Variable Annuities – Recent Trends and the Use of Captives

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Executive Summary

This paper explores how the variable annuity (VA) market has changed since the recent financial crisis, including insurers' use of reinsurance captives to transfer the risks of the VA guarantee exposures. We identified the 10 largest U.S. life insurers by VA asset size and reviewed their statutory and U.S. GAAP financial statements for the 2008–2012 period. Our research revealed the following:

- VA risk exposure is growing and is more concentrated, particularly among the top five VA life insurers.[1] Reserve growth appears to have been driven by guarantees issued prior to recent changes in products designed to reduce the issuers' risk—i.e., by legacy business.

- On a statutory basis, the financial strength of the top ten VA life insurers utilizing captives appears to have weakened, despite the growth in reserves and high reported risk-based capital (RBC) ratios. This is demonstrated by: modest and stagnant statutory capital levels, increased reserve leverage, and increased use of contingent assets backing captive reserves since 2009. Without the RBC benefit derived from captive transfers, an estimated $14.4 billion - $34.9 billion of additional statutory capital (capital) would be required of the top 10 VA life insurers transferring VA risk to captives.

Table 1: Top 10 U.S. VA Writers Ranked By VA Assets as of September 30, 2012

Rank by VA Assets	VA Writers of:	Variable Annuity Assets ($MM)	% of U.S. Industry
1	TIAA-CREF[1]	394,136	24.30%
2	MetLife	157,800	9.70%
3	Prudential	128,115	7.90%
4	AXA Equitable[2]	91,478	5.60%
5	Lincoln Financial	90,028	5.60%
6	Jackson National[2]	82,914	5.10%
7	AIG	77,087	4.80%
8	Hartford	66,658	4.10%
9	ING U.S.A.[2, 3]	66,577	4.10%
10	Ameriprise	66,169	4.10%
11	John Hancock/Manulife [2]	52,021	3.20%
Top 10[4]			**54.20%**

Source: Morningstar.

1. *The Top 10 VA Writers includes VA issuers ranked 2 through 11, based on assets as of September 30, 2012. The group excludes TIAA because TIAA does not write guaranteed living benefits or death benefit (beyond return of premium). Source: TIAA Statutory Financials, General Interrogatory, Question 9.2. December 31, 2012.*
2. *Foreign insurers' U.S. operations.*
3. *ING U.S.A. ("ING") is becoming an independent, standalone, U.S.-based life insurance company since its IPO in May 2013. ING U.S.A. has been renamed Voya Financial.*
4. *Sum of Top 10 VA Writers excludes TIAA-CREF and includes #11 John Hancock.*

[1] Gross reserve refers to the statutory general account insurance reserve for variable annuity guarantees before reinsurance risk transfer. A net reserve refers to post-reinsurance risk transfer statutory general account insurance reserve for variable annuity guarantees.

Variable Annuities

Overview

According to a recent Gallup Poll survey, 9% of U.S. retirees cite annuities and insurance plans as major sources of retirement funds.[2] Variable annuities in particular have emerged as the leading retirement product choice, forming a cornerstone of retirement products offered by the life industry. Over the past two decades, the life insurance industry has increasingly shifted its product offerings toward retirement products, as growth and profitability prospects of traditional, protection-oriented products have diminished. Annuity product premiums—primarily VAs with guaranteed living benefit features—have increased at an average annual compounded growth rate of 4.6 percent in the past decade, well outpacing individual life premium growth of just 0.84 percent during the same period.[3]

VAs with guaranteed living benefits represent a relatively newer business model for life insurers, as they are not underwritten principally for the traditional insurance risks of longevity or mortality. Instead, these products take on market risk, primarily through their guarantees. Unlike the risks of traditional insurance products, market risk cannot be mitigated through pooling, and writing more business generally escalates the risk rather than reducing or diversifying it. VA guarantees broadly fall within two primary benefit categories: Guaranteed Minimum Death Benefits (GMDB) and Guaranteed Living Benefits (GLBs). Unlike GMDBs which, at a minimum, return the net premium invested by the policyholder upon his/her death, GLBs offer the policyholder protection from equity market declines by providing guaranteed accumulated account value, withdrawal, or income benefits, which policyholders often consider the more relevant of guarantee features. Refer to Appendix I for additional details.

Variable Annuity Pre/Post Financial Crisis Environment

Pre Crisis

Prior to the recent financial crisis, strong equity market performance fueled exceptional growth of the VA business.[4] In 2008, declines in the major equity markets caused policyholders to sustain steep fund losses and VA guaranteed benefits exceeded current account value leading to a spike in exposures. Insurers' hedging programs mitigated some, though not all, of the losses. According to a November 2008 report issued by actuarial consulting firm Milliman, as of October 31, 2008, U.S. VA writers' financial statements reflected an aggregate reported $232 billion in benefit value in excess of current account value.[5] In the midst of the crisis, many industry analysts questioned the long-term viability of the VA GLB product.[6]

With equity markets largely recovered since the crisis and underlying fund performance generally favorable, demand for VA GLBs has returned. At the end of 2012, the combined effect of strong equity market performance and returning product demand led to the industry reporting VA assets of $1.6

[2] Gallup Annual Economy and Personal Finance survey, April, 2013.
[3] "More Than Meets The Eye: What is Behind the Long-Term Credit Erosion in the North American Life Insurance Sector," Standard & Poor's, May 25, 2012.
[4] Source: LIMRA Survey—in the five-year period leading up to the crisis (2003–2007), VA assets increased 49 percent.
[5] Milliman, Milliman Research Report –"Performance of Insurance Company Hedging Programs During the Recent Capital Market Crisis," November, 2008.
[6] McKinsey & Company, Working Paper—"Responding to the Variable Annuity Crisis," April 2009.

trillion,[7] surpassing the 2007 peak of $1.5 trillion and representing an increase of 46 percent since the financial crisis. The majority of VAs written (84 percent) since 2008 contain GLB features.[8]
As will be discussed in more detail, transferring VA GLB risks to captives eliminates the statutory capital charge for these exposures at the traditional VA legal entities, reducing the overall amount of capital required to be held.[9] On a consolidated GAAP basis, shareholders' equity (equity) at the 10 largest VA writers has largely recovered from declines that occurred during the crisis.[10] Equity increased from 2008 to 2012 for all insurers in our sample to levels at or above reported pre-crisis levels. Yet during this period, VA GLB risk exposures have substantially increased.[11]

Post Crisis, Market Leaders Shifting and More Concentrated

High losses in the VA business sustained during and after the crisis have led some of the largest VA writers to exit the market and have prompted many of the remaining VA writers to reduce product benefits.[12] For example, AXA, ING, Manulife and Hartford were among the largest VA insurers before the crisis in 2008. VA benefit spikes during the crisis strained the statutory capital of these VA writers.[13] Subsequently, ING and Hartford placed their VA books into run-off and AXA and Manulife have de-emphasized growth due to high legacy business exposures. A flight to quality by policyholders also appears to have taken place, with Prudential and MetLife gaining considerable market share through new sales, resulting in a significant re-shuffling of market positions.

