



SOCIETY OF ACTUARIES

Article from:

Health Section News

April 2004 – Issue No. 47

and can work for health care. Thus, just as it does for food and shelter, the government should provide regulation to ensure that quality care is provided, and act as a backstop for Americans who cannot otherwise afford to purchase health insurance or pay for care. Moving to a national health-care system where the government pays for all services does not solve the problem of health-care inflation, not without price controls and/or rationing of care, both of which pose a large risk of eroding the quality of care currently delivered in the United States.



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David Tuomala:

I believe that government should primarily seek to facilitate a competitive marketplace across the whole spectrum of health-care participants. Purchasers of health-care services should be able to choose from competing plans and competing providers based on cost and quality considerations like they do elsewhere in the economy. Without healthy competition among market participants we are unlikely to see significant innovations in either the financing or delivery of care over the long term.

I would prefer to see the market compete to provide the best choices for each individual purchaser rather than for the government to try to mandate a "one-size-fits-all" approach for everybody.

➤ Wolak: On the other hand, the government is also the largest purchaser of health-care services, which include Medicare, Medicaid and the military and government employee health-care

plans. Given this fact, can it be argued that the government is more concerned about its own ability to control cost at the expense of the private market?

➤ Tuomala: My initial response was in terms of what I think the government should do rather than what they actually do today. Government is clearly the single-largest purchaser of health-care services, so it obviously exerts a great deal of influence on the system. Unfortunately, the current approach to cost control in most public health-care programs is to effectively mandate a limited increase (sometimes even a decrease) in the cost per unit of health care. At best, this approach merely controls the cost to the government at the expense of the private market as you suggest.

Besides the potential for cost shifting from the public to private market, there are other possible undesirable effects of this approach that may be overlooked. Because government is the biggest payer, most health care business models need to generate revenue based on the number and type of services provided rather than on quality or efficiency. This carries over into private-sector financing models as well. I think this has a detrimental impact on investment and innovation in health care delivery systems. More efficient systems that result in fewer or less costly services may actually be less attractive for investment than more inefficient systems that actually generate more revenue. This probably leads to less investment in health-care innovation than in other industries. 📧

Moneyball and the Actuarial Profession

by Kurt J. Wrobel

After recently reading the book, *Moneyball: The Art of Winning an Unfair Game*, I became interested in how the book could be applied outside of baseball. After considering several creative ideas, I finally came to consider its application to the actuarial profession. Although a book written on baseball may appear to be an unusual source for ideas to change our business, the fundamental premise of the book—the systematic use of data to identify and then exploit market inefficiencies—has a very clear application to our profession.

A Summary of Moneyball

In writing this book, Michael Lewis attempted to answer a basic question:

How do the Oakland Athletics consistently outperform other baseball teams while having one of the lowest payrolls in the league?

As addressed throughout the book, Billy Bean, the general manager for the Oakland Athletics, has exploited a market for baseball players that incorrectly values their skills. In order to uncover these market inefficiencies, Billy has ignored the traditional views of scouts and long-time baseball

insiders, and, instead, has chosen to focus on evaluating players through an in-depth data analysis. His analysis focuses on the most important elements in baseball—scoring runs on offense and preventing runs on defense. Using this strategy, Billy developed a list of statistics and attributes that are either overvalued or undervalued in the baseball player marketplace. These statistics and attributes are outlined on the next page.

Billy used his sophisticated data models to either draft or trade for players with undervalued attributes and trade or avoid drafting players with overvalued attributes. The resulting strategy has allowed the A’s to become one of the most successful baseball franchises, while many small market teams continue to struggle and complain about the inequities of a system that allow wealthier teams to sign players with the best perceived skills.

In highlighting Billy’s strategies, the author describes a number of players who best exemplify his strategy for identifying overvalued and undervalued players.

