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FINDINGS FROM FACULTY RESEARCH AT COLUMBIA BUSINESS SCHOOL

Starving the Budget Beast to Feed the Public Interest

To keep self-interested politicians from squandering public funds, governments should consider carrying more debt, more often.

In the aftermath of Hurricane Katrina, billions of dollars in federal funds were directed toward relief and rebuilding efforts along the Gulf Coast, many in the form of contracts to private firms. But taxpayers soon learned that much of the money was misused: Cruise ships used to house hurricane victims charged the government more than \$5,000 a month per person, many times the cost of available apartment housing in the area. Close to \$1 billion was spent on manufactured or modular homes that didn't meet key safety standards for flood zones. Many of these contracts, worth millions, went to firms with close ties to elected officials from both sides of the aisle.

When faced with spending abuses like those exposed in the wake of Katrina relief efforts, as well as perennial pork-barrel spending, citizens may easily conclude that trusting elected officials to make spending decisions in the public interest is overly optimistic. Yet the notion that governments act benevolently by spending wisely and efficiently to benefit overall social welfare is popular with economists, and most base their fiscal-policy recommendations on this idea. Given so much contrary evidence, Professor **Pierre Yared** suggests it's an assumption economists may want to reconsider.

To determine what kind of fiscal-policy prescriptions can best offset



the conflict posed by politicians' self-interest while ensuring that public money is spent more efficiently, Yared used a mathematical model to examine how electoral political decisions interact with the overall economy.

"When you view electoral democracy together with fiscal policy and the market for government bonds, you can identify two constraints. There's a savings constraint, which emerges from the fact that politicians can't sit on massive amounts of wealth without extracting *rents*—money they direct towards their own personal or political purposes," Yared explains. "At the same time you have a debt constraint: politicians cannot take on as much debt as

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might be socially optimal because they would not be able to garner support from citizens if they did.” That’s because in the eyes of the public large amounts of debt are associated with making sacrifices, usually in the form of higher taxes.

“Economists have typically advised governments to do a very simple thing: save for a rainy day,” Yared says. “Like parents who begin to tuck away college tuition money when they start raising children, it seems logical for governments to save in anticipation of a big increase in spending for future needs.” That goes for expected needs, like covering increases in Social Security costs related to an aging population, as well as for unanticipated needs, like a large-scale natural disaster or a war.

But what is sound advice for a legitimately self-interested household doesn’t hold for governments. “The problem with the save-for-a-rainy-day policy is that it hinges on assumptions that rely on politicians to do the right thing,” Yared says. “When governments are wealthy, there’s a natural tendency—and temptation—for these officials to squander public wealth on questionable projects. Even in the United States we know that politicians like to use some of the resources in government coffers to pay themselves rents: instead of cutting taxes during peacetime or when the economy is burgeoning, they keep taxes as they are and use the extra resources for a project that lines the pockets of a friend or a donor.”

Citizens’ motives can perpetuate bad government spending habits. “Politicians have trouble getting support from citizens when they allow big deficits to accumulate, because high debt is associated with high taxes to finance the debt,” Yared explains. But the more money that’s available to politicians in the public till, the more that is available to be siphoned away from legitimate uses and into pet projects or elsewhere.

So what does Yared’s model prescribe to help governments manage their budgets and discourage elected officials from dipping into the public

till? “Governments should tax conservatively, spend liberally and live in perpetual debt as a way of keeping politicians well-behaved. As long as there are high debts, there is less for politicians to ‘eat,’ since they need to service interest on the debt,” he says. Economists describe this approach to fiscal management as *starving the beast*.

But governments can’t run on deficits forever. One reason economists typically recommend that governments accumulate rainy-day savings is to maintain constant tax rates, rather than responding to spending increases by moving tax rates up and down a lot, which is expensive and inefficient. But if a government, in order to keep its politicians from extracting rent, hasn’t accumulated a lot of savings and finds itself facing an event that requires a surge in spending—like a large increase in the number of children about to enter public schools—how can the increase be paid for?

“The government will increase taxes and increase debt to accommodate the increase in spending,” Yared explains. “However, since citizens put a check on how much debt the government can actually take out, taxes end up increasing a little bit more during the rise in spending compared to after the rise in spending when the government is repaying its debt.”