[7] InvestmentNews, "Variable-Annuity Asset Leaders: Participating Issuers Ranked by Net Assets" (source: Morningstar as of September 30, 2012), December 23, 2012.
[8] LIMRA Retirement Research, May 2013.
[9] Captive refers to a company that insures risks of its parent, affiliated companies, controlled unaffiliated businesses, or a combination thereof.
[10] In this paper, equity refers to GAAP shareholders' equity unless stated otherwise.
[11] Moody's Special Comment: "Unpredictable Policyholder Behavior Challenges US Life Insurers' Variable Annuity Business," June 24, 2013. According to Moody's, increases in lapses, and to a lesser extent, policyholder behavior has resulted in significant reserve increases. AXA-Equitable and ING US recently sustained over $1 billion GLB reserve increases—mostly due to lapses. Similarly, MetLife wrote down GLB-related Deferred Acquisition Costs (DAC) of $750 million in 2012. Lesser, though material impacts, GLB lapse impacts were also observed at Prudential and John Hancock.
[12] Hartford, ING USA, and John Hancock have all stopped writing new VA business, based on statutory financial statements and recent analyst reports.
[13] In this paper, capital refers to statutory capital and surplus unless stated otherwise.

Table 2 below illustrates the changes in market share of the top sales writers of variable annuities post crisis. Prudential, Jackson National (a subsidiary of Prudential UK) and MetLife, have emerged as market leaders, and together they generated 50 percent of all sales of the top 10 VA producers (and 39 percent of total industry sales) in the 2010–2012 period.

Table 2: Ranking of Top 10 U.S. Variable Annuity Writers By Premium Sales: 2008 and 2012[14]

Top 10 VA Writers		Top 10 VA Writers	
2008	Market share	2012	Market share
TIAA-CREF	9.3%	Prudential	13.6%
MetLife	9.0%	Jackson National	13.4%
ING	8.9%	MetLife	12.0%
AXA Equitable	8.6%	TIAA-CREF	9.6%
Lincoln Financial	7.2%	Lincoln Financial	7.1%
Prudential l	6.6%	AXA Equitable	6.0%
John Hancock	6.1%	AIG	6.0%
AIG	5.3%	AEGON/Transamerica	3.6%
Hartford	5.1%	Ameriprise	3.5%
Pacific Life	5.0%	Nationwide Financial	2.9%
	71.0%		**77.4%**

Source: LIMRA 2008 and 2012.

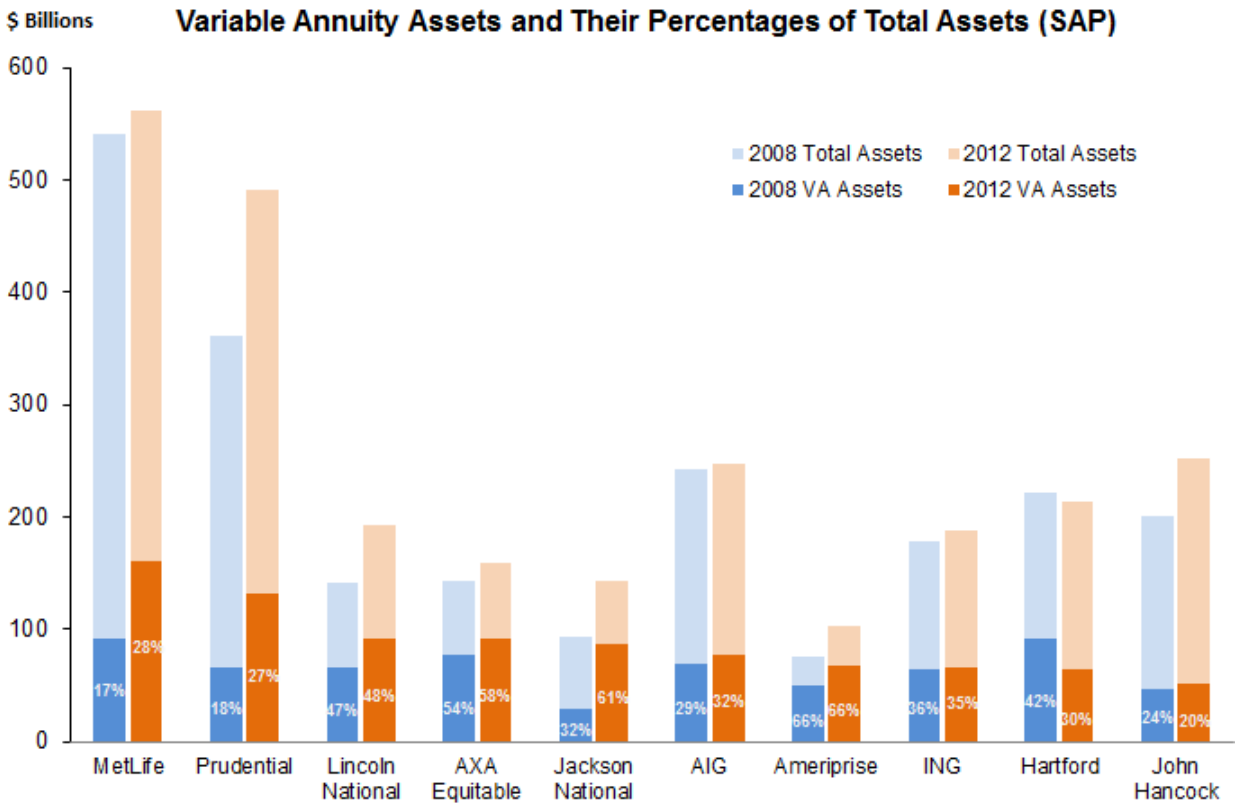
Post Crisis, Increased Materiality of VA Business

At the same time, the VA product has become a more material line of business for several of the top 10 VA firms. As a percentage of total assets, VA separate account assets have increased among the top 10 VA writers; with the exception of the three insurers who chose to stop writing or significantly de-emphasized the business line—Hartford, ING USA, and John Hancock.

[14] TIAA-CREF does not write guaranteed living benefits or death benefits (a fixed income product tied to return of premium.) TIAA-CREF Statutory Financials, General Interrogatory, Question 9.2. December 31, 2012.

As shown in Figure 1 below, for the most active writers—MetLife, Prudential, and Jackson National—VA assets nearly doubled from 2008 to 2012.

Figure 1: Materiality of VA Business—Top 10 VA Writers (2008 vs. 2012)



Source: Morningstar statutory data, SNL Financial SNL Group statutory data obtained from Annual Statements.

