Journal for Interdisciplinary Research on Religion and Science,
No. 4, January 2009

A regret analysis of religiosity

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Abstract

A regret analysis has been carried out in this article to show why more risk-averse people are more religious. By regret here we mean avoidable cost or opportunity cost. Some interesting results have been found. It has been observed that the regret for not worshipping God when bad fortune appears is more for the risk-averse people. On the contrary, the risk-lover might feel more regret after worshipping God even when good fortune does not appear.

Introduction

Studies on religion have explored the relationship between religiosity and risk preferences[1]. It has been demonstrated that more risk-averse people are more religious, which indicates that the consequence of religion on risky behaviors are from the effect of risk aversion. Thus religiosity or "religious doing" in the narrowest sense, may be assumed to be the risk premium that one is willing to forego to have desired effects without risk. Here the underlying assumption is that the person is certain about the existence of God, and he believes that the desired results will be achieved according to his religiosity (risk premium in this context).

However, people hold divergent beliefs and they update their beliefs rationally in explaining religious behaviour[2]. Also it is understood that religion itself involves a great deal of risk[3]. In this sense, religiosity has the character of risky investment, which implies that religiosity can hardly be

[1] P. Stephens, A. Leach, H. Jones and L. Taggart, *Think Sociology*, Chapter 14, Nelson Thomes, 1998.

[2] J. D. Montgomery, *Contemplations on the Economic Approach to Religious Behavior*, The American Economic Review, 86, 2, 1996.

[3] L. R. Iannaccone, *Risk, Rationality and Religious Portfolios*, Economic Inquiry, 32, 2, 1995.

acknowledged as risk premium. To understand this problem more clearly an analysis has been carried out in this article. The analysis supports the above findings by expressing religiosity in terms of regret which one experiences by taking religious decisions. By regret here we mean avoidable cost or opportunity cost.

Regret Analysis

We begin the analysis with a simple model. Let us assume that a person has two options regarding religion – either he worships (WS) or he does not worship God (WN). Two outcomes of the above activities are "good fortune" (G) and "bad fortune" (B) irrespective of the decisions one takes. Costs associated with these two decisions and two outcomes are shown in Table 1. It is to be noted here that these costs are often difficult to measure (viz., costs of mental disturbance, life after death, etc.). In spite of this difficulty, all persons impute some value to them. So, the cost matrix in Table 1 comprises of imputed values, and these values are different for different people. Likewise G and B are uncertain events. Probabilities of occurrence of these events are also difficult to estimate. Nevertheless, people are assumed to have the religious belief that G appears with probability *P*, and *B* appears with probability $(1-P)$. With this subjective probability the expected costs can be calculated for each decision.

Now, as a risk-averse person is assumed to be religious, so his expected imputed cost for WS is supposed to be less than that for WN, i.e.,

$$PX_{11} + (1-P)X_{12} \leq PX_{12} + (1-P)X_{22} \tag{1}$$

On the other hand, if we assume that a person is risk-neutral, i.e. indifferent between WS and WN, then

$$PX_{11} + (1-P)X_{12} = PX_{12} + (1-P)X_{22} \tag{2}$$

After simplification equation (2) reduces to

$$Z = \frac{1-P}{P} \tag{3}$$

where

$$Z = \frac{X_{11} - X_{21}}{X_{22} - X_{12}} \tag{4}$$

The ratio *Z* can be interpreted as follows. The numerator of *Z* i.e., $(X_{11} - X_{21})$ is the regret that a person experiences after worshiping God when good fortune appears (R_1 say), and the denominator i.e., $(X_{22} - X_{12})$ is the regret that a person feels after not worshiping God when bad fortune appears (R_2 say). Thus *Z* is the ratio of two regrets R_1 and R_2. The meaning of this result (3) is that a person might feel almost no regret R1 when $P \approx 1$ (i.e., mostly good fortune appears). Similarly, another person might feel practically no regret R_2 when $P \approx 0$ (i.e., mostly bad fortune appears). This situation is slightly different for the risk-averse people. It can be derived from (1) that

$$Z \leq \frac{1-P}{P} \qquad (5)$$

So, the regret R_2 of the risk-averse people could be more than that for the risk-neutral people even if P is nearly equal to zero (because of the inequality "less than"). There are many examples in reality. A patient suffering with terminal illness such as cancer, AIDS is found praying to God for his recovery or less distress. If $P = 1$ (i.e., a case of certainty), then Z will not be positive which implies that the risk averse people will not experience any regret ($R_1 \leq 0$) after worshipping God even when good fortune occurs.

The above two cases are extreme cases. Now we consider an intermediate value of *P*, say $P = 1/2$. Then *Z* in equation (3) is equal to one, i.e., $(X_{11} - X_{21}) = (X_{22} - X_{12})$. It implies that either

Condition 1: $(X_{11} - X_{21}) > 0$ and $(X_{22} - X_{12}) > 0$, i.e., $X_{11} > X_{21}$ and $X_{22} > X_{12}$, or

Condition 2: $(X_{11} - X_{21}) < 0$ and $(X_{22} - X_{12}) < 0$, i.e., $X_{11} < X_{21}$ and $X_{22} < X_{12}$.

Mathematically, condition 2 is true. But condition 1 is more logical than condition 2, because it is logical to assume that cost of "good fortune" is zero except the cost of

worshipping. So, X_{11} should be greater than X_{21}. We construct Table 2 based on this reasoning. Here we assume that cost of worshipping is CW = 10, and cost of bad fortune (without worshipping) CB = 100. Then the Condition 1 implies that the cost of bad fortune when the believer worships God is less than 100. Actually, X_{22} is a function "*f*" of CB and CW. In the present case the function is assumed as follows:

$$X_{22} = f(C_B, C_W) = C_B - C_W .$$

Expected costs for decisions WS and WN are same in the above table. This is true for a risk neutral person. But for the risk averse people, inequality (1) holds true. Inequality (1) would be satisfied if they impute lower value to X_{12} or higher value to X_{22}, i.e., if they feel more regret R2. However, for the risk-lover

$$Z \geq \frac{1-P}{P} \qquad (6)$$

So, a risk-lover will assign more value to R_1 than R_2 if $P = 1/2$. It signifies that if a person is risk-lover then he might believe that worshipping would not lessen his cost of bad fortune. In this case there are two possibilities: (i) the imputed cost X_{12} in Table 2 might be higher than 90, or (ii) the cost of worshipping, i.e., X_{11} seems to be higher than CW (CW includes both money and time). Again if $P = 1$, then unlike the risk-averse the risk-lover might feel regret R_1 for worshipping God since $Z \geq 0$. To be precise, risk-lover might not be religious.

Conclusion

It has been empirically observed in different studies on religion that more risk-averse people are more religious. The analysis in this work also supports those findings. The analysis has been carried out in terms of regret that a person experiences by taking religious decisions. By regret here we mean avoidable cost or opportunity cost. It has been shown in the above analysis that the regret for not worshipping God when bad fortune appears is more for the risk-averse people.

On the contrary, the risk-lover might feel more regret after worshipping God even when good fortune does not occur. The result implies that a risk-lover might not be religious, and a risk-averse will always be religious whether good fortune or bad fortune occurs.

Bibliography

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