In other words, Yared’s model suggests that temporarily raising taxes to respond to increased spending needs is a better approach to discouraging politicians from seeking too much rent and at the same time results in the most efficient use of public monies. “Governments shouldn’t run surpluses in anticipation of spending sprees. Moreover, they should take out lots of debt if they want to go on a spending spree, and raise taxes later to repay it.” The public keeps this spend-now-pay-later approach in check because there’s a limit to how much people are willing to be taxed.

Policies based on starve-the-beast fiscal models may have important

“The problem with the save-for-a-rainy-day policy is that it hinges on assumptions that rely on politicians to do the right thing.”

implications for developing countries. “Governments in developing nations used to hold too much debt, and it wasn’t clear they would be able to repay those debts. The International Monetary Fund responded by closely monitoring these nations, asking, Is the debt sustainable? Is the country taxing enough? Is it running surpluses?” notes Yared. That is quickly changing now that commodities prices have boomed, boosting the income of many developing countries. “Right now, many of these nations don’t have those old problems because they are becoming wealthy. Nonetheless, this wealth leads to a host of new and different problems since politicians in these nations are likely to want to use this windfall for their own pet projects,” he says.

However counterintuitive it seems for a government to run more debt instead of less as a lever to curb questionable spending by politicians, Yared emphasizes that it is more beneficial for citizens. “It’s better for the public to have money flowing in and out than to have politicians sitting on a tempting pile of cash,” he says. “You don’t want to have a lot of money in the cash register.”

Read More

Yared, Pierre. “Politicians, Taxes, and Debt.” Working paper, Columbia Business School, 2007.

Pierre Yared is assistant professor of finance and economics at Columbia Business School.

THE IDEA: Conservative investors' comfort with familiar stocks lessens their likelihood to diversify.

THE RESEARCH

Conventional wisdom dictates that spreading stock investments across several sectors—from healthcare to natural resources to technology—lessens risk. If the value of one holding in a portfolio plummets, possible positive returns from others may offset that shortfall, reducing the overall risk.

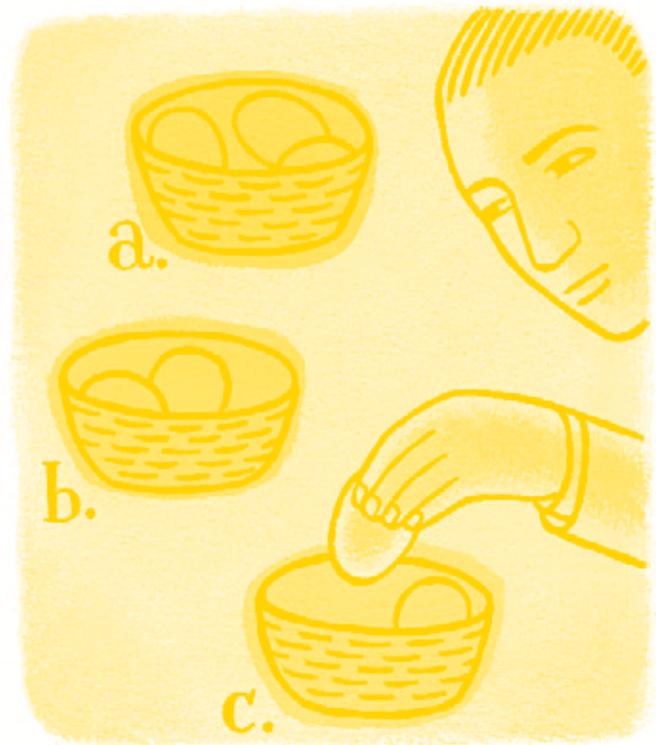
This diversification tenet should be particularly appealing to conservative investors. But new research by Professor **Gur Huberman** and Daniel Dorn at Drexel University suggests that risk-averse investors rarely embrace diversification, even though those investors say they seek low volatility. What's the reason for this paradox? Conservative investors' comfort with a narrow range of similar stocks trumps their desire to diversify, the research shows.

Huberman and Dorn examined the trading records of 1,300 German investors from January 1995 to May 2000 and polled the investors to ascertain their investment objectives and attitudes, investment experience, portfolio structure and socioeconomic status. Respondents also ranked their comfort level with risk on a scale from 1 to 4. The researchers analyzed respondents' stock holdings based on country of issue, industry and size, because those attributes are most closely correlated with volatility.

