

# The Effects of the Great Recession and the Implications on the Insurance Market

by

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### Abstract

My thesis investigated the life insurance industry prior to the financial crisis, as well as the vulnerabilities of the industry post-crisis. My studies have collectively affirmed that significant risks still remain and may pose detrimental effects to life insurers, perhaps forcing them to face insolvency if these risks occur together. Vulnerabilities, such as longevity risk, the interest rate environment, guarantees, and regulatory shortfalls, during the post-criss period have been largely overlooked. With lifespans increasing and interest rates remaining at unprecedented low levels, the life insurance market is exceptionally vulnerable and must be carefully evaluated with respect to its susceptibilities and investment approaches. As life insurance companies assume more risk, their derisking strategies, such as the use of reinsurance captives, are also associated with risks that are not well understood. Further research is necessary to analyze the performances of life insurers that are greatly intertwined with the banking industry and have heavily invested in securitization products.

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## **Introduction**

While the growth of the life market has been steadfast, there has been increasing concern regarding its long-term stability and financial security. Given new challenges, such as increased life expectancies and financial innovations, I believe the life insurance industry is facing multiple sources of risk and will not maintain long-term stability. Following a brief overview of the recent financial crises and its vast impacts on our global economy, this paper delves into each risk factor – all of which can foretell great distress in the large insurance industry if they should occur together at an unexpected time. In sum, this paper will probe into the question of whether unforeseen combinations of adverse circumstances will result in a downwards spiral for the life market as companies seek growth in business by assuming more risks, perhaps too confident in the protection they see in de-risking techniques.

In Section II, I will highlight works that greatly contributed to the development of my thesis. The works cited have had a profound impact on my concluding remarks regarding inadequacies of previous regulation reforms following the 2007-2008 financial crisis, in an effort to prevent financial distress in the life insurance industry. Rather than an exhaustive survey, I have included in the Literature Review only those works that have been most influential in the formation of my thesis.

Section III will outline causes of market bubbles, as well as studies regarding company failures within the life insurance industry, including risks faced by life insurers, such as longevity risk and an ongoing low interest rate environment. Unlike other economic sectors, life insurance companies are particularly susceptible to longevity risk, or the likelihood of higher-than-anticipated payout ratios on annuity lines because of increasing life expectancy trends. In addition, long durations of low interest rates also threaten the profitability of life insurers, since

life insurance premiums are invested in financial assets whose values are directly correlated with interest rates. Another risk facing the life insurance industry is the interconnectedness of life insurance companies with financial institutions and with other life insurance companies.

Interconnectedness makes life insurers vulnerable to the distress of other life insurers through contagion and spillover effects.

In Section IV, I will discuss vulnerabilities within the life insurance industry. Most importantly, there will be an evaluation of the risks associated with variable annuities, such as the fluctuations of interest rates and how greatly they impact life insurers. The variable annuities line of business has grown, and is expected to continue growing, as more people seek life insurance solutions to their risk of outliving their retirement savings. Because of the growing importance of this line of business, the risks faced by life insurers in this line can impact the overall profitability and financial viability of life insurers. I will next discuss captive reinsurance companies—entities used to reduce portfolio risks—and the realization that they encompass potentially greater risks than insurers have bargained for. Although life insurers use captive reinsurance to pass on some of the risks they have assumed, critics have noted the risks associated with the use of captive reinsurance. Finally, as a result of the widespread panic from the 2007-2008 financial crisis, life insurers have witnessed large-scale policy surrenders. The experience of Korean life insurers during the Asian crisis has demonstrated that significant increases in policy surrenders can pose a threat to the stability of the large insurance industry.

Section V will examine both regulatory reforms undertaken before the 2007-2008 financial crisis and the regulatory reforms undertaken during the post-crisis period and show how they are inadequate in preventing another financial crisis from erupting. I will examine the regulation on reserves first implemented before that financial crisis, after which I will focus most

specifically on the effectiveness, or lack thereof, of the Dodd-Frank Wall Street Reform and Consumer Protection Act, which was enacted in July 2010 under Barack Obama's presidency. Although financial regulation is supposed to prevent future crises, there have been many criticisms of the Dodd-Frank Act, as some critics maintain that it counteracts its purpose and can potentially even accelerate another economic calamity. I will end by briefly examining some major post-crisis regulatory changes besides the Dodd-Frank Act.

Taking these aspects into consideration, my thesis will provide evidence that the life insurance industry has not substantially improved after the 2007-2008 economic collapse. In fact, the strategies of life insurance companies have become riskier, which regulators have not resolved. The risks posed by life insurers and the potential impact that our economy may face must be realized, and if we are not aware of them we may be surprised by another financial crisis brought on by the struggles of a large number of life insurance companies.

### **Literature Review**

To support my thesis, I have gathered research from various authors. While none of the references predict my argument specifically, they have helped me to arrive at my conclusion based upon previous data collections and analyses, including studies of previous life insurance failures, risks faced by life insurance companies, and inadequacies of regulatory reforms during the post-crisis period. The studies mentioned below have contributed considerably to the formation of my thesis.

#### **Previous Studies of Risks Facing the Life Insurance Industry**

**Studies of life insurance company failures.** Before examining the current state of the life insurance industry, I first analyze past studies of life insurance company failures. Stephen A. Robb, Paul F. Della Penna, and Alicia M. Robb conducted, for the Society of Actuaries

(SOA), a comparative study between United States and Canadian company failures within the life insurance industry between 1980 and 2010. Before tackling debates regarding the effectiveness of current regulatory reforms, it is necessary to consider the different institutional structures and risk management policies amongst the United States and another country in the years leading up to and including the financial crisis.

The period between 1980 and 2010 includes several changes in the economic environment of the United States. The early 1980s depicted a time of rising interest rates and high inflation, and was also recognized for the large number of failures of banks and savings and loan associations. Research concluded that closely linked Canada was not unscathed, but did not have failure rates as high as the United States. While the proceeding period until 2005 was stable with minimal company failures, the financial crisis indicated a spike in failure rates for financial service entities. Their study had confirmed that Canada was not impacted as significantly and did not suffer parallel failure rates. Nevertheless, while the differences in failure rates of savings and loans associates between the United States and Canada were not significant, the differences were notably significant with respect to the failure rates of commercial banks and insurers. It is therefore imperative to examine why the United States is vulnerable to higher failure rates as opposed to other countries, such as Canada.

The study further defines three types of failures events: Class I Failure, Class II Failure, and Class III Failure. Class I Failure refers to the failure of a financial institution, resulting in the liquidation of the institution by regulators or through bankruptcy, such as filing for Chapter 11. Class II Failure occurs when a financial institution is not forced into liquidation, but must merge or sell the entity. Lastly, Class III Failure represents government action prior to a company failure in order to avoid contagion effects that a potential failure can trigger (Robb et. al., 4).



With that being said, high failure rates among these three classes imply that the commercial banks and life insurers within the United States assume more risks and are therefore more susceptible to company failures than those from other countries.

Three factors, which I will discuss in more detail in later sections, are the economic environments, the repeal of the Glass-Steagall Act in the United States, and the level and complexity of risk within the financial system, and the insurance industry as well (Robb et. al., 6). My thesis will focus primarily on the risks faced by life insurers, as well as the inadequacies of regulatory reforms to support why I believe the life insurance industry within the United States will not be able to maintain long-term stability with its current conditions and regulatory structures.

Having said that, a recent study by Ralph J. Koijen and Motohiro Yogo focuses primarily on the risks within the life insurance sector. If the great risks, which life insurers assume, are not recognized, they could potentially cause severe problems within our economy. Over the past two decades, the risk profile of United States life insurers has significantly changed, such as the increasing demand for variable annuity products with minimum guarantees, as well as the use of de-risking techniques, such as captive reinsurance. The rapid growth of both annuity products and captive reinsurers signify the high level of risk that life insurers have assumed over the past decades. This, they argue, must be recognized by regulators in order to prevent life insurer failures.

**Longevity risk.** As I will discuss fully in my thesis, longevity risk poses great risks for life insurers, as life insurers have been faced with increasing life expectancies of policyholders, resulting in high pay-out ratios than expected on annuities lines. To offset these risks, the concept of hedging has been increasingly popular. Ya-Wen Hwang and Chenghsien Tsai

published a study in 2014 in *The IUP Journal of Financial Risk Management* entitled "The Longevity Risk of Life Insurance Policies Induced by Pricing Error." If actuaries fail to account for all product characteristics, as well as the ever-changing mortality tables, the products result in significant underpricing and under-reserving (Hwang and Tsai, 34). Using a Compounded Increasing Whole Life Insurance Policy, or CIWLIP, Hwang and Tsai illustrated pricing problems that life insurance companies may face. CIWLIPs have both investment and insurance characteristic; after a few years into the policy, the policy reserves will become higher than the total insured amount of that policy year. The death benefits, though, is determined by the largest value, or whichever is the greatest (Hwang and Tsai, 35). Underestimating premiums may occur if insurance companies employ the non-recursive method, which only uses the insured amount to calculate the premiums rather than a recursive method, which uses the largest value of the insured amount (Hwang and Tsai, 35). Moreover, improved mortality rates further exacerbate pricing errors, which may cause longevity risk for the life insurance company (Hwang and Tsai, 48). Longevity risk is detrimental to the sustainability of the life insurance sector, and the effects are even more profound during periods of improved mortality tables, coupled with a low interest rate environment. It has been argued that mortality tables that are used by life insurers are not updated frequently enough. Outdated mortality tables, which do not reflect greater longevity, lead to underestimations of life expectancies. Thus, underfunding liabilities can threaten the solvency of life insurers (IMF, 136 of report (2 of Ch. 4). Consistent with the IMF's Table 4.3 in their 2012 report, it has been found that life insurance companies with important annuity businesses have calculated the structure of pension plans based on outdated mortality tables, not considering the impact of longevity increases (IMF, 148 of report (14 of Ch. 4). By 2007, the last year covered by the report, a greater percentage of insurers were

employing the 1983 Group Annuity Mortality table than those who used the 2007 table, which would imply and increase in longevity of 2.1 years (IMF 148 of report (14 of Ch. 4)).

Ultimately, it is essential that life insurers properly price and maintain appropriate reserves for the products they offer.

With that being said, an article by Helmut Grundl, Thomas Post, and Roman N. Schulze was published in the 2006 edition of *The Journal of Risk and Insurance* further alludes to the demographic risks faced by life insurers, such as changing life expectancy tables. Demographic risk, otherwise known as longevity risk, can result in significant losses for both parties if the risks are misperceived (Grundl et al., 21). Annuity providers and life insurance providers, they asserted, have contrasting interests; while annuity providers benefit from lower mortality rates, life insurers suffer, and vice versa. This is not to say that the risks are offset by these contrasting interests. There are two ways in which diversification across different lines of insurance may not provide an adequate hedge for longevity risk. One possibility is that the growth of the annuity lines may dominate the growth of life insurance lines, whereby the exposure to longevity risk is not offset by the benefits to the life lines. The other possibility is that the losses from the annuity lines may be greater than the benefits from the life insurance lines. Further research is needed in order to determine if these possibilities are relevant. For instance, medical science may be close to conquering life-threatening diseases such as cancer. An unexpected breakthrough could therefore lengthen life for many people, ultimately increasing the benefits that insurers have to pay annuity lines. A detrimental risk faced by life insurance companies is the unpredictable timing of changes of mortality rates and the adverse effects these changes have on life insurers' portfolios.

**Low interest rate environment.** Low interest rates are unfavorable to life insurers because investments yield lower returns and make it difficult for life insurers to engage in new business. Premiums that life insurers accumulate from policyholders are invested in financial products for profits. However, low interest rates have not benefited both life insurers and policyholders of variable annuities alike. Following the financial crisis, the United States has faced a stagnant economy with long-term low interest rates. Though the intent was to encourage lending and ultimately improve the macroeconomy, the effects are disadvantageous for the life insurance industry, as most sell long-term products.

Kyal Berends, Robert McMenamin, Thanases Plestis, and Richard J. Rosen published a study in 2013 to discuss just how detrimental low interest rate environments are to the life insurance industry. In doing so, the authors study publicly traded life insurance companies, beginning August 2002 through December 2012. Their findings show that prior to the crisis, stock returns of these publicly traded insurance firms were uncorrelated with ten-year Treasury bond return, though after the crisis, the stock returns were negatively correlated to these ten-year Treasury bond returns. In addition, policyholders have typically opted not to purchase fixed-rate annuities during periods of low interest rates. Insurance firms, similar to financial institutions, are nevertheless highly sensitive to interest rate fluctuations. To properly assess the effects of low interest rates on life insurance companies, Elia Berdin and Helmut Grundl, authors of "The Effects of a Low Interest Rate Environment on Life Insurers," examined the low interest rates on a balance sheet of a German life insurer. Their results indicate that, consistent with the 2013 study mentioned above, a long duration of low interest rates substantially affect the solvency of life insurers, as these life insurance companies struggle with insufficient capital (Berdin and Grundl, 33). Berdin and Grundl's results were based on a scenario analysis of various interest

rate scenarios rather than empirical data of actual struggles with insufficient capital. The model used is a condensed version of a life insurer's balance sheet without product lines diversification, group diversification, or reinsurance activities (Berdin and Grundl, 34). In other words, the study explored pessimistic possibilities, but it did not estimate how likely these possibilities will occur.

### **Regulation Failures, Particularly with Respect to the Dodd-Frank Act**

**Criticism of Title VII.** There must be effective regulations in place to monitor the practices of life insurers and prevent high company failures, namely within the life insurance industry. A focal point of my thesis is the inadequacies of regulation reforms, chiefly the implementation of the Dodd-Frank Act. Charles L. Hauch, author of "Dodd-Frank's Swap Clearing Requirements and Systemic Risk", argued that credit default swaps, cleared or uncleared, can pose great systemic risk. Since clearinghouses reduce counterparty risks, there is an underlying incentive to clear as many swaps as possible, though it may threaten the solvency of the clearinghouses. The Dodd-Frank Act has established a central clearinghouse to reduce systemic risk. Hauch provides a strong case regarding the causes of clearinghouse failures, which the Dodd-Frank Act exacerbated instead of alleviated.

The Dodd-Frank Act, as authors Hester Peirce and James Broughel averred, does not take sufficient account of the possibility that a financially weak or poorly managed clearinghouse could falter and devastate the financial markets. Furthermore, the Act's Title VII requirements could weaken clearinghouses, as the incentive to clear as many swaps as possible could bring unmanaged risks into clearinghouses (Peirce and Broughel, 80). Regulators have since acknowledged that a clearinghouse could be a systemic risk, which undermines Act's intent to reduce total risk.

