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Summary

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Variable Annuity Guaranteed Living Benefits Utilization

2016 Experience

Guaranteed Minimum Income Benefits
(GMIB)

A Joint Study Sponsored by the
Society of Actuaries and LIMRA

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Variable Annuity Guaranteed Living Benefits Utilization

2016 EXPERIENCE

Participants' Report

About the Study

LIMRA Secure Retirement Institute and Society of Actuaries Variable Annuity Guaranteed Living Benefit Utilization Study (VAGLBUS) — 2016 Experience is an update of earlier investigations, conducted since 2006.

The study examines the GLB utilization of over 4.9 million contracts that were either issued during or in force as of 2016. Twenty insurance companies participated in this study. These 22 companies made up 67 percent of all GLB sales in 2016 and 69 percent of GLB assets at year-end, and thus provides a substantial representation of this business.

Few product innovations have transfigured the variable annuity (VA) industry as much as guaranteed living benefits (GLBs). Evolving from simple income benefits over a decade ago, they are now offered in a variety of forms on the vast majority of VA products sold today.

Research on GLBs generally focuses on sales and elections rather than on how annuity owners actually use their benefits. However, knowing more about benefit utilization — as well as the connection with behaviors such as persistency — can assist insurers with assessing and managing the long-term risks of these GLBs.

Note that the combined results displayed for all other companies must meet two criteria: 1) they must be based on at least 5 companies, and 2) no single company represents more than 50 percent of the contracts contained in the analysis.

Click on the tabs at the top of the screen to move between pages. The buttons and menus on the right side of each screen allow you to filter results.

Access to this information is a benefit of LIMRA and SOA membership.
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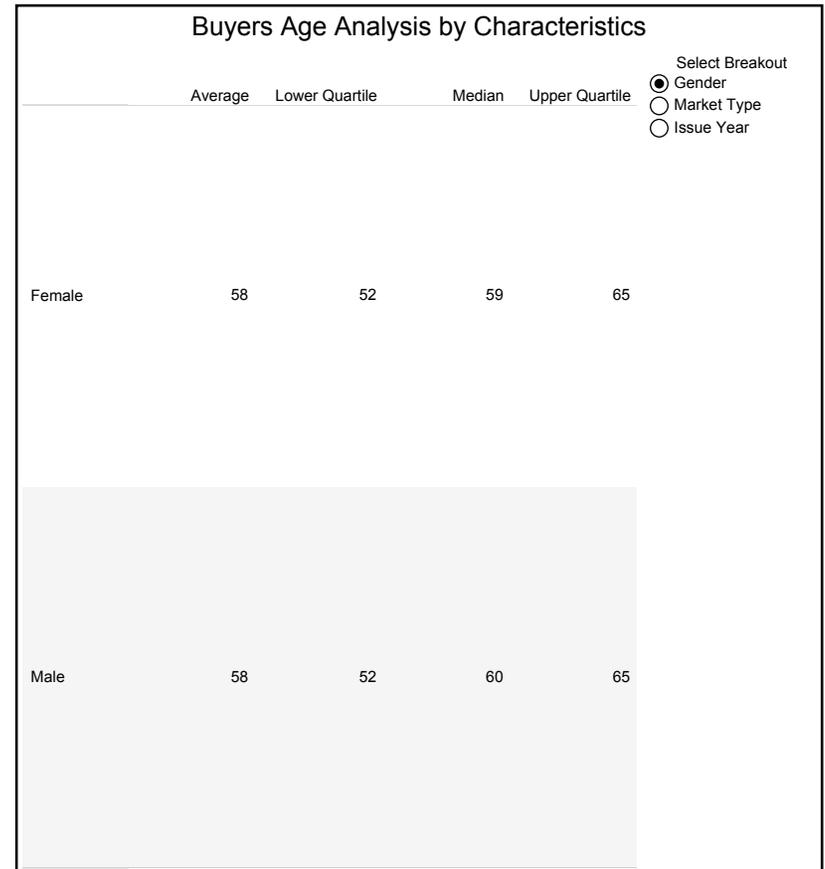
Buyer Profiles

Guaranteed minimum income benefits (GMIBs) are the second most popular type of GLB in the VA market. Sales of GMIB riders have declined substantially in recent years as only a few carriers are still offering GMIB options. GMIB election rates, when any GLB was available, were at 7 percent for 2016. With the purchase of a GMIB, owners can receive guaranteed income at the end of a waiting period, based on annuitization of the benefit base. However, most GMIB owners have the flexibility of taking withdrawals during the waiting period without disturbing the benefit base. Feature innovation for GMIBs has incorporated withdrawals similar to GLWBs, blurring the distinction between GLWBs and GMIBs.

Nearly all GMIBs have waiting periods of 7 to 10 years or more before the contract can be annuitized. During the waiting period, annuitizations are not subject to the guarantees specified within the GMIBs. By the end of 2016 1 in 3 contracts had reached their benefit maturity date.

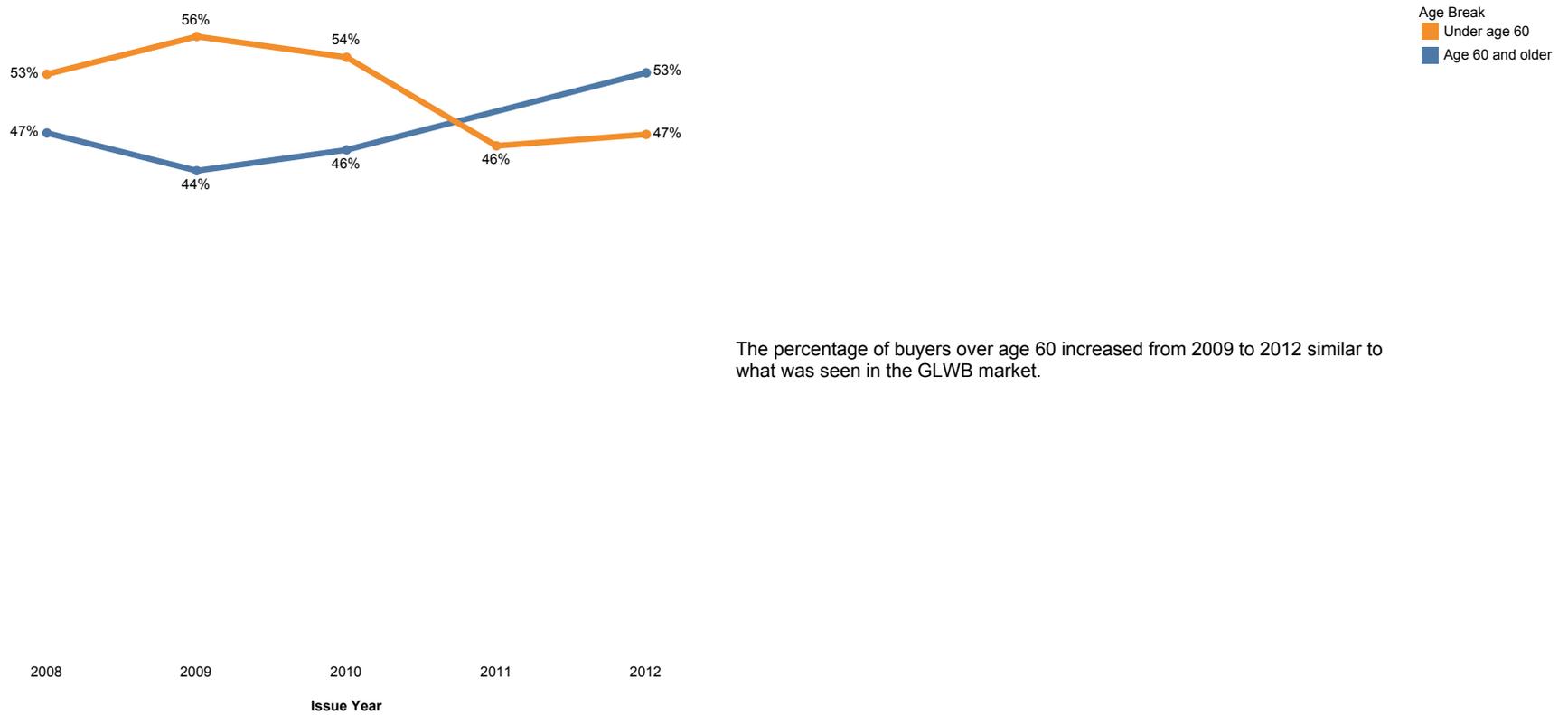
Companies should use the data provided throughout this dashboard as a basis for examining:

- Whether their customer mix deviates from that of the industry
- How they manage the risks associated with providing a guarantee to younger buyers —both short- and long-term (A particular company's risk in providing guarantees may stem from issues such as potential growth in benefit bases, depending on customers' actual deferral periods before taking withdrawals; the source of funds used to purchase the annuity; what percentage of customers begin to take withdrawals due to the required minimum distribution (RMD) rule; and the persistency of their contracts.)
- If the benefit base is greater than the contract value — where market volatility and the asset allocation models offered have had an impact on the contract value in the contract.
- The competitiveness of the payout rates that are typically set by age bands.
- Each year, customer behavior adds another layer of uncertainty that may change the dynamics of a company's in-force book of business. They may have different withdrawal patterns based on their age, sources of funding, and enhanced longevity risk. These factors have an impact on the pricing of the riders, long-term profitability, and asset management, as well as the overall risk management.



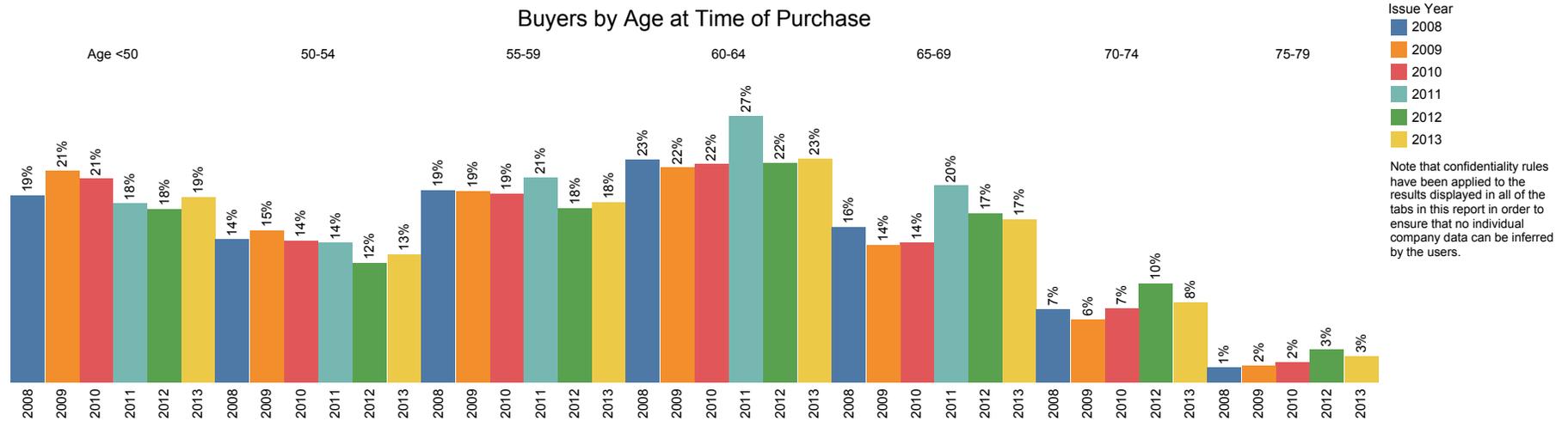
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Percentage of Buyers Over Age 60 at Time of Purchase



The percentage of buyers over age 60 increased from 2009 to 2012 similar to what was seen in the GLWB market.

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This tab provides a view of buyer age distribution by year of issue. For all issues years studied, for GMB, the largest percentage of buyers are between ages 60 and 64, the largest proportion being 27 percent for issue year 2011.