The results confirmed the time-tested axiom that investors choose investment options that suit their risk tolerance. Risk-averse investors bought mutual funds more often than stocks, and when they chose stocks, they generally purchased low-volatility assets. But aspects of those buying decisions mean that risk-averse investors actually have less diversity in their portfolios than more aggressive investors, notes Huberman. Conservative investors often limited themselves to a small number of familiar and similar stocks—with similar volatilities—which resulted in a relatively consistent *average component volatility* (ACV), or the median swing in each asset's value, depending on that asset's weight in the portfolio.

As a result, conservative investors' portfolio returns tend to resemble those of their peers, while more aggressive investors' comparative returns vary widely.

In other words, by staying within their investment comfort level, conservative investors may have overlooked



the fact that share prices for companies in the same or similar industries tend to move up or down in lockstep. They also appear to be unaware of the link between diversification, volatility and projected returns.

PRACTICAL APPLICATIONS

Asset managers, financial advisers

You may want to keep this oversight of diversification in mind when explaining the rationale for choosing stocks to more risk-averse investors. Show how corresponding swings in stock prices and returns offset one another over an extended period of time.

Read More

Huberman, Gur, and Daniel Dorn. "Preferred Risk Habitat of Individual Investors." Working paper, Columbia Business School, 2007.

Gur Huberman is the Robert G. Kirby Professor of Behavioral Finance at Columbia Business School.

Why Do Dancers Smoke?

Using smoking as a proxy for time preference may help explain why some workers invest more in career development than others.

A few years ago the debate over New York City's then new indoor smoking ban had much of the city talking and thinking about when, where and how people smoke. Around that time Professor **Nachum Sicherman**, attending dance performances, began to notice a lot of dancers outside smoking after the performance. "The contradiction of seeing a person smoke who you would assume puts a high premium on staying healthy puzzled me," he says.

As a labor economist, Sicherman wondered if smoking could serve as a proxy for *time preference*, the degree to which a person is oriented to the present or the future. Dancers have relatively short careers, with little prospect of future income, and this suggested to Sicherman that they were perhaps more present-oriented than future-oriented.

Economists are naturally interested in measuring differences in time preference because many economic decisions involve tradeoffs between present and future benefits. "Labor economists," Sicherman says, "always assume that one of the factors affecting wage changes over time is how much individuals invest in their human capital, in their own job training and education, and that differences in investments are at least partially due to differences in time preference." The more future-oriented people are, the more likely they are to spend time and money on developing their careers.

But since time preference is unobservable, there is little empirical evidence demonstrating the role that time preference plays in decision making. How do you measure something you can't see?

"Time preference is not a trait you can observe in a direct way, so we hypothesized that an indirect way to observe it is to assume that, on average, people who smoke place less value on the

future than people who do not smoke," Sicherman explains.

Working with Lalith Munasinghe of Barnard College, Sicherman examined data from the National Longitudinal Surveys of Youth (NLSY), which gathered annually over a 15-year period information about the health, income, employment and education of thousands of respondents.

The researchers hypothesized that if smokers were indeed more present-oriented than future-oriented, they would, on average, see their wages rise more slowly than those of nonsmokers. (The team also conducted a survey at Barnard that showed that among students of all majors dancers were by far the most likely to be smokers.)

Munasinghe and Sicherman focused on the respondents' first decade in the workforce because it's during this time that most wage growth related to individual investments in human capital takes place (most people's wages grow fast early in their careers and then slow over time). The researchers' primary interest was tracking wages after respondents started their first jobs, and they found a clear correlation between wage growth and smoking.

Munasinghe and Sicherman found a 4.7 percent gap (after controlling for a range of family and individual characteristics) between smokers' and nonsmokers' first wages (what people were paid at their first full-time job).

Many studies have determined that smokers earn less than nonsmokers, but because Munasinghe and Sicherman took wage dynamics into account, their results were more definitive: over the first decade of employment, the difference in wages increased dramatically—nonsmokers' wages grew to be anywhere from 15 to 40 percent higher than those of smokers. The far-reaching NLSY data allowed the researchers to eliminate variables other



than smoking—including sex, age, race, health, schooling, cognitive ability, religion and neighborhood income—that might correlate with the wage changes they observed.

