



SOCIETY OF ACTUARIES

Article from:

Risk Management

March 2010 – Issue 18

The Law of Risk and Light

By David Ingram

Editor's Note: This article originally appeared in the September/October 2009 issue of Contingencies. It has been reprinted here with permission.

“In the country of the blind, the one-eyed man is king.”
—Erasmus, *Adagia*

IT'S WIDELY REPORTED THAT MARKETS

are made because participants have different views of the opportunities in the market. For every transaction, there may be an agreement on price but also an inevitable complete disagreement on the direction of the next move in price. One source for these differing opinions is the differing views of risk held by various market participants. In this article, I'll take a look at five common perspectives on risk and see how they affect not just each participant's own choices but everyone else's choices, as well.

FIVE COMMON VIEWS OF RISK

1. EYES SHUT—Some risk-takers firmly believe that real rewards come only to those who take risks blindly; they think that caution, preparation and analysis will generally result in avoiding those opportunities that have the best payoffs. Many successful entrepreneurs share this eyes-shut view. They are often the visionaries who stick to their dream in the face of all the naysayers. Are these people phenomenally talented, or just lucky? Even if the eyes-shut entrepreneurs follow completely random strategies, one out of 100 might be wildly successful. That one will be celebrated in the press, while the 99 losers are quickly forgotten. Perhaps some of these individuals are indeed transcendently talented, but I will proceed under the assumption that there are too few such supermen to worry about.

2. QUICK LOOK—These risk-takers apply an approach that is tried and true, often based on practical rules of thumb. If the situation is familiar, they immediately turn to their usual method of risk selection. Unfamiliar risks are rejected, generally without further thought or analysis. The reward for the quick-look view of risk is often relatively low. But the risk is generally low, as well.

3. ONE-EYED—This perspective adopts a single specific quantitative measure of risk. The two most common examples are volatility and ruin probability. Defining risk

as volatility is the basis for modern portfolio theory, the Black-Scholes-Merton model and pricing methods based on risk margin as a function of standard deviation. The ruin theory (or cost of risk capital) approach defines risk (or capital) as a function of the loss potential in an extremely remote situation.

4. TWO-EYED—In this blended approach, the risk-taker seeks compensation for both volatility and the possibility of ruin— or at least seeks to avoid extremes of one or the other.

5. MULTIDIMENSIONAL—Risk managers with a multidimensional view consider volatility, ruin and everything in between. In addition, they consider risk factors such as parameter risk, correlation, market cycles, liquidity and execution risk. They include not only types of risk that are readily quantifiable but also those that may be extremely difficult to measure. The choice of which view of risk is the best isn't immediately obvious. There are several strengths and weaknesses to each approach, as summarized in Table 1.



David Ingram, FSA, CERA, FRM, PRM, is an ERM advisor to insurers at Willis Re in New York, N.Y. He can be reached at david.ingram@willis.com.

Table 1: Strengths and Weaknesses of Various Risk Views

RISK VIEW	STRENGTH	WEAKNESS
Eyes Shut	Low Cost. High Reward.	Low Predictability. High Failure rate.
Quick Look	Reliable. Proven.	Declining / fluctuating returns due to forces outside of field of view. May miss non-traditional risks.
One-Eyed	Can readily develop and explain risk reward trade-offs.	Expensive. Choices will eventually tend toward aspects of risk that are not covered by the single view.
Two-Eyed	Two views of risk just might take care of most of the risk.	Which two views will be the most important?
Multidimensional	Never have to say you are sorry.	Very expensive.

CONTINUED ON **PAGE 8**

The Law of Risk and Light | from Page 7

Each risk view will tend to drive the firm's risk portfolio in a certain direction. Most important, risks that are "in the light" (i.e., recognized by the prevailing risk view) will be managed, mitigated or avoided, while risks that remain "in the dark" (i.e., unrecognized by the prevailing risk view) will tend to accumulate, generally without adequate compensation. This can be summarized as:

The Law of Risk and Light

- Risks in the light shrink, risks in the dark grow;
- Return for risks in the light shrinks faster than the risk;
- Return for risks in the dark doesn't grow as fast as the risk.