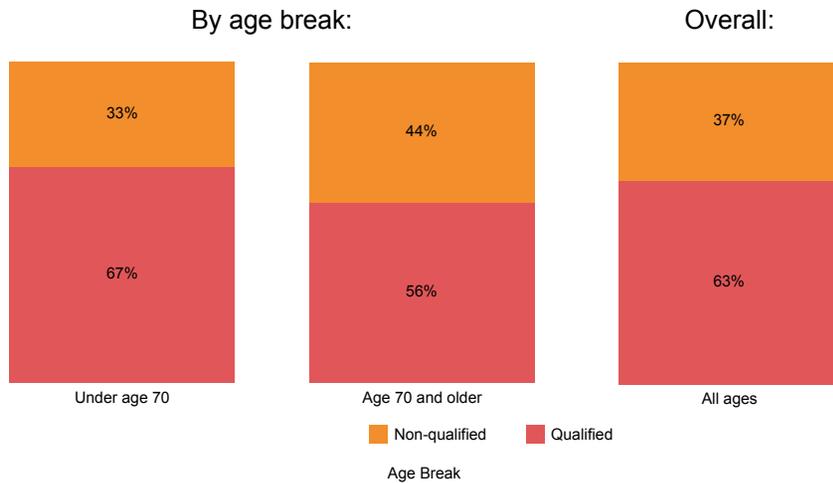
1. Welcome	2. Introduction	3. Buyer Profiles	4. Age Analysis 1	5. Age Analysis 2	6. Owner Profiles	7. Benefit Base/Contract Value Summary	8. Contract Value vs. Benefit Base by Quarter of Issue	9. Ratio of Benefit Base to Contract Value by Quarter of Issue	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts ..
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Owner Profiles

For contracts issued prior to or in 2016, nearly two-thirds of GMIB contracts were funded from qualified sources of money, part of a trend where a greater share of annuity contracts are being funded from qualified sources or rollover assets rather than non-qualified sources. Funding a GMIB with Qualified savings is more common among younger buyers.

It appears that some consumers intend to use their non-qualified savings for other investment or planning needs. Advisors and sales representatives can build relationships with prospective buyers before they reach these key retirement decision ages to assess their income needs.

This tab provides a summary of GMIB owner and product characteristics at EOY 2016.



	Issued Before 2016	Issued In 2016	Overall	Avg. Premium for Contracts Issued in 2016
Age 59 & under	27%	54%	27%	\$114,322
60 to 64	17%	23%	17%	\$160,677
65 to 69	21%	15%	21%	\$156,633
70 to 74	17%	6%	17%	\$153,075
75 to 79	11%	2%	11%	\$134,650
80 or older	7%	0%	7%	\$170,472

Select Breakout

- Age of Owner
- Gender
- Market Type
- Qualified by Age
- Nonqualified by Age
- Distribution Channel
- Cost Structure
- Contract Value EOY

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Benefit Base and Contract Value Comparison

	Benefit Base	Contract Value	CV as % of BB	Time of Year
Sum	\$206,456,078,234	\$163,862,666,750	79.4%	<input checked="" type="radio"/> Beginning of Year 2016
Avg. Benefit Base	\$152,887	\$121,346	79.4%	<input type="radio"/> End of Year 2016
Median Benefit Base	\$95,227	\$74,741	78.5%	

Percent of contracts where benefit base was greater than contract value:

95.2%

At the beginning-of-year (BOY), nearly all contracts issued before 2016 had benefit base amounts greater than the contract value. The average difference at the BOY between the benefit base and the contract value exceeded \$30,000.

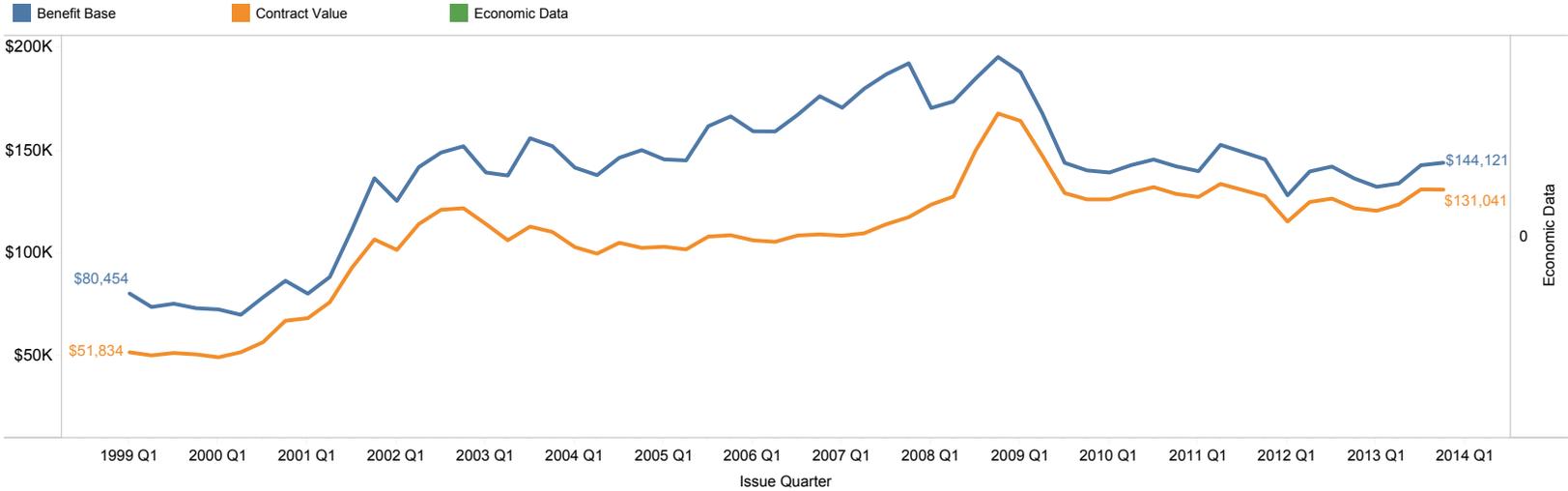
3. Buyer Profile	4. Age Analysis 1	5. Age Analysis 2	6. Owner Profiles	7. Benefit Base/Contract Value Summary	8. Contract Value vs. Benefit Base by Quarter of Issue	9. Ratio of Benefit Base to Contract Value by Quarter of Issue	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal A..
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Contract Value vs. Benefit Base by Quarter of Issue

Even with double-digit equity market growth, returns in variable annuity subaccounts after expense could not exceed any guaranteed rollup and the relative relationship between the benefit base and contract value expanded when compared to the BOY.

Contracts sold before 2002 have smaller contract values than those sold in the mid to late 2000s. For these contracts, exposure to two bear markets (2001–2002 and 2008–2009) impacted their contract values while their benefit bases remained the same or grew. Market losses had the most impact on contracts issued from late 2006 through early 2008.

- Time of Year
 - Beginning of Year 2016
 - End of Year 2016
- Average or Median
 - Average
 - Median
 - Quartiles
- Economic Data
 - None
 - 10-year Treasury Yield
 - S&P 500



Note that confidentiality rules have been applied to the results displayed in all of the tabs in this report in order to ensure that no individual com..

Source : Oxford Economics

4. Age Analysis	5. Age Analysis 2	6. Owner Profiles	7. Benefit Base/Contract Value Summary	8. Contract Value vs. Benefit Base by Quarter of Issue	9. Ratio of Benefit Base to Contract Value by Quarter of Issue	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by...
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Ratio of Benefit Base to Contract Value

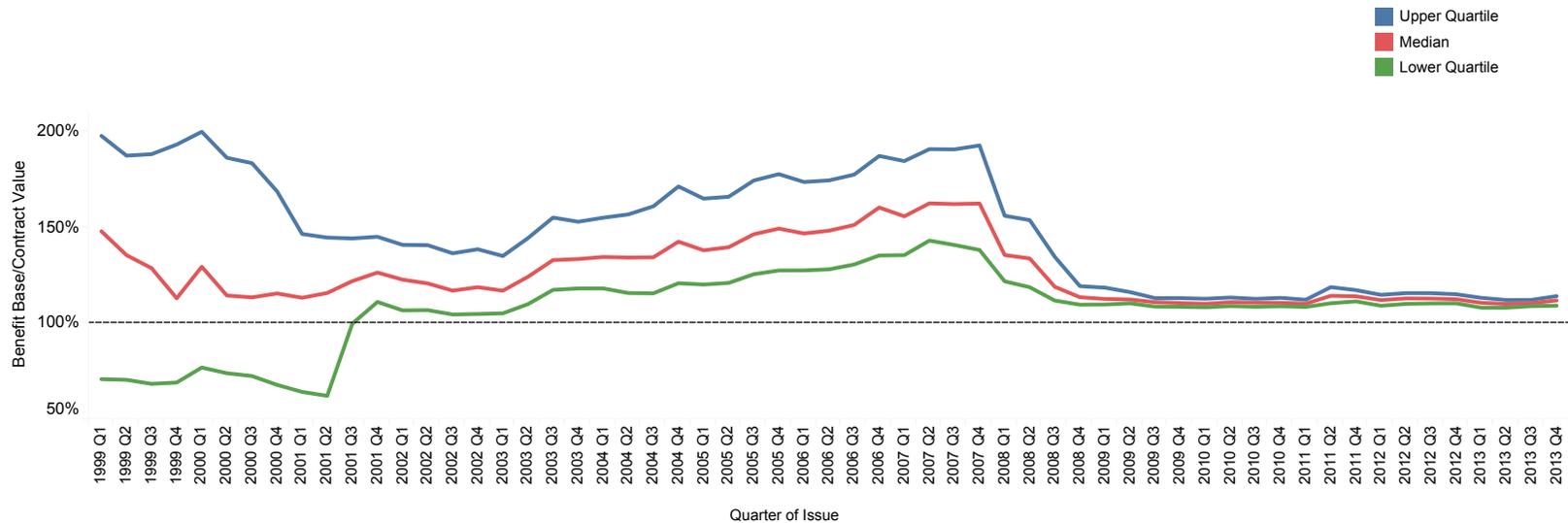
Looking at the quartile ranges of the benefit base to contract value (BB/CV) ratios, contracts issued before 2008 had the greatest deviations in BB/CV ratios.

The upper and lower quartiles refer to the distribution of BB/CV ratios at the BOY and the inter-quartile range gives a sense of how widely (or narrowly) the ratios are distributed.

As one would expect, the inter-quartile range narrows with decreasing duration (more recently issued contracts tend to have a tighter distribution) because there has been less time for any group of contracts to pull far ahead (or fall far behind) the rest of the pack in terms of performance.

Time of Year
 ○ Beginning of Year 2016
 ○ End of Year 2016

Note that confidentiality rules have been applied to the results displayed in all of the tabs in this report in order to ensure that no individual company data can be inferred by the users.

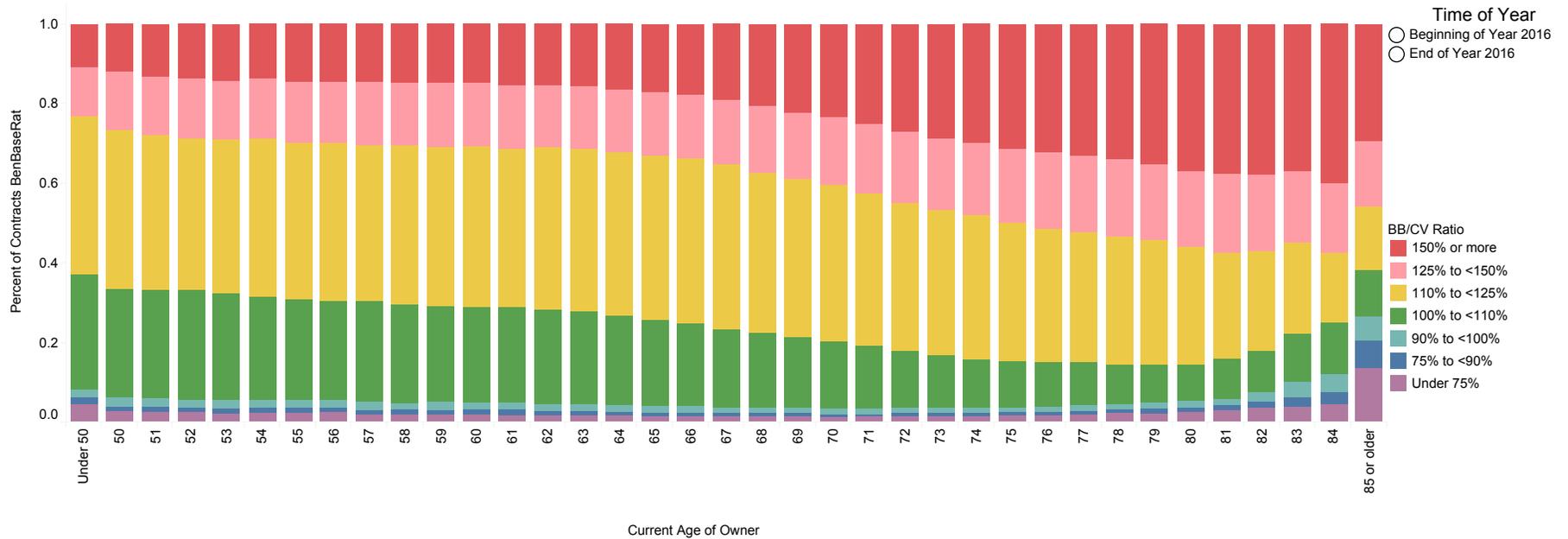


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Ratio of Benefit Base to Contract Value by Age