Post Crisis, Product Design Changes

Many VA writers continued to face challenges in managing their legacy book, generally composed of annuity business written before the crisis, containing rich policyholder benefits (e.g., frequent rollup of account values and aggressive minimum rate guarantees). These benefits, combined with low lapse rates, have resulted in growing VA legacy liability exposures, even though some VA insurers have deemphasized this line of business. In a recent Moody's report, the credit rating agency disclosed VA stress test results of the three largest sales producers – Prudential, Jackson National, and MetLife.[15] Moody's found the insurers' capital vulnerable to a shock to the equity and fixed income markets. Moody's estimated that the net amount at risk "NAR" – or the net present value of benefits above what insurer is currently holding - attributable to VA GLB ranges from 135 percent (MetLife) to as much as 354 percent (Jackson National) of surplus.[16] The report suggests that despite recent sales slowdown and

[15] Moody's Investors Service, Credit Focus "Prudential, Jackson National, and MetLife: Headache from Legacy Variable Annuity Business Lingers", March 11, 2014.
[16] Ibid, pp. 2-3. NAR is defined by Moody's as the "difference between the total claim amount payable if a benefit election were made immediately (on an undiscounted basis) and the account value...to support the claim".

de-risking actions, the VA legacy book of these VA writers remains a concern which Moody's "does not expect to dissipate any time soon".[17]

The uncertainties associated with legacy exposures limit risk divestiture prospects for several insurers. Some insurers such as Hartford and AEGON/Transamerica have offered policyholders VA guarantee buy-outs, which have met with limited success. Other insurers such as Sun Life sold their VA business to private equity firms.[18]

Since the crisis, VA writers have redesigned product offerings in order to mitigate their risk, including the risk of equity market volatility and declines. Product design changes include, for example, reduced benefits and variable fees for guarantees. In addition, new products were introduced with embedded risk management features designed to minimize equity market volatility, such as volatility-managed funds as underlying investment vehicles and variable fee structures for guarantees.

VA Risk Factors

There are many risks associated with VA guarantees and the product design is highly complex. For example, policyholder behavior (which may be independent of market conditions)—such as the timing of annuitization and choice of benefit election—combined with policyholder longevity present unique pricing challenges. Market and interest rate risks are involved with GLBs – for which a policyholder may receive a guaranteed accumulation benefit or a guaranteed income or withdrawal stream. Guarantee writers assume the risk of having to make large policyholder payments regardless of market performance and interest rate movements. Generally, the pricing of GLBs is established at policy commencement and reflects a long-term view of equity market conditions, interest rates, policyholder behavior and longevity. GLB liability values are sensitive to changes in market conditions and policyholder behavior, which can expose companies to tail risks and produce volatile financial results. In general, GLBs give rise to more substantial risks for annuity writers.

Captive Reinsurance

Traditionally, reinsurance is designed to spread risks broadly among insurance companies. For statutory accounting purposes, VA writers can reduce their liabilities (reserves) and assets (which back the reserve) and reduce RBC charges for these exposures by transferring risks to third party reinsurers. However, the unique risks posed by VA guarantees have driven most external reinsurers out of the VA reinsurance market, resulting in limited external capacity at an acceptable price.[19] In order to take advantage of the capital benefit achieved through reinsurance, many VA writers have chosen to reinsure risk internally, by establishing affiliated reinsurance subsidiaries (reinsurance captives) to assume VA guarantee risks from the traditional insurance subsidiaries within the consolidated group.

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[17] Moody's presents its stress test results using two metrics which compare the VA guarantee Net Amount at Risk ("NAR") with the consolidated GAAP VA account value as well as statutory surplus. NAR is defined by Moody's as the difference between the total claim amount payable if a guaranteed benefit election were made immediately, and the account value.

[18] In 2013, Sun Life sold its U.S. VA business to Guggenheim Partners.

[19] VA risk management differs from more traditional asset liability management techniques, due to differences in the nature of the product guarantees. Insurers can use derivatives (and other financial instruments) to hedge certain elements of VA embedded risks. But reinsurance remains as an effective tool to manage statutory capital and reserves. Especially, reinsurance can mitigate certain risks, policyholder behavior in particular, while hedging programs cannot.

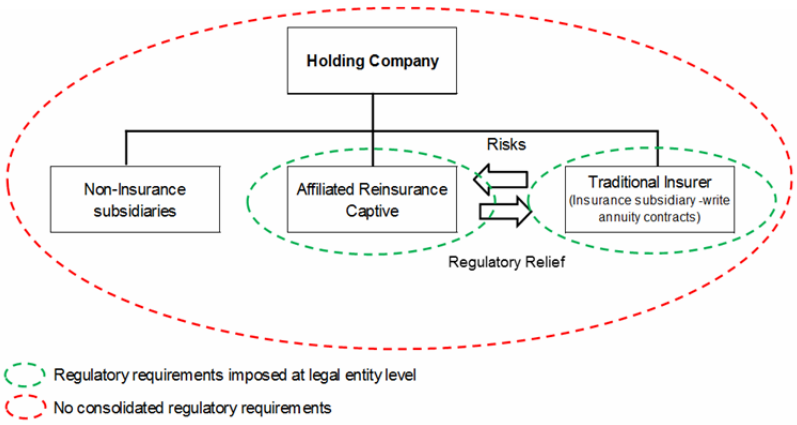
While VA reinsurance captives owned by life insurers have been in existence for over a decade, it is in the past four years that their use has accelerated for VA business.

While there are some similarities in the regulation of traditional domestic insurers and captives, there are also some key differences. Both traditional insurance regulation and captive regulation are conducted on a legal-entity basis. However, regulatory requirements for lines of business can differ, depending on whether the business is booked in a traditional insurer or a captive.

The statutory reserve and capital requirements for VA guarantees apply only if guarantees are retained in the traditional insurer (insurance subsidiary) that issued the annuity contracts. Conversely, if the guarantee risks are transferred to a reinsurance captive, the statutory requirements no longer apply, and the captive is subject to the laws, regulations, and permitted practices of the captive's domiciled state or offshore regulator. Captives are not required to follow statutory capital requirements mandated for traditional insurers and often have a fixed-dollar capital requirement regardless of the risks assumed. Captives generally have lower reserve and capital requirements, freeing up statutory capital to be redeployed elsewhere in the organization.[20]

Through the use of captives, traditional insurers can lower statutory reserve and capital requirements, although as with all reinsurance, the ceding traditional insurer remains contractually responsible for the exposure. Since there are no uniform regulations for captives, the same liabilities can be valued differently based simply on the jurisdiction of the captive. Figure 2 below illustrates a typical organizational structure used by VA writers.

Figure 2: Typical Holding Company Corporate Structure with an Affiliated Reinsurance Captive



VA captives can also employ other mechanisms that reduce regulatory capital requirements, such as parent company capital maintenance/support agreements and regulatory permitted practices.[21] Furthermore, captives can reduce collateral requirements by domiciling the traditional ceding insurer and captive in the same state. Insurers can also re-domicile from off-shore to domestic states to eliminate

[20] "The Captive Triangle: Where Life Insurers' Reserve and Capital Requirements Disappear," Moody's Investment Research, August 23, 2013, p.4.

[21] Permitted practices are the granting of accounting practices alternative to the standard set of accounting practices to which insurers must conform as established by the NAIC. State insurance regulators may grant permitted practices under special circumstances. Permitted practices can be granted to traditional as well captive insurers.

collateral requirements.[22] As limited public financial disclosures are required of captives, they largely escape public scrutiny.

Although major financial markets have largely recovered from the past crisis, substantial VA risks remain. This is demonstrated by the increasing guaranteed gross reserve levels with major VA writers, higher reserve concentration among a few large VA writers and the growing popularity of captives.

