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The Economics and Regulation of Captive Reinsurance in Life Insurance

Scott E. Harrington



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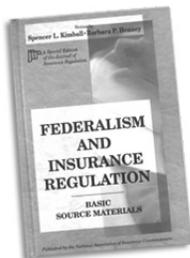
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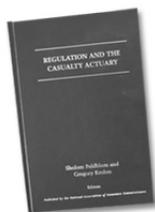
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The Economics and Regulation of Captive Reinsurance in Life Insurance

Scott E. Harrington*

Abstract

The use of captive reinsurance arrangements in life insurance has generated significant debate and led to recent adoption of new regulatory requirements by the NAIC. This paper provides an overview of the regulatory reserve requirements that spurred growth in captive reinsurance and how captive arrangements are used. It elaborates potential efficiencies and risks from the arrangements, as well as how insurers' financial incentives, previous regulation, rating agency monitoring and monitoring by non-insurance creditors mitigate those risks. It provides evidence on the scope and structure of captive reinsurance using data from NAIC reporting requirements that became effective in 2013, and it compares A.M. Best ratings for life insurers with and without captive arrangements, documenting that most entities using captive reinsurance have relatively high ratings. Finally, it discusses the new NAIC regulatory framework for captive reinsurance arrangements and specific requirements for the amounts and types of assets permitted to back the arrangements.

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I. Introduction

Holding more capital to ensure payment of claims, protect going concern value, achieve desired financial ratings and/or meet regulatory standards increases insurers' costs and generally requires commensurately higher premiums. The fundamental challenge of insurance solvency regulation is to establish financial reporting rules, controls and monitoring systems that help achieve the right balance between safety and soundness on the one hand and the cost of coverage to consumers on the other. This challenge is highlighted by debate over the use of captive reinsurance arrangements by life insurers, which has produced significant divisions among state regulators and among life insurance companies.¹

The use of captive reinsurance arrangements in life insurance has its roots in growth since the early 1980s of term insurance products and universal life insurance products with secondary guarantees (ULSGs), which provide consumers long-term death protection with level premium payments over time and little or no savings accumulation.² Like traditional, savings-oriented permanent life insurance products, the level premiums under these policies are expected to exceed the annual cost of benefits during the earlier years of the policy in order to fund benefits in excess of the level premiums in later years. Insurers are, therefore, required to establish liabilities, known as policy reserves, which reflect assumptions concerning the excess of the present value of expected future benefits over the present value of future premiums. The reserves required under statutory accounting principles (SAP) are based on conservative assumptions about future mortality and investment income compared with best estimates of the economic value of liabilities, thus providing a cushion against adverse experience in the calculated reserves. Reserves based on generally accepted accounting principles (GAAP), in contrast, are more closely aligned with the estimated economic value of liabilities.

Captive reinsurance arrangements primarily evolved in response to the adoption by state regulators in the early 2000s of more conservative statutory reserve requirements for level-term and ULSG products to mitigate the potential for certain policy features to cause insurers to understate their liabilities by manipulating those features. The new rules, however, created a quandary. Absent an alternative solution, the significant increase in required reserves for certain products would require insurers to hold more capital to avoid an increase in the probability of financial impairment and regulatory intervention, and an attendant decrease in financial strength ratings. That additional capital would materially

1. The term "captives" is used throughout this paper to refer to captives for life insurance, as opposed to captives for other types of risk and insurance. Issues similar to those addressed here have also arisen with respect to the use of captive reinsurance for variable annuities and long-term care (LTC) insurance.

2. Universal life policies with secondary guarantees (ULSGs) typically guaranty that the policy will remain in force for a specified period or indefinitely if the cash value becomes zero, provided that specified amounts of premiums have been paid.

increase the costs of providing those products and premiums to consumers. Captive reinsurance arrangements evolved as a mechanism for managing capital to comply with the new rules at lower cost, facilitating lower insurance prices and more insurance protection.

The growth of captive reinsurance arrangements was accompanied over time by dialog and debate over potential risks from the arrangements and the efficacy of the formulaic reserve requirements that spurred their growth. In December 2012, the NAIC approved, with dissent by some commissioners, a regime of principle-based reserves (PBR) that, if adopted by 42 states accounting for at least 75% of relevant premiums, will largely replace traditional formula reserves with requirements that permit substantially more flexibility in establishing reserves in relation to factors that influence the underlying economic value of insurers' liabilities.³ Once implemented, PBR is expected to reduce but not eliminate the use of captive reinsurance.

In June 2013, a report by the New York State Department of Financial Services (NYSDFS), following an earlier media report, brought national attention to potential hidden risks from captive reinsurance arrangements and motivated renewed attention and regulatory proposals by state regulators. Borrowing language from the debate over "shadow banking," the report asserted that such "shadow insurance" arrangements involve "shell" corporations, often located offshore, which are engaged in financial "alchemy" with little public disclosure to hide financial weakness and inflate capital ratios. The report suggest the arrangements placed the broader financial system at risk, with parallels to the subprime mortgage crisis and federal bailout of the American International Group (AIG) in 2008.⁴ The study recommended a national moratorium on new captive

3. Thirty-six states had passed relevant legislation as of mid-2015, and it is anticipated that principle-based reserving (PBR) will take effect in 2017 (Willkie Farr & Gallagher, 2015). Studies suggest that PBR would likely significantly reduce reported reserves for certain products for which current requirements exceed economic reserves (Milliman 2012, Towers Watson 2012).

4. Kojien and Yogo (2014a; also see 2014b and 2014c) purport to show that appropriate recognition of liabilities for "shadow insurance" arrangements would substantially reduce life insurers' capital ratios and financial ratings and that expected capital impairment rates were much higher than implied by current financial ratings, producing large expected costs of life insurer insolvencies. Harrington (2014) highlights that study's failure to consider how rating agencies actually evaluate captive arrangements and enumerates multiple biases in the estimates of expected costs. Kojien and Yogo (2012) estimate significant price reductions for immediate annuities and zero cash value universal life policies in late 2008, which they interpret as "fire sales" to improve reported capital during the financial crisis. The analysis basically assumes that failure to increase premiums significantly and immediately in response to sharply lower U.S. Department of the Treasury (Treasury) rates at that time and despite higher corporate bond yields constituted "fire sales." The paper documents that companies most affected by the crisis on average shifted to safer assets, reduced shareholder dividends and raised external capital, which is clearly desirable from the perspective of safety and soundness. Niehaus (2014) provides evidence that internal capital flows among life insurance affiliates surrounding the crisis on average helped to improve capital ratios of weaker affiliates, which also is desirable from a safety and soundness perspective.

arrangements pending development of improved disclosure and uniform regulation.⁵

A subsequent NAIC study group white paper on captive arrangements recommended improved disclosure, greater uniformity of regulation and areas for further study, without a moratorium or significant new restrictions (NAIC, 2013). (The NAIC had earlier expanded financial reporting requirements for captive reinsurance transactions effective in 2013.) In late 2014, based on a series of reports by Rector & Associates (2013, 2014a, b), the NAIC approved a framework for further disclosure and, very importantly, for significant new requirements for insurers to receive balance sheet “reserve credit” for new captive reinsurance arrangements.

The present study—with financial support provided by the American Council of Life Insurers (ACLI)—explores the economics and regulation of captive reinsurance arrangements in life insurance to provide context and insight to help inform the policy debate. Section II provides an overview of the reserve requirements that spurred growth in captive reinsurance and how captive arrangements are used. Section III considers potential efficiencies and risks from the arrangements, and how insurers’ financial incentives, previous regulation, rating agency monitoring, and monitoring by non-insurance creditors mitigate those risks. Section IV provides evidence on the nature and scope of captive reinsurance using data from new NAIC reporting requirements for captive reinsurance in 2013. Section V summarizes A.M. Best ratings for life insurers with and without captive arrangements, documenting that most entities using captive reinsurance have relatively high ratings. The new NAIC framework for additional regulation of captive reinsurance is discussed in Section VI. The paper concludes with a brief summary and perspective on the use and regulation of the arrangements.

II. Reserving and Captive Reinsurance in Life Insurance

Reserves Based on Regulation XXX and AXXX

As noted, insurance company capital can be broadly defined in economic terms as the amount of assets held in excess of liabilities, which serves as a buffer

5. The New York State Department of Financial Services (NYDFS) adopted expanded disclosure requirements for captive reinsurance in 2013. In 2014, the NYDFS acknowledged that that statutory reserves for certain products significantly overstated anticipated mortality rates, and it issued draft regulations to relax reserve requirements for term life insurance issued beginning in 2015 (see Routhenstein, Schreiber and Silverman, 2014). The Federal Insurance Office (FIO) (2013) also recommended improved and consistent disclosure.

to help assure that policyholders' claims will be paid if asset returns are lower than expected and/or claim costs turn out to be higher than expected. Specific calculations of regulatory capital for accounting purposes are based on SAP, which are conservative compared with GAAP. The term "economic capital" is often used to describe capital calculated with economic estimates of asset and liability values, which need not correspond with either SAP or GAAP values.

Other things equal, insurers that hold more capital in relation to their liabilities have lower insolvency risk and receive higher financial strength ratings than insurers with less capital. Strong financial ratings help insurers attract customers who care about security; they are a prerequisite in many cases for attracting a large customer base. Holding more capital is costly to insurers, thus on average requiring higher premiums to cover the increased costs. Insurers have strong incentives to manage capital efficiently to reduce costs and provide more attractive prices for any given level of financial strength. In addition to competitive market pressure for adequate capital and strong financial ratings, states impose elaborate minimum RBC requirements for insurers. Insurers that fail to meet the RBC minimums face various levels of regulatory intervention. Most life insurers hold capital substantially in excess of the RBC minimums in order to achieve high financial strength ratings, attract risk-sensitive customers, and reduce the likelihood of regulatory intervention or insolvency.

Because expected mortality rates increase with age, long-term life insurance policies with level premiums over time involve the payment of premiums in excess of mortality costs during the early life of policies to fund claim payments in later years when mortality costs are expected to exceed premiums. The sale of level premium policies, therefore, generates economic liabilities equal to the excess of the discounted value of expected future claims over expected future premiums. SAP and GAAP specify complex rules (or guidance) for calculating policy reserves. The more conservative the required assumptions, the greater the required reserve. SAP rules are more conservative than GAAP, producing larger SAP than GAAP reserves.

The actuarial mortality tables that are required for statutory reserve calculations are conservative and infrequently updated.⁶ Given inherent conservatism, lags in adjustment, long-term improvements in mortality, anticipated further improvements and diverse insurer underwriting standards, statutory reserves can significantly exceed economic reserves for certain life insurance products. The gaps between statutory and economic reserves motivate insurers to take actions to offset potential reductions in reported capital and the need to raise additional capital.