Criticism of Dodd-Frank's Title VII requirements is implied in the work of Craig Pirrong. Pirrong alleged that for factors including moral hazard and adverse selection, clearing can encourage risk taking, which thereby increases default risk and ultimately contagion risk (Pirrong, 25). As Horton alluded to earlier, clearing induces hedgers and speculators to take larger positions in clearing swaps. With that being said, clearinghouses can fail in the aftermath of large price movements that strain the liquidity of the financial system, which would impair the ability of financial markets to operate for some time (Pirrong, 28). So, rather than reducing systemic risk, these clearinghouses essentially create more systemic risk as a result of incentives, information, and costs. The establishment of clearinghouses may conceivably be less robust than the previous system.

**Failure to Define Systemic Risk.** And so, alongside Hauch's position, Brent J. Horton, author of "When Does a Non-Bank Financial Company Pose a "Systemic Risk"? A Proposal for Clarifying Dodd-Frank", addresses the Act's failure to clearly define what systemic risk is. While the Act empowers the Treasury to determine non-bank financial companies that pose systemic risk, if systemic risk is not explicitly defined, the Treasury's task is highly unclear, though the Treasury has the power to force an institution into bankruptcy. The Treasury retains a great deal of power but is not properly instructed how it should be used. It is unable to accurately detect which non-bank financial companies threaten the stability of the life insurance industry. Horton, therefore, commendably challenges the effectiveness of the Dodd-Frank Act and further validates the need for improved regulatory reforms.

Parallel to Horton's argument, Julie A.D. Manasfi also stated that there is no widely accepted definition of systemic risk, though one way to describe it is to define it as the risk of a collapse of a financial system of market serious enough to potentially have adverse impacts on

the real economy (Manasfi, 188). In order for the Financial Stability Oversight Council (FSOC) to effectively prevent systemic risk, a better understanding of systemic risk must first be developed before a wall is erected that may decrease economies of scope (Manasfi, 212). We cannot expect regulatory reforms to be effective if the risk that is regulated is not understood.

Daniel Schwarcz and Steven Schwarcz published an article for the *University of Chicago Law Review* in 2014 regarding the failure of Dodd-Frank to effectively prevent systemic risk. In addition to its failure of defining what banks constitute as systemically important, the authors also suggested that the Act overlooked correlations among individual insurance companies, which could cause widespread financial stability (Schwarcz and Schwarcz, 1569). Because of increasing interconnections between insurance companies, through products, investments strategies, and risk management techniques, the life insurance industry can certainly contribute to systemic instability (Schwarcz and Schwarcz, 1573). Their argument essentially raised the notion that systemic risk does not necessarily only derive from too-big-to-fail companies, but also from individual insurance companies taken as a whole. Because their perception that systemic risk in life insurance stems from the interconnections between many insurance companies, they argue that the present system of state regulation will not be effective and advocate a greater regulatory role for the Federal Insurance Office.

**Failure to prevent the too big to fail problem.** As we saw during the 2007-2008 financial crisis, the issue of companies being "too-big-to-fail" has become a growing concern, as large institution failures pose threats to our economy. Arthur E. Wilmarth, Jr. published a study in 2011 titled "The Dodd-Frank Act: A Flawed and Inadequate Response to the Too-Big-to-Fail Problem." After witnessing bailouts during the financial crisis, regulators have aimed to prevent further bailouts, though their efforts have fallen short to do so, as Wilmarth explains. Ultimately

the Act will not prevent future bailouts nor does it remove public subsidies for too big to fail financial institutions. In addition to its failure to remove public subsidies, many financial institutions have become too big to fail through mergers and acquisitions, which the Dodd-Frank Act has also failed to prevent (Wilmarth, 984-986). And so, the likelihood of another financial crisis, similar to the recent one that impaired our economy, is still rather high. If institutions are too big to fail and require government assistance to prevent an economic meltdown, they are essentially too-big-to-exist.

Thomas J. Fitzpatrick IV and James B. Thomson asserted that the Dodd-Frank Act essentially creates a viable option to providing funds to failing firms and how the firms should be resolved (Fitzpatrick and Thomson). Through the Act, a multi-step process has been established in an effort to distinguish what companies are eligible for Dodd-Frank's Title II resolution. If Congress takes appropriate action, the Act would move toward alleviating the too big to fail problem, but has not ended the problem in its entirety. In conclusion, Title II merely provides a feasible process for handling the failure of a large, complex financial institution without sustaining significant consequences on the real economy.

Richard W. Fisher testified before the House Committee on Financial Services in 2013 with respect to the Dodd-Frank Act's failure to correct the too big to fail problem. Fisher, in fact, believed the Title I of the Dodd-Frank Act exacerbated the issue by designating financial institutions as being "systemically important," as customers would be less enticed to do business with non-SIFI banks since they would not necessarily be bailed out in the event of a company failure (Fisher, 8). Customers would therefore prefer to bank at institutions that will receive financial assistance by the government in the event of insolvency. Even with the current regulatory reforms, there is still a great deal of moral hazard, just as our country had witnessed in



the years leading up until the 2007-2008 financial crisis (Fisher, 11). SIFIs are essentially more enticed to make riskier investment decisions than a small institution that will not be provided with any financial resolution by the government if it faces asset liquidation.

The studies I have surveyed point to specific risks or regulatory failures in preventing these risks from leading to a financial crisis. Taken by themselves, they may not suggest that the life insurance industry may face severe problems in the future. But when all the findings I have mentioned are considered together, they lend support to my thesis that the current structure of the life insurance industry is not efficient and will not avert a financial crisis from occurring.

### **Bubbles and Insurance Company Failures**

To confirm where the insurance industry is and its likelihood, it is critical to analyze the causes of both bubble and insurance company failures, and to notice if there are any correlations from past occurrences, namely the financial crisis. Research previously conducted suggests that the life market has reached a cyclical peak and will be facing debilitating factors that will lead the market into a trough. Insurance companies generate revenue through investments, as well as policy premiums; according to the Federal Insurance Office, roughly 75% of the life and health sector is derived from premiums, and the remaining 25% is originated from earnings on investments and revenue generated from administrative fees charged (Federal Insurance Office, 13). In spite of the global financial crisis of 2007, in 2012, the life and health sector's aggregate premiums reached record levels.

### **Shiller's Argument about Bubbles and Their Causes**

Robert J. Shiller, author of *Irrational Exuberance*, had conjectured that there are twelve factors of a market bubble: capitalism, cultural and political changes, technology, monetary policy, the baby boom/bust, media influences, optimistic forecasts, the expansion of defined

contribution pension plans, growing popularity of mutual funds, declining inflation and money illusion, expansion of trade, increasing gambling (Shiller, 33). However, the forces that are most relevant to the life market are capitalism, technology, optimistic forecasts, and declining inflation. Every company, whether in the life market, or a mom and pop shop, have self-fulfilling prophecies and conduct business in order to spawn revenues. That is, in essence, the concept of capitalism; often times, corporations become gluttonous and simply look at short-term profitability as opposed to long-term stability, such as over-leveraging investments. In terms of technology, financial innovation, including but not limited to the use of complex derivatives to offset risks, are highly associated with the life market.

The United States' stock market more than tripled upon the commencement of the new millennium as opposed to other economic indicators, such as personal income and gross domestic product, which had not, illustrating the overvaluation of the stock market and, therefore, an overflow of consumer confidence. The exponentially high levels of stock prices preceding the financial crisis and the associated expectation had led to a speculative bubble, as speculations were not met, or in other words, satisfied (Shiller, 5). In the context of insurance, overly optimistic forecasts have resulted in an increase in annuity products, as consumers elected to engage in long-term investments. Life insurers had become too eager to expand annuity sales that, during a period of lengthened longevity and a low interest rate environment, they are experiencing declining returns. Increased annuity sales have created unforeseen exposures that are now putting immense pressure on life insurers' balance sheets, while threatening the survival of others. Market volatilities after the financial crisis arose have resulted in significant losses, which according to a 2008 study conducted by Morgan Stanley Research, is estimated to be \$1 billion annually (Chopra et. al., 8). And so, to curtail further capital strains, life insurers have

responded by increasing product prices while reducing living benefits, such as guarantees (Chopra et. al., 10).

In order to accurately forecast a retrogression of the life market, it is imperative to consider previous cases in insurance companies for emblematic causes of industry failures collapses and find correlations, if any. Insurance company failures are typically dependent upon a multitude of factors, which include the current economic state, management, inadequate reinsurance, imprudent investments, market competition, rapid expansion, high leveraging (or under-reserving), and regulatory levels. The liability insurance crisis of 1984 and 1986 encompassed major economic disturbances in the insurance market that drove public concerns about the availability and affordability of specified coverage. The crisis had been characterized by increasing prices, reduction in coverage, as well as an unavailability of certain coverage. Between 1992 and 1994 several key life insurance companies, such as Executive Life Insurance Co., Mutual Benefit Life Insurance Co., and Confederation Life Insurance Co., failed largely due to illiquidity problems of meeting maturing liabilities (Brennan, 4). In other words, these distinguished life insurance companies did not withhold enough liquid assets to meet obligations of maturing life products. If the life market does in fact collapse, several sectors of our economy will be adversely impacted, namely policyholders, shareholders, other insurance companies, and creditors, just to name a few. We will now take a look at our current economic state and other influences on the life insurance industry.

### **How the Financial Crisis Affected Different Lines of Life Insurance**

To measure the severity of the financial crisis, researchers have examined its effects on various lines of insurance and how the impacts have differed. Altogether, it was concluded in a study published by the Geneva Association that during the Financial Crisis, all segments of the

insurance industry moved uniformly towards lower capital elasticity, though the annuities sector was impacted the most. While all segments remained in the finite-risk realm, they are trended towards excessive risk, with the annuities segments having the largest movements (Baranoff, 349). This is pertinent because, as a result of the 2007-2008 financial crisis, as these segments trend toward being inelastic, life insurers will become unable to increase capital in response to increased asset risk, thus moving towards excessive risk.

With that being said, the crisis has generated considerable losses within the insurance and pension industries. As mentioned prior, the banking sector was indubitably hit the hardest; however, it is evident that banking and insurance exposures have been cross-linked, such as through derivatives and complex hedging initiatives. In the paper “The Financial Crisis and Lessons for Insurers,” Klein et al. averred,

“Throughout the crisis, the insurance industry has been significantly stressed with respect to both assets and liabilities. Several large insurers have sought aid from within their holding companies and/or federal government” (Klein et al., 12).

Financial contagions, which will be mentioned more in-depth in the next section, of losses among insurance companies add to financial strains on banks alike, and can weaken the confidence of depositors. In short, had the insurance sector not delved so deeply into securitizations, it would not have been as vulnerable to volatilities, chiefly the financial crisis; instead, because of the large mortgage exposure, the insurance industry was debilitated. The insurance industry has nevertheless fared better than the financial sector because of its limited subprime exposure, and less leverage, among other factors, but that is not to say that the insurance industry is efficient.

## **Contagion Effects**

More important than individual company failures are the contagion effects they possess-- that is, small shocks that initially only affect a few companies but proliferated throughout the rest of the insurance sector. For instance, declining stock prices may trigger loss of consumer confidence, thereby potentially sparking widespread market failure. The issue of contagion has been of primary importance, particularly since the credit contagion stemming from the financial meltdown in 2007. Naturally, the greater the financial contagion, the greater the severity of the financial crisis will be. There have been several studies related to contagion effects within the banking industry, which are advantageous to determining factors of contagion effects with respect to the insurance industry. Overall, it has been concluded that company failures were induced by fraud, risk loan practices, and a plunging stock market. The Diamond and Dybvig model, coined by the developers Diamond and Dybvig, was established to analyze causes of bank runs and the effect of deposit insurance on banks' vulnerabilities (Avila and Eastman, 304). In sum, the model ascertains that banks are susceptible to bank runs because they hold illiquid assets such as mortgages, but are faced with liquid liabilities such as cash withdrawals.

These bank runs can be closely associated with the life insurance market, as runs for insurance markets can be referred to as lapses or policy surrenders, and the system of state guaranty funds are comparable to federal deposit insurance. Declining confidence, resulting from events such as rating downgrades, can likely trigger mass surrenders. Surrender behavior is defined within two categories: endogenous factors (i.e. surrender fees, tax relief delays, and contract options), and exogenous, or environmental, factors (i.e. financial markets, reputation risk, and bankruptcy fears). Surrenders herein will focus primarily on exogenous reasons. On the brink of a financial crisis, or anticipated crisis, surrenders may relieve financial strains of

policyholders, thus threatening the liquidity of insurance companies. Consumers generally purchase life insurance policies for long-term investments. In spite of disincentives to surrender, including but not limited to surrender charges and tax penalties, personal financial distress or speculation of the economy may drive consumers to terminate their contracts prematurely and instead hold the cash value. Dr. Changki Kim avowed in his work “Policyholder Surrender Behaviors under Extreme Financial Conditions”,

“There are many factors affecting surrender/lapse rates such as the difference between reference market rate and policy crediting rate, seasonal effect, age and gender of clients, economy growth rate, foreign exchange rate, inflation rate, policy age since issue date, and unemployment rate, etc” (Kim, 1).

Since surrenders significantly impact the cash flows of assets and liabilities, it is vital to accurately model the sensitivity of lapses to economic conditions, for instance, interest rate fluctuations. Though the risk of surrenders have been incorporated as a potential liquidity risk for life insurance companies, sizeable cash-ins can deteriorate the liquidity of a life insurance company if they are more than anticipated and the life insurers become incapable of covering surrenders with its net operating cash flow. Just as households’ investment decisions are dependent upon interest rates, so are the decisions of life insurers. Life insurers invest their net policy premiums in investment products in order to generate profits and fund future obligations on the products they offer. If interest rates remain low, as they are now, life insurance companies become financially strained because of both low returns and minimum rate guarantees that had been included in past annuity products. Kim illustrated policyholder surrender behavior during times of extreme financial conditions, such as the 2007-2008 financial crisis, using data from both the United States and Korea. His findings affirm that policy surrenders are interest

rate sensitive and are highly reactive to market volatilities. While the insurance industry is under scrutiny for engaging in non-traditional practices, regulators have implemented laws that attempt to ensure insurance companies have sufficient liquidity to withstand mass panic surrenders.