Captive reinsurance has gained significant popularity due to its effectiveness in releasing insurers from insurance regulatory mandates. The benefits of captive reinsurance lie in the fact that different regulatory reserve/capital requirements and asset recognition are applied to same risks as the exposures move from ceding insurers to captives.

[22] For example, AXA Equitable recently re-domesticated their Bermuda-based VA captives to Arizona, freeing the insurers from significant collateral requirements.

Research Results

Our research determined that the extensive use of captives weakens the balance sheets of the ceding statutory insurers in several ways. Our key findings indicate that since 2009, there has been increased growth and concentration in the gross VA GLB reserve levels. At the same time, reported capital as well as capital quality have not kept pace with reserve levels, as evidenced in higher reserve leverage (gross reserves/statutory capital) of VA writers and increased use of lower quality assets to back reserves (such as LOCs) held by their affiliated captives. Moreover, statutory minimum capital requirement levels (Authorized Control Level "ACL" RBC) have remained relatively static due to the significant reinsurance credit and RBC benefit that VA writers receive for affiliated captive reinsurance transfers. Jurisdictional differences in captive reinsurance capital requirements have facilitated the weakening of balance sheets and resulted in a substantial reduction in overall statutory capital among VA writers ceding to captives.

Growth and Concentration in VA Gross Reserves

Statutory VA guarantee exposures have grown and also become more concentrated. As shown in Table 3, statutory reserve growth, before reinsurance (Gross Reserve), among a concentrated group of VA writers has accelerated since the financial crisis, despite the 'de-risking' of products and relatively strong equity market performance.[23] In the three years following the financial crisis, gross reserves of the top 10 VA writers have grown at a considerably faster pace than reserves of the industry as a whole. MetLife, Prudential, and John Hancock have reported the highest reserve growth since 2009. MetLife and Prudential are also the leading sales producers in this period, which may account for some of the increase. However, gross reserve growth trends were also observed among VA writers with substantial legacy

Table 3: U.S. VA Statutory Reserve Growth and Concentration: 2009 vs.2012

The VA Writers of:	VA SAP Gross Reserve ($MM)	
	2009	2012
AXA Equitable	8,490	13,105
ING	5,208	7,205
Prudential	2,812	5,804
MetLife	1,699	4,921
John Hancock	1,673	4,906
Top 5	**19,882**	**35,940**
As of % of Top 10	78%	86%
As of % of Industry	42%	55%
Top 10	**25,648**	**41,975**
As of % of Industry	54%	64%
Life Industry	**47,653**	**65,517**

Source: SNL Financial. The Top 5 and Top 10 ranked based on the sum of VA Writer domestic legal entities general account VA guarantee reserves located in the Annual Statement statutory filings, life interrogatories part 2, responses to question 9.2.

exposures, notably among those writers no longer issuing new VA policies (ING and Hartford) or de-emphasizing the VA business (John Hancock (Manulife) and AXA). Gross reserve growth among the top

[23] Gross reserve refers to the statutory general account insurance reserve for variable annuity guarantees before reinsurance risk transfer. A net reserve refers to post-reinsurance risk transfer statutory general account insurance reserve for variable annuity guarantees.

VA writers has increased the concentration of risk exposure. At year-end 2009, the five largest VA writers together accounted for $19.9 billion of gross reserves or 78 percent of the total gross reserves for the top 10 VA writers and 42 percent of the industry. At the end of 2012, these five VA writers accounted for $35.9 billion or 86 % of the top 10 VA writer gross reserves, and 55 percent of industry gross reserves.

Higher Reserve Leverage

Despite growing exposure, VA writers' capital has not kept pace with reserve growth, as illustrated in higher statutory reserve leverage (VA statutory gross reserves relative to total statutory capital and surplus). With higher reserve leverage, VA writers have less capital to support future policyholder obligations on variable annuity guarantees. Thus VA writers' capital strength has weakened during this period.

Table 5 shows that since 2009, statutory reserve leverage has increased for the majority of the top 10 VA writers and has exposed capital to what is primarily GLB VA risk. At the end of 2009, only two of the top 10 VA writers, AXA-Equitable and ING, reported reserve leverage above 50 percent. At year-end 2012, one-half of the top 10 VA writers' reserve leverage exceeded this level, and three VA writers approached or exceeded 100 percent, which is high for VA GLB risks. The increase in reserve leverage in 2012 is especially notable as it stands in sharp contrast to VA writers reserve leverage immediately following the financial crisis.[24] Thus, as of 2012, these VA exposures are supported by less capital.

Table 4: Variable Annuity Writers' Statutory Reserves, Capital, and Reserve Leverage

The VA Writers of:	VA SAP Gross Reserve ($MM)			Reserve Leverage (Rsv/Capital)	
	2009	2012	Growth %	2009	2012
AXA Equitable	8,490	13,105	54%	197%	235%
ING	5,208	7,205	38%	77%	97%
John Hancock	1,673	4,906	193%	33%	85%
Prudential	2,812	5,804	106%	26%	64%
Hartford	2,483	3,013	21%	41%	52%
Ameriprise	1,032	1,040	1%	31%	33%
MetLife	1,699	4,921	190%	7%	20%
Lincoln Financial	935	1,032	10%	14%	16%
Jackson National	728	412	-43%	22%	11%
AIG	588	539	-8%	5%	4%

Data Sources: SNL Financial. Based on the sum of VA Writer domestic legal entities' general account reserves located in the Annual Statement statutory filings pp. 2 & 3 "Assets, Liabilities, Surplus & Other Funds and the General Interrogatories, Part 2 —Life Interrogatories Note. 9.2, column 6 "Gross Amount of Reserves" for VAs with guaranteed benefits.

[24] Other differences in reserve changes and capital impact among the top 10 writers are noteworthy. Two insurers—AIG and Jackson National—reported consistently low reserves in both 2009 and 2012, despite their top 10 ranking. Also, a few of the writers reported modest changes (or reduction) in reserves (AIG, Lincoln, and Jackson National). Low reserves may be attributable to a number of factors, including limited pre-crisis VA GLB exposures.

Captive Transfers Weaken Reserves: Contingent Asset Use Growing

From 2009 to 2012, total reserves transferred to captives increased from $10.8 billion to $25.8 billion, or 139% from 2009 to 2012. An increased portion of these reserves is supported by lower quality assets in captives. Different regulatory requirements present captives with the opportunity to finance portions of their reserves with contingent assets, such as letters of credit (LOCs). While not all reserve transfers are supported by LOCs, their use is increasing.[25]

Table 6 illustrates the increasing use of LOCs by VA writers since the crisis. In 2009, only 7 percent of statutory reserves were backed by LOCs. The percentage has increased to 27 percent in 2012, with MetLife, AXA Equitable, and ING as the three largest users of LOCs.

