting strategy, the downside protection of the VA with GMAB does not have the same smoothing effects because the performance is measured once in the same period. This creates a cluster of results where the guarantee is triggered and the client receives the return of premium after 10 years. By contrast, the FIA very rarely has returns close to zero.

- Compared against a FIA crediting strategy using a rate cap, the VA with GMAB is more likely to have higher upside. The rate cap creates a tight banding of results with less variance but also a strict limitation on upside due to the maximum gain in any year. The VA with GMAB outperformed the FIA most of the time and, when it did, generally did so with a high margin.

- Compared against a FIA crediting strategy using a participation rate, the VA with GMAB is not as likely to have higher upside but has greater potential for upside when it does outperform the FIA.

- In order to exceed the performance of the VA with GMAB (higher performance more than 50% of the time), a strategy using a rate cap must have a cap greater than 8.25%. For a strategy using a participation rate, the participation rate must be greater than 42.30%.

- One element of uncertainty that distinguishes the two product types is that the VA guarantee is static for the full 10-year term, whereas the insurer is able to renew the FIA with different rates from those in effect at issue. CANNEX speculates that this variability is most likely to manifest in situations with deteriorated market conditions which are most likely to skew the lower end of performance even lower. However, because the factors that drive rate setting are opaque and vary among companies, there are likely other situations in which the rate may vary after contract purchase.

OBJECTIVE

The research described in this report is designed to compare the performance of the principal guarantee of a New York Life VA with GMAB against common FIA designs after a period of 10 years, when the GMAB has matured and both products may be surrendered without penalty. The aim is to evaluate these contracts under realistic market conditions using models that fully reflect the design characteristics of the respective products.

BACKGROUND

In addition to providing guaranteed lifetime income, many annuities also offer principal guarantees. All fixed annuities share this feature and are fundamentally fixed income instruments. Standard fixed annuities offer a straightforward rate like a bank certificate of deposit. However, FIAs leverage a component of equity performance that creates the opportunity for upside gains while still offering downside protection.

VAs are by nature fully exposed to the market movement of the individual subaccounts. The contract does not inherently preserve principal, but a GMAB offers protection against loss for a fee. There is a waiting period before the benefit can be exercised, often around 10 years; it is possible to reset the benefit base to a higher amount if the market increases the contract value, but this also restarts the waiting period and may change the rider fee. This style of living benefit is not as ubiquitous as those that guarantee income, but it is currently available and sometimes embedded as a component of another benefit. The value proposition of the GMAB is straightforward and addresses the same fundamental concerns about loss of principal that contribute to the popularity of FIAs.

It is difficult to superficially compare the performance of the FIA and VA because their designs are inherently different. FIAs do not invest directly in subaccounts like VAs do but instead use crediting strategies that are linked to indices, most commonly the Standard & Poor's 500 Index. The crediting strategies use a limit on either the maximum positive index contribution (cap) or the percentage of the index (participation rate) in any period. Point-to-point crediting methods measure the index changes on a regular basis, most often annually. Earlier CANNEX research provides more details on the performance dynamics of certain FIA crediting strategies (Accumulation Value of Fixed Annuities (MYGA & FIA): Understanding Yields by Product Design, April 2018).

It is possible for insurers to change the crediting rates on FIAs during the term of the contract, before the surrender period ends. Typically, the participation rate or rate cap is guaranteed for a year and thereafter is subject to change at the discretion of the insurer. There is sparse information on renewal rates or factors that affect renewals, so this does add an element of unpredictability to the potential accumulation value of an FIA over 10 years. That said, it is widely understood that insurers rely on derivatives to manage these products and subsequently determine renewal rates of performance limitations, with the caveat that renewal rates for some strategies are more sensitive to changes in market conditions.

This is a key and unquantifiable difference between these contracts and VAs when considered over a decade. As mentioned earlier, the VA retains the flexibility to change the cost with an increase in the benefit base. However, without a step-up in the benefit base, the cost does not change.

The value proposition of the GMAB is straightforward and addresses the same fundamental concerns about loss of principal that contribute to the popularity of FIAs.