A closely related law is:

Gresham's Law of Risk

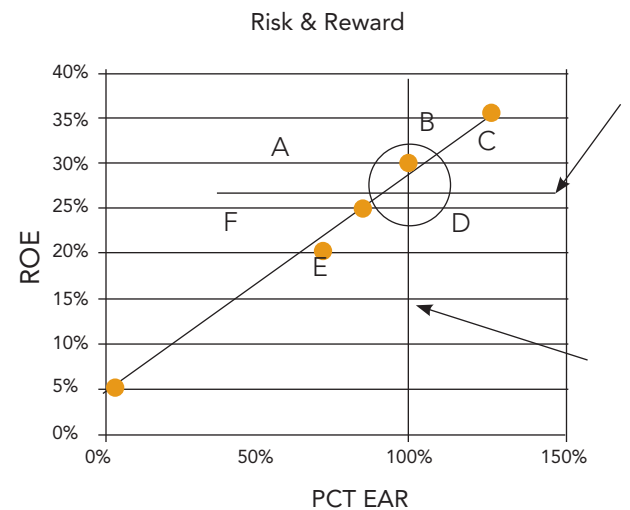
- Those who don't see a risk will drive those who do see the risk out of the market.

Gresham's law is, of course, the same as the adage, "Bad money will drive out good." The varying risk views affect the types of transactions that are likely between counterparties with different risk views. Since five risk views were defined, there are 20 counterparty pairs that can be formed in a two-way transaction. I'll examine a few examples of the counterparty effects using three risk views: one-eyed (volatility), one-eyed (ruin) and two-eyed.

MARKET EFFECTS

Think of Figure 1 as representing the space of all risk and reward choices that are possible to these three market participants. The vertical axis shows the expected reward as a percentage of the ruin estimate. The horizontal axis represents the expected reward as a percentage of volatility. The vertical line at the 100 percent mark represents a hypothetical minimum target for the one-eyed (volatility) risk manager and the horizontal line slightly above the 25 percent mark is a hypothetical minimum target for a one-eyed (ruin) risk manager. The diagonal line represents a very hypothetical target for the two-eyed risk view—different weights on volatility vs. ruin would affect the slope and position of the line.

Figure 1:
Viability of Transaction Depends on Risk View



With these three lines, the risk universe is divided up into six regions, labeled A through F. The one-eyed (volatility) risk view favors risks that are in areas B, C and D. The one-eyed (ruin) risk view favors risks in areas A, B and C. The two-eyed risk view favors risks in areas F, A, and B. Since the ruin and volatility risk views overlap in areas B and C, then that is where they are likely to find agreements as counterparties. The two-eyed risk manager finds agreement with the one-eyed (ruin) risk manager for risks in areas A and B, but only in area B with the one-eyed (volatility) player. In this case, agreement can only be found in areas A, B and C.

THE INFLUENCE OF COMPETITION

As mentioned earlier, financial market theories often assume that the market is completely immune to any influence of the participants. In some situations, that's just not the case for risk transactions. The participants often do seem to affect the market, and diverse risk views may play a major role. Again using the graph, the evolution of the market and the working of Gresham's law can be seen to operate in much the same way as a natural progression of types of trees in a forest. For example, consider a market where long positions are dominated by two-eyed risk

managers. Only risks that are priced to fall into areas F, A and B will be taken up. In order to exit a risk position, the risk-holder will need to pay enough risk premium to put the risk into F, A or B. The risk premium is seen here to be a function of both volatility and ruin.

If a one-eyed (volatility) player enters this market, he will take on the risks in areas C and D that the two-eyed risk manager finds inadequately priced. This new player has now changed a significant part of the market. He has split the market with the two-eyed player and lowered the cost of risk to the part of the market with lower volatility and higher ruin.