Whether these laws are effective will be discussed in a later section.

A study sponsored by the Society of Actuaries observed the years 1910 through 2009 and found that overall policy rates increased among the sample group of 27 insurance companies, even compared solely to date from years 2005-2007. The most significant increases in policy lapse rates were whole life and term products, concluding that the economic conditions are believed to largely have contributed to the fluctuations. The study affirmed, “The poor economy, including the stock market drop in 2008, likely contributed to the increased lapses” (Ho and Muise, 62). Under extreme economic conditions that cause financial strains amongst households, surrenders, conversion and maturities are more frequent for policy years 26 and later among older ages (Ho and Muise, 21). It is safe to assume that the life market is not protected from economic fluctuations in that they are subject to changes in policyholder behavior.

Furthermore, in a 1995 study, Steven Avila and Kevin Eastman attested that larger companies experience a greater contagion effect than smaller companies once investors become concerned with unfavorable information released, such as through media (Avila and Eastman, 322). Announcements regarding large life insurance companies can result in widespread harm to policyholders, financial institutions intermingled with the subject company, as well as spillover effects throughout the whole economy from the interdependencies. These systemic risks may include a large company that is forced to sell assets and undercut prices, further reducing market values of companies that hold similar assets, shocks that result in a company’s inability to fund their obligations, reluctances to trade between institutions due to revelations of

financial problems, and irrational contagion where funds are withdrawn without knowledge if that specific institution is at risk (Harrington 2009, 2). Such panic may only be pertinent to larger companies due to fear of strict regulatory scrutiny that may arise. However, announcements do not necessarily have to mean bankruptcy announcements, but can be any form of bad news, including rating downgrades or sizeable loss expectations.

While most studies of contagion effects are largely engrossed in intra-industry contagion, or within the same industry, a 2002 study conducted by the Federal Reserve Bank of Chicago provides insight on effects between industries, or inter-industry contagion - a concept which is, for the most part, neglected. Their results evidenced compelling inter-industry shareholder wealth effects, though are directly linked to components, such as leveraging, geographic location, and regulatory expectations (Brewer, 37). Similar to banks, financial distress announcements with life insurance companies reflect contagion effects, but are much more significant among banks. Nonetheless, contagion effects should not be ignored in the life insurance industry because as life insurers become more integrated with financial institutions, spillover effects become more likely and the possibility of a crisis increases. The failure of a prominent financial institution can also threaten the returns of interconnected life insurers.

With regard to the financial crisis, financial markets suffered catastrophic losses, as several companies fought to stay afloat, such as Bear Stearns, Countrywide, and Lehman Brothers. American International Group's (AIG) bailout has validated contagion effects, as industry rivals were adversely affected by AIG's collapse. AIG's bankruptcy had ultimately unfavorably affected the market value of rival firms, which was representing through declining stock prices (Egginton et al., 3). This analysis reflects the influence of public opinion, or lack of consumer confidence; after large-scale disruption has occurred, such as a bankruptcy of a



multinational corporation, the public generally loses assurance in all competitive firms as well. However, conversely, competitive effects occur if firms realize that the competing firm's demise, in this case AIG, can benefit its own business (Egginton et al., 241). As I will discuss later, contagion effects poses regulatory implications, as state and federal intervention may be necessary to halt systemic risk and the snowballing effects of a firm's downfall.

Alongside contagion effects, there have been indications of competitive effects as well throughout AIG's failure. Competitive effects occur when investors anticipate rivals will benefit from the insurance company's decline (Egginton et al., 225). This is contrary to the belief under contagion effects, where rivals are believed to experience decreased returns from the negative effects surrounding AIG. Though all insurance companies, AIG and rivals alike, suffered negative overall returns and experienced adverse impacts from the CDS write-down on February 11, 2008 and the bailout extension on October 9, 2008, rivals had in fact benefitted from the September 15, 2008 credit crisis, verifying the presumption of competitive effects. Egginton et al.'s analysis therefore confirms that there have been signs of both contagion and competitive effects following AIG's collapse.

To further analyze contagion effects, take the failures of two prominent life insurance companies: First Executive and Travelers. First Executive in the early 1990's was the sixteenth largest life insurance holding company within the United States, with roughly \$18 billion in assets (Fenn and Cole, 1). Unlike prior decades where the insurance industry experienced stability, during the 1990s insurers experienced significant asset problems, stemming from commercial banks' issuance of junk bonds and poor investments in real estate--all of which negatively impacted the life insurance industry. In January 1990, First Executive announced writing down the value of its bond portfolio by \$515 million. Later that same year, in October,

Travelers, the seventh largest life insurance firm, announced that it was reserving \$650 million to cover anticipated losses in its commercial real estate portfolio (Fenn and Cole, 1). As a result, the stock values of each firm noticeably plummeted, by roughly 57% and 35%, respectively. In addition to sinking stock prices, policyholders' behaviors have also played significant roles; as policy surrenders heightened, new policies were nearly zero (Fenn and Cole, 20). In sum, the collapse of the non-traditional securities markets, such as mortgage-backed-securities, had worldwide effects on financial institutions, and has since led to increased capital requirements by regulators. Additionally, there are hypotheses in connection with outcomes from announcements of asset-quality problems, namely the irrelevance hypothesis, the asset-information hypothesis, the policyholder-response hypothesis and, lastly, the bank-run hypothesis (Fenn and Cole, 4). These hypotheses, in essence, serve as alternative effects a negative announcement can have on a given insurance company, and whether it is unfavorable enough to spread throughout the industry. The irrelevance hypothesis states that if the firm's announcement does not contain new information, with no impact on the policyholders' evaluations on credit risk, there will be no effect on the company's share prices. Under the asset-information hypothesis, if the announcement conveys unfavorable information about the quality of the insurance company's assets, share prices will in fact decline. As for the policyholder-response hypothesis, if the announcement affects the way policyholders use publicly available information to evaluate credit risk, share prices will decline for firms that carry significant exposure to problem assets and offer liquid liabilities. Lastly, the bank-run hypothesis ascertains that if the announcement weakens policyholder confidence in all life insurance companies, share prices will fall, regardless of the company's asset-liability structure (Fenn and Cole, 4).

The policyholder-response hypothesis indicates that risk portfolios, if announced to policyholders, will exacerbate financial strains of life insurers if they are affiliated with problem assets. The bank-run hypothesis is a similar theory that explains a shortfall of public confidence, though this hypothesis asserts that the value of a firm, through its share prices, will be greatly impacted by public announcements, despite the life insurance company's asset-liability portfolio. Both hypotheses indicate how crucial public perception is to the profitability and long-term success of life insurance industry in particular. Unrestored public confidence will inevitably lead to policy surrenders, thus resulting in larger payouts for life insurers than anticipated. And so, while all theories are useful, the policyholder-response hypothesis and the bank-run hypothesis are vital to explaining policyholder behavior of withdrawing liquid liabilities from insurance companies. Furthermore, as indicated in the cases of First Executive and Travelers, the policyholder-response hypothesis stresses that all publicly available information is reflected in the performance of the company's stock prices.

Another aspect that is paramount in determining contagion is the interconnectedness between firms. Although contagion does not necessarily have to affect only interconnected firms, the interrelations between companies do retain possibilities of contagion. If the shock is substantial, systemic failure can permeate throughout the financial system and cause, perhaps, a crisis. The 2007 financial crisis did stimulate panic, leading to bank runs, as well as liquidity hoarding. Unlike other major causes of instability within a system, contagion does not discriminate, meaning solvent, thriving institutions are also susceptible to contagion, just as insolvent, weakened institutions. With that being said, many economists focus on financial institutions, as they are more vulnerable to contagion because they rely on short-term borrowing and long-term lending.

Although contagion has historically not been much of a concern within the insurance industry, the increasing innovations, including non-traditional products that have recently emerged, can potentially increase systemic risk and the likelihood of facing contagion effects if they are not appropriately regulated (IAIS, 16). While risk transfers help to alleviate the obligations of the insurer and diversify the risk, they can also induce contagion and possibly result in an economic crisis. Since the 2007 financial crisis is an ideal representation of the effects of contagion, it is useful to examine the products that were issued and how the instruments further impacted the economy. In relation to the financial industry, collateralized debt obligations (CDOs), which mostly comprised of subprime mortgages, were subprime and essentially greatly contributed to the calamity. According to the Securities Industry and Financial Markets Association, the total issuance of asset-backed securities within the United States in the years leading up to the crisis, between 2005 and 2007, approximated to \$3.289 trillion, and the total issuance of CDOs within the United States amounted to roughly \$965 billion (Longstaff, 5).

Announcements of asset-quality problems will signal concerns pertaining to the quality of insurance companies' portfolios as a whole. Deterioration of portfolio quality will spur doubts regarding the financial security of the life insurance industry altogether. Since most life insurers hold similar assets, the poor performance of one life insurer or increased company failures can prompt potential customers to no longer engage in new business and for current policyholders to terminate their contracts. Predating the financial crisis, life insurance companies had held lower capital in relation to their extending liabilities, increasing their vulnerabilities to shocks.

As risk exposures increase amongst the financial market, it is imperative to understand the increasing integration between financial institutions and insurance companies; banking risks

which had once only threatened the financial market may also spread to other markets, namely insurance, perhaps causing company failures. Just as contagion effects may ensue as a result from announcements, they may also be triggered by reputational reasons, regardless of the financial performance of the subject company. Additionally, as previously mentioned, another cause for potential contagion is in fact the continuing market integration and the continuing developments of credit risk transfers, whereby insurance companies have been assuming risks from banks (Mayr, 22). In sum, securitization and complex derivative products, serving as special purpose vehicles (SPVs) to transfer credit risk, should seem alarming, as they challenge the long-term stability of the insurance industry, which will later be discussed in its entirety.

Insurance-linked securities, or ILS, of which life insurance securitization is a sector, are innovative products for the purpose of convergence between insurance industries and the capital markets. The ILS market represents a modest, yet increasing, exposure, which should pose concerns for investors and policyholders. Although insurance industry's portfolios have been "safer" than they were decades prior, securitized assets, such as mortgage-backed securities (MBS), can make up to one-third of a portfolio, which has contributed to substantial losses. With the rise of securitization, mortgage-backed securities alone account for over half of the industry's exposure (Klein et al., 33). In addition to stock prices plummeting for many major publicly traded insurance companies, asset quality ratings were re-evaluated, as many companies experienced investment losses on securities, such as credit default swaps.

Policyholders, fearing loss in savings, will opt to surrender their policies, forcing insurance companies to liquidate their assets. For this reason, it is imperative to examine contagion effects, as the insurance industry has involved, implicating more possibilities of systemic risk. Nevertheless, spillover effects from shocks can even be attributed to company

failures from outside industries, such as a multinational investment firm declaring bankruptcy, affecting the life insurance industry. The magnitude of inter-industry spillover effects must be realized, as the life insurance industry being such a large sector of the United States' economy. After the passage of the Gramm-Leach-Bliley Act of 1999, commercial banks and life insurance companies have become highly affiliated with one another.

In terms of interrelationships, variable annuity products encourage partnerships between banks and insurance companies, further eliciting concerns of widespread spillover effects. Many insurers have investment banking, mutual fund, and securities dealing operations. Since life insurance companies now directly compete with commercial and investment banks for financial products, this may trigger a negative competitive effect. With that being said, banks have a significant impact on life insurers; as I have mentioned, there are significant negative inter-industry spillovers from banks to insurers (Cummins et al., 21). Not only have banks become increasingly active in the selling of life insurance products, but life insurance companies have invested in risky assets, such as MBS. If the banks conduct immoral business activities, per say, thereby threatening the quality of their portfolio of assets, the spillover effects can potentially harm other sectors of the economy, specifically the life insurance industry (Cummins et al., 32). In fact, the 2012 study conducted by Cummins, Wei, and Xie inferred that there is strong quantitative evidence that the integration of the United States' financial services industry has progressed further and is much more profound than previous evidence would indicate (Cummins et al., 32).

### **Vulnerabilities in the Life Insurance Industry**

With savings nearly depleted by unemployment, policyholders have been induced to cancel their insurance policies for cash. Studies indicate that leading up to the financial crisis,

annual surrenders and withdrawals increased from \$226 billion in 2005 to \$305 billion in 2007 (Federal Insurance Office 2013, 16). Some insurers, who did not foresee the crash nor incorporate variables for possible economic shocks, have been forced to liquidate their assets. For those who have not purchased insurance policies, the economic downturn has still deterred households from purchasing life insurance, as households have instead opted to pay off financial debts. Overall, total surrenders have still not improved to pre-crisis levels, which prove that consumer confidence is still not fully restored. The NAIC has affirmed that under-reserving is a vital component of many company failures (Massey, 15).

To put the vulnerabilities of the life insurance industry into perspective, I would like to focus on risks associated with variable annuity products, the use of captive reinsurers, and the overwhelming cash-ins as a result of the financial crisis. Variable annuities, which I will first discuss, are risky products due to market volatility and their reliance on market conditions. Although they can be profitable for policyholders and life insurers, I would like to highlight the risks of these products and how they can potentially exacerbate a bleak economic climate.

### **Risks Associated with Variable Annuities**

Unlike traditional, fixed annuities, where the policyholder is guaranteed a fixed payment amount each month until he or she dies, a variable annuity is dependent upon market conditions. In other words, while annuities provide the policyholder with a steady income for the rest of his or her life and protects against market risks, a variable annuity is like a mutual fund in the sense that the premiums are invested into a portfolio of assets. This is not to say that variable annuities are interchangeable with mutual funds, as variable annuities encompass death benefits, which will be discussed later.

Variable annuities are comprised of three phases: an accumulation phase, a withdrawal phase, and an insured phase. As the name implies, policyholders accumulate assets during the accumulation phase, whereas the withdrawal phase and insured phase provide the policyholders with income. During the initial phase—the accumulation phase—policyholders build up their investment through savings, which can be accomplished by a lump-sum payment or fixed periodic payments to the insurer, which would accumulate savings to be paid back later to the annuity owner at a later date. The accumulation phase can be characterized as investment, while the withdrawal and insured phases can be defined as longevity protection (The Geneva Association, 12). While a fixed annuity provides stable returns to the policyholder or annuity owner, variable annuities can instead provide potentially greater, though uncertain, returns, which pose a gamble for both insurers and policyholders.