RESEARCH METHODOLOGY

The research focuses on one New York Life VA contract and four FIA designs that were available in contracts sold during September 2018 and represent common designs at that time. The analysis uses a holding period of 10 years, which coincides with the shortest guarantee option for the GMAB.

The VA we analyze is the New York Life Premier Variable Annuity II VA with Investment Preservation Rider 3.0, a B share contract with a contingent deferred surrender charge period of seven years. There are two options for the annual mortality and expense fee: a higher rate based on the initial premium or a lower rate based on the contract value. The higher rate is 1.30% during the 7-year surrender charge period and 1.10% thereafter. The lower rate is 1.20% during the surrender charge period and 1.00% thereafter. Given the 10-year holding period of this analysis, it makes more sense to select the 1.30% premium-based fee, as an investor would expect the contract value to rise significantly over the 10-year period. We estimate a fund expense ratio of 1.00%. The GMAB has a fee of 1.15% with a maximum rate of 2.00%. We assume no election of the optional death benefit; the base death benefit guarantees return of premium. There is a $30 annual policy service charge that is waived at $100,000, which is also the starting premium; therefore, the model does not include the service charge.

Investment Preservation Rider 3.0 offers options with a longer waiting period and the same base guarantee, 100% of starting premium. These options have fees that get lower as the waiting period gets longer. In addition, there is a version with a 20-year waiting period and a 150% return of premium guarantee. In order to conduct a fair comparison with the FIAs, we analyze the 10-year waiting period. The guarantee can only be exercised after 10 years and does not continue to increase in value beyond that period. Based on the investment restrictions and available investment options, there is a 30% required allocation to fixed income and the equity allocation can be as high as 70%.

The FIAs all offer no premium bonus, include no optional benefits, and have no explicit fees. In order to represent the most common designs available, we model annual point-to-point strategies that use the S&P 500. Crediting strategies that use rate caps and participation rates are both prevalent; in order to calibrate against the market for each crediting strategy, we use two different rates: "competitive" and "average." The competitive rate is a higher rate that is within the range of competitive rates and a lower one that represents an average rate among contemporary products.

FIA Crediting Strategy with Rate Cap

- **6.5%**—Competitive Rate
- **4.0%**—Average Rate

FIA Crediting Strategy with Participation Rate

- **45%**—Competitive Rate
- **40%**—Average Rate

To conduct the analysis, we use custom versions of the CANNEX VA Benefit Analysis℠ and CANNEX FIA Benefit Analysis℠ services. We calculate the contract value net of guarantees, either the GMAB or the FIA design, based on 10,000 randomly generated market scenarios. The S&P 500 model uses an 8% mean return and 16% volatility. The bond portion uses a 4% mean return, 8% volatility and 30% correlation to the stock index. The underlying VA fund is allocated 70% to equities and 30% to bonds, rebalanced monthly. The stock portion uses the model of the S&P 500 with a 2% annual dividend rate added to the mean return for a total mean return of 10%. For the FIAs, which are all based on the S&P 500 without dividends, we assume a static cap or participation rate over the full term, which may not reflect how these contracts would actually perform, especially in the event of changes in equity volatility and interest rates.

RESULTS

At a high level, the VA had an average annualized return of 4.99% over the 10-year period. One FIA strategy, using a competitive participation rate, had an average annualized return of 5.10%, and the rest had lower returns, ranging between 2.45% and 4.54%. **Exhibit 1,** below, summarizes high-level results for all the strategies.

In order to capture the relative performance of strategies, we compare performance for a given scenario. This means that, for a specific sequence of returns over 10 years, we determine how the VA performed relative to that of the FIA and the magnitude of the difference as a percentage. For this purpose, we regard the results to be equivalent when they are within 5% of each other.

It is no surprise that the relative performance follows a similar pattern as the average annualized return, which is an aggregated figure. However, we also see that the instances in which the VA underperforms the FIA result in a more modest difference in return, ranging between 14% to 19% lower than the FIA's return. However, the gain in the instances where the VA overperformed the FIA was much higher, ranging from 25% to 56%.

