LIVING TO 100 SYMPOSIUM*

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Session 5A: Longevity Risk Pricing Q&A

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BOB HOWARD: My question is for Jiajia. I looked at the longevity bonds and it seemed that one of the main difficulties with them is that there is an imbalance of information. The people who are doing the work on the morbidity index, which is crucial to setting the price at an ongoing basis for that bond, may have knowledge long before it can become public. They're the people who are much closer to the underlying information, although they may not be a direct party who have information and consequently, you can have a delay of a year or two and differing degrees of information for the parties. And those things I thought would almost make it unsatisfactory to have that as a public issue or at least a tradable issue. I could see it as something where you buy it and you got to hold it for a period of time. But not something where it can be traded. I'm wondering if you've thought of any way around that difficulty, so that it could become an actively traded issue?

JIAJIA CUI: Thank you for this excellent remark that brings us to a very realistic and serious issue of information asymmetry between the markets, sell side and buy side. Of course, in my model, I assumed that it's symmetric information. but in reality I acknowledge that it is much more complicated than this and in my opinion, if this market is to be developed a crucial thing is that the markets sell side of the investors, needs time to educate or get this information. So I think there are benefits for doing this. It is the responsibility of the insurance company pension funds to make this knowledge, information understandable to the general public, to provide this information in a timely manner and as broad as possible. Also, it is beneficial for the broad investors, consumers to get this information as early as possible and as good as possible so that they can better prepare themselves for their retirement. So the better you learn from this type of instrument, you can be more aware of the longevity improvements and you can better plan the retirement. That's what our research has shown that it's clearly for our benefit for getting this information in a timely manner. But how this information asymmetry will be resolved in reality, it depends on both sides to put more effort in getting the information. I hope it will be done in the education sector and also by the industry to educate the general public.

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TONY GREEN: Two questions. Jiajia, the first one related to the question of the misstatement risk. The misstatement risk, is this more a risk of lack of data or some ignorance that could be diversified or eliminated if you had a longer period of time? It just seemed to me if you have a feedback loop, where you can look back over time and estimate the true mortality for these different risks, then that risk that we're seeing is an un-diversifiable risk, could be eliminated.

JAY VADIVELOO: Can I respond to that? It's a reality that is happening that underwriters could underestimate the true life expectancy. Now given that you know that's going to be happening, then how do you put some decent parameters to capture that? One thing is sort of commonsense,, unless there is fraud involved and we assume there is no fraud involved, the chance of an underwriter misstating say the true life expectancy by understating by two years, has a higher probability than understating it for say four years. So you have that declining type of probability. Of course, the more important thing is when you come up with a pad, you really cannot artificially increase the underwriting life expectancy by too much, otherwise, you won't have a competitive product. What's the cost?

You set it up so that the piece on this probability distribution and using some kind of a cost measure, you keep it to a certain level. I think it can be partially diversified if you have several underwriters, but what most life settlement companies are doing, they're taking the average or taking the shorter one. So it is just a way to capture the fact that there is really understatement and I've done other work where I've seen that but it's not something that is based on ignorance or lack of data. They're continually improving it, but certainly it's still happening there.

TONY GREEN: But it seemed that regardless of what the underwriters are doing, if you have access to data in the past that shows a pattern of overestimating the life span, then you could actually adjust whatever they've given you. If constantly over a two year or 10, 20 percent overestimation, you could always adjust for that. So, some of the data could actually help you to correct the problem.

JAY VADIVELOO: Correct. One of the problems is getting access to life settlements data. Actually when we came up with the model, what we did was, and I think Mike mentioned it, we actually calibrated this technique or this methodology against structured settlements data and we had access to structured settlements data from an insurance company and we found that this method did create a decent estimate for this sort of risk, but we haven't yet been able to get access to life settlements data to be able to check this.

TONY GREEN: I think Texas requires that life settlement companies file that data and there is actually a report that does go back and look at that data. That was actually the case where there was a lot of overestimation in terms of life span.

JAY VADIVELOO: Okay that is good to know.

TONY GREEN: Does your model contemplate a tax status of the individual retiree or the tax status of the different vehicles?

JAY VADIVELOO: The model does capture that, but probably not in a sophisticated way. I think the whole purpose of this financial planning model, I don't want to defend sort of the completeness of the model, but I think the most important thing the model revealed was that an integrated strategy can outperform a pure investment strategy. One of the questions that I was expecting someone to ask me, why is this happening? Sometimes when you have this complicated model, it's very hard to determine why the results are what they are. One explanation that I think is true and it's a very subtle simple explanation, suppose you are a retiree and you'd need $5,000 a month to be comfortable. You can do a pure investment strategy and given that you have your ruin probabilities kept to minimum, chances are your investment strategies will be relatively conservative. And that's commonsense, right? Now suppose you purchase some form of immediate annuity type protection which guarantees you an income level of say $3,000 a month. To fill up the remaining $2,000 you can take a more aggressive investment posture and that's where the richness of the model comes in and that's how you get this variety of results. But the key thing is that we let the model display and we don't use an analytical solution. We actually use sort of an old-fashioned exhaustive approach and pick the best solutions, so that the nice thing about it is that relative to our combinations, this is the best approach based on the assumption, so it is fairly easy to check whether it's logical or not. That's the approach we used.

SAM GUTTERMAN: Question regarding the second paper. There's reference to risk preference and it seemed as if it was a significant variable. I believe you mentioned that it was based on a utility something. Could you describe how you calibrated your utility for risk preference?

JIAJIA CUI: In this preference parameter place at because it's determining the risk aversion of the company and that's one of the driving force for the magnitude of the risk of premium. And the way it calibrates this parameter is by observing assets allocation of the company and the dividends policy of this company. Because from this model, it does not only provide a risk of premium, the results do not only have the risk premium, it also gives you the optimal portfolio choice and optimal dividends choice. So, my opinion of calibrated this model is to match assets allocation of the company and to match the dividend policy of the company to back out this parameter. In this exercise, I didn't calibrate this B parameter myself. I let it vary from 0 to 1 and I didn't do the calibration myself. But what I said is a strategy to be able to back it out.

ARSHAD QURESHI: With respect to the life expectancy extension risk, the general life expectancy extension risk can be taken care of by buying insurance. It is not available now, but it will be available. The other thing is that life expectancy could be absolutely accurate but the incidence of death is what really creates the financial disparity. The deaths could come earlier and the tail could be much longer or the deaths could come later and the tail could be shorter. You would still get the same life expectancy so the risk is really not there. Some of the things you need to incorporate or

look at is the incidence of death. That goes back to the problem of what is the appropriate mortality table or what is the appropriate slope? It's further compounded by the fact that most life settlement businesses is transacted at older ages, 65 and older or 70 and so on. Most of the data included in the VBT and any other tables published by the Society of Actuaries, at those ages is not really suitable for this. The third problem is that the underwriting norms were developed by the insurance industry and the insurance industry underwrote only up to age 65 and didn't go beyond that. So those indices which are normally used are really not applicable to this population. Now there are solutions to that and I think that those need to be incorporated into your research. Thank you.

JAY VADIVELOO: I agree with all your comments and I would actually strongly recommend that the Society of Actuaries sponsor a mortality study of life settlements business. I think that's something that will benefit a lot of players in this marketplace.