During the 1990s, regulators became concerned with strategies that some life insurers were using to reduce statutory reserves for certain level premium term policies and associated strains on capital associated with improved mortality. An insurer, for example, might have specified a relatively low level premium, with the

6. Statutory reserves also reflect other conservative assumptions, such as the assumption of no policy lapses for term insurance.

contractual ability to increase premiums up to a higher maximum amount in later years under extraordinary circumstances. Calculation of reserves using those higher maximums would reduce statutory reserves. After extensive debate, the NAIC adopted new reserve requirements for level premium term life insurance policies in 2000 that effectively required significantly higher reserves (known as Regulation XXX reserves) and that were subsequently implemented in all states.⁷ The new requirements were widely predicted to substantially increase the gap between statutory and economic reserves, putting upward pressure on term life insurance rates—even after the adoption of a revised mortality table in 2001. In 2003, the NAIC adopted new reserve requirements (known as AXXX reserves) for universal life policies with secondary guarantees, which in turn were implemented in all states. Those requirements were again modified in 2005, 2007 and 2012.

Captive Reinsurance Structures

Traditional methods of funding reserves have an inherent cost. The implementation of XXX and AXXX statutory reserves produced substantial pressure for insurers to adopt new methods of capital and reserve management to deal with the resulting capital strain from providing competitively priced products based on projected mortality, leading to the development and expansion of captive reinsurance arrangements. The arrangements have commonly been used to manage the difference between statutory XXX/AXXX reserves and economic reserves.

With captive reinsurance, the insurer writing the policy (the “ceding” insurer) enters into a reinsurance agreement with an affiliated reinsurer that is wholly owned by the insurer or, more commonly, its parent holding company. If certain conditions are met, and depending on the specific form of reinsurance, these sometimes complex and often customized arrangements allow the ceding insurer to take credit for reserves ceded and to reduce its required RBC associated with the policies ceded.

As is true for reinsurance with unaffiliated reinsurers, the ceding insurer receives such credit if the captive reinsurer is “authorized” by regulators in the ceding insurer’s state of domicile, which requires that the reinsurer be licensed or accredited in the ceding company’s state of domicile or in a state with equivalent laws to the domiciliary state. If not, the reinsurer—captive or otherwise—is considered “unauthorized,” and the ceding insurer generally receives reserve and/or required RBC credit only if the reinsurer’s obligations are collateralized by a qualified letter of credit (LOC) from an accredited bank, by the ceding insurer withholding specified funds on its balance sheet or by placing assets in a reinsurance trust account.

Captive reinsurance arrangements commonly take the form of “coinsurance,” a type of reinsurance used extensively in non-captive reinsurance. With coinsurance, the ceding insurer transfers assets and reserves to the captive. If the

7. New York adopted similar requirements a few years earlier.

reinsurer is authorized in the ceding insurer's state of domicile or meets the collateral requirements for credit for unauthorized reinsurance, a reduction in ceding insurer assets and reserves is allowed under statutory accounting and RBC requirements. As is true for non-captive reinsurance, captive reinsurance also can involve arrangements in which the ceding insurer transfers specified risks to the reinsurer without transferring associated assets. With "modified coinsurance" (modco), the ceding insurer maintains the assets and reserves on its balance sheet while transferring specified investment and mortality risk to the reinsurer and receiving credit in its required regulatory capital. With a "funds withheld" arrangement, the ceding insurer transfers policy reserves and specified investment and mortality risk, but it withholds the associated assets, reporting an offsetting accounts payable liability on its balance sheet. Because the ceding insurer maintains the assets, modco and funds withheld agreements generally entail less credit risk than regular coinsurance.

The details of captive reinsurance arrangements are often complex, and many variations are used. While the specific details generally are not publicly available, industry analysts, consultants and regulators typically highlight whether structures are funded or involve LOCs or related security (see, for example, Avitabile, 2012; Alberts, Hamilton, and Andurschak, 2013; Willkie Farr & Gallagher, 2013; Routhenstein, Schreiber, and Silverman, 2014; Stern, 2014).⁸ Under a basic funded structure involving coinsurance, the parent contributes capital to the captive. The ceding insurer cedes XXX or AXXX statutory reserves and transfers assets to the captive equal to the estimated economic reserves, which generally reflect some degree of conservatism compared with best estimates. The gap between statutory and economic reserves is then funded by the captive issuing surplus notes (or similar security) to a bank or other investors. The assets backing the estimated economic reserves and the proceeds from the notes are generally held in trust for the benefit of the ceding insurer. The assets backing the economic reserves and capital contribution from the parent are used to fund claim payments, with the proceeds from the lenders/investors used only if those sources of funds are inadequate. Funded solutions can be recourse—where lenders/investors have recourse to seek reimbursement from the parent company for any losses—or non-recourse. Funded structures became popular in 2003–2007, but the market for such structures largely disappeared with the onset of the financial crisis.

As an alternative to funded structures, many captive reinsurance arrangements employ structures where the gap between statutory and estimated economic reserves is collateralized by a bank LOC. Under a basic LOC structure, the parent contributes capital to the captive, the subsidiary ceding insurer cedes the statutory reserves and transfers assets to the captive equal to the estimated economic reserves, and the LOC backs the difference between statutory and estimated

8. The NAIC's Financial Analysis (E) Working Group recently conducted an extensive review of existing arrangements, but the details are not publicly available. Cowley and Cummins (2005) provide an early detailed treatment of securitization of insurance assets and liabilities in general.

economic reserves. LOCs can be short-term or long-term, unconditional or conditional, and recourse or non-recourse. While early captive arrangements involved short-term LOCs, the arrangements evolved over time to long-term agreements. The captive or parent can draw on an unconditional LOC for any reason. With a conditional LOC, draws generally are contingent on exhaustion of the captive's other assets (including the parent's capital contribution). Under a recourse structure, the LOC provider has recourse against the ceding insurer's parent for any draws (i.e., the LOC entails a "parental guarantee"), as opposed to only having a claim against the captive in a non-recourse structure. Non-recourse LOCs became more common over time.

Funded structures involving credit-linked notes became popular as an alternative to LOCs in 2012–2013, with traditional reinsurers commonly serving as providers of financing (Routhenstein, Schreiber and Silverman, 2014). The basic structure involves the issuance by the captive of surplus notes to a special purpose vehicle (SPV) in an amount equal to the gap between statutory and economic reserves in exchange for a credit-linked note in the same amount. The credit-linked note is redeemable by the captive for cash in the event of a specified stress event, with an external counterparty, such as a reinsurer, funding the payment.

The regulation and accounting requirements for captive reinsurers are complex, varying across states and countries. Many captives are domiciled and regulated onshore in one of the states that has established specific rules and regulations to facilitate captive arrangements, including Delaware, South Carolina and Vermont. During 2010 and 2011, four states (Georgia, Indiana, Iowa and Texas) enacted Limited Purpose Subsidiary laws that permit domiciled insurers to establish captive vehicles with LOCs and parental guarantees as admitted assets. Other captives are located offshore and subject to regulation and taxation in offshore jurisdictions.

III. Benefits, Risks and Monitoring

Potential Benefits and Risks

Captive reinsurance arrangements can lower the cost to insurers and, thus, their customers of achieving a given level of financial strength in the presence of highly conservative, formula reserve requirements under statutory accounting. Insurance companies' capital and risk management strategies are generally designed to achieve target financial strength ratings from insurance rating agencies that require capitalization and risk management well beyond regulatory minimums. The targets are chosen in view of the insurers' underlying business models, policyholder preferences for safety and soundness, the potential loss of

companies' franchise (going concern) value from financial distress, and the costs of holding capital.

Financial ratings are based on the likelihood of insurer financial difficulty, including very importantly the likelihood that the insurer will become subject to regulatory "impairment" and subject to regulatory action.⁹ Holding capital and risk constant, conservative regulatory reserve requirements that produce required reserves significantly greater than economic reserves increase the likelihood of impairment, with downward pressure on ratings. Insurers, therefore, are confronted with the choice between: 1) holding relatively more capital with attendant higher costs and need for higher prices to achieve impairment probabilities that are consistent with desired ratings, thus reducing the amounts of life insurance demanded by consumers; or 2) developing alternative mechanisms for achieving desired ratings at lower cost.

Captive reinsurance arrangements provide a mechanism for meeting rating agency criteria at lower cost than holding the additional assets and capital on insurers' balance sheets that would be needed if captive reinsurance could not be used. While the details of the arrangements and specific effects on costs and prices are complex, the essence of the transactions is to obtain some amount of external financial support and/or guarantees, which can lower the cost of achieving desired levels of financial strength and ratings. As has been emphasized in the economic literature on securitization of financial obligations, sources of cost savings include broader diversification of risk; the segmentation of assets and/or liabilities to facilitate such diversification and risk evaluation by regulators, rating agencies and financing providers; and, in some instances, reducing tax costs, including those associated with corporate/investor double taxation of investment returns on capital.

Captive reinsurance arrangements also pose potential risks, including those associated with: 1) limited transparency; 2) levels of captive capitalization; 3) the riskiness and accounting treatment of captive assets; 4) the reliability of LOCs and related instruments as a source of financing; 5) the effects of parental guarantees; and 6) diverse state regimes for regulating captives.¹⁰ The key underlying risk is whether worse than expected mortality and/or investment experience could exert substantial pressure on the ceding insurer's financial condition. That could occur directly if the captive's assets and financing support proved insufficient to fund claims, or indirectly if parental guarantees of captive obligations ended up weakening the parent and its subsidiary insurers.

When assessing risks posed by captive reinsurance, it is important to recognize factors that can mitigate the risks. These include: 1) incentives for insurers to operate safely and soundly; 2) regulatory oversight of captive

9. For example, according to the A.M. Best Impairment Study (2013), impairment "is a substantially wider category of financial distress than an event of default. In particular, impairment frequently occurs when an insurer still is able to meet its current policyholder obligations, yet regulators have become sufficiently concerned ... to intervene in the insurer's business."

10. Also see the discussion of potential risks by the Financial Stability Board (FSB) (2014).

reinsurance transactions; 3) rating agency scrutiny; and 4) lender monitoring and potentially beneficial aspects of parental guarantees.

