Variable Annuity Guaranteed Living Benefits Utilization

2016 Experience

Guaranteed Lifetime Withdrawal Benefits (GLWB)

A Joint Study Sponsored by the
Society of Actuaries and LIMRA

Variable Annuity Guaranteed Living Benefits Utilization

2016 EXPERIENCE

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 20 companies made up 66 percent of all GLB sales in 2016 and 70 percent of GLB assets at year-end, and thus provide 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.

Since 2011, the average and median age has been slowly increasing. This increase has been driven by the continued popularity of this rider with leading edge Baby Boomers (age 60 to 69) — combined with some manufacturers that have raised the minimum age requirements over the years.

Companies should use the data provided throughout this chapter 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.

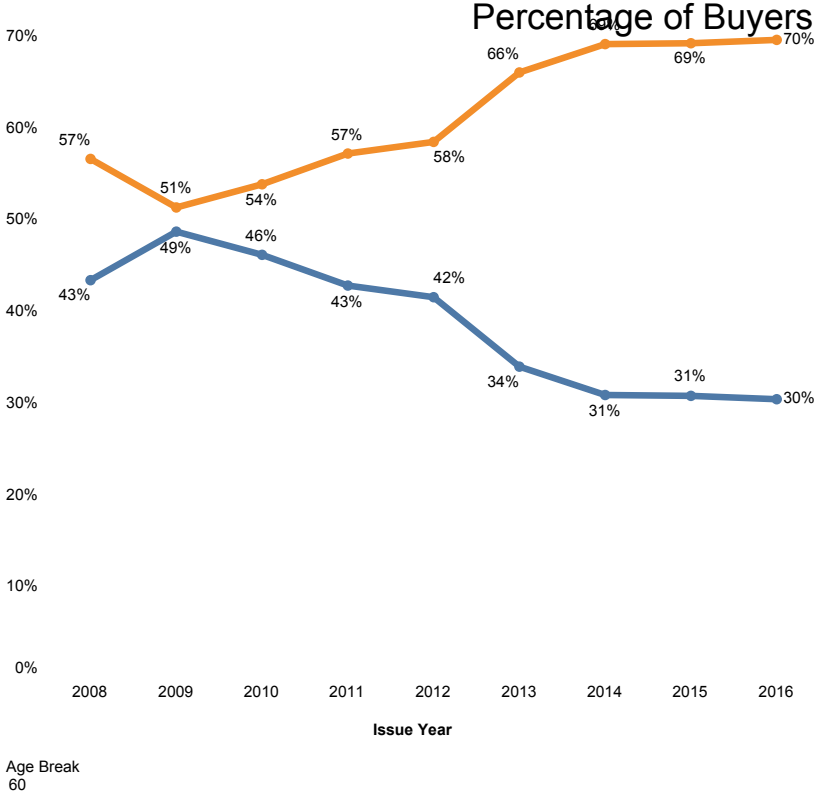
Buyers Age Analysis by Characteristics

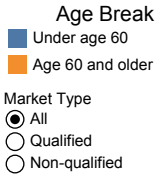
Select Breakout
- (•) Issue Year
- ( ) Gender
- ( ) Market Type
- ( ) Cost Structure
- ( ) Single-Joint
- ( ) Premium Size
- ( ) Distribution Channel

	Average	Lower Quartile	Median	Upper Quartile
2008	61	55	61	66
2009	60	54	60	65
2010	60	55	60	65
2011	61	55	61	66
2012	61	56	61	66
2013	62	57	62	67
2014	63	58	63	68
2015	63	58	63	68
2016	63	58	63	68

Percentage of Buyers Over Age 60 at Time of Purchase

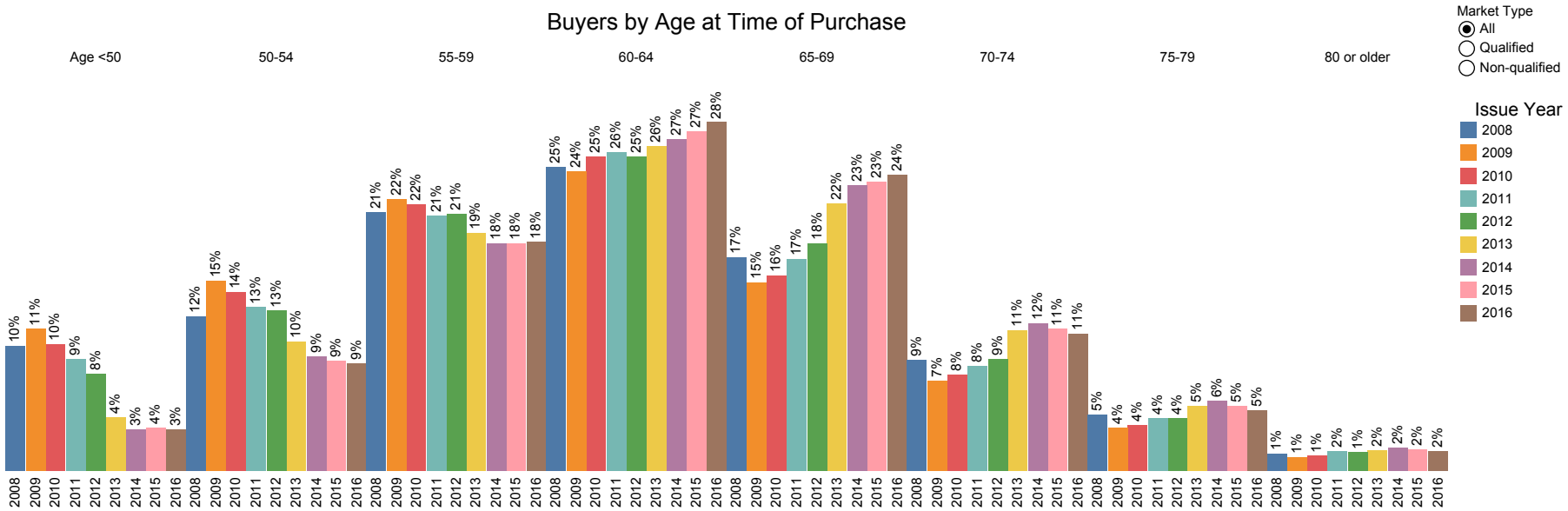
Percentage of Buyers Over Age 60 at Time of Purchase





GLWBs are popular with pre-retirees for a couple of reasons. First, pre-retirees can take advantage of the deferral bonus of the non-withdrawal provision in GLWBs if they do not need immediate income, and can grow the benefit base to maximize their retirement income. Insurance companies have focused on marketing messages that highlight these benefits, and how GLWBs address the need for securing guaranteed lifetime income in the future. Second, pre-retiree investors exposed to turbulent markets can get the upside market potential of the VA contract while benefiting from protection of the lifetime income guarantee as a floor.

From 2008 to 2013, overall the percentage of buyers aged 60 and older was increasing. One reason for this is companies focusing their marketing efforts toward individuals nearing retirement. Some companies also changed their products to carefully manage risk, and this includes increasing their minimum purchase ages and reducing withdrawal percentages for younger consumers. Since 2013, that percentage has been dropping again and as of 2016, has returned to 2008 levels (this was mostly driven by a drop in buyers age 60-64). At the same time, the percentage of buyers under age 60 remained relatively flat from 2008 to 2013 and then began declining to well below the 2008 level by 2013. This combination has led to an average an median buyer age approximately 2 years higher between 2008 and 2016 issues.



Some Baby Boomers have become interested in annuities that can guarantee a part of their retirement income. This demand will continue to increase as more Baby Boomers enter retirement without employer-sponsored pension plans. In addition, pre-retirees are increasingly concerned about the uncertainty of Social Security and healthcare benefits like Medicare. Insurance companies have succeeded in marketing guaranteed lifetime withdrawal or income benefit features, as more retirees and pre-retirees are forced to take personal responsibility for ensuring stable retirement income from their savings/investments.

Increasingly, advisors consider protecting against longevity risk to be one of the most valuable services they offer. More advisors recognize that annuities are one of the few retirement products that provide a guaranteed lifetime income stream to mitigate part or all of this risk for their clients. In addition, the vast majority of GLWBs provide built-in flexibility so that clients can begin receiving income at any point — now or in the future. Despite changes and the shifting focus on these riders, GLWBs continue to play an important role in clients' retirement portfolios.

..

Owner Profiles

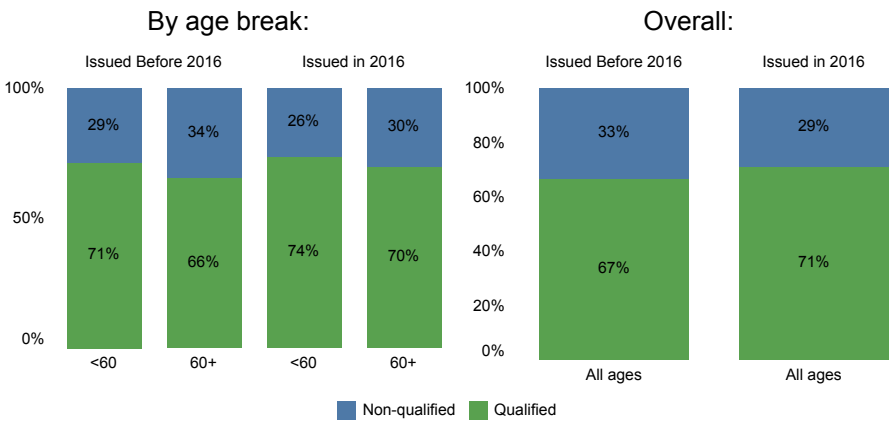
In 2016, 71 percent of contracts were funded from qualified sources of money, a slight increase from 2015 buyers. This is slightly higher than broader industry developments the LIMRA Secure Retirement Institute has tracked, where roughly 6 in 10 retail VAs are funded with qualified money, the bulk of which is from rollovers.

More rollover dollars are significant to insurance companies for two reasons. First, LIMRA studies show that rollover dollars are a significant source of VA funding. As Boomers start to retire or plan for retirement income, their use of qualified savings will play an increasingly important role.

Boomers are using a portion of their savings from employer-sponsored plans or other qualified contracts to purchase products that can provide a guarantee on a portion of income in retirement, if needed. The use of qualified savings for annuity purchases may be influenced by the recognition that these savings must be withdrawn as the buyers reach the RMD age of 70½. The distinction is important for multiple reasons:

The use of qualified funds for GLWB purchase by younger buyers fits with similar behaviors of younger buyers of immediate income annuities. A 2016 LIMRA study of immediate income annuity buyers demonstrates that buyers under age 70 are more likely to use qualified money. There are other similarities. One third of immediate annuity buyers who funded their income annuity with

Age Break 60



Owner and Contract Characteristics

	Issued Before 2016	Issued In 2016	Overall	Avg. Premium for Contracts Issued in 2016
Age 59 & under	20%	30%	21%	$133,098
60 to 64	21%	28%	21%	$154,072
65 to 69	25%	24%	25%	$151,041
70 to 74	18%	11%	17%	$145,792
75 to 79	10%	5%	9%	$144,869
80 or older	7%	2%	6%	$145,530

Select Breakout
- (•) Age of Owner
- ( ) Gender
- ( ) Market Type
- ( ) Qualified by Age
- ( ) Nonqualified by Age
- ( ) Distribution Channel
- ( ) Cost Structure
- ( ) Contract Value EOY

Benefit Base and Contract Value Comparison

Time of Year
- (•) Beginning of Year
- ( ) End of Year

GLWBs are complex products and insurers are exposed to the risk that the underlying investments may underperform before or during the withdrawal period, and that the account balances in the contracts may be insufficient to cover the lifetime withdrawal guarantee. With a guarantee of lifetime benefit option — particularly on joint lives — insurers also are exposed to longevity risk. The performance of underlying investments may remain vulnerable to the complex mixture of risk arising from equity, interest rates, and the correlation thereof.

Over the last few years, insurance companies have worked to better manage the volatility of the subaccounts by restricting the funds into which GLWB owners can invest. This has evolved from asset allocation funds to automatic asset transfer programs, to most recently, managed volatility funds.

When analyzing the benefit bases of GLWBs, it is important to understand the details behind the equity market growth and volatility during the year as well as the withdrawal behavior of GLWB owners in that economic environment. The benefit bases in many GLWB riders are guaranteed to roll up for owners who delay taking their first withdrawal.

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 $20,000.

	Benefit Base	Contract Value	CV as % of BB
Sum	$319,346,823,559	$275,911,523,320	86.4%
Average	$156,038	$134,815	86.4%
Median	$107,475	$94,548	88.0%

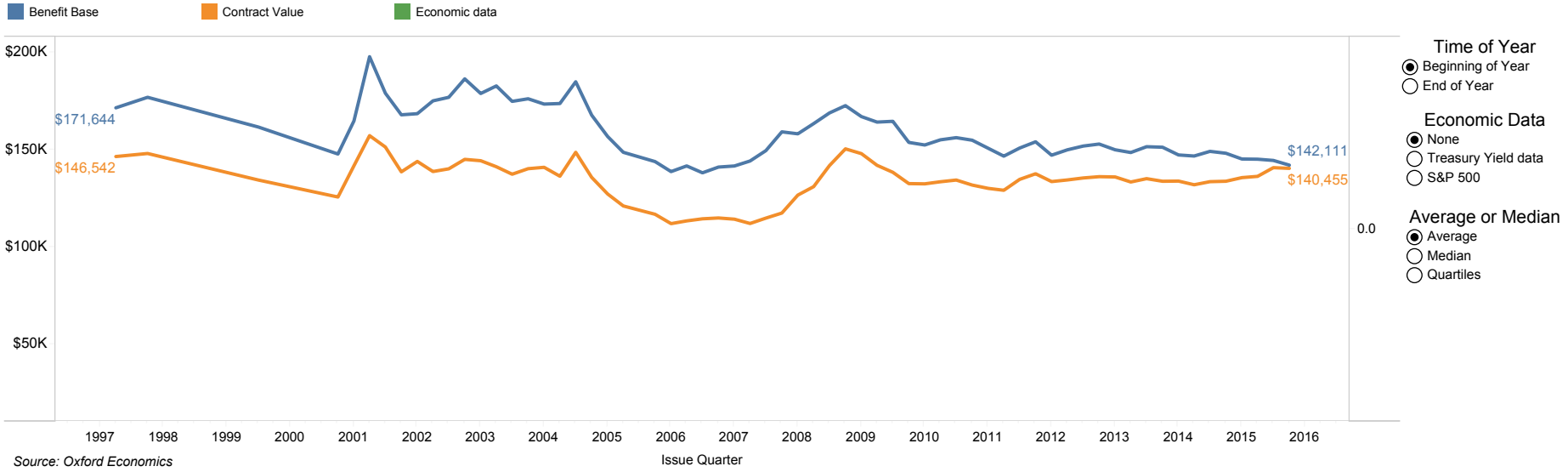
Percent of contracts where benefit base was greater than contract value:

97.9%

Contract Value vs. Benefit Base by Quarter of Issue

When a contract was issued has an impact on if — and how much — the benefit base might exceed the contract value. Some contracts have experienced considerable market volatility — involving both gains in the early periods of 2006–2008, losses during the market crisis in 2008–2009, moderate gains in 2010, a flat return in 2011, and then improvements in 2012–2014, and a drop in 2015.

For example, the contracts issued in 2004 experienced robust market gains in 2006–2007 and as a result had less of a setback during the market plunge in 2008 and subsequent market changes. Conversely, contracts issued between 2006 and early 2008 had less time to realize gains or suffer significant losses, making the gap between the benefit base and contract value wider. Market losses and automatic benefit base roll-ups had the greatest impact on contracts issued in the second half of 2007, resulting in a larger gap between the contract value and benefit base. However, contracts issued in the last quarters of 2008 through early 2011 had a very similar gap between contract values and benefit bases — as gains in contract values were similar to the increase due to benefit-based roll-ups.