Prior to the financial crisis, between 2003-2007, the life insurance sector was exceptionally strong, with total revenues increasing by 15 percent and profits totaling \$165 billion over the five-year span. Variable annuities were the main contributing factor in generating revenue in the insurance industry, with sales growing by roughly 9 percent each year (Chopra et al., 3). Annuities can best be defined as a series of periodic payments provided by an insurer to a policyholder, starting at a specified time for life. With increasing life expectancies, as mentioned prior, this product has become highly favorable to policyholders, most of whom feared they would outlive their assets. Variable annuities tie the growth of an annuity to stocks and mutual funds. And so, as these long-term products are invested into mutual funds, life insurers require a minimum rate of return (ROR), in addition to any other associated fees, such as administrative fees. The United States alone accounted for \$1.6 trillion in variable annuity accounts in 2012 (Kouijien and Yogo 2014a, 2). As the insurance industry recognized and soon



met the consumers' needs, variable annuities became increasingly popular not only in the United States, but also most of Europe and even Japan. As insurers offered more guaranteed benefits, which is further discussed in the subsequent paragraph, more individuals purchased these long-term products, resulting in considerable revenues for the insurance companies during the pre-crisis period.

With life expectancy only increasing, retirees have worried about losing their 401(k) investments or that they will outlive their savings, since twenty to thirty years are typically spent in retirement. To address these concerns of investments losses, increasingly companies have, within the last decade, offered two common forms of guarantees. Risks posed by insurers when issuing variable annuities may be further expanded with guarantees; annuities may be guaranteed minimum death benefit (GMDB) investment in which the policy holder is guaranteed at least the capital invested at the time of death, or may be guaranteed minimum accumulation benefit (GMAB) investment whereby the policy holder is guaranteed a minimum return at the time of the policy's maturity; however, there are several types of guarantees, including guaranteed minimum income benefits (GMIB) and guaranteed minimum withdrawal benefits (GMWB). As this bleak economy threatens the investment insurance of life insurers, these life insurance companies may be able to fund these guaranteed benefits (Bruning et al.).

Prior to the financial crisis, life insurers had offered variable annuity products with guarantee benefits, including lifetime guaranteed withdrawal products. While these products have behooved policyholders who sought guaranteed income, long-term market volatility and low interest rates on fixed-income investments have certainly inflicted losses on life insurers. Prior to the financial crisis, the acquired risk from proliferated annuity sales with guaranteed

benefits were not only evident in the United States, but also Japan and Canada (The Geneva Association, 8).

Japan is an ideal example of how variable annuities can result in considerable losses for life insurers. The rapid growth of the variable annuity market in Japan began in the early 2000s, fueled by bank deregulation. Banks' variable annuity sales surged--most of which included aggressive benefits to annuitants. Insurance companies in Japan issued an abundance of variable annuities during the thriving economy between 2003 and 2008. The rapid growth of this market, particularly in Japan, was fueled by the deregulation of the variable annuity products. To counter possible losses from an economic downturn, insurers have hedged these investments. Japanese insurers nonetheless faced sizable losses, coupled with low interest rates. Once the financial crisis hit, many foreign countries exited the market or noticeably de-risked their products (The Geneva Association, 10).

Japan's dilemma in particular can be correlated to that of the United States because of the high levels of guarantee products sold in Japan prior to the financial crisis. After living benefits were introduced between 2002 and 2003, Japanese variable annuity sales surged to the JPY200-400 billion, as opposed to less than JPY100 billion in 2002 (The Geneva Association, 9). The poor market conditions, which are advantageous for policyholders, are detrimental to the equity and performance of insurance companies. Unlike other contracts, demands for guarantee annuities has remained persistent, despite insurance companies failures or significant losses that caused insurance companies to leave the market altogether. Because of increasing hedging costs and limited reinsurance capacity, insurance companies have sought to outsource market risks to investment banks. Wenli Yuan, senior analyst at Celent in Tokyo, insisted,

"Japan is a country that is ageing[sic] rapidly, resulting in significant pension requirements, while at the same time savings opportunities are limited due to the historic low interest rates. Even if variable annuities are likely to offer less guarantees than they have in the past in order to reduce the risk to the insurer, there is no doubt these products remain and will stay appealing to a lot of Japanese investors" (Blees, 16).

Changing economic conditions make hedging more challenging, causing many insurers, namely in the United States, to become less aggressive with the benefits they offer and heavily de-risk their liabilities. Consumers who purchased variable annuities, on the other hand, have been well-protected since the contracts performed as indicated. However, many insurers who provided the benefits were forced to increase reserves and because of the low interest rate environment, the hedging costs to provide the benefits surged (Foster and Skolnick, 1). Life insurers have altered the designs of living benefits in an effort to effectively manage their risk exposures, such as by offering buy-outs to policyholders, as well as transfers from equity funds to fixed income funds for more stable returns (Foster and Skolnick, 4).

The United States has experienced, and is still experiencing, significantly low interest rates since the brink of the financial crisis. The life insurance industry, which is a large sector of the financial system, is highly sensitive to interest rate fluctuations because of their long-term products, whose values vary according to the interest rates. Life insurance companies are, in essence, financial intermediaries, as they purchase investments such as bonds and repackage the profits into life insurance products. Being that life insurance companies are the largest institutional holders of corporate bonds, demand for these said bonds would drastically decline, causing further detriment to the economy (Kojien and Yogo 2014a, 4). Therefore, to price these

life insurance products, all insurance companies factor in an interest earnings assumption; the higher the interest rate assumption, the more favorable the products, and the lower the interest earnings assumption, the less favorable. In a low interest rate environment, insurers can only profit from annuities if they promise policyholders low returns. A low interest rate environment adversely affects the investment income of life insurance companies because most premiums are invested in fixed-income securities. Between 2006 and 2011, the life insurance industry reportedly lost 32 basis points of net yield. (Obersteadt et al.,142). With insurers investing such a high concentration of assets in bonds, the products they offer are intensely dependent upon interest rates.

Most notable for the impact of a low interest rate environment on life insurers is in Germany, where a prominent share of insurers' portfolios is comprised of high guaranteed returns (Berdin and Grundl, 1). Just as it was worthy to consider Japan's conundrum with the selling of guarantee products, it is also worthwhile to analyze the effects of a low interest rate environment on life insurers in Germany, as it may very well be comparable to that of the United States. The International Center for Insurance Regulation (ICIR) suggested that a prolonged period of low interest rates, in general, would considerably affect the solvency of life insurers, most likely leading to defaults for companies with minimal capital accumulations. When currently low interest rates are markedly lower than they were at the inception of the contract, liabilities become more expensive to fund, as assets that mature would be reinvested at a lower rate of return (Berdin and Grundl, 2). The recent economic environment, with weak equity markets and low interest rates, has prompted many consumers to purchase guaranteed annuities--fixed, if available--with yields significantly lower than pre-crisis levels. As for variable annuities in this low interest rate environment, insurers have had to decide whether to increase

the cost of benefits and/or decrease the benefits in order to generate a profit. Having said that, low interest rates are primarily problematic for life insurers, who have issued long-term interest rate guarantees. In response to the economic calamity, Germany has introduced new life insurance regulation reforms, which include reductions of payouts to policyholders, greatly enhancing the solvency situation of less-capitalized insurers. It should be noted that insurance companies drastically reduced their prices during the financial crisis and sold them at large losses, specifically -19 percent for annuities (Kojien and Yogo 2014a, 3). Even though life insurers during the economic decline generated losses by selling products below market value, they in fact produced accounting profits for the companies. If insurers, though, do not modify their regulatory supervisions, the insolvency risk of insurers altogether can be quite extensive.

While prolonged low interest rates can result in sizable losses for life insurers, high interest rates can also pose great risks, potentially even greater risks. When interest rates spike, policyholders are prompted to terminate their current policies in order to enter into new contracts with higher yields. Because asset values and interest rates move inversely, guaranteed credit interest rates on policies may cause solvency problems for life insurers (Obersteadt et al., 141). Had interest rates returned to early-2011 levels—a 200 basis points increase—the average BBB-rated corporate bond with a 10-year maturity could lose roughly 15 percent of its value, while a corporate bond with a 30-year maturity could lose up to 26 percent of its value (Obersteadt et al., 41). If policy surrenders exceed what is anticipated, life insurance companies will be forced to liquidate assets in order to meet financial obligations. And so, unforeseen high interest rates can also jeopardize the profitability of life insurance companies.

Insurers who have not disengaged from the market have recently developed new de-risking strategies, including high-level hedging programs, to mitigate the costs and risks of

issuing variable annuities guarantees. These new complexities of de-risking have concerned regulators because these exposure managements have invented outlets to avert regulations. And so, while variable annuity guaranteed living benefits provide additional protections to consumers, their intricacy makes the products challenging for regulatory actions.

Most guarantee benefits within variable annuities have retained a greater value than accumulated assets of the policyholders, unfavorably impacting insurers' equity values. After witnessing sizable losses during the financial crisis, many players have exited the variable annuities market, such as The Hartford and ING, or have significantly de-risked their products (The Geneva Association, 9). These products pose great challenges in the life market during a low interest rate environment coupled with poor risk management. Hedging strategies, which Moody's has researched through stress tests and cash flow projections, deem to be effective and limit the impact of market risk exposure, especially during times of market volatility and policy lapses (Ledlie et al., 382). Although hedging programs seem to effectively distribute risk, they are only effective to an extent and still face risk factors, including market risks, insurance risks, and operational risks (Brunner, 6). To further illustrate the benefits of hedging with regards to minimizing capital strains, a 2008 study found that compared to no hedge assets, hedged assets noticeably alleviate capital strains. In their findings, shown in Table 10.8.4a, a firm with no hedging that retained a capital strain of £253 would bear a strain of only £14 if the firm adopted delta rho hedging strategies, and a strain of only \$2 if the firm adopted delta rho vega hedging strategies (Ledlie et al., 377). Irrespective of the growth of hedging, most insurers do not fully hedge their volatility exposure, otherwise known as "Vega." Market fluctuations, or volatility risks, have consequently raised hedging costs. John H. Robinson, managing director of a Honolulu-based wealth management firm, found that perhaps the 1973-1974 bear market was not

severe enough to force insurers to meet their guarantees through reserves. However, the 2000-2002 bear market has indicated that insurers do need to retain a certain level of investment risk for the premiums they collect (Robinson, 56). As a proxy for Robinson's test, a 5 percent GLWB rider was chosen, whereby insurers typically guarantee the investor, or policyholder, a lifetime, systematic withdrawal rate of up to 5 percent of the investment value at the commencement of the contract. Even if the investment value has previously been drawn upon or has suffered from poor investment performance, the investor can still withdraw, so long as withdrawals have not exceeded 5 percent. With that being said, the 1973-1974 bear market was severe enough to lead to depletion of mutual funds and annuity contracts; instead, the stock market rebounded and both the mutual funds and annuity values significantly grew over time. This is not to say that the life insurance industry was left unscathed, as a total of 87 insurance companies failed – most of which occurred in the 1990s (Robinson, 58). Although insurance company failures have not been alarming since the financial crisis, it should be noted that the portfolios of these companies have been reviewed by rating agencies during post-crisis period, with most being downgraded from AA ratings to A (Obersteadt et al., 128). It should be clear that some companies still face asset quality problems.

In contrast to a low interest rate market, if and when the Federal Reserve conducts contractionary monetary policy, thus raising interest rates, current policyholders make opt for fixed-rate annuities. Insurance risks include manifold aspects, though most importantly, longevity risks and lapse risks, or surrenders. Generally speaking, the increasing mortality rates in the life market adversely affect liabilities for life companies selling pension funds and annuities. As a result of unexpected increases in life expectancies, companies have underfunded defined benefit pension plans, leading to reductions in promised benefits to employees or

increased contributions. The term longevity risk, which will be alluded to throughout my thesis, refers to any risk associated with increasing life expectancies of pensioners and policyholders, resulting in higher pay-outs. Most institutions are “short” longevity, meaning that liabilities will increase as longevity increases. Conversely, institutions that are “long” longevity, such as term life and whole-of-life insurance policies, benefit from increases in longevity risk, as the liabilities move inversely with increasing longevity risks. With that being said, a growing concern in the life market has been to minimize longevity risk that is associated with increasing life expectancies.

As retirees continue to live longer, with roughly 20 years in retirement, savings need to last longer. Loss of confidence in equity investments has created a retirement problem. With growing demand for maintaining a lifetime income safety net, insurers must redesign current living benefit riders until there is an ideal balance between risk mitigation and consumer satisfaction (Foster and Skolnick, 1). With surrenders increasing, investors should keep in mind that if they abandon their contracts, they would risk losing guarantees that may have accumulated during the poor market. In addition, new contracts that are offered may not provide the same benefits, as mentioned prior. Operational risks are difficult to measure and cannot be hedged, though must be closely monitored, as these risks include model risks, technological malfunctions, and legal risks.

From 1999 through 2009, variable annuities have overall not fared well, based on a downward stock market and market index funds. In 2012, over 220 arbitration claims were filed, according to the Financial Industry Regulatory Authority, Inc. (Rieker, 1). Insurance providers have responded by raising prices on living benefits (also known as death benefits), reducing overall benefit levels, and sometimes considerably lowering the amount of capital used against it.



With that being said the product pricing of these variable annuities should take into account the potential costs of hedging, risk capital, and also possible policyholder behavior. If such low interest rates persist, several insurance companies may avoid failing by re-pricing their products. Moody 's Senior Vice President, Scott Robinson, recently stated in an interview on March of 2014 that despite de-risking initiatives taken by insurance companies – including Prudential, Jackson National, and Metlife – risk exposures will still remain a major concern, as the substantial risks of the living benefit guarantees will continue to linger on their balance sheets (Koco). And so, even with post-recession initiatives to reduce risk exposure, the risks derived from legacy variable annuities still remain. If innovation is ultimately the key for insurance companies' survivals, along with the ability to profitably roll over their income into new products, regulations must be tailored in such a way to accurately monitor the new life insurance market.

### **Use of Captive Reinsurance**

Captive insurance companies, used by a vast majority of the Fortune 500 companies, are separate entities that provide risk-mitigation services to their parent company. Because they do not shift the risk, or re-distribute risk, to another party, captive insurance companies do not, in actuality, hold true insurance contracts at all. In 1992, the Commissioner of Internal Revenue Service determined in the case of AMERCO Group, the parent company, and Republic Western Insurance Company, the captive, that the relationship and their transactions did not represent insurance, as risks were not being transferred from the parents, but rather being spread. (Lai and Witt, 235). In addition, an issue currently being litigated by the Internal Revenue Service is the excess premiums being charged by captives; a captive company should not be treated as a legitimate insurance company if it charges unreasonable premiums.