Exhibit 1: VA Performance Relative to FIA Designs

Strategy	Cap Rate	Participation Rate	Average Annualized Return	VA Higher (Frequency)	Performance Difference (Compared to FIA)	VA Same (Frequency)	Performance Difference (Compared to FIA)	VA Lower (Frequency)	Performance Difference (Compared to FIA)
VA with GMAB			4.99%						
Annual Point-to-Point with Rate Cap (Average)	4.00%		2.45%	66%	56%	9%	0%	25%	-14%
Annual Point-to-Point with Rate Cap (Competitive)	6.50%		3.78%	53%	44%	11%	0%	35%	-18%
Annual Point-to-Point with Participation Rate (Average)		40%	4.54%	46%	30%	14%	0%	40%	-17%
Annual Point-to-Point with Participation Rate (Competitive)		45%	5.10%	38%	25%	15%	0%	47%	-19%

Source: CANNEX Financial Exchanges Limited

Break-Even Analysis

Based on the results comparing the GMAB against these four FIA designs, there is a break-even point that defines where the VA and FIA are roughly equivalent, meaning that the probability that the VA performance is higher equals the probability that the VA performance is lower.

The strategy with rate cap must be much higher than the rates we considered in the study in order to exceed the performance of the VA. By contrast, the break-even for strategies with participation rates sits between the 40% and 45% participation rates. From this perspective, there is greater parity between participation rate FIAs and the VA, products that share fundamental design characteristics that also allow for greater upside.

Annual Point-to-Point with Rate Cap Needed to Match VA with GMAB

8.25%

Annual Point-to-Point with Participation Rate Needed to Match VA with GMAB

42.30%

PERFORMANCE PROFILES OF THE VA WITH GMAB AND FIAS

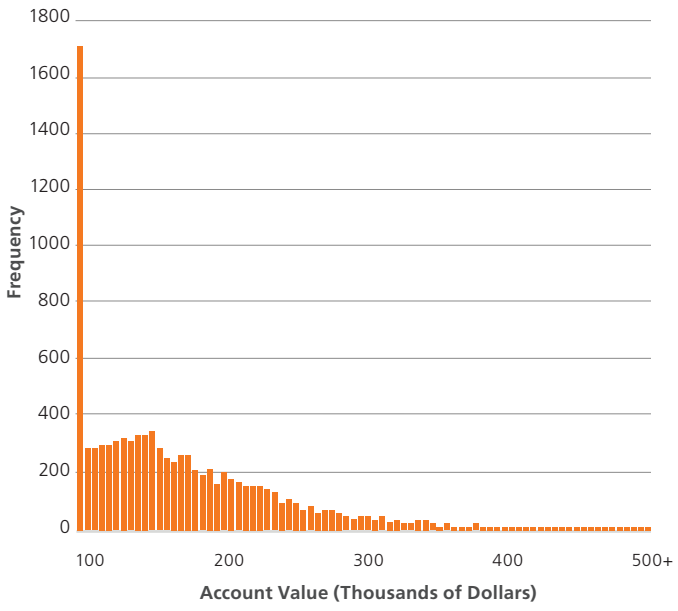
In order to fully appreciate the functional differences between the VA and the two FIA crediting methods, it is helpful to look at the performance profile. For each contract, CANNEX creates a histogram that indicates the frequency of results that fall within a cluster. The height of each point on the histogram represents the density of results within that cluster. The lowest result within the study is the base guarantee, which is return of premium. Every other position represents realized upside. This presentation allows a visual understanding of the distribution of results in terms of frequency and magnitude that is otherwise unclear when looking strictly at averages.

Annual Versus 10-Year Point-to-Point

The FIA crediting strategies with rate caps and participation rates have very different performance profiles, so it is important to evaluate each separately in relation to the VA with GMAB. However, there is one principle that is important and applies to both crediting methods and the VA with GMAB, although it has different effects based on product design. All of these products assure that returns will be no less than zero over a certain period of time, but that period varies based on product design. Because of the guarantee, all results that are equal to or less than 0% return provide the same return, 0%, and these cluster together on the year they are calculated. We see this in **Exhibit 2**, below, which shows the distribution of results for the VA with GMAB.