Source: Oxford Economics

Ratio of Benefit Base to Contract Value by Quarter Issue

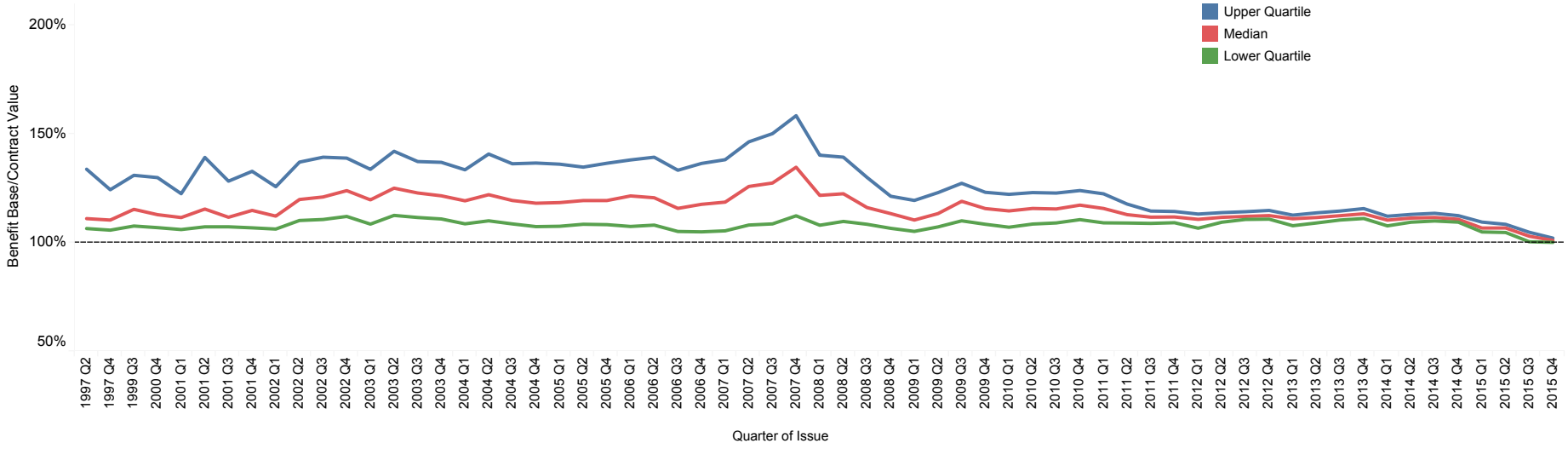
Time of Year
(•) Beginning of Year
( ) End of Year

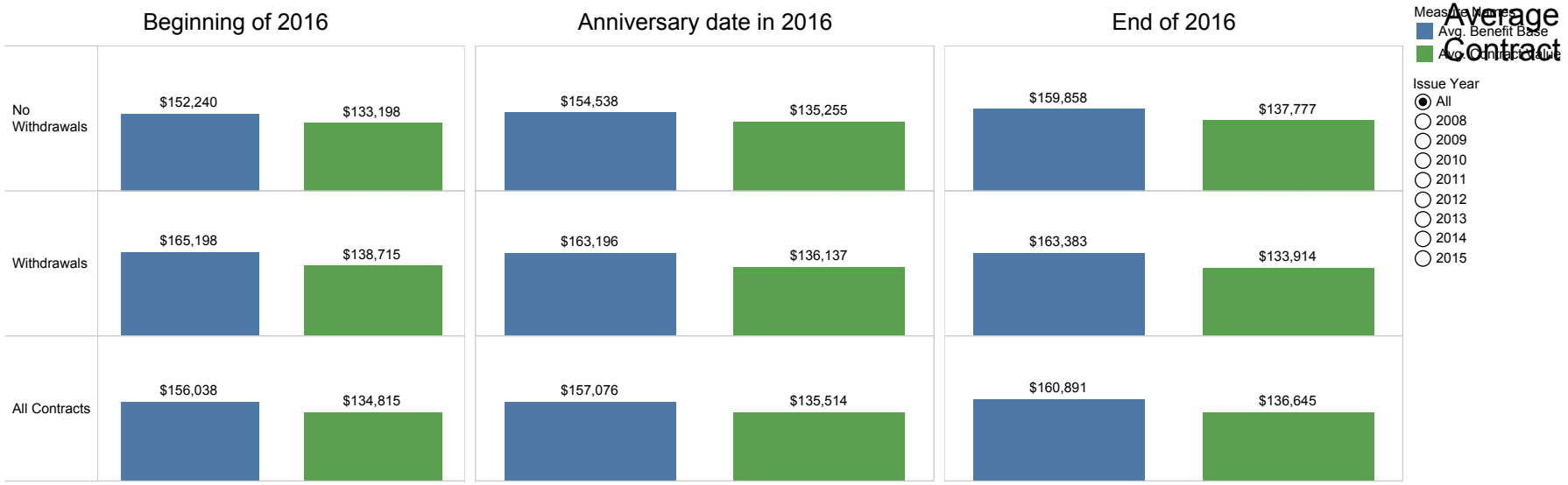
Looking at the quartile ranges of the benefit base to contract value (BB/CV) ratios, contracts issued before 2008 had the greatest deviations in BB/CV ratios.

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.

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, across all years of issue, the average contract value increased slightly from the BOY to the EOY. During that time the average benefit base grew at a slightly more rapid pace.

The average benefit base declined 1.1 percent, driven in part by younger owners taking excess withdrawals. Absent of any investment gains after expenses, contact values dropped 3.5 percent by EOY.

We can further expand our benefit base analysis to look at those contracts that had withdrawals compared with those that did not have withdrawals. When withdrawals are made from GLWB riders, in most cases the benefit base remains unaffected while contract values are reduced by the withdrawal amounts. One risk that exists with the contracts that utilize guaranteed withdrawal riders is that the contract values in these contracts will decline absent any market growth. In these cases, the contract may eventually run out of money. This could be expedited if negative returns happen early in the withdrawal phase, due to the impact of the sequence of returns.

For in-force contracts issued before 2016 that did not have withdrawals in 2016, the benefit base rose steadily, registering a 5 percent increase at the EOY. This increase can be attributed mainly to automatic roll-ups of benefit bases for contracts without withdrawals. Contract values could not keep pace with this auotmatic roll-ups, only increasing 3.4 percent for the year.

Benefit Base to Contract Value Ratios 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.

This figure shows the BB/CV ratios by age at the BOY. For in-force contracts issued before 2016, only 3 percent had BB/CV ratios of less than 100 percent. A approximately two-thirds of the contracts had BB/CV ratios greater than 110 percent.

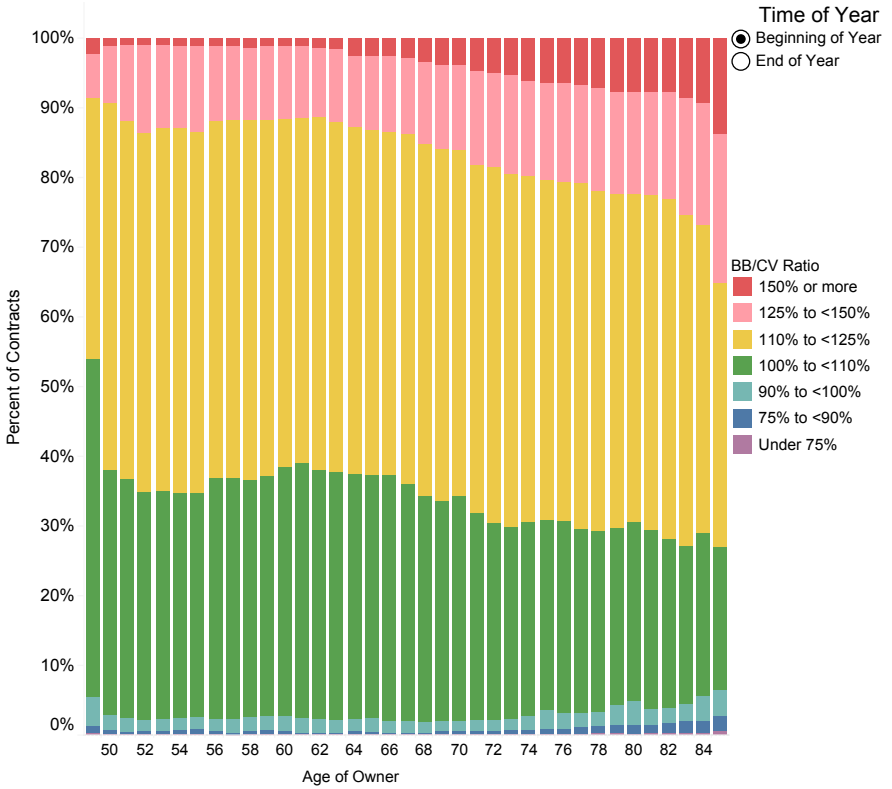
This clustering above 100 percent was due to flat investment performance in the prior year and the net investment returns not keeping pace with the growth of the benefit base.

However, owners aged 70 or older had comparatively more contracts with BB/CV ratios of 125 percent or more (similar to what we have seen in past years). One in five contracts with owners aged 70 and older — had BB/CV ratios of 125 percent or more. Though owners aged 70 or older constituted only a third of all contract owners, nearly half of all contracts with BB/CV ratios of 125 percent or more were within this age cohort. Older owners hold comparatively more contracts with higher BB/CV ratios because:

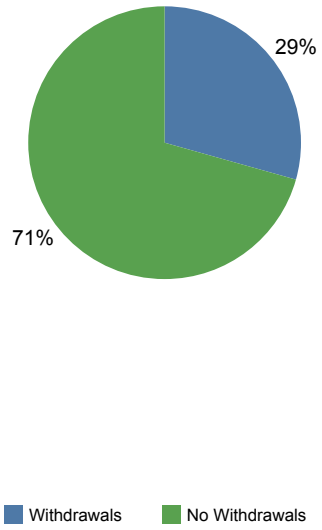
- They are more likely to own contracts for a longer duration of time. So these contracts are likely to have suffered from increased market volatility.

- Older owners — particularly those aged 70 or older — are more likely to take withdrawals over a longer period of time. Also, those funded with qualified money are required to begin taking withdrawals at age 70½. If their withdrawal amounts remain within the maximum amount offered in the contract, their contract values may diminish due to the withdrawals while the benefit bases are likely to remain level and relatively high.

- They may also have had their contracts for more years in deferred withdrawal mode prior to withdrawals, while annual roll-up features pushed up their benefit base amounts automatically.



Percent of owners who have taken withdrawals in 2016:



Determining whether a contract owner has actively "used" a GLWB during the year is straightforward. If partial withdrawals have occurred, then benefit utilization has occurred. However, determining whether contract owners will continue to take withdrawals up to the maximum allowed under the terms of the benefit, or whether they will take benefits for life, is more difficult to determine. However, owners' inclinations to take lifetime withdrawals are more obvious when they take withdrawals from a systematic withdrawal plan (SWP).

Much of the present study is based on a single calendar year. However, in some sections we analyzed withdrawal activity over time. To try and assess overall withdrawal behavior, we asked companies to provide cumulative total withdrawals prior to 2016 (not all companies could provide this information). In addition, some companies found it difficult to distinguish systematic withdrawals — which are more likely to be associated with utilization of GLWBs — from non-systematic withdrawals. So, LIMRA defined "utilization" of GLWBs as the presence of partial withdrawals during the year, with the caveat that benefit "use" may occur in other ways. In this report, we emphasize five key determinants that will guide companies in understanding the intention of owners to use withdrawals as a lifetime income stream:

• Age of customers taking withdrawals — At what ages are owners likely to take withdrawals and how many are likely to take withdrawals?

• Source of funding for their annuities and how this impacts withdrawal behavior

• When they take their first withdrawal —Are they likely to continue withdrawals once they start?

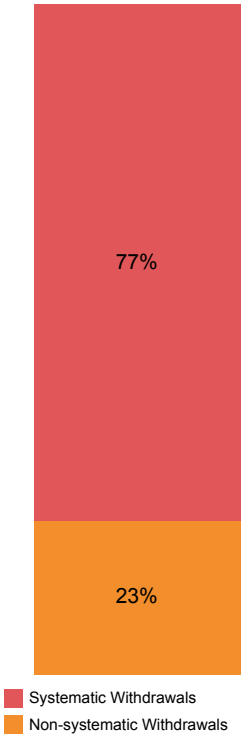
• Method for withdrawals — Are the customers taking withdrawals through an SWP or through occasional withdrawals?

• Amount of withdrawals — Are withdrawal amounts within the maximum annual income amount allowed in their contracts?

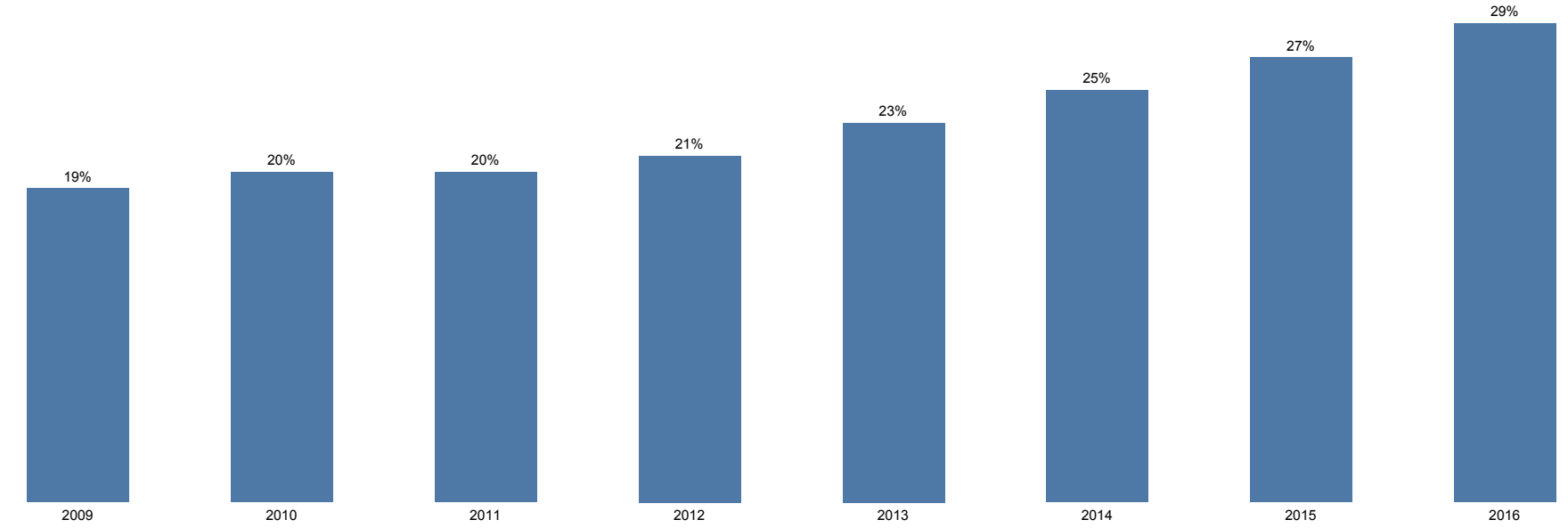
If customers take withdrawals on a continuous basis through SWPs, and withdrawal amounts remain within the maximum allowed, it is very likely they are utilizing the GLWB in their contracts. Our findings suggest that this is the case for most of these owners.

For VA contracts with GLWBs issued before 2016 and still in-force at the EOY 2016, only 29 pecent had some withdrawal activity. Just over three-quarters of those withdrawals were taken systematically.

Of those taking withdrawals in 2016:



Overall Utilization of Contracts by Calendar Year

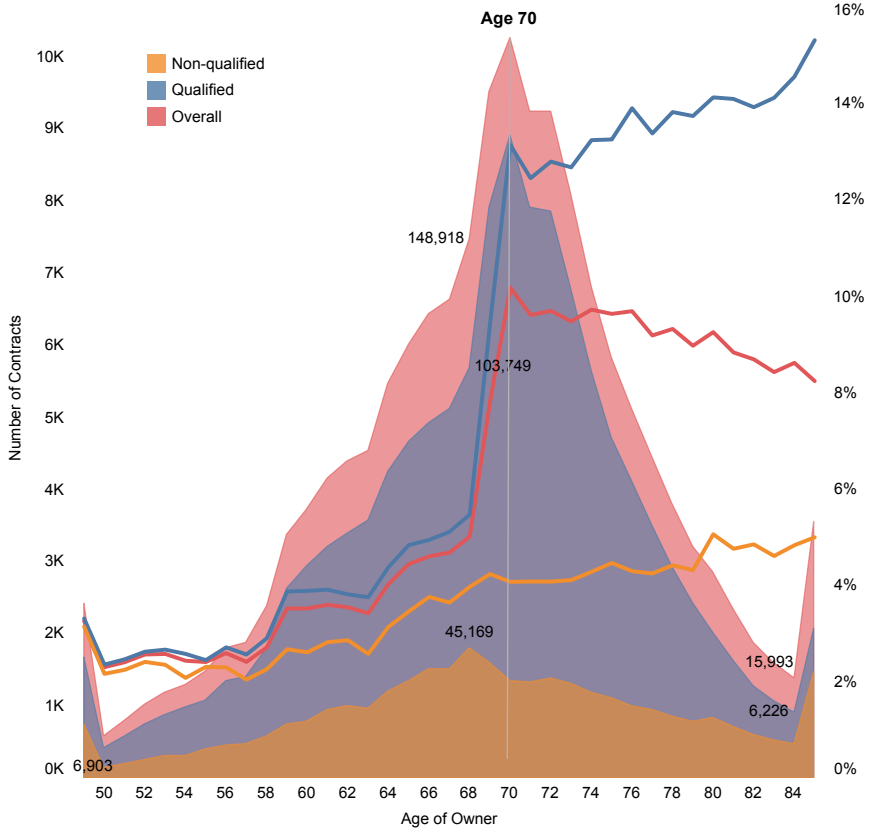


This chart shows overall utilization rates over study years - from 2009 to 2016. Note the increasing trend as the underlying population ages.

Utilization by Source of Funds and Age of Owner

Market Type
- (●) All
- ( ) Qualified
- ( ) Non-qualified

Withdrawal Type
- ( ) All Withdrawals
- ( ) Systematic
- (●) Non-systematic



The source of funds is one of the most important factors in understanding customer withdrawal behavior. Examining withdrawal activity by source of funds and customer age shows that GLWB utilization rate is quite high for older customer segments.

The withdrawal behavior of GLWB owners can be categorized into three life stages: pre-retirement, entering retirement, and RMD. Up to age 60, when most owners are not retired, withdrawals rates for customers who use either qualified or non-qualified money to buy their contracts remains low. 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. In this phase the percent of customers taking withdrawals rises steadily in parallel for both qualified and non-qualified owners. In many GLWBs owners become eligible to withdraw starting at age 60. However, between ages 60 and 70 — sometimes termed as the transition ages in retirement — few customers are fully utilizing the withdrawal benefits.

The overall percent of older owners taking withdrawals is closer to the percent of customers withdrawing from non-qualified annuities, since more customers aged 70 or over own a non-qualified annuity (and a majority of them are not taking withdrawals). However, this pattern will change as more customers with qualified annuities age and start to withdraw due to RMDs. The distinction between qualified and non-qualified sources of funds is important for several reasons:

- Overall withdrawal activity — even the composite withdrawal activity by age cohort — is not a reliable measure of actual risk. The measure is particularly skewed downward because the majority of current GLWB owners are under age 70, and most of them have not yet started withdrawals.

Only 478,900 GLWB owners aged 70 or over funded their contracts with qualified money. They represent only a quarter of all GLWB owners who funded their annuities with qualified savings. In the next decade, another half of owners (more than 850,000) currently between ages 60 and 69 will reach age 70 and a majority of them will take withdrawals from their contracts to meet RMDs.

