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FINDINGS FROM FACULTY RESEARCH AT COLUMBIA BUSINESS SCHOOL

Paying It Safe: What We'll Spend to Keep Crime Risk at Bay

New research uses Megan's Laws data to confirm that property values decline when sex offenders move into a neighborhood—and points to how much it's worth spending on policies that prevent violent crime.

In the 1990s, new laws aimed at protecting communities from sex offenders began to crop up around the country. The earliest versions of these laws were dubbed Megan's Laws, named for a seven-year-old girl who was sexually assaulted and murdered by a neighbor who, unbeknownst to the community, had a previous record of assaulting children. These state and federal notification laws require that the public be informed of the location and description of convicted sex offenders.

The laws have not been without controversy, having faced challenges on grounds that they violate due process and subject sex offenders to retroactive punishment, but they remain intact. The reasoning behind the laws is simple: neighbors can use the knowledge that a convicted criminal lives nearby to reduce the risk of becoming a victim.

While the instinct to avoid crime risk is clearly high, its demand and impact can't be easily measured, so it can be difficult for policymakers to determine how best to direct resources to cultivate safety and reduce risk. In a world of scarce resources, both public and private, what is the cost of crime? Or more precisely, what are individuals willing to pay to reduce their exposure to the risk of crime?

Data made public as a result of Megan's Laws may help answer such questions by allowing economists to more accurately assess how much



people value limiting their proximity to crime risk. Professor **Jonah Rockoff** and his coresearcher, Leigh Linden of Columbia University's Department of Economics and School of International and Public Affairs, learned of a case in which a property owner claimed his home had declined in value as a result of a known sex offender's move to his neighborhood. The homeowner sued to have his property taxes lowered. The researchers were interested in learning what a clear link between the arrival of sex offenders and declines in property values could reveal about how much people are willing to pay to lower their exposure to crime risk.

Paying It Safe continued on page 2

In This Issue

FEATURES

Paying It Safe: What We'll Spend to Keep Crime Risk at Bay	1
Rewarding Efficient Commuters, Easing Traffic Congestion	4
Is Cash Really King in Valuations, or Do Earnings Trump All?	6
When Getting Bad News Is Good News for Banks	7
A Little Bad Behavior Goes a Long Way	8
Does Technological Tying Spark or Stifle Innovation?	9

RESEARCH BRIEFS

Adaptive Idea Screening	3
Positioning and Pricing Without Market Information	5

OFF THE SHELF

Putting the Customer Back at Center Stage <i>Q&A with Noel Capon</i>	10
Puzzling Over China's Growth <i>Q&A with Geert Bekaert</i>	12

VIEWPOINTS

Congestion Pricing: Can it really balance fairness and efficiency?	14
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The researchers' first step was to learn if Megan's Laws really do cause property values to fall. To do this, they mined a variety of real estate and tax information. Although Megan's Laws are widespread, North Carolina is one of only a handful of states that include exact move-in dates of sex offenders in their registries—information that previous similar studies didn't have and that would help the team make more precise calculations.

What could taking a more precise look at the relationship between property values and crime risk reveal?

A colleague of Rockoff's provided home-sales figures and exact geographic data for Mecklenburg County in North Carolina. The researchers also pulled records from the county tax assessor's office. With the assistance of the School's Paul Milstein Center for Real Estate, Rockoff and Linden painstakingly mapped property parcels and the residences of all sex offenders in Mecklenburg County, using the geographic data to measure distances between sex offenders and property locations, and compared sales and tax-assessor records before and after the dates the sex offenders moved in.

With all this data, Rockoff and Linden were able to take a far more precise look at the relationship between property values and crime risk than previous studies. "We weren't just looking at what happened to property values generally in one section of town, at the aggregate level, and saying that property values overall drop when crime risk increases," says Rockoff. "We were measuring the

distance in feet, from house to house—what *your* distance is from crime risk."

Here's what that precision yielded. Property values did indeed drop by about 4 percent after a sex offender moved into the neighborhood, which was about \$5,500 of the median home price in Mecklenburg County. If there's any good news in this, it's that the decreases occurred in a very limited area—within about one-tenth of a mile, or two city blocks, of the sex offender. The closer another home was to a sex offender's home, the greater the decrease: a home next door to a sex-offender's residence could see a drop in property value by as much as 12 percent, whereas a house four or five doors away might see a drop of only 5 percent. The researchers found no evidence of a decrease outside of that tenth-of-a-mile radius.

A previous study that examined property-value decreases and sex offender locations, conducted by a team in Ohio, wasn't able to account for other reasons that property values in a neighborhood might have fallen.

"The problem is that if sex offenders are moving to particular kinds of neighborhoods, particularly where property values are low—which is often the case—you can confound the arrival of the sex offender with other things that might be making the neighborhood less desirable to live in, like a neighbor who paints his home bright pink or stops caring for his lawn," Rockoff points out. Because they had the specific date of each offender's arrival, Rockoff and Linden were able to reasonably eliminate other possible causes of declines in property values unrelated to crime risk that happened after those dates.

"The motivation for most economists to look at the relationship between property value and crime risk is to think about what people are willing to pay to reduce crime or their exposure to the risk of becoming a crime victim," Rockoff explains. "For example, if property values near the residence of a sex offender in Mecklenburg County drop by an average of \$5,500, you can

estimate that an average person would be willing to pay a premium of \$5,500 not to live in close proximity to a sex offender."

Determining that figure allowed the researchers to make a rough estimate of the costs borne by victims of sexual offenses. Using additional data on criminal behavior, their rough estimate suggests that current Department of Justice figures of slightly more than \$100,000 for the cost of victimization for rape and sexual assault should be much higher—as high as \$1 million or more.

It may be discomfiting to quantify the experience of being a crime victim in economic terms, but there's a compelling reason to do so. "If we know the cost to victims, then we know what it's worth if we have a policy that might reduce the incidence of crime," Rockoff explains. The researchers' calculations imply that spending large amounts of funds for preventing sexual assault would be justified.

As for Megan's Laws, because people view information as a tool that can reduce their risk, they may want to be armed with the uncomfortable knowledge that a sex offender has moved in around the corner. But it's not clear such laws achieve their intended purpose, and Rockoff is now looking at whether they actually prevent further crimes. "It's important to understand whether these laws are doing something positive for public safety," he says. "If they're not doing that, it may be that all we're doing is scaring people and reducing property values."

Read More

Linden, Leigh L., and Jonah E. Rockoff. "There Goes the Neighborhood? Estimates of the Impact of Crime Risk on Property Values from Megan's Laws." *American Economic Review* (forthcoming).