This is also true for the FIAs in any given year, with a large number of results clustering at the 0% mark. However, the FIAs experience a smoothing effect over a decade as the calculation is performed on an annual basis and combines with all years' returns to arrive at a final rate (as noted earlier, the renewal rates may differ from the starting rate, which will affect the end result but does not change this phenomenon). With repetition over 10 years, the annual calculation means that there is very low probability of near-zero results, causing a shift in the distribution away from the 0% mark.

Exhibit 2: VA with GMAB at Year 10

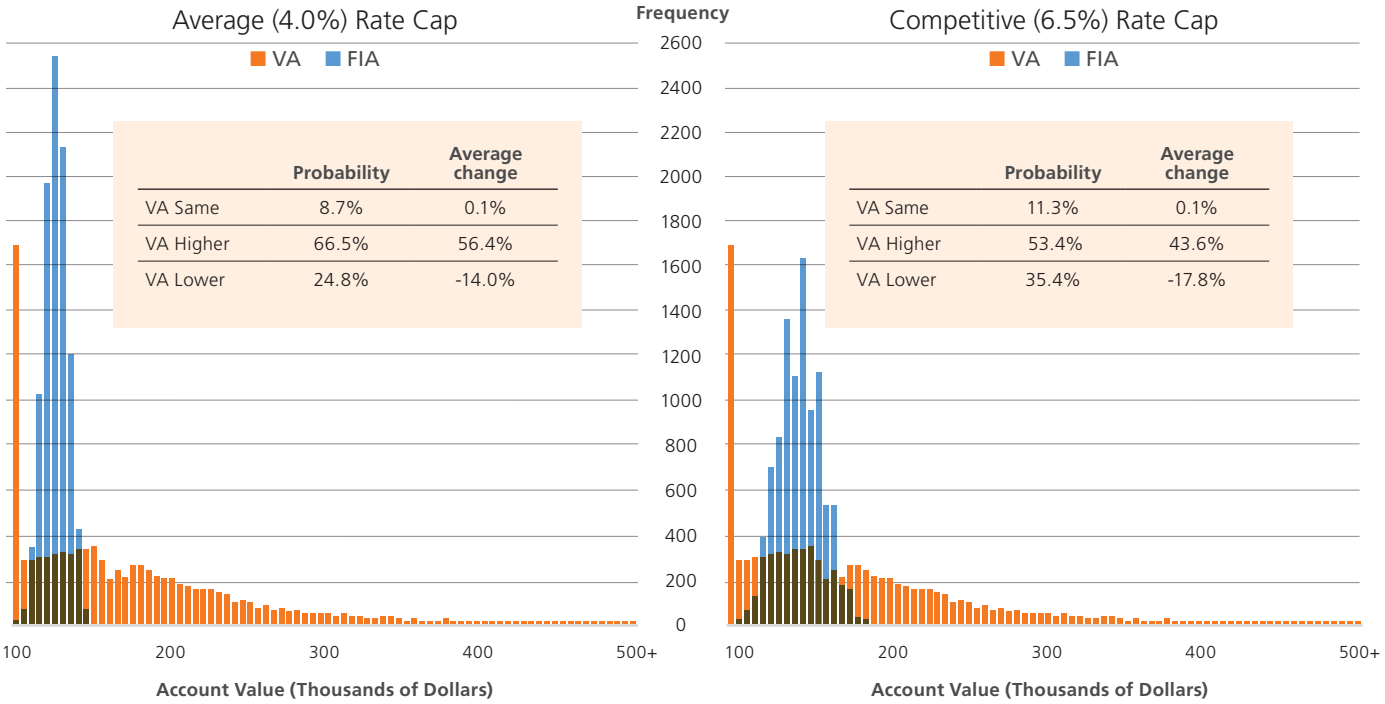


Account Value After 10 Years (Thousands of Dollars)	Percentage of Results
100	14.44%
100 – 150	31.12%
150 – 200	26.19%
200 – 250	15.26%
250 – 400	11.80%
400+	1.19%

Note: Ranges are not proportional.

