

Investing in Insurance Linked Investments

Come rain or shine

Introduction

Since 2006 PGGM has been investing in Insurance Linked Investments on behalf of the Pensioenfonds Zorg en Welzijn ('PFZW'). Over the past 12 years, this has grown into a mandate of over € 4 billion (June 30, 2018), or around 2% of PFZW's assets under management. Through this mandate, PFZW shares natural catastrophe risk with (re)insurance companies. These risks relate to high impact events that do not occur regularly but can lead to a large number of insurance claims. For PFZW, this is an investment that provides an attractive return of 7% per year since inception and offers unique diversification of the overall asset mix due to its low correlation with economic variables. In addition, due to the short tenor of contracts, sophisticated models and large amount of data available, the risk involved can be measured and priced with a relatively high degree of precision. For insurers and reinsurers, Insurance Linked Investments ('ILI') enables them to reduce concentration risk on their balance sheet, making them better able to withstand extreme events and continue writing affordable insurance contracts.

In this paper we elaborate on why we incorporate this asset class in our investment portfolio, how we implement this and how expected losses are measured.

PGGM and PFZW

PGGM is a leading pension fund service provider in The Netherlands and currently manages € 215 billion (June 30, 2018) of pension assets for a number of Dutch pension funds, including € 202 billion (June 30, 2018) for the pension fund for the care and healthcare sector ('PFZW'). PGGM and PFZW are both not-for-profit organisations and strongly believe that financial return and social responsibility go hand in hand. Consequently, we have developed a social agenda and a responsible investment philosophy in which we invest in companies, projects and assets in which environmental, social and governance standards are met. Through these initiatives we try to take our responsibility as a financial institution and actively contribute to a more sustainable financial system.

PFZW has given PGGM an exclusive mandate to invest in insurance linked investments. We focus on taking over natural catastrophe risk from (re)insurers through catastrophe bonds ('cat bonds') and private contracts. We have started investing in 2006 and our current portfolio exceeds € 4 billion notional invested. As such, we are recognized as one of the largest end-investors in ILI. By engaging in insurance linked investments PFZW receives attractive risk-adjusted returns and efficiently diversifies its portfolio. In addition, through ILI PGGM and PFZW help the insurance industry to manage their natural catastrophe exposures, leading to a healthier, more affordable insurance sector with less systemic risk and therefore a more sustainable financial system – an important pillar in PGGM's responsible investment philosophy.

The origin of Insurance Linked Investments

The rationale for insurance is well understood. While individuals and businesses can efficiently keep reserves for expenses that occur frequently, such as building maintenance, it is inefficient if everyone reserves individually for infrequent but high impact events, such as fire damage to your house. Insurance companies can aggregate and reserve for these risks efficiently by diversifying over many different individuals and businesses, spread over different locations and covering different types of insured risks (such as property & casualty, life and health insurance programs). It is a clear win-win situation: the insurance company receives a premium, while the client can rest comfortably knowing they are financially protected, come rain or shine.

Insurers strive to have a balanced book of risks they insure. Reinsurers help insurers achieve this by taking over some of the risk concentrations from different insurance companies. This predominantly relates to natural catastrophe risk. Such risk, for example a hurricane or earthquake occurring in a highly populated and insured area, could lead to a significant number of damages claims for an insurance company.

Reinsurers in turn try to globally diversify their exposure to different kinds of natural catastrophes or 'perils', such as wind damage, flooding, wildfires and earthquakes. This traditional insurance model is viable as long as the insurers are able to control the total expected loss in their books through a large number of insureds and through diversification, and allocating appropriate policy rates to their insurance programs.

However, there are limits to the diversification an insurer or reinsurer can achieve. In August 1992, the category 5 hurricane Andrew made landfall in Florida, leading to over 100,000 homes damaged or destroyed and over 15 billion dollars of damage claims to insurers. This amount was so large that several insurance companies did not have sufficient capital to cover all claims, going bankrupt and causing almost 1 million policyholders to lose their insurance coverage.

The issue then is that insurers and reinsurers can be diversified but that a single extreme event can still consume all their capital. The stunning losses of Hurricane Andrew (1992) and, more recently, hurricane Katrina (2005) have highlighted the limitations of the capital available in the traditional reinsurance world and spurred a paradigm shift in catastrophe risk financing. It has become increasingly clear that the traditional reinsurance industry needs to tap into the funds of (institutional) investors to share the risks in return for sharing the insurance premium. This is why insurance linked investments exist.