To distribute risk from a parent company and captive, a sufficient, unrelated insurance premiums of approximately 30 percent must be pooled together to offset potential losses. Most captives do not have a diversified pool of insurance premiums; for that reason, several captives participate in a risk distribution pool to spread risk and enhance involvement in unrelated insurances. A risk distribution pool combines investments of the participating captives into a single account that is held by a reinsurance company. The reinsurer and respective captive would then enter into a contract, consenting to hold the pool of premiums for a specified period. Although there are evident benefits, if a captive insures against a risk that is more than the parent company can afford, the insurance company can go bankrupt. The establishment of captives began in the 1920s and since then, over 5,000 captives worldwide have been formed. A captive insurance company is generally formed when the parent company is so large that it retains more resources than the insurers who would be covering its risks. Another common reason is because of the fact that it is less expensive to run an insurance subsidiary rather than pay the market value for certain insurance coverage. Captives are often regarded as a long-term risk management strategy, as captives are the central determinant of risk financing and insurance coverage among corporate, parent companies. These captives have enticed life insurers because of special tax incentives, as premium income is not taxable. The ability to retain control of a captive insurance company allows the captive owner to offer custom-designed products with respect to coverage, premiums, and deductibles (Schaller and Harshman, 25).

Other advantages include lower insurance costs, cash flow, and access to the reinsurance market. Through the establishment of captives, the parent company retains profits by not having to seek an outside party for claims processing. With most captives being located offshore, there becomes a direct cash flow advantage for the parent, since premiums can be invested until claims

become payable. Entering the reinsurance market through a captive enables the parent company to structure its program with great flexibility (Bunting et al., 4). In terms of tax benefits, investment control, and risks management, captive reinsurance companies have emerged as a beneficial strategy for life insurers.

Although captive reinsurance companies retain risk exposures, they also possess disadvantages, such as potential losses, limited risk spreads, capital requirements, and management time. Credit risk is also pertinent to licensed insurers if the structure of a captive program required licensed insurers to issue policies to the captive. As a result of acquiring credit risk, reinsurance laws require unlicensed, unaccredited reinsurers to post security for their liabilities; ultimately, the ceding insurers must monitor the captive's ability to secure its obligations (Hall, 1).

A United States legal case in 2008 *Everest National Ins. Co. v. Sutton* is the quintessential example of just how problematic the relationship between the parent company, the captive, and a ceding insurer can be. Centrix, owned by Robert Sutton, originated subprime auto loans, placed with a third party, and arranged for default protection insurance to protect the third party. Everest agreed to assume the program insurer role, as the previous insurer refused to renew the relationship. As a condition, Everest ceded reinsurance to the captive company of Centrix, Founders Insurance Company. In summary, Founders failed hold up their end of the agreement and did not post security in the amount of \$70 million, prompting Everest to seek execution on the guarantees (*Everest National Insurance v. Sutton*, 2007). In Koijen and Yogo's study, they affirmed,

“the current rating methodology has not kept pace with recent developments in shadow insurance, which is different from traditional reinsurance” (Koijen and Yogo 2014b, 9-10).

Furthermore, their study, conducted in 2014, alleged that the cost of life insurer insolvencies could be upwards of \$70 billion. If captives face greater losses than expected, capital requirements may need to be increased, in addition to a rise in renewal premiums. Vermont, in fact, is the single largest captive domicile in the United States, and the third largest in the world, following Bermuda and the Cayman Islands. Therefore, being that the United States, as a whole, has partaken in the captive movement, it is critical to analyze the pros and cons. To ensure financial assurance and to prevent captive insurance failures, there have been seven states within the United States that have assigned provision; Delaware, for example prohibits captive insurance for solid waste, though it permits it for hazardous waste. All in all, captives have become an accepted risk management tool for cost reductions, risk financing, and risk control. Nonetheless, this strategy of so-called “shadow insurance” fundamentally conceals the parent company’s financial weaknesses, placing much risk on the overall financial system, thus significantly understating insolvency risks. For these reasons, a great deal of scrutiny has been placed on the use of captive reinsurance arrangements by regulators and rating agencies.

The concept of captive reinsurance entities is still being contended; since these reinsurers are not properly monitored as other insurance companies are and are not required to abide by the same statutory accounting practices, they could exacerbate a distressed insurance company’s financial situation. The over-dependency and extensive use of captive reinsurance companies weakens the balance sheets of the ceding statutory insurers (Brenneman et al., 10). Reported capital, as well as capital quality, has not kept pace with reserve levels, as illustrated with higher

reserve leverage. Higher reserve requirements reduce the capital strength of variable annuity writers. Statutory minimum capital requirements (Authorized Control Level “ACL” RBC) have remained relatively constant due to the significant reinsurance credit and RBC benefit that variable annuity writers receive for affiliated captive insurance transfers. Search results conclusively found that jurisdictional differences in captive reinsurance capital requirements have weakened balance sheets, thus resulting in a substantial reduction in overall statutory capital among variable annuity writers ceding to captives (Brenneman et al., 10). As stated in the Financial Stability Oversight Council’s annual report, captive reinsurers should be closely monitored by state and federal regulators (Jeffrey, 1). Otherwise referred to as shadow insurance entities, these reinsurers are established to retain risks of the parent company, but could in fact make problems worse. Benjamin M. Lawsky, Superintendent of the New York Department of Financial Services, voiced that these reinsurance companies, or captives, can potentially threaten the stability of the broader financial system, putting policyholders and taxpayers at tremendous risk (Lawsky, 1).

As mentioned earlier, life insurers typically invest premiums in fixed-income investments. However, due to the alarmingly low interest rate environment, the Financial Stability Oversight Council has found that some insurers have invested in riskier assets, such as private equity funds and hedge funds (Jeffrey, 1). Struggling to remain profitable in a not-so-profitable interest rate scenario, insurance companies have considered alternative investment strategies, which may or may not yield higher returns. Even though newer policies were re-priced to reflect the poor economic conditions, life insurance companies have been struggling to fund products with prices based on higher interest rate assumptions profitably (Earley and Aver, 2). United States Treasury bond yields have been on a downward sloping trend for over a

decade. For this reason, many insurance companies have even invested in derivatives, such as commercial mortgage-backed securities.

Considering both the advantages and disadvantages of captive reinsurance companies, let us analyze whether these entities reduce the risks and costs of insolvency as they are intended to, or if they rather augment these risks and costs. Ralph S.J. Kojien and Motohiro Yogo, both experts in the field of life insurance, researched the pros and cons of shadow reinsurance. While shadow insurers reduces marginal costs by 21 percent for the average company, the actual cost of shadow insurance could be even higher than predicted because of the lack of public disclosures and inconsistent regulatory standards, which makes it difficult to analyze the global shadow insurance sector (Kojien and Yogo 2014b, 21). As they have been mentioned in previous discussions, shadow insurance can have severe repercussions on the economy, as there have been banks and life insurers that have become heavily interconnected, taking into account that the most important institutional investor of corporate bonds are indeed life insurance companies (Kojien and Yogo 2014b, 21).

The study conducted by Kojien and Yogo has been criticized by Scott E. Harrington because he believes they fail to properly consider rating agency scrutiny of captive arrangements and overstate any increase in risk. While Kojien and Yogo argued that expected costs from life insurer insolvencies are much more substantial than implied by the current financial ratings, Harrington provided rating agency scrutiny as well, but also criticizes the flaws in the study by Kojien and Yogo. It is crucial to evaluate the reinsurance business, as there has been substantial growth in affiliated reinsurers within the life insurance sector between 2002 and 2012 (Harrington 2014, 6). Harrington alleged that Kojien and Yogo's study does not contain any discussion of XXX or AXXX reserves and captive reinsurance arrangements. And so, while

Harrington insisted that ratings have included reinsurance risks, Koijen and Yogo have essentially over-calculated these risks by adding these risks to the current risk ratings again. After examining Koijen and Yogo's study, Harrington determined that they have been overestimated, as their regression model to support their hypothesis that A.M. Best ratings do not accurately reflect the risks associated with shadow insurance is flawed and "not credible" (Harrington 2014, 6). While I am not certain if Koijen and Yogo incorporated XXX or AXXX reserves into their calculations, I will like to point out that these conservative reserve requirements introduced in 2000 were prior to the financial crisis, when rates were indubitably inaccurate. In addition, even if Koijen and Yogo had overestimated the risks of shadow insurance because of the miscalculations of reserves, it is imperative to note that with the high reserve requirements, life insurers began to rely heavily upon letters of credit, or LOCs, as I will later discuss in greater detail.

Reinsurers are too heavily relied upon by insurance companies; if the reinsurer struggles to meet its financial obligations, it will spawn a domino effect, leaving the insurance company with a hefty obligation that it had no longer anticipated. The case of Mission Insurance Company is the epitome of such over-dependency, as well as under-reserving, as it retained business relations with roughly 600 reinsurers, most of whom were unregulated. As the reinsurers failed or refused to pay, Mission was left with substantial losses between 1984 and 1985 (Massey et al., 46).

Regulators have found the four following ploys that constitute serious reserving weaknesses for captives and can potentially lead to company failures: conditional letters of credit, two-step transactions, hollow assets, and naked parental guarantees (Katz). During periods of financial stress, letters of credit restricted captives from funding policyholder claims

until certain conditions are met. If certain conditions are not yet met and mass claims are filed, the captive will most likely fall short of the funds. Two-step transactions of transferring risk from one insurer to other insurers outside of the state and then to the initial insurer's captive obscures the amount of risk assumed. A letter of credit with a parental guarantee is considered an asset for the captive, while the insurer counts an undrawn letter of credit, which is "hollow", as an asset. Lastly, in some instances, captives do not even obtain a letter of credit as collateral if they hold a parental guarantee and instead assures that its parent company will cover any possible losses (Katz).

Initially, the idea of spreading risks seems logical and even profitable to improve the parent company's portfolio. This may seem promising until the parent company experiences a financial struggle and has to liquidate its assets with the possibility of the reinsurer failing to pay the claims. Because the captive is not an entirely separate operating entity, the transfer of risk is merely taking it from the portfolio of the parent company and onto its captive, though the obligations would affect both entities equally, especially if the parent company becomes insolvent. Once the risk has been transferred, parent companies typically lower their reserves, previously set aside to pay policyholders, for other purposes (Lawsky, 1). This new concept, echoing the financial system's shadow banking concept, could potentially put the stability of the broader financial system at risk if the captives are not sufficiently capitalized.

### **Large-scale Cash Ins of Life Insurance Policies**

A potentially devastating threat to life insurers are mass surrenders, as policyholders terminate their insurance products, thereby endangering the liquidity of the life insurance companies affected. As one can predict, annual surrenders substantially increased during the financial crisis. In 2012 specifically, total surrenders were \$246 billion (Federal Insurance Office



2014, 16). In order to properly gauge the trend in voluntary terminate rates for life insurance policies, the NAIC has concluded that 2012 data individual termination rates of 5.9 percent, 6.2 percent for group, and 15.6 percent for credit. (American Council of Life Insurers, 69). While individual terminations have declined from over 7 percent in 2008, group and credit rates both have fluctuated after the financial crisis. With that being said, it is also important to consider the age ranges that have constituted a majority of these lapses and surrenders. A 2011 study by Canadian Center of Science and Education founded that ages 25 through 35 have been recorded with the highest number of exit occurrences (Mojekwu, 184). The results ultimately show a high correlation between contract terminations and the ages of life insurance policyholders. It is likely that the younger age bracket is more inclined to both allow their life insurance policies to lapse and surrender their policies due to less pressure to accumulate savings for retirement.

Nigeria, in particular, has faced higher lapse rates than the United States due to high inflation and, consequently, declined public confidence. Mortality tables, for instance, have been based on those of advanced countries such as the United States. In addition, policy premiums do not reflect changes in inflations, deterring potential policyholders from investing in life insurance policies. Premiums have been inaccurately priced, and the life insurance industry in Nigeria has ultimately suffered because of the blunders. Policies were not tailored to the needs of policyholders and so, with poor premium pricing and weak customer relationships, many insurance companies suffered mass surrenders in portfolios. With a sluggish economy, Nigeria should focus its efforts on improving policyholders' confidence with regards to the benefits of life insurance policies (Mojekwu, 183).

If the interests of policyholders are not met, surrenders can have devastating effects. Inflation, which was alluded to in the case of Nigeria, adversely impact both life insurers and

policyholders, as economies with high levels of inflation experience eroding the value of payments (Ahlgrim and D'Arcy, 15). That is not to say that inflation is the only concern of life insurers. Both inflation and deflation alike pose risks to insurance companies; while inflation and deflation alike threaten investment returns. As an increasing life expectancy challenges insurers, it also prompts aging policyholders to allow their policies to lapse due to a rise in premiums, whereas younger individuals are less likely to surrender their life insurance policies. Some lapses, though, are not from deliberate attempts to discontinue policies, but rather unknown alternatives, such as life settlements for elderly policyholders.

To further analyze how economic crises impact the actions of policyholders and the performances of life insurers, consider Korea's economic 1997 meltdown during the Asian Crisis, whereby factors including unprecedented unemployment rates and price levels deteriorated demand for life insurance policies, leading to an increase surrender-and-lapse ratio (Park and Hurr, 263). Korea's surrender rates between July 1991 through June 2002 indicate that there had been a sharp rise in lapses, beginning June 1997 and there had been great volatility thereafter (Park and Hurr, 269). Although it is anticipated that high inflations levels, unemployment, and high price levels will prompt policy lapses, it is difficult to scale to what extent lapses will affect life insurers. Driven from a foreign currency shortage and a fall in the money supply with respect to high demand, the insurance industry was scurrying to liquidate assets. While surrendering a life insurance policy is an attempt for policyholders to alleviate financial burdens, such as paying out premiums to a life insurance company, it is more-or-less an abandonment of financial security – a withdrawal from a lifetime investment. Based on data from July 1991 through June 2002, surrenders and lapses during the peak time of the economic crisis reportedly hit unprecedented highs. During the same period, though, households that were

not in financial distress, possibly those have benefitted from the crisis, surrendered their previous contracts and entered into new insurance contracts (Park and Hurr, 269). Some crises, namely the 1997 crisis in Korea as well as the 2007 financial crisis in the United states, detriment economies so greatly that it takes decades for economies to recuperate and function as they did prior to the downturn. In this environment, policyholders may lingeringly suffer from falling income and steepening poverty and insurers may struggle greatly as a result.

