

EDITORIAL

Pure vs. Speculative Risk: False Choice; Sham Marriage

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As a young statistician cutting my professional teeth in the world of insurance, I was an early and easy convert to the creed of financial services “convergence”. Like many others, I found the traditional distinction between the *pure risks* of insurance (i.e., those risks yielding only negative outcomes, like fire, accident, or theft) and the *speculative risks* of finance (i.e., those risks yielding both positive and negative outcomes, like equity, credit, or commodity securities) both conceptually unwieldy and mathematically naïve. After all, it is a relatively simple theoretical matter to transform a pure risk into a speculative risk. All that is needed is to adjust the former by subtracting its statistical mean (expected value);^[1] then, like a market price, it will have the potential of both increasing and decreasing.

Interestingly, however, large-scale practical attempts to fold insurance risk into financial markets have met with little success. Property catastrophe derivatives – highly touted as an inexpensive and capacious alternative to reinsurance in the mid-1990s^[2] – were traded only briefly by the Chicago Board of Trade and the Bermuda Commodities Exchange before fizzling out completely. Even the subsequent multi-billion-dollar insured losses from September 11, 2001 and Hurricane *Katrina* have failed to resurrect interest in this area. Although a reasonably serious catastrophe-bond market has developed and survived, it remains rather limited in scope, and has not significantly altered the overall landscape of the insurance/reinsurance business.

If pure and speculative risks are so similar, then why has the convergence of insurance and other financial markets been so slow to take hold?

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Unfortunately, this question is poorly posed, on two grounds. First, the pure risk/speculative risk dichotomy is somewhat misleading; it hints at, but fails to identify clearly, the distinction between two major classes of risk. Second, the suggestion that convergence is a future phenomenon is incorrect; insurance and financial markets are already somewhat integrated, and while the nature of their relationship will continue to evolve, there is no reason to anticipate a dramatic – almost millennial – future convergence.

The distinction between pure and speculative risks is the source of much confusion. As already noted, this commonly accepted dichotomy provides something of a “false choice” because a pure risk so easily can be rewritten as a speculative risk. More importantly, however, the dichotomy offers a “false choice” because it fails to capture precisely the fundamental difference between insurance-sector risks and other financial risks (although, as we shall see, this difference is partially reflected in connotations of the words *pure* and *speculative*).

Instead of pure risk, I propose the term *empirical risk* to denote one of the traditional insurance perils of fire, accident, theft, etc. The purpose of the new term is to emphasize that the risk arises from an observable natural process that is largely insulated against behavioral (e.g., psychological, social, or political) effects.^[3] From this perspective, the decision of whether or not to subtract the statistical mean is of limited importance. While it is generally true that most empirical risks are measured from a baseline of their minimum absolute value (zero), simply subtracting the expected value does not in any way alter the characteristics defining empirical risk.

As an alternative to speculative risk, I propose the term *market risk* to indicate the economic-transaction origin of the uncertainties prevalent in various financial markets. While a market risk certainly contains components of empirical risk – e.g., the ripple effects of

commodity shortages/surpluses – it also contains substantial non-empirical or behavioral components.

In light of the new terminology, it is interesting to note that one connotation of pure risk is “purely natural” or “purely process-oriented” risk – in other words, the empirical risk covered by traditional insurance. Moreover, one connotation of speculative risk is the behavioral risk influenced by tendencies to “gamble” or “speculate” – in other words, the non-empirical portion of financial market risk. Thus, we see that the empirical/market dichotomy is suggested, although not formally defined, by the pure/speculative dichotomy.

To return to the issue of convergence, we can now replace our earlier question with the following: Are empirical and market risks sufficiently similar to engender substantially greater convergence of insurance and other financial markets?

Since empirical risk is already a component of market risk, it is quite evident that any instance of empirical risk can be converted into one of market risk simply by embedding it in a financial-market context. This is exactly what occurs when empirical risks, like property catastrophe losses, are exchange-traded. But why have such transformations of empirical risks to market risks not found greater favor among practitioners?

One possible explanation – and the one I find most attractive – is that this approach is nothing more than a “sham marriage.” If empirical risks are already handled reasonably well by traditional insurance markets, then there is little reason to corrupt the “pure” empirical risks with additional behavioral risks. In the end, such an adulteration is likely only to increase transaction costs. Alternatively, a seemingly more auspicious marriage of insurance and financial markets would be to try to strip market risks of their behavioral components, thereby transforming them

into empirical risks. However, a cursory examination of the latter approach shows just how infeasible it would be.^[4]

So what manner of future convergence can be expected?

The answer is disappointingly simple: more of the same.

As previously mentioned, some integration of insurance and financial markets is already with us. Insurers and reinsurers, which serve as the principle mechanisms for handling exclusively empirical risks, are often publicly traded companies, and so their risks can be bought and sold on the equity markets. For traders who wish to add empirical risks to their portfolios without assuming the attendant managerial or operational risks of an insurance/reinsurance company, the market provides an elegant solution – the elimination of such extraneous risks through diversification.

For scholars and practitioners eagerly awaiting further convergence, there is some (albeit limited) consolation: not all insurers/reinsurers are yet publicly traded. In the United States, several of the largest insurance companies possess a mutual corporate structure, thereby insulating their accumulated capital from the forces of the financial markets. Internationally, many sizeable insurance writers are government-owned. If greater convergence implies greater economic efficiency, then we should observe a long-term increase in insurer listings on the equity markets ... which in fact we do.^[5]

References

- Powers, I. Y. and Powers, M. R. (1997), "Seeking the perfect catastrophe index," *Best's Review, Property/Casualty Edition*, December, pp. 101-103.
- Viswanathan, K. S. and Cummins, J. D. (2003), "Ownership structure changes in the insurance industry: an analysis of demutualization," *Journal of Risk and Insurance*, Vol. 70, No. 3, pp. 401-437.

[¹] Consider the following example: A building whose current assessed value is \$1 million is exposed to exactly one pure risk – total loss from fire, which occurs with probability (w.p.) 0.10. This situation can be described as a pure risk that equals -\$1 million w.p. 0.10 and \$0 w.p. 0.90. Alternatively, one can subtract the mean loss (i.e., $-\$100,000 = (-\$1 \text{ million})(0.10) + (\$0)(0.90)$) from each of the two possible outcomes, thereby defining a speculative risk that equals -\$900,000 w.p. 0.10 and \$100,000 w.p. 0.90.

[²] See, for example, Powers and Powers (1997).

[³] Naturally, all insurance transactions are subject to potential problems of moral hazard and/or fraudulent claims. However, these problems are generally controlled reasonably well by imposing policy deductibles and/or copayments. Moreover, the overall costs of these problems are included *ex ante* in the insurer's premiums.

[⁴] Consider the relatively simple example of gold futures prices. One can imagine eliminating undesirable market “bubbles” and “panics” by replacing gold futures with conventional insurance contracts that compensate the buyer if there is a global decrease [increase] in the supply of [demand for] gold. However, unlike typical empirical risks, the levels of supply and demand would still be subject to considerable behavioral components (e.g., a gold mine's consideration of the effect of expanding/contracting operations on the prices of gold futures).

[⁵] See, for example, Viswanathan and Cummins (2003).