- 68 percent of owners aged 70 or older, who funded their GLWB contracts with qualified savings, took withdrawals. In comparison, only 21 percent of qualified owners aged 60–69 took withdrawals. The need to take RMDs will essentially drive withdrawal behavior for contract owners, and the more a company's customer mix is weighted with qualified contract owners, the more carefully it needs to manage its book of business.

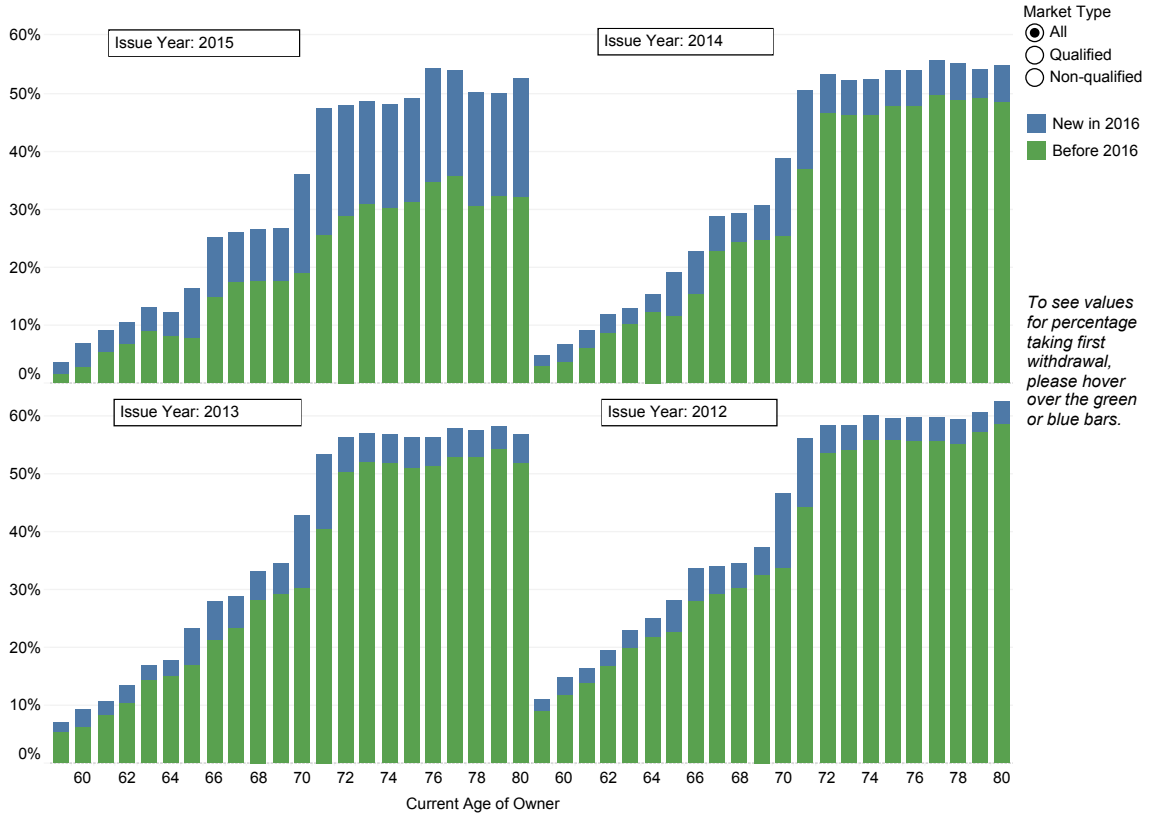
- In comparison, 40 percent of non-qualified annuity owners were aged 70 or above. The percent of non-qualified owners taking withdrawals in this age group was 36 percent, roughly half of the percentage of owners withdrawing from their qualified annuity

Percentage Taking First Withdrawals

One of the important value propositions for GLWB annuities is the ability to create guaranteed lifetime income. To better understand owners' inclinations to take lifetime withdrawals, we have analyzed owner withdrawal behavior by considering at what age or in what year of annuity ownership owners are likely to initiate their first withdrawal. We also look at how many will 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 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 the purchase.

The first withdrawal activity analysis can be done in a few different ways: First, we 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 (Tab 15). Second, we explore how sensitive the first withdrawal activities are to the potential increases in guaranteed annual withdrawal percentages, typically determined by age bands prescribed in the GLWB contracts. In other words, do owners take advantage of the maximum guaranteed withdrawal rates occurring in the current year or wait if the withdrawal percentage amount is set to increase in the next year (Tabs 16 and 17)? Third, we analyze the first withdrawal history for owners from a particular issue year, and track how age and sources of money influence their first withdrawals (Tab 18). Finally, we will extend this analysis for owners who take withdrawals through SWPs (Tab 19).

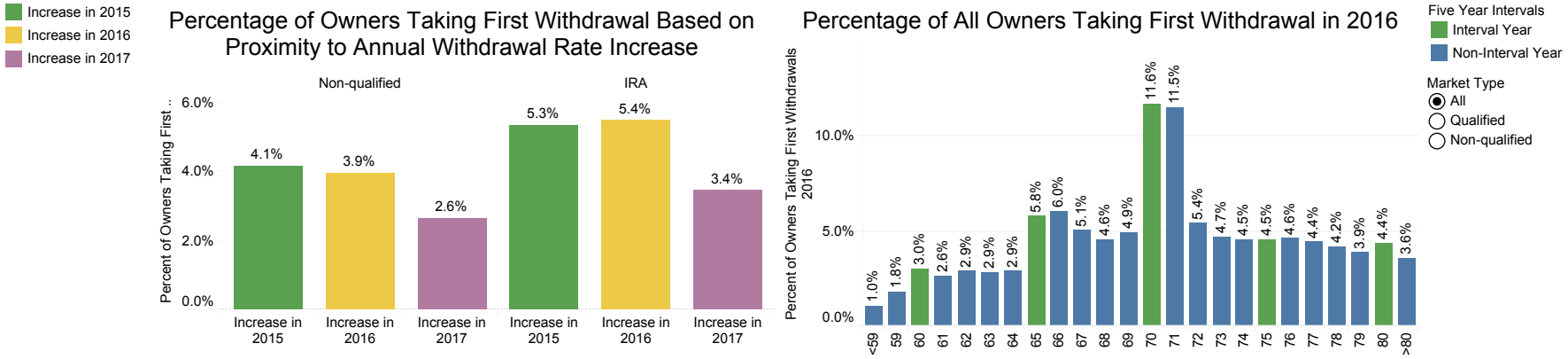


Percent of Qualified Owners Taking First Withdrawal in 2016 - Near RMD Age

Attained Age During Analysis Year	Issue Year 2012	2013	2014	2015
Age 67.5	4.3%	5.1%	5.1%	9.1%
Age 68.5	5.4%	5.4%	5.9%	9.9%
Age 69.5	15.2%	15.4%	17.0%	20.5%
Age 70.5	16.0%	18.7%	18.5%	28.6%
Age 71.5	5.4%	6.3%	6.8%	24.7%
Age 72.5	4.7%	5.1%	6.6%	25.7%
Age 73.5	4.4%	5.0%	7.1%	29.5%

Many insurance companies provide tools to assist GLWB buyers who take withdrawals, particularly to satisfy RMDs on or before a particular date when they turn age 70½, so that RMDs are not treated as excess withdrawals. If the annual RMD amount exceeds the annual guaranteed income amount, most companies will not treat it as an excess withdrawal. Also, nearly all companies administer programs to calculate RMD amounts and offer SWPs to receive RMDs.

For qualified contracts, age and the need to take RMDs are the principal drivers for withdrawals. In this tab, we assessed the percentage of qualified owners taking their first withdrawal in 2016 around age 70½ (when RMD withdrawals must begin for qualified contracts).



Most GLWB contracts provide owners with a step-up in guaranteed annual withdrawal rates based on certain age bands or owners reaching a certain age, e.g., age 60, 65, 70 or 75 — if they wait to initiate their first withdrawals until obtaining these ages. If owners are sensitive to the potential increase in maximum annual withdrawal percentage, then they will wait until after they have reached one of the ages where the maximum percentage increases. For example, if the owner reached age 65, they might be expected to initiate their first withdrawal activity after reaching age 65 to take advantage of the higher annual income. On the other hand, if an owner is currently aged 64, the owner may wait until they reach age 65 if a step-up in annual withdrawal percentage is to occur at age 65.

Our analysis of a subset of owners who are close to reaching an age threshold (one year before, current year, and one year after) where a step-up in annual guaranteed withdrawal rates can occur shows that some owners do wait to initiate their first withdrawals and take advantage of higher annual guaranteed withdrawal rates offered on those particular age thresholds in the GLWB contracts.

Owner Age

Withdrawals started at	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	All Ages
56	3%																				11%
57	2%	3%																			8%
58	2%	2%	2%																		5%
59	4%	3%	4%	5%																	7%
60	6%	6%	7%	6%	8%																6%
61	5%	5%	5%	5%	6%	8%															6%
62	5%	6%	5%	5%	6%	6%	12%														5%
63	3%	5%	5%	4%	5%	5%	7%	11%													5%
64	4%	4%	5%	4%	5%	5%	4%	7%	11%												4%
65	7%	6%	7%	8%	8%	8%	8%	7%	8%	13%											
66		6%	7%	7%	7%	8%	7%	9%	8%	9%	16%										
67			5%	4%	5%	6%	7%	7%	8%	7%	8%	15%									
68				4%	4%	5%	5%	6%	6%	7%	7%	7%	16%								
69					4%	4%	5%	5%	6%	6%	8%	7%	9%	18%							
70						13%	14%	17%	19%	20%	20%	23%	9%	25%	29%						
71							12%	13%	15%	16%	18%	20%	33%	9%	32%	35%					
72								4%	4%	4%	5%	6%	8%	20%	5%	27%	37%				
73									2%	3%	3%	3%	5%	6%	10%	4%	25%	35%			
74										2%	2%	4%	4%	4%	5%	9%	4%	29%	40%		
75											2%	2%	3%	3%	4%	5%	10%	4%	24%	37%	
76												2%	2%	3%	3%	4%	5%	10%	4%	28%	
77													2%	2%	2%	3%	3%	4%	9%	5%	
78														1%	2%	2%	3%	4%	5%	9%	
79															2%	2%	2%	2%	5%	5%	
80																1%	2%	2%	2%	4%	
81																	2%	2%	3%	3%	
82																		1%	1%	2%	
83																			1%	1%	
84																				1%	
Total	40%	47%	50%	52%	58%	69%	83%	86%	87%	88%	89%	90%	91%	92%	93%	93%	93%	95%	94%	96%	62%
Took withdrawals all subsequent years	69%	72%	77%	78%	79%	80%	86%	87%	88%	88%	88%	87%	89%	82%	77%	75%	77%	74%	76%	74%	79%

In order to get a clear and consistent picture of when owners first start to take withdrawals and how many start to take their first withdrawals in the following years we followed 2007 VA GLWB buyers and tracked their withdrawal behaviors. We looked at withdrawal behavior of 2007 buyers aged 56 to 76 from 2007 to 2016, and assessed what percent of those buyers began taking their first withdrawals from 2007 to 2016. This chart focuses on qualified buyers.

The last row of the table provides the percent of owners taking withdrawals in all subsequent years, based on contracts where the first withdrawal occurred between 2007 and 2016 and with withdrawals continuing every year through 2016. Overall, once owners begin to take withdrawals, they are more likely to continue utilizing the withdrawal benefit.

This analysis reveals some important insights:

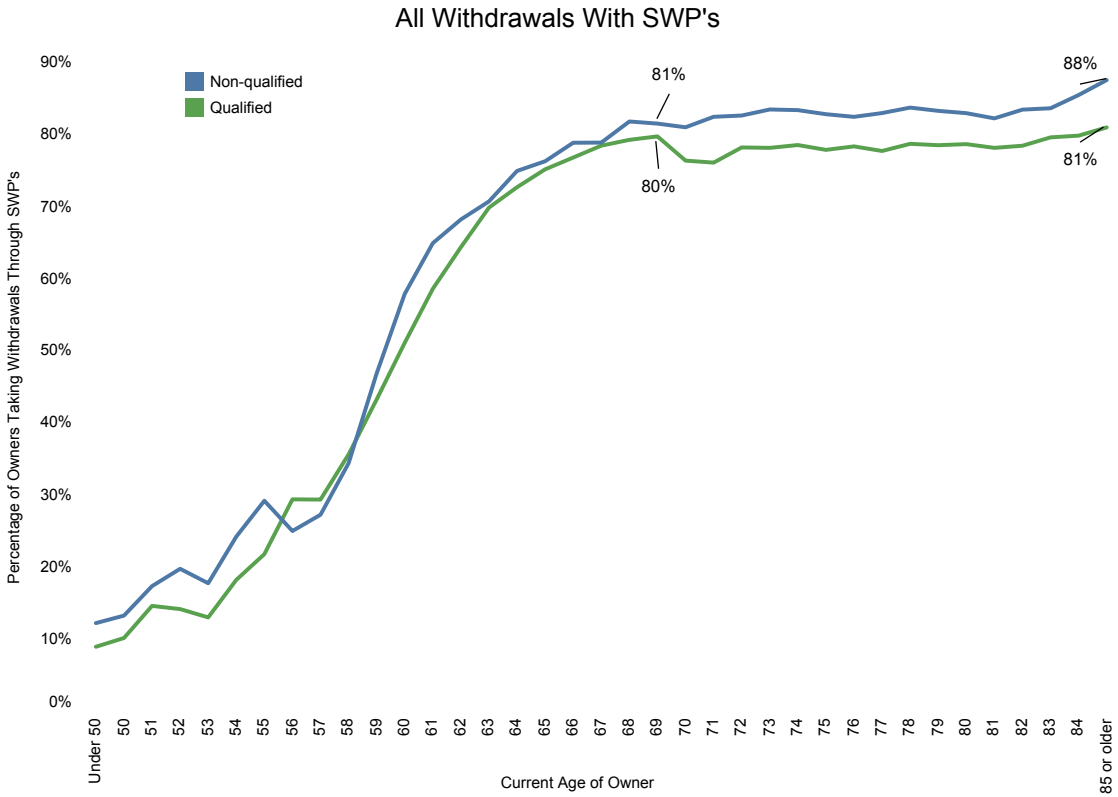
- Overall, just over 1 in 10 owners initiated their withdrawals immediately in 2007, the same year they purchased their annuities.
- The percentages of owners taking their first withdrawals in subsequent years are typically lower than in the first year, as the number of owners who have not taken withdrawals diminishes.
- Overall, once owners initiate withdrawals, three quarters continue to take withdrawals in all subsequent years.
- Across all ages, almost two thirds have used the guaranteed benefit rider in their contracts.

Select a View
- (●) Qualified 2007
- ( ) Qualified 2008
- ( ) Non-qualified 2007
- ( ) Non-qualified 2008

Withdrawal Type
- (●) All Withdrawals
- ( ) Systematic

Withdrawals started in
- 1st Year
- 2nd Year
- 3rd Year
- 4th Year
- 5th Year
- 6th Year
- 7th Year
- 8th Year
- 9th Year
- 10th Year

Systematic Withdrawal Activity



One predictor that can help determine if GLWB owners are likely to take withdrawals to generate a lifetime income stream is how regularly they take withdrawals — either through SWPs or occasional withdrawals. Most insurance companies allow GLWB owners to use SWPs and typically categorize those withdrawals as lifetime withdrawals under the benefit. In general, withdrawals through SWPs are a customer's affirmation to take withdrawals on a continuous basis, and strongly indicate that customers are utilizing the GLWB in their contracts.

Overall, three quarters of non-qualified owners and 7 out of 10 qualified owners who took withdrawals in 2016 used an SWP. The rest of the owners took occasional withdrawals. Older owners are more likely to take withdrawals through SWPs, and younger owners — particularly those under age 60 — are more likely to take occasional withdrawals.

For owners under age 60 who took only occasional withdrawals, the withdrawal amounts were unusually high, and they more likely intended to partially surrender the contracts.

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	$12,129	$11,120	$6,740	$7,564	$31,081	$24,015	$13,175	$12,070
Age 60-69	$9,244	$9,842	$5,950	$7,032	$20,715	$18,173	$8,993	$9,678
Age 70 or older	$8,605	$7,694	$5,760	$5,250	$16,244	$9,666	$7,500	$5,572
Grand Total	$8,814	$8,405	$5,820	$5,813	$19,520	$13,624	$8,500	$6,970

The table shows the average and median withdrawal amounts for owners who took only SWP withdrawals in 2016 for both qualified and non-qualified contracts. The median withdrawal amounts for both qualified and non-qualified owners aged 60 and older are within expectations, while those under age 60 were influenced by owners who were likely taking partial surrenders. This is a very small percentage of the overall contracts that had withdrawals.

For those contracts with only occasional or non-systematic withdrawals, the median and average withdrawals amount was significantly higher, particularly for individuals under age 60, which is a sign they more likely to intend to partially surrender the contract.