Jonah E. Rockoff is assistant professor of finance and economics at Columbia Business School.

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THE IDEA: Use adaptive screening to engage consumers in selecting the best ideas for new products.

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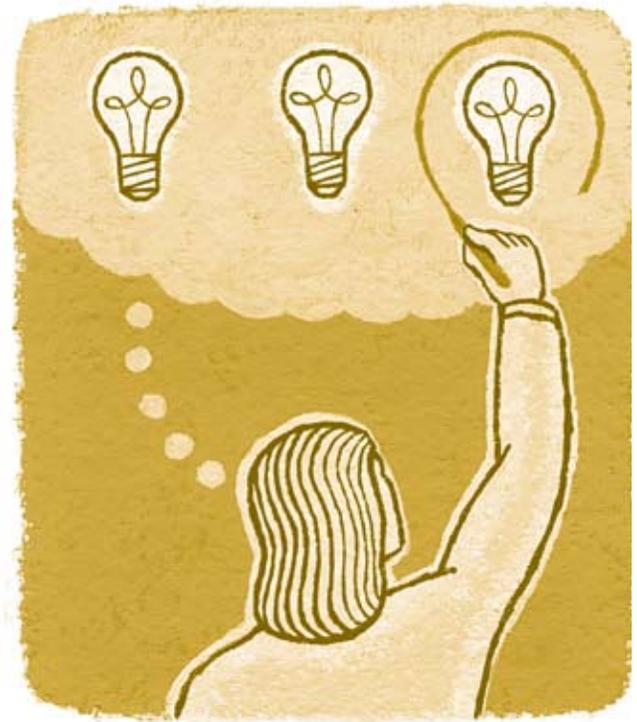
THE RESEARCH

Companies increasingly involve consumers in idea generation exercises, understanding that dreaming up new products is best done by those who buy and use them. But large volumes of new ideas present a problem: screening and testing those ideas to find the ones most likely to succeed in the market.

New research from Professor **Olivier Toubia** shows a method for engaging customers in the screening process at a low cost to the firm. Toubia and coresearcher Laurent Florès of Institut d'Administration des Entreprises d'Aix-en-Provence in France worked from the assumptions that a company can probably capture only five minutes' worth of a customer's attention and that the Internet is the least-expensive platform to reach targeted customers. In that brief five-minute window on the Web, only a few ideas can be shown to each consumer, and the company needs to get reliable assessments that will funnel an ocean of ideas into a pool of only the highest-quality ideas.

Using the same basic adaptive screening method employed in educational testing, Toubia and his coresearcher developed a series of algorithms that identify the optimal sets and order of ideas that should be presented to successive consumers for screening. The most important of these is a "misclassification" algorithm, which is used to get more information about ideas that may have been placed in the wrong category. It's important that ideas are neither mistakenly pulled from the rotation too soon—lest a great idea be lost—nor left in too long, since the system needs to make sure all ideas get screened.

As customers evaluate ideas, the algorithm filters out ideas that are clearly bad and can be discarded. Once a threshold of customer responses is reached, an idea is set aside as definitively good or bad and taken out of rotation. In repeated simulations with consumers, the researchers found that from a pool of 100 ideas even as few as 200 screeners could, with a very high degree of accuracy, winnow a small group of best ideas that appeal to the rest of the population.



PRACTICAL APPLICATIONS

Marketing managers, human resources managers

Marketing departments can use this research to design Web surveys and use customers to screen ideas after an idea generation exercise, especially when there are a large number of ideas in need of sorting. For human resources professionals, adaptive screening allows a small number of staff to screen a large number of potential job candidates. This research can also be useful in other fields, in situations where many items need to be classified based on the kind of attributes they possess.

Read More

Toubia, Olivier, and Laurent Florès. "Adaptive Idea Screening Using Consumers." *Marketing Science* 26 (forthcoming).

Olivier Toubia is associate professor of marketing at Columbia Business School.

Rewarding Efficient Commuters, Easing Traffic Congestion

How municipal governments can use incentive programs to create a shorter commute and improve welfare for all.

To Professor **Nicolás Stier**, whose research focuses on network design, traffic jams are a sign of a network gone wrong. Consider a congested metropolis like New York. Stier judges a city's transportation network on its average commuting time, which is a way of measuring how well the transportation system works. The system is considered equitable if it isn't structured to give unfair advantages to one socioeconomic class—for example, providing short, cheap commutes for the rich but few affordable options for the poor.

In most major cities, people can choose either to drive or take public transportation to work. Commuters select the option that works best for them based on a combination of travel time and cost (for example, many prefer the option that requires less travel time, even though taking the subway, bus or commuter train may be less comfortable than driving one's car). In urban networks, roads are in high demand, and the choices made by each person affect the choices that others will make. When too many commuters decide to drive, congestion increases sharply. For this reason, having relatively few people switch to other modes will significantly improve the commute time of an average worker.

To influence drivers to opt for public transportation, municipal governments can offer incentives, such as subsidies or discounts for using the subway, or create disincentives for commuting by car, such as higher taxes and fees. Subsidies decrease the costs of the poor, who are price sensitive, and decrease the commute time of the rich, who are time sensitive, thus improving everybody's welfare. In addition, subsidies are the more politic approach, since they don't increase costs; that's why most major cities subsidize subways, while only a handful have tried congestion pricing. (For Stier's and other

researchers' views on congestion pricing, see page 14.)

Cities encourage commuters to use mass transit to achieve a variety of objectives, such as reducing congestion and pollution, which not only benefits the environment but also helps businesses to operate more efficiently (thereby generating more tax dollars). That's another reason public transportation systems are often heavily subsidized. "Even with the recent fare increases in New York, users aren't paying the real cost of operating the subway," says Stier. "The subsidies are a way of influencing behavior."

The problem is figuring out which options should be subsidized, how much they should be subsidized and how to pay for the subsidies. Stier and his research partner, Patrick Maillé of École Nationale Supérieure des Télécommunications de Bretagne in France, developed an optimization model that can be used to compare different pricing schemes and to find the best possible subsidies for all transportation alternatives.

The researchers' model can be applied to any system in which a central organization can give incentives to influence the choice of an alternative over others. For example, a shipping company that uses planes, trains and trucks to move packages around the world might want to encourage its business units to choose the shipping option that maximizes profits on a corporate level. Or a government agency could impose price controls on contracts offered by network providers (and compensate them) to increase the efficiency of telecommunications networks.

"In a company that is not tightly integrated," Stier says, "business units may seek to maximize their own profits, just like every commuter in a city wants to



have the shortest commute possible. But the management can offer rebates to align the incentives of the unit to those of the corporation as a whole."