- Jeremy Brown was an overweight catcher from the University of Alabama with a long statistical history of earning walks and hitting well in a competitive college environment. In addition, Jeremy was also considered to have a substandard throwing arm. By virtue of his less-than-appealing physique (one scout even said that he wore “a large pair of underwear”) and poor throwing arm, the traditional view among

scouts was that he would never be a major leaguer and should probably not even be drafted. Because of his excellent hitting record, Billy decided to make Brown a second round draft pick, but only if he agreed prior to the draft to a contract that was well below other second round draft picks. In contrast, the other major league teams used many of their first and second round draft picks to draft unproven high school players with insufficient data to adequately measure their baseball talent.

- Dave Justice represented a new approach for Billy. If he’d been in his prime career years, the A’s never could have afforded a player like Justice. In his prime, Justice hit for power, walked frequently, had an excellent throwing arm, and an excellent physique, but at age 36, Justice’s market value had fallen so much that Billy felt he had become a bargain worth signing.
- Scott Hatteberg had recently ruptured a nerve in his elbow that prevented him from continuing in his career as a catcher. Because the market for ballplayers puts significant importance on defensive ability, this injury significantly lowered his perceived market value and allowed him to become available to the A’s. In allowing the A’s to sign Hatteberg for a relatively small amount, the other major league teams had not put sufficient importance on his undervalued offensive attributes. In particular, Hatteberg was a very

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<i>Overvalued Statistics and Attributes</i>	<i>Undervalued Statistics and Attributes</i>
Batting Average	On base percentage
Runs Batted In	Slugging percentage
Earned Run Average	Factors controllable by the pitcher (Home runs allowed, walks, strikeouts)
Win-loss percentage for pitchers	Ground ball to fly-out ratio
Relievers that are considered closers	Pitches per plate appearance
High school players with insufficient data to adequately measure their ability	College players with significant data to measure their performance



baseball insiders have become enamored with certain attributes that are not supported by statistical evidence. In many cases, these insiders, instead, will rely on a vague notion of past experience or loosely constructed arguments that ignore hard data. They will also look for qualitative evidence that supports their position without adequately developing a statistical case for their position. Invariably, the scouts also put an inordinate amount of credibility on a player's most recent performance. In addition, because the most over-valued characteristics have become so ingrained in baseball, many of these insiders simply can not change their thinking about evaluating baseball players. In summary, this market inefficiency is caused by "sloppy data analysis" and an unwillingness to change one's preconceived notion of market value.

Application to the Actuarial Profession

As the chief data analysts for health plans and employer groups, we have a duty to conduct a similar in-depth statistical review as Billy Beane has done for the Oakland A's. In this capacity, we need to guard against practices within our organizations that use misguided, qualitative judgement to make important business decisions. Instead, we need to ensure that our business decisions are based on a well-reasoned examination of all available information using sophisticated data analysis. We should also attempt to instill a mindset within our organizations that puts greater reliance on data and statistical analysis and less on "gut feelings" and long-held opinions of financial risk.

Although baseball may have been somewhat backward in its statistical analysis, health care organizations and employers certainly have room to make better-informed decisions based on a more detailed examination of information. Who knows? Maybe we'll even find room for actuaries in baseball. 📊

disciplined hitter (he was third in the league for pitches seen per at bat) who rarely struck out and had an excellent on-base percentage.

- Chad Bradford was another player who didn't have the attributes that appealed to the scouts. Bradford had an awkward pitching delivery and below-average velocity on his fastball. Despite this, Bradford consistently pitched well in the minor leagues by using the movement on his fastball to induce outs, particularly ground-ball outs from hitters. Unfortunately for Bradford, his major league team put far too much emphasis on less important attributes (fastball velocity, pitching delivery) and insufficient value on important attributes (fastball movement, ground ball to fly out ratio). Billy acted on this market inefficiency by trading for Bradford.



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The next obvious question one must ask is:
How can the A's continue to systematically exploit these market inefficiencies in drafting and signing baseball players?

As highlighted in the book, scouts and other