The research has implications for behavioral economics. "Our findings highlight the importance of time preference in individual decision making about the labor market: smokers, presumably because they are more present-oriented, are more likely to self-select into jobs that have lower wage growth and invest less in their own human capital," Sicherman says. "Social scientists should consider factors that play a role in time preference, and policymakers may in turn want to consider the social costs and benefits influencing time preference in individuals."

Read More

Munasinghe, Lalith, and Nachum Sicherman. "Why Do Dancers Smoke? Smoking, Time Preference, and Wage Dynamics." *Eastern Economic Journal* 32 (2005): 595–616.

Nachum Sicherman is professor of finance and economics at Columbia Business School. This paper won the Eckstein Prize for best article published in the *Eastern Economic Journal* for 2005–06.

Shopping for Certainty

Consumers' goals for what to buy and how much to spend become increasingly concrete as they navigate the shopping process.

Some people go shopping with a get-in-and-get-out mentality: they know exactly what they want to buy, stick to their original purchase plan and leave the store quickly. But most consumers head to a store with only a general idea of what to buy and how much they wish to spend. This uncertainty makes them susceptible to external factors, such as marketing promotions, that can influence their purchases, shows new research from Professor **Leonard Lee**.

Lee and coresearcher Dan Ariely of the Massachusetts Institute of Technology examined how consumers' goals become increasingly concrete throughout the shopping process and identified two shopping stages. During stage 1, shoppers are uncertain of their goals and think of the products they intend to purchase in general terms; as shopping progresses and consumers reach stage 2, they are exposed to more products and have considered them in relation to their own needs and preferences, so they are more certain of what they want to buy and how much to spend.

A psychological aversion to uncertainty is what motivates consumers to move from "I'm looking for a snack and a drink" to "I'm buying Lays potato chips and a Coke." "Consumers have a strong desire to decide what they want to buy and how much they want to spend; the evolution from less-concrete to more-concrete shopping goals is pretty natural," Lee says.

Not surprisingly, when shoppers are at the snack-and-a-drink stage they are most likely to be influenced by marketing promotions. At this point, consumers are building their shopping preferences based on internal likes and dislikes as well as available environmental cues. Lee found that goal-evoking marketing efforts, such as conditional coupons (spend \$10 and get \$1 off, for instance), could act as a



motivational tool to spur these purchase decisions because the minimum dollar requirement suggests a concrete spending target. "People use coupons not just to save money but also to help them decide what to buy or how much to spend," he notes.

To test the relationship between goal concreteness and promotional marketing susceptibility, Lee and Ariely conducted a series of field experiments at a convenience store. The researchers handed conditional coupons to shoppers just outside the store entrance—when customers would be in the first, undecided shopping stage—or along the store's back aisles, when shoppers had reached the second shopping stage, characterized by concrete goals. The researchers also manipulated the coupons' spending requirements (either a minimum amount of \$6 or \$2 to receive a \$1 discount) to be either above or below consumers' typical spending at the convenience store so they could be certain shoppers were using the coupons to help construct concrete shopping goals and not just to save money.

As expected, the coupons had different effects on consumers depending on the concreteness of their shopping goals. Shoppers who received the

coupons inside the store (those whose goals were more concrete) responded in similar ways to the two minimum spending levels, while those who received the coupons outside the store (those with less-concrete goals) differed in their average spending.

Compared to the shoppers in the later stage, the undecided shoppers shifted their spending in step with the minimum spending conditions on their coupons. When the required level was higher than what shoppers typically spend, they spent more; when the required level was lower, they spent less. "The earlier you expose consumers to these promotions, the more effective the promotions are," Lee says. "Once consumers have decided what they want to buy it is difficult to get them to change their minds."

Because of the goal-driven nature of consumers' responses to promotions, marketers must be careful when setting spending requirements for these types of coupons, Lee cautions. Though companies can clearly influence undecided shoppers by offering conditional coupons, setting the requirements too low can backfire and result in lower overall spending.

"Common sense says that consumers who receive a conditional coupon will always be more willing to spend money," Lee says. "But because they are using these conditions to set goals, if the minimum spending requirement is low, they will likely spend less money."

Read More

Lee, Leonard, and Dan Ariely. "Shopping Goals, Goal Concreteness and Conditional Promotions." *Journal of Consumer Research* 33 (June 2006): 60–70.