Ideally, he says, an incentive policy should be structured to at least partially fund itself. In the case of a city managing its transportation network, the subsidies should produce an economic benefit. "If a city subsidizes mass transit, more people will choose that option," Stier says. "That will reduce the average commute time among travelers and also reduce traffic jams for those who continue to drive." Everyone will spend less time getting to work, businesses will operate more efficiently and will pay more taxes and the city can use this money to offset some of the cost of the subsidies. "It enables the city to increase its social welfare," Stier adds.

Read More

Maillé, Patrick, and Nicolás Stier. "Eliciting Coordination with Rebates." Working paper, Columbia Business School, 2007.

Nicolás Stier is assistant professor of decision, risk and operations at Columbia Business School.

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THE IDEA: Optimize product positioning and pricing in the face of missing market information.

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THE RESEARCH

The traditional approach to product-line positioning and price optimization seeks to understand consumer preferences by analyzing historical data or conducting market research. But in extreme cases when a firm has minimal market information and where gaining insight into market demand is costly, a company must determine how it can guide the launch of an untested product line or a new service. Consider an airline introducing service in a new city without information about the flow of demand throughout the day: How should it determine how flights should be spaced and what destinations those flights should connect to, and how should it price each of those flights?

Professor **Garrett van Ryzin** and business doctoral student Serkan Eren set out to show how companies can make pricing decisions when they have very little information about market demand and consumer preferences. The team applied concepts from computer science to develop a mathematical model that can help maximize profit in a worst-case scenario. The model accounts for missing market information by taking a conservative approach designed to perform uniformly well against unknown market factors.

The model confirms that firms do best by hedging their bets and covering themselves against a range of possible outcomes. In the case of horizontal differentiation—variations in product-line attributes like color, flavor or size—the best strategy is a defensive strategy of uniform coverage and uniform price: if a retail outlet carries 10 shirts, those shirts should span the color spectrum, and each color should be priced the same. Vertical differentiation—differences in quality levels within a product line—requires a slightly different approach in cases of an extreme lack of market information: a firm should offer more product versions when there is a lot of ambiguity about customer willingness to pay for quality, but when there is less variation in people's preference for quality, it's optimal to offer only a few versions of products of varying quality.



PRACTICAL APPLICATIONS

Product developers, marketing managers

You can use this research to minimize risk and ensure a threshold of profit when your firm lacks market information for a new product or service. For horizontal differentiation, position your products evenly throughout the attribute space, and price them identically. For vertical differentiation, the right number of quality levels to offer depends on the degree of uncertainty about customers' willingness to pay for quality.

Read More

Eren, Serken, and Garrett van Ryzin. "Product Line Positioning Without Market Information." Working paper, Columbia Business School, November 2006.

Garrett van Ryzin is the Paul M. Montrone Professor of Private Enterprise in the Decision, Risk and Operations Division at Columbia Business School.

Is Cash Really King in Valuations, or Do Earnings Trump All?

Forecast U.S. earnings are the closest proxy for share price when compared with actual financial statement variables. But do they beat forecast cash flows and dividends in an international sample?

About five years ago, as investors licked their wounds in the wake of the Enron and WorldCom scandals, analysts clamored for financial measures beyond earnings that might paint a truer picture of a company's intrinsic value. Earnings, many argued, could be more easily inflated than other financial variables.

At the time, as had happened cyclically many times before, institutional investors rallied around cash flow from operations as perhaps the best sign of a company's future cash flows and, by extension, its likely stock price.

Because cash flow, unlike earnings, excludes relatively arbitrary items like depreciation and amortization, the logic went, cash flow might be a closer proxy of a company's value. Earnings in some high-profile scandals had proved fallible, since companies could fudge the numbers. Forecasts of other variables, including dividends, might also more perfectly signal a company's value, some thought.

To see if, in fact, "Cash is king," Professors **Doron Nissim**, Jacob Thomas of Yale and Jing Liu of the University of California, Los Angeles, studied financial data from I/B/E/S (Institutional Brokers Estimate System) for nearly 26,000 international companies from 1987 to 2004.

Examining variables from individual industries rather than all industries together and extending the analysis to other forecast variables by drawing on a larger swath of geographies and industries might make results more comparable and representative, they hypothesized.

"Theoretically," explains Nissim, "forecast cash flows should be a better indicator of share price than earnings, since net asset value equals the present value of expected cash flows. And price is the present value of expected dividends."

A 2002 study by the professors studied

a sample of U.S. companies. That research showed that, on average, forecast earnings trumped all reported variables—including earnings, cash flow, sales, EBITDA and book value—as an indicator of a company's share price, with sales and operating cash flows correlating least with a company's share price.

The current study extended the researchers' earlier work by looking outside the United States to a sample of listed firms in Australia, Canada, France, Germany, Hong Kong, Japan, South Africa, Taiwan and the United Kingdom. Using global data was important because analysts in some countries tend to calculate forecast variables beyond earnings more often than their U.S. peers.

International data would also allow for a more diverse group of industries and, by extension, more cross-industry comparisons. That is because non-earnings forecasts in the United States might be skewed, since they tend to be restricted to industries like mining, and oil and gas, with larger-than-average arbitrary expenses. Analysts following these industries often direct investors to variables beyond earnings like cash flow and dividends, which exclude these expenses.

Nissim and his coresearchers found that, on average, forecast earnings beat other variables—actual and projected—as a sign of a company's stock price. The key takeaway for an underwriter pricing stock in a company about to go public or an investor calculating a company's worth following that IPO? "Work with earnings," says Nissim. "They may be a better indicator of a company's value than cash flow."

The researchers also found that forecasts nearly always beat their reported peers as an indication of value. Those results bore out across geographies and industries and when cash flow and



dividends were also analyzed. In fact, projected earnings, the researchers say, were "remarkably accurate" measures of value for a "substantial majority of companies."

And nearly always, forecast dividends outperformed actual dividends by only a small margin, perhaps because dividends tend to be "sticky," or vary little over time. (The incentive to change the amount is minimal because most tax laws favor capital gains over dividends.) The exceptions were in Hong Kong and Australia, where dividends and capital gains receive the same tax treatment. For that reason, in those countries dividends tend to be a close proxy for company value.

The researchers also concluded that current and forecast dividend data appear to be less important in countries and industries with earnings forecasts that perform relatively well.

There are, as always, a few caveats. This analysis does not extend to companies with nonpositive earnings, cash from operations or dividends. Also, for early-stage companies in, say, the biotechnology or technology industries, other variables might be better indicators of value than forecast earnings.