This illustrates both Gresham's law and the law of risk and light. The volatility risk view doesn't see ruin, so it drives the two-eyed player out of the ruin-concentrated part of the market. Since ruin risk is in the dark for the one-eyed (volatility) player, his share of that risk grows. Since he isn't asking to be paid for it, the implied spread for ruin risk in the market shrinks.

In a market where the two participants hold the one-eyed (volatility) and the one-eyed (ruin) risk views, the result is stark. The one-eyed (volatility) view looks for risks in areas B, C and D, and the one-eyed (ruin) view looks for A, B and C. Prices for deals with more volatility and less ruin risk will be bid down to area C by the one-eyed (volatility) player, where the one-eyed (ruin) view will not take them; deals with more ruin and less volatility would be bid down to area A by the one-eyed (ruin) player, where the one-eyed (volatility) view would shun them. This may be great for the risk sellers, but it guarantees that the two one-eyed players will be subject to a maximum dose of the law of risk and light.

One defense against this situation would be for the one-eyed (ruin) player to convert the one-eyed (volatility) viewer to his point of view. If successful in converting everyone to the ruin risk view, the market will shift from a competition between risk views to a competition on the basis of other advantages (such as size). Further into the future, the regime of a pure ruin view would come to an end when one of the losers in the competition "discovers" the one-eyed (volatility) view of risk and easily starts to find a large target market that is mispriced by one-eyed (ruin) viewers.



THE CREDIT CRISIS AND SOLVENCY II

The collateralized debt obligation (CDO) market prior to the credit crisis provides a stark example of the law of risk and light. Some market participants were clearly operating under a one-eyed view of risk that was focused on volatility with no regard whatsoever for ruin risk. They effectively drove any one-eyed (ruin) players, any two-eyed market and ruin players, and all multidimensional players completely out of the market. The ruin risk that they weren't looking at was in the dark: It grew unchecked as the CDO market came to include more and more sub-prime mortgages. It was obvious that ruin wasn't a concern when the mortgage market participants stopped even trying to collect the information that would allow them to know the loan-to-value or coverage ratio for the mortgagees.

The new European insurance prudential regulatory system (Solvency II) requires all insurers to focus on their ruin risk. (It might seem that Basel 2 has the same effect, but there must be some definitional misunderstanding by either the bankers or their regulators about what the term "ruin" means.) The insurance markets in which European insurers participate may evidence shifts as described above for market participants focused on one-eyed (ruin).

It also would seem possible that European or other insurers who develop a two-eyed risk view will easily be able to find opportunities that the vast majority of one-eyed (ruin) market participants will not be able to discern.

CONTINUED ON **PAGE 10**

Since shortterm ruin is the accepted definition of risk under Solvency II, that risk is in the light and firms will seek to shrink their exposure to it. Other risks that will not register as significant under Solvency II may end up in the dark and will therefore grow until they provide an unpleasant surprise.

There's clearly a need for future discussion on the implications of large-scale shifts in risk views. It's quite possible that some portion of market disruptions can be explained by large-scale shifts in risk views such as are likely to happen under Solvency II.

In classical microeconomics, markets are made because buyers and sellers have different utility functions. The

person with the powerful car who resents its low fuel efficiency would be best off selling it to a person who values its acceleration capabilities. Neither person has a right or wrong view; each just has different preferences. So it seems to be for risk. Some people have a risk view that emphasizes one aspect of risk; some have a view that emphasizes another. As I have shown, markets are made by the interactions of these risk views that buyers and sellers bring to the market. However, some of these different views are in fact financially dangerous when they involve only limited views of risk. The additional danger comes from the risks in the dark that will always grow until they generate large enough losses to demand attention. ♦

SOCIETY OF ACTUARIES

CPD

STANDARD COMPLIANCE

It's 2010, the second year of the 2009-2010 SOA CPD Requirement cycle. Here are three simple steps to keep you on track.

- 1-2-3
- STEP 1:** Know your CPD compliance path.
- STEP 2:** Track and earn CPD credits.
- STEP 3:** Attest at year-end.

Visit the SOA.org Web Site for more information on Continuing Professional Development.