Withdrawals as a Percentage of Annual Benefit Maximum

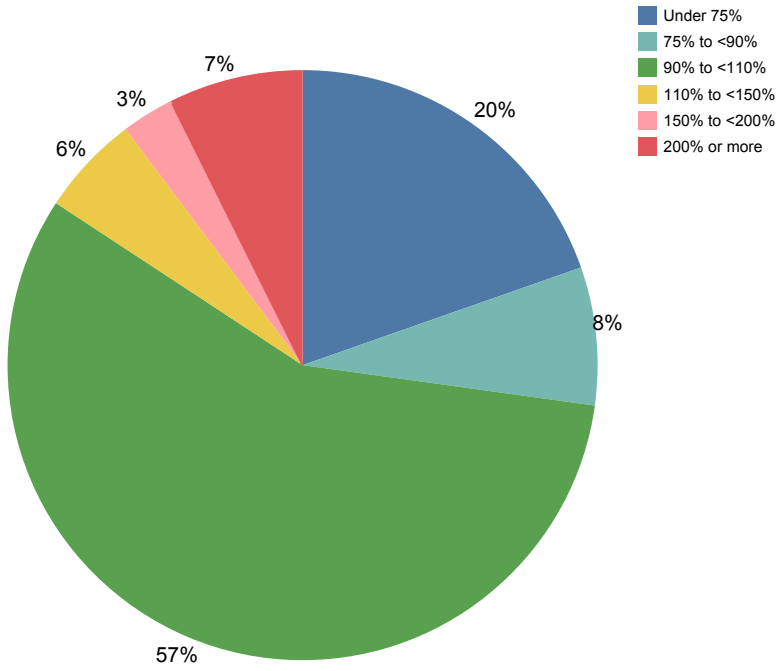
GLWBs provide a specified maximum withdrawal amount annually for life, through periodic withdrawals from annuity contracts, thus ensuring protection against adverse market performance. However, if the owner withdraws more than the maximum allowed in a contract year, they have taken an excess withdrawal. Excess withdrawals trigger an adjustment of the benefit's guaranteed amount, which reduces the benefit base.

For percentage of benefit maximum withdrawn, we looked at the relationship of customers' actual withdrawal amounts in the calendar year to the maximum withdrawal amounts allowed in the contracts. Given that our study is done on a calendar-year basis, there is some imprecision in measuring the maximum annual withdrawal amounts because benefit bases can vary under certain circumstances during the year (e.g., if additional premium is received) and most benefit base increases occur on a contract anniversary. Accordingly, we used a conservative measure of excess withdrawals — if partial withdrawals exceeded the maximum annual withdrawal as of BOY by at least 10 percent, then we considered the contract to have exceeded the benefit maximum.

We asked participating companies to provide this allowed maximum amount as of the BOY. If companies did not provide the maximum withdrawal amount but provided the benefit base as well as the maximum percentage of this base that could be withdrawn each year, then we calculated an estimate of the percent of maximum annual benefit withdrawn in the following manner:

- If the company provided BOY maximum withdrawal amount, then it equals partial withdrawals divided by this amount.
- If the company did not provide BOY maximum withdrawal amount, then the percent of maximum annual benefit = partial withdrawals divided by (BOY maximum withdrawal percentage) x (BOY benefit base).
- If the company did not provide BOY maximum withdrawal amount or BOY maximum withdrawal percentage, the percent of maximum annual benefit = partial withdrawals divided by (maximum withdrawal percentage from rider specs) x (BOY benefit base).

Overall, 86 percent of owners who took withdrawals in the observation year withdrew income that was below or close to the maximum amount calculated — under 110 percent of annual benefit maximum. Only 5 percent of owners withdrew 110 to less than 150 percent of the maximum amount allowed. Some of these customers, if older, may have remained within the withdrawal limit allowed because of higher RMDs from their qualified annuities.



Withdrawals as a Percentage of Annual Benefit Maximum by Age

When we look at the age of owners and their withdrawal amounts in relation to maximum amounts allowed, we see that younger owners are more likely to take 150 percent or more of the maximum amount allowed.

There are some salient insights from the chart at right:

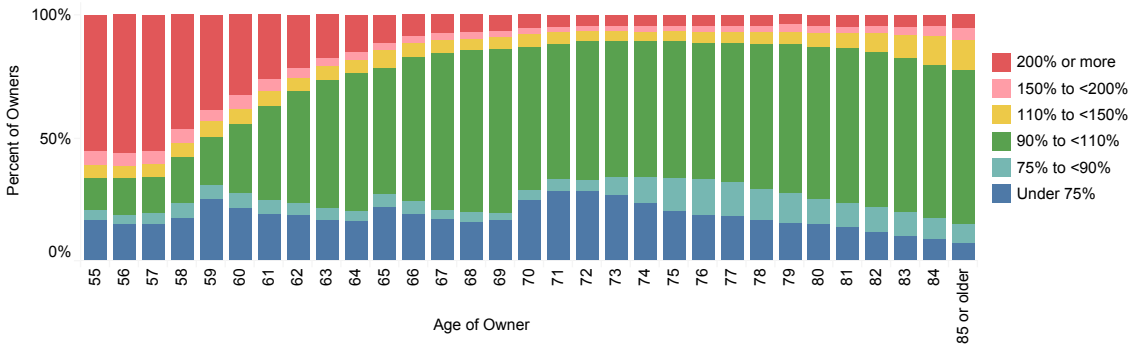
- The majority of owners taking withdrawals, as we have seen in previous sections, are typically aged 65 or older. There are very few instances where these older owners take more than the annual benefit maximum.

- Younger owners, particularly under age 60, are more likely to take 200 percent or more of the benefit maximum allowed in the contract.

- There is a noticeable increase at ages 70 and 71 in the percentage of owners taking withdrawals of less than 90 percent of the benefit maximum. This can be explained by the need for qualified owners to take RMDs, which are typically at a lower withdrawal rate.

- On the other hand, some qualified owners aged 75 or older are taking withdrawals in the range of 110 to 149 percent of the maximum benefit rate allowed in the contracts. They are apparently using higher RMD withdrawal rates applicable in these older ages, often without jeopardizing their benefit bases in the contract, as most insurance companies allow qualified owners to adhere to the RMD rules.

The majority of GLWB owners are taking withdrawals within the rider limits. Eighty-six percent of owners who took withdrawals in 2016 took less than 110 percent of the benefit maximum allowed in their contracts.



Withdrawals With SWP's

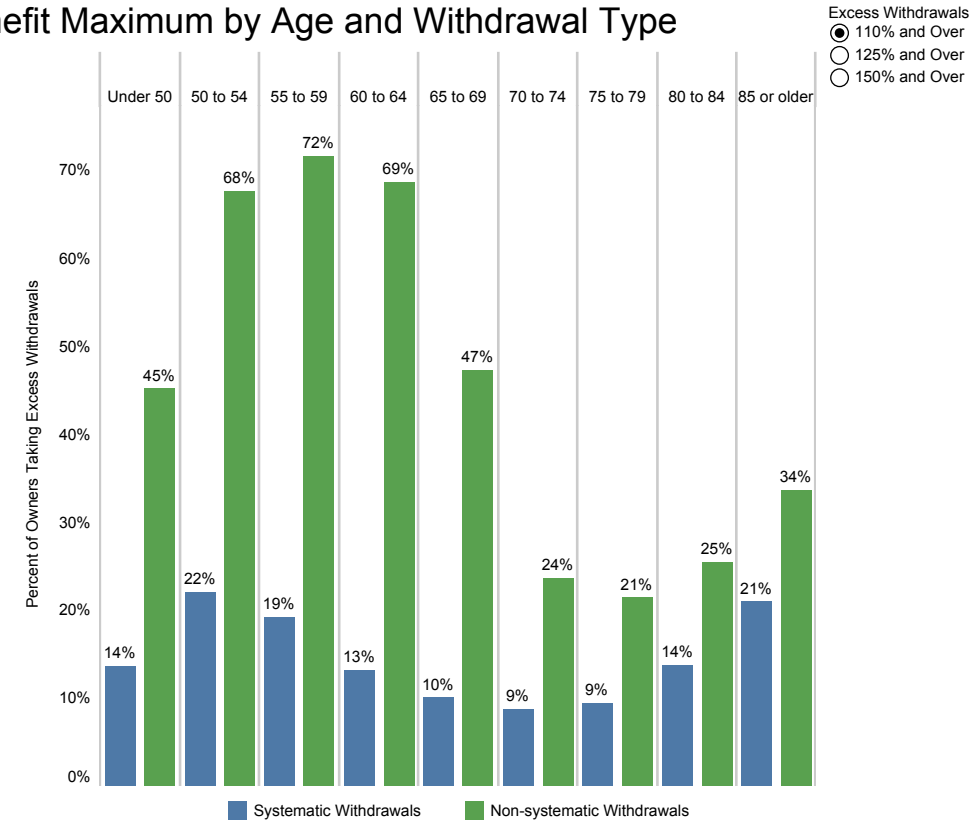
	Under 75%	75% to <90%	90% to <110%	110% to <150%	150% to <200%	200% or more
Under 50	49%	3%	30%	3%		11%
50 to 54		10%	29%	5%	5%	14%
55 to 59	40%	9%	31%	7%	3%	10%
60 to 64	22%	6%	59%	6%	2%	6%
65 to 69	20%	5%	66%	5%	2%	3%
70 to 74	26%	6%	60%	4%	2%	2%
75 to 79	18%	13%	60%	4%	2%	3%
80 to 84	13%	9%	64%	8%	3%	3%
85 or older	7%	7%	64%	13%	5%	4%
Grand Total	20%	8%	61%	5%	2%	3%

Withdrawals as Percentage of Annual Benefit Maximum by Age and Withdrawal Type

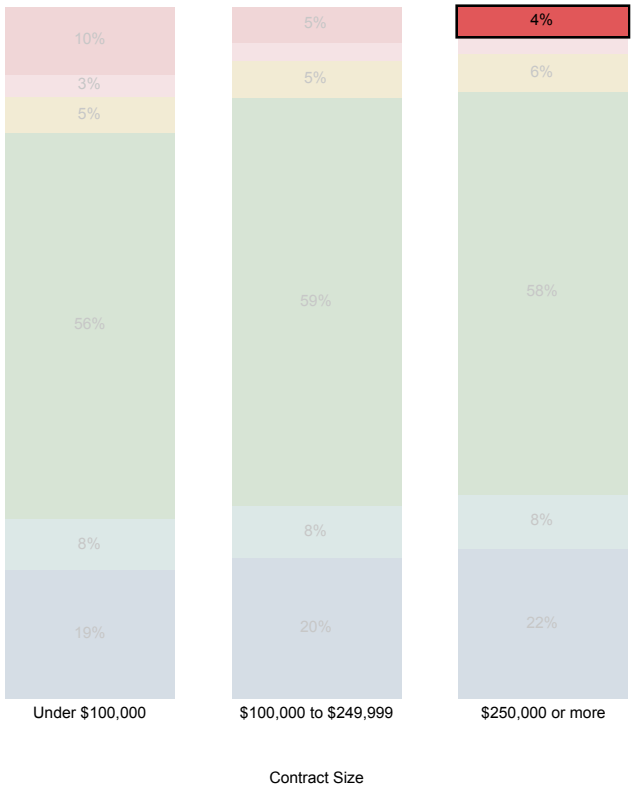
The method used for withdrawal — systematic or occasional — is a strong indicator of whether owners are likely to exceed the benefit maximum. Most withdrawals that exceed 125 percent of the annual benefit maximum amount are occasional.

For example, for owners age 60 to 64, 66 percent of non systematic withdrawals are 125 percent of more of the allowed amount and only 10 percent of systematic withdrawals were at 125 percent of the allowed amount.

The percentage of both systematic and non systematic withdrawals that materially exceed the maximum are lower after age 65.



Withdrawals as Percentage of Annual Benefit Maximum by Age and Contract Size



Age of Owner
- ☑ Under 55
- ☑ 55 to 59
- ☑ 60 to 64
- ☑ 65 to 69
- ☑ 70 to 74
- ☑ 75 and older

Withdrawal Percentages
- 200% or more
- 150% to <200%
- 110% to <150%
- 90% to <110%
- 75% to <90%
- Under 75%

We also examined how the proportion of the benefit maximum withdrawn varies by contract size. We might expect larger contract sizes to be linked to wealthier and more sophisticated owners who are more likely to work with financial advisors and less inclined to exceed the GLWB benefit maximum, which could result in a reduction of the annual benefit maximum in future years. They might also be less likely to take out an amount well below the maximum, thereby passing up a potential opportunity to maximize the value of the benefit. Taking out more or less than the benefit maximum could represent an “inefficient” (or sub-optimal) utilization of the guarantee.

The relationship between efficiency and contract size is limited to owners under age 60; and even among this group, the greatest difference across contract sizes is not the increasing proportion taking amounts close to the benefit maximum, but rather the proportion of owners with contract sizes below $100,000 taking amounts well above the benefit maximum. In short, owners of VAs with higher contract values, especially younger owners, are less likely than those with lower contract values to significantly exceed the benefit maximum.

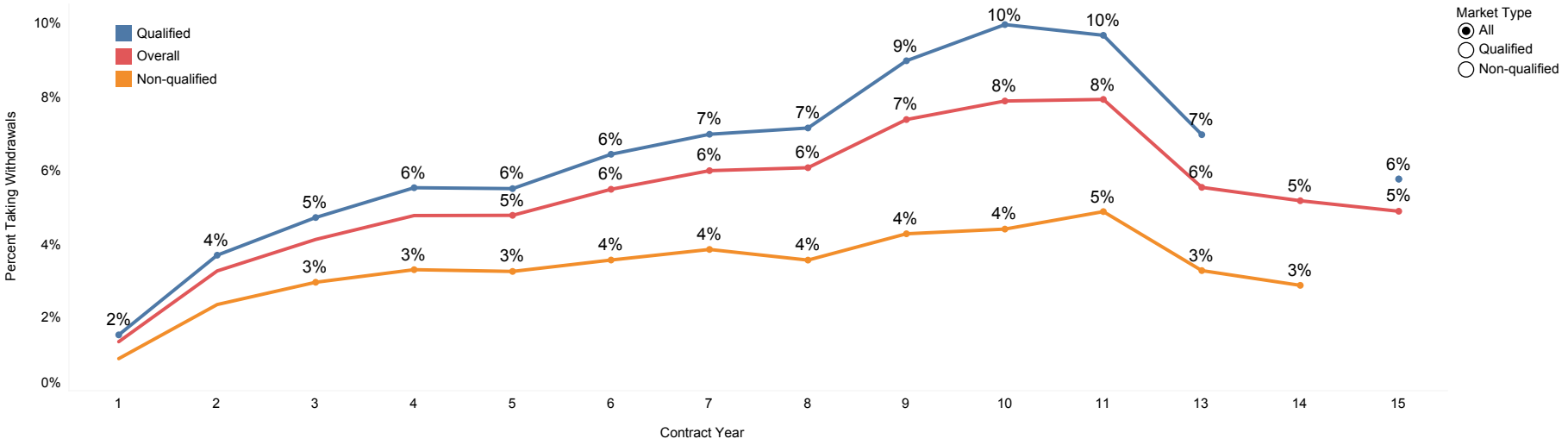
At ages under 65, contracts of size under $100,000 and over much more likely to take withdrawals at 110% or greater of the guaranteed maximum. Around age 65, the differences begin to narrow and they disappear almost entirely by ages 75-79.

Withdrawal Activity by Contract Year

Contract duration (i.e., the number of years since contract purchase) is an important measure in determining what proportion of new buyers or existing owners take withdrawals from their annuities. In some cases, immediate utilization of the GLWB is appropriate for certain customers' retirement income needs, but there are also circumstances in which delaying withdrawals makes sense. By comparing their own withdrawal activity by contract duration to that of the industry, companies can assess the extent to which their customers' usage patterns match both their own expectations and the experience of other VA companies. The comparison will also facilitate internal forecasts by estimating when and how many of the GLWB customers will likely take withdrawals, and the resulting cash flow needed for the book of business.

Owners who bought their GLWB annuity in Q4 2016 had only three months (maximum) to set up withdrawals and receive payments, thus only a small portion of these owners took withdrawals from their annuities. As the contract duration increases, withdrawal activity increases.

In the long run, the changing customer mix as well as the need to satisfy RMDs, will influence the slope of the withdrawal rates by duration.