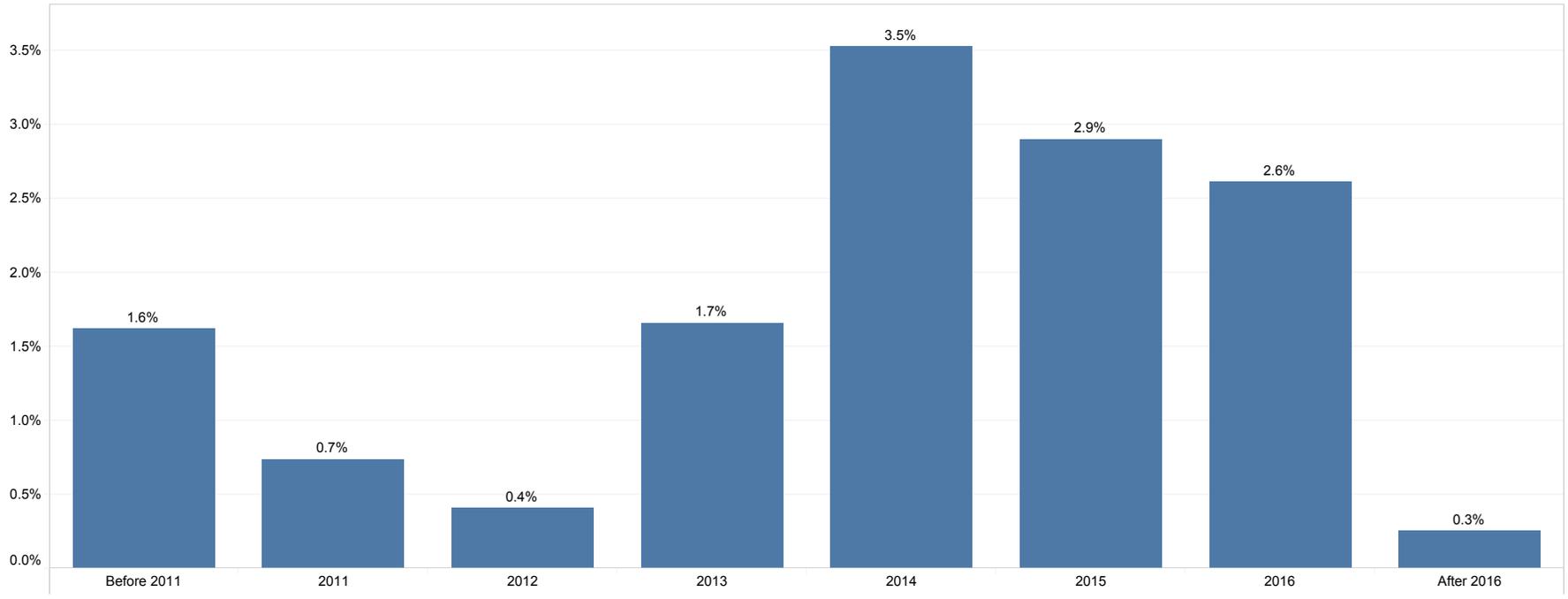
The analysis of BB/CV ratios can be expanded to include age or age cohorts to see how the withdrawal risks from a particular age or age cohort can be linked to BB/CV ratios. The BB/CV ratios are impacted by factors like the duration of contracts and the impact of market returns on the contract values, infusion of new contracts into the book by age groups, richness of in-force contract features like automatic roll-up percentages, and impact of withdrawals on the contract values and benefit bases. This analysis can allow companies to assess withdrawal risks associated with each age or age cohort in relation to the industry.

At BOY 2016, five percent of contracts had BB/CV ratios below 100 percent; 19 percent had BB/CV ratios of 100 percent to less than 110 percent; 38 percent had BB/CV ratios of 110 percent to less than 125 percent; and 38 percent had ratios of 125 percent or more.



6. Owner P..	7. Benefit Base/Contract Value Summary	8. Contract Value vs. Benefit Base by Quarter of Issue	9. Ratio of Benefit Base to Contract Value by Quarter of Issue	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by A..
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Percent of GMI B riders annuitized in 2016



Eligible Contracts

80,491

32,250

75,657

103,356

94,243

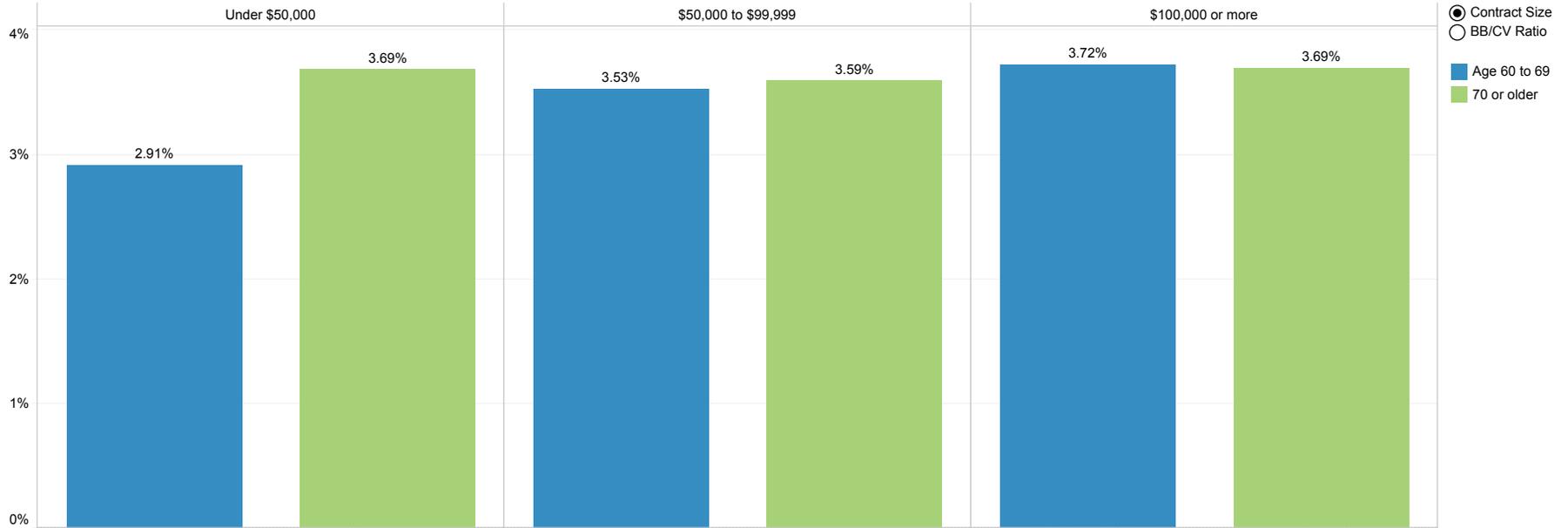
96,568

103,994

886,485

7. Benefit B..	8. Contract Value vs. Benefit Base by Quarter of Issue	9. Ratio of Benefit Base to Contract Value by Quarter of Issue	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawals
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Percent of Contracts Annuitized in 2016 (Benefit Maturities in 2015 and 2016)

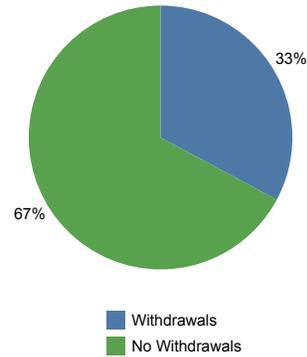


Distribution of Contracts Annuitized in 2016

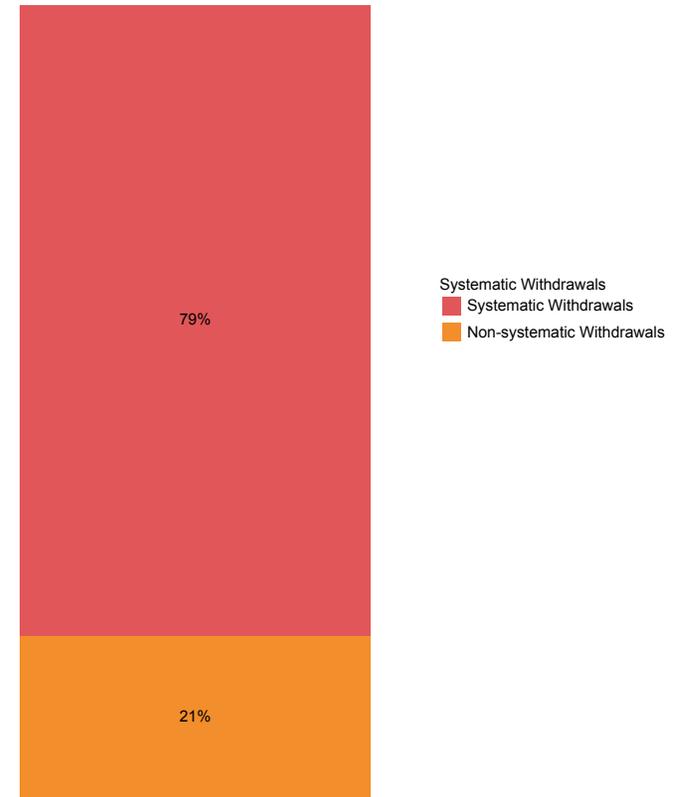
Age of Owner	GMB Contracts in Force
Under 50	0.48%
50 to 54	0.64%
55 to 59	2.57%
60 to 64	15.27%
65 to 69	28.38%
70 to 74	23.94%
75 to 79	15.51%
80 or older	13.21%

8. Contract Value	9. Ratio of Benefit Base to Contract Value by Quarter of Issue	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Age
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Percent of owners who have taken withdrawals in 2016:



Of those taking withdrawals in 2016:



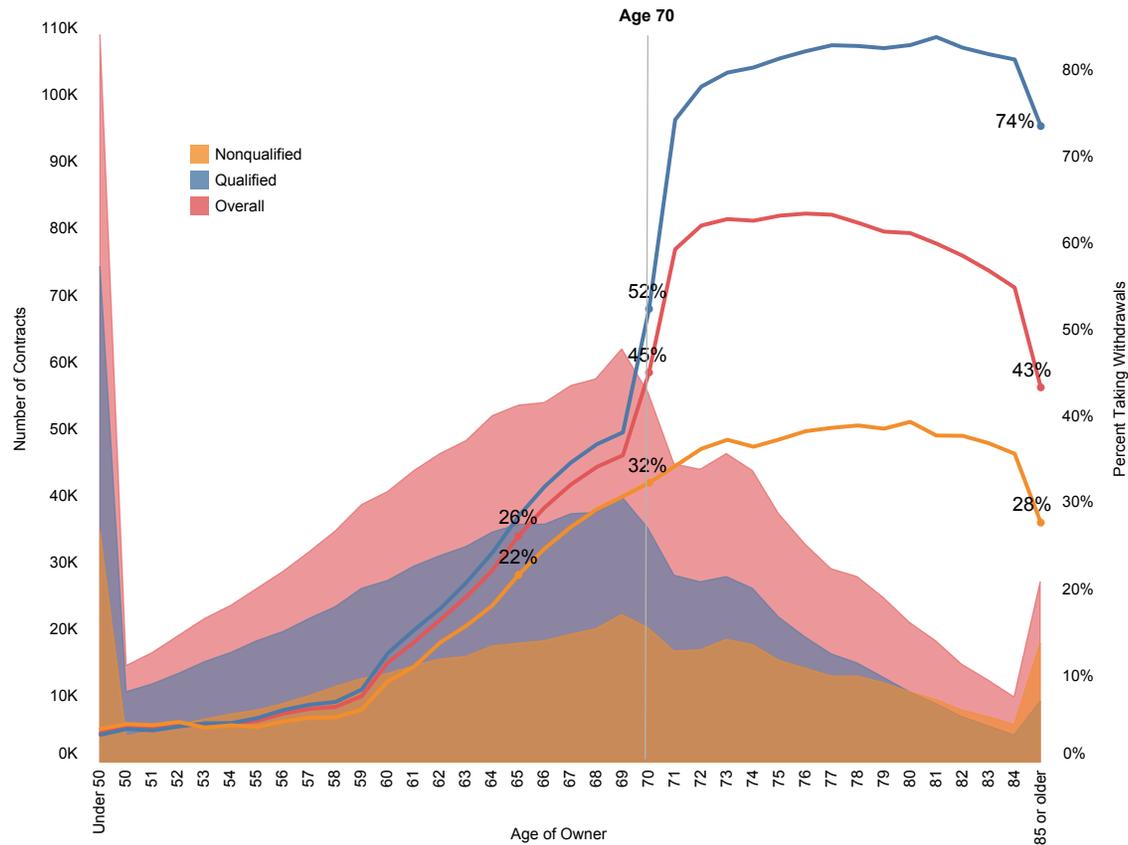
GMIB contracts have no guaranteed withdrawal benefit during the accumulation years, and the true guaranteed income benefit or benefit utilization starts after annuitization. However, many popular GMIB contracts allow dollar-for-dollar annual withdrawals, typically equal to or less than the roll-up percentages applied in the contract to reset the benefit base upward on every anniversary. Thus, a GMIB owner can withdraw up to a certain percentage annually without reducing the starting benefit base. This is an attractive and flexible option for many investors. The attraction lies in the ability to take withdrawals at a prescribed rate, without disturbing the benefit base, irrespective of market gains or losses. So, if partial withdrawals occur, we assume that owners have utilized the withdrawal provisions in their contracts.