Leonard Lee is assistant professor of marketing at Columbia Business School. This paper won the Journal of Consumer Research's 2007 Robert Ferber Award (honorable mention).

Product Customization Decisions: Order Does Matter

Giving consumers too many options early in a build-to-order transaction may trigger decision-making meltdowns—which can boost or erode product sales.

In an unforgettable scene from *When Harry Met Sally*, Meg Ryan's high-maintenance character asks a waitress for dressing on the side, lightly toasted bread and endless other options, triggering a near apoplectic fit in dining companion Billy Crystal.

This type of insatiable appetite for customization has prompted manufacturers of products to churn out millions of options, from chicken-asparagus pizza to candy-colored iMacs to custom-colored Nike swooshes.

The proliferation of these tailored products, along with the growth of Web-based configuration programs that allow customers to build items to their exact specifications, prompted Professors **Jonathan Levav** and **Sheena Iyengar** to ask if the order in which value-added features are offered to consumers influences their buying decisions.

Their research was inspired by the late Columbia economist Kelvin Lancaster's pricing theory, which asserts that a product's perceived value is the sum of the perceived values of its attributes—and should thus be unaffected by the order in which each attribute is assessed. By this reasoning, a laptop, for instance, is the sum of such components as memory and a disk drive, and the order in which these attributes are added to the laptop should not matter to customers. But, Levav and Iyengar wondered, would Lancaster's theory about order hold up in a real-world purchasing environment where order is manipulated?

Levav and Iyengar's thesis—that order may indeed matter—is rooted in two psychological premises: First, a product's value is based on a customer's assessment at the moment he or she is mulling a purchase. This decision, according to psychologists, involves a finite source of mental

energy that dwindles over time unless the customer takes a break from a decision to, in a sense, reenergize. The second premise asserts that customers tend to focus only on the task at hand and are thus unlikely to conserve precious mental resources for an extended decision-making process involving a series of complex choices.

The research, comprising two studies, showed that presenting consumers with a multitude of options at the beginning of a decision-making process triggers a sort of short-circuiting of the brain. As a result, buyers gave up on tailoring each aspect of a product, switching instead to a default option—company-selected features, such as silver for a car color—toward a transaction's end because they neared sensory overload. By contrast, those warming up with fewer choices at a study's start tended to settle for the default choice less often.

Levav and Iyengar also found that customers reported greater satisfaction with a transaction when offered fewer choices at the beginning. Finally, buyers completed a transaction involving many similar choices in roughly the same amount of time irrespective of whether they were offered more options at the beginning or the end of a transaction. Mental exertion, and its influence on buying decisions, thus appeared to be a function of both the number of choices consumers had to make and the number of subsequent options for each choice, but not a function of time spent making choices.

"The order in which numbers are added doesn't matter in math, and it might not matter in economics. But it matters a lot to the consumer," says Levav.

“The order in which numbers are added doesn't matter in math, and it might not matter in economics. But it matters a lot to the consumer.”

The first study asked 73 male subjects to customize a suit plus accessories like socks. Participants were divided into two groups. The first group started by focusing on 100 suit-fabric choices; the second, conversely, started by choosing from a simpler selection of 20 different sorts of socks and worked their way up to attributes like suit fabric that had a greater number of choices.

Confirming Levav's and Iyengar's hypothesis, subjects in the first, front-loaded options group appeared tapped out before the second group. They seemed to have little energy for decision making by the end of the task and were more likely to choose the default option (as suggested by the tailor) for the remaining suit features instead of continuing to make customized choices. Conversely, suit buyers with fewer options at the study's start were far less likely to choose the default option as they moved through the decision-making sequence.

Levav and Iyengar's second study, involving the computer-based configuration of a car at a dealership, produced similar results. It also shed light on several important implications of the order in which features were offered for a company's profit-making prospects.

In this study buyers selected 67 car attributes in a task that took roughly 30 minutes. Eight attribute categories were manipulated for the purpose of the study. One group of subjects was offered more variety up front—a choice of 56 car interior colors—and fewer choices later (four different gearshift knobs), while the other subjects tackled the same transaction in reverse. And, unlike the suit study, in which price or cost was never mentioned, subjects in this study could see the immediate cost implications of their decisions because of a split-screen system that showed real-time price updates as they chose various car features.