The Role of Market Discipline and Incentives for Safety and Soundness

Insurance markets generally have been characterized by relatively strong market discipline and correspondingly low insolvency risk, reducing concern that major entities might be inherently prone to excessive risk taking.¹¹ Many, if not most, policyholders prefer to deal with financially strong insurers. State guarantee systems are limited in coverage and scope, reducing the potential for moral hazard from protecting customers against losses from insurer insolvency compared with explicit and implicit federal guarantees of bank obligations. Insurance intermediaries (agents, brokers and advisors), private ratings of insurers' financial strength and, for business products, knowledgeable corporate staff help match risk-sensitive policyholders with financially strong insurers. Insurance production and distribution often involve the creation of sizable insurer franchise value. This could diminish or evaporate if an insurer experienced financial distress, providing additional incentives for adequate capitalization and other forms of risk management by insurers. Also, many life insurance entities issue debt at the holding company level, which is subordinated to policyholder claims, creating another category of stakeholders concerned with insolvency risk and its management.

Consistent with strong market incentives for solvency, the life insurance industry weathered the worse financial crisis since the Great Depression reasonably well. The last significant episode of life insurer insolvencies, other than small entities, took place in the early 1990s, in conjunction with severe downturns in the markets for high yield debt and commercial real estate. Since that time, significant additional prudential requirements have been imposed on insurers, such as asset adequacy analysis, RBC requirements and codified accounting requirements. A notion that many major life insurers would risk their existence as going concerns through excessively risky captive insurance arrangements is inconsistent with incentives for safety and soundness and historical experience in the sector.

Regulatory Oversight

Captive reinsurance transactions are subject to significant regulation (predating the new regulation discussed below). The transactions generally receive two levels of regulatory scrutiny (see, for example, Willkie Farr & Gallagher,

11. I discussed this issue in detail in Harrington (2004). Epermanis and Harrington (2006) provide detailed discussion and evidence of market discipline in U.S. P/C insurance. Also see Eling (2012).

2013). First, and in addition to meeting regulatory requirements for the ceding insurer to receive reserve or RBC credit under SAP and state regulation, the terms of the reinsurance agreement with the captive must be approved by the ceding insurer's primary state regulator. The review process often includes independent actuarial analysis of the transaction and estimated economic reserves. Domiciliary state regulators of ceding insurers also have requirements and/or guidelines for the use of reinsurance trusts, LOCs and investment of assets within or outside of the trust.

Second, the captive reinsurer must meet regulatory requirements in its state of domicile (or non-U.S. jurisdiction). The requirements encompass organization and licensing of the captive, the terms of the reinsurance arrangements, the use of surplus notes and LOCs, and financial reporting and examination. Thus, while questions might be raised about variation in regulation of captive reinsurance arrangements across jurisdictions and the specific details in some cases, any suggestion that the arrangements are unregulated or beyond the purview of regulators would be incorrect.

Rating Agency Scrutiny

The use of captive reinsurance arrangements to manage life insurance reserves and capital has received extensive discussion by leading insurance rating agencies for at least a decade, including recent reports dealing with the growth and security of such arrangements.¹² Among other issues, rating agencies have considered how financing support for captives should be treated when assessing the ceding insurer's financial and operating leverage and the extent to which ceded reserves are isolated from the rest of the ceding insurer's business, with dedicated funding and de minimis risk of default. In addition, captives often cede some portion of mortality risk to traditional reinsurers, which rating agencies likewise evaluate when assessing risk associated with captive reinsurance arrangements.

A.M. Best. The A.M. Best Company bases its insurance financial strength ratings on quantitative and qualitative analysis, including discussions with management and calculation of Best's Capital Adequacy Ratio (BCAR), the ratio of "adjusted capital" to estimated required capital from Best's proprietary RBC model. Along with growing use of captive reinsurance, a 2006 A.M. Best report "Review of BCAR Treatment for XXX Captives" indicates that "A.M. Best has been monitoring the evolution of XXX solutions and its impact on direct writers' [ceding insurers'] capital strength," including consideration of transaction features "that could result in sending reserves back to the parent company."

12. This section draws heavily from Harrington (2014).

When discussing life insurance captives and XXX/AXXX reserves, A.M. Best's March 25, 2013, report "Understanding BCAR for Life/Health Insurers" notes:

For A.M. Best to properly review the relationship between a captive and the direct writer, and to provide the appropriate treatment in the BCAR model, A.M. Best reviews the structure of the transaction and the schematics of the organizational structure/capital structure of the captive. In addition, A.M. Best reviews terms and provisions of any guarantees to determine other risks present in these transactions.

A June 2013 *Best's Briefing* "Shedding Light on Captive Reinsurers," released soon after the NYSDFS report, explained that "A.M. Best will continue to look through these transactions, and analyze groups on a consolidated basis using its capital model, BCAR, regardless of which affiliate entity assumes the risk." An October 2013 A.M. Best Special Report, "Rating Factors for Organizations Using Life Captive Reinsurers," indicates that A.M. Best "adheres to analytical processes and rating factors that are relevant for life insurance organizations using captive reinsurers," including analysis of captive transactions on a consolidated basis using the BCAR. The report also indicates that A.M. Best considers the potential effects of decreasing LOC capacity or increasing LOC costs on the risk of the arrangement and that it evaluates "differences in the quality of collateral involved in these funding solutions, such as reinsurance trusts, long-term LOCs, short-term LOCs, contingent LOCs and parental guarantees." The report concludes: "A.M. Best's rating process entails a full understanding of insurance companies' use of U.S. and offshore captives, and incorporates—through both quantitative and qualitative assessments—how the captive impacts an issuing insurance group's balance sheet strength."

Standard & Poor's. A March 2004 Standard & Poor's (S&P) report, "Evaluating the Effect of Regulation XXX on Insurers' Capital," discusses how improvements in expected mortality experience contributed to substantial increases in statutory versus economic reserves for certain products, how XXX requirements amplified those increases, and how the requirements affected insurers based on product mix, design, and underwriting standards. The report explained how alternative funding solutions involving affiliated reinsurers, trusts and LOCs affected S&P evaluation of capital adequacy. A follow-up report dated December 2004 discussed in detail criteria for evaluating reserve funding solutions, including criteria for treating such funding as financial leverage and the detailed stress testing required to evaluate economic reserves.

A March 2006 report elaborated how S&P would treat short-term funding solutions to XXX/AXXX reserve requirements, refinancing risks associated with short-term LOCs, how the market for multiyear LOCs had expanded, and criteria for treating the solutions as financial leverage in its evaluations based on maturity of the LOCs. A February 2012 S&P report, "The Changing Landscape of

XXX/AXXX Reserve Requirements Will Challenge U.S. Insurers,” reviewed the predominant use of short-term LOCs in the early 2000s, the growth of securitized arrangements during 2003–2007, and the predominance of LOCs after 2007, with increasing terms to maturity and decreased prices. It noted:

One constant we have observed is that the likelihood of a draw [on the LOC] is remote. Typically, for the XXX deals, there would have to be extended mortality in excess of 150% per annum. ... The AXXX issues would need combinations of extended low interest rate environment periods such as exist now, and lapse and mortality experience that differed significantly from expectations.¹³

Moody’s Investors Service. A January 2004 Moody’s Investor Service report, “Hidden Credit Risks of Regulation XXX/Guideline AXXX Reinsurance Programs,” reviewed reserve requirements and credit risks associated with captive reinsurance solutions involving LOCs and reinsurance trusts, including potential risks associated with short-term LOCs in the form of possible LOC capacity squeezes and/or increases in LOC prices, as well as possible financing capacity squeezes and price increases from using reinsurance trusts. An August 2013 Moody’s report, “The Captive Triangle: Where Life Insurers’ Reserve and Capital Requirements Disappear,” described the magnitude of reserve transactions, how captive arrangements could increase capital efficiency and how they could increase an insurer’s credit risk. It discussed possible credit negatives from the arrangements, including lack of transparency, funding risks and light regulation of captives in some jurisdictions, as well as possible credit positives, including increasing regulatory scrutiny and the potential for increased transparency of captive transactions. The report noted, “While the use of captives by the industry is incorporated in our analysis, a growing reliance on captives places incremental negative pressure on the industry.” It specifically stated, however, that credit negatives associated with captives were “already incorporated into ratings.”

Potential Benefits of Lender Monitoring and Parental Guarantees

Providers of financial support for captive reinsurance through LOCs, surplus or credit-linked notes, or other means evaluate the likelihood that experience on the ceded business could produce draws on such funding, including the use of independent actuarial analysis. These entities, therefore, provide an additional source of risk evaluation and monitoring of captive reinsurance arrangements.

13. In March 2014, Standard & Poor’s issued a proposal for further revisions in its procedures for evaluating captive arrangements (Standard & Poor’s, 2014), including analyzing capital on a consolidated basis and directly adjusting reserves for excess conservatism.

The segmentation of particular blocks of business through captive transactions facilitates such evaluation.

In recourse transactions, under which the financing provider has recourse against the ceding insurer's parent, the funding provider also evaluates and monitors the likelihood that the parent will be able to back up its guarantee in the event that adverse experience leads to draws on the lender and reimbursement claims against the parent. Parental guarantees in captive reinsurance arrangements also commit the parent to providing financial backup to the ceding insurer. The resources of the holding company, therefore, formally and legally stand behind such transactions. Although scenarios exist where meeting parental guarantees could weaken the parent and reduce its ability to serve as a future source of strength for its operating insurance subsidiaries, the existence of a parental guarantee nonetheless has the potential to enhance rather than undermine the security of the arrangements.

IV. Data on Captive Reinsurance Use

According to a Moody's report (Moody's Investor Service 2013; also see Kojen and Yogo, 2014a, and Office of Financial Research, 2014), at year-end 2012, life insurers reported \$169 billion of reserve credits from business ceded to unauthorized affiliates and another \$155 billion of modco reinsurance with unauthorized affiliates, which provided some capital relief without reducing reported reserves. The \$324 billion was equivalent to 12% of total reserves and about 85% of total capital and surplus.

Until 2013, reinsurance schedules in life insurers' statutory financial statements did not separately identify aggregate transaction statistics for captive reinsurance versus other affiliated reinsurance. In 2013, insurers were required to provide such information for authorized captives, unauthorized captives and all captives combined. To provide additional insight into the nature and scope of captive reinsurance using the new data, I identified the largest 100 affiliated life insurer groups and unaffiliated life insurers in terms of admitted assets in 2013 using data from SNL Financial. These top 100 entities represented 98% of industry assets and aggregate reserves and 95% of industry surplus. I then analyzed selected balance sheet and reinsurance data for those entities during 2007–2013.¹⁴ This time period follows the initial rapid growth of captive reinsurance in the early to mid-2000s.