Based on 1,394,299 contracts issued before 2016 and still in force at the end of 2016, 33 percent of GMIB contracts had at least some withdrawal activity during 2016. Very close to the 31 percent of GMIB owners took withdrawals in 2015.

Of those contracts which experienced withdrawal activity, 79 percent utilized systematic withdrawals.

9. Ratio of Benefit Base to Contract Value by Age	10. Ratio of Benefit Base to Contract Value by Age	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Age
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Withdrawal Activity by Source of Funds and Age of Owner



The source of funds (i.e., whether the annuity was funded with qualified or non-qualified money) is one of the key drivers in understanding customer withdrawal behavior. The overall incidence of withdrawals in GMIB contracts over the past few years has stayed around 20 to 30 percent. However, analyzing withdrawal activity by source of funds and age reveals that the utilization rate of withdrawal provisions in GMIB contracts is in fact, quite high for certain customer segments.

As with GLWBs, GMIB owner withdrawal behavior has three different phases:

- Under age 60, when most of the owners are not retired, withdrawal rates for customers who use either qualified or non-qualified money to buy their contracts remain low, typically less than 10 percent. Withdrawals for both types of owners do not start to rise until they reach age 60 or later, when some of the owners enter the retirement phase. Early in this phase, the percent of owners taking withdrawals rises slowly in parallel for both qualified and non-qualified owners.
- Between ages 60 and 69 — sometimes termed "the transition ages in retirement" — 40-45 percent are utilizing the withdrawal provisions in their GMIB contracts.
- After age 70, the need for RMDs from qualified annuities forces many GMIB owners to take withdrawals, and the percent of qualified customers taking withdrawals quickly jumps to 78 percent by age 71. After this age, the percent of qualified owners withdrawing slowly rises to 84 percent by age 80.

- Market Type
- All
 - Qualified
 - Non-qualified
- Withdrawal Type
- All Withdrawals
 - Systematic
 - Non-systematic

10. Ratio of B..	11. Annuitized Contracts by Benefit Maturity	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal ..
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Percentage of All Owners Taking First Withdrawal in 2016

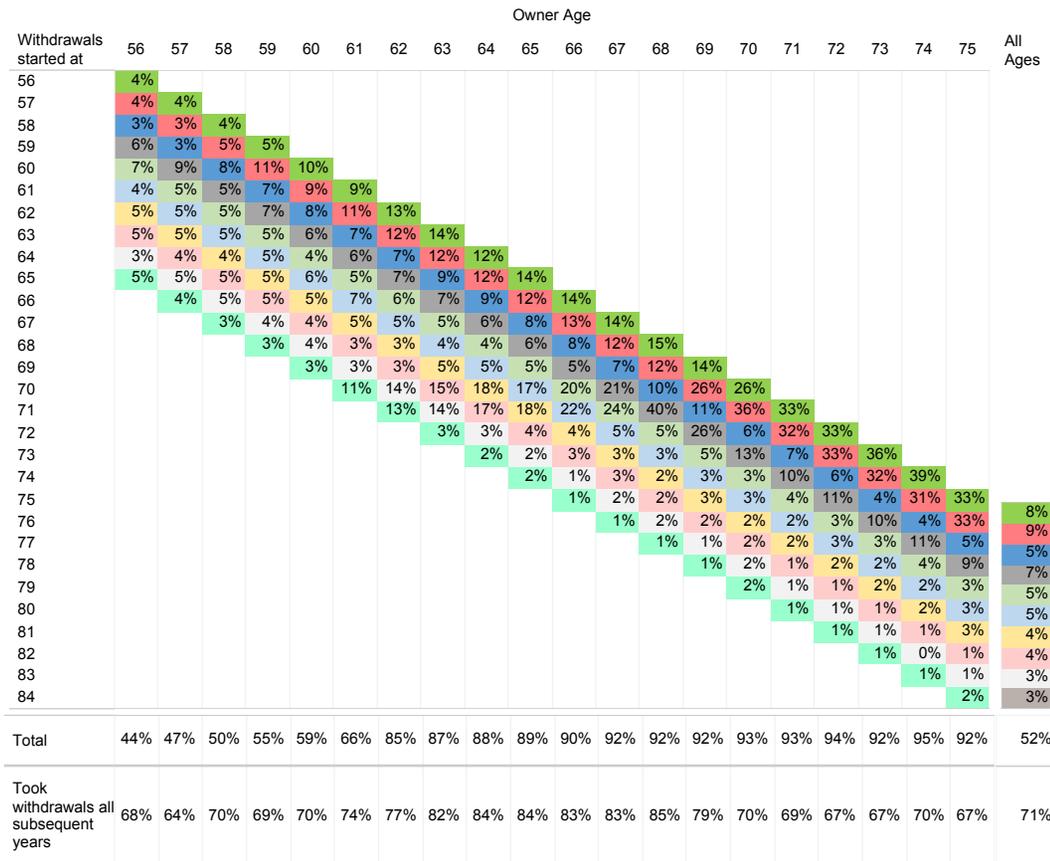


One of the value propositions for GMIB annuities is the ability to take withdrawals. To better understand owners' inclinations to take withdrawals, we have analyzed owner withdrawal behavior by considering at what age or in what year of annuity ownership the owner is likely to initiate their first withdrawal. We also look at how many continue taking withdrawals once they start doing so. Extending that logic, we might expect to find corollary relationships among other variables, like when owners decide to take their first withdrawals, whether their withdrawal amounts remain within or around the prescribed withdrawal maximum amount allowed in the contract, or whether the persistency of these contracts differs from contracts that have not had withdrawals or excess withdrawals.

Analysis of when owners are likely to take first withdrawals provides important information on the withdrawal risks of these contracts. These findings can help insurance companies to assess risk more precisely by identifying clusters of owners who are likely to start withdrawals in their first year, second year, etc., after purchase. The first withdrawal activity analysis can be done in two ways: First, we can determine the percentage of owners who initiated their first withdrawals in 2016 by age, source of money, and issue year, to provide various trends and relationships. Second, we can analyze the first withdrawal history for owners from a particular issue year, and track how age and sources of money influence their first withdrawals.

11. Annuity e..	12. Contracts Annuitized in 2016 with Benefit Maturity Date in 2015 or 2016	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals..
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First Withdrawals by Buyers and Policy Year



In order to gain a clear and consistent picture of when owners first start to take withdrawals by both buyer age and attained age, we tracked GMIB contracts bought in 2007 and 2008 and measured owner withdrawal behaviors over time from issue. This table shows the withdrawal behavior of 2007 qualified buyers aged 56 to 75 during 2007 to 2016 and assesses what percent of those buyers took their first withdrawals from 2007 to 2016.

- Qualified 2007 Issues
- Qualified 2008 Issues
- Non-qualified 2007 Issues
- Non-qualified 2008 Issues

Analysis of the nine years of first withdrawal history of 2007 qualified buyers shows some important insights:

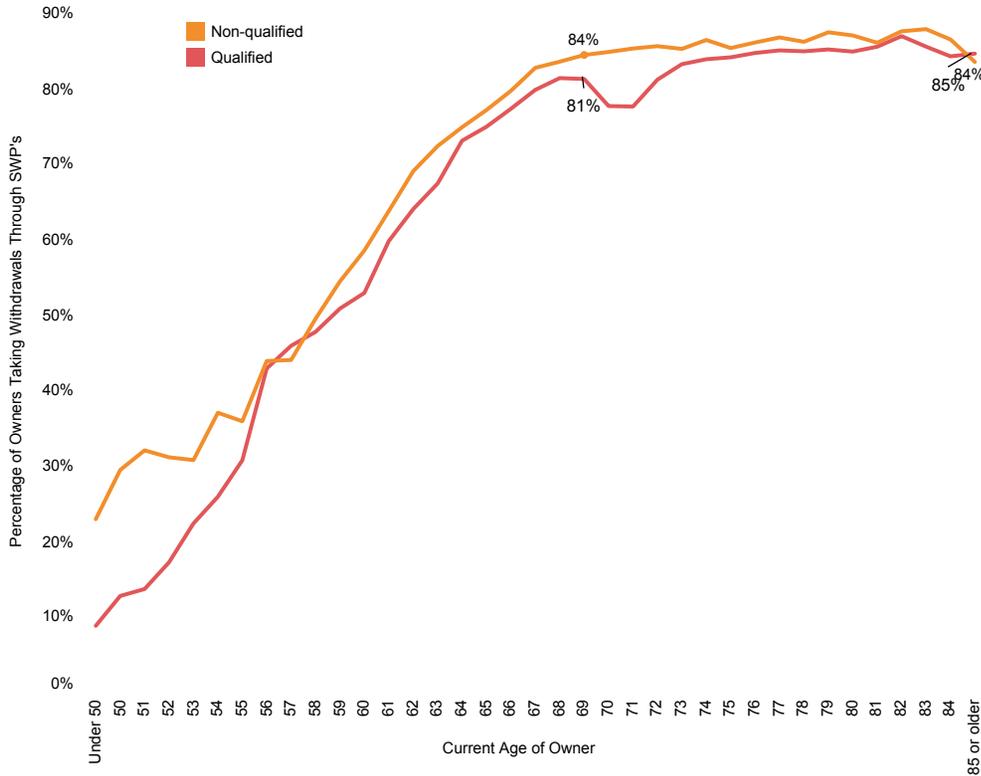
- Overall, 8 percent of buyers initiated their withdrawals in the same year they purchased their annuity. In the first year, the percent of buyers taking withdrawals rises from ages 60 to 65, then levels off until age 70.
- Once owners initiate withdrawals, 71 percent continue to take withdrawals in all subsequent years.
- More than 90 percent of owners aged 65 or above in 2007 took withdrawals from their annuities in the last nine years. Across all ages, just over half of 2007 owners took withdrawals.
- Contract benefits being greater than the benefit bases appears to have very little impact on first withdrawal behavior. From 2009 to the beginning of 2012, most of the GMIB contracts had benefit bases that exceeded the contract values. However, the percentage of owners taking withdrawals from their contracts does not show any deviation from the general trend by any particular age or age groups.

- Withdrawals started in
- 1st Year
 - 2nd Year
 - 3rd Year
 - 4th Year
 - 5th Year
 - 6th Year
 - 7th Year
 - 8th Year
 - 9th Year

12. Contract S...	13. 2016 Withdrawal Activity	14. Withdrawal Activity by Source of Funds and Age of Owner	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals
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Systematic Withdrawal Activity

Withdrawals With SWP's



One predictor that can help determine if GMIB owners will continue to take advantage of withdrawal provisions is what method they use — SWP's or occasional withdrawals. Withdrawals through SWP's indicate customers' intentions to take withdrawals on a continuous basis, and strongly suggest that they are utilizing the withdrawal provisions in their GMIB contracts.

For those contracts with only occasional (i.e., non-systematic) withdrawals, for owners under age 60, the mean withdrawal amount was relatively high. The average occasional withdrawal amount was \$14,600 for qualified contracts and \$20,154 for non-qualified contracts.

