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The Science of Negotiations

by Andrew Vazsonyi, Feature Editor



OUR MAGICIAN Raiffa (Raiffa, Richardson, & Metcalf, 2003) proved that the science of negotiations may be brought within the framework of decision sciences. But how do

we build a bridge to bring these two fields closer together?

For instance, when I make an investment decision using the Markowitz portfolio theory, I have a split personality working for conflicting goals. Andy1 wants to maximize equity, but Andy2 wants to minimize risk. Markowitz suggests you draw a diagram and represent each potential investment with a point; the horizontal coordinate is expected return, the vertical the risk. For each value of expected return there is a minimum risk, an efficient solution. The efficient points form the efficient frontier, and I need to consider only efficient points. Dominated inefficient points lie above the frontier and can be ignored

What does this have to do with a negotiations problem? Andy1 and Andy2 can be understood as two people trying to negotiate a deal. Each particular solution has an expected value for each negotiator. To get a geometric view, you plot a point with the horizontal axis for the expected value for Andy1 and on the vertical axis for Andy2. Portfolios under the frontier are dominated, and those above are not feasible. The negotiation problem is restricted to solutions on the efficient frontier. Of course, this is an enormous simplification, and Raiffa uses the Solver of Excel to calculate the efficient solutions. (Raiffa adds this witty aside in his book: "Our next task is to show how we can solve . . . the problem . . . using mathematical programming . . . Those readers who are unfamiliar with this type of operation are the lucky ones!").

So far we have discussed only the critical concept of efficient solutions that we

already have in traditional decision sciences. Now comes the difficult issue of selecting the solution on the frontier. Markowitz suggests that investors search their minds, gazing at the curve of the frontier and use their judgment to select the point. Tradeoff analysis between return and risk is a useful tool. Investment advisors provide suggestions using their mindsets.

In negotiations, the concept of fairness appears to be decisive (Chapter 19 in Raiffa's book includes Nash equilibrium solutions). One suggested approach is to select on the frontier the point where the marginal gain to Andy1 is close (or equal to) the marginal loss of Andy2.

Raiffa stresses the importance of the FOOTE (Full, Open, Truthful Exchange) style of negotiations: collaborative decision making. Here, joint decision making is based on direct communication of interests, aspirations, expectations, beliefs, visions of the future, and so forth. Equilibrium solutions of game theory are important.

Raiffa presents two suggestive armchair case studies to show how his theory of negotiations work: the fair division problem of Janet and Marty, and the contractor problem between the contractor Nelson and the retail firm Amstore. Working through these cases is a rewarding effort.

All this is only a beginning, my personal introduction to the book. You would undoubtedly take another view.

The Amazon Editorial Review from *Publishers Weekly* says: "[Raiffa's] stated goal is to 'suggest how people—perhaps you—might negotiate better,' that's a bit of wishful thinking; the book, more a mathematics text than a popular guide, isn't designed for a broad-based audience."

Our challenge is to show that this is not "a mathematics text" but an introduction to a potential branch of the mainstream of decision sciences. Many have tried to apply game theory to negotiations, but so far no one has succeeded in a practical way. Raiffa seems to have accomplished this.



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To meet our challenge means that we must do several important things: (1) Develop the material further so that more varied problems can be solved. (2) Find more situations to which existing theory can be applied. (3) Increase the number of people who know the basics of the theory and apply it to problems they encounter or suggest applications to problems they encounter. (4) Collect more data on situations which can improve the base of the theory.

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Raiffa, H., Richardson, J., & Metcalf, D. (2003). *Negotiation analysis: The science and art of collaborative decision making*. Belknap Press. (See March 2003 Decision Line for review.) [Self summary: The book stresses the analysis of deals in contrast with disputes. It synthesizes the use of individual making (as in decision analysis), interactive decision making (as in game theory), and behavioral decision making in the analysis of negotiations (broadly interpreted.)]

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NAMES IN THE NEWS

**CAROL LATTA, Executive Director,
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The Carnegie Bosch Institute is pleased to announce the publication of *Business Aspects of Closed-Loop Supply Chains*, edited by **Daniel R. Guide, Jr.**

(see photo) of the Smeal College of Business Administration, The Pennsylvania State University, and **Luk N. Van Wassenhove** of INSEAD. The book is based on the idea that the best way to address the extended producer responsibilities requirements imposed on businesses is to approach the problem from a business perspective. The book explores the idea that economic incentives (increased profits) provide the strongest argument in favor of firms developing closed-loop systems. The book takes a multidisciplinary approach. Each of the 13 chapters includes a more detailed discussion of the research needs for each of the areas addressed in the book.

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