

ankle joints all increased, reducing the strain running placed on them by distributing the stress over larger surface areas.

At the other end of the body, the skull's shape also changed, causing its center of gravity to move back, balancing the head on the neck and allowing it to be held steady easily. The nuchal ligament, which also assists in holding the head still, developed in the back of the neck. An external nose developed, providing a chamber in which dry air could be humidified by mucous membranes, helping to stave off dehydration during

long bouts of exertion. Again, none of these adaptations seem beneficial while walking or sprinting.

Imagine the advantages such adaptations might have provided early hominids: the ability to cover long distances in search of food, or to hunt and wear down otherwise swifter animals. It's easy to imagine our ancestors staring out at a flock of vultures circling in the distance, knowing that there was food on the ground and that the strongest runners, human or animal, would reach it first.

#### SOAR LIKE SOROS

## Stars, Bulls, and Bears

**P**ICTURE AN INVESTOR trying to decide which mutual fund will make the most of her retirement savings. As she reads prospectuses, the fine print and pie charts begin to blur before her eyes and all funds start to sound the same. She might choose based on reputation or past performance—although, as every prospectus warns, “past performance is no guarantee of future results.” Furthermore, track records say little about start-up funds that could be winners. To buy one of these unproven funds is, in essence, gambling.

For evaluating funds that are relatively new, “the existing methods are basically useless,” says assistant professor of business administration Randolph Cohen. That's important because, according to the financial data firm Lipper Inc., 55 percent of all diversified and sector equity funds in the United States are five years old or younger.

The standard methods for rating mutual funds by their performance records date from the 1960s, and have had only minor modifications since then. Now, Cohen and Joshua Coval, associate professor of business administration, along with Ľuboř Pástor of the University of Chicago, have developed an algorithm that compares the decisions a fund manager makes with decisions made by all other managers, including those with proven

track records. Their formula shows that if a fund holds the same stocks as other funds with a history of doing well, it is in good company and is likely to perform well itself.

Because even new funds normally hold dozens of stocks, creating an abundance of data points, the researchers say their method allows a degree of statistical confidence four to eight times higher than a traditional results-based analysis, depending on how the traditional approach adjusts its performance measures for risk.

It's still too early to say if the Marathon Man hypothesis will attract support. “Up until now, all of the focus and research has been on understanding bipedalism and walking,” says Lieberman. “And once people start working on something, they tend to just keep doing it. But there really isn't any animosity to this idea in the scientific community. It just hasn't been thought about a great deal yet.”

—JERRY SHINE

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Coval compares the method to a game of blackjack. After just a few hands, it's impossible to tell which of two players is more skilled, because neither has won much money yet. But suppose there is a third player at the table who has been playing for a while and has amassed a huge stack of chips. We can compare the strategies of the first two players to the one used by the big winner. The more skilled player is probably the one whose strategy most resembles that of the man who has beaten the house so far.

To some degree, this all seems obvious. Why wouldn't any blackjack player try to copy a winner? Why wouldn't a fund manager buy the same stocks held by a fund that usually gets good returns? In



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fact, "This paper started out with my asking why no one had done this," Coval says. As with any mathematical discovery, adds Cohen, "If it *doesn't* eventually seem obvious, then it probably isn't quite right." What's less obvious is that, according to the researchers, investors who followed their system from April 1977 to December 2000 would have made as much as 1 percent per year more than they would have by consulting track records alone.

The three scholars present their findings in an as-yet-unpublished paper (available on-line at [http://ssrn.com/abstract\\_id=353620](http://ssrn.com/abstract_id=353620)). Meanwhile, they are working on making their system available to the public. Pástor, for example, has given a presentation to Morningstar Inc., which rates mutual funds on its website. Like the researchers, Morningstar judges funds against others with comparable investment profiles, but unlike them, Morningstar would not assign a higher rating to a fund that had been outperformed by others of its type, however closely that fund's current holdings matched those of the top-ranked fund.

The ranks of successful fund managers include both innovators and copycats. In some cases, it doesn't matter whether the manager leads or follows. For cases where an assessment of a manager's true skill matters, however, the researchers devel-

oped a formula based on trading transactions that rates managers on the timing of their purchases and sales as well as on the list of stocks they hold. Most mutual funds publicly disclose their transactions quarterly, so if a manager picked a good stock before it was disclosed that other high-performing managers bought it, he gets credit for the decision.

If this new method emphasizes current holdings and recent transactions, downplaying the fund's performance history, could a fortunate winning streak sway the ratings? The researchers say that the new method actually uses *more* data points than the traditional one. Suppose a fund has been operating for five years. With the traditional rating method, there are essentially five data points. "You'd need hundreds of years of history to get a very accurate evaluation," Cohen points out. But when you analyze every transaction completed in those five years, your measure is much more precise. "When you look at the decisions that are being made, rather than the returns that are earned," says Coval, "you filter out luck."

~ELIZABETH GUDRAIS

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## EXTRA-DIMENSIONAL PERCEPTION

# Gravity's Riddle

**E**VER SINCE the fabled apple fell before Isaac Newton, gravity has posed enigmas. Along with electromagnetism and the strong and weak forces that bind atomic nuclei together, it is one of the four fundamental forces of physics. Gravity behaves idiosyncratically. While other forces cancel each other out (positive and negative charges, for example), gravity just keeps adding up: the bigger the mass, the more its gravitational attraction. "Gravity is definitely the weirdest of all these forces," says professor of physics Nima

Arkani-Hamed. "It was the first force discovered, and it's still the most mysterious."

In physics, deep problems often arise from simple questions, like this one: Why is gravity so weak? Consider that a refrigerator magnet easily picks up a paper clip from the kitchen tabletop; its magnetic force defeats the gravitational power of the entire Earth, a ball 8,000 miles in diameter. Even at the subatomic level, the electrical forces binding two protons together are  $10^{40}$  times stronger than the gravitational attraction between them.