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When Lady Luck Plays Moneyball

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By David R. Henderson & Charles L. Hooper : [BIO](#) | 20 Oct 2006

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Most sports fans and sports analysts, for all their hours examining their teams, are fundamentally wrong about one important aspect of sports. Most of these spectators decide which teams are good or bad right now based on their winning and losing streaks. They shouldn't.



How often have you seen sports analysts castigate a team for losing four straight games or a player with a .300 batting average for going hitless for five games? It's pretty frequent, right? But this frequency alone should tell you something. The fact is that the best teams and the best players have slumps. And, to take the baseball season as an example, in a 162-game schedule, the best teams and players are even likely to have more than one slump per season. These slumps aren't necessarily due to the team or the player doing anything different or wrong. Rather, they're based on the laws of probability. To put it in slightly jargony terms, "there's much randomness in the world." And randomness doesn't make an exception for sports.

The best professional baseball teams, the ones that make the playoffs, generally win about 60 percent of their games. Using probability theory and Monte Carlo simulations, we've proved that the probability of a team that wins 60 percent of its 162 games having at least one losing streak of five or more games is 80 percent. Such a team will have, on average, 1.2 such losing streaks a season. In other words, it's almost a certainty that a playoff team will have had at least one substantial losing streak during the regular season. So it shouldn't have been shocking -- and was hardly informative about their future -- that the Detroit Tigers ended the season on a five-game losing streak. The worst teams, in comparison, generally win only 40 percent of their games. (For example, in the 2006 baseball season, Tampa Bay and Kansas City won 37.7 and 38.3 percent of their games, respectively.) Using probability theory and Monte Carlo techniques, we've shown that the probability of such a team having at least one winning streak of three or more games is virtually 100 percent. Such a team will have, on average, 6.4 such winning streaks a season. In other words, even the worst teams can expect to have winning streaks. That's why it shouldn't have been so shocking that the Detroit Tigers, with the third-best American League regular-season record, ended the season by losing all their games against the Kansas City Royals, the second-weakest AL team.

It seems that only a few people in sports get this basic point. How else can one account for their surprise after the St. Louis Cardinals had an eight-game losing streak at the end of the season and, yet, went on to demolish the San Diego Padres in the first round of the National League playoffs? Sports commentator Joe Morgan, who often talks about the importance of momentum, surely doesn't get it. Morgan almost invariably explains how he thinks baseball teams will do in the next game based on how they did in the previous few games. Now there could be such a thing as momentum. But simply probability theory can explain many of the streaks we observe in baseball. What Joe Morgan and others should really say is, "Team A has been lucky during its last four outings, but it is still a weak team, and so we shouldn't expect it to be lucky today."

One person who distinctly does get the point is Oakland A's General Manager Billy Beane. Beane, whom we discuss in our book *Making Great Decisions*, recognizes that his job is to

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get his team to the playoffs, where whoever wins has more to do with luck than skill. As Michael Lewis wrote in *Moneyball*:

Pete Palmer, the [sabermetrician](#) and author of *The Hidden Game of Baseball*, once calculated that the average difference in baseball due to skill is about one run a game, while the average difference due to luck is about four runs a game. Over a long season the luck evens out, and the skill shines through. But in a series of three out of five, or even four out of seven, anything can happen.

As Billy Beane put it, when asked by Lewis why he was so detached during the 2002 playoffs, "My s**t doesn't work in the play-offs. My job is to get us to the play-offs. What happens after that is f***ing luck."

So what does this have to do with business and with life in general? A lot. There's a huge difference between decisions and outcomes. Decisions can be good even if bad outcomes follow or bad even if good outcomes follow, all because of the role of chance and luck. Luck and probabilities have a huge role. Here's an example from our [Making Great Decisions in Business and Life](#).

Imagine that you own two uranium processing plants, and you believe that good decisions should be measured solely by the good outcomes they produce. The plants generate the same revenues, but one plant (Plant A) has 30 percent lower labor costs than the other (Plant B). Plant A certainly is enjoying a better outcome -- higher profits, quarter after quarter. For the last six years, Plant A's outcomes have been better than Plant B's by any objective measure. So it follows that Plant A's managers have made better decisions, right? How could anyone argue with this? If you had a bonus pool to distribute, would you give more to the Plant A's or Plant B's managers and workers?

Before you hand out the bonuses, disaster strikes. Uranium processing Plant A suffers a horrible accident, killing four workers and nearly releasing enormous amounts of toxic radiation into a nearby community. Lawsuits bury your company. How could this happen? Simple. Plant A workers skipped many safety procedures in their quest to reduce labor costs, increasing their risk of disaster from infinitesimal to perhaps one accident every 100 months. Each day, they were able to speed their work by skipping burdensome and "unnecessary" safety procedures.

The Plant A managers were playing Russian roulette, yet you were about to reward them for their good outcomes during the last six years. Had you studied their *decisions* instead of their *outcomes*, you would have realized that they were making horrible tradeoffs to achieve their objectives. The question is: which processing plant made the best decisions? The best decisions are based on the cost of adhering to the safety procedures versus the expected cost -- or risk -- of skipping them. Managers who base their rewards purely on outcomes will unwittingly encourage risky behavior that focuses on the short term at the expense of the long term.

This example, unfortunately, is not fictitious. In 1999, workers at the JCO Co. uranium processing plant in Tokaimura, Japan didn't follow proper procedures and mixed too much uranium -- 16 kilograms instead of the approved 2.4 -- with nitric acid in a storage tank and started a fission reaction that went temporarily out of control. All 310,000 residents in the city were evacuated, 21 people were sickened, and three workers were hospitalized. While this may have been an innocent accident, it probably was the result of a technique the JCO workers used to improve their efficiency.

Luck is like a great wind that blows randomly. It camouflages people's decisions and actions. Our job, if we want to make good, or even great, decisions, is to look past the wind that blows today for intrinsic quality and give credit where credit is due. Sometimes we can learn important lessons from sports like baseball. And we don't even have to be lucky, just clear-thinking enough to pay attention.

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