Using 2013 data, 32 of the top 100 entities reported reserve credits and/or modified coinsurance (MODCO) reinsurance reserves with authorized or

14. The reinsurance data are from Schedule S, Section 3, Part 1, and Schedule S, Section 4. Given a change in reporting format, SNL Financial does not include summary data on affiliated life reinsurance prior to 2006. Reporting anomalies in 2006 favored beginning the analysis with 2007 data.

unauthorized captive reinsurers. Of those 32 entities, 14 used unauthorized captives only, nine used authorized captives only, and nine used both authorized and unauthorized captives. Six of the 32 entities were mutual organizations (compared with 25 mutual or similar organizations in the 68 entities in the top 100 without captives). I divided the 32 entities into two subgroups based on domestic versus international control. The “domestic” group includes 23 entities with captives with ultimate parents within the U.S. This group includes a number of U.S. organizations that own captives domiciled outside of the U.S. The “international” group includes nine entities with captives where the ultimate parents are incorporated outside of the U.S. The Appendix lists the 32 entities with captives, their use of authorized and/or unauthorized captives, and their domestic or international classification.

**Table 1:
Large Entity Samples – 2013 Data**

Sample	No. of entities	No. with unauthorized captive reinsurance	No. with authorized captive reinsurance	No. mutual owned (or similar)	Average adjusted reserves (\$bill.)	Percentage of life industry			
						Adjusted reserves*	Unauthorized affiliate reserve credit	Unauthorized captive reserve credit	Authorized captive reserve credit
Entities with captive reinsurance	32	23	18	6	\$42.9	53.9%	80.9%	99.97%	99.0%
Domestic entities	23	15	15	6	\$43.6	39.3%	35.5%	36.8%	75.6%
International entities	9	8	3	0	\$41.2	14.5%	45.4%	63.1%	23.4%
Entities without captive reinsurance	68	0	0	25	\$16.6	44.2%	0%	0%	0%

*Adjusted reserves equals reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

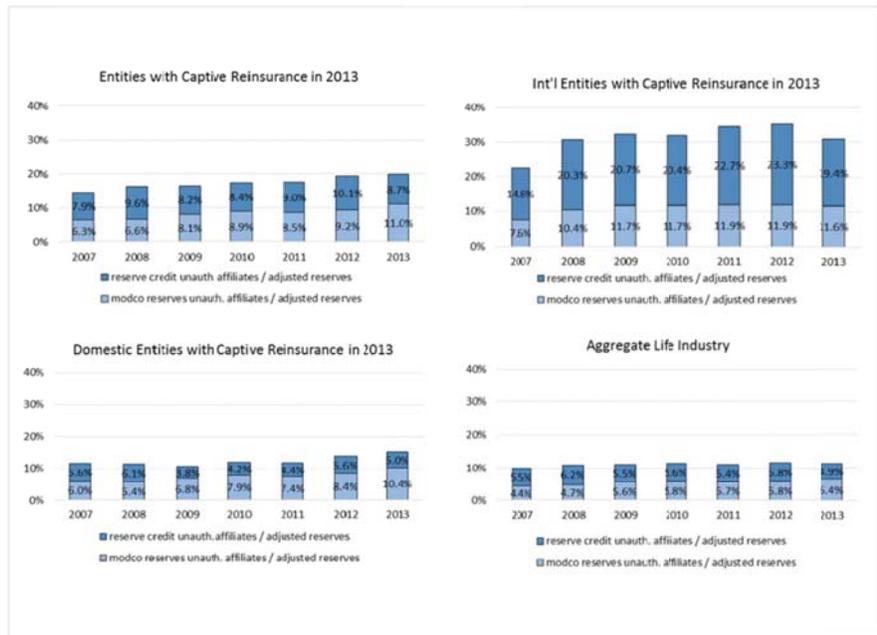
Table 1 shows selected 2013 summary information for the 32 entities with captives and for the domestic and international subgroups. The sample entities with captives accounted for 54% of industry adjusted life reserves in 2013, where I define adjusted reserves as reported life (and annuity) contract policy reserves plus reserve credits taken for authorized and unauthorized captive reinsurance. The 32 entities accounted for 81% of industry reserve credits with unauthorized affiliates, including captives and non-captive affiliates, and nearly all of industry reserve credits with authorized and unauthorized captives. International entities with captives accounted for disproportionate shares of reserve credits with all unauthorized affiliates and unauthorized captives.

Trends in Unauthorized Affiliate Reinsurance

Because summary information on the use of captive reinsurance, whether authorized or unauthorized, was not separately identified in insurers’ statutory financial statements until 2013, to examine trends I calculated ratios of reserve credits and MODCO reserves with all unauthorized affiliates to adjusted reserves and to surplus during 2007–2013 for insurers identified as having captive

reinsurance in 2013 and for the entire industry. For this comparison, I defined adjusted reserves as the ratio of reported life reserves to the sum of life reserves and reserve credits with all unauthorized affiliates. The results, shown in Figure 1 (ratios to adjusted reserves) and Figure 2 (ratios to surplus), will reflect any combined trends in unauthorized captive reinsurance and unauthorized non-captive affiliate reinsurance. They will not reflect growth in authorized captive reinsurance or identify possible substitution of authorized for unauthorized captive reinsurance.

**Figure 1:
Reserve Credit and MODCO Reserves for Unauthorized Affiliates as
Percentage of Adjusted Reserves,* 2007-2013: Industry and Large Entities
with Captive Reinsurance in 2013**



*Adjusted reserves equal reported policy reserve plus unauthorized affiliate reserve credit.

Unauthorized affiliate reserve credits and MODCO reserves as a percentage of adjusted reserves for entities with captive reinsurance in 2013 grew from 14.2% of adjusted reserves in 2007 to 19.7% of adjusted reserves in 2013. Unauthorized affiliate MODCO reserves for these entities, which are retained on the ceding insurer’s balance sheet, increased from 6.3% to 11% of adjusted reserves. Unauthorized affiliate reserve credits as a percentage of adjusted reserves grew from 7.9% in 2007 to 10.1% in 2012 and then declined to 8.7% in 2013 in conjunction with an increase in unauthorized affiliate MODCO reserves. Figure 1

also shows that domestic entities with captives used much less captive reinsurance than international entities and that unauthorized affiliate MODCO reserves represented a much smaller percentage of total unauthorized affiliate reserve credits and MODCO reserves for international entities than for domestic entities. Unauthorized affiliate reserve credits as a percentage of adjusted reserves declined from 23.3% in 2012 to 19.4% in 2013 for international entities, and from 5.6% to 5% for domestic entities. For the aggregate life industry, unauthorized affiliate reserve credits and MODCO reserves represented 11.3% of industry adjusted reserves in 2013, up from 9.9% in 2007, with the growth attributable to MODCO reserves.

Figure 2:
Reserve Credit and MODCO Reserves for Unauthorized Affiliates as Percentage of Surplus, 2007–2013: Industry and Large Entities with Captive Reinsurance in 2013

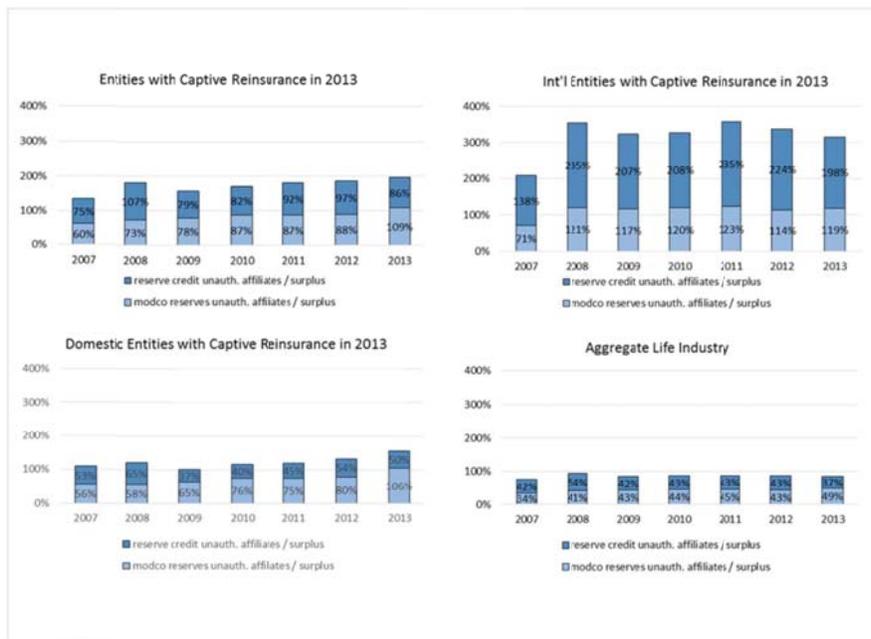
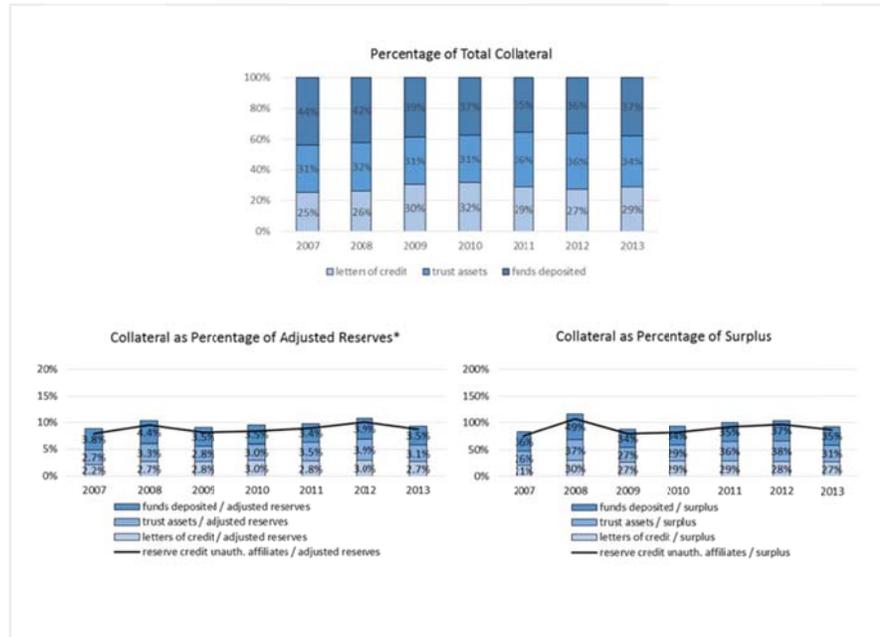


Figure 2 shows similar calculations for unauthorized affiliate reserve credits and MODCO reserves as a percentage of surplus as opposed to adjusted reserves. The patterns for surplus are generally similar to those for adjusted reserves, except that the percentages of surplus spiked moderately in 2008 as the financial crisis negatively affected surplus. For domestic entities with captives in 2013, unauthorized affiliate reserve credits in 2013 equaled 50% of surplus; unauthorized affiliate MODCO reserves equaled 106% of surplus. The

corresponding percentages for international entities were 198% and 119%, respectively.