A key finding for both groups was a higher likelihood of passing on the default choice when it was presented at the beginning of a sequence, because neither group had reached the stage where their energy levels were depleted and they were seeking simplification. Having consumers pass up the default is a less-than-desirable outcome for companies if a specific category's default offering is more expensive than a customized option. In other words, the researchers found that manipulating offerings and the order in which they are presented could help companies maximize profits.

"If the default option is cheapest and shoppers at the start of a build-to-order buying decision lean toward more expensive options, a company should offer attributes with more expensive options at the beginning," Levav says. "Alternatively, in the reverse situation in which customers nearing the end of a transaction may approach sensory overload from too many front-loaded options, a firm might want to make the default options at the end a bit more expensive."

This strategy holds value for any firm offering product customization or configuration, Levav notes. Convincing customers to select specific options can add up—in this case to a few thousand dollars per car. "It's free money for the company," he says.



The researchers also found that gradually increasing the number of options decreased the probability that customers would choose the default option when it was offered at the end. These findings seem to indicate that willingness to pay depends more on the configuration sequence than on the price of attributes in a certain order.

Thus shifting the order in which options were presented influenced the purchase—and its final price—even though buyers had access to ample information about their various options and were kept constantly aware of cost. The research shows that the low-cost, low-effort process of tweaking the order of option offerings can materially impact a company's bottom line.

"Preferences are malleable," says Levav. Ordering options in the most appealing way to both buyers and sellers, he says, may help firms "make more money

and—as the study showed with high satisfaction ratings from subjects offered fewer choices at the beginning of a transaction—keep customers happy."

Read More

Levav, Jonathan, and Sheena Iyengar. "Order in Product Customization Decisions: Evidence from Field Experiments." Working paper, Columbia Business School, 2007.

Jonathan Levav is the Class of 1967 Associate Professor of Business in the Marketing Division and **Sheena Iyengar** is professor of management at Columbia Business School.

Can a Firm's 'Last Resort' Be Its Stock Price's Best Option?

When market shocks occur, firms with the financial resources to repurchase their own shares experience less volatility.

In response to last summer's subprime mortgage crisis, the Federal Reserve pumped more than \$38 billion into the U.S. banking system to help shore up financial markets. The agency also played a similar role after the September 11 terrorist attacks. Because the Fed and other central banks often have a hand in such bailouts, they are frequently referred to as lenders of last resort.

Not every market shock is worthy of the Fed's involvement, however. In cases where individual stocks become undervalued, can firms act as "buyers of last resort" to boost their own stock prices? Professor **Jialin Yu** recently examined this question and found that firms with the ability to repurchase their own shares can indeed have an impact on their stock prices.

"Firms often buy back their own shares after market shocks in the hope of making money," explains Yu. "Repurchasing also signals to the market that a company has confidence in its own value."

The overall impact of repurchasing on a company's stock price and volatility has been unclear, however. To better gauge the asset-pricing implications of firms acting as buyers of last resort for their own stocks, Yu and coresearchers Harrison Hong of Princeton University and Jiang Wang of MIT developed a model that measures the relationship between a company's ability to buy back shares and its stock price's short-term return variance (the rate of fluctuation in its stock price during a short period, such as one week or one month).

The researchers discovered that firms with a greater ability to repurchase shares—those that are financially unconstrained because they have available cash, for example—tend to experience less variation in short-term share prices. "If two firms, one

unconstrained and one constrained, experience a liquidity shock and their stock prices drop, the unconstrained firm can buy back its own shares. The constrained firm cannot intervene, even though it knows its shares are now undervalued, because it does not have the cash to perform the buyback," Yu explains. "So, in a crisis situation the unconstrained firm's stock price will deviate less because it can step in and buy back some shares."

To be certain that this intervention effect is not due to other factors—for example, that financially constrained firms are often less successful than unconstrained firms and therefore more likely to have volatile stocks—Yu and his coresearchers further examined the relationship between financing constraints and return variances. They expected the relationship to be stronger in time periods or environments in which the legal cost of repurchasing was cheaper.

The first evidence of this effect came from a 1982 U.S. regulatory reform that encouraged repurchases. Until then, it had been difficult and costly to buy back shares because, though the practice was legal, firms often faced lawsuits accusing them of manipulating stock prices through repