WHITE PAPER

The Dynamic Journey of Risk Needs Evolving Frameworks of Insurance

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Abstract

All risks that are not pure in nature are considered speculative. Is this always true or is there a different class of risk that can be placed between these two extremes? Can we explore a 'non-pure and non-speculative' category of risk?

In the existing framework, such scenarios and opportunities are treated as speculative risks and therefore, insurance products are not offered for them. However, new dynamism, innovations, and capabilities in the last few years have given us improved technical skills and infrastructure. This enables us to not only differentiate between speculative risk and non-pure and non-speculative risk, it also enables us innovate and design new insurance products.

Such a new framework can create immense market opportunities for the insurance business. The evolving implementation of such insurance products and strategies will bring more stability for businesses and global economies. In its working module, this will also demand improved transparency and will lead to better corporate governance. So, we are left with the task of making preparations to build and capitalize on this game-changing insurance framework.

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Theory of 'void' between pure and speculative risks

Without delving into textbook explanations of pure and speculative risks, it seems prudent to highlight the core difference between the two. The risks where there is no chance of making a profit from an insurance contract, or in other words there is an insurance claim only against incurred losses (actual or expected), are categorized as pure risks. Risk scenarios where an insurance contract can be used to garner profits are classified as speculative risks. Based on this core difference, it seems reasonable that insurance products are not offered for scenarios under speculative risk category. The motivation behind purchase of insurance should never be to make profits. Insurance should only play the role of financial transfer of risk.

Nevertheless, there exists a space that remains unattended. Before we go further and explain this space, consider the following scenario. Let's consider a situation at time 't', when our analysis estimates that the projected cash flow at time 'T' will be $10 million out of which $4 million is the profit. All parties agree to this calculation and its underlying assumptions. However, in reality, the cash flow turns out to be only $8.5 million at time 'T'.

Is this not a financial risk that needs to be insured? The first reaction to this expected response will be to focus on the concept of speculative risk. There is a good possibility that the cash flow at time 'T' may turn out to be $12 million, in which case the insured will be making additional profits. Therefore, having an insurance product eliminates the downside risk. An upside potential, however, is still present. This is against the principles of insurance and is not sustainable. Can a new framework upgrade this situation? Before we talk about an upgrade, let us further analyze the situation presented above. Is it not a business need to have a risk transfer product for this scenario? An insurer will have its own underwriting in place to analyze business projections, assumptions, and data before insurance coverage for such a risk is provided.

As shown in the figure above, if the actual cash flow at time 'T' is less than $6 million, it is a clear loss situation. If it is between $6 and $10 million, it is not a nominal but a real loss situation because the whole analysis and projections at time 't' estimated and approved $10 million cash flow for time 'T'. More than $10 million cash flow at time 'T' is a case of additional profit.

Based on these profit and loss situations, people can argue that this is the real essence of business and additional profits in business processes are an outcome of risk reward trade-offs only. The idea of insurance is actually in contradiction to the concept of business itself. This analogy can weaken the case for all insurance offerings for businesses. Commercial transactions at component level will lose their importance as they can also be classified as business frameworks. The idea here is to underline whether any business wants to have its own risk reward trade-off based on an underlying proposition, which they are always free to do. However, if businesses want to have a risk transfer product for such scenarios that is currently not available, the insurance companies can create and offer products for them.

If we can build confidence in this understanding, it will make sense to innovate insurance products for actual cash flow situations between $6 and $10 million at time 'T', if it has passed through the process of underwriting at time 't'. We will discuss details about underwriting in another section of this paper. The interesting situation will be when there is a cash flow of more than $10 million at time 'T'. We need to discount this situation in advance when we are designing such products so that principles of insurance remain intact, and fundamental purposes and motivations of insurance are not defeated.

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Can analogy help us understand better?

We can take some clues from annuities, where similar things happen. In a defined benefit annuity product with periodic, certain payments, today's amount X is periodically paid and the actual nominal disbursement is generally X+Y. The Y is mainly the time value of money that is guaranteed at the time of contract inception. Therefore, a gain/profit of Y is being guaranteed. Here, the only underlying risk factor appears to be the interest rate risk.

Henceforth, when a business has a strategy with multiple risk factors and after analyzing all of them in a coordinated manner, they want to insure 'Y' (according to the example above) that is a profit, why should we not offer such an insurance product?

This cross reference suggests that such an offering is restricted because of the possibility of cash flow that can be greater than $10 million. We will analyze and address this issue in the coming section.