Alongside the emergency fund hypothesis, voluntary lapse rates within younger households fluctuate with income shocks and are related to the changes in purchases of other insurance products while the determinant of lapse rates within older households is largely unrelated (Fier and Liebenberg, 1). Households that suffer large, negative income shocks surrender life insurance policies and may decide to purchase a different policy as a substitute. That is not to suggest that there are not households that surrender their policies and opt to retain the cash values instead of reinvesting. The policy replacement hypothesis affirms that consumers surrender their policies with the intent of replacing the original life insurance policy with one that has better terms and a lower price (Fier and Liebenberg, 10). As it will be alluded to later in this section, this is ambiguous, as once insurance companies struggle to alleviate their financial burden, policy terms may be compromised and may not meet all the needs of consumers as they once did. Just like with most investments, there is a give and take, whereby a feature that may benefit the consumer may pose a risk for the insurer. With increasing risks come increasing policy prices.

Also consistent with the emergency fund hypothesis, unemployment has been tested to have a strong correlation with lapse rates. The policyholder has the option to surrender his or her policy at any point in time, which can adversely impact the solvency of the life insurer if the

amount of surrenders, or cash-ins, are large-scale. During recessionary times, especially for those unemployed, most consumers have decided to withhold their investments at cash value in fear that it may be needed. Life insurance is ultimately a contract of periodic added expenses in return for a future savings. Although it provides a security blanket, if household savings are nearly depleted, life insurances will be terminated.

Increasing interest rates have a direct relationship with policy surrenders; as interest rates rise, consumers tend to surrender their life insurance policies. This is because as interest rates increase, alternative investments become more appealing. Policyholders would surrender their policies for a specified cash value and then re-invest those funds into higher, market rate instruments that may accumulate a higher rate of return than a fixed interest rate insurance product (Russell et al., 40). In other words, for both insurers and policyholders, an increase in interest rates reduces the value of long-term fixed income instruments. However, this is somewhat misleading because it also suggests that declining interest rates reduce policy surrenders. As we have witnessed with the recent financial crisis, an extraordinarily low interest rate environment can threaten the financial security of life insurers, as the life insurance market became unprofitable for life insurers.

With that being said, it should be noted that the insurer incurs costs during the inception of a new contract, such as administrative costs and commissions, which may take years to recoup through premiums. If however, the policy is surrendered early on, the insurer may have to realize a loss--sometimes substantial. This may lead to a domino effect; to compensate for these losses from excessive, unexpected lapses, pricing may be re-evaluated for later contracts, dissuading potential customers (Fier and Liebenberg, 3).

Despite improved unemployment rates since July 2008, unemployment in the United States floats around 6 percent, with over nine million individuals in the labor force unemployed (Bureau of Labor Statistics, 1). Seven years after the start of the financial crisis and our economy is far from being fully recovered. Roughly seven million jobs are still needed to restore the unemployment rate to pre-recession levels, which does not include the amount of workers who are currently under-employed. It is therefore anticipated to take years for the United States to fully improve from the bleak economic conditions that have plagued the country for nearly a decade. After noticeable growth during the post-crisis period, the U.S. economy has begun to stagnate, with no implications of growth in the near future.

The life insurance sector indubitably has a direct correlation with harsh economic climates. Just as Korea has witnessed, the United States should not take these alarming economic factors lightly, as they may very well detriment the insurance industry and challenge its long-term stability. As the life market is developing at a rapid pace, it is imperative to recognize and monitor macroeconomic variables that can considerably hinder the financial stability of life insurers.

### **Financial Reform and its Inadequacies**

#### **Changes in Insurance Regulations before the 2007-2008 Financial Crisis**

**Regulation XXX and AXXX.** In 2000, the NAIC adopted the concept of XXX reserves, which required significantly higher reserve requirements than previous levels. Under these new regulatory standards, it was anticipated that the requirements would put upward pressure on term life insurance rates. Implemented in 37 states, Regulation XXX has imposed conservative assumptions for determining the levels of statutory reserves. Within first six years, over \$20 billion face amount of securities had been issued to fund reserve requirements under the new

regulation (Stern, 30). As mentioned, much dissent has emerged, as life insurers believe the new method of calculating reserves are actually redundant since life insurance policies are typically priced to adjust to risk volatilities (Stern, 31). Products subject to these new restrictions require more dedicated capital that cannot be reinvested in other business. The over valuation has hindered insurance companies from engaging in new business, as capital has become considerably limited, especially for term life insurance policies for periods within 20 to 30 years (Stern, 31). Prior to regulatory changes, including the imposition of Regulatory XXX, life insurers were able to engage in new business, though at a risky price; with minimal reserves that would minimize the effects of threats to sustainability, life insurers were unable to compensate for potential risks. For policies with 20- to 30-year life insurers are unable to render larger profits because the turnaround times for each product are rather lengthy. If, however, the term was, say five years, although the reserve requirements are “unnecessary,” life insurers would readjust the prices to reflect inadequate levels of capital investment after the product’s term had concluded.

In an effort to access more capital, insurers have introduced reserve funding securitization structures, though such arrangements have, for the most part, only been completed by large insurance companies because of the excessive costs of the transactions. Securitization is a method in which insurers reduce the risks associated with transactions, namely mortality and longevity. The demand for securitization began in the 1980’s and had proliferated with the United States’ deregulatory system, with insurers engaging in “nontraditional” business practices (Cowley & Cummins, 204). Securitization can reduce transaction costs and create non-redundant securities while improving portfolio efficiency. In this way, securitization has mitigated regulatory costs, as well as reduced portfolio risks, while freeing up capital to conduct

new business. Reserve funding securitizations seek to reduce leverage in order to finance new business transactions and reduce capital costs. But these securitizations have embedded risks, as Cowley and Cummins have noted:

“The actuarial and financial modeling undertaken in support of insurance securitizations are also quite complex and unfamiliar even to sophisticated investors. Each layer of complexity increases the degree of informational asymmetries between the investor and the issuer, reducing credit ratings and adding to costs” (Cowley and Cummins, 223).

Therefore, such reserve funding securitization can in actuality result in reverse effects, whereby the capital costs are increased, as credit ratings are downgraded because of the complexity of securitization.

To relieve itself from the conservative reserve requirements under Regulation XXX, in July 2003, First Colony Life Insurance Company, a subsidiary of Genworth Financial, completed a \$1.15 billion service, of which \$300 million was drawn down immediately, through a special purpose vehicle (SPV), Rive Lake Insurance Company. An additional draw down of \$300 million was completed in December 2003. A SPV is a derivatives product company, created to issue debt of the United States-based insurer or reinsurer. SPVs are often used for securitization purposes and serve no other purposes. Products are packaged into categories, or tranches, and sold in the form of notes to investors. The proceeds from each sale are then transferred from the SPV to the reinsurer and then placed in a Regulation 114 trust (Lash and Wang, 18).

Typically, term life policies, subject to Regulation XXX, are pooled and sold to a captive reinsurer, along with a reinsurance premium for assuming the policy liabilities. These costs are likely to be offset by large tax benefits; as reserves build up, captive reinsurers will receive large

tax deductions in the early years of the transaction, though they may be counterbalanced in later years by generated income. Most of the treaties between the insurer and reinsurer are backed by short-term letters of credit (LOCs) that represent collateral to receive reserve credit.

Since Regulation XXX, United States' life insurers have become increasingly dependent upon LOCs. Aware of such reliance, Standard and Poor's has assessed these risks when assigning ratings, and effective with year-end 2005, the rating agency has factored in the following components: rollover risk, pricing risk, as well as other company-specific issues (Ahern). Rollover risks occur when the LOC or short-term funding solutions are not available in the market and the issuer must recapture the policies and deploying its capital or issuing debt. There is a possibility that this may result in a shortfall of meeting statutory requirements. Pricing risk can arise when LOCs become more expensive and the cost is reset when the collateral is renewed, since there is no price cap on LOCs. Lastly, company-specific issues are any other challenges insurers may face. The call for revisions in the rating criteria had surfaced as a result of the reserve requirements exceeding many insurance companies' equities. The new criteria would treat LOCs or short-term funding of terms less than three years as 100 percent debt. Any LOCs or short-term funding of more than three years, but less than eight, would be treating as a financial leverage as follows: for a term of four years, the short-term funding would be treated as 80 percent debt; for a term of five years, the funding would be treated as 60 percent debt; LOCs or short-term funding with a term of six years would be treated as 40 percent debt; and funds with terms of seven years would be treated as 20 percent debt (Ahern). As you can see, as the term, in years, increases by one, the percentage treated as debt decreases by 20 percent. Standard & Poor's had rated \$4 billion XXX notes in 2008, compared with only \$600 million in 2003 (Martucci). According to a Moody's Investor Service report, life insurers reported a total of



\$324 billion of reserve credits and reinsurance with unauthorized affiliates in 2012, representing 12 percent of total reserves (Harrington 2014, 3). “Unauthorized” captives are permitted to conduct transactions where the insured is located, without the need for licensing outside of the captive’s domicile.

In a similar respect, Standard & Poor’s amended its rating criteria to Regulation AXXX LOCs or short-term funding: LOCs or short-term funding with terms less than five years would be treated as 100 percent. Any LOCs or short-term funding of more than five years, but less than fifteen would have the following proportions of terms and percentage of outstanding notional treated as debt, respectively: six-year term treated as 90 percent debt, seven-year term treated as 80 percent, and so on; as the term increases by one, the percentage treated by national debt decreases by 10 percent. In 2003, the NAIC further implemented regulatory reserve requirements, AXXX reserves, for specified universal life policies with secondary guarantees.

Regulation AXXX, commonly referred to as AG38 or Actuarial Guideline XXXVIII, would, when joined with unexpected lapse and mortality rates, pose great impediments for insurers during a low-interest rate environment. In general, just as low interest rates adversely affect the financial stability of life insurers, so do unanticipated lapses and mortality rates brought about by unexpected disasters. While these high reserve requirements ensure that the life insurers would be able to sustain themselves in unexpected events, these requirements also prevent life insurance companies from accumulating higher profits. To meet the capital requirements in Regulations XXX and AXXX, capital-funding solutions of securitizations have been accepted business practices. It should be noted that the cash flows of insurance securitizations are derived from liabilities rather than assets, and that risks such as mortality and lapsation threaten the ability for life insurers to withstand insurance risks (Lash and Wang, 19).

Ultimately, both endorsements target life insurers of captive reinsurers to finance reserves for both term and universal life insurance policies; many critics have collectively affirmed that Regulations XXX and AXXX are exceedingly conservative and are thus, putting unnecessary strains on insurers. While these traditional statutory regulations are considered unnecessary, securitization vehicles have been used to alleviate capital strains on life insurers. As it has been mentioned, regulators and life insurers should bear in mind the risks that go along with using securitization as a funding option.

**Regulation of reserves.** In 2009, the National Association of Insurance Commissioners (NAIC) adopted the Standard Valuation Law (SVL), in which a new method, referred to as Principle-Based Reserving (PBR), superseded the previous rule-based reserving regulatory environment. The new methodology is aimed at tailoring reserve requirements for each product, rather than determining an across-the-board reserve requirement, which may be too conservative for simple products yet too small for highly complex products. The methodology of calculating reserves was a rule-based system, which was based on interest and mortality rate assumptions. With the development of new underwriting structures overtime, such as captive reinsurances, these underwriting classes require different levels of reserves.

Through a PBR system, insurers set aside a level of reserves, which would be measured by the higher of either using prescribed factors or a wide range of future economic conditions and is computed using justified company experience factors, such as mortality and policyholder behavior. The Valuation Manual, established by the SVL, encompasses guidelines to calculating such reserve requirements, including both life and health insurers, though for the purpose of this paper, only the life sector will be examined. Rather than a concrete formula, state laws would institute standards upon which reserves are based on, with further constraints set forth in the

Valuation Manual, as the prior formulas did not accurately reflect the risks or liability expenses (NAIC).

The American Academy of Actuaries' Life Practice Council (AAA LPC) was appointed by the NAIC's Life and Health Actuarial Task Force (LHATF) to establish a principles-based reserving structure suitable for regulatory purposes (Gorski, 39). Later, the American Academy of Actuaries and the Society of Actuaries (SOA) formed the Preferred Mortality Project Oversight Group (PM POG), comprised of stakeholders, actuaries, regulators, and others within the insurance industry, to develop an approach to calculate, through several algorithms, company-specific underwriting rules through a multifaceted process. With the evolution of new life products, there was been a widespread perception that current reserving methods have led to excessive reserves. Unlike the SVL, the principles-based reserving approach does factor in lapse assumptions, as they are critical to the performance of insurance companies. In addition, the actuarial guidelines also require investment returns. In fact, with realization of the captives industry and its efforts to free up capital from XXX reserves or AXXX reserves, it has become more evident that captives require a revised regulatory regime than Regulation XXX and Regulation AXXX. As of August of 2014, the NAIC assigned the Task Force with developing an action plan to propose changes to reserve requirements with respect to the captives industry (Gorski, 39).

There are several drawbacks to the principles-based reserving methodology, which include untested experience studies, possibilities of weakening consumer protection, potential increases in company insolvencies. In response to the principles-based reserving structure, Benjamin Lawsky, superintendent of the New York State Department of Financial Services, rebutted,

"Given the importance of the solvency and soundness of the life insurance industry to ordinary Americans, state insurance regulators need to be careful about removing the current regulatory scaffolding and replacing it with a structure whose ramifications are not clearly and fully understood" (Davidson, 1).

Under this technique, some products may require lower reserves, while other may mandate higher reserves than originally set forth. It has been a concern that the principles-based reserving model will decrease reserves and as such, these lowered reserve requirements may lead to insurance company insolvencies. Lower reserves thus become problematic when risks are higher than expected. Also, since the principle-reserving method is a new concept and requires new software, it is questionable as to whether or not the data collected for the method is sufficient for it to be implemented well. Gorski attested against the implementation of the reserving structure, stating,

"The introduction of variable annuity guarantees has created the need for dynamic lapse rates and benefit utilization rates that vary by the 'net amount at risk'" (Gorski, 47).

