

The Economics of... Sumo Wrestling

BY AARON STEELMAN

If you asked a random person on the street what economists study, you might get a response like inflation or unemployment. The reason is pretty clear: such macroeconomic issues are crucially important and do, in fact, occupy the attention of many economists, including those in the Federal Reserve System. But there is a group of microeconomists who are grappling with many issues beyond what is normally thought of as the purview of economics—issues such as crime, divorce, and abortion, among others.

The pioneer in this regard is University of Chicago economist Gary Becker. Among his best-known books are *The Economics of Discrimination* (1957), *The Economic Approach to Human Behavior* (1976), and *A Treatise on the Family* (1981). These books apply the tools of economic analysis to issues that had long been studied almost exclusively by sociologists and psychologists.

For instance, in *A Treatise on the Family*, Becker looked at parents' "demand for children." He used "the price of children and real income to explain, among other things, why rural fertility has traditionally exceeded urban fertility, why a rise in the wage rate of working women reduces their fertility, why various government programs ... have significantly affected the demand for children, and why families with higher incomes have had more children, except during the past 150 years in Western and developing countries."

Not surprisingly, many noneconomists attacked Becker's work. It was, they maintained, inappropriate to use "rational choice" analysis to think about such intimate personal issues. People are not always cold, calculating utility maximizers, the critics charged.

In the last 20 years, the practice of "economic imperialism" has burgeoned, as many younger microeconomists have followed Becker's lead to explore new and exciting topics. One of the best examples is Steven Levitt, also of the University of Chicago. Levitt was recently awarded the John Bates Clark Medal, which is given to the nation's most outstanding economist under the age of 40, for his work on crime, corruption, and education. Among his most cited—and criticized—recent papers are "The Impact of Legalized Abortion on Crime" and "An Economic Analysis of a Drug-Selling Gang's Finances," both published in the *Quarterly Journal of Economics*.

In the December 2002 issue of the *American Economic Review*, Levitt and co-author Mark Duggan took on an issue that has long been of interest to some sports fans, but which few economists have even considered: corruption in sumo wrestling.

"The key institutional feature of sumo wrestling that makes it ripe for corruption is the existence of a sharp non-linearity in the payoff function for competitors," the authors write. A sumo tournament involves 66 wrestlers competing in 15 bouts each. A wrestler who has a winning record—that is, who has won at least 8 of his 15 matches—is guaranteed to rise in the rankings, while a wrestler who has a losing record is destined to fall. A wrestler's rank determines his prestige, salary, and the perks that he enjoys. For instance, the lowest-ranked wrestlers must rise early each morning to clean the building and prepare meals.

There is a strong incentive, then, to achieve that eighth victory in a tournament. "The critical eighth win ... garners a wrestler approximately 11 spots in the ranking, or roughly

four times the value of the typical victory. Consequently, a wrestler entering the final match of a tournament with a 7-7 record has far more to gain from a victory than an opponent with a record of, say, 8-6 has to lose," Duggan and Levitt write. "We uncover overwhelming evidence that match rigging occurs in the final days of sumo tournaments.

Wrestlers who are on the margin for attaining their eighth victory win far more often than would be expected."

Duggan and Levitt admit that high winning percentages among wrestlers with seven victories is not proof positive of corruption. After all, wrestlers may simply try harder in these important matches because the benefits of winning are larger. But the authors offer evidence against this alternative hypothesis. For example, while the wrestler who is on the cusp of winning his eighth match wins with surprisingly high frequency, the next time he is paired against that same wrestler he usually loses. "This result suggests that at least part of the currency used in match rigging is promises of throwing future matches in return for taking a fall today." Duggan and Levitt also tested their data against claims made by two former wrestlers against specific competitors charged with rigging matches. Their statistical analysis confirmed the whistle-blowers' stories.

One might say, "All of this is interesting. But what does it have to do with economics?" Duggan and Levitt anticipate such criticism. They write: "The success of our study in documenting the predicted patterns of corruption in one context raises the hope that parallel studies with more substantive economic focus may yield similar results." **RF**

"Winning Isn't Everything: Corruption in Sumo Wrestling," by Mark Duggan and Steven D. Levitt. *American Economic Review*, December 2002, vol. 92, no. 5, pp. 1594-1605.