Let's examine a reckoner to explain why insurance products with speculative risks only cannot be sold even if they can be designed in many cases. For this, we will consider a simple example of a gamble and try to price it. Let's see how many people will be willing to buy such an insurance product even if they are offered in the market. Based on this, we can explain that there exists a 'non-pure and non-speculative' category of risk that can not only be priced but also be sold as it is different from the 'speculative' category of risk. Further, in its working framework, we will analyze current challenges and try to capture them.

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Will there be buyers for insurance products covering speculative risks?

Let's put all things aside and assume that an insurance product covering speculative risk has been created. We are going to understand its pricing based on a simple gamble.

Scenario: There are two parties A and B who play a gamble and toss a six-faced dice, numbered 1 to 6 on each face.

Rule: The dice will be tossed and if A bets on 6 and 6 is the outcome of the toss, B will pay party A $118. To play the gamble, A has to make an upfront payment of $20 to B. Here B is offering the gamble.

Analysis – How are the rules created? There is 1/6 probability of landing a 6 when the dice is tossed. Therefore, in a fair gamble, on a bet of $20 a person should get $120 if she / he wins. However, in a fair gamble, what is the motivation for another party to offer a gambling product? What about infrastructure and transaction costs? Therefore, in practice, the winner of a bet will always receive less than the 'probabilistic calculation' value from the party creating the gamble. In this case, we are assuming that $2 is the infrastructure and transaction costs including profit margins.

Now consider the situation when A approaches an insurer to provide insurance coverage for this rule-based gamble. For some time, we assume that the insurer agrees to offer coverage for this rule-based gamble but the coverage will have a price. We need to look at this price to understand why such an insurance product will not get buyers in the market.

Probability of winning the gamble = 1/6

Winning amount = $118

Profit when gamble is won = $118 - $20 = $98

Probability of losing the gamble = 5/6

Loss when gamble is defeated = $20

So, the insurer will be required to make claim payments as per the scenarios stated below.

If the gamble is won, no payment is required to be made to the insured with a probability of 1/6.

If the gamble is lost, a payment of $118 is required to be made to the insured with a probability of 5/6.

Therefore, the probabilistic claim payment from the insurer to the insured will be $98.33 [=$118*(5/6) + $0*(1/6)]

When the insurer is accepting such risk, there will be additional costs and profit margin in offering insurance coverage. If we assume that the additional cost is $1.67 in this example, a payment of $100 is required to be made as premium from the insured to the insurer to have an insurance coverage for speculative risk.

Therefore, the final payoff for the insured with an insurance coverage for speculative risk will likely to be as follows:

If the gamble is won, she has already paid $20 towards entering the gamble and $100 towards insurance coverage premium. So her final payoff is $ -2 ($2 loss, calculation = -$20 - $100 + $118). In this case, $118 is the winning amount.

If the gamble is lost, she has already paid $20 towards entering the gamble and $100 towards insurance coverage premium. So her final payoff is $ -2 ($2 loss, calculation = -$20 - $100 + $118). In this case, $118 is the claim payment from the insurer to the insured.

Hence, why would someone buy an insurance coverage for speculative risk when they are always going to make a loss in any situation? Even in a frictionless business environment where there is no cost towards offering a gamble and the insurer charges zero cost towards infrastructure and profit margin (which in practice is never possible), there will be zero benefit for the insured in all scenarios under insurance coverage for speculative risks.

The lesson from this example is that speculative risk-based insurance products will not get buyers in the market, even when an insurance product can technically be designed and offered.

Based on this learning, this paper will explore an in-between risk category that is non-pure and non-speculative. This will allow us to understand that there is a need to structure risk categories in three groups rather than in two groups.

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Introducing new risk category as non-pure and non-speculative

This paper proposes to introduce a new risk category 'non-pure and non-speculative' that will partially inherit features from both existing risk categories of pure risk and speculative risk. At present, this category of risk is categorized under speculative risk, for which insurance products are not offered.

Once this new category of risk is established, we need to understand its properties in detail to design insurance products for them using basic insurance principles and underlying business propositions. We can cover multiple scenarios under this category, including business profits, cash flows, strategy, business decisions, IT projects, regulatory changes, expansion or contraction decisions, and product introductions.

Pure Risk	Non-Pure & Non-Speculative Risk	Speculative Risk

This paper does not claim that all of these scenarios will be technically feasible in the form of a new insurance product at this point in time. But, these are not speculative risks as they need supportive arguments, analysis, logic, research, backgrounds, and decisions before they are actioned upon.