As more products are fast emerging, it is important to note that regulations may not keep pace with product innovations and the reserve requirements may hinder the profitability of life insurers. Since risk factors of these new products are difficult to measure, a risk-based reserve requirement may demand reserves that are too conservative, which reduce profitability for insurers, or too low, which expose insurers to insolvencies and may lead to devastating economic effects. In fact, Anne Obersteadt of the NAIC observed that large insurers specializing in life insurance had large unrealized capital losses in 2008, thereby decreasing capital by 15.7 percent (Obersteadt et al., 119). Though the capital losses were recouped within the following two years

by accessing additional capital, reducing stockholder dividends, and experiencing unanticipated capital gains, the substantial losses in 2008 should be recognized (Obersteadt et al, 119).

### **Changes in Financial Regulation after the 2007-2008 Financial Crisis**

The financial innovations of the insurance sector, coupled with minimal regulation, pose a great risk to the stability of both the insurance and financial sectors alike. Shadow insurances, for example, have inconsistent disclosures, diverted reserves, artificial capital buffers, and weak transparency. Needless to say, these tools are similar to the practices used by investment banks leading up to the financial crisis.

Although financial innovations have profited insurance companies by clearing out their current portfolio for new products, we can simply refer to the financial crisis to conjecture that it was mainly due to excessive risk taking that too big to fail companies went under, specifically one of the largest insurance corporations: American International Group, Inc. As a whole, the concept of risk-taking is believed to be profitable in the short-term, though the long-term effects can be quite detrimental. In the financial markets, an amalgamation of financial innovations and vulnerabilities led to an increase of mortgages on progressively broader terms to less-qualified borrowers, increasing the demand for housing and, soon after, the prices. In order to lend more, investment banks sold mortgages that were in their portfolios in pools, called mortgage-backed securities (MBS). Similar securities bought by investors were collateralized debt obligations (CDOs), which are a type of asset-backed security including MBSs as well as other assets such as auto loans, credit cards, and corporate loans. CDOs were then separated into tranches: the super senior tranches, the senior tranches, the mezzanine tranches, and lastly, the equity tranches. Nevertheless, most of these poorly-constructed instruments received AAA ratings. The life

insurance industry bears asset risks because they invest in derivatives in an effort to earn higher returns.

This poses concerns even today because life insurers are still notably exposed to risky securities, chiefly MBS. Regulators, such as the NAIC, should continue to monitor the performance of the derivatives market and its impact on the life insurance industry's investments. With that being said, it is also necessary to consider the implication of systemic risk derivatives carry. According to Cummins and Weiss, there has been some evidence that insurer investments in MBS are associated with systemic risk (Cummins and Weiss, 29). With \$466 billion of invested assets in MBS in 2006, the United States' life insurance industry witnessed an increase in the mean exposure to MBS from 9.1 percent in 2003 to 11.1 percent in 2006 (Baranoff, and Sager, 102). In response to the financial crisis, regulators mandated a call for all MBS' risk ratings to be re-evaluated, which, in most cases, constituted downgrades. Whether or not life insurers assumed the MBS in particular to be higher quality than they actually were, the greater percentage of portfolios that are invested in such securities create substantial asset risks. Instead of investing capital in assets that would balance risks, insurers had most likely unknowingly invested in MBS that actually carry increased risks (Baranoff and Sager, 111).

**The Dodd-Frank Act.** In response to the 2007-2008 financial crisis, President Obama signed into law a legislation on July 21, 2010 known as the Dodd-Frank Wall Street Reform and Consumer Protection Act. Though its main focus was regulation with respect to the financial sector, Title V targets the insurance industry.

The bill established the Federal Insurance Office (FIO), located within the Department of the Treasury; the Office's duties are to monitor the insurance industry to prevent a systemic

crisis, ensure that all individuals have access to affordable insurance, and report to the President regarding insurance matters relevant to the national level. The FIO has been instituted as the United States' first federal regulator of the insurance industry.

The first section of the Dodd-Frank Act, the Nonadmitted and Reinsurance Reform Act, as it implies, pertains to non-admitted carriers and reinsurers, though the act does not reference any regulations on captives. Although the Dodd-Frank Wall Street Reform and Consumer Protection Act has dissipated many fears of insurance insolvencies, concerns still remain, as the act does not regulate certain sectors of the insurance industry, which pose as dangers to the stability of the life market as a whole. Indeed, because of shortcomings in the regulation, even the sectors that have been monitored by the Dodd-Frank Act may still be exposed to dangers as well. In other words, risks have not been mitigated as the act had sought to achieve.

**Systemic risk regulation.** To gauge the effectiveness of state and federal regulation, it is necessary to examine the systemic risks associated with the insurance sector. Factors that are indicative of systemic risks are the exposure size, interconnectedness, and lack of substitutability (Cummins and Weiss, 5). Risk will proliferate throughout the financial system if institutions have large exposures, are highly networked with other institutions, and are irreplaceable with respect to the services they provide. In other words, if a large insurance company, such as MetLife, Inc., the holding company for Metropolitan Life Insurance Company, went under and was interconnected with several other companies, the adverse affects would spill over to the broader financial system and would more-or-less create a snowball effect that would impair our economy as a whole. The Dodd-Frank Act, though, did not explicitly declare what constituted a non-bank financial company to pose systemic risk, such as the size of the firm and the

interconnectedness. The regulation, therefore, has been implemented with such vagueness that it is too difficult to determine which companies should be closely monitored (Horton, 848).

David Schwarcz and Steven Schwarcz, argued that the Act focuses too heavily on too big to fail companies in an effort to reduce systemic risk. They maintain that life insurers, regardless of size, are interconnected, and interconnected insurance companies can also threaten the financial stability of the life insurance industry. The Dodd-Frank Act failed to adequately address flaws in insurance regulation that could contribute to systemic risk (Schwarcz and Schwarcz, 1569). They call for a regulatory structure that is devised to identify, assess and manage new potential sources of systemic risk in the insurance sector that are not limited to an individual company but from all life insurers because of interconnectedness. In their view, such a structure will give greater regulatory power to the Federal Insurance Office (Schwarcz and Schwarcz, 1576).

Under the Dodd-Frank Act, the Financial Stability Oversight Council (FSOC) was formed to mitigate the potential systemic risks and ultimately reduce fears of future federal bailouts. Based on the company's leverage, risk exposure, and interrelations to other financial institutions, the Council identifies risks posed by companies and reports to the Federal Reserve Board. The FSOC has three primary responsibilities: identify risks to the United States' financial stability caused by large, interrelated bank holding companies, or nonbank financial companies, uphold market discipline, and respond to surfacing threats to the financial system. To designate financial institutions are systemically important, they retain consolidated financial assets of or more than \$50 billion, and either possess at least \$30 billion in gross estimated credit default swaps for which the nonbank financial company is the reference entity, \$3.5 billion in derivative liabilities, or \$20 billion of total debt outstanding (Cummins and Weiss, 27). Those



that have met the above-mentioned criteria would be further analyzed by the FSOC, which will then determine whether or not the company is to be classified as a systemically important financial institution. In the second stage of process for designating a nonbank financial institution as a systemically important financial institution (SIFI), the institution will be subject to further analysis if it has at least \$50 billion of consolidated financial assets and meets or exceeds any one of several additional quantitative thresholds, including \$30 billion in gross national credit default swaps for which the company is the reference entity, \$3.5 billion in derivative liabilities, or \$20 billion of total debt outstanding. Lastly, the final stage is for the FSOC to make a final determination about designating the company as a SIFI (Cummins and Weiss, 27). Despite the rigid guidelines, regulations toward nonbank financial institutions have not been fully enforced, as companies that qualify are not considered as such; as of March 2013, FSOC has not reported any nonbank financial institutions as being systemically important financial institutions (Cummins and Weiss, 27).

Effective in July 2012, the FIO was instituted within the Department of the Treasury to detect loopholes in regulations that may prompt a systemic crisis. However, while the FSOC has the authority to supervise financial institutions and establish conditions to determine whether a company poses a systemic threat to the stability, the FIO serves only as an information-gathering body on insurance matters and monitors activities related to the insurance sector exclusively, except for health insurance and long-term-care insurance. Within the life insurance and annuities sector, the FIO has required life insurers to perform regular reviews of records to confirm that policyholders have not deceased that that no benefits were due to beneficiaries. The FIO has also strongly encouraged all states to adopt the National Association of Commissioners Suitability in Annuity Transactions Model Regulation in an effort to standardize consumer

protection with purchasing annuities (Federal Insurance Office 2014, 4). Thus far, roughly 30 states have adopted this regulation model (Federal Insurance Office 2014, 4). However, these actions taken by states do not represent adequate protection against systemic risk.

The Dodd-Frank Act was put into action to mitigate systemic risk by moving trades to central clearinghouses. Title VII of the Dodd-Frank Act ineffectually attempts to restructure the swaps market so that it appears to be highly liquid. This false liquidity undermines the risk-management aspect of regulations. Swap transactions must now be publicly reported, which could potentially adversely impact the ability of companies to hedge their risks, making dealers weary of engaging in new transactions since they have to report it before hedging the risks (Peirce and Broughel, 79). The swaps market contains a wide a range of categories. For that reason, the rules for reporting should be flexible enough so that each swap is accommodated. If the transparency rules and exceptions from those rules are not properly calibrated, the business strategies of market participants could be compromised and market liquidity could be falter (Peirce and Broughel, 79). The central clearinghouse assumes the risk of swap interconnections and the possibility of one participant failing and the effects proliferating through the market. However, while the counterparty is protected by the clearinghouse, this could in turn destabilize the clearinghouse. In actuality, Charles L. Hauch argued that this enticed both banks and life insurers to clear as many swaps as possible –specifically, credit default swaps (Hauch, 279). Having said that, clearinghouses are also subject to failures when defaults rise among member that owe them substantial amounts on their positions, elevating the risk of clearinghouses, which are left with great financial burdens (Hauch, 285).

Unlike previously, clearinghouses nowadays are for-profit and in an effort to achieve higher profitability, clearinghouses have reduced their risk-management standards (Hauch, 286).

With the Federal Reserve acting as a safety net, providing clearinghouses with funds at the discount window if faced with company defaults, as set forth under the Dodd-Frank Act, there is an apparent conflict of interest, where clearinghouses assume more risks under the assumption that the Federal Reserve bank would rescue them from company failure. By clearing as many credit default swaps as possible, the likelihood of systemic risk is not reduced, in spite of the covenants detailed in the Dodd-Frank Act. Though the credit default swaps were devised to provide protection against the risk of a borrower's default on an obligation, they can contribute to systemic risk, as the failure of one major participant in the credit default swap market may destabilize the overall financial market. Clearinghouses were intended to reduce the systemic risks that these credit default swaps posed by acting as an intermediary between the buyer and seller of the protection, thereby protecting both from one another's potential default. However, as Hauch has mentioned, clearinghouses are enticed to clear as many swaps as they can, even though it may result in failure if member defaults heighten. The Dodd-Frank Act does not consider the possibility of clearinghouses not imposing adequate margin requirements and not properly managing the risks they are undertaking. As a result, a poorly managed clearinghouse could devastate the financial markets as well (Peirce and Broughel, 80). New financial reforms that have been enacted to prevent systemic risks from over-spilling into other markets may instead exacerbate potential harms.

As cited above, the Dodd-Frank Act empowers the Treasury to take action when a non-bank financial company is in default or is in danger of default. Prior to the enactment of the Dodd-Frank Act, bankruptcies and mergers were not analyzed to determine whether they pose systemic risk. As Horton alluded to in his argument, the term systemic risk is difficult to measure and is not clearly defined in the Dodd-Frank Act. He further argued that there is an

ambiguity between the definition of systemic risk and that of financial stability because it has been understood that the systemic risk is when there is no financial stability, where financial stability is described as "the successful management of systemic risk" (Horton, 832). An in-depth description, detailing the criteria under which a non-bank financial company poses systemic risk, must therefore be provided. Systemic expected shortfall (SES), a strategy used by Acharya et al. to measure systemic risk, assesses the amount by which a financial institution's capital drops below its target level conditional on the occurrence of a financial crisis" (Cummins and Weiss, 19). Cummins and Weiss alluded to a 2010 study, which calibrated the SES by analyzing the stocks of 102 financial institutions, including 36 insurance companies. The results confirmed that the top three insurance companies in terms of systemic risk, which were Genworth, Ambac, and MBIA, were "heavily involved in providing financial guarantees for structured products in the credit derivatives market" (Cummins and Weiss, 19).

Further supporting Horton's assertion, Arthur E. Wilmarth, Jr. affirmed that the Dodd-Frank Act did not solve the issue of companies being too big to fail because Congress did not set strict limits on the growth of large, complex financial institutions through mergers and acquisitions (Wilmarth, 956). The Act does make bailouts more difficult, though they are still available, as the Federal Reserve Bank and the Federal Home Loan Bank both maintain the authority to provide emergency assistance to struggling financial institutions. Instead, in troubling times, the Orderly Liquidation Fund will be obliged to borrow funds from the Treasury Department, which is ultimately taxpayers' money. Being that too big to fail companies were a large hindrance during the recent financial crisis, it is worrisome that the Dodd-Frank Act fails to solve the problem of bank supervision and still relies on capital-based regulations on reserves, which failed to prevent the financial crisis (Wilmarth, 1053). The Act, which was primarily

enacted to prevent future bailouts, does not completely prohibit emergency financial assistance during times of financial distress, as we have witnessed prior to the Dodd-Frank Act (Wilmarth, 1054).

**Capital standards.** The National Association of Insurance Commissioners (NAIC) is another regulatory organization which is committed to protecting consumers from unethical insurance practices. The association regulated company licensing, producer licensing, product regulation, market conduct, financial regulation, and consumer services. Through these supervisions, the NAIC ensures consumers that their insurance policies are legitimate and comply with state laws. In addition to analyzing a company's accounting practices and financial presentation, the NAIC also attempts to guarantee that insurance products are justly priced through market regulation. Furthermore, it validates that regulators acting individually on the state-level are deemed ineffective and must be regulated in a unified, organizational body.

An imperative component of the NAIC is the adoption of Risk-Based Capital (RBC) to measure the required capital for a reporting entity to support its overall business operations in consideration of its size and risk profile. RBC therefore limits the amount of risk a company can attain; a company with a greater amount of risk must hold a higher amount of capital, providing a cushion if faced with insolvency. Since RBC is a minimum regulatory capital benchmark, it is not necessarily the full amount of capital that an insurer may prefer to hold. The RBC level can be calculated by the formula equity/risk charges. If a RBC level is, say, 200 percent, the company holds \$2 capital for every \$1 of assumed risk. With that being said, the NAIC has implemented required regulatory actions for each RBC level tier; if above 200 percent, there is no action necessary, if between 150-200 percent, the company must submit a plan to improve capital, if the level is between 100-150 percent, state regulators must specify corrective actions to

take, between 70-100 percent, state regulators may take control of the company, and lastly, if below 70 percent, the state regulators are obligated to seize the company (Eling and Holzmueller, 35).