Figure 3:
Sources of Collateral for Unauthorized Affiliate Reinsurance, 2007–2013:
Large Entities with Captive Reinsurance in 2013



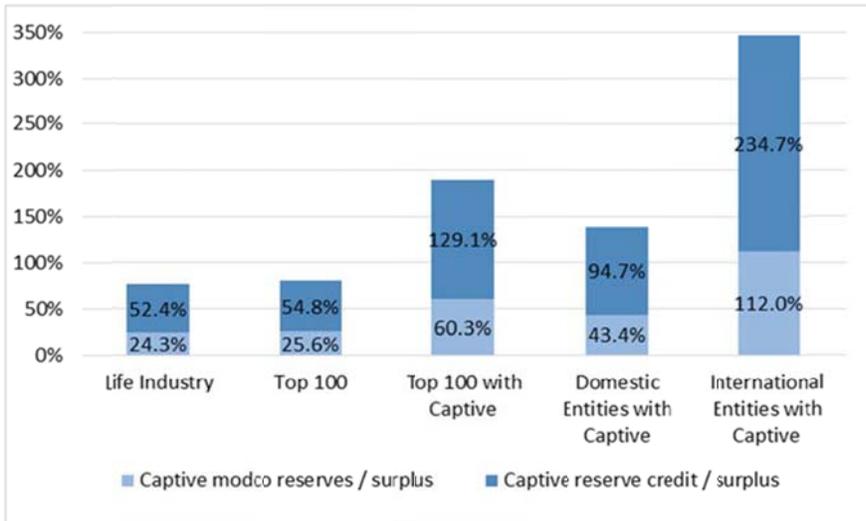
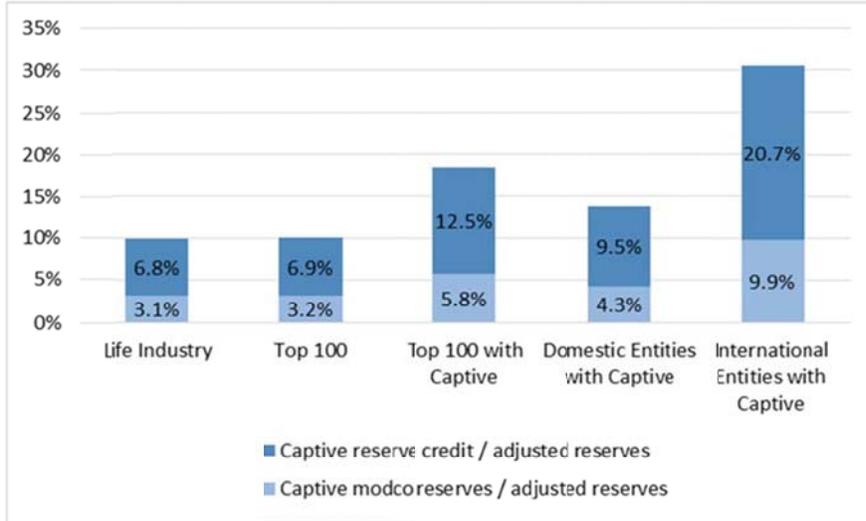
*Adjusted reserves equal reported policy reserve plus unauthorized affiliate reinsurance reserve credit.

Figure 3 shows sources of collateral for unauthorized affiliate reserve credits during 2007–2013 for the 32 large entities with captive reinsurance in 2013. The first panel shows percentages of total collateral represented by LOCs, trust assets and funds deposited with the ceding insurer. The second and third panels show each source of collateral as a percentage of adjusted reserves and surplus, respectively. LOCs represented 25% of total collateral in 2007, growing to 32% in 2010, and then declining to 29% in 2013. LOCs represented 3% or less of adjusted reserves and 30% or less of surplus for the 32 entities throughout 2007–2013.

Authorized and Unauthorized Captive Reinsurance in 2013

Figure 4 and Figure 5, as well as Table 2 and Table 3, use the newly reported summary data in 2013 for captive reinsurance transactions to present evidence on the type and prevalence of captive reinsurance in that year.

Figure 4:
Captive Reserve Credit and MODCO Reserves as Percentage of Adjusted Reserves* and Surplus in 2013: Industry and Large Entities with Captive Reinsurance

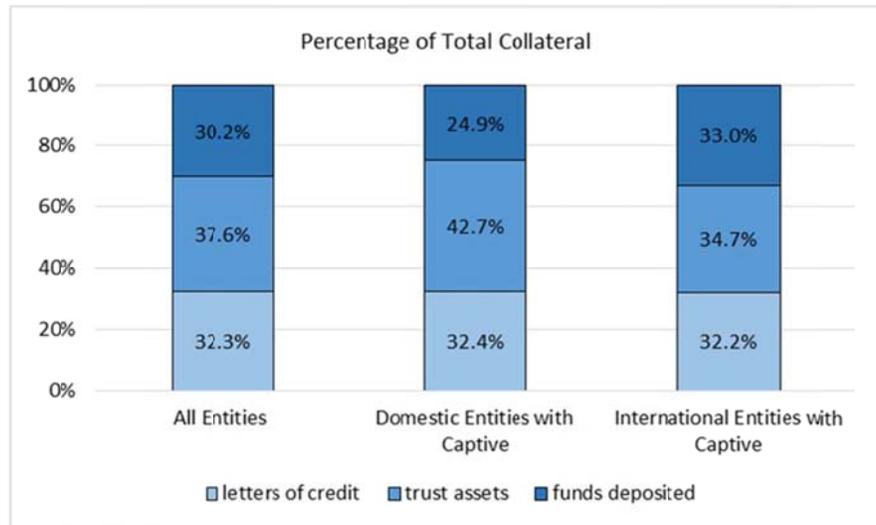


* Adjusted reserves equals reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

Figure 4 shows captive reserve credits and MODCO reserves, including both authorized and unauthorized captives, as a percentage of adjusted reserves and surplus for the 32 entities, for the domestic and international subgroups, for the top 100 entities in terms of admitted assets, and for the entire industry. Thus, in contrast to Figures 1–3, the data include transactions with authorized captives but exclude transactions with unauthorized non-captive affiliates. In addition, to focus on captive reinsurance per se, adjusted reserves in Figures 4–9 and Tables 2–4 are defined as aggregate life reserves plus captive reserve credits, as opposed to aggregate life reserves plus all unauthorized affiliate reserve credits.

For all 32 entities with captives, captive reserve credits equaled 12.5% of adjusted reserves and 129.1% of surplus in 2013. (See Figure 4.) Captive MODCO reserves equaled 5.8% of adjusted reserves and 60.3% of surplus. Consistent with Figure 1 and Figure 2, the percentages shown in Figure 4 indicate much greater use of captive reinsurance by the international entities than by the domestic entities. The domestic entities with captives had captive reserve credits equal to 9.5% of adjusted reserves and captive MODCO reserves equal to 4.3% of adjusted reserves. The corresponding percentages for the international group are 20.7% and 9.9%. Compared to the results for all unauthorized affiliate reinsurance (including captive and non-captive affiliates, Figure 1 and Figure 2), the percentages of adjusted reserves and surplus represented by captive (authorized and unauthorized) reserve credits for domestic entities with captives are much larger than the percentages represented by MODCO reserves.

**Figure 5:
Sources of Collateral for Unauthorized Captive Reinsurance in 2013:
Large Entities with Captive Reinsurance**



Percentages of total collateral for unauthorized captive reinsurance transactions represented by LOCs, trust assets, and funds deposited are shown in Figure 5. LOCs represented about 32% of total collateral for both the domestic and international entities. The domestic entities made relatively greater use of trust assets than funds deposited compared with the international entities.

Table 2:
Reserves for Industry and Large Entities in 2013 (\$ millions)*

Variable	Life Industry	Top 100	Top 100 with Captive	Int'l with Captive	Domestic with captive
Reported aggregate policy reserve	\$2,377.2	\$2,328.7	\$1,201.7	\$907.8	\$293.9
Adjusted reserves*	\$2,549.5	\$2,500.2	\$1,373.2	\$1,002.8	\$370.4
Reserve credit	\$172.3	\$171.5	\$171.5	\$95.0	\$76.5
Authorized	\$81.2	\$80.4	\$80.4	\$61.4	\$19.0
Unauthorized	\$91.1	\$91.1	\$91.1	\$33.6	\$57.5
U.S.	\$147.2	\$146.4	\$146.4	\$94.4	\$52.0
Non-U.S.	\$25.1	\$25.1	\$25.1	\$0.6	\$24.5
MODCO reserves	\$80.1	\$80.1	\$80.1	\$43.6	\$36.5
Authorized	\$4.4	\$4.4	\$4.4	\$4.4	\$0.0
Unauthorized	\$75.6	\$75.6	\$75.6	\$39.1	\$36.5
U.S.	\$18.9	\$18.9	\$18.9	\$13.2	\$5.7
Non-U.S.	\$61.1	\$61.1	\$61.1	\$30.3	\$30.8
Reserve credit + MODCO reserves	\$252.4	\$251.6	\$251.6	\$138.5	\$113.0
Authorized	\$85.6	\$84.8	\$84.8	\$65.8	\$19.0
Unauthorized	\$166.8	\$166.8	\$166.8	\$72.7	\$94.1
U.S.	\$166.1	\$165.3	\$165.3	\$107.6	\$57.7
Non-U.S.	\$86.3	\$86.3	\$86.3	\$30.9	\$55.3

Table 2 and Table 3 present further details on captive reinsurance transactions in 2013. Table 2 shows the reported aggregate reserve, adjusted reserves, and captive reserve credits and MODCO reserves for authorized versus unauthorized captives and for U.S. domiciled versus non-U.S. domiciled captives. Table 3 shows captive reserve credits and MODCO reserves as percentages of adjusted reserves and surplus for authorized versus unauthorized captives and for U.S. domiciled versus non-U.S. domiciled captives. Transactions with unauthorized captives represented the bulk of captive transactions for international entities with captives, whereas authorized captives were relatively more important for domestic entities with captives. Unauthorized captive reserve credits and MODCO reserves represented 25.4% of adjusted reserves for international entities versus 5.1% for authorized transactions. In contrast, authorized captive reserve credits and MODCO reserves for the domestic group represented 6.6% of adjusted reserves compared with 7.2% for unauthorized captive transactions. Perhaps not

surprisingly, international entities made much greater use of non-U.S. captives than did domestic entities. MODCO reserves for transactions with authorized captives were negligible for domestic entities and nil for international entities.