Read More

Liu, Jing, Doron Nissim and Jacob Thomas. "Is Cash Flow King in Valuations?" *Financial Analysts Journal* 63, no. 1 (March/April 2007): 1–13.

Doron Nissim is professor of accounting at Columbia Business School.

When Getting Bad News Is Good News for Banks

Rotating loan officers makes them more likely to report bad news about their portfolios, leading to more accurate internal reporting for lenders.

When it comes to a bank's assessment of its lending portfolio, the only truly bad news is unknown news. A basic tenet of the economics of asymmetrical information holds that when a lender has poor information about prospective borrowers, its disinclination for risk prompts it to ration credit, and when a lender is more fully informed about borrowers, it is more likely to allocate more credit.

But in the quest for accurate information, banks can be hindered by their loan officers, who don't always provide accurate reports about the portfolios they manage. That's because loan officers often play dual roles that present them with conflicting incentives.

Loan officers' initial reviews of prospective borrowers' financial portfolios requires that the officers act as *active monitors*, in which they make decisions about allocation of capital based on information they collect. But loan officers then take on a second role, as *passive monitors*, reviewing borrowers' repayment histories and reporting back to the bank about the status of the same loans they approved. In organizational terms, this dual active and passive role is known as *delegated monitoring*.

That loan officers should have monitoring responsibility for credit they recommended that the bank extend makes sense intuitively. But what if some of the loans an officer approved end up teetering on default? It's unlikely the officer wants his or her employer to see evidence of bad credit assessment checkering their portfolio. Wanting to appear competent, the loan officer's reports can fail to reflect the true status of the portfolio.

"How to provide incentives to loan officers is a big question among banks," says Professor **Daniel Paravisini**, who recently examined different incentive practices. "Some pay loan officers with stock options in the hopes that having a stake in the upside of the bank's stock prices induce them to behave better. Others have given loan officers very little

say in lending decisions — they transcribe hard data into a computer, which does all the work—knowing the officer might not report the accurate data."

Between those extremes, one tactic banks have used is to regularly rotate officers and their portfolios. The idea behind rotation is that, knowing their current portfolio will pass into the hands of another officer who would have little incentive to hide bad information about loans he or she hadn't previously managed, a loan officer would prefer to reveal that information rather than be exposed later by a colleague about to take on the portfolio.

Banks have relied on the thesis that rotation will prompt better reporting because of officers' concern for their reputations, but haven't been able to show that the tactic works. Rotation is also a common practice in many settings where there is a delegated monitor, such as auditing and governance, so confirming that rotating loan officers has an incentive effect to induce more accurate reporting has implications for organizational design and practice beyond banking.

Paravisini, along with coresearchers Andrew Hertzberg and Jose Maria Liberti, both of the Kellogg School of Management at Northwestern University, were granted access to a bank's data as part of an internal review to improve its organizational design and practices. With access to loan reports—information that is never made public—the researchers were able to measure the accuracy of its internal reporting, accuracy being the main measure of the ability of the bank's internal rating to predict future default.

The researchers found that the threat or possibility of rotation induced more accurate reporting on the part of the loan officers. Confirming the principle of asymmetrical information, they also found that the bank was allocating increased credit in periods right before rotation—just when the reports would have been at their highest level of accuracy.

"Rotation does impact banks' capital



allocation decisions," says Paravisini. Loan officers do a better job of reporting, banks make more credit available and borrowers find it easier to get credit.

This research bears only indirectly on the recent credit market crisis, but Paravisini points out that the potential for information to be lost inside financial organizations may be partly to blame.

"Banks are fully aware of internal conflicts of interest, but it's difficult to predict the full consequences of lending policy changes," he explains. "A variety of circumstances—development of derivatives markets, rising real estate prices, high liquidity—led banks to expand lending to the sub-prime mortgage markets but the high default rates in this sector seem to have caught the same banks, and investors, by surprise."

Read More

Hertzberg, Andrew, Jose Maria Liberti and Daniel Paravisini. "Information and Incentives Inside the Firm: Evidence from Loan Officer Rotation." Working paper, Columbia Business School, 2007.

Daniel Paravisini is assistant professor of finance and economics at Columbia Business School.

A Little Bad Behavior Goes a Long Way

A few bad impressions can quickly undermine all the good ones that have come before.

The old maxim that there's no second chance to make a first impression is founded on the notion that it takes a lot of evidence of good behavior to change a bad impression. But new research by Professor **Daniel Ames** and his coresearchers shows that good first impressions can be precarious.

"One of the things I find shocking about impression research is how little we know about how real-world impressions evolve and change," says Ames. Much research has focused on first impressions but not on what comes next. As it turns out, sustaining a good impression is a high-maintenance activity.

Ames worked with psychologist **Lara Kammrath** and psychology doctoral student Abigail Scholer to examine how long different kinds of impressions last and which impressions are more likely to change for better or worse over time. They also looked at what it takes to make those changes.

First, the researchers asked college students to rate their new roommates on each of the "Big Five" personality traits that behavioral researchers commonly examine: extraversion, openness, agreeableness, conscientiousness and emotional stability. The researchers then asked for new ratings for these traits during the year and one last time at the end of the academic year.

For impressions of some key traits, like extraversion and openness, ratings declined only slightly over the academic year, but not a lot. That wasn't true for all traits. "Agreeableness was the most volatile dimension. The vast majority of the times that it changed, it changed for the worse," Ames says. Conscientiousness and emotional stability were susceptible to similarly negative changes.

In a second experiment the researchers wanted to learn how often certain traits had to be exhibited for a person to be perceived as possessing that trait—in other words, how much does

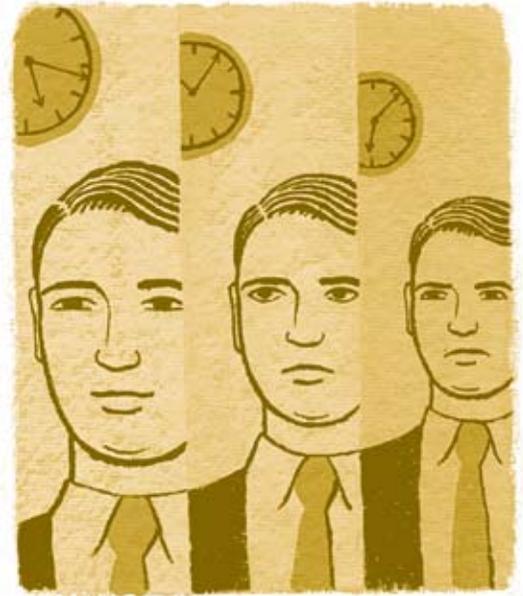
it take to keep up impressions of each trait? Using a list of 100 different traits, the researchers asked study participants to tell them how often somebody needed to show extraverted behavior, for example, to be seen as extraverted.