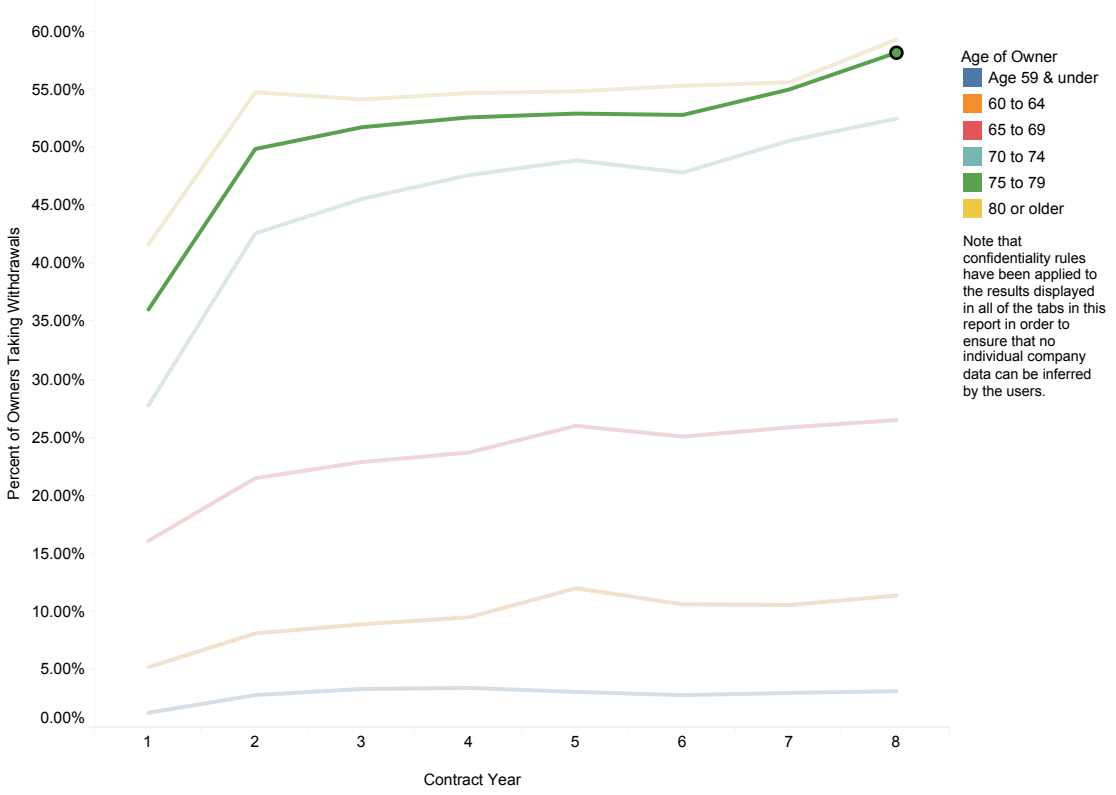


Withdrawal Activity by Contract Year and Age

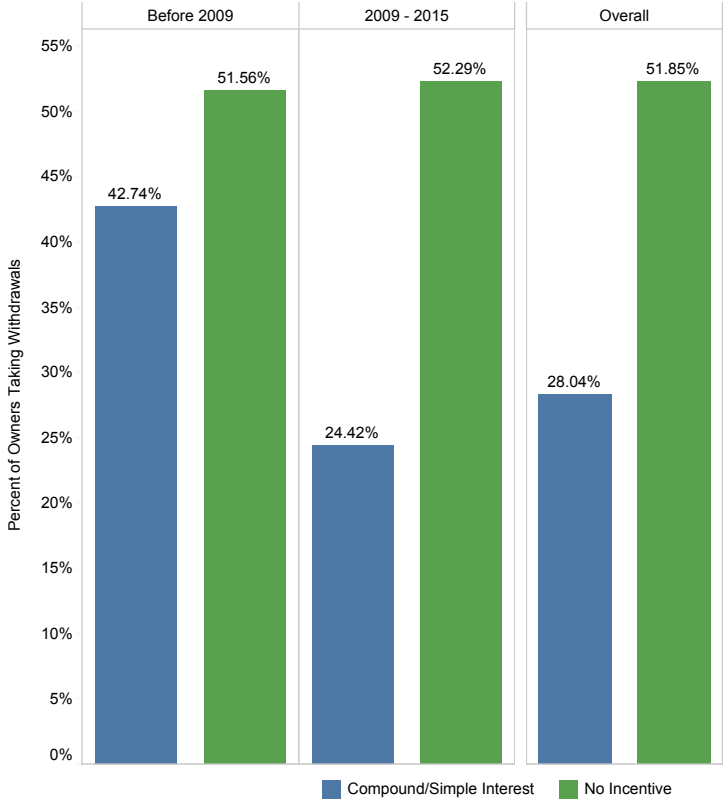
We also analyzed withdrawal activity by contract duration and owner age. Mapping the duration of contracts with age group can improve understanding of GLWB customer withdrawal behavior. For contracts purchased by individuals under age 60, the overall utilization rate is fairly stable across different issue years. Withdrawals among these younger age groups are uncommon.

From age 60 withdrawal activity increases as owners begin to retire or need to make withdrawals to satisfy RMDs. For older age groups (70–74 and 75–79), the marginal increase in withdrawal utilization by contract duration is smaller. However, the source of funds used to purchase the annuity remains the underlying force for these incremental increases. Therefore, mapping the duration of contracts by age groups can improve understanding of a company's GLWB customer withdrawal behavior.

Perhaps the best explanation for the duration effect may simply be that older contracts have provided owners with a longer time period in which to initiate withdrawals. As discussed earlier in this section, once owners have begun withdrawals, most owners (especially those ages 60 and older) do not stop. There may also be a related survival effect, where the pool of contracts becomes increasingly biased toward owners who want to use their contracts for income – those who do not want to use their GLWBs may surrender their VA contracts while those who are using them will generally not want to surrender their contracts. This survival effect should be especially pronounced among contracts that exited the surrender penalty period in a prior year, as is the case for 40 percent of the 2008 issues but only 9 percent of contracts issue in 2009 or later.



Withdrawal Activity in Contracts With/Without Withdrawal Incentives



Withdrawal activity can vary depending on whether a contract offers incentives for owners to defer withdrawals. Many GLWB offerings include “roll-ups,” or deferral bonuses, that increase the benefit base by a certain percent — typically 5 percent or more a year for a certain period — for typically 10 years or until the first withdrawal, whichever comes first.

When we examined contracts that offer both a deferral bonus and no increase to the benefit base when an owner defers withdrawals, we found that withdrawal activity is lower when a contract has incentives for non-withdrawals. Even among longer-duration contracts, a larger percent of owners take withdrawals when no incentive is present.

These findings suggest that pre-withdrawal benefit base growth does provide incentives for owners to postpone withdrawals. It is likely that owner expectations of when to take withdrawals are set during the purchase process.

Average Withdrawal Amounts by Owners' Current Age

Contract owners took average withdrawals ranging from $8,000 at age 79 to $26,000 at age 53. The highest average withdrawal amounts occurred at ages under 60, however these owners constituted only 3 percent of all contracts with withdrawals in 2016. Given the high average withdrawal amounts, it is likely that these contracts intended to partially surrender.

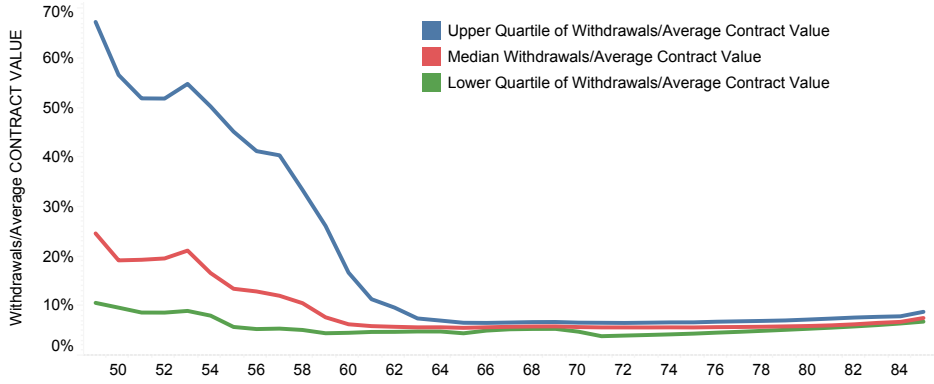
With increasing age, a greater number of owners took withdrawals in more sustainable withdrawal patterns and amounts. The average withdrawal amount at ages over 60 ranges from $17,600 at age 60 to $8,000 at age 79. As owners start to retire, the volume of withdrawals rises considerably. Average withdrawal amounts for owners over age 70 are commensurate with the maximum withdrawal amount supported by the GLWB benefit base and guaranteed withdrawal rates offered to respective age bands.

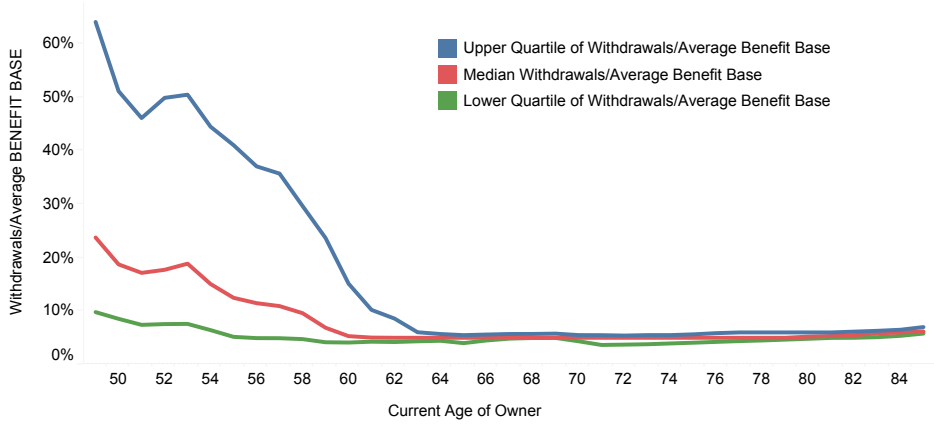
Ratio of Withdrawals to Average Contract Value & Average Benefit Base

In-the-Moneyness
All

Market Type
(●) All
( ) Qualified
( ) Non-qualified

Issue Year
All





Note: Some data points are suppressed due to confidentiality.

In order to provide some context, we assessed the withdrawal amount in relation to both contract value and the benefit base. Our figures show the median withdrawal amount for all ages and also the quartile distribution of the withdrawal amounts in 2016.

The distribution of the withdrawals as a percent of average contract value withdrawn shows that, for owners aged 65 or over, the median, the upper quartile, and the lower quartile values are almost identical. The pattern also indicates that the majority of older owners taking withdrawals do so at similar ratios from their contract values.

For owners under age 60, there is a wide difference between the median and the upper quartile values, indicating that the majority of these owners are taking more than the maximum allowed in the contracts. Only a small number of owners under age 60 — mostly below the lower quartile line — are withdrawing a sustainable rate without impairing the benefit base.

The distribution of withdrawal amount to the average benefit base ratio supports the same conclusion that we reached earlier: that the withdrawal amount is unduly weighted by very large withdrawals taken by a smaller number of younger owners.

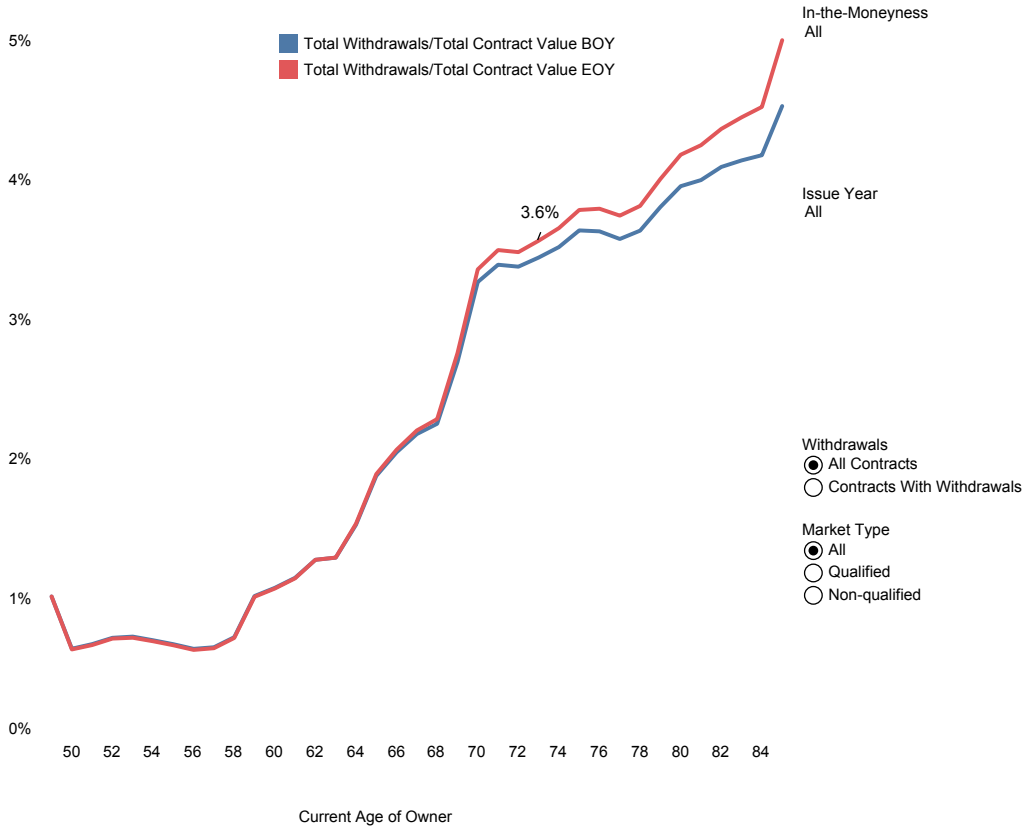
The distribution of ratios of withdrawal amount to benefit base shows that the median, the upper quartile, and the lower quartile values are almost identical for owners aged 65 or over. The ratios also indicate that the majority of owners ages 65–75 taking withdrawals do so at a rate of around 5 percent of their benefit base values — a typical GLWB maximum payout rate for this age. The median of the benefit base ratios begins to increase for owners over age 75 due to age banded benefits.

The overall results hold across issue years and market type. However there are some differences by level of ITM. For contracts with a 90 percent or greater ratio of Benefit Base to Cash Value ratio (ITM level), differences between the median and upper quartile are much larger than for those with ratios under 90 percent.

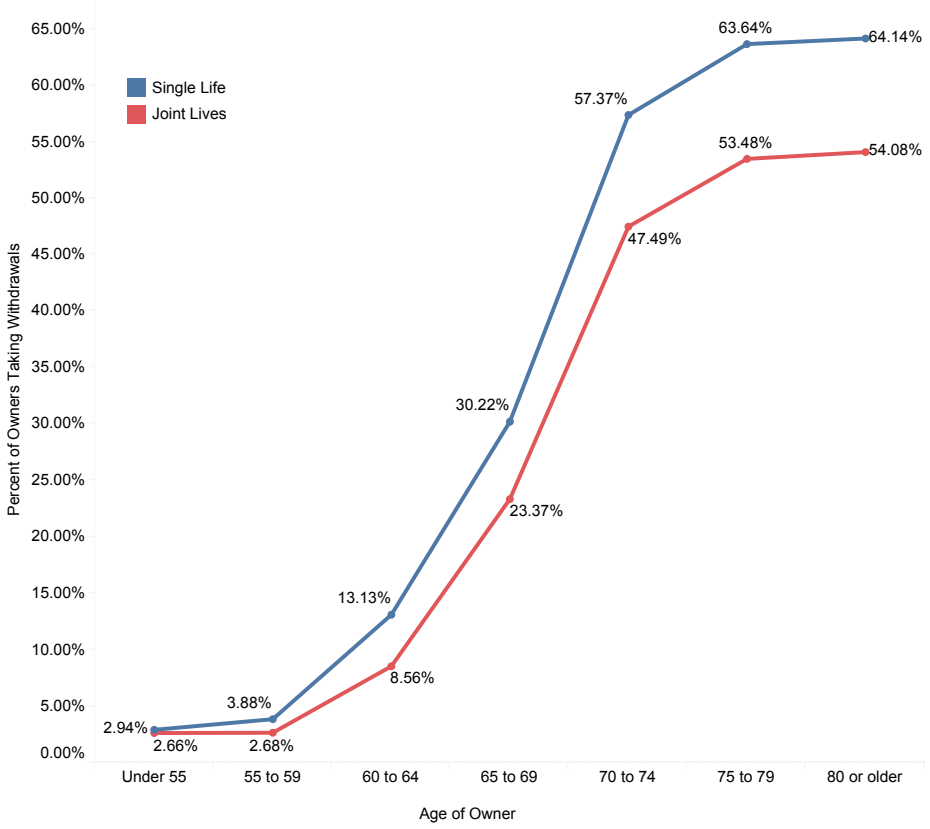
Ratio of Total Withdrawals to Total Contract Value

By comparing the ratio of total withdrawal amount to contract values at BOY and the ratio of total withdrawal amount to EOY contract values, we can ascertain another measure of GLWB risk originating in customer behavior. We calculate this measure at two levels. First, total withdrawals during the observation year can be divided by total contract values at BOY and EOY, for all contracts in-force. Second, the same ratio can be computed for only the subset of contracts that experienced withdrawals in the observation year. The first measure provides a view of risk from withdrawals in terms of the total book of business, while the second provides an estimation of risk from withdrawals among the contracts that are in withdrawal mode.

For all contracts in-force in 2016, at all ages over 65, the ratio of total withdrawals to BOY contract values was less than the ratio of total withdrawals to EOY contract values. When the ratio of total withdrawal amounts to contract values at EOY remains steady to the ratio calculated at BOY, it means that the total contract values have remained level as investments gains have offset reductions in account values due to withdrawals. The increase in the ratio from beginning to end of year implies that investment gains have not offset the reductions in account values due to withdrawals.



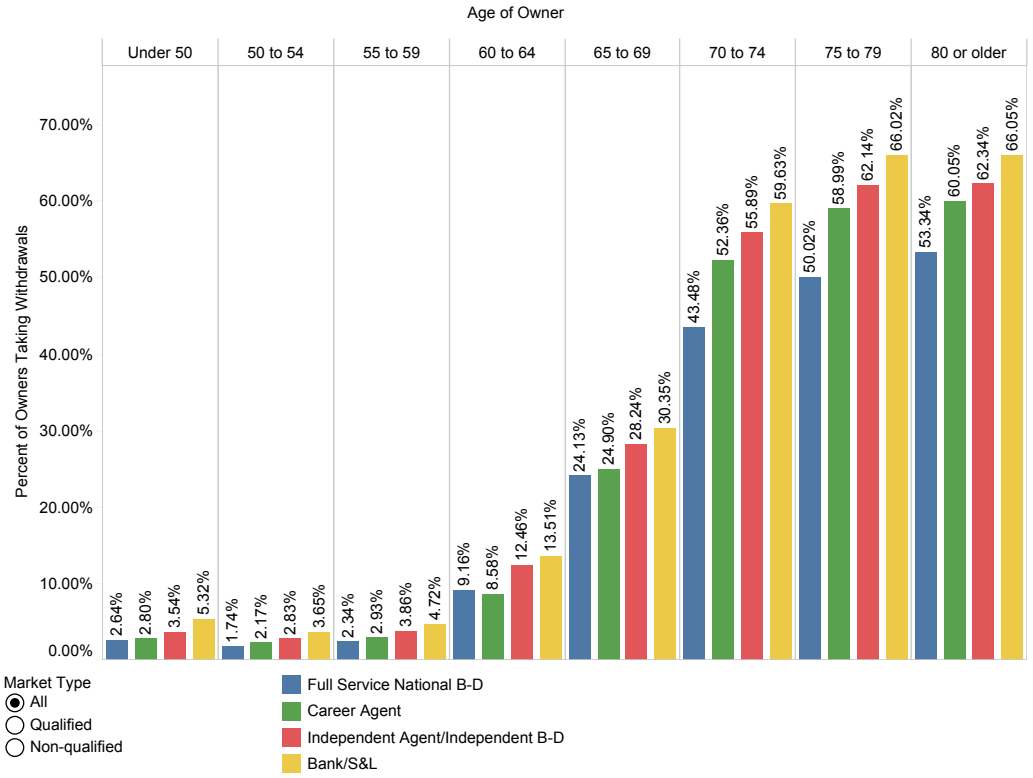
GLWB: Withdrawal Rates for Single & Joint Lives



Market Type
- (●) All
- ( ) Qualified
- ( ) Non-qualified

Some GLWB contracts offer guaranteed lifetime withdrawals on joint lives, allowing the withdrawals to continue as long as one of the annuitants is alive. Typically, the payout or guaranteed withdrawal rates for joint-lives contracts are lower than single-life contracts. One third of GLWB contracts had payouts based on joint lives.