**Table 3:
Captive Reserves as Percentage of Adjusted Reserves and Surplus for
Industry and Large Entities in 2013**

Variable	Life Industry	Top 100	Top 100 with Captive	Int'l with Captive	Domestic with captive
Reserve credit/adj. reserves	6.8%	6.3%	12.5%	20.7%	9.5%
Authorized	3.2%	3.2%	5.9%	5.1%	6.1%
Unauthorized	3.6%	3.5%	6.6%	15.5%	3.3%
U.S.	5.8%	5.9%	10.7%	14.0%	9.4%
Non-U.S.	1.0%	1.0%	1.8%	6.6%	0.1%
MODCO reserves/adj. reserves	3.1%	3.2%	5.8%	9.9%	4.3%
Authorized	0.2%	0.2%	0.3%	0.0%	0.4%
Unauthorized	3.0%	3.0%	5.5%	9.9%	3.9%
U.S.	0.7%	0.8%	1.4%	1.5%	1.3%
Non-U.S.	2.4%	2.4%	4.5%	8.3%	3.0%
Reserve credit + MODCO/adj. reserves	9.9%	10.1%	18.3%	30.5%	13.8%
Authorized	3.4%	3.4%	6.2%	5.1%	6.6%
Unauthorized	6.5%	6.7%	12.1%	25.4%	7.2%
U.S.	6.5%	6.5%	12.0%	15.6%	10.7%
Non-U.S.	3.4%	3.4%	6.3%	14.9%	3.1%
Reserve credit/surplus	52.4%	54.8%	129.1%	234.7%	94.7%
Authorized	24.7%	25.7%	60.5%	58.2%	61.2%
Unauthorized	27.7%	29.1%	68.6%	176.5%	33.5%
U.S.	44.7%	46.8%	110.2%	159.6%	94.1%
Non-U.S.	7.6%	8.0%	18.9%	75.2%	0.6%
MODCO reserves/surplus	24.3%	25.5%	60.3%	112.0%	43.4%
Authorized	1.3%	1.4%	3.3%	0.0%	4.4%
Unauthorized	23.0%	24.2%	56.9%	112.0%	39.0%
U.S.	5.7%	6.1%	14.2%	17.5%	13.2%
Non-U.S.	18.6%	19.5%	46.0%	94.5%	30.2%
Reserve credit + MODCO/surplus	76.7%	80.4%	189.3%	346.7%	138.1%
Authorized	26.0%	27.1%	63.8%	58.2%	65.7%
Unauthorized	50.7%	53.3%	125.5%	288.5%	72.5%
U.S.	50.5%	52.9%	124.4%	177.0%	107.3%
Non-U.S.	26.2%	27.5%	64.9%	169.7%	30.8%

*See Table 1 for sample descriptions. Adjusted reserves equal reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

V. Captive Reinsurance and A.M. Best Ratings

Do captive reinsurance arrangements increase ceding insurers' insolvency risk? I know of no statistical modeling approach with available data that would likely provide convincing evidence on this question in view of the multitude of factors affecting insolvency risk, the complexity of captive arrangements and uncertainty concerning levels of insolvency risk that would prevail if the agreements were not used. Providing convincing evidence concerning the narrower question of whether captive insurance arrangements place downward pressure on insurers' financial ratings is also problematic.

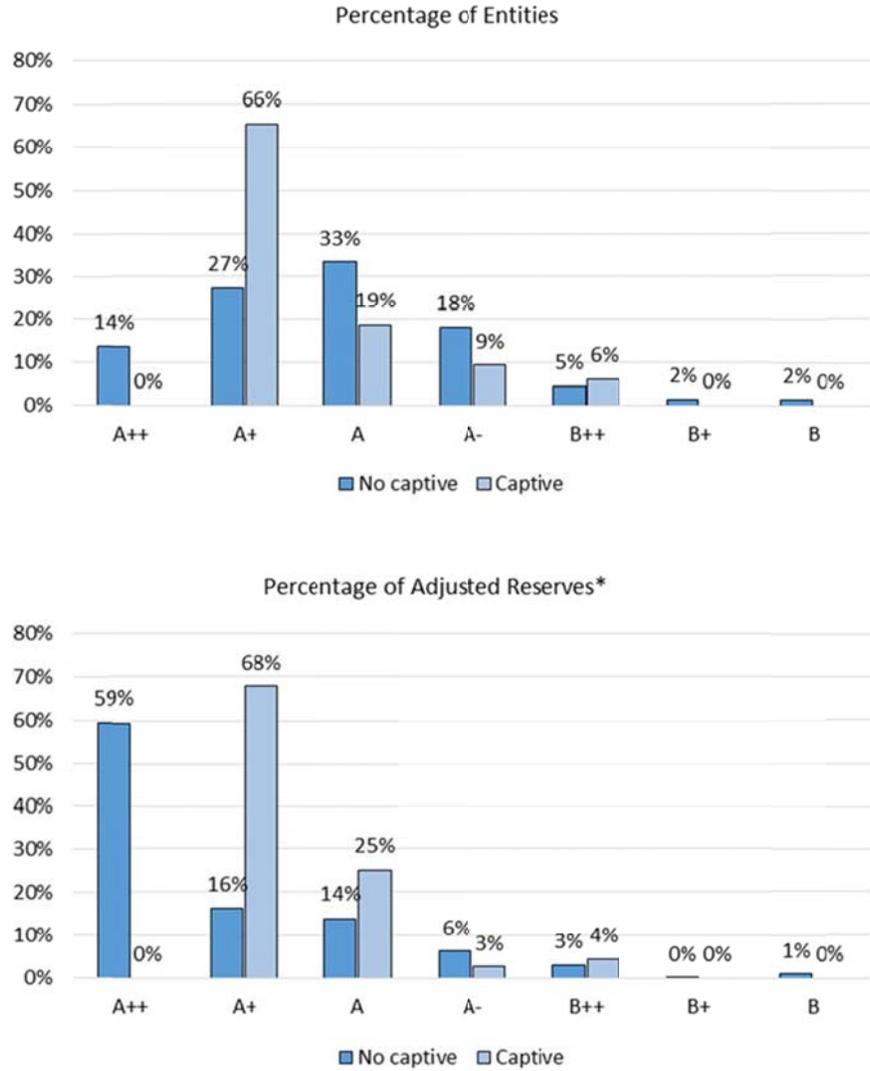
This section of the paper has the more limited purpose of providing descriptive information on A.M. Best ratings for entities with and without captive reinsurance arrangements. It first summarizes 2013 A.M. Best ratings for insurers with and without captives for two samples: 1) affiliated group entities and unaffiliated companies among the top 100 in 2013 assets for which the lead company in the group or the unaffiliated company had an A.M. Best rating; and 2) all individual life insurance companies with an A.M. Best rating and available data. It then uses regression analysis to provide additional descriptive evidence of whether A.M. Best ratings are statistically related to the use of captive reinsurance after controlling for the relationship between ratings, insurer size (policy reserves), the ratio of reserves to surplus and organizational form (whether a mutual or mutual-like entity).

A.M. Best ratings at year-end 2013 were obtained from SNL Financial. For the top 100 entity sample, I used the lead company rating for each affiliated group. Individual company ratings were used for unaffiliated companies in the top 100 and for the individual company sample. All 32 of the top 100 entities with captive reinsurance in 2013 had an A.M. Best rating in 2013; 66 of the 68 entities without captives had ratings. Seventy-one of the 613 individual life companies with data reported by SNL Financial used captive reinsurance in 2013, and nine of the 71 companies did not have an A.M. Best rating. One hundred forty-eight of the 542 individual companies without captive reinsurance did not have an A.M. Best rating.

Distributions of Ratings

The first panel of Figure 6 shows percentages of rated entities by rating category (A++, A+, A and so on) in 2013 for the large entities using captive reinsurance (32 entities) and those not using captive reinsurance (66 entities). The second panel shows the percentage of adjusted reserves (policy reserves plus affiliated captive reserve credits, if any) written by entities falling in each rating category.

Figure 6:
A.M. Best Lead Company Rating Distribution for Large Entities in 2013



*Adjusted reserves equal reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

The distributions in Figure 6 are similar for entities with and without captives, except that no entities with captives received the highest A++ rating, with correspondingly more entities with captives receiving the second highest A+ rating. Specifically, 14% percent of the rated entities without captives received A++ ratings. These entities were relatively large, accounting for 59% of reserves for the 66 entities without captives. While no large entity with captive reinsurance received an A++ rating, 66% of the entities with captives received an A+ rating, accounting for 68% of adjusted reserves for the 32 entities with captives. Eighty-five percent of the large entities with captives had a rating of A or better (accounting for 93% of adjusted reserves for the entities with captives), compared with 74% of the entities without captives (accounting for 89% of the group's adjusted reserves). Ninety-four percent of the entities with captives had a rating of A- or better (96% of adjusted reserves), compared with 92% of the entities without captives (96% of adjusted reserves).

