

The Effectiveness of Debt Insurance as a Valid Signal of Bond Quality: Reply

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The comment by Puelz takes issue with our work in Hsueh and Liu (1990). Puelz argues that our study mixed the "how to" literature with the "what is" literature of insurance markets theory and suggests that our findings are not necessarily inconsistent with a debt insurance signaling equilibrium. In this reply, we address the concerns raised by Puelz and provide further analysis in support of our findings.

Testing for a Signaling Equilibrium

Puelz stresses that our study (Hsueh and Liu, 1990) did not answer the question of "what is" a signaling equilibrium, and he proposes "a methodology to more precisely explore this phenomenon" of debt insurance signaling. Specifically, Puelz argues that borrowers who choose to purchase debt insurance signal their high-risk characteristics in the market. In order to test this signaling phenomenon, he proposes that "if high-risk municipalities were more likely, on average, to purchase debt insurance, the hypothesis of market signalling would be confirmed." We feel that Puelz's proposed hypothesis offers a limited view of debt insurance signaling, because it examines only the self-selecting (or signaling) behavior between insured and uninsured borrowers and fails to address the key issue of whether a signaling equilibrium can be obtained or is sustainable in the debt insurance market.

Our approach was to identify the conditions for the existence of a debt insurance signaling equilibrium and present empirical evidence of whether all the necessary conditions are satisfied. In defining the signaling equilibrium, Thakor (1982, p. 722) states that the interest yield on every insured debt issue should be contingent only on the associated observable optimal insurance coverage. Since there is only one observable insurance coverage (i.e., complete coverage) in the debt insurance market, different

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quality borrowers are indistinguishable on the basis of that signal. In a pooling equilibrium, therefore, the interest yield on every insured debt issue must be priced as if all such issues have the same default probabilities (Thakor, 1982, p. 727). We showed that, other things constant, bonds with the same insurance coverage obtained from the same insurer do not command the same amount of risk premium. Hence, we rejected the hypothesis that a debt insurance signaling equilibrium exists.

One Signal Conveys One Message

The signaling equilibrium as defined by Spence (1973, 1974) and subsequently developed by Rothschild and Stiglitz (1976) suggests that for bond insurance (or any other signaling alternatives) a valid signal must be directly observable and the inference drawn from the signal must be unambiguous and correct. That is, if only one signal is observed in the market, only one interpretation of this signal should exist.

Consider the following example. Suppose all borrowers in the market are observably identical, except that their default probabilities are different and unknown to investors. Furthermore, half of the borrowers purchased complete debt insurance coverage from the same insurer and the other half did not. Following the signaling theory, it is obvious that, as pointed out by Puelz, borrowers who purchase debt insurance coverage should have a higher default probability, on average, than those who do not. We, however, examined a more critical issue concerning debt insurance signaling: whether bond investors can learn something from the signal (i.e., complete coverage by the same insurer) about the differential underlying default probabilities among *insured* borrowers. That only one signal is observed in the market suggests that the differing bond quality of these insured borrowers cannot be known by the investors. Otherwise, signaling equilibrium cannot exist.

Thakor (1982, p. 725) also points out that the complete insurance "situation is equivalent to the information producers (i.e., bond insurers) purchasing all the debt issues in the market and then reissuing debt on their own account." Thakor essentially suggests that, in a pooling equilibrium, all observably identical insured bonds (with only unobservable underlying credit risk) must be treated as if they were all sold by the insurer. In a signaling equilibrium, therefore, all insured debt must have the same default risk premium that reflects the default risk of the insurer, not that of the insured borrowers (Thakor, 1982, p. 725). More precisely, the risk premium on insured bonds should reflect the joint probability of an insurer's default risk and the average default risk of all insured borrowers.

Analogy to the Collision Insurance Market

Using the analogy between collision insurance and debt insurance, Puelz equates our findings to that of "17-year-old male drivers pay more [insurance premium] than 50-year-old female drivers for the same quantity of insurance coverage." This comparison mistakenly suggests that what we

found was equivalent to showing that two observably *different* drivers pay different insurance premiums to the insurer. We used a multiple regression bond yield model to control for different issue characteristics, such as issue size and maturity, across borrowers. Hence, our model correctly tests whether observably *identical* bonds with the same insurance coverage command the same amount of credit risk premium. A correct analogy with regard to our findings, therefore, would have been that two 17-year-old male (observably identical) drivers, choosing the same amount of insurance coverage and deductible (i.e., sending out the same signal), are charged with different insurance premiums. This result, of course, violates the necessary conditions for a signaling equilibrium.

We stand by our conclusion that complete debt insurance coverage in the market should not be viewed as a valid signal of bond quality.

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