Withdrawal Activity by Distribution Channel



If we look at distribution channels, we find that more bank GLWB owners took withdrawals in 2016 than in any other channel. Overall, 34 percent of bank channel owners took withdrawals, 5 percentage points higher than the independent B-D channel. Twenty-six percent of owners in full-service national B-D channel and in the career agent channel took withdrawals.

Withdrawal behavior by age and distribution channel shows the same pattern that we have already seen — the percent of owners taking withdrawals remains modest up to age 69; increasing at age 70 and over due to RMDs. Differences in withdrawal activity across channel can be partly explained by the different mix of qualified and non-qualified business.

Historical Trends of Contracts In-The-Money

	2009	2010	2011	2012	2013	2014	2015	2016
Number of Contracts Issued before Calendar Year	0.89M	1.25M	1.45M	1.89M	2.04M	2.39M	2.52M	2.67M
Percent of Contracts where Benefit Bases > Contract Values	93%	73%	62%	92%	79%	48%	74%	97%

Time of Year
(•) Beginning of Year
( ) End of Year

The equity market meltdown from 2008–2009 and the financial uncertainties of a weak economy that followed could have encouraged more GLWB owners to start lifetime withdrawals from their contracts. This incentive to exercise their option to receive guaranteed lifetime withdrawals from their contracts could have been compelling when a majority of GLWB contracts were in-the-money (benefit base greater than contract value at BOY).

From the perspective of in-the-money analysis the GLWBs are, in essence, owners' options to receive lifetime income. Naturally as the value of the contract declines with market losses, the value of the guarantee increases.

In order to understand the impact of contract in-the-moneyness on withdrawal activities, we need to give proper consideration to the severity and spread of in-the-moneyness among owners by age and by duration of contracts. We must also consider many other factors like market performance, investor confidence in the market, market volatility, the state of the economy, and confidence in the financial strength of financial service providers. In order to conclude that contracts being in-the-money influence owner withdrawal activity, we would expect to see increased withdrawal activities irrespective of age.

There are multiple ways to measure in-the-moneyness. One method is to compare the benefit base to the contract value. Another method is to calculate the actuarial present value of withdrawals of the in-force block of business.

Being in-the-money has not been a major driver of withdrawal behavior for GLWB contract owners.

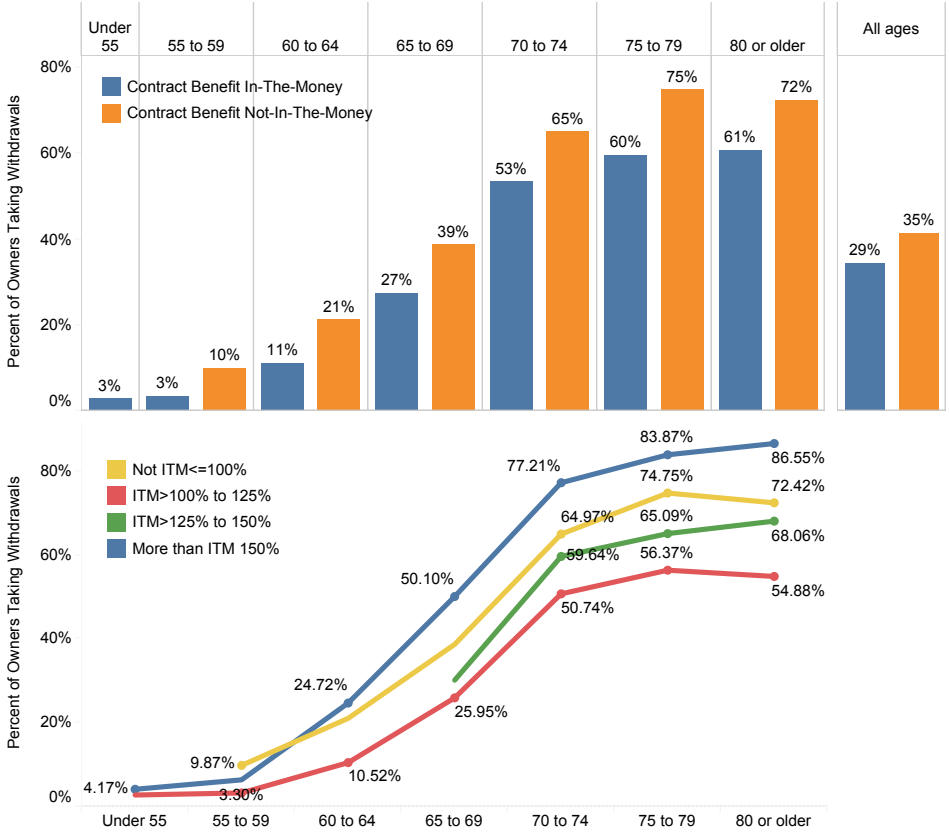
After the market crisis of 2008–2009, a majority of GLWB contracts were in-the-money for a number of years. Previous LIMRA VA GLB utilization studies are helpful in understanding the context of the association between benefits being in-the-money and owner withdrawal activity.

Examining the GLWB contracts issued before 2016, it is also evident that:

• Older duration contracts are more likely to be in-the-money (See Median Contract Value vs. Benefit Base). The older duration contracts are also more likely to have older owners than newer duration contracts.

• At the beginning of 2016, benefit bases in-the-money were not widely spread across all age groups due to improvement in contract values from positive market returns in 2012 through 2014 (see Benefit Base to Contract Value Ratios by Age). In fact, contracts owned by investors aged 70 or older were more likely to be deeper in-the-money than younger owners. This is because a large number of older

Withdrawal Rates for Contracts In-The-Money vs. Not-In-The Money



We expect that the percentages of owners taking withdrawals by the degree of in-the-moneyness will be skewed by current age and duration of contracts. We can also expect that the gap between the percentage of owners taking withdrawals in a particular year for contracts in-the-money versus not-in-the-money may grow in the future.

Our findings indicate that given the ups and downs in equity-market returns over the last few years, and increased market instability, most contracts were in-the-money at the beginning of the year, with 30 percent having withdrawals, compared with 44 percent of contracts that were not-in-the-money.

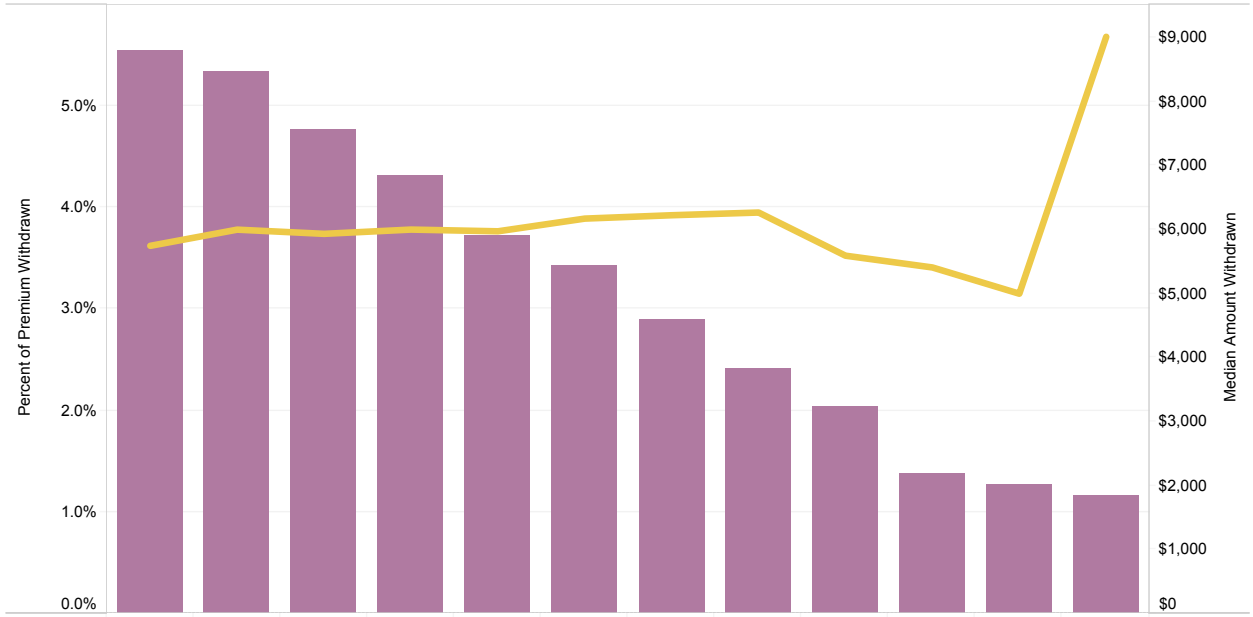
The percent of owners aged 65 or older who took withdrawals was higher among contracts not-in-the-money than for those in-the-money.

As shown earlier, the percentage of owners taking withdrawals is linked closely with owners reaching age 70½ and the need to meet RMDs. So the overall increased withdrawal activity among owners aged 70 or older is mostly due to their taking withdrawals from contracts with longer durations — those most likely to be in-the-money. If in-the-moneyness were a forceful reason for taking withdrawals, owners aged 65 to 69 would have been more active in taking withdrawals and we would have seen a wider gap between the percentage of owners taking withdrawals from in-the-money contracts versus those not-in-the-money, or a sudden jump in withdrawal activity compared with previous years.

Although looking at contracts being in-the-money by their magnitude and age, in isolation, may not provide a complete picture, our figure showing withdrawal activity by age and degree of in-the-moneyness does show the increased levels of withdrawal activity with increasing levels of in-the-moneyness. We have already discussedthat primarily age, not benefits being in-the-money, is what drives owner withdrawal behavior, though there may be a small in-the-moneyness effect mainly driven by withdrawals among younger owners. In-the-moneyness, particularly where benefit base exceeds contract values by more than 150 percent, appears to impact withdrawals among owners aged 60 to 69, but the effect is not substantial where in-the-moneyness ranges between >100 percent to 125 percent. The effect is less significant among contract owners under age 60.

However, as we have mentioned before, if in-the-moneyness were a compelling reason to take withdrawals, we would have seen a bump in the percentages of owners taking their first withdrawals based on the degree of in-the-moneyness, but this did not occur. Also, the proportion of owners taking withdrawals with higher levels of in-the-moneyness are lower among owners under aged 65 and higher among owners aged 65 or older, compared to owners with contracts where benefits are equal or less than 100 percent of their contract values. Such differences are likely caused by younger owners starting their withdrawals in recent years, and older owners taking withdrawals for longer periods of time, thus increasing the probability of contracts remaining in-the-money. Our conclusion remains that, even among owners who started withdrawals earlier, owners kept taking withdrawals whether or not the contracts were in-the-money. We have seen little support or evidence that contract benefits being in-the-money is a major driver for withdrawal activities.

Withdrawal Activity for Contracts Issued in 2016



	January	February	March	April	May	June	July	August	September	October	November	December	Grand Total
Percent of Contracts Taking Withdrawals	14.1%	13.2%	12.7%	12.3%	12.1%	13.0%	12.5%	12.0%	11.4%	9.4%	7.2%	2.0%	11.3%

Median Amount Withdrawn
- (●) Annualized*
- ( ) Not Annualized

Median Amount Withdrawn
Percent of Premium Withdrawn

Withdrawal activity for contracts issued in the observation year and still in-force at EOY was less common than for contracts issued before the observation year. Overall, 11.3 percent of contracts issued in 2016 had some withdrawal activity.

The lag between the issuance of the contract and the onset of withdrawals can be approximated by examining the proportion of contracts with withdrawal activity by year end.

*Withdrawal amounts were annualized by multiplying them by 12/(13-months since BOY).

Utilization by Selected Characteristics

	Unweighted		Weighted by BOY 2016 Contract Value	
	Percent of Owners Taking Withdrawals	Percentage of Owners Taking Withdrawals Through SWP's	Partial Withdrawals Weighted by BOY Contract Value	Systematic Withdrawals Weighted by BOY Contract Value
Under 50	3.52%	0%	4%	1%
50 to 54	2.68%	0%	3%	1%
55 to 59	3.58%	1%	4%	2%
60 to 64	11.33%	8%	14%	10%
65 to 69	27.47%	22%	30%	25%
70 to 74	53.60%	42%	53%	43%
75 to 79	60.20%	48%	58%	46%
80 or older	61.24%	50%	57%	46%

Select Breakout
- (•) Owner Age
- ( ) Gender
- ( ) Market Type
- ( ) Distribution Channel
- ( ) Contract Value (EOY)

Utilization of GLWBs varies substantially across a variety of owner, contract, and benefit characteristics for contracts issued before the observation year. These patterns are relatively consistent across utilization measurements, such as the percent of contracts with systematic withdrawals or the withdrawal rate weighted by contract value.

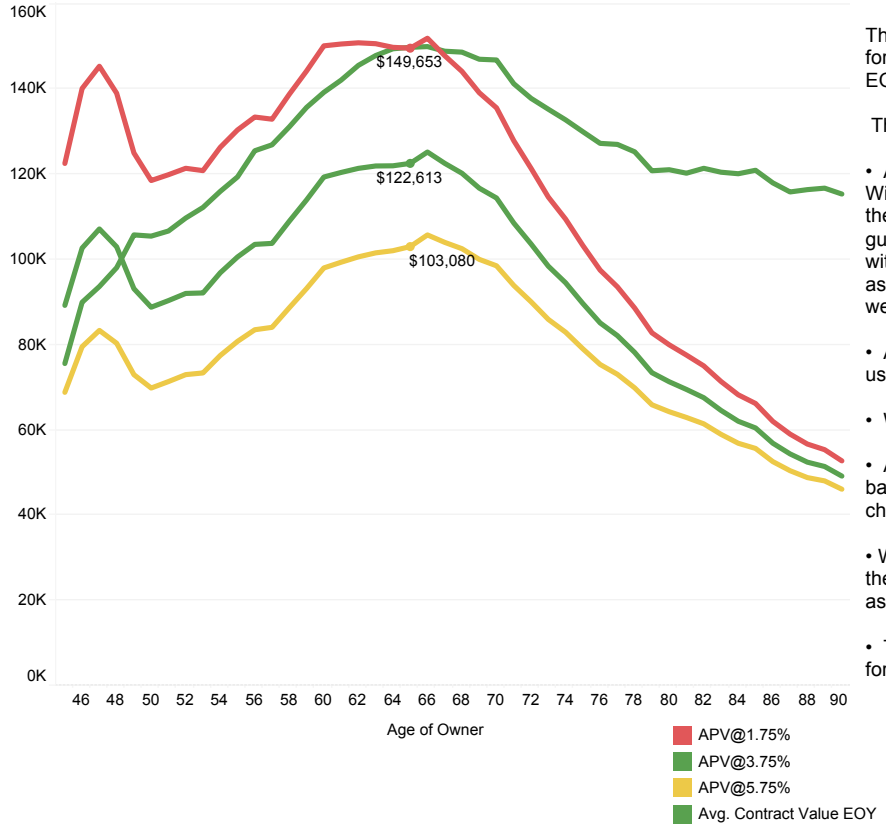
• Older owners are much more likely to take withdrawals, especially systematic withdrawals, than are younger owners. In part, this activity reflects RMDs from qualified contracts after age 70½.

• Overall utilization is higher among VA owners in qualified contracts than non-qualified VA owners.

• Differences across channels in part reflect the age profiles of their customer bases. For example, a larger proportion of bank-issued contracts (with an older client base) take withdrawals compared to independent B-D issued contracts.

• Owners with larger VA contract values are slightly more apt to take withdrawals than are owners with smaller contract values.

GLWB Average Actuarial Present Value vs. Average Contract Value by Age



The graph presents an actuarial present value (APV) analysis of benefit-maximum guaranteed withdrawals for the in-force block of business by age, and compares the average APV to average contract values at the EOY.

The analysis is based on the following assumptions:

- All contract owners eligible to take withdrawals as of EOY do so under the current terms of the riders. Withdrawals are taken at the beginning of each year of analysis, and contract owners are assumed to take the maximum guaranteed annual withdrawal amount, which equals the higher of a) the BOY maximum guaranteed annual withdrawal amount as specified by companies, or b) the BOY maximum annual withdrawal percentage multiplied by each contract's benefit base on its anniversary date or, if not available, as of the EOY. If companies did not specify the BOY annual withdrawal percentage at the contract level, we determined it based on the rider specifications, with appropriate adjustment to the contract owner's age.

- Annual withdrawals or payments continue until the owner's gender- and age-specific life expectancy, using the U.S. Annuity 2000 Basic Mortality Table with projection scale G.