- Market Type
- All
- Qualified
- Non-qualified

13. Withdrawal Activity by Source of Funds and Age of Owner	14. Taking First Withdrawal from Annuity	15. First Withdrawals by Age	16. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Co..
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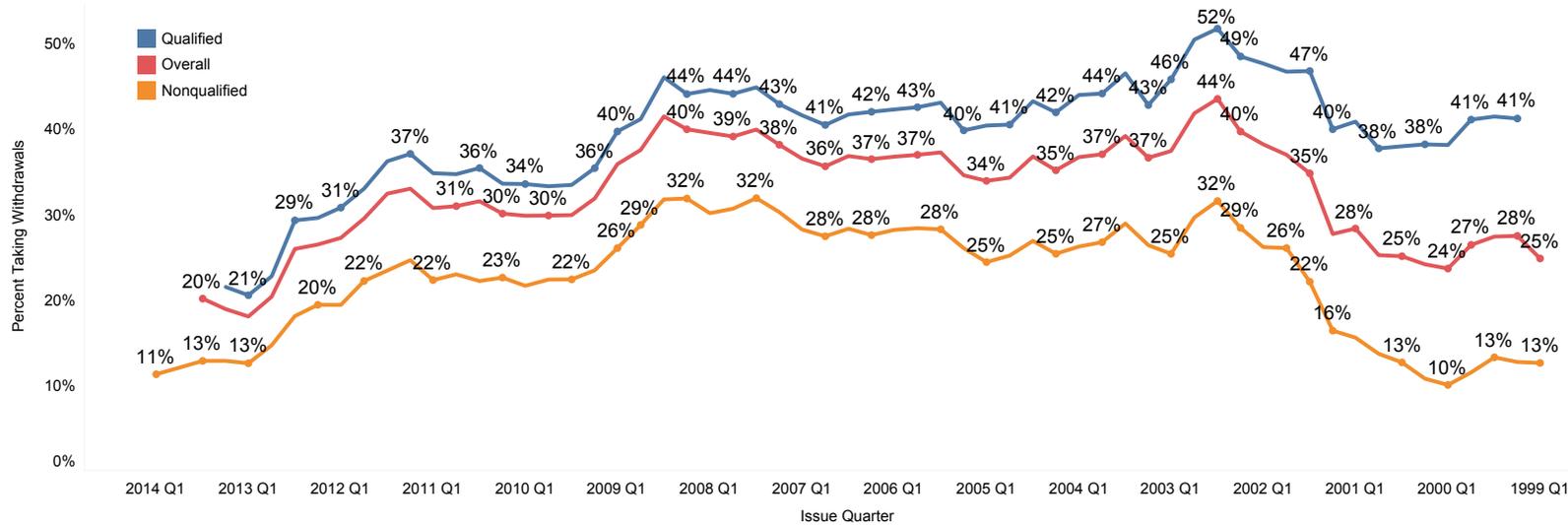
Withdrawal Activity by Issue Quarter

- Market Type
- All
 - Qualified
 - Non-qualified

Contract duration is an important measure for evaluating what proportion of owners take withdrawals from their annuities. By comparing their own withdrawal activity by contract duration with that of the industry, companies can assess the extent to which their customers' withdrawal patterns match both their own expectations and the experience of other VA companies. The comparison could also facilitate internal forecasts by estimating when and how many of the GMIB customers will take withdrawals and the resulting cash flow needed for the book of business.

Note that confidentiality rules have been applied to the results displayed in all of the tabs in this report in order to ensure that no individual company data can be inferred by the users.

Overall withdrawal rates ranged from 28 to 44 percent for contracts issued between 2001 and 2008 and still inforce at EOY 2016 where the largest block of inforce was issued. Withdrawal activities in longer-duration GMIB contracts were comparatively lower than those in GLWB contracts.

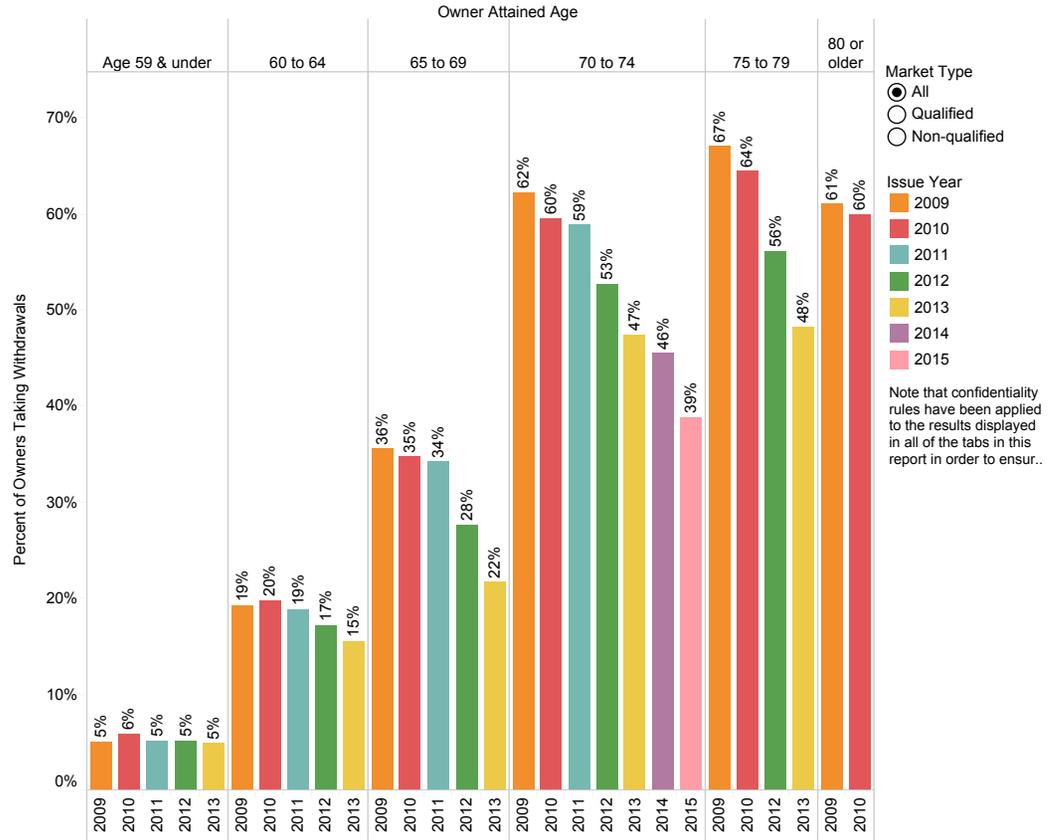


14. Withdrawal Activity by Age	15. Taking First Withdrawal from Annuity	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Moneyness	24. Withdrawal Rates for ..
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Withdrawal Activity by Issue Year and Age

We analyzed withdrawal activity by contract duration and owner age. For contracts purchased by individuals under age 60, the overall utilization rate is fairly stable across different issue years. Withdrawals among these younger age groups are uncommon.

From ages 60 to 79, withdrawal activity increases, as owners begin to retire or need to make withdrawals to satisfy RMDs. Withdrawal rates peak for ages 75 to 79 and then decrease for ages 80 and older. The source of funds used to purchase the annuity remains the underlying force for these incremental increases. However, mapping the duration of contracts by age groups can improve our understanding of GMIB customer withdrawal behavior.



15. Taking Fir..	16. First Withdrawals by Age	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Money	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdra..
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Average Withdrawal Amount by Withdrawal Type

Average Withdrawal Amount

Systematic

Non-systematic

	Mean		Median		Mean		Median	
	Non-qualified	Qualified	Non-qualified	Qualified	Non-qualified	Qualified	Non-qualified	Qualified
Under age 60	\$14,941	\$12,461	\$8,673	\$9,000	\$30,918	\$21,729	\$12,000	\$11,000
Age 60-69	\$10,943	\$11,547	\$6,515	\$8,100	\$20,441	\$17,677	\$9,801	\$9,711
Age 70 or older	\$8,973	\$7,631	\$5,985	\$4,879	\$17,226	\$11,043	\$8,035	\$6,000
Grand Total	\$9,680	\$8,808	\$6,000	\$5,760	\$20,353	\$14,634	\$9,262	\$7,531

Average Contract Value EOY

Systematic

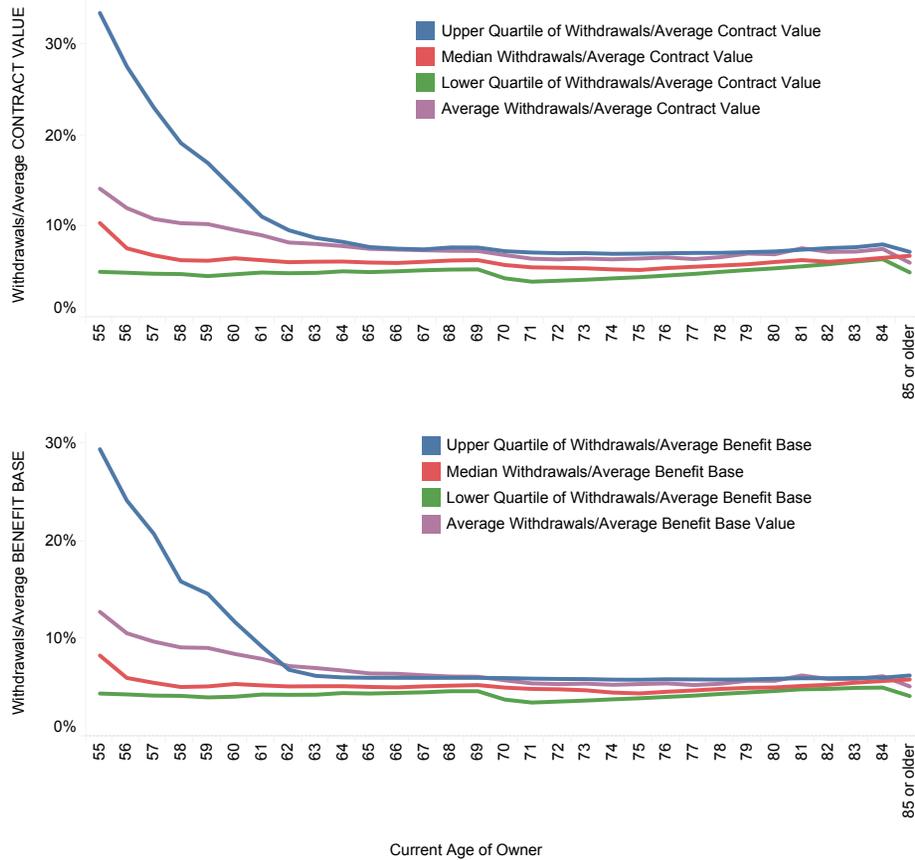
Occasional

	Mean		Median		Mean		Median	
	Non-qualified	Qualified	Non-qualified	Qualified	Non-qualified	Qualified	Non-qualified	Qualified
Under age 60	\$241,864	\$222,849	\$132,997	\$160,084	\$128,371	\$82,638	\$54,738	\$47,392
Age 60-69	\$161,775	\$176,427	\$97,411	\$124,455	\$138,043	\$126,754	\$75,044	\$79,346
Age 70 or older	\$118,887	\$113,015	\$75,312	\$72,633	\$133,760	\$130,280	\$77,496	\$80,331
Grand Total	\$134,136	\$132,592	\$82,448	\$86,054	\$134,552	\$123,212	\$73,645	\$75,584

The table above shows the mean and median withdrawal amount for owners who took only SWP withdrawals or only occasional (non-systematic) withdrawals in 2016. The average systematic withdrawal amount was \$8,800 for qualified contracts and \$9,700 for non-qualified contracts.

16. First Withdrawal	17. Systematic Withdrawal Activity by Age	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Moneyness	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium
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Ratio of Withdrawals to Average Contract Value and Benefit Base



In order to provide context for the withdrawal amounts, we assessed the withdrawal amounts in relation to the contract value and benefit base. This tab shows the mean, median and inter-quartile range for withdrawal amount as a percentage of contract value and benefit base. Typically, a small number of younger owners take out large withdrawals. However, as we have seen, an increasing number of owners beginning at age 60, take withdrawals, and their withdrawal amounts represent a more sustainable withdrawal pattern.

The overall distribution of the withdrawals as a percent of average contract value withdrawn shows that, for owners aged 70 or over, the median, the upper quartile, and the lower quartile values are relatively close. This pattern also indicates that many owners taking withdrawals at older ages are withdrawing at similar ratios from their contract values. For example, for owners in their 60s and 70s, the median was around 5 to 6 percent. For owners under age 60, the median of the ratios is higher than that of older owners, ranging from 6 to 10 percent, with the highest ratios among younger owners. In addition, there is a wide difference between the median and the upper quartile values, indicating that a group of these younger owners are taking far more than the maximum allowed in the contracts. These large withdrawal amounts push up the overall average.

Comparing the average withdrawal amount as a percent of average contract value to the withdrawal amount as a percent of the average benefit base yields valuable insights into the risk associated with withdrawal provisions in GMIB riders. If the ratio of withdrawal to contract value remains lower than or very close to the ratio of withdrawal to benefit base, insurance companies take very little risk on the withdrawal provisions offered in GMIB riders.

For all ages, the ratio of average withdrawal amount to average contract value is higher than the ratio of average withdrawals to average benefit bases. The average difference between the ratios is around one to two percentage points. For owners under age 60 who took withdrawals, the ratios of their withdrawal amount to average contract value as well as to benefit base were higher. Many of these withdrawals are likely partial surrenders of contracts that may be fully surrendered in the future.