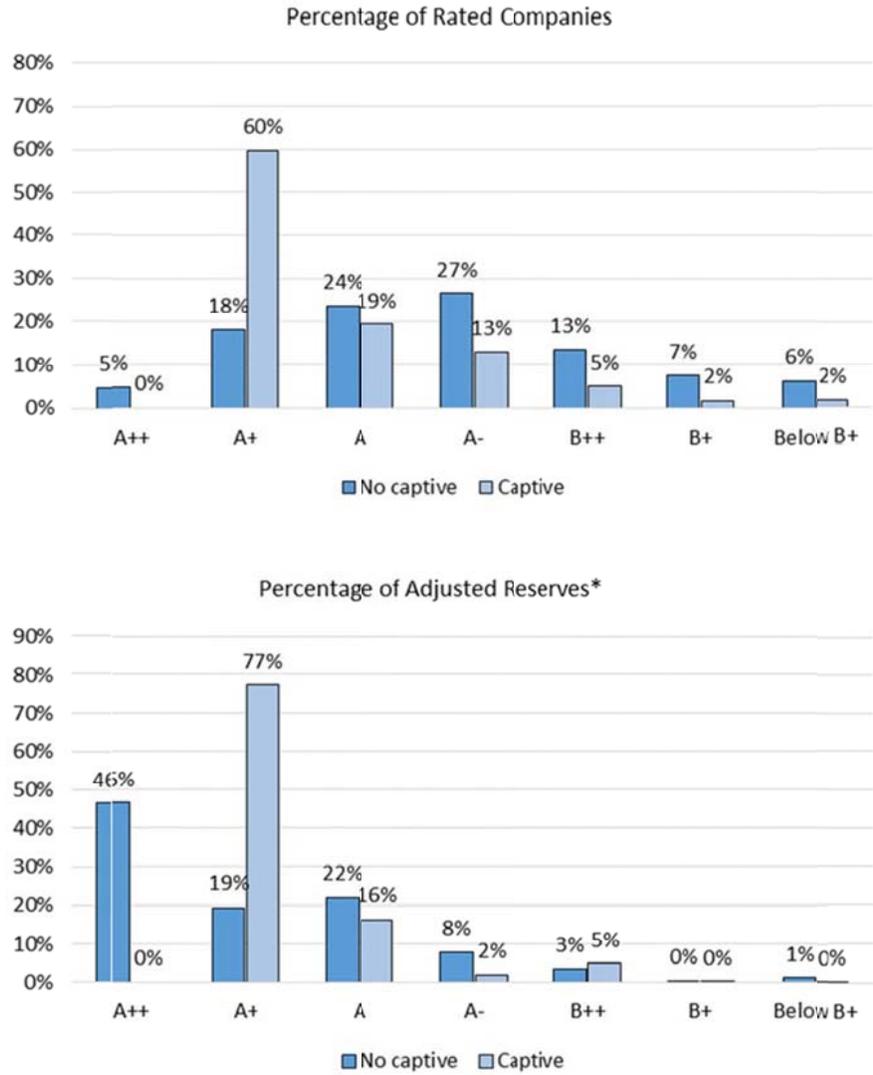
Figure 7 on the next page shows the rating distributions for individual companies with and without captive reinsurance. The patterns are broadly similar to those shown for the large entities in Figure 6. A smaller percentage of rated companies without captives received A++ ratings than for the large entity analysis. There also were relatively more (generally small) individual companies without captive reinsurance than with captive reinsurance in the lower rating categories. Twenty-six percent of the rated companies without captives had a rating below A-, but they only accounted for 4% of the reserves for all rated companies without captives. Eight percent of the companies with captives had a rating below A-, accounting for 5% of adjusted reserves for that group.

The data shown in Figure 6 and Figure 7 indicate that A.M. Best's evaluation of the risks from captive reinsurance arrangements did not prevent the assignment of relatively high ratings for a sizable majority of entities utilizing the arrangements. That, of course, does not imply that captive reinsurance arrangements necessarily have little or no risk. It simply indicates that the evaluation of the firms' overall risk generally yielded high ratings.

Regression Analysis

As noted above, firms' insolvency risk and associated financial ratings in general depend on numerous, and in many cases difficult to measure, factors, including the types of business written, the amount of business written relative to capital, firm size, asset risk, interest rate risk, underwriting standards, product and geographic diversification, organizational form, and reinsurance arrangements, whether captive or not. In order to provide additional descriptive evidence regarding the relationship between A.M. Best ratings and captive reinsurance, I estimated multivariate regression models of ratings, including measures of captive reinsurance and several key company characteristics that could influence risk and ratings.

Figure 7:
A.M. Best Rating Distribution for Individual Companies with Ratings in 2013



*Adjusted reserves equal reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

I constructed the “dependent” variable for the regression analysis by assigning a value of 5 for an A++ rating, 4 for an A+ rating, 3 for an A rating, 2 for an A- rating, 1 for a B++ rating and 0 for a rating lower than B++.¹⁵ The specific explanatory variables included in the models are: 1) the natural logarithm (log) of the firm’s adjusted life reserves (a measure of the firm’s size or volume); 2) the ratio of reported reserves (i.e., net of reinsurance reserve credits) to surplus; 3) the ratio of captive reinsurance reserve credits to surplus; 4) an indicator for mutual or related organizational form; and 5) an indicator for unaffiliated companies (stand-alone companies not part of an affiliated group of insurers).¹⁶

The regression estimates provide evidence of whether A.M. Best ratings were statistically related to the use of captive reinsurance after controlling for the other characteristics included in the model. Specifically, the estimated coefficient for the ratio of captive reinsurance reserve credits to surplus provides evidence of how the numerical rating index varies as that ratio changes holding the other variables constant. I am not asserting that the estimates have a “causal” interpretation. The estimated coefficients will reflect the influence of any variables that are: 1) not included in the model; and 2) correlated with ratings and the independent variables that are included.¹⁷ For example, if factors omitted from the model that reduce A.M. Best’s assessment of impairment risk are positively correlated with the use of captive reinsurance, the estimated coefficient for the ratio of captive reserve credits to surplus will reflect that correlation.

Table 4 shows the results from estimating the model using 2013 data for two samples. The first sample includes 96 of the top 100 groups and unaffiliated life companies in terms of 2013 assets. (For groups, the numerical rating index is based on the A.M. Best rating for the lead company.) Two of the top 100 entities did not have ratings. Two others (SCOR and Athene) were clear outliers and, therefore, excluded, although the implications did not depend on that exclusion. The second sample includes 416 individual life companies with A.M. Best ratings and positive reserves and premiums.¹⁸

The estimation results for the control variables are sensible. First, for a given ratio of reserves to surplus, ratings are positively and significantly related to (log) adjusted reserves, a proxy for the entity’s size and, thus, size-related diversification of risk. Second, for a given size (log adjusted reserves), the ratio of

15. The regression estimates reported in Table 4 below are those obtained with least squares estimation. I obtained results with the same implications using ordered probit estimation, which only considers the ordinal ranking of ratings. The standard errors reported are robust to heteroskedasticity in model errors and, for the individual company sample, to correlations in the errors among affiliated companies.

16. I estimated various versions of the models, including models that included captive modified coinsurance (MODCO) reserves and/or authorized versus unauthorized captive reinsurance, or including the log of reported reserves instead of adjusted reserves, with the same basic implications.

17. There also is a likely endogeneity issue between ratings and the use of captives that precludes causal interpretation.

18. For both samples, an entity is classified as a mutual if it or its ultimate parent is a mutual or similar organization (e.g., a farm bureau or similar cooperative organization).

reserves to surplus is negatively and significantly related to ratings: more reserves (policy liabilities) in relation to surplus lowers ratings. Third, for a given size and ratio of reserves to surplus, mutual organizations on average had higher ratings than non-mutual entities, which could indicate lower risk of mutuals on other dimensions, cushions for adverse experience in participating policy premiums or related influences. Fourth, for the individual company sample, the estimated coefficient for the indicator that a company is not part of an affiliated group is negative and statistically significant, which might be expected, for example, due to less diversification of risk or the lack of possible parental or affiliate assistance in the event of adverse experience.

Table 4:
A.M. Best Rating Regressions – 2013 Data

Variable	Large Entities (Lead Co. Rating)	Individual Companies
Log of adjusted reserves*	0.348*** (0.066)	0.242*** (0.029)
Reserves/surplus	-0.104*** (0.030)	-0.078*** (0.015)
Captive reserve credit/surplus	0.135*** (0.044)	0.045 (0.028)
Mutual affiliation	0.642*** (0.179)	0.756*** (0.175)
Unaffiliated company	0.321 (0.292)	-0.788*** (0.167)
Constant	-1.794* (1.029)	-0.133 (0.365)
No. of observations	96	416
R-squared	0.357	0.369
Robust t-statistics in parentheses		

*** p<0.01, ** p<0.05, * p<0.1

*Adjusted reserves equal reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

The estimated coefficient for the captive reinsurance reserve credit to surplus variable, the measure of reliance on captive reinsurance, is positive for both samples and larger and statistically significant for the large entity sample. The

estimates, therefore, provide no evidence that, for any given size (log adjusted reserves) and ratios of reserves to surplus, increases in captive reinsurance reserve credits were associated with lower ratings. Instead, and at least for the large entity sample, increases in such credits were statistically associated with higher ratings. This result implies that the use of captive reinsurance was correlated with factors omitted from the model with positive ratings implications, which more than offset any perception of increased risk from captive reinsurance.¹⁹

Reserves-to-Surplus and RBC Ratios

Figure 8 and Figure 9 on the following pages provide perspective on two additional dimensions for the large entity sample. Figure 8 plots for 2013 the ratio of adjusted reserves (reported reserves plus captive reinsurance reserve credits) to surplus versus the log of adjusted reserves, with the data points for entities with captive reinsurance labeled “C”. The plot shows a clear, positive relationship between the ratio of adjusted reserves to surplus and log adjusted reserves: Larger firms can operate with higher ratios of reserves to surplus. The plot also illustrates that larger entities within the large entity sample were more likely than smaller entities to use captive reinsurance.²⁰

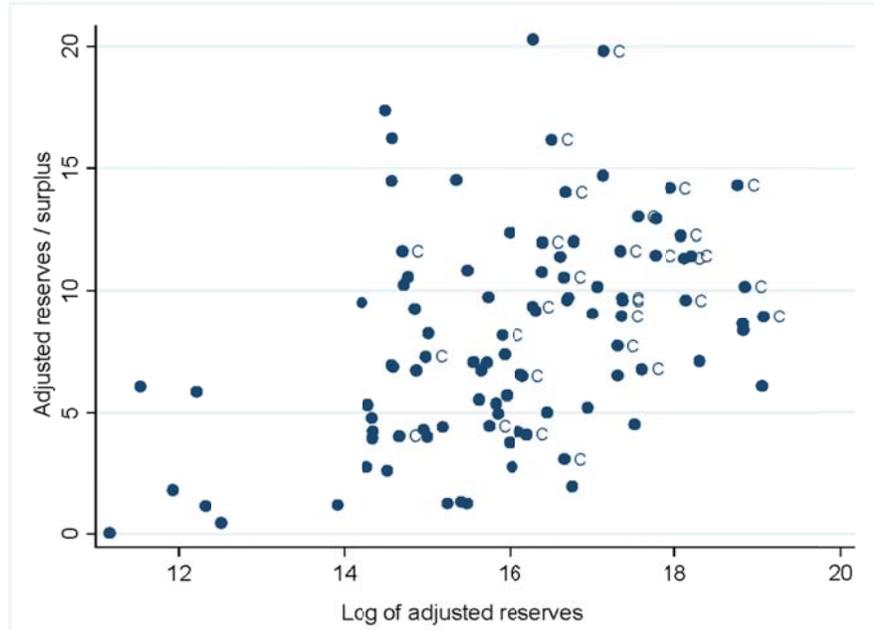
Figure 9 plots for 2013 the ratio of “adjusted capital” to “company action level” RBC from the NAIC RBC model versus log-adjusted reserves for the large entities, again labeling companies with captive reinsurance arrangements. (The ratios of adjusted capital to “authorized control level” RBC are twice as large as those shown.) The six smallest entities and several entities with ratios above 10 are excluded to improve visualization. The plot illustrates that most entities with and without captive reinsurance had adjusted capital substantially in excess of the levels that would require the company to take action to develop a plan to improve its RBC ratio.²¹

19. Based on a numeric A.M. Best ratings model with different control variables over multiple years, Koijen and Yogo (2014a) interpreted an insignificant coefficient estimate for an indicator that the insurer had reinsurance with an affiliated, unrated reinsurer (their proxy for captive reinsurance) as evidence that ratings did not reflect risk associated with captives, despite inherent limitations in statistical modeling and contrary to the historical literature on how rating agencies evaluate captive reinsurance.