Table 5: Growth of Captive Reserve Levels & Use of LOCs by Captives (in Thousands)

	2009			2012		
The VA Writers of:	Reserve Credit Received from Captives	Letter of Credit (LOC)	%	Reserve Credit Received from Captives	Letter of Credit (LOC)	%
MetLife	1,253,817	417,000	33%	4,236,436	1,705,000	40%
Prudential	877,936			4,104,175		
AXA Equitable	4,144,427			9,361,340	2,626,000	28%
Lincoln Financial	799,052			831,246		
Hartford	137,555			212,089		
ING	3,361,344	320,000	10%	6,781,633	2,520,000	37%
John Hancock	209,450			266,854		
Total	**10,783,580**	**737,000**	**7%**	**25,793,773**	**6,851,000**	**27%**

Source: SNL Financial, Based on the sum of VA Writer domestic legal entities' general account VA guarantee reserve credit and LOCs located in the Annual Statement statutory filings, Schedule S.

[25] Contingent-form assets include lower quality or less liquid assets that weaken the strength of reserves. Through a captive reinsurance transaction, ceding companies receive statutory reserve credit relevant to the risk transferred, and captives post reserves corresponding to risk assumed. However, reserves established by the captive will not necessarily equal reserve credits received by the ceding companies, due to differing regulatory requirements. In order to bridge the differences between reserve credits ceding insurers received and actual reserves captives established, ceding companies must post eligible collateral equal to the reinsurance reserve credit. Eligible collateral may consist of LOCs, assets held in trust, or funds withheld. LOCs are a form of contingent asset and, permit the ceding company a full reinsurance reserve credit without the support of equivalent-quality assets.

Captive Transfers Keep Minimum RBC Levels Low

Given the inherent risks with VA GLBs, VA writers need to hold significant capital to support VA exposures. However, the reported minimum statutory capital levels (Reported ACL) have remained relatively stagnant post crisis. It is through risk transfer to captives that VA writers have produced substantial statutory capital relief during this period of high VA growth. Reinsuring risk, even to an affiliated entity, allows the VA writer to free up statutory capital, as observed in the very low and stagnant minimum regulatory capital requirement levels of the top five VA writers'. The Adjusted ACL shown in Table 4 estimates the impact on ACL had the reserves not been ceded to captives. This table illustrates how aggregate statutory minimum ACL would increase in the nine domestic VA legal entities by 96 percent, from $2.9 billion to $5.7 billion, had the reserve (e.g., risk exposure) remained with the respective VA writer.[26]

Table 6: Gross Statutory Reserve Growth vs. ACL ($ Millions)

Legal Entities	Gross Reserve			Reported ACL	Reported ACL		Adjusted ACL	
	2009	2012	% of Rsv Incr	2009	2012	% of ACL Incr on Reported Basis 2012/2009	2012	% of ACL Incr on Adjusted Basis 2012/2009
MetLife Investors USA Ins Co.	767	2,397	213%	133	151	14%	489	269%
MetLife Investors Insurance Co.	275	1,154	320%	44	25	-44%	94	114%
Pruco Life Insurance Co.	647	2,464	281%	130	137	5%	697	437%
Prudential Annuities Life	1,280	1,652	107%	55	55	-1%	177	222%
AXA Equitable Life Insurance	7,591	12,260	62%	525	505	-4%	864	64%
Lincoln National Life Ins. Co.	887	883	0%	723	758	5%	1,340	85%
Hartford Life & Annuity Ins. Co.	1,852	2,754	49%	183	153	-16%	320	74%
ING USA Annuity Life Insurance	5,034	5,046	40%	253	218	-14%	484	91%
John Hancock Life Ins Co (USA)	1,573	4,630	194%	881	888	1%	1,192	35%
Total					**2,889**		**5,656**	

Data Sources: SNL Financial. Based on the individual domestic legal entities' VA general account reserves located in the statutory filings General Interrogatories, Part 2 —Life Interrogatories Note. 9.2, column 6 "Gross Amount of Reserves" for VAs with guaranteed benefits, and the Authorized Control Level and Total Adjusted Capital located in the Five Year Historical Summary. Adjusted ACL is Required ACL had reserves not been ceded to captive. (See Appendix II).

[26] For a description of methodology used to produce Adjusted ACL estimates, see Appendix II: Data Assumptions and Methodology.

Heightened Potential for Capital Arbitrage

Jurisdictional differences in regulatory capital regimes of affiliated captives raise the potential for capital arbitrage. Since statutory RBC applies at the legal entity level and is not a consolidated standard, the 'Reported RBC' levels depicted in Table 7 obscure the true capital position for major VA writers. In the absence of consistent capital and reporting requirements, RBC at the leading VA writers appears to have been inflated – in some instances significantly – by internal reinsurance programs.

Table 7 illustrates how the use of captives produce high RBC ratios in VA legal entities holding less capital and the estimated capital that would be required had the reserves not been ceded to captives under two risk-based capital scenarios ("Scenario 1" and "Scenario 2"). The table was produced using statutory data and estimates for ACL and TAC since some RBC data (e.g. market risk) is not publicly available.

Table 7: Estimated Amount of Capital Required without Reinsurance Captives ($ Millions)

						Estimated TAC Range			
						Scenario 1		Scenario 2	
Variable Annuity Writers	**Reported TAC $[1]**	**Reported ACL $[2]**	**Reported RBC Ratio[3]**	**ACL Reduction by Captives $[4]**	**Adjusted RBC Ratio[5]**	**Estimated TAC Required $[6]**	**Estimated Capital Impact $[6]**	**Estimated TAC Required $[7]**	**Estimated Capital Impact $[7]**
	A	B	C = A/ (B * 200%)	D	E = A/[(B+D) * 200%]	F = (B+D)*800%	G = F-A	H = (B+D)*C*200%	I = H-A
MetLife Investors USA Insurance Co.	1,907	151	633	338	195	3,909	2,002	6,183	4,277
MetLife Investors Insurance Co.	725	25	1478	69	386	751	26	2,775	2,050
Pruco Life Insurance Co.	2,302	137	842	560	165	5,575	3,273	11,737	9,435
Prudential Annuities Life	461	55	421	123	130	1,419	958	1,493	1,032
AXA Equitable Life Insurance	5,308	505	526	359	307	6,909	1,600	9,082	3,774
Lincoln National Life Ins Co.	7,362	758	485	582	275	10,724	3,362	13,012	5,650
Hartford Life & Annuity Ins Co.	3,189	153	1039	166	499	2,557	0	6,644	3,455
ING USA Annuity Life Insurance	2,222	218	510	266	230	3,870	1,648	4,936	2,714
John Hancock Life Ins Co (USA)	7,373	888	415	304	309	9,537	2,164	9,896	2,523
Total	**30,849**	**2,889**	**534**	**2,767**	**273**	**45,250**	**14,400**	**65,759**	**34,910**

Data Sources: SNL Financial. Based on the individual domestic legal entities' Authorized Control Level and Total Adjusted Capital located in the Five Year Historical Summary. Adjusted ACL, Adjusted RBC, Estimated TAC Required and Estimated Capital Impact based on Modified S&P methodology (see Appendix II).