Note: Starting premium is $100,000.
Source: CANNEX Financial Exchanges Limited

Exhibit 3: VA with GMAB Compared Against FIA Strategies with Rate Caps



Source: CANNEX Financial Exchanges Limited

By contrast, the VA with GMAB measures performance only once over the 10-year period, effectively making it a 10-year point-to-point strategy. There is a cluster of results at the guarantee (0% return) that captures all scenarios where the market was negative at the end of the 10-year period but the guarantee came into effect. This is analogous to similar clustering with the one-year return for the FIAs. In **Exhibit 3**, above, the VA with GMAB has a large spike on the left followed by the bulk of results and then a tail that extends past 400% of the starting premium. There are very few results in this zone, but they are extremely high. Because these relatively few data points can skew the average, we do not rely on the averages alone to compare performance.

VA with GMAB Compared Against FIA Strategies with Rate Caps

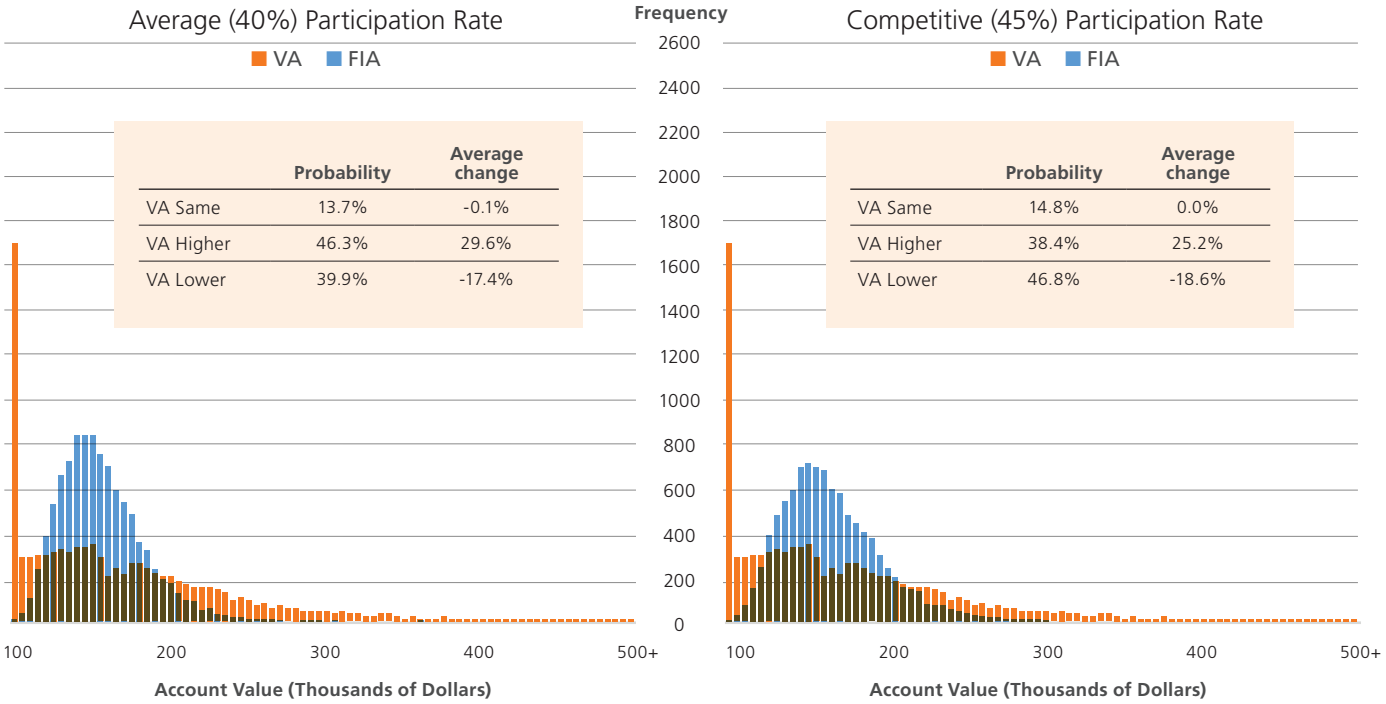
In any given year, strategies with rate caps limit the gains to the cap, which constrains results between the base guarantee, 0%, and the cap rate. The effect of this is that the results cluster tightly, also eliminating extreme outliers. The return profile is very consistent and reduces the effect of results that are 0% or less.