20. Regression estimates (not shown) controlling for log adjusted reserves and mutual organization indicated that the ratio of adjusted reserves to surplus was significantly and positively related to captive reinsurance reserve credits to surplus, but that the ratio of reserves (net of captive reinsurance credits) to surplus was not statistically related to the use of captive reinsurance.

21. Regression estimates controlling for log adjusted reserves and mutual organization indicated a negative but statistically insignificant relationship between RBC ratios and the ratio of captive reinsurance credits to surplus.

Figure 8:
Adjusted Reserves/Surplus vs. Log of Adjusted Reserves* for Large Entities
in 2013 (C indicates entity with captive reinsurance)



*Adjusted reserves equal reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

VI. New NAIC Regulatory Framework

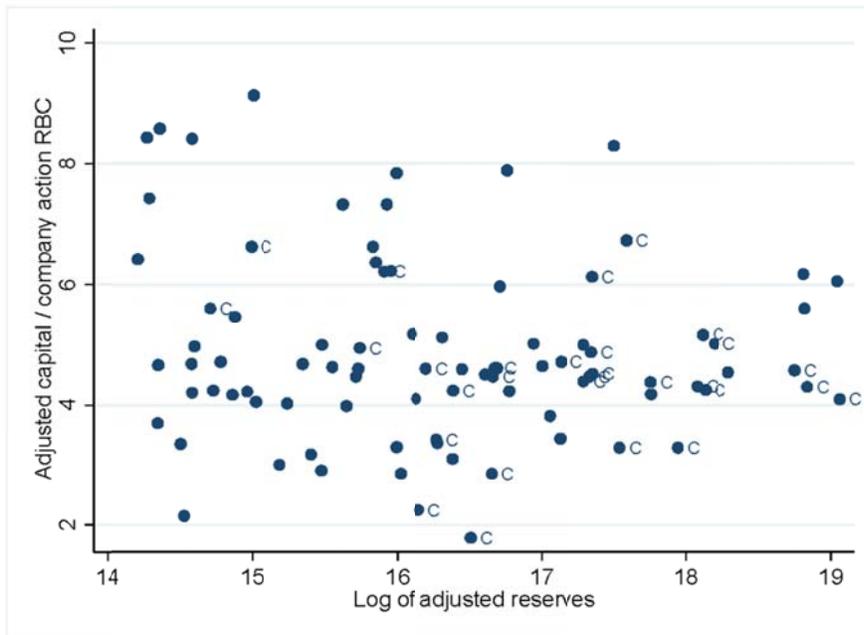
The NAIC Executive (EX) Committee in August 2014 adopted in concept a modified XXX/AXXX Reinsurance Framework (Framework) for standardized disclosure and captive reinsurance reserve credits proposed by Rector & Associates in its June 2014 report (Rector & Associates, 2014b), with the goal of early implementation pending development of specifics and approval by numerous NAIC committees. The Framework proposed expansion and standardization of disclosure of captive reinsurance arrangements and permitting ceding insurers in new captive reinsurance arrangements to receive reserve credit only if:

- The ceding insurer establishes full XXX/AXXX statutory (formulaic) reserves before any reinsurance credit.
- The ceding insurer receives collateral on a funds withheld, trust or MODCO basis in an amount and form that meets a “Primary Security

Requirement,” with the amount determined according to an “Actuarial Method,” which parallels PBR.

- The ceding insurer collateralizes the remaining portion of the statutory reserves with other assets and/or security acceptable to regulators.
- Either the ceding insurer or the captive holds an appropriate RBC “cushion.”

Figure 9:
NAIC RBC Ratios vs. Log of Adjusted Reserves* for Large Entities in 2013
(C Indicates Entity with Captive Reinsurance)



* Adjusted reserves equal reported policy reserve plus authorized and unauthorized captive reinsurance reserve credit.

As was true for the two earlier Rector & Associates reports (2013, 2014a), numerous comment letters were submitted to the NAIC in response to the organization’s June “modified” proposal.²² The letters highlighted substantial division among both insurers and state regulators on multiple dimensions. One issue was how LOCs should be treated under the Framework and, in particular, whether and under what conditions they could be counted towards the Primary Security Requirement. A second issue was whether the Actuarial Method would include the minimum formula reserve (known as the net premium reserve)

22. The letters are available at www.naic.org/committees_ex_pbr_implementation_tf.htm.

contained in guidelines for PBR or some modification of that minimum. The two issues are connected. The greater any minimum reserve, the more likely the Primary Security Requirement will exceed economic reserves for some contracts, which in turn could make LOCs, credit-linked notes or other funding mechanisms a potentially attractive source of support for the excess of the Primary Security Requirement over economic reserves.

In November 2014, the NAIC's Principle-Based Reserving Implementation (EX) Task Force adopted *Actuarial Guideline XLVIII—Actuarial Opinion and Memorandum Requirements for the Reinsurance of Policies Required to be Valued Under Sections 6 and 7 of the NAIC Valuation of Life Insurance Policies Model Regulation* (AG 48) to be effective Jan. 1, 2015, for new reserve financing transactions, including any post-2014 reserve financing transactions for any policies issued prior to Jan. 1, 2015. AG 48 does not permit LOCs, credit-linked notes or related instruments to be counted towards the Primary Security Requirement, and the guideline's Actuarial Method includes the net premium reserve requirement. As a result, the ongoing implementation of AG 48 will likely reduce but not eliminate the incentive for new captive reinsurance arrangements.

The adoption of AG 48 and related regulatory developments might be viewed as a middle ground between no new regulation of captive reinsurance and more severe measures, such as an indefinite moratorium on or prohibition of new arrangements, or possibly subjecting many or even most captives to regulatory requirements of traditional insurers and reinsurers.²³ Given what is known about the benefits and risks of captive reinsurance, and the divisions in opinion among both insurers and regulators, the efficacy of adopting a new and complex regulatory regime—in the midst of the anticipated albeit still uncertain transition to PBR—is arguable. An alternative would have been to focus on additional and potentially cost-effective improvements in disclosure and transparency to facilitate better risk evaluation by regulators, rating agencies, financing providers and other users of insurer financial statements, while respecting legitimate concerns over proprietary information regarding the details of specific captive arrangements.

VII. Conclusion

The debate and controversy over captive reinsurance arrangements reflects the fundamental problem that confronts insurance regulators: how to establish a prudent framework for valuing and reporting long-term life insurance policy reserve liabilities without increasing the costs to insurers and consumers from excessive conservatism. Captive reinsurance arrangements evolved as a mechanism for navigating the specific tension created by formulaic XXX/AXXX

23. The NAIC Financial Regulation Standards and Accreditation (F) Committee has discussed a proposal that would require states to categorize captives assuming business in more than one state or in a state other than the state of domicile as a "multi-state reinsurer" subject to traditional regulatory requirements, or lose state status as accredited by the NAIC.

reserve requirements for long-duration term life policies and ULSG. That tension will be reduced but not necessarily eliminated by recent NAIC actions and the extent to which PBR eventually supplants formulaic reserves.

In contrast to some assertions, the development and oversight of captive reinsurance arrangements have received substantial attention. Issues associated with life insurance regulatory reserve requirements in an environment of long-term improvements in mortality have been discussed for at least two decades. Regulation XXX/XXXX reserves and their potential adverse effects on the prices and affordability of certain term and universal life insurance products have been debated since the early 2000s. Captive reinsurance arrangements have required regulatory approval, generally by two different regulators, and they must meet various regulatory rules and guidelines. Rating agencies have considered the arrangements' potential effects on ceding insurers' financial strength for at least a decade, and most entities employing captive reinsurance receive relatively high financial ratings.

Captive reinsurance arrangements have provided a method of satisfying formulaic reserve requirements at lower cost to insurers and policyholders than would be achievable without such arrangements—in an environment of generally strong market discipline and significant regulatory, rating agency and counterparty monitoring. The arrangements have allowed insurers to back the excess of formula over economic reserve estimates at lower cost, but generally only if: 1) the ceding insurer's domiciliary regulator approves; 2) the captive's domiciliary regulator approves; 3) rating agencies evaluate the risks to the ceding insurer and parent; and 4) external financing providers evaluate the risks and finance the arrangement.

Debate over the arrangements' benefits and potential risks has been valuable. While it is unclear whether the new regulatory framework adopted by the NAIC was needed given available evidence on captive reinsurance arrangements' benefits and risks and the expected movement to PBR, the organization was prudent to forego even tighter restrictions.

Appendix

Large Entities with Captive Reinsurance in 2013

Entity	Entity has Authorized Captive	Entity has Unauthorized Captive	International Entity*
AEGON	X	X	X
Allianz Group		X	X
Allstate Corp.		X	
American International Group	X		
Athene Holding Ltd.		X	
AXA		X	X
Beneficial Financial Group	X		
CUNA Mutual Insurance Group	X		
Fidelity & Guaranty Life Group		X	
Genworth Financial Inc.	X	X	
Global Atlantic Financial Group	X	X	
Great-West Insurance Group		X	
Hartford Financial Services		X	
Legal & General Group		X	X
Lincoln National Corp.	X	X	
Manulife Financial Corp.		X	X
MetLife Inc.	X	X	
Mutual of Omaha Insurance Co.	X		
Nationwide Mutual Group		X	
Ohio National Mutual Holdings		X	
Pacific MHC	X	X	
Principal Financial Group Inc.	X		
Protective Life Corp.	X	X	
Prudential Financial Inc.	X	X	
Reinsurance Group America Inc.	X		
Sammons Enterprises Inc.	X		
Savings Bank Life Ins Co of MA	X		
SCOR	X		X
Sun Life Financial Inc.	X	X	X
Swiss Re Ltd		X	X
Torchmark Corp.		X	
Voya Financial Inc.		X	X

*Ultimate parent or controlling party of the entity is incorporated outside of the U.S. The non-international (“domestic”) entities have ultimate parents incorporated in the U.S.; several of the U.S. organizations own captives domiciled outside of the U.S.

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Cummins, J. David and Richard A. Derrig, eds., 1989. *Financial Models of Insurance Solvency*, Norwell, Mass.: Kluwer Academic Publishers.

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