"To keep up an impression of extraversion, a person needs to show a moderately high level of talkativeness. But they can also get away with showing occasional reticence and nonetheless be seen as extraverted," Ames says. "Openness also seems to require only a moderate amount of evidence. But you have to consistently show a very high level of agreeableness, conscientiousness or emotional stability to still be seen as possessing those traits."

A third experiment reinforced the notion that all impressions require maintenance, and some require much more than others. First the researchers gave participants one piece of positive information about the behavior of another person (known as a target) and asked the participants to rate that person's personality. Participants then read about 10 additional behaviors performed by the target—6 positive and 4 negative behaviors, each related to one of the "Big Five" traits. The participants were then asked to rate the target's personality one last time.

Impressions of openness declined the least; those for extraversion declined somewhat. "But even though there was the same 60-40 mix of positive and negative behaviors that the extraverted targets showed, the participants' perception of the targets who were initially agreeable, conscientious or emotionally stable fell considerably more," says Ames.

What does it all mean? "Impressions are somewhat fragile," Ames explains. "You're more likely to have an impression get worse than better, and a negative behavior can readily undermine a positive one. For leaders and



managers, who are almost always highly visible and under scrutiny, even a small and seemingly forgivable slipup can be judged harshly. It reinforces the need for managers to be mindful that they are always on stage."

Does that mean people should aim to always appear agreeable, even when they don't feel that way? Not necessarily, says Ames. "One thing people can do is try to clarify that there may be reasons for why they're behaving in a way that isn't typical. You can signal, in effect, that a certain behavior 'shouldn't count.' Even something as basic as a circular excuse — 'I'm really upset because I'm frustrated' — can satisfy a person, and limit a behavior's harm, if it's delivered in a sincere way. For isolated instances, perceivers may let it slide, but over the long haul, actions speak louder than words."

Read More

Kammrath, Lara, Daniel R. Ames and Abigail A. Scholer. "Keeping Up Impressions: Inferential Rules for Impression Change across the Big Five." *Journal of Experimental Social Psychology* 43, no. 3 (May 2007): 450–57.

Daniel Ames is the Sanford C. Bernstein Associate Professor of Leadership and Ethics, and **Lara Kammrath** is adjunct assistant professor in the Management Division at Columbia Business School.

Does Technological Tying Spark or Stifle Innovation?

Technological tying may allow a market leader to maintain an edge, but innovation is another question.

About 10 years ago, Microsoft made headlines for a series of landmark cases stemming from the integration of its ubiquitous operating system, Windows, with its Internet Explorer browser. Microsoft's key browser rival, Netscape—which then was said to have the better browser—later sued, alleging unfair competition. The rest is history.

The lively debate triggered by those antitrust cases about the economic merits and ills of market dominance inspired Professor **Michael Riordan** and Richard Gilbert of the University of California, Berkeley, to examine *technological tying* in a monopolistic market. Their conclusion: Once a company has locked up a market for a key component, it can maintain its edge through a technological tie. As a result, innovation doesn't necessarily follow intense and open competition. In fact, innovation often lies fallow, or falls off, after the winner takes all.

Technological tying is basically the electronic bundling of products so that a key component works better with a complementary part from the same supplier than that of a rival. (Bundling is the packaging of products or services into a single offering, often at a discounted price). This approach often weakens the competitor's chance at eroding the monopolist's market share.

With similar cable and content situations unfolding in the broadband market, the researchers surmised that rampant product commoditization and price wars might make companies cautious about investing in improving products without a lead.

"When innovation is intense, the stakes are high and the strategic uncertainty is important," Riordan



explains. "Severe price competition can prevent a company from recovering its investment. Technological tying may help foreclose competition with rival products."

The researchers modeled scenarios in which one company controlled the market for a key component, while competitors made superior complementary products.

The professors found that when a company holds a monopoly on a key component (in Microsoft's case, the operating system) and rivals have an edge with a complementary offering (Netscape's Navigator browser, for example), the dominant player's release of a competing product (here, Explorer) would squelch its rivals' or new arrivals' will to innovate.

In fact, even the possibility that the monopolist could technologically tie may push the competing maker of a complementary component to curb planned investment and even exit a market.

Whether or not the monopolist keeps innovating, it will maintain its edge over rivals for complements after the competition walks away. "The monopolist knows it can earn a return from an investment in product improvement," Riordan adds. "And rivals will be discouraged from investing in innovation."

Of course, this analysis is based on a simulation and excludes unseen legal, political and cultural forces that could—as in Microsoft's case—erode advantages over time. "It's a stark model of an extreme business environment," Riordan says.

"Most markets are not winner take all."

Still, with many products meeting key characteristics of nearly monopolistic markets—such as filling an unmet niche (YouTube), interdependency (Napster) and interoperability (GSM phones)—"technological tying reduces the strategic uncertainty," Riordan says.

But some monopolists may reap more profit by charging a premium price for key components and complementary products than they would by technologically tying them, or by enabling their dominant product to work seamlessly with other companies' complementary products. Similarly, if a rival for complementary components is ahead, the monopolist may want to avoid that market or collaborate so that the two offerings work in concert.

"Sometimes the tradeoff involves a choice between profits in the core or in the complements businesses," Riordan says. "It may be best to leave complementary product innovation to others with an edge in that area."

Ultimately, though technological tying may not spur innovation, for companies with market dominance over a key component, tying could be a smart strategy to help them keep or gain an edge in the complementary product market, provided antitrust laws aren't infringed.

Conversely, companies with superior offerings should question follow-on investment if a monopolistic maker of a key component has or is mulling a competing complementary product that could be linked to its key component. "Investment decisions," says Riordan, "should be based on where a company sits on the spectrum of conflict versus cooperation."

Read More

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Michael Riordan is the Laurans A. and Arlene Mendelson Professor of Economics and Business at Columbia Business School.

Putting the Customer Back at Center Stage

Q&A with Noel Capon

Noel Capon looks at how companies succeed in a new world where an oversupply of goods and services means an undersupply of customers.

In your new book, *The Marketing Mavens*, you argue that there's been a shift in the marketplace, from "scarcity of supply" to "scarcity of demand" today. Can you talk about that shift?