The most crucial challenge, here, is to bring the situation of cash flow exceeding $10 million at time 'T' (from the earlier example) under insurance coverage parlance. The second area of research will be the availability of data to come up with modelling exercises. The third area of research will be in understanding practices and challenges in setting up a suitable and cost effective underwriting infrastructure for this new category of risk. To summarize, it is necessary to take these constraints one by one. Only then can we be in a position to draw a conclusion. We will talk about these three constraints later in the paper.

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Concept of reverse co-payment

In the newly proposed risk category of non-pure and non-speculative, we have encountered a potential situation where the cash flow at time 'T' may be more than $10 million. To find a solution to this situation without violating the basic principles and business propositions of insurance, this paper aims to introduce the concept of reverse co-payment. Co-payment refers to the portion of risk that is assumed by the insured and any loss is correspondingly shared between the insurer and the insured. For example, if the insurance contract states a co-payment of 20 percent, it means that 20 percent of the risk is going to be assumed by the insured and in the event of a loss, only 80 percent of the loss is paid as claim amount from the insurer (considering it is a simple insurance contract with co-payment only).

Subsequently, in the potential situation of profit, we can have reverse co-payment where the pre-stated proportion of reverse co-payment will be retained by the insured while the remaining will be paid to the insurer. For example, consider that the reverse co-payment is fixed as 30 percent and the business, including the insurer's underwriter, foresees a profit of $5 million. The final profit earned is $7 million. In this situation, 30 percent of the additional $2 million profit, which is $0.6 million (0.3*2), will be retained by the insured and the remaining $1.4 million (2.0-0.6) profit goes to the insurer.

The point to be noted here is that the reverse co-payment proportion should always be greater than the co-payment proportion as the business should be motivated to earn higher profits and productivity. If co-payment is fixed as 20 percent in a contract, the reverse co-payment proportion should be greater than 20 percent. It can be argued that this will limit the business from working harder to achieve better profits as their upside is limited. However, it can also be argued that the business will take more risks as it will have the potential to earn comparatively better profits than losses.

The idea of transparency, working approaches, standardization of things, and other business-related ideal scenarios becomes relevant here. This will enhance standardization in business processes. Deviation from these standards will bring negative points for companies and they may even lose insurance coverage, as insurance is a contract of 'utmost good faith'.

The additional potential profit with respect to potential loss is not going to be a free rider. They will be discounted in the policy risk premium with their respective expected probabilities of occurrence. As the gap between profit-loss mismatch narrows, the actuaries will have better pricing power. A suitable trade off will have to be found up-front to give ample scope and motivation to the business to make higher profits under this new insurance framework.

The proportional difference between co-payment and reverse co-payment can be adjusted as per the nature of business, industry, available data, and other company-specific factors. This is going to open a new world of opportunities for insurers as they will be upgraded to 'partners' of the business rather than remaining as just insurance providers.

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Finding the enablers of risk quantification

To have a framework where we can offer insurance products for non-pure and non-speculative category of risks, we need specific and relevant data to compute pricing. This can be a challenge initially but we can expand our product horizon in the future based on the availability of data.

For now, we can use project appraisal and historical data built and consolidated by the banks during the project financing. Therefore, in a sense, this paper proposes to use debt financing-based historical data of banks to develop introductory products.

Apart from these data, we have financial tools such as scenario analysis and sensitivity analysis. Modern technological infrastructure is capable of generating such scenarios and sensitivities seamlessly and quickly. We can use Monte Carlo simulation and other financial tools to expand our analysis horizon. We must accept the challenges of possessing limited data while working on a new concept. However, technological advancement in the last decade can help us overcome this constraint considerably even when the data is limited.

Can we fit a new risk category into an existing underwriting framework?

It will not be prudent to answer this question before we gain more experience based on actual data, scenarios, or simulations.

This new concept is bound to bring in new and additional parameters that will need to be analyzed during risk assessment and selection. Nevertheless, the contrast here will be the continuous and expanded monitoring of risks that will be covered under the non-pure and non-speculative risk category. The underwriting framework will be required to be redesigned so that it can coordinate in near real-time with such monitored inputs.

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Conclusion

This white paper has established the need and practicability of a new category of risk called non-pure and non-speculative risk. It has also tried to differentiate within the speculative category of risk for better understanding. The working approach to innovate insurance products based on this category is also suggested along with solutions to some potential challenges. This is expected to bring more stability, transparency, and monitoring, in the existing business processes due to its working module. These are also required ingredients of improved corporate governance.

This may require our attention to further details and is likely to touch other chords of business environment. One area it could positively influence is the stability of stock prices as the defined range for future profits and losses, due to insurance protection, will become narrow. We may be able to analyze many of these things in the future once we decide to embark on this new risk path. The big store is yet to be explored and we can work collectively to enjoy the benefits of this exploration.

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