Both of the strategies with rate caps have the same basic shape, with results peaking around the average and a hard stop at the cap rate, as shown in **Exhibit 3**, above. The VA performance in both instances is identical. In both cases, there is a noteworthy number of results for the VA that is lower than the central part of the FIA distribution curve. The primary difference between the two rate caps is the breadth and concentration of that curve.

The probability that the VA will use the guarantee and return zero is significant. By nature of its design, the FIA is very unlikely to give a return close to 0%.

However, on the other side of the FIA results, the VA is able to provide significant upside. Based on our break-even criteria, rate cap strategies start outperforming

Exhibit 4: VA with GMAB Compared Against FIA Strategy Using Participation Rate



Source: CANNEX Financial Exchanges Limited

the VA with GMAB with a cap of around 8.25%. Both FIAs examined here are well below that mark.

VA with GMAB Compared Against FIA Strategies with Participation Rate

FIA strategies using a participation rate share one important characteristic with the VA with GMAB. Because neither has a strict cap on the upside, both have the potential for significant gains. This factor drives up the average and gives the strategies with a participation rate a performance profile that is more similar on the higher end than those using a rate cap, as seen in **Exhibit 4**, above.

Unlike strategies using a rate cap, those using a performance rate have a tail. However, that tail is not as pronounced as it is for the VA with GMAB. The probability of the portfolio doubling is similar with the 40% participation rate, but the chance of performance exceeding that mark is markedly higher for the VA with GMAB.

Based on our break-even criteria, strategies using a participation rate start outperforming the VA with GMAB with a participation rate of around 42.30%. The two FIAs examined here straddle that figure.

There is greater parity between participation rate FIAs and the VA, products that share fundamental design characteristics that also allow for greater upside.

CONCLUSIONS

Contemporary annuities offer a variety of solutions for savers and retirees and there are some instances where value propositions overlap significantly, even on very different product chasses. Both FIAs and VAs with GMABs protect the starting premium at the 10-year time horizon while offering the potential for additional upside. However, differences in pricing and the guarantee structure make it difficult to directly compare these value propositions based on contract characteristics alone.

CANNEX analysis demonstrates that there are advantages to both approaches that are appealing to investors with different concerns. Principal protection is the common baseline for all these designs. The modeling demonstrates that the VA with GMAB provides more upside potential along with greater variability and about a 14% probability that the investor will experience no gains over the 10-year span. All of the FIAs share tighter clustering of results compared with the VA with GMAB.

The FIA strategies with rate caps that we evaluated were well below the break-even range compared to the VA with GMAB, so the opportunity for the VA to exceed the performance of those FIAs was significant. The trade-off in these cases is very similar: the FIA provides greater predictability with a lower average return and limited upside potential.

The FIA strategies with participation rates that we evaluated straddled the break-even range and both have greater upside potential than the cap rate strategies. This is no accident, as the lack of a cap does increase performance potential and mirrors the ability of the VA with GMAB to realize higher gains in outlier years with unusually high market increases.

Differences Beyond the Analysis

Even though we can elicit some performance parallels between the VA with GMAB and the FIAs, these are products that have fundamental differences that might influence the perception or use of the product. An investor's appetite for maximizing market gains or desire to have a more predictable outcome can drive the product decision.

In earlier research, CANNEX concluded that FIAs provide returns similar to a fixed income guarantee but with average annualized returns that can be higher than the fixed rate annuity offered by the same firm. In that study, we found the FIA crediting strategy added as much as 1% – 2% to the same company's fixed rate annuity.

By contrast, the VA with GMAB does not share the performance profile of a fixed return vehicle, as there are many scenarios that provide little to no upside. On the other hand, this structure of guarantee provides greater access to upside potential. Thus, the value proposition allows investors the opportunity for higher gains without the risk of losing starting principal.

