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Decision making with Expected Shortfall and spectral risk measures: The problem of comparative risk aversion

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We analyze spectral risk measures with respect to comparative risk aversion following ARROW (1965) and PRATT (1964) for deterministic wealth, and ROSS (1981) for stochastic wealth. We argue that the Arrow-Pratt-concept per se well matches with economic intuition in standard financial decision problems, such as willingness to pay for insurance and simple portfolio problems. Different from the literature, we find that the widely-applied spectral Arrow-Pratt-measure is not a consistent measure of Arrow-Pratt-risk aversion. Instead, the difference between the antiderivatives of the corresponding risk spectra is valid. Within the framework of Ross, we show that the popular subclasses of Expected Shortfall, and exponential and power spectral risk measures cannot be completely ordered with respect to Ross-risk aversion. Thus, for all these subclasses, the concept of Ross-risk aversion is not generally compatible with Arrow-Pratt-risk aversion, but induces counter-intuitive comparative statics of its own. Compatibility can be achieved if asset returns are jointly normally distributed. The general lesson is that these restrictions have to be considered before spectral risk measures can be applied for the purpose of optimal decision making and regulatory issues.

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