Market Type
 All
 Qualified
 Non-qualified

Issue Year
 All

In-the-Moneyness
 All

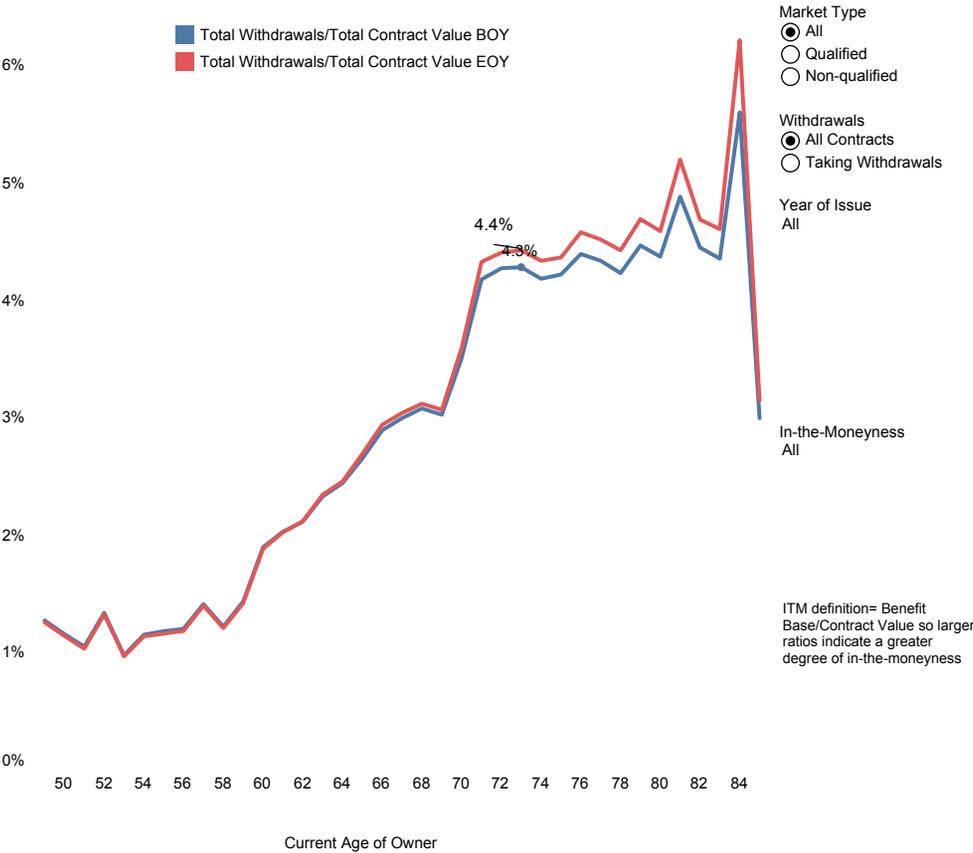
ITM definition= Benefit Base/Contract Value so larger ratios indicate a greater degree of in-the-moneyness

17. Systemati..	18. Withdrawal Activity by Issue Quarter	19. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Moneyness	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows
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Ratio of Total Withdrawals to Total Contract Value

Another measure of withdrawal risk in GMIB riders originating in customer behavior can be ascertained by comparing the ratio of withdrawal amount to BOY contract value and the ratio of withdrawal amount to EOY contract value. This measure can be calculated two ways. First, total withdrawals in 2015 can be divided by total contract values at BOY and EOY, for all in-force contracts. Second, the same ratios can be computed for only the subset of contracts that had withdrawals in 2016. The first metric provides a measure of risk in terms of the total book of business, as well as the rate of cash outflow for each age, while the second provides an estimation of risk among the contracts where owners use the withdrawal provisions in GMIB riders.

The cash outflow ratio, or ratio of total withdrawals to total BOY contract values for all contracts in force throughout the year was slightly lower than the ratio for EOY contract values again in 2016. Across all ages, the ratio of total withdrawals to total contract values increased in 2016.



18. Withdrawal Activity by Issue Year and Age	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Money	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Company
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Historical Trends of Contracts – In-The-Money

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of Contracts Issued before Calendar Year	1.22M	1.33M	0.82M	1.44M	1.45M	1.44M	1.35M	1.35M	0.86M
Percent of Contracts where Benefit Bases > Contract Values	96%	81%	83%	88%	83%	64%	82%	95%	90%

Time of Year
 Beginning of Year 2016
 End of Year 2016

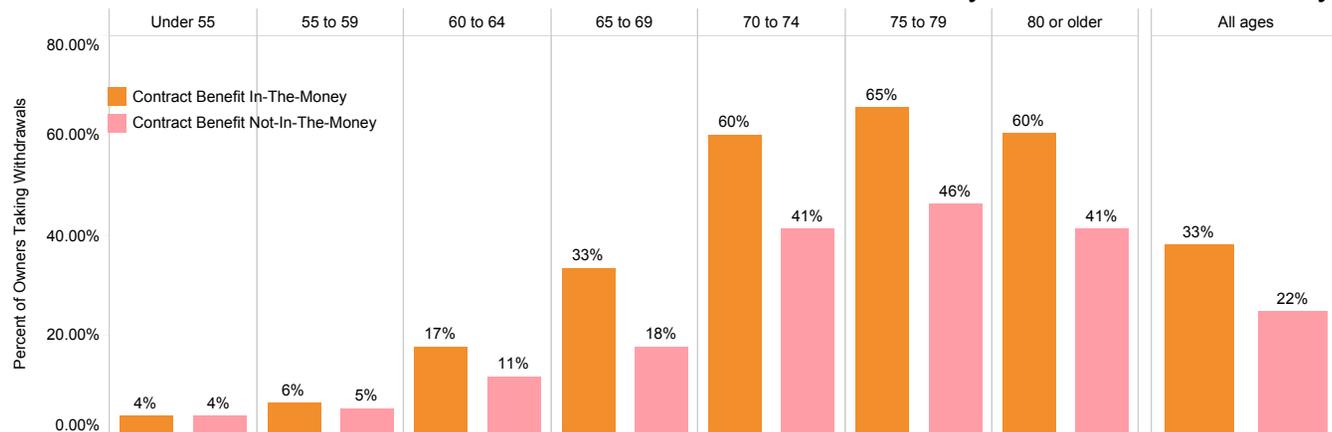
The 2008–2009 market downturn caused large losses in contract values of annuity contracts, causing most GMIB contracts to have benefit base balances that were higher than the contract values. Many of these contracts experienced gains due to the market recovery that began in the later part of 2009 and continued through 2014.

In order to understand the impact this relationship had on withdrawal activities, it helps to understand the severity and spread of the benefit base balance compared to the contract value among owners by age and by duration of contracts. We should also consider other factors, like market performance, investor confidence, market volatility, the state of the economy, and confidence in the financial strength of financial service providers. In order to conclude that the benefit base balance being greater than the contract value influenced the owners' withdrawal activity, we would expect to see increased withdrawal activity irrespective of age when the contracts benefit base balance exceeded the contract value.

Similar to GLWBs, it is likely that age and source of funds — not the amount the benefit base balance exceeds the contract value— drive owner withdrawal behavior, although there may be a small effect driven mainly by withdrawals among younger owners.

19. Withdrawal Rates	20. Average Withdrawal Amount by Withdrawal Type	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Money	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Y..
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Withdrawal Rates for Contracts In-The-Money vs. Not-In-The Money

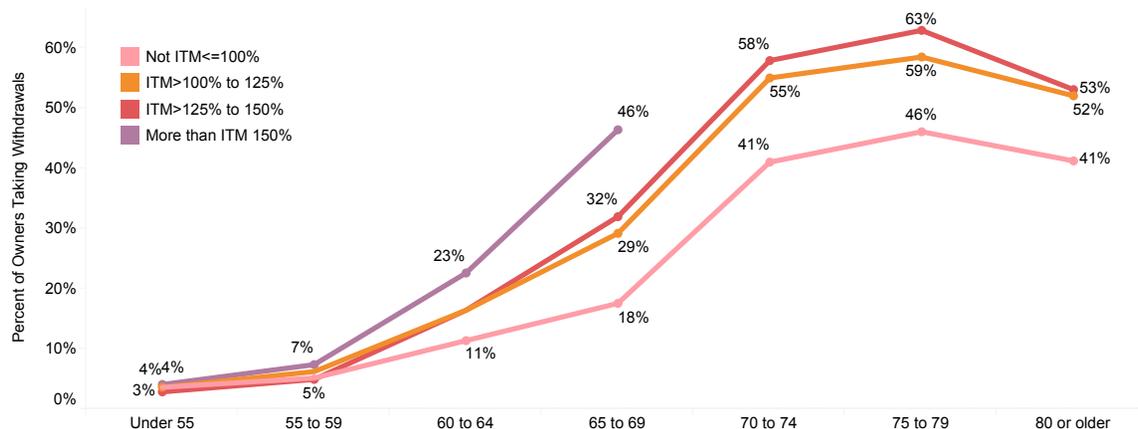


For this purpose we are defining In-the-Money (ITM) as having a ratio of benefit base to contract value greater than 100 percent.

For this purpose we are defining In-the-Money (ITM) as having a ratio of benefit base to contract value greater than 100 percent.

Note that as we have seen with other guaranteed living benefit types, overall contracts in-the-money have higher rates of withdrawal than contracts Not-In-the -Money. Also, at most owner ages, withdrawal rates are highest for contracts that are most in-the-money.

- Market Type
- All
 - Qualified
 - Non-qualified



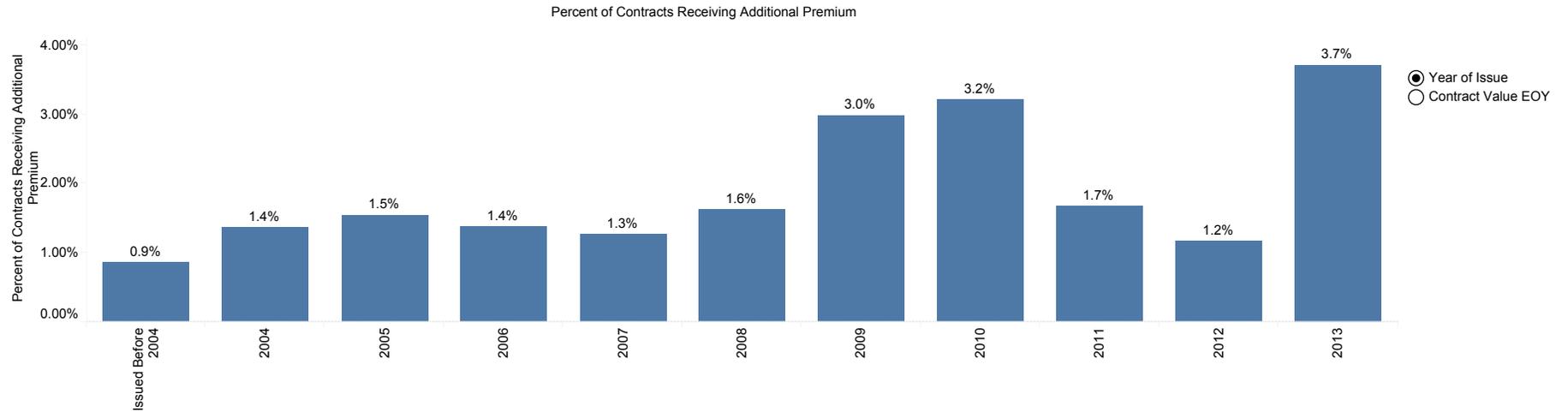
20. Average W..	21. Ratio of Withdrawals to Average Contract Value and Benefit Base	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Moneyness	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by S..
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Summary of Withdrawal Rates by Selected Owner and Product Characteristics

	<u>Unweighted</u>	<u>Weighted by BOY 2016 Contract Value</u>
Gender	Percent of Owners Taking Withdrawals	Percentage of Owners Taking Withdrawals Through SWP's
Male	33%	26%
Female	32%	25%
		Partial Withdrawals Weighted by BOY Contract Value
		Systematic Withdrawals Weighted by BOY Contract Value
Age of Owner		
Under 50	3%	0%
50 to 54	4%	1%
55 to 59	6%	3%
60 to 64	17%	11%
65 to 69	32%	26%
70 to 74	59%	49%
75 to 79	64%	55%
80 or older	57%	49%
Market Type		
Non-qualified	24%	20%
Qualified	37%	29%
Contract Value (EOY)		
Under \$25,000	25%	18%
\$25,000 to \$49,999	32%	25%
\$50,000 to \$99,999	35%	28%
\$100,000 to \$249,999	35%	28%
\$250,000 to \$499,999	38%	31%
\$500,000 or higher	37%	29%
Distribution Channel		
Bank/S&L		
Career Agent		
Direct Response		
Full Service National B-D		
Independent Agent		
Independent B-D		

21. Ratio of W..	22. Ratio of Total Withdrawals to Total Contract Value	23. Historical Trends of Contracts – In-The-Money	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by T..
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Additional Premium



Many retail VAs allow owners to add premium after issue, though in practice, most contracts do not receive ongoing deposits. For most GMIBs, the calculation of the benefit base incorporates premium received within a certain time period after contract issue.