Note:
1. Column A – [Reported Total Adjusted Capital] (TAC) as it appears in the Annual Statement statutory filing, Five Year Historical Summary;
2. Column B – [Reported Authorized Control Level] (ACL) as it appears in the Annual Statement statutory filing, Five Year Historical Summary;
3. Column C – [Reported RBC Ratio] are author' calculations based on public data; Reported RBC Ratio=Reported TAC/200% Reported ACL as a percentage;
*4. Column D – [ACL Reduction by Captives] based on S&P static factors corresponding to entities' financial strength rating and **reduced by 25% due to de-risking**;*
5. Column E – [Adjusted RBC Ratio] is authors' estimates based on public data and S&P static capital charge factors. The estimates assume the risks return from captives to ceding insurers, equal to Reported TAC divided by Reported ACL plus ACL Reduction by Captives.
6. Columns F and G (Scenario 1) – [Estimated TAC Required] and [Estimated Capital Impact] calculated assuming the entities will sustain RBC at 400% when risks are back to ceding insurers; and
7. Column H and I (Scenario 2) – [Estimated TAC Required] and [Estimated Capital Impact] calculated assuming the entities will sustain same RBC ratios when risks are back to ceding insurers.

In determining capital arbitrage potential, we reviewed various methodologies used by rating agencies and those used by state insurance regulators to estimate the market risk component of the RBC calculation for VA guarantees. Using only publicly available data, simulating insurers' market risk stochastic models allowed by RBC methodology was not an option. Therefore, we developed two scenarios to estimate a required capital range, using static risk factors developed by Standard & Poor's ("S&P") and publicly available statutory account value data. [27] The S&P risk factors take into consideration risk profile differences for the various types of guarantees. In Table 7, the Reported TAC ("Total Adjusted Capital"), Reported ACL ("Authorized Control Level"), and Reported RBC ("Risk-Based Capital") ratios are the publicly reported values at the legal entity level. These values are "net of reinsurance" and thus exclude capital charges for the risks ceded to captives. The 4th column - ACL Reduction by Captives – uses the S&P static factor charge and shows how ceding insurers can reduce a large amount of their minimum statutory capital requirement through the use of captives, with a range of reduction from $69 million (MetLife Investors Insurance Co.) up to $582 million (Lincoln National Life Insurance Co.). Without the risk transfer to captives, the minimum statutory capital requirement would be the sum of the columns B and D - Reported ACL and the ACL Reduction.

Table 7 illustrates how VA legal entities produce high RBC ratios with less capital ("TAC") due to the benefit of this reduced minimum capital requirement. However, should those legal entities need to unwind the captive reinsurance transactions and transfer the risks back to the legal entities, their RBC levels would be sharply lowered - as shown in "Adjusted RBC" column. For example, MetLife Investors USA Insurance Co., Pruco Life Insurance Co., and Prudential Annuities Life would have RBC levels below 200%, which could require discussion of their financial condition with the state regulators.

To address lower RBC ratios shown in the 5th column of "Adjusted RBC", the VA legal entities would need additional capital. We developed a range of estimated capital that would be required, shown as Scenario 1 and Scenario 2 in Table 7. In Scenario 1, we assumed the VA legal entities target an RBC ratio of 400%.[28] Scenario 1 represents the lower bound of our required capital range. In Scenario 2, we assumed legal entities would maintain the RBC ratio at their 2012 Reported RBC levels, which represents the upper bound of our required capital range. We also compared our estimated capital range to an estimate using the NAIC pre- C-3 Phase II market risk formula. We found that using the NAIC formula closely approximated the upper bound of our Estimated Capital impact.[29] We determined that without the capital benefit derived from captive reinsurance, the aggregate TAC or total adjusted capital required for the nine domestic VA legal entities would be substantially higher. Based on these scenarios, we estimate the additional amount of capital required of VA writers ranges from $14.4 billion (Scenario 1) to $34.9 billion (Scenario 2).

[27] For a description of methodology used to produce ACL Deduction by Captives, Adjusted RBC, Estimated TAC Required and Estimated Capital Impact, see Appendix II: Data Assumptions and Methodology.
[28] In this scenario we conservatively assumed the legal entities dividend capital in excess of 400%.
[29] Prior to adoption of C-3 Phase II in 2009, the NAIC RBC formula used a factors-based approach to capture VA guarantees market risk. The static factor used by the NAIC averages at 2% of the reserves, depending on risk. We have estimated at $35.5 billion of additional amount of capital for the period ended December 31, 2012.

Policy Implications

VA guarantee exposures (both legacy and new business) have grown rapidly and have become more concentrated among a handful of annuity writers since the financial crisis. The majority of these exposures were transferred to affiliated captives during the 2008-2009 period, and this movement has continued at an increasing rate post-crisis. The significance of the capital arbitrage opportunities and the current degree to which they are exploited are supporting arguments for consolidated capital standards. The use of affiliated reinsurance captives does not transfer risk outside of the consolidated organization, yet their use allows VA writers to hold less RBC and enables the transfer of risk to a regulatory regime with lower capital requirements. Thus, the use of reinsurance captives obscures existing statutory capital adequacy assessments and can leave VA statutory writers and their insurance holding companies with less ability to absorb market and other tail risks which emanate from this significant and volatile business. In the absence of consolidated capital standards, market participants' understanding of a firm's financial condition would benefit from better public disclosures with respect to the use of affiliated captives for risk transfer.

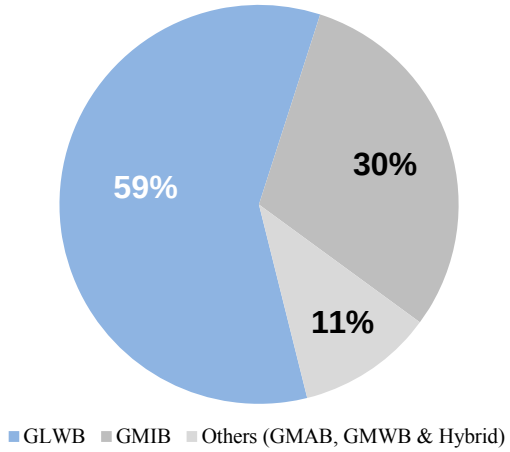
Appendix I - Primer

Insurers sell variable annuities with various types of guarantees. The primary guarantees include:

Guaranteed Minimum Death Benefits are referred to as GMDB.
Guaranteed Living Benefits (GLBs) are commonly referred to by three primary guarantee sub-types:

- Guaranteed Minimum Income Benefit (GMIB)
- Guaranteed Minimum Accumulation Benefit (GMAB)
- Guaranteed Minimum Withdrawal Benefit (GMWB) and Guaranteed Living Withdrawal Benefit (GLWB)

Figure AI.1: Variable Annuity Asset Allocation by Guaranteed Living Benefits Election: 2012



Source: LIMRA, as of December 31, 2012.