These observations speak to the basic nature of these annuities. Despite some similarities in the performance and protection, these are, respectively, fixed and variable products. In addition to the growth-guarantee dynamic, there are other characteristics of these designs that may be more or less important to an investor.

The ability to change the investment framework, whether the crediting method or the individual investments, is one area where the VA and FIA materially diverge. For example, our analysis assumes that the FIA crediting rate remains the same throughout the 10-year period, but the fact is that the insurer may change it within contractual limits. Also, the investor can typically select a different index or crediting method at the end of the crediting term.

VA investors are freely able to change the investment choices within the stated limits of the contract. This flexibility allows an advisor to adapt to market changes or respond to specific concerns of the client. Note that such changes could also change the underlying investment fee assumptions included in our analysis.

On the point of flexibility, both the VA and FIAs provide liquidity with caveats. Both have surrender charges that reduce the withdrawal value of the contract based on how many years have elapsed since the contract inception. In addition, insurers price features based on holding period assumptions. Accordingly, policyholders who want to withdraw their assets early do not receive the same benefit as those who remain for the full duration, which is the assumption in this research.

In the case of the VA, the GMAB value is modified by withdrawals before the maturity date; a total surrender loses any benefit of the guarantee and a partial surrender reduces the benefit proportionally, though this type of withdrawal may make sense in the event of significant gains in the early years. It is therefore possible for a policyholder electing an early withdrawal to end up paying fees that reduce the account value without benefiting from the guarantee. As for the FIA, a withdrawal before the end of the surrender charge period may alter the credited amount or invoke a market-value adjustment; the former may provide some gains while the latter can result in either an increase or decrease to the expected surrender value, as the market-value adjustment can be added to or subtracted from the withdrawn amount depending on the change in the value of a reference asset.

Clearly, there are many reasons that investors gravitate towards one product or another. Those who are looking for growth of assets but also seek certainty have options within the annuity market that span different product types.

IMPORTANT: The projections or other information generated by the Monte Carlo analysis regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Also, please keep in mind that results may vary with each use and over time.

Multiple cap and participation rates are shown to demonstrate a balanced comparison of a range of fixed indexed annuities available in the market today. The rates used in this analysis represent the common and competitive rates, respectively, currently available and were obtained from CANNEX's FIA Rate Service. It should be noted that although this analysis uses a single cap and participation rate to simplify these hypothetical examples, the cap and participation rates for actual fixed indexed annuities may change over time based on market conditions.

To do the analyses in this study, Monte Carlo simulations for 10,000 market scenarios were used to simulate the range of possible outcomes. Each scenario started with a $100,000 account value and was run through randomly generated annual rates of return to determine the ending account value for all 10,000 scenarios at the end of a 10-year period. Applicable fees, caps, and participation rates were also included in the analysis.

The equity return and volatility assumptions used in this analysis (8% price returns, 10% total returns, and 16% volatility) were based on historical returns of the S&P 500 Index, while bond returns and volatility of 4% and 8%, respectively, were based on JP Morgan's 2018 Long-Term Capital Market Assumptions (for blended government and corporate bonds). Correlation between equities and bonds was assumed to be 30%

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ABOUT CANNEX

CANNEX supports the exchange of **pricing information** for annuity and bank products across North America. We provide financial institutions with the ability to evaluate and compare various guarantees associated with retirement savings and retirement income products.

Our **quantitative research** team provides methodologies that help optimize the selection and allocation of annuity and insurance guarantees in support of retirement programs and practices.

Our pricing and analytic services can be deployed to support a variety of processes, including:

- Research & Market Intelligence
- Financial Planning & Education
- Sales & Compliance
- Transaction Processing
- Product Service & Administration

Contact Information

CANNEX Financial Exchanges Limited
1200 Bay Street, Suite 1001
Toronto, Ontario
Canada
M5R 2A5

Phone: (416) 926-0882
Toll Free: (800) 387-1269
Fax: (416) 926-0706

Email: cannex@cannex.com
Web: cannex.com