Among GMIB contracts issued before 2016 and still in force at EOY 2016, overall only 2 percent of contracts received additional premium in 2016. And focusing on a constant group of contracts issued in 2007, younger owners were more likely to add premium than older owners and premium was most likely to be added in the first year after issue.

By issue year, the percent of contracts receiving additional premium ranged from 1 to 4 percent.

22. Ratio of T..	23. Historical Trends of Contracts – In-The-Money	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by ..
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Net Flows

		Total Dollars	Number of Contracts Taking Withdrawals	Avg. Dollars
	In-Force BOY	\$144.8B	1,162,577	\$124,514
Premium Received	Existing Contracts	\$0.8B	1,473,471	
	Newly Issued Contracts	\$2.8B	20,736	\$133,963
Benefits Paid	Annuitizations	\$1.8B	14,666	\$120,122
	Death/Disability	\$1.4B	12,849	\$106,657
	Full Surrenders	\$4.5B	51,812	\$86,765
	Partial Withdrawals	\$5.4B		
	Investment Growth	\$3.3B		
	In-Force EOY	\$174.7B	1,414,880	\$123,456

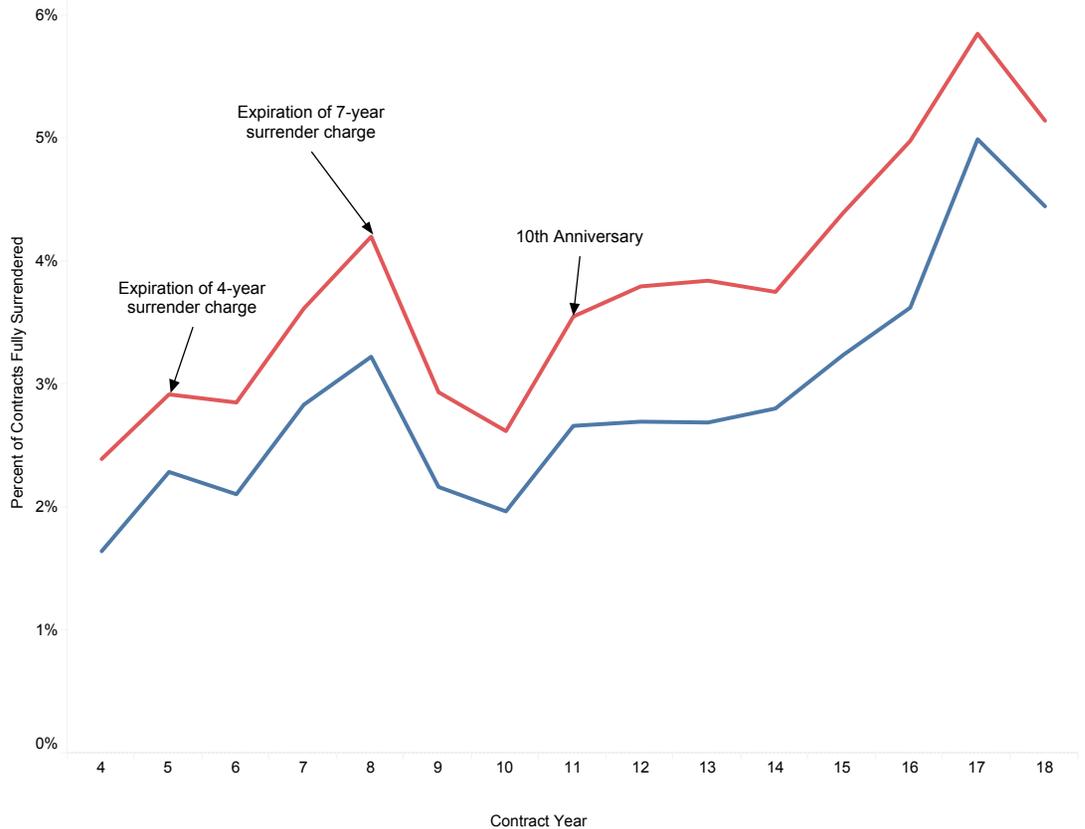
Premiums received for newly issued and existing contracts were below the outflows associated with withdrawals, surrenders, deaths, and annuitizations — \$3.6 billion and \$13.1 billion, respectively. For participating companies, the total number of GMIB in-force contracts increased slightly during 2016.

23. Historical..	24. Withdrawal Rates for Contracts In-the-Money vs Not-In-the-Money	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by L..
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Surrender Rate by Contract Year

Surrender activity among VAs with GMIBs is a critical factor in measuring risk. High or low persistency, as well as withdrawal rates and the difference between benefit bases and contract values, can have an impact on product profitability and the reserve requirements for insurance companies.

Overall surrender rates for VAs with GMIBs in 2016 were higher than surrender rates for VAs with GLWBs — 4.0 percent versus 3.4 percent. However, the comparison to GLWBs reflects the older GMIB contract base — just over half of which were issued in 2008 or before, thus completing at least eight years of holding periods — so that by 2016 most of these contracts were free of surrender charges. The surrender rate among contracts issued in 2008 or before was 5.0 percent.

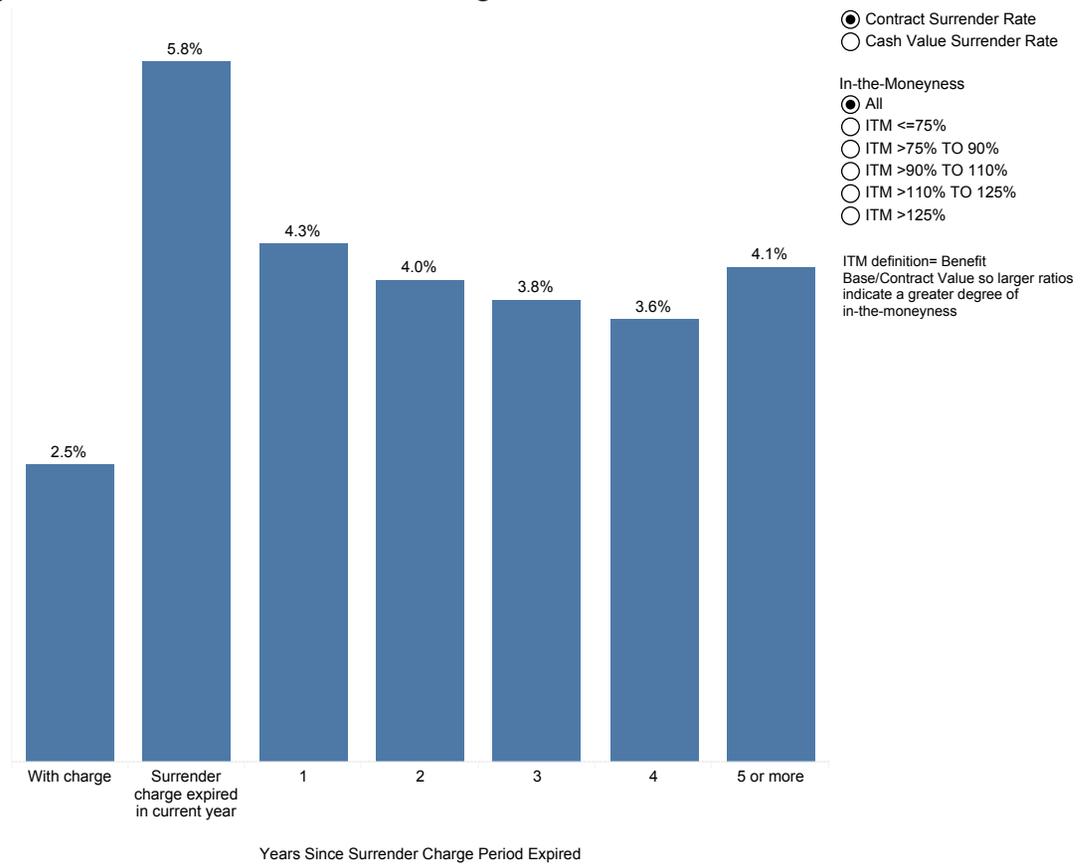


Some later issue years are suppressed due to confidentiality safe harbors.

24. Withdrawal Rates by Selected Owner and Product Characteristics	25. Summary of Withdrawal Rates by Selected Owner and Product Characteristics	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by S..
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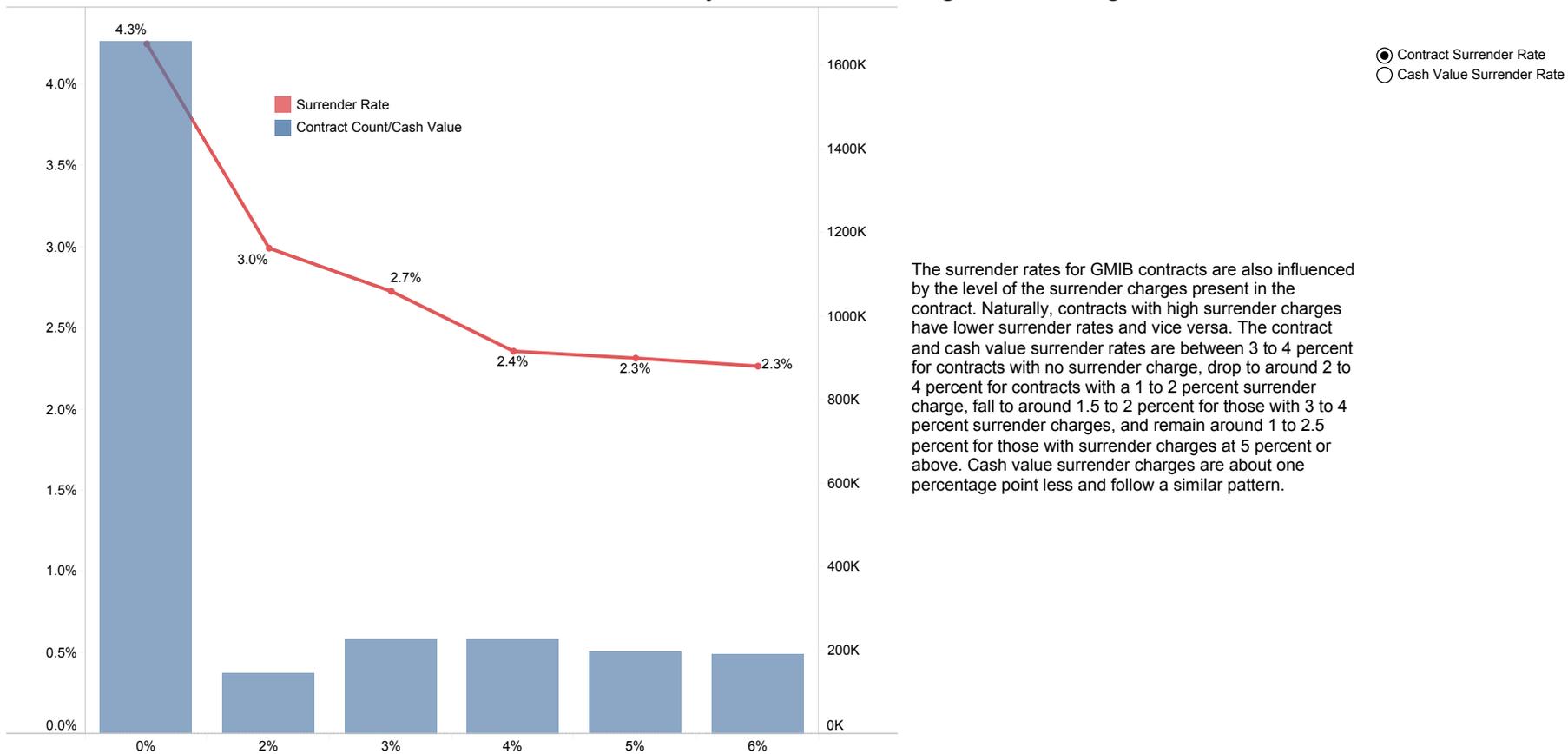
Surrender Rates by Years Left in Surrender Charge Period

The surrender rates for GMIB contracts are influenced by the level of the surrender charges present in the contract. Naturally, contracts with high surrender charges have lower surrender rates and vice versa. The surrender rates are around 5 to 6 percent for contracts in the first year after the surrender charge period end on both a contract count and cash value amount basis.