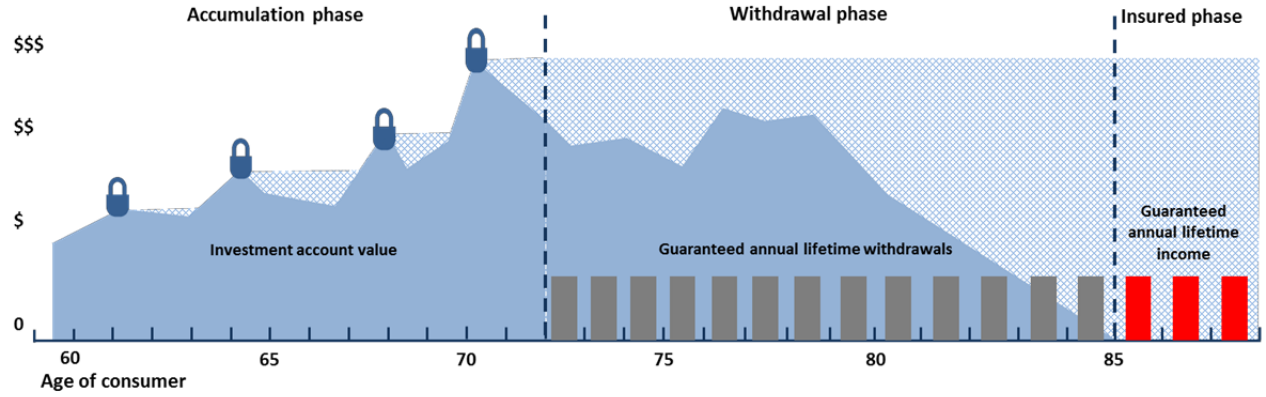
GLBs are elected on the majority of VAs written. As of March31, 2013, VAs with a GLB feature accounted for $707 billion of total market account value with GLBs election rate of 84%. The most common GLB elected is the GLWB with $421 billion out of $707 billion, or 60%. The next most common GLB feature is GMIB with $211 billion, or 30% of total $707 billion total VAs assets with GLB features.

Table AI.1: Key Death and Living Benefit Features

Key Features	GMDB	GMAB	GMIB	GMWB	GLWB
Fixed annuity payments over life time			√		
Period certain lump sum payment		√			
Fixed payment over lifetime			√		√
Fixed payment until exhaust benefit base				√	
Roll-up / Ratchet Option	√	√	√	√	√
Lump sum death payment	√				
Timing of benefit stream at policyholder option			√	√	√
Accumulation period surrender option	√	√	√	√	√

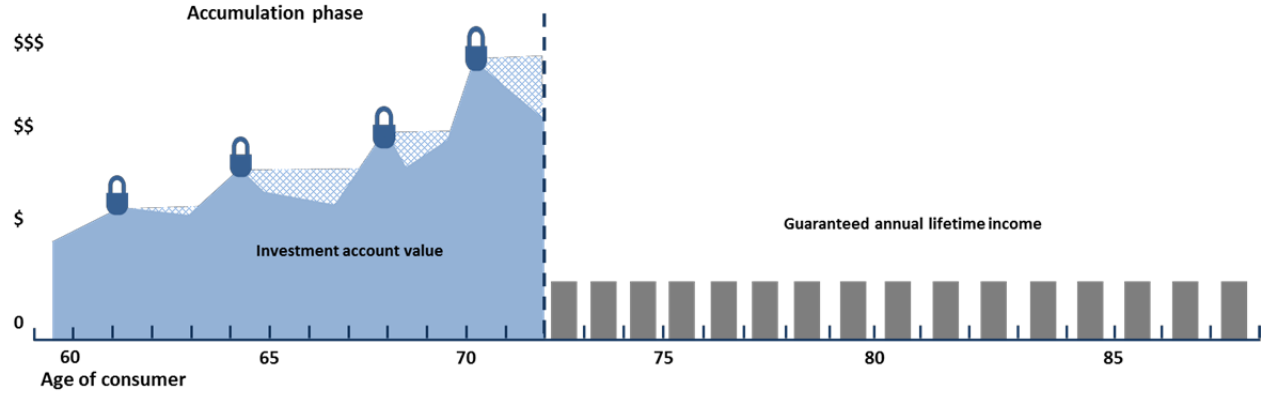
Source: authors' assessment.

Figure AI.2: Variable Annuity Payout Pattern with Guaranteed Lifetime Withdraw Benefit (GLWB)



Source: Government Accountability Office (GAO) Reports: Retirement Security, December 2012.

Figure AI.3: Variable Annuity Payout Pattern with Guaranteed Minimum Income Benefit (GMIB)



Source: Government Accountability Office (GAO) Reports: Retirement Security, December 2012 and authors' estimation.

Cash flows during the life of each of the GLB offerings will differ. For example, the GMIB—a commonly elected benefit—*permits the policyholder to decide* when to begin to receive fixed income, and until annuitization occurs, enables the policyholder to benefit from rollups and/or ratchets to increase the benefit base that may be used to calculate the ultimate annuity income. Additionally, the *policyholder has the option* to surrender the GLB during the accumulation phase. If the policyholder elects to annuitize, the VA fund balance converts to a general account asset (typically invested in high-quality bonds) and is increased to make up for any fund shortfall against the Benefit Base (via a Claim). The general account assets support the stream of fixed-income benefit for a lifetime that will be provided based on policyholder-elected options set at policy inception (e.g., the benefit base or the current fund value).

The GLWB—the most popular of benefits—shares many features with the GMIB, including surrender during accumulation phase and timing on commencement of policyholder withdrawals. Similarly, GLWB enables the policyholder to benefit from rollups and ratchets until such time as withdrawals commence. Also, the GLWB pays at an agreed withdrawal rate for the lifetime of the insured. However, the GLWB contrasts with the GMIB in some important aspects. The GLWB fund balance remains in the Separate Account during the withdrawal phase, invested in funds (equities and bonds) at the

policyholder's election. Additionally, during the withdrawal phase, the policyholder may elect a lump sum withdrawal of the fund balance. If the benefit base is more attractive than the fund balance, the policyholder will likely elect to continue receiving withdrawals.

Under statutory accounting principles, GLB reserves are subject to the AG43 reserve methodology that calculates the level of reserve requirement. The AG43 reserve requirement is the greater of a set of two calculations: one stochastic and the other deterministic. The stochastic method calculates the 30 percent of the largest scenarios rendered from a multiple economic scenario (stochastic) projection (CTE 70). The deterministic scenario serves as a reserve floor. Being in the money, reduced mortality assumptions, certain rollup features, lapses, and updated assumptions may all increase the reserve requirement. Additionally, only a portion of hedging credit is allowable (i.e., a maximum credit of 70 percent). State insurance regulators have proposed changes to statutory accounting rules on lapse rates, a development that may increase the deterministic reserve requirement. Insurance statutory capital risk-based capital (RBC) requirements for GLB exposures are similar to the AG43 reserve methodology, resulting in a minimum capital requirement valued on the basis of the worst 10 percent of post-tax losses (CTE 90) or a deterministic floor, whichever is greater.

Appendix II- Data Assumptions & Methodologies

The data used in this research were derived exclusively from public sources, with our primary data sourced from life insurer statutory Annual Statements and exhibits, and from insurer consolidated SEC financial statement filings, primarily from 2008 through 2012. Data from industry surveys, statistics, and research reports published by consulting firms and rating agencies were also used. Because no public data are available on capital held by captives, no attempt was made to analyze potential capital arbitrage at the consolidated holding company level. Rather, our research focused on estimating the capital and leverage impact on the insurance subsidiaries and the magnitude of regulatory capital reduction obtained through the use of affiliated reinsurance captives.