Insurance Linked Investments

Insurance linked investments refer to a collection of financial instruments whose value and risk-return characteristics are determined by a pool of (re)insurance contracts. As mentioned, the purpose of ILI is to enable insurers and reinsurers to manage the concentration risks in their insurance books by transferring a specific part of that risk to the capital markets. Because damage claims from natural catastrophes generally present the largest concentrated exposure for insurers and reinsurers, the vast majority of ILI relates to this risk. However, ILI can relate to all types of insured risks, such as operational liability risks.

An insurer can decide which portfolio of (re)insurance contracts it wishes to share and which instrument it wishes to use for that purpose. The best known ILI instrument are the publicly tradeable catastrophe bonds, or 'cat bonds', that have a 3-year tenor. Due to the cost of listing securities on an exchange these are only issued by the larger insurers and reinsurers. Therefore a large segment of the ILI market consists of private contracts with investors or fund managers, which typically mature and are renewed every year. Both private and public instruments can be used to share the same risk. As such, the risk profile of an investment does not predominantly depend on the financial instrument, but on the underlying risk of the (re)insurance contracts.

Why PFZW invest in ILI

After the active hurricane seasons in 2004 and 2005 the growth of the ILI market accelerated, as capital requirements for insurers were further increased. PFZW started investing in ILI in 2006, initially in cat bonds as these have the lowest barrier to entry. Between 2009 and 2014, the step was taken to expand the portfolio by investing in collateralized reinsurance fund managers. Since 2014, PGGM has focused on building strategic partnerships with top tier reinsurance companies to improve access to and selection of risk.

The rationale for investing in ILI is first and foremost because it provides attractive long-term risk-adjusted returns. In addition, while insurers transfer these risks to mitigate concentration risk, ILI provides excellent diversification for a traditional pension fund investment portfolio. After all, where a stock market crash could lead to a poor investment performance for most asset classes, it does not trigger a hurricane or earthquake to occur and therefore has no direct impact on the performance of ILI.

Finally, ILI fits within PGGM's and PFZW's broader ambition to contribute to a sustainable financial system and a valuable future. By providing capital to insurers and

reinsurers, PFZW helps to keep insurance for consumers against extreme events affordable and sustainable. In addition, ILI contributes to helping countries, people and businesses deal with the effects of climate change and natural disasters. ILI has therefore been identified as a Sustainable Development Investment, on the basis of the United Nation's classification for Sustainable Development Goals¹.

PGGM's approach to investing in ILI

PFZW has given PGGM a mandate to invest in ILI focused on natural catastrophe risk. PGGM implements this mandate on the basis of a philosophy consisting of five interrelated core investment beliefs.

Firstly, PGGM believes that the best way to access this risk is by building **long-term strategic relationships** with established industry leaders, such as ILS managers, reinsurers and insurance companies. Together with these partners, we set up dedicated investment vehicles that allow us to control the structure and risk profile of the investments as much as possible. In addition we look for strong alignment of interest and we value responsiveness, transparency and an open mind towards new ideas and initiatives in our partners.

Secondly, we strive for **efficient implementation** of the investments. By disintermediating the insurance distribution chain from insurer to capital market, we believe we have more efficient access to the risk; leading to more control, more transparency and lower costs.

Thirdly, we aim to **pro-actively adapt** to meet the changing demands of the reinsurance industry, thereby remaining an attractive and reliable partner for our relationships.

Fourthly, we aim to build a **balanced portfolio** across geographies and risk levels that is a good representation of the market, with a focus on **peak perils**, meaning those risks that the reinsurance sector cannot diversify sufficiently. Through this focus we believe we can achieve stronger risk-adjusted returns.

Finally, we believe that the **quality of our people** together with **PFZW's long-term and solid commitment** to the asset class form the basis of our success. Through a thorough understanding of the (re)insurance market and the solid and long-term capital base PFZW offers, we believe we can become a long-term reliable partner for the (re)insurance industry without forgetting our roots. For this reason, we speak our own voice on topics that matter to

us. We continue to develop and strengthen our strategy and implementation, by means of consistency and innovation.