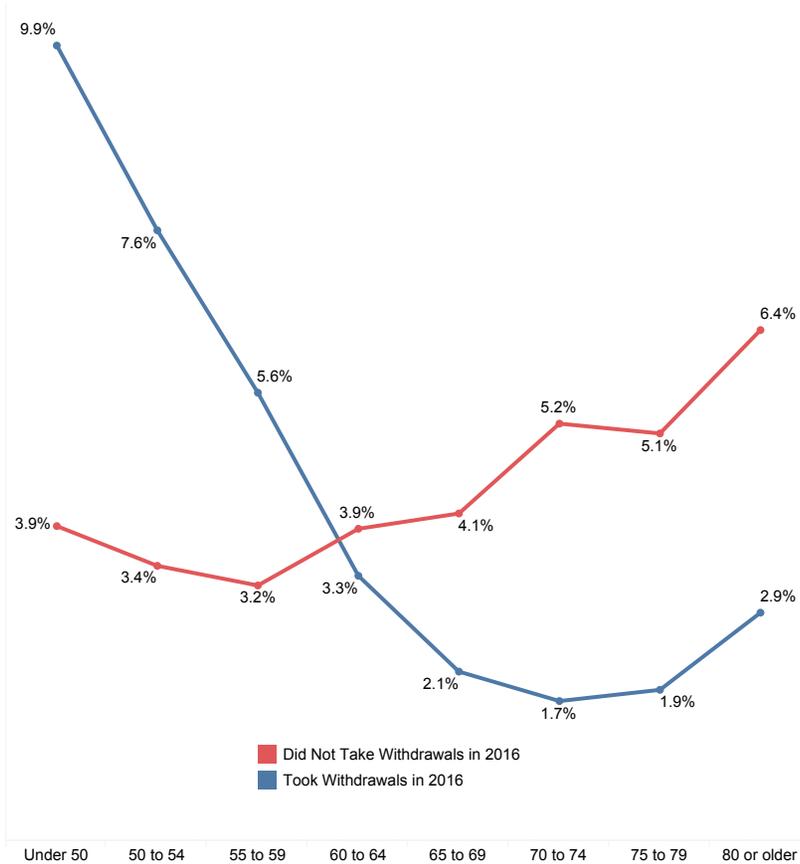
25. Summary..	26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by Selected Owner and Product Characteristics	35. Product & Benefit Cha..
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Surrender Rates by Surrender Charge Percentage



26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by Selected Owner and Product Characteristics	35. Product & Benefit Characteristics
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Surrender Rates by Timing of Withdrawals



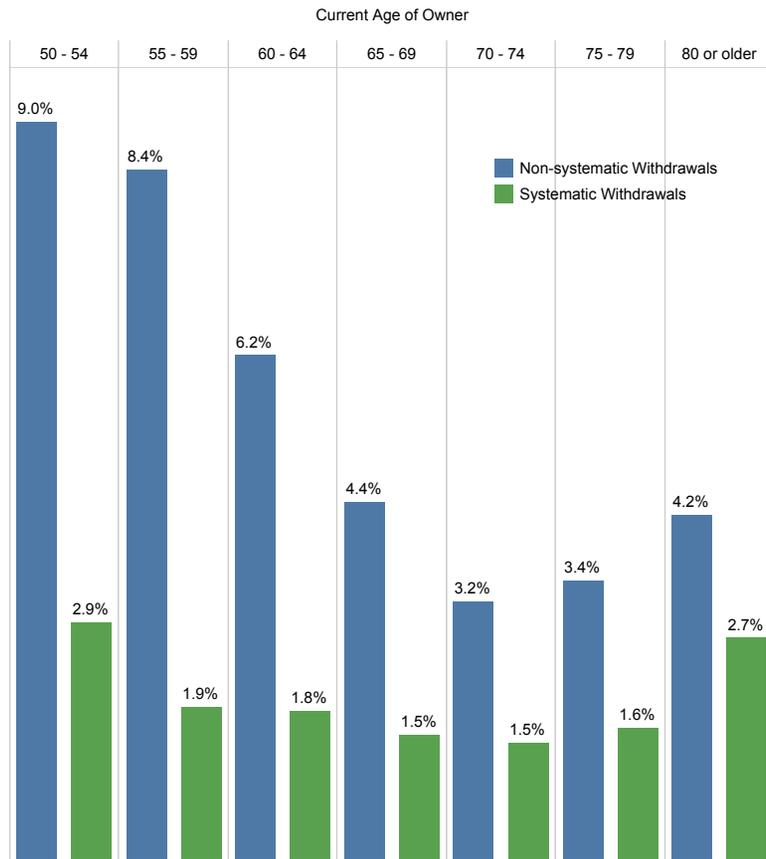
- Contract Surrender Rate
- Cash Value Surrender Rate
- Withdrawals in Analysis Year
- Withdrawals before Analysis Year

As we have seen, younger owners are the most likely to take withdrawals that exceed the benefit maximum. Contracts where owners under age 60 took withdrawals — either in current or past years — show an increased likelihood of surrender. However, this increased surrender activity did not occur for owners over age 60. For them, a withdrawal in one year did not necessarily signal a higher likelihood of surrender in the next year. In general, the likelihood of surrender increases with age among contracts with no withdrawal activity. Understanding this behavior is important since withdrawal activity, particularly withdrawals that exceed the benefit maximum, can be an early indicator of increased surrender activity for a book of business.

The contract surrender rate among owners under age 60 who took withdrawals in 2016 was 7.3 percent. On the other hand, the surrender rate was only 3.9 percent among owners under age 60 who did not take any withdrawals in 2016. The surrender rate for owners aged 60 or older who took withdrawals in 2016 (2.6 percent) was lower than the rate for those who did not take withdrawals (4.9 percent).

26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by Selected Owner and Product Characteristics	35. Product & Benefit Characteristics
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Surrender Rates by Withdrawal Method



- Contract Surrender Rate
- Cash Value Surrender Rate

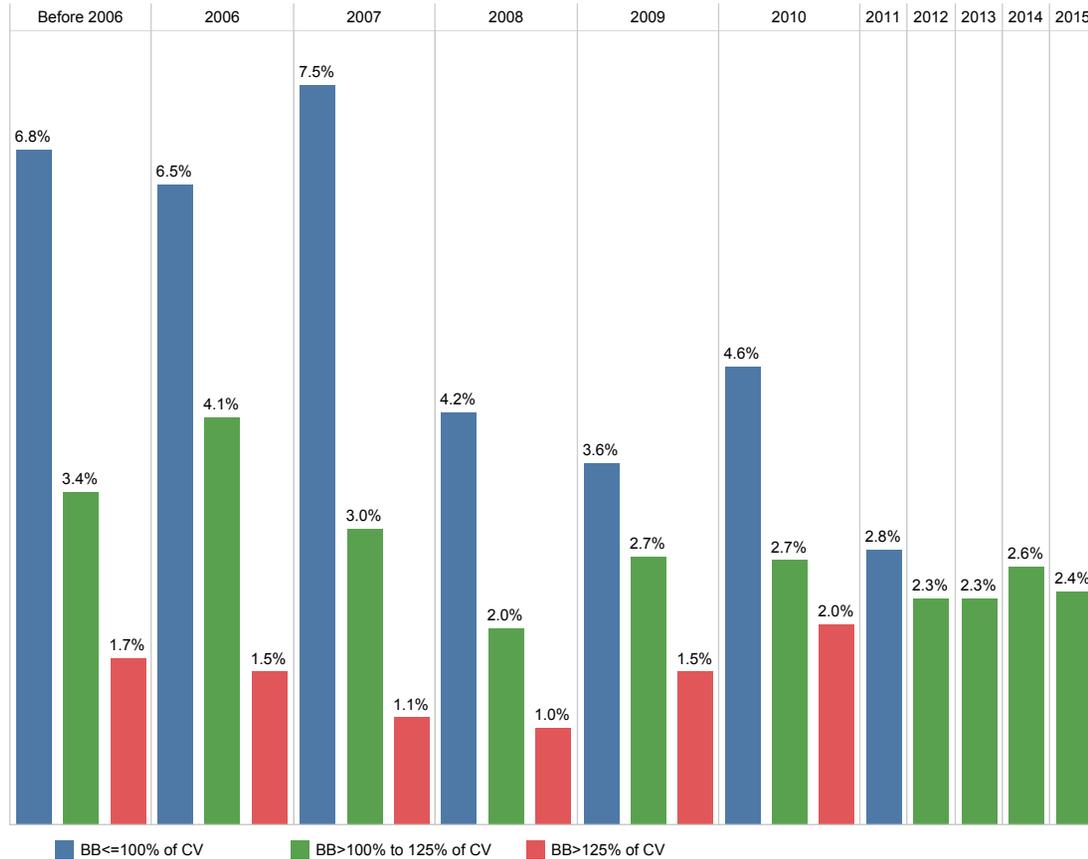
Another strong indicator of whether owners are likely to surrender their contracts is the type of withdrawal method they use — systematic or occasional. As we have seen, owners who use systematic withdrawals are less likely to take more than the benefit maximum, and most excess withdrawals are being made by younger owners.

Overall, the contract surrender rate among owners who took non-systematic or occasional withdrawals in 2016 was 5.6 percent, while the surrender rate among owners who withdrew systematically was a very low 2.0 percent. Non-systematic or occasional withdrawals do not always maximize the benefit withdrawals and, for younger owners, this indicates higher surrender rates.

However, companies should note that GMIB contract owners — particularly owners under age 70 who are not taking withdrawals — hold on to their contracts longer. All VAs with GLBs are experiencing lower persistency compared with VAs without GLBs; this will have an impact on the company's assets and reserves, as a greater number of contract owners may ultimately receive benefits over the life of their contracts.

26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by Selected Owner and Product Characteristics	35. Product & Benefit Characteristics
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Surrender Rates by Level of In-the-Moneyness



Another important way to look at GMIB surrender rates is by whether or not the benefit base exceeded the contract value.

- Contract Surrender Rate
- Cash Value Surrender Rate

However, looking at the surrender rates based on only the amount the benefit base exceeded the contract value may not completely address all issues when trying to understand the persistency risk. First, the vast majority of contracts — particularly those issued before 2008 — had benefit base amounts that exceeded the contract values at the beginning of 2016.

Second, for contracts with withdrawals before 2016, the benefit bases being lower than contract values could have been caused by owners taking withdrawals exceeding the benefit maximums, resulting in pro-rata adjustments. Contracts that had benefit base amounts that exceeded the contract values were most likely the contracts where owners took withdrawals within the benefit maximums, or through SWPs, or where owners have not yet started their withdrawals.

We looked at surrender rates by ratio of benefit base to contract value for contracts issued before 2016 that did not have withdrawals before 2016 for issue years 2008 and earlier. Surrender rates were lower for contracts that did not have any withdrawals before 2016 and the benefit base amount exceeded the contract value. GMIB owners appear to be sensitive to this when deciding whether to surrender their contracts. Actuaries should account for this sensitivity when setting assumptions for lapse behavior.

26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by Selected Owner and Product Characteristics	35. Product & Benefit Characteristics
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Surrender Rates by Selected Owner and Product Characteristics

- Year of Issue
- Age of Owner
- Contract Value BOY
- Gender
- Market Type
- Distribution Channel
- Cost Structure

	Contract Surrender Rate	Cash Value Surrender Rate
Before 2006	4.6%	3.3%
2006	3.9%	2.9%
2007	2.8%	2.0%
2008	3.2%	2.3%
2009	4.1%	3.1%
2010	3.7%	2.9%
2011	2.9%	2.2%
2012	3.0%	2.4%
2013	2.4%	1.6%

Some later issue years are suppressed due to confidentiality safe harbors.

Key Findings

- Larger GMIB contracts tend to have lower surrender rates than smaller contracts.
- There is no significant difference in GMIB overall surrender rates based on gender.
- B-share contracts tend to have slightly higher surrender rates than L-share contracts and non-qualified contracts had slightly higher surrender rates than qualified contracts.

26. Additional Premium	27. Net Flows	28. Surrender Rate by Contract Year	29. Surrender Rates by Years Left in Surrender Charge Period	30. Surrender Rates by Surrender Charge Percentage	31. Surrender Rates by Timing of Withdrawals	32. Surrender Rates by Withdrawal Method	33. Surrender Rates by Level of In-the-Moneyness	34. Surrender Rates by Selected Owner and Product Characteristics	35. Product & Benefit Characteristics
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Product & Benefit Characteristics

Average Charges and Number of Subaccounts by Issue Year

	2006	2007	2008	2009	2010	2011	2012	2013
Average Mortality and Expense Charge	1.46%	1.48%	1.44%	1.37%	1.36%	1.36%	1.32%	1.34%
Average Benefit Fee	0.66%	0.68%	0.77%	0.92%	0.96%	0.99%	1.00%	1.04%
Average Number of Subaccounts	60.45	60.45	58.64	53.92	59.47	55.06	65.41	78.71
Avg. lb Max Age Elect	76.16	75.92	76.39	77.39	77.60	77.65	77.92	78.90

Product Features – Distribution by Issue Year

	2008	2009	2010	2011	2012	2013	2014	2015
No	2%	2%	3%	3%	2%	2%	1%	2%
Yes	98%	98%	97%	97%	98%	98%	99%	98%

- Product has fixed account
- Product still available as of EOY
- Rider still available as of EOY
- Cap on benefits
- Benefit fee basis
- Asset allocation restrictions
- Step-up availability