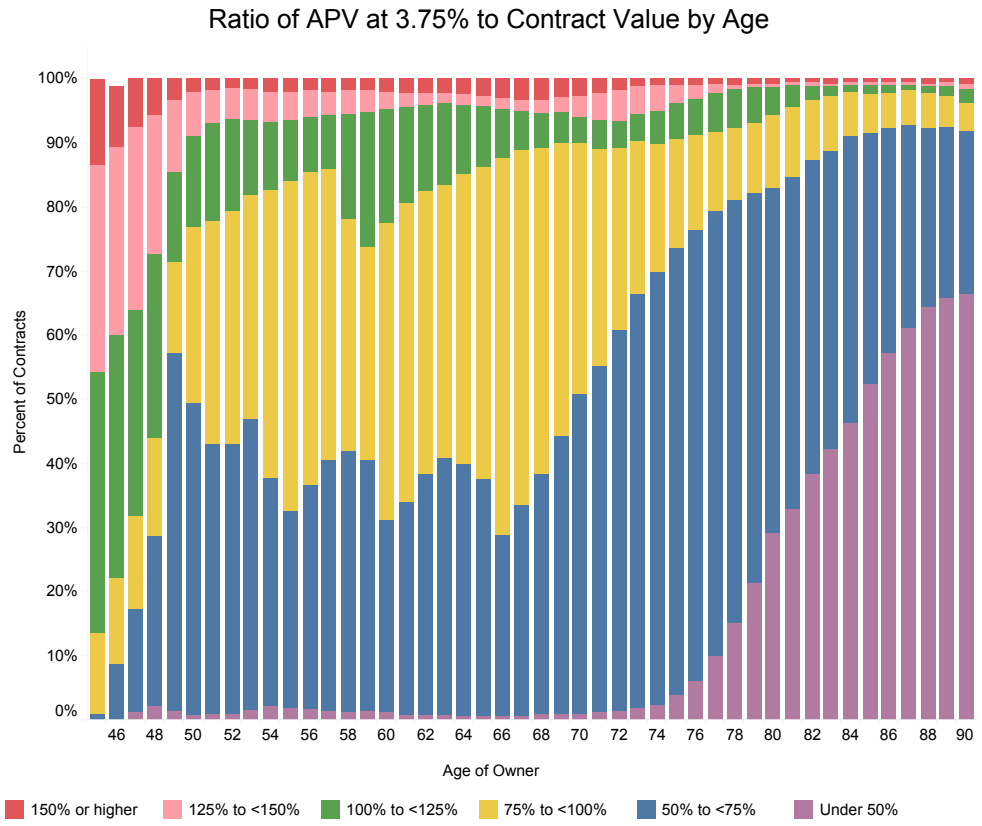
- We did not consider contract surrender activity or payment of guaranteed death benefits.

- APV analysis is based on an interest rate of 3.75 percent. We used two other interest rates at ±200 basis points from this valuation rate (i.e., 1.75 and 5.75 percent) to assess the sensitivity of interest rate changes.

- We do not intend the industry to use this analysis as a measure of risk or efficiency of risk management in the industry, as we do not consider factors such as fees, lapse rates, effectiveness of hedging programs, asset allocation restrictions, and other related factors in the calculation.

- The results indicate that the average GLWB contract value exceeded the average APV at 3.75 percent for most ages at EOY.

GLWB Ratio of APV to Contract Value - Distribution by Age



In aggregate, the APVs were close to contract values among contracts owned by individuals in their early 50s or younger. In general, for customers aged 70 or over, the EOY contract values were larger than EOY discounted cash outflows of guaranteed withdrawals.

The graph shows that not all of the GLWB contract values exceed their APV. Eleven percent of all GLWB contracts had APVs above their contract values.

- Twenty-one percent of contracts owned by customers aged 45–59 had APVs higher than the contract values. This age group held nearly a quarter of all GLWB contracts at the EOY.

- Eleven percent of owners aged 60 to 69 and only 2 percent of owners aged 70 to 79 had APVs greater than their contract values. For customers aged 80 or over, almost all of the contracts had larger contract values compared to APVs.

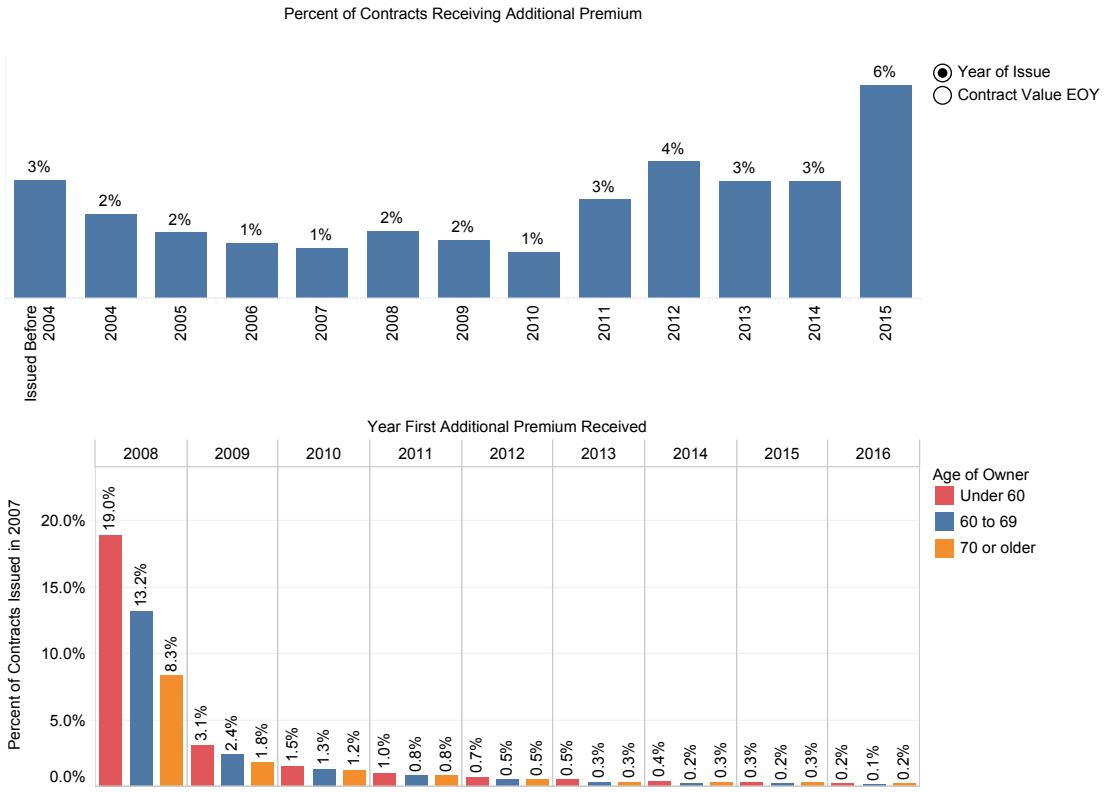
Additional Premium

Many retail VAs allow owners to add premium after issue, though in practice most contracts do not receive ongoing deposits. For most GLWBs, the calculation of the benefit base incorporates premium received within a certain time period after contract issue. For contracts issued before 2015:

- Three percent of contracts received additional premium in 2016. Contracts issued in the prior year were more likely than contracts issued in earlier years to have additional premium.

- Younger owners are more likely to add premium than older owners. For example, 10 percent of owners under age 50 added premium, compared with 2 percent of owners aged 70 or older. Six percent and 5 percent of owners aged 50–59 and aged 60–64 respectively added additional premium to their contracts in 2016.

Owners rarely added premium after the second year of owning a GLWB contract. Based on a constant group of contracts issued in 2007, 14.6 percent added premium in one of the calendar years after issue, and only 6.4 percent added premium two or more years after the year of issue. In addition, younger owners are more likely to put additional premiums into their contracts. In the first year, owners under age 60 were more than two times as likely to put additional money into their contracts as owners aged 70 or older. In the second and future years, owners under age 60 were only slightly more likely to contribute additional premiums than older owners. We found a very similar pattern for a constant group of contracts issued in 2008 and 2009.



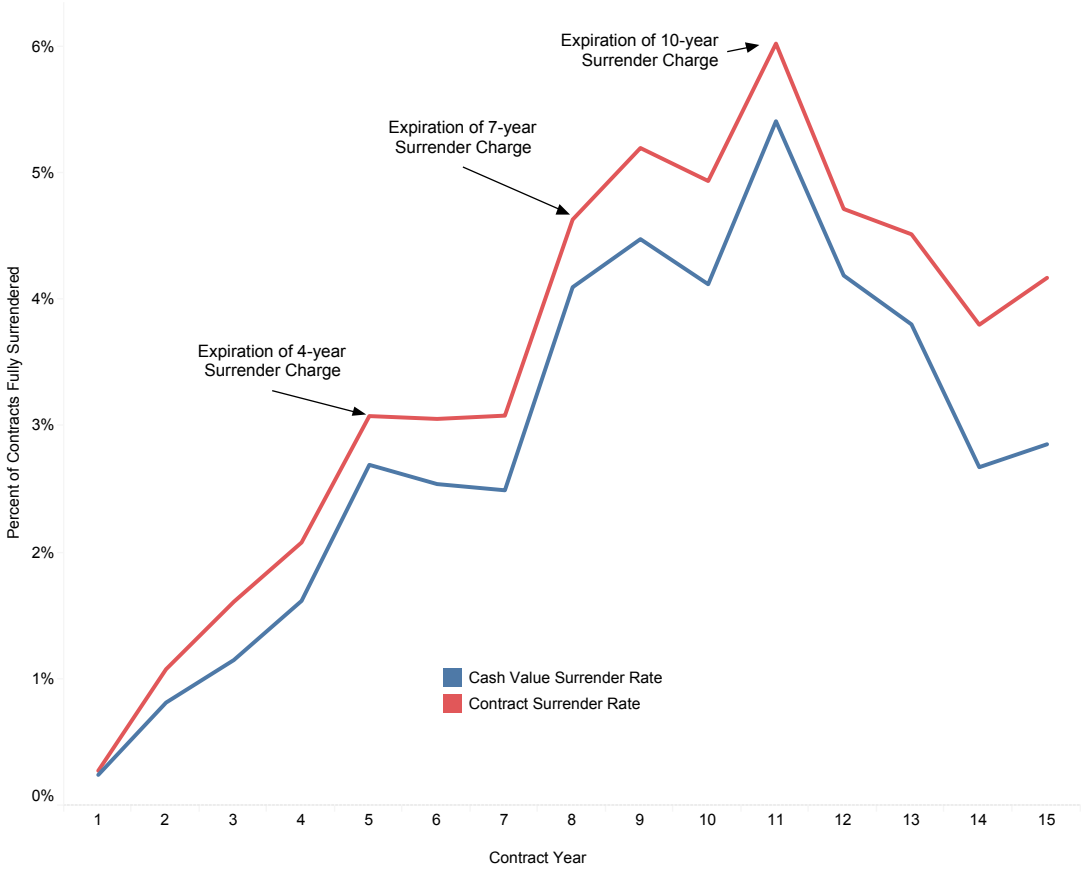
Net Flows

		Total Dollars	Number of Contracts Taking Withdrawals	Avg. Contract Value
	In-Force BOY	$368.5B	2,957,694	$132,210
Premium Received	Existing Contracts	$2.0B	2,810,146	
	Newly Issued Contracts	$24.7B	170,304	$145,397
Benefits Paid	Annuitizations	$0.1B	878	$136,665
	Death/Disability	$2.2B	18,052	$122,291
	Full Surrenders	$10.3B	92,711	$110,969
	Partial Withdrawals	$8.6B		
	Investment Growth	$4.8B		
	In-Force EOY	$390.6B	2,868,809	$136,149

Premiums received for newly issued and existing contracts far exceeded outflows associated with withdrawals, surrenders, deaths, and annuitizations — $26.8 billion and $21.2 billion, respectively. The total number of GLWB contracts in force grew by 3 percent during 2016. At year-end, GLWB assets were $391 billion, 6 percent higher than the beginning of the year.

Surrender activity for VAs with GLWBs is a critical factor in measuring liability. If persistency is very high among contracts with benefit base amounts that are larger than the contract value, or in contracts where the owners take withdrawals regularly, then insurers may have payouts that are larger or for longer durations than anticipated. The presence of living benefits on VAs may lead owners to keep their contracts beyond the surrender penalty period.

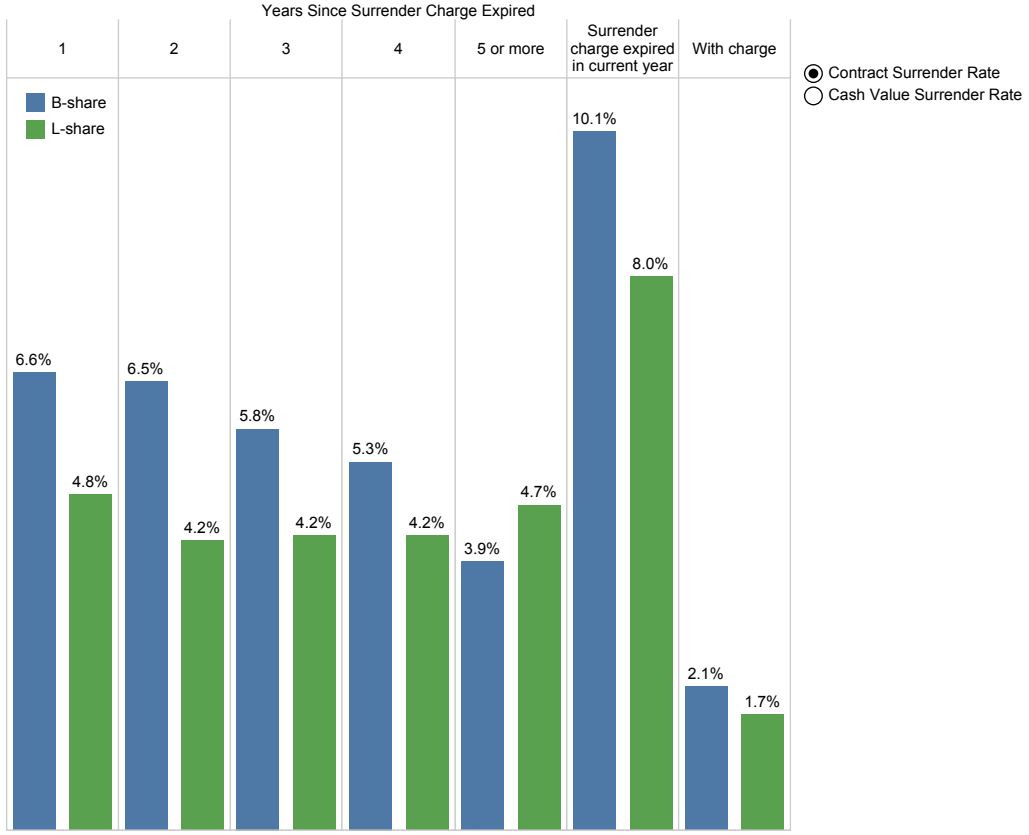
Surrender rates for VAs with GLWBs in 2016 were relatively low, even among contracts issued five years earlier. There was a noticeable increase in surrender rates at the expiration of the L-share and B-share surrender charge. Cash value surrender rates were lower than contract surrender rates for all contract years, suggesting that smaller size contracts were more likely to be surrendered.



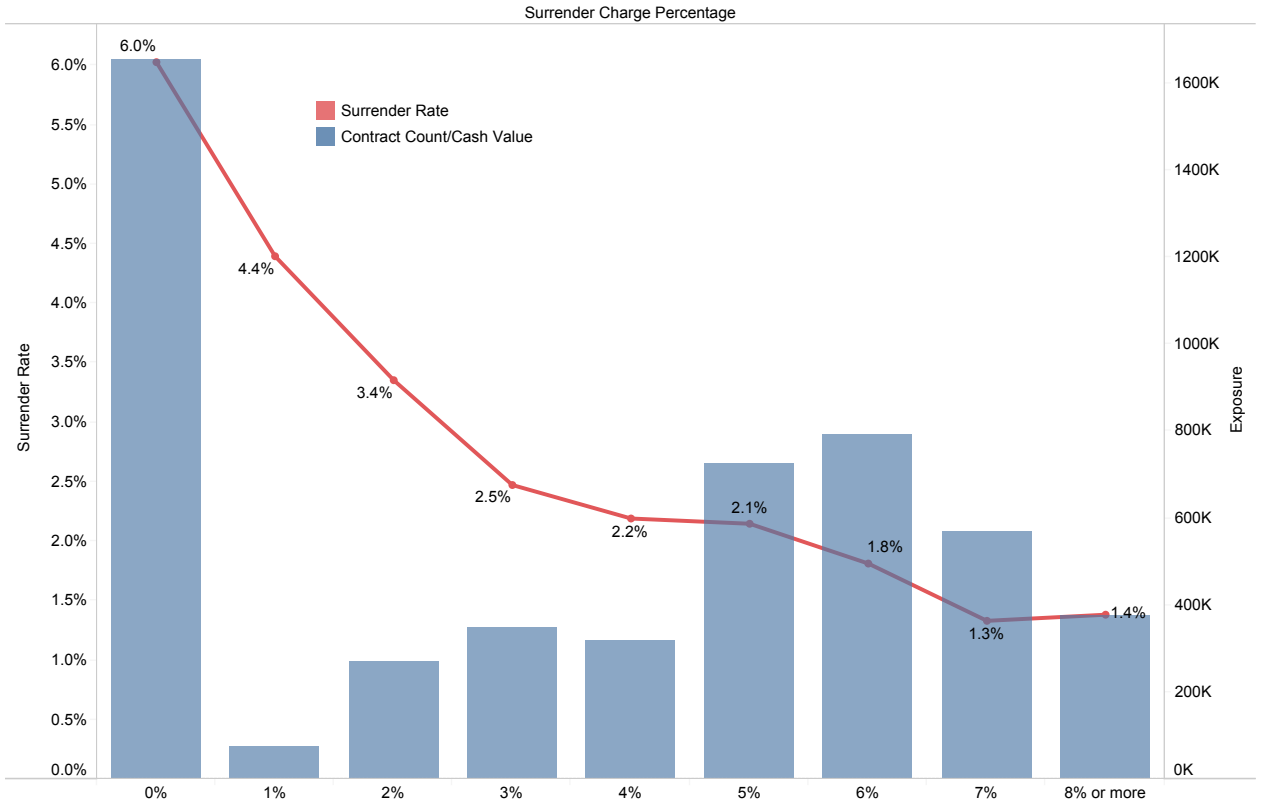
Surrender Rates by Share Class

Looking at the surrender rates by the presence of surrender charges shows that persistency among contracts with surrender charges was higher than for contracts without surrender charges. A majority of B-share and L-share contracts were within the surrender charge periods in 2016.