Measuring expected loss

One of the key considerations when investing in ILI is how to reach an appropriate estimate what losses to expect in the case of infrequent but potentially high impact events such as natural catastrophes. For this purpose, specialised models are used to provide a best estimate of what kind of extreme events could occur and their impact. These estimates are based both on historical experience and also include up-to-date knowledge of climate conditions, therefore allowing these to estimate theoretical future events that have not occurred historically.

The expected loss on insurance policies as a result of a natural catastrophe can be broken down in four main components: (1) the probability of an event occurring, for example the number of hurricanes in the East Atlantic Ocean basin in a given year; (2) the intensity of that event, whether it is a category 1 or a category 5 hurricane; (3) the location of the event, or the path of the hurricane; and (4) the total insured value in that location or path.

To be able to estimate these components, a wealth of data is collected and analysed that can be used by (re) insurance companies. For example, measurement of the frequency, intensity and paths of hurricanes in the East Atlantic Ocean basin dates back to 1851. Data on the occurrence and intensity of earthquakes even goes back thousands of years, thanks to geological research of earth layers. In addition, insurers and reinsurers have access to vast databases that contain detailed information about insured property, such as location, value and building standards, in order to be able to predict the potential damage to a property based on the nature and intensity of an extreme event.

Specialised catastrophe risk models then combine this data to simulate thousands of potential scenarios and provide a reasonable estimate of the probability of an extreme event occurring and the damage it could cause.

These models are updated and are further refined on a yearly basis to ensure the best possible measurement of the risk. In addition, as these are stochastic models, they do not only base their scenarios on events that have happened historically but can also simulate the impact of

¹ This relates to Sustainable Development Goal number 13 regarding Climate Change, which amongst others things targets the strengthening of resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

theoretical scenarios in which natural catastrophes occur with an unprecedented frequency, severity or location.

Thanks to these sophisticated models, expected losses for insurance policies are updated every year to include new information and additional risks. Insurers and reinsurers use this new information regarding expected loss as input to adjust insurance premiums every year. These premiums also factor into the return of the investments, ensuring that for the expected return of the portfolio such additional risks, if any, are duly taken into account.

Climate Change

Considering the exposure to extreme weather events, it is natural that climate risk and climate change are key themes for the insurance sector and a much researched topic. Currently, global warming only accounts for a minor part of the variability of hurricanes and therefore expected loss. Changes in climate risk are updated into the catastrophe risk models every year and the pricing in the insurance sector of the coming year is set taking these risks into account. Due to these factors, as well as the fact that the vast majority of ILI contracts have tenors of one to three years, any increase in claims as a result of climate change on the ILI portfolio will be substantially compensated by an increase in premiums.

Our experience

As PGGM focuses on taking over the infrequent but potentially high impact risk of natural catastrophes, the return pattern is by its nature relatively binary: in many years the portfolio will experience little to no losses and a positive return, but when a major natural catastrophe occurs in an area with high total insured value, for example a hurricane passing over Miami, the portfolio could take a severe loss.

To illustrate the nature of the risk and return profile: in the 12 years since inception of the mandate the average return is 7% per annum. For 11 years the portfolio had a positive return, and for only one year the return was slightly negative². Consequently, as a result of the long-term commitment to the asset class, the portfolio has been able to build a 'buffer'. As per June 2018, the portfolio could withstand a significant loss and still have a long-term performance since inception in line with the long term return target. Due to the nature of the risk, while it is highly unlikely, such an extreme loss event could happen in any year.

Conclusion

We consider Insurance Linked Investments a good addition to PFZW's portfolio. It offers attractive, risk-adjusted returns on a stand-alone basis and unique diversification benefits from the traditional asset classes such as equity and debt. In addition, it fits into the ambition to contribute to a sustainable financial system and the UN's sustainable development goals regarding climate change. That said, investing in ILI should not be taken lightly: it requires investment expertise and a strong understanding of the insurance industry as well as the specific risk and return characteristics of the asset class. It is essential to take a long-term perspective, something that comes naturally to a pension fund, and not to invest opportunistically trying to time when to get in or out. It is possible that an extreme event causes a large loss in the first year that you invest, however in the long term the many positive return years should compensate for that. Because there is always sunshine after the rain.

² In 2017 the portfolio experienced a return of -2%, as a result of hurricanes Harvey, Irma and Maria and wildfires in California.

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Voor een waardevolle toekomst