If you look at the history of business since the Second World War, with all the rebuilding of national economies that were mostly destroyed, from a very broad-scale perspective, the marketplace for many industries could be defined by a shortage of supply. It was a matter of companies manufacturing enough products to supply people's needs. Over time, as companies have become more effective and efficient at producing goods and services, and as many new players have emerged in different parts of the world—just think of the increased competition from Japan, Korea, the Asian Tigers and now China—marketplaces are increasingly being defined by scarcity of demand.

Just ask any senior executive whether it's easier to win customers today versus 10 or 20 years ago. I guarantee that in virtually every case, he or she will tell you that it's getting tougher and tougher. Michael Hines from Prudential Financial made a very telling comment in the very first interview I conducted as part of this study. He said, "There is a lot of supply and a lack of demand," and what Prudential bases its strategy on is that "people don't need to do business with us."

It's not just that competitors are producing large volumes of products, it's that those products and services are getting better and better. The core challenges for all firms are how to deliver more value than the other guys and how to secure differential advantage over them. Firms are only going to succeed if they develop a visceral sense of the critical importance of customers.

You studied all kinds of industries and found that, across the board, the most successful ones all shared what you call the "capital M mentality." What does it mean for a company to operate with a capital M mentality?

Capital *M* companies are those where everybody in the organization knows that the only reason that their firm exists is because they have paying customers. Hence, marketing is not just a job for the marketing department; at some level, marketing is the job of everyone in the company. No matter where you sit in the organization, even—or especially—if you're physically removed from customers, the only reason you get a paycheck is because your company sells a product or service that customers pay for.

In small companies, like the local grocery store or dry cleaner or garage, the owner takes care of all of the functions. That person serves customers, is closely involved with manufacturing or service delivery, does the finances, organizes its human resources and so on. The owner is connected to every part of the business and really understands the job that each function has to do to serve customers.

When companies get bigger they typically specialize their functions, and a lot of those functional departments develop their own visions and missions. Some of the functions may never see a single customer, and ultimately customers take a back seat to the *important jobs* they have to do day to day. There's a real danger of growing firms losing a customer focus.

That's what happened at IBM in the 1980s. In the 1960s and 1970s, IBM did a great job of providing customers with value through their mainframe computers. Remember "You never got fired for buying IBM!?" But IBM lost



Marketing departments typically focus all of their energies on communications. Marketing is much bigger than that.

— Noel Capon

sight of what its customers wanted. Over a three- or four-year time frame in the early 1990s, IBM went from being highly profitable—and probably the most highly admired company in the world—to almost going bankrupt. There were a lot of reasons for that negative transition, but at root, IBM lost touch with its customers and needed Lou Gerstner to come in and restore that customer focus.

Bloomberg is a great example of a firm with a capital *M* mentality. The only thing that matters inside Bloomberg is selling terminals. Everyone in the organization from the top guy to the janitor gets equity equivalency certificates based on terminal sales. The more terminals customers buy, the more equivalency certificates everyone gets. No matter where you sit in Bloomberg, you know that, at the end of the day, the only thing that really matters is customers buying Bloomberg terminals.

Did these companies all find their way to embrace this kind of customer-obsessive focus in the same way? Is there a formula?

Generally, these companies embrace the capital *M* philosophy at a very deep level. Now, where did it come from? It may have come from a visionary CEO. Certainly someone like Howard Schultz [of Starbucks] lives and breathes that philosophy. It may have come from a strategic change. For example, Samsung

used to be a highly manufacturing-focused company; what was core at Samsung was efficient production and low costs. Then Samsung shifted its strategic direction; it pulled its products out of Wal-Mart and sought a different kind of customer that desired high quality and design. And the marketing people we talked to were strongly supported from the top of the organization.

In many companies, the job of marketing is essentially a communications function: we know the customers, we've figured out our product and how to price it, and all that really matters now is communication—through traditional advertisements, the Web, sales brochures and so on. These marketing departments essentially focus all of their energies on communications.

In *The Marketing Mavens*, I argue that marketing is much bigger than that. We've already talked about marketing at the philosophical level, but marketing also embraces five imperatives—these are the set of jobs that must be done.

ExxonMobil and ESPN are two excellent examples of firms that understand each of these imperatives. Let's just take the first imperative: Pick markets that matter. ExxonMobil has embraced this by shifting its focus from servicing cars with oil and gas; it figured out that what's important today is servicing drivers. It understands that as automobiles have become more and more reliable, they don't need so much servicing. So ExxonMobil focuses on serving drivers with the Speedpass for paying at the pump and with its convenience stores.

ESPN decided to focus on sports, and then narrowed down into different sports where there were small groups of fanatically interested fans, as with extreme sports. ESPN is also a great example of acting on another imperative: Design the market offer to create customer value and secure differential advantage.



It's surprising to learn that this zoom in on customers doesn't necessarily mean that customers always get what they want, or what they think they want.

Right! And, of course, it's also the case that there are some customers you don't want. Although my underlying argument is for a visceral focus on customers, customers do not always know best.

UnitedHealthcare is an especially interesting example to look at. This HMO essentially decided that its mission, as well as the way to increase its profitability, was to become a facilitator of its customers' healthcare. It set out to do away with the adversarial relationship between HMOs and their customers.

But one of the things they ended up doing was getting rid of a lot of variations in coverage. Those variations, addressing customers' fine-grained concerns, were great for closing sales, but UnitedHealthcare found that special features made for significant relationship problems later on. Then the firm would end up with unhappy customers, and would ultimately lose them. Instead, UnitedHealthcare focused on providing *manageable* variation in their policies. But they also improved call centers to move people more quickly through the system, eliminated referrals approval,

and took all sorts of other actions to embrace their role as a facilitator. Just look at its financials; it's clearly paid off.

Why do you say that it's okay for a company to make mistakes?

Before writing this book, I hadn't really thought about this issue too much, although of course, any risk-taking firm must expect to have some failures. The fact of the matter is that with the environment becoming ever more complex and changing ever faster, it's almost impossible to be at the top of your game all the time. Even with the best planning in the world, things are going to go wrong. The best companies are going to do well most of the time, but they will also probably

make missteps and have problems, and they will bounce back.

A couple of the companies I talked to are in that situation right now. Both Dell and Sony have seen better days, and each is going through some tough times. But when you look at their past performance over an extended time horizon, you see that they have both had spectacular success. Maybe their stock price will not do so well in the short run, but I wouldn't bet against either firm over the long run.

If you want a couple of contemporary examples, just look at Apple and IBM. It's not so long ago that many people were writing their obituaries, but I believe that most people would agree that both firms are a long way from being dead and buried.

Read More

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Noel Capon is the R. C. Kopf Professor of International Marketing at Columbia Business School.