Capital Charge Estimation Methodology

Statutory Risk-Based Capital (RBC) Background

Statutory RBC ratio is calculated as Total Adjusted Capital (TAC) divided by Authorized Control Level capital (ACL). RBC = TAC/ACL.

TAC is the qualified capital actually held by insurers, and ACL can be viewed as the minimum regulatory capital requirement. Insurers often desire to have a higher RBC because a higher RBC illustrates the level of excess capital over the regulatory minimum. Insurers have two ways to obtain higher RBC—hold more capital (higher TAC) or reduce the minimum capital requirement (lower ACL).

We discovered that VA writers have achieved higher RBC through the second method—reducing ACL by transferring risks to affiliated reinsurance captives.

ACL is based on a hybrid method (both formulaic and stochastic). Life, Property/Casualty, and Health insurers use different formulas to calculate their minimum regulatory requirement (ACL).

For life insurers,

TAC = Statutory Capital and Surplus + Asset Valuation Reserve ("AVR") + ½ Policyholder Dividends

$$ACL = \{C\text{-}0 + C\text{-}4a + \sqrt{[(C\text{-}1o + C\text{-}3a)^2 + (C\text{-}1cs + C\text{-}3c)^2 + (C\text{-}2)^2 + (C\text{-}3b)^2 + (C\text{-}4b)^2]}\}/2$$

(Divided by 2 because 200 percent or more of ACL results in "no action.")

C-0: Asset Risk—affiliates
C-1o: Asset Risk—other
C-1cs: Asset Risk—common stock
C-2: Insurance Risk or Pricing Risk
C-3a: Interest Rate Risk
C-3b: Health Provider Credit Risk
C-3c: Market Risk
C-4a: Business Risk—guaranty fund assessment risk
C-4b: Business Risk—health administration expense risk

Based on NAIC's RBC formula, most types of risk charges can be quantified with a formulaic approach. The exception is the market risk charge (C-3c), which will be discussed later. Under a formulaic approach, risk charges are computed as risk exposures times the corresponding risk factors. Risk exposures differ depending on the type of risk. For example, asset risk exposures are subject to statutory carrying values. Interest rate risk exposures are measured by the amount of statutory reserves.

The NAIC introduced a market risk component (C-3c) into the RBC formula in 2009 to capture the tail risk embedded in variable annuity guarantees. Market risk (C-3c) is the only stochastic component in the RBC formula (commonly referred to as C3 Phase II). The market risk capital charge cannot be computed using a risk factor, but instead is determined by stochastic modeling.

Statutory Capital Charge Estimation

By using reinsurance captives, VA writers can effectively reduce their minimum regulatory capital requirement (ACL) because regulatory capital charges are net of reinsurance.

VA writers can reduce statutory capital charges from at least two risk categories—asset risk and market risk. Asset risk is reduced because exposures are lower after the transference of reserves and assets backing reserves to captives.[30] Market risk can be reduced to as low as zero if all market risks are transferred to captives.

Compared with the straightforwardness of asset risk charges, which are calculated by a formulaic approach, the market risk charge is especially challenging to quantify because it depends on stochastic modeling. Thus we sought to identify credible non-stochastic approaches for our market risk charge estimate. In our research, we examined a number of alternative approaches to estimate the market risk charge, including the NAIC pre- C-3 Phase II market risk factors-based approach, a 2004 Society of Actuaries CTE 90 methodology paper on VA guarantees RBC capital requirements approach, and a Standard & Poor's ("S&P") static capital charges methodology approach.[31] In our analysis, we utilize the S&P static capital charges with certain modifications as specified in the following paragraphs. We selected the S&P static capital charges as our preference is to utilize factors which incorporate degree of guarantee product feature risk (e.g. a high factor for GMWBs, a low factor for Return of Premium Death Benefits) and legal entity credit quality (e.g. lower rated legal entities require more capital and thus a risk higher factor). Moreover, we favored the relative ease of application of the S&P factors to VA guarantee account values, using data obtained from statutory filings.

In calculating the Adjusted ACL in Table 6 and the ACL Deduction by Captives and Adjusted RBC in Table 7, we used the 2012 Annual Statement General Interrogatory, Life Interrogatories – Part 2, response to question 9.2. We matched each VA legal entity living and death benefit riders (Columns 1. & 2.) and

[30] For coinsurance, assets supporting reserves are directly transferred to captives and cause lower total assets in traditional insurers. For Modco, although assets stay on traditional insurers' balance sheets, this portion of assets is exempt from the RBC risk charge. The treatment of reserves is similar.

[31] Reference materials included: Session 91OF, "Risk-Based Capital Requirements on Variable Annuities with Guarantees", Society of Actuaries, Orlando Annual Meeting, October 26-29, 2003, Panelists: Geoffrey Henry Hancock and Jeffrey A. Leitz, and "Attention Life Insurance Actuaries! Standard & Poor's Needs You (and C-3 Phase II) for its Insurance Capital Model", Greg Gaskel and Dave Ingram, Society of Actuaries: Risk and Rewards, February 2008, Issue 51; Standard and Poor's Rating Direct, "Refined Methodology and Assumptions For Analyzing Insurer Capital Adequacy Using the Risk-Based Insurance Capital Model", June 7, 2010, p. 33 item 185 and p. 47 Appendix 2.

the total related account values (Column 5.) with S&P's living and death benefit riders' descriptive breakdown. Next, we multiplied S&P's static capital charges by the related account values to produce a market risk charge component of ACL for each VA legal entity. These static charges vary based on the current S&P insurance entity financial strength rating of each VA legal entity.

Next, we modified the S&P market risk requirement result to allow credit for post-crisis product de-risking activities. A conservative de-risking haircut of 25% was deducted from each VA legal entity market risk charge. With respect to asset risk charges, we assumed the assets transferred back to traditional insurers from captives are financial derivatives. The sum of the asset risk charge and the Modified S&P market risk charge result in post-tax and after-covariance Adjusted ACL, ACL Deduction by Captives used to calculate the Adjusted RBC estimates. Based upon our ACL and RBC estimates, Lincoln National Life Insurance Co., Pruco Life Insurance Company, AXA Equitable Life Insurance Company, MetLife Investors USA Insurance Co., and John Hancock Life Insurance Co., and ING USA Annuity Life Insurance benefitted significantly from captive use.

Finally, we produced two scenarios to generate Estimated TAC Required and Estimated Capital Impact range (Scenarios 1 and 2) in Table 7. Scenario 1 assumes the VA legal entity will target an RBC ratio of 400%, and upstream dividends when RBC exceeds 400%. Scenario 2 conservatively assumes the VA legal entities will maintain the RBC ratio at 2012 Reported RBC levels. According to Scenario 1 in Table 7, TAC required would rise substantially to an estimated $45.3 billion, a 47% increase over Reported TAC and by an estimated $65.8 billion (a 113% increase) according to Scenario 2, with the most material capital impact produced by legal entities Lincoln National Life Insurance Company, John Hancock Life Insurance Co. (USA), and Pruco Life Insurance Co. Our Estimated TAC Required and Estimated Capital Impact range are not intended to generate precise numbers, but aim to provide readers a sense of the level of statutory capital that can be reduced through affiliated reinsurance captives.