Since the United States was among the first few countries to shift their regulator frameworks to RBC standards, a study was conducted to compare four different regulatory approaches and determine which is most effective. While the United States upholds the RBC standards, Europe has put into practice a two-stage regulatory framework: Solvency I and Solvency II. New Zealand has adopted a self-regulatory framework, and Switzerland has implemented the Swiss Solvency Test (SST), which is comparable to Solvency I. It is unclear which of the models from the United States, the European Union, New Zealand, and Switzerland, best protects its policyholders by minimizing potential policyholder loss (Eling and Holzmueller, 54).

Just as there are advantages to the RBC standards, there are also disadvantages, which should be examined. Some critics of the RBC framework argue that it actually encourages risk-taking, encouraging banks specifically to adopt capital arbitrage techniques. For instance, just as MBS were once-viewed as low-risk assets, they are now recognized as high-risk securities, as the risks had been underestimated. If the RBC methodology of assessing risks is indeed flawed, it may increase systemic risk in both the banking system and the life insurance industry alike (Hogan et al., 2). As Cummins and Phillips noted,

“The U.S. system would be vastly improved if it relied on market values and took a stochastic approach to solvency analysis. In addition, RBC should be revised to recognize operational risk and catastrophe risk. The U.S. system also should consider the quality of risk management and corporate governance and should

require insurers to conduct ORSA (Own Risk and Solvency Assessment)”  
(Cummins and Phillips, 60).

Nevertheless, NAIC is a voluntary organization of state insurance commissioners and does not have the ability to impose state reform. As a private, nongovernmental entity largely funded by the insurance industry, it is highly vulnerable to industry influence. Thus, NAIC has yet to achieve centralized regulatory control over the insurance sector, initially assuming an advisory role and later expanding its influence until it resembled, in many ways, a federal agency (Randall, 628). NAIC's proposed accreditation program, which encourages uniformity, is anything but unvarying, as it is vague and lacks specificity (Randall, 646). This is not to say that the NAIC does not retain much authority; although the NAIC is a powerful organization, it lacks specificity in its accreditation program and is essentially not uniform in its approach. Just as Randall affirmed, the NAIC has a great deal of influence on states, though cannot force them to act according to their suggestions. Although Randall's work was published in 1999, nearly a decade before the financial crisis, her argument remains valid. If there is no federal regulator with power to force states to comply with regulations, individual states can choose to delegate authority to the organization, which may be problematic, as actions may collide. Potential problems that could arise, as Randall pointed out, are encroachment of the federal government's authority and also the possibility of rescinding delegations. Regulatory reform was needed then and is demanded even more so now, as consumer protection and the stability of the life insurance industry are at risk. I also believe that the Federal Insurance Office, to which the NAIC closely coordinates with, is no better equipped to solve these issues, as it is not a regulatory agency and is responsible for monitoring the insurance sector, including data collection. Given that it has no regulatory authority, there is no reason to believe it would be well-suited to unify the actions of

states to act in accordance with the forum of state insurance regulators under the NAIC. Mark A. Hofmann, reviewed the limited power of the Federal Insurance Office, stating that leaving the power to the states poses inherent challenges. Subcommittee Chairman Randy Neugebauer of Texas affirmed, “FIO has been in existence for over three years, and it’s still not clear what value the office is bringing to policyholders and our domestic industry” (Hofmann).

In an effort to strengthen transparency and improve risk management, another bill, Basel III, was developed by the Basel Committee on Banking Supervision on a global scale. The reforms set forth in the third accord were mainly directed towards the financial sector and to prevent run on banks, as capital requirements were raised by increasing bank liquidity and lowering bank leveraging. In fact, the United States’ Federal Reserve Bank had further reinforced regulations by implementing much forceful standards, such as raising the leverage ratio from 3 percent, as administered by Basel III, to 6 percent for eight systemically important financial institution banks, and 5 percent for their bank insured holding companies (Forbes). The Basel III applies to large financial institutions, as well as small-scale, community banks; it is, therefore, dubious whether this agreement will benefit smaller banks or harm them with great cost burdens.

In attempting to strengthen the quality of capital for life insurance companies and banks, Basel III may lead to excessive risk transfer from the life insurance companies to the consumers, thereby requiring consumer protection to be strengthened (Al-Darwish et al., 53). The Federal Insurance Office’s 2013 Annual Report on the Insurance Industry asserted,

“In general, the Basel III NPRs would apply to BHCs and SLHCs and would increase the amount and quality of capital that such organizations must hold” (Federal Insurance Office 2013, 41).



While the effectiveness of Basel III is being contested, and though regulators have considered requiring insurance companies to abide by the legislation, no rules have been issued thus far with regards to life insurers.

The goal of promoting a stable, resilient banking sector has been hindered by the weaker banks crowded out, decreases of profitability, and inconsistent implementation of Basel III on the international scope (KPMG, 4). Unsettling as this is, regulation has not eliminated the risks tied to both the insurance and financial sectors of the economy; as such, the public should still proceed with caution when engaging in transactions and purchasing investment products.

And so, to remedy the effects of the financial crisis and to prevent future occurrences, regulations have been implemented to restrict investment banks in engaging in the market – for instance, Basel III, though the effectiveness is uncertain. Regulation plays a key role in implementing guidelines for, in this case, insurance companies, requiring certain capital levels and licensing rights. It can also limit techniques in which products are sold. And so, the purpose of insurance regulations is to protect the public from insurance company failures, thereby maintaining high levels of consumer confidence. The aim of regulation is to protect consumers from moral hazard, lack of transparencies, and possible losses. There are, however, regulatory deficiencies, as United States' requirements vary according to jurisdiction. Recent trends indicate an increasing number of companies setting up in less-regulated areas, such as Bermuda, mainly because of a reduction in costs and lower capital requirements. Despite various efforts to thwart company failures, the United States' regulatory system, the Insurance Regulatory Information System (IRIS), was considered ineffective in the 1990s --a period in which company insolvencies peaked (Klein et al., 72).

**Other financial changes besides the Dodd-Frank Act.** Aside from the Dodd-Frank Act, another notable change in the life insurance industry has been the Interstate Insurance Product Regulation Compact (Insurance Compact) and its Commission, which was put into action in order to improve the life insurance regulatory system for life insurers conducting business in more than one state. As of 2013, there had been approximately 41 member states have enacted the Insurance Compact, accounting for 70 percent of the nationwide asset-based premium volume. Over 150 life insurance companies have utilized the compact to make one product filing under one set of uniform standard, requiring one approval to sell the product amongst the participating states (Obersteadt et al., 180). The development and implementation of the Insurance Compact has been widely accepted as a multi-state regulatory system for the filing, review and approval of life insurance products through the concept of uniformity (Obersteadt et al., 172), This regulatory achievement is instrumental in standardizing the regulatory process within the life insurance industry, with states being receptive in their participation. This regulation thus prohibits the use of any inconsistent, ambiguous provisions in a uniform product. These higher standards set forth are therefore aimed at protecting consumers from engaging in misleading business with life insurance companies.

Despite its contributions, the Insurance Compact was established in March 2004 – before the financial crisis devastated the United States economy – and does not make it mandatory for states to participate. As it has been previously mentioned, there must be a mandated regulatory response that all life insurers must adhere to. While these improvements, both the Dodd-Frank Act and the Insurance Compact, are necessary and improve the life insurance industry, they are not effective enough to neither get us out of this stagnation nor prevent another crisis from occurring.

## Conclusion

The life insurance industry has flourished over the past decade by assuming new risks, but while these new strategies may have been deemed profitable until now, assuming new risks may potentially signal financial trouble in the future because of factors such as longevity risk and regulatory shortfalls during the post-crisis period. Although the banking industry was affected the most by the 2007-2008 financial crisis, the life insurance industry, which is a large sector of our economy, was noticeably affected as well. The risky business practices of the life insurance industry predate the financial crisis, but have been largely overlooked. It is true that the rapid growth of life insurance business practices carry extraordinary risks of unforeseen and misjudged losses. I have found that the regulatory reforms do not properly assess the risks of the current life market conditions.

The life insurance industry is susceptible to much vulnerability, which have been largely overlooked. While the vulnerabilities mentioned may not be critical in isolation, they can pose severe threats to the life insurance industry if they occur together and unexpectedly. Also, the attempts to protect life insurance companies, including conservative regulations may drive life insurers to use techniques whose risks are misjudged and not well understood.

In addition, we must also consider the potential spillover effects posed by the insurance industry. The issue of contagion has not been of much concern with the life insurance sector, though the increasing innovations may increase systemic risk and the likelihood of facing contagion effects if these products are not properly regulated. A contagion effect may occur if life insurers that were not experiencing similar problems, experience negative consequences of a life insurance company failure when one company makes an unfavorable announcement. Similar to bank runs, if policyholders lose confidence, they are liable to terminate their policies

with their life insurance companies, even if the life insurer's practices are financially sound. And so, even a solvent life insurance company may be exposed to contagion effects, whether they are intra-industry or inter-industry.

Even without the possibility of contagion from outside of the life insurance industry, the life insurance industry is still susceptible to the risks that stem from the interconnectedness. Life insurance companies have become increasingly interconnected with financial institutions through transactions such as risk transfers; the integration between both economic sectors may threaten the financial stability of each company, as both may now be exposed to the same risks. Not only have banks become increasingly active in the selling of life insurance products, but life insurance companies have invested in risky assets, such as mortgage-backed securities. If the banks conduct immoral business activities, thereby threatening the quality of their portfolio of assets, the spillover effects can potentially harm the life insurance industry. There is ultimately strong evidence that the integration of the United States' financial services industry has increased significantly and is much more profound than previous evidence would suggest.

The risk of increasing life expectancies, known as longevity risk, is pertinent with the growth of annuity lines. This risk is evident when life insurers experience higher than anticipated payout ratios relative to the premium income they had collected. For life insurers, this risk of underestimating survival rates may result in increased liabilities to sufficiently cover payments payable to the policyholders. Longevity risk has certainly been miscalculated; pricing matrices, or pricing strategies to value products offered, used by life insurance companies are flawed, as life insurers have used exceptionally outdated mortality tables, which have underestimated life expectancies. With annuities in particular, the life insurance company promises to make a series of future, predetermined payments to the annuitant in exchange for

either a lump sum payment or a series of regular payments prior to the withdrawal phase of the annuity. The pricing of this contract, though, is determined by various characteristics, including life expectancies. By using outdated mortality tables, life insurers are significantly underestimating this upward trend of life expectancies.

Along with longevity risks are the detrimental effects of a low interest rate environment. With lifespans increasing and interest rates remaining at unprecedented low levels, the life insurance market is exceptionally vulnerable and must be carefully evaluated with respect to its susceptibilities and investment approaches. The life insurance industry is highly sensitive to interest rate fluctuations, especially with annuity products that contain guaranteed benefits, which have inflicted losses on life insurers because of the long-term market volatility. As for annuity products, we should recall that during the financial crisis, life insurance companies drastically reduced their prices and sold annuities at large losses, specifically -19 percent (Koijen and Yogo 2014a, 3). A low interest rate environment also adversely affects the investment income of life insurance companies because most premiums are invested in fixed-income securities. Recall that between 2006 and 2011, the life insurance industry reportedly lost 32 basis points of net yield. (Obersteadt et al.142).

In addition to pushing the federal funds rate as low as possible, the Federal Reserve adopted other tools as well to ease monetary policy, including increasing the size of the Federal Reserve's balance sheet, altering the composition of its balance sheet, and forward guidance to guarantee the continuation of low interest rates for a long period of time. However, these attempts to stimulate economic growth bear notable risks. Through the Federal Reserve's large-scale purchase of risky assets, otherwise known as quantitative easing, questions have been raised about the risks of unwinding the policy (Haltom and Wolman, 3). And forward

guidance may not increase business confidence if the promise to maintain low interest rates is not credible (Haltom and Wolman, 4)

It should also be noted that life insurance companies face potentially even greater risks posed by high interest rate environments as well. As we have seen, when interest rates rise, policyholders are enticed to terminate their current policies in order to purchase new contracts with higher yields, causing solvency problems for life insurers. If policy surrenders exceed what is anticipated by life insurers, life insurance companies will be forced to liquidate company assets to meet financial obligations.

Earlier in the paper I have noted how derisking strategies, particularly the use of reinsurance captives, are associated with risks that are not well understood. These reinsurance captives are inadequately monitored, and if a captive struggles to meet its financial obligations, the parent company will be obligated to meet the financial responsibility that it had no longer anticipated, thus distressing both entities. Life insurers have ultimately evaded statutory regulations through securitization vehicles to alleviate capital strains. However, there is a strong parallel between factors that influence individual insurance company failures and aspects of the current life market, suggesting a possible danger to the life market as a whole.

Although the regulatory environment has improved from the recession, I am uncertain whether regulators will keep pace with the ever-changing innovations of the life insurance industry. The new restrictions imposed by regulators require hefty reserves, such as Regulation XXX and Regulation AXXX, and have been considered too conservative. Too much regulation may steer life insurance companies to assume new risks to evade regulations. The Dodd-Frank Act, which was a regulatory effort to determine companies that are systematically important and prevent excessive risks, is heavily flawed as well. Systemic risk is difficult to measure and is not

explicitly defined in the act. Also, Title VII's attempt to regulate derivative trading may backfire because of incentives to clear as many swaps as possible through clearinghouses. So, rather than reducing systemic risk, these clearinghouses essentially create more systemic risk. Lastly, the Dodd-Frank Act fails to solve the too big to fail problem, as Congress did not set strict limits on the growth of large, complex financial institutions through mergers and acquisitions.

Regulatory reforms cannot keep up with financial innovations that are designed to circumvent regulation. In addition, as risks have become more complex, life insurers may unknowingly assume too much risk and overly rely on risk-hedging instruments.

While my data collection is limited to the research above, further research is necessary to examine the performances of life insurance companies that are greatly intertwined with the banking industry and have heavily invested in securitization products. Over time, as more experience with the use of these securitization products allows us to analyze their true impact, it would be intriguing to compare their current profitability of life insurers with their profitability after having used these products for a number of years to determine if the profitability of life insurers has declined as a result of their use. It will also be helpful to analyze the impact of new de-risking practices and to probe further into the interconnectedness among life insurers.

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