- With B- and L-share combined, 65 percent of GLWB contracts were under surrender penalty.



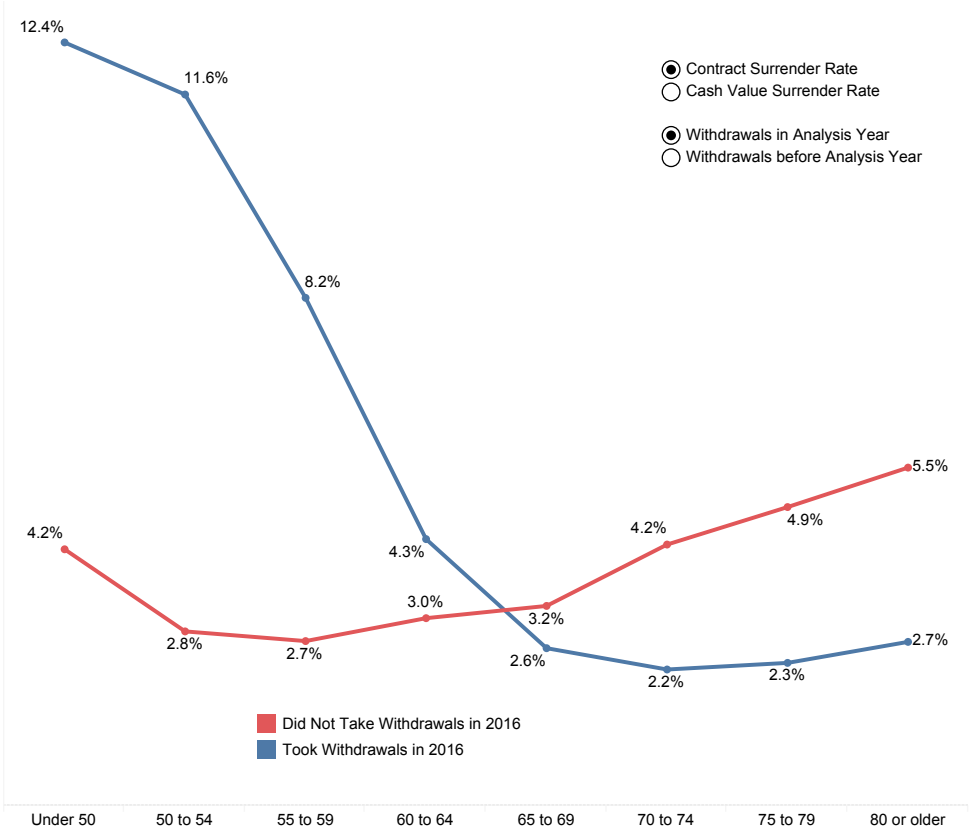
Surrender Rates by Surrender Charge Level



◉ Contract Surrender Rate
○ Cash Value Surrender Rate

The surrender rates of GLWB contracts are also influenced by surrender charge level in the contract. Naturally, contracts with high surrender charges have low surrender rates and vice versa. At the end of the observation year, just over half of the contracts had surrender charges of 4 percent or more, while just under one-third of the contracts were free of surrender charges.

Surrender Rates Based on Timing of Withdrawals



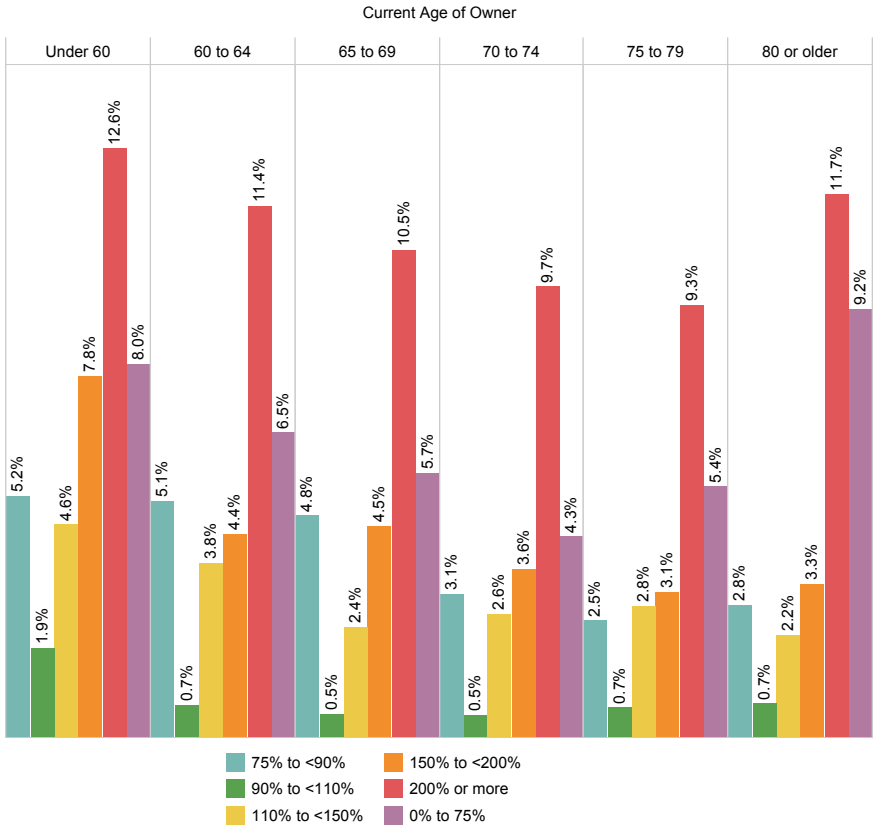
Owner surrender behavior is closely connected with withdrawal behavior. Insurance companies assume more risk when the business left has more contracts where the benefit base amounts are greater than the contract values, and these contracts have lower surrender rates. They need to fulfill their commitments on withdrawal guarantees if owners decide to start or continue withdrawals.

Younger owners have higher surrender rates, particularly those under age 60 who took withdrawals before or in the observation year. We have already shown that even though younger owners own a significant portion of GLWB contracts, most of them are not likely to take withdrawals. When some of these younger owners take withdrawals, they typically do so through occasional withdrawals. Moreover, their average withdrawal amount is much higher, and not likely to be supported by the guaranteed benefit base in their contracts. It is likely that these younger owners are really taking partial surrenders. Younger owners who took withdrawals in the oberservation year were also more likely to fully surrender their contract.

Some of these younger owners may have had emergency needs while others may have decided they no longer need their contracts. Past withdrawals can also indicate whether younger owners are more likely to fully surrender contracts in the future.

As we have seen, younger owners are the most likely to take withdrawals that exceed the benefit maximum. We believe that this activity represents an increased likelihood that their contract will surrender. There was an increased likelihood of surrender for contracts where owners under the age of 60 took withdrawals, either in current or past years. However, this increased surrender activity did not occur for owners over age 60 who took withdrawals. For them, a withdrawal in one year did not necessarily signal a higher likelihood of surrender in the next year. 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.

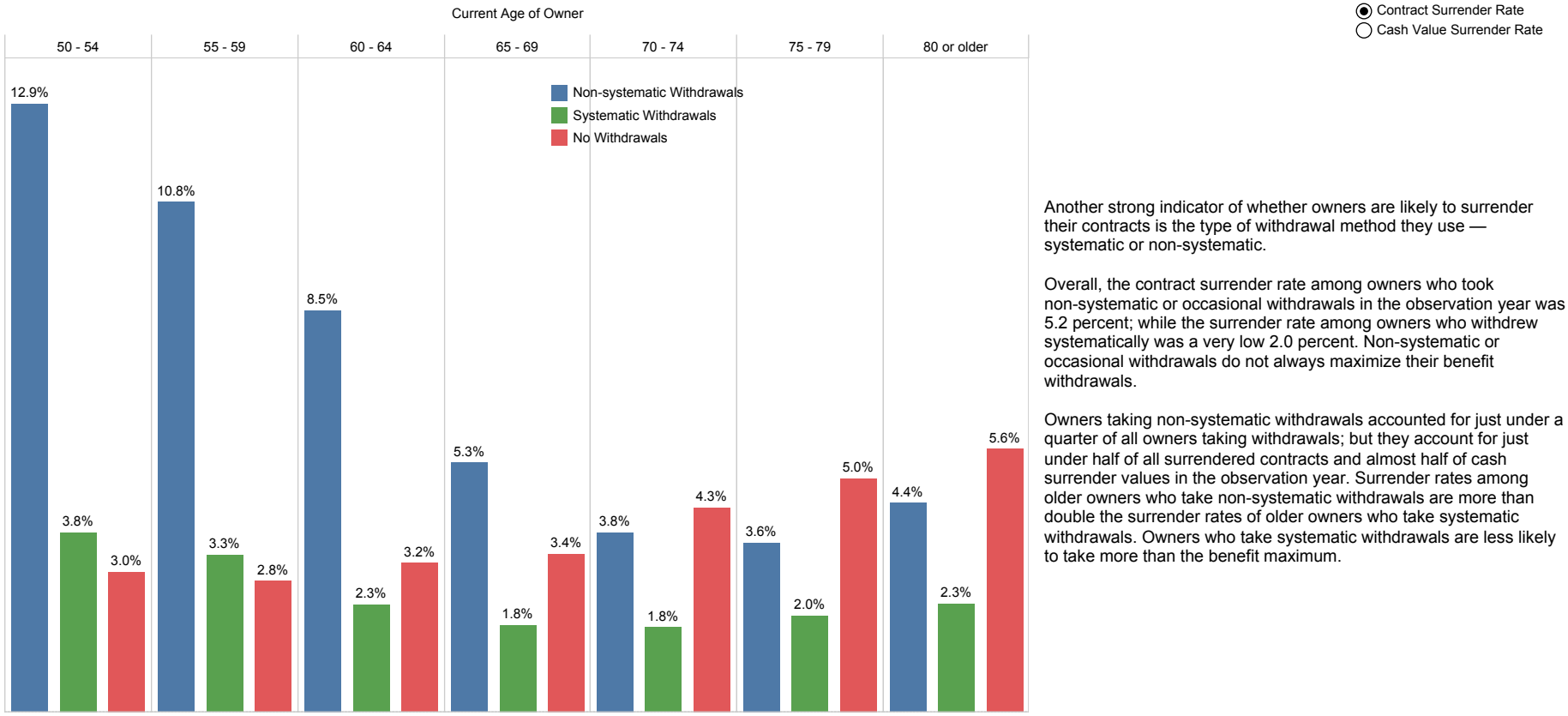
Surrender Rates by Percentage of Annual Benefit Maximum Withdrawn



Our analysis shows the contract and cash value surrender rates for owners who took withdrawals in the observation year based on the percentage of annual benefit maximum withdrawn. Contract surrender rates for owners who under-utilized or significantly exceeded the benefit maximum, are quite high.

The surrender rates show a U-shaped relationship to percent of benefit maximum withdrawn - those with very low and very high ratios of withdrawals to maximum allowed have higher surrender rates than those in the middle categories.

Surrender Rates by Withdrawal Method

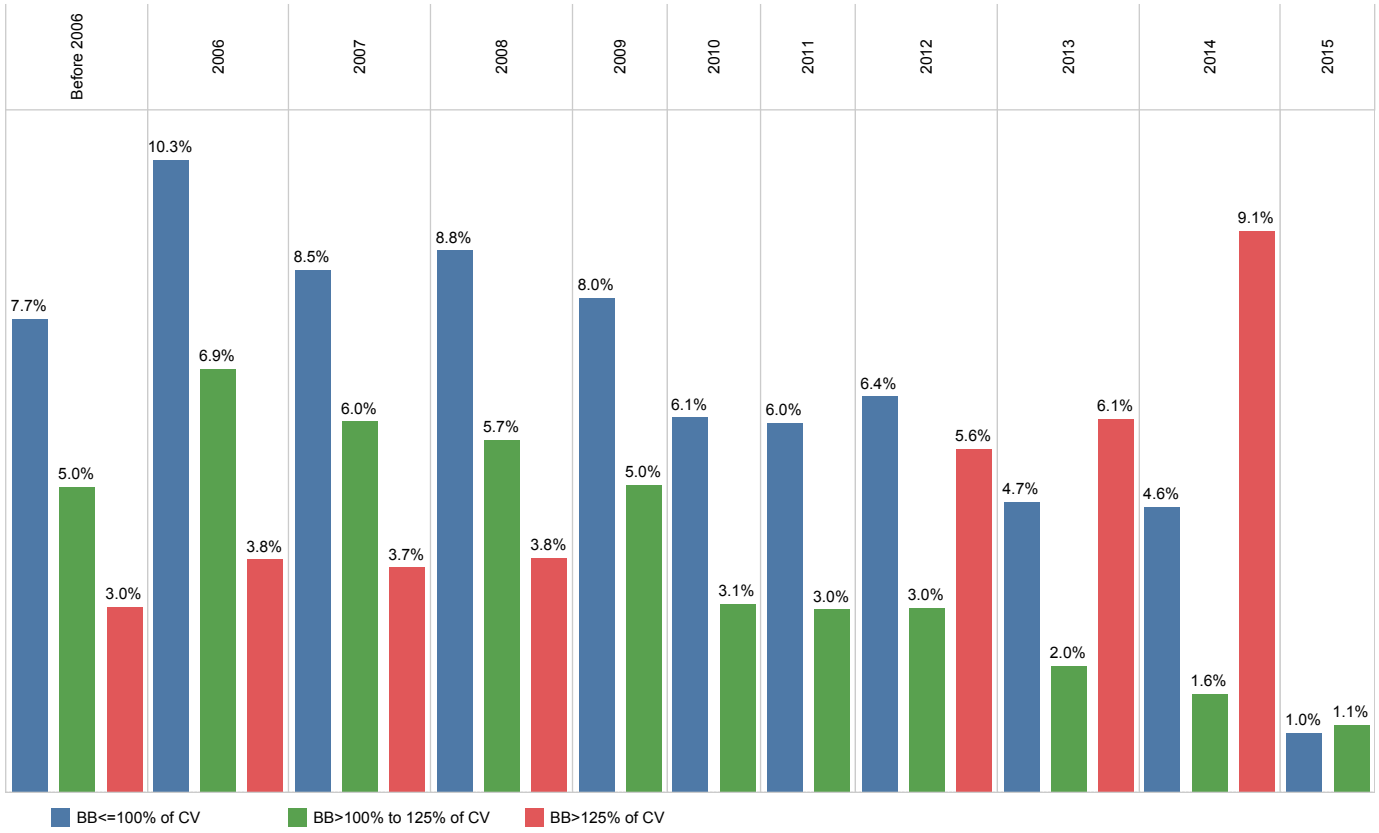


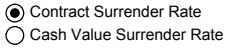
Another strong indicator of whether owners are likely to surrender their contracts is the type of withdrawal method they use — systematic or non-systematic.

Overall, the contract surrender rate among owners who took non-systematic or occasional withdrawals in the observation year was 5.2 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 their benefit withdrawals.

Owners taking non-systematic withdrawals accounted for just under a quarter of all owners taking withdrawals; but they account for just under half of all surrendered contracts and almost half of cash surrender values in the observation year. Surrender rates among older owners who take non-systematic withdrawals are more than double the surrender rates of older owners who take systematic withdrawals. Owners who take systematic withdrawals are less likely to take more than the benefit maximum.

Surrender Rates by Amount Benefit Base Exceeds Contract Value





Another important analysis of surrender rates involves whether the benefit base is greater than the contract value. Surrender rates for most issue years are lower when the benefit base is greater than the contract value.

GLWB owners appear to be sensitive to how much the benefit base exceeds the contract value when deciding whether to surrender their contracts.

- (●) 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	4.4%	3.7%
2006	6.0%	5.4%
2007	4.9%	4.1%
2008	5.2%	4.5%
2009	4.6%	4.1%
2010	3.1%	2.5%
2011	3.1%	2.5%
2012	3.1%	2.7%
2013	2.1%	1.6%
2014	1.6%	1.2%
2015	1.1%	0.8%

Contracts issued in more recent years generally have lower rates of surrender than those issued four or more years ago.

Cash value surrender rates are lower than contract surrender rates for all years of issue - implying that smaller contracts are more likely to surrender than larger ones.

Product & Benefit Characteristics

Issue Year

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Avg. Mortality and Expense Charge	1.43%	1.38%	1.39%	1.37%	1.30%	1.27%	1.24%	1.24%	1.21%	1.18%	1.13%
Avg. Benefit Fee	0.69%	0.66%	0.83%	0.97%	0.99%	1.02%	1.05%	1.08%	1.14%	1.18%	1.23%
Avg. Num Subaccts	83.12	77.01	74.28	79.51	67.60	62.92	62.86	64.47	61.70	61.68	60.47
Avg. Maximum Owner Age at Election	87.05	85.68	85.62	88.61	90.33	85.88	84.30	83.79	82.83	82.98	83.48
Avg. Maximum Age at Onset	98.45	98.41	98.39	95.79	95.50	90.78	88.70	89.47	87.51	88.43	88.68
Avg. Minimum Age at Onset	56.76	57.72	58.16	52.55	51.62	51.69	51.56	53.55	53.24	52.61	51.46

	2008	2009	2010	2011	2012	2013	2014	2015
No	12%	4%	2%	3%	4%	5%	4%	4%
Yes	88%	96%	98%	97%	96%	95%	96%	96%

- (●) 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
- ( ) Benefit base automatically increases if withdrawals are deferred
- ( ) Payments can continue to spouse after owner's death
- ( ) Impact on benefit base if excess withdrawal are taken

Note: Some data points are suppressed due to confidentiality.