Puzzling Over China's Growth

Q&A with Geert Bekaert

Forget the old assumptions about China's boom—the country's economic growth doesn't fit the usual models. Geert Bekaert talks about what is and isn't behind China's ever-mushrooming economy.

You worked with Campbell R. Harvey and Christian Lundblad to apply a wide range of standard growth models to China to try to explain its growth experience with standard growth determinants, such as trade openness, financial development and so forth. You found—not so surprisingly, you say—that the standard models cannot explain China's growth miracle.

We do say that it's not surprising that China doesn't fit the standard models, but our study still yielded some surprising results. For example, usually when there is such strong growth, there's also a lot of volatility—the growth rate moves up and down a lot from one year to another. China has had a lot of growth and very steady growth, without much volatility.

It's also been assumed that trade plays a big role and that China is more open to trade than other countries. A lot of big countries—like the United States—do

on average than that of other emerging markets, and in our analysis contributed surprisingly little to economic growth.

What does play an important role in China's growth experience is its enormous investment-to-GDP ratio. Some 40 percent of total resources available are being used for investments; in other countries that number is typically 20 to 25 percent.

In all, even accounting for exceptional investment levels and for some of the measurement problems associated with Chinese statistics, China's growth potential remains a real outlier.

How does all this investment get financed?

It turns out that most of the investments are really financed by a huge pool of local domestic savings. It all gets plunked into investing for growth. If you think about welfare, you want people to consume, you want people to get richer. But individuals are saving a lot of money—because they *have* to. There's no social security to speak of, so people have to really plan for old age; and they have to save to fund educational expenses, etc. China should figure out how to keep growing fast but at the same time use more of its resources to build a welfare system with pensions and health-care to care for its people, deal with pollution and other problems. It can

do so if it manages to allocate capital more efficiently than it currently does.

The state sector remains huge, but capital allocation by state-owned enterprises is notoriously inefficient. So



Usually when there is such strong growth, there's also a lot of volatility. China has had a lot of growth and very steady growth, without much volatility.

— Geert Bekaert

in some sense what is kind of amazing is that as fast as it is already growing, China could actually grow even faster if it employed capital more efficiently.

The flip side of the huge savings and investment rates is that a smaller proportion of the total resources available is being consumed than is typical in most countries. But if you think about general welfare, it's consumption that should grow, not necessarily investment and GDP. You want the people to benefit from all these investments, and right now China is totally focusing on growth. They will have to make some sort of shift there, I think.

China has also taken a different path when it comes to financial openness. Can you explain the dynamics there?

Typically, when countries open their capital markets for foreign investment, it's a two-way street. Foreigners can invest in the country either through the capital markets or through foreign direct investment [FDI], which most people believe is the most valuable form of capital. FDI involves buying or starting up real companies, as opposed to buying stocks on the stock market. And people in that country can also invest abroad. Whereas I firmly believe that financial openness promotes economic growth, a number of countries that have opened up their markets in the past also went on borrowing

The state doesn't leave the Chinese people with many good options for increasing their own consumption or welfare through a better return on their individual savings.

not have large trade sectors relative to the size of their economies, and compared to the United States, China is actually quite open. However, China's ratio of trade to GDP is actually smaller

binges. While the subject of much debate, some see too much or too fast financial openness as the root cause of the crises Mexico and Southeast Asian countries faced in the mid- to late '90s.

China has avoided such crises perhaps because it has opened up in an asymmetric and controlled fashion. First, Chinese citizens cannot invest abroad. Second, China has very purposely avoided borrowing from

How does that affect the local investment climate for the Chinese?

At home, investors have few interesting investment options: they can put their savings under their mattress, they can try to invest in private enterprises—but that can be difficult—or they can go to the local stock market, which last year did really well but over the 10 years before performed terribly. They can also deposit their savings in a state bank, but

the real interest rate in China is negative. I suspect those individuals would prefer to put their money somewhere else, probably in Europe or the United States, but they cannot.

The upshot is that the government is sitting on this massive pool of local savings it uses to invest in the economy, but the return on savings for those individual Chinese is very low. Ironically, the Chinese central bank itself is investing massively abroad, especially in U.S. Treasury

bonds, which the Chinese people themselves cannot buy.

So that's another asymmetry: on the one hand, the savings allows the government to invest, which drives overall growth, but the state doesn't leave the people with many good options for increasing their own consumption or welfare through a better return on their individual savings. Yet, our analysis does reveal that the avoidance of foreign debt has played a role in promoting growth, and without a massive pool of domestic savings, China could not have sustained such high investment levels.

What's next?

That's certainly the question, isn't it? It's really hard to predict what will happen. I'm not an expert on China, by the way, but I can offer some perspective building on what I learned doing this project.

China features prominently in the current debate about global trade imbalances. Many believe China's restrictive exchange-rate system has led to an undervalued exchange rate that gives it an unfair advantage in international trade. The United States has pressured China to make its exchange rate more flexible, thinking that market forces would make the exchange rate in China appreciate.

I'm not so convinced. Over the long term, probably yes. But if China opens its capital markets further, those with domestic capital might search for better investment opportunities and diversification abroad. This market force may cause the exchange rate to depreciate. Some of the more well-off are already trying to park capital abroad, and the central bank in China is trying to slow this illegal capital outflow down.

However, the current growth model with an emphasis on high GDP growth, without regard to the resources used, is unsustainable. The state has to get out of the way. China needs to focus more on the overall welfare of its aging population. To sustain high growth, it must find a way to grow more efficiently. Using efficient capital allocation through developing its local financial markets and through financial openness is the best way forward.

It's not really an issue of growing faster, it's an issue of growing more efficiently.

Read More

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Geert Bekaert is the Leon G. Cooperman Professor of Finance and Economics at Columbia Business School.



abroad; foreign capital mostly comes in the form of FDI. Now, we shouldn't assume FDI is enormous, either. Shang-Jin Wei, who also contributed to the book and is a true China expert, has already pointed this out. While there is much hype about FDI in China, the UK gets proportionally more FDI than China. Foreigners can also invest in the Chinese stock market, but that's still being opened up and is still pretty limited as an option for foreign investors.

Congestion Pricing: Can it really balance fairness and efficiency and still work for the cities that embrace it?

Congestion pricing aims to cut urban traffic congestion and pollution by charging drivers entering downtown cores an access fee. Professors Nicolás Stier, Nachum Sicherman and Eric Johnson weigh in on congestion pricing, which is up for consideration in more than a dozen U.S. cities.



Nicolás Stier

Assistant Professor,
Decision, Risk and
Operations

Congestion pricing aims to encourage commuting decisions that maximize efficiency. But an optimized system isn't everything. Equity should also be a top priority for congestion-pricing schemes. If such systems are well thought out, social welfare should also improve.

For example, a system focused overwhelmingly on efficiency might make the poor worse off, since they would have to pay more than they currently do (and can afford). It might also make life easier for the rich, since the fee is so little to them, and they can thus drive faster downtown.

The poor, on the other hand, who live far away, may not have any other option than driving into the city if their lower-rent neighborhoods offer few mass transit options. Or driving may be too expensive and they must make a time-consuming combined bus-subway commute.

Thus, when designing a congestion-pricing system it is important to quantify who can pay what, and analyze their alternatives. Ideally, over time, some solutions to improve equity could in part be financed from congestion-pricing proceeds.

If congestion pricing were done well, with toll revenue used for better mass transit in areas that are poorly served by subways or buses, the overall system would improve, while improving equity.

Reinvesting in roads rather than mass transit is the wrong approach. It sends commuters a mixed signal. Tolls motivate

drivers to switch to public transportation; road improvements encourage driving.

Correlating the amount paid in tolls to income could also improve equity. If the collection scheme records total payments per year, low-income drivers could be reimbursed after filing a tax return.

One should look to London—the textbook case for congestion charges—for lessons on fairness. People who live in London's central business district get a 90-percent discount on the congestion tax just for living in “the zone.” This encourages people with cars to move into that area. For that reason, urban residents should be charged the same rate as those who live outside the city. On the other hand, if city residents are driving outside the zone against traffic, they shouldn't have to pay a fee, because their presence in a less dense area imposes less of a cost.

Critical success factors to meet a congestion charge's dual goals of improving efficiency and equity include the amount to be charged and the manner of implementation. If the charges are too high, people will be angry and boycott the system—and the poor, who have few options other than driving, suffer most.

On the other hand, setting the price too low means not enough people will switch from cars to mass transit, and the public transportation system will not improve. So, though drivers would pay, little congestion relief would follow. This scenario may be the most dangerous because a second opportunity to implement a congestion charge may not emerge if a scheme does not work in its first trial.

Professor Stier specializes in the study of the design, coordination and incentives of decentralized systems.



Nachum Sicherman

Professor,
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Congestion pricing makes sound economic sense. It builds on two economic concepts: peak load pricing, which means, “spread the load,” and negative externalities.

Peak load pricing is similar to lower-cost calls at certain hours. Just as phone calls may be more expensive between 9 a.m. and 5 p.m., thus encouraging more calls in the evening, higher peak-load pricing fees during rush hour might motivate drivers to shift their driving patterns accordingly. Deliveries, for example, might happen more frequently in the early mornings or after 7 p.m. because they would be less costly.

As for externalities, with cars come costs, such as pollution, noise and traffic jams. Drivers don't take those into account. Congestion pricing fixes this by imposing an additional price that would correct a market failure. That price forces decision makers to consider the full consequences of their actions, and thus improves efficiency.

Congestion pricing is an old idea. Nobel Prize-winning economics professor William Vickery of Columbia applied the concept to New York City, its suburbs and the subway as early as the 1950s. He suggested different prices, depending on location and time of day. He also proposed a sophisticated plan for an EZ Pass-type system years before others. His vision didn't materialize then; perhaps it was too complex in a computer-free world. New York City

Mayor Michael Bloomberg's congestion-pricing proposal builds on these ideas. But it would charge just two prices: zero and one fixed rate.

Of course, the practice demands efficiency and practicality tradeoffs. And questions remain about the appropriate fee, and how to collect it. For example, since fewer people drive on a holiday or in bad weather, crossing beyond the toll border imposes no or little cost—and should mean no charge. What about moving a car from your home just one block over the border at 11 a.m.? Should you pay? Many “border” issues exist, and the border must be defined. But changing fees based on traffic flow would be too complicated. While the idea is good, the devil is in the details.

Professor Sicherman's research interests include cost-benefit analysis in decision-making and the effects of technological change in the U.S. labor market.



Eric Johnson

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So, it still remains unclear how or when—and perhaps even if—New York City will adopt congestion pricing.

Amid heated debate and partisan politics, politicians in Albany and elsewhere may want to turn to behavioral economics for clues on how the new practice might pass muster and actually work. That's because behavioral economics

suggests two things about congestion pricing that standard economics might miss.

The first is that congestion pricing will run into some roadblocks. The second is that if it becomes a reality, people will get used to congestion pricing very quickly and might, as in London, end up liking it more than they thought.

Behavioral economics emphasizes fairness (or at least the perception of fairness) and studies how it weighs heavily in peoples' economic reactions. For example, research shows that people will actually make themselves worse off to punish someone who was unfair. If congestion pricing is seen as unfair to a large number of people, it will have a hard time being accepted. In New York City, the Bloomberg administration anticipated this in its proposal and had already wisely excluded some people, like cabbies, from the charge, even though an \$8 congestion charge might well hurt them much less than a 10-cent increase in the price of gas.

But in New York City, this has been the argument most used by the opposition, which perhaps led to the proposal's recent setback: people were worried about charges in cases where it would seem unfair, like paying the charge for trips to the hospital. The major argument advanced by many opponents was that the plan would be unfair to most major neighborhoods brushing Manhattan, including Queens and the Bronx.

But the Bloomberg Administration should also emphasize how the plan, through improvements in mass transit, would help ordinary New Yorkers. Otherwise people could be offended

by the image of a limousine-driven Manhattan executive paying the same charges as cleaning staff driving in from the outer boroughs. Emphasizing how mass transit will be improved outside Manhattan might help win over those initially opposed to the program.

Why would people be surprised by how much they like congestion charges? Another basic difference between traditional economics, with its rational expectations, and behavioral economics is that in many cases people have a hard time predicting how they will feel about future situations. For example, research shows that people adapt to negative events much more quickly than they predict. Think about the ban on smoking in restaurants and bars: pundits offered dire predictions of the end of New York nightlife, but these predictions did not come to pass. Similar arguments about economic outcomes are made for congestion pricing.

In introducing the smoking ban, the Bloomberg administration ignored polls and did what most people found out was the right thing. Polls might not always be good predictors of what people really want. Similarly, I suspect people will adapt to the congestion charge and learn to enjoy its perhaps unanticipated benefits: fewer clogged roads, a cleaner atmosphere, quicker entry and exit into the city and more funds for mass transit. If this is true, ignoring the polls and correctly anticipating public reactions might be called a new kind of political leadership.

Professor Johnson's research interests include consumer and managerial decision making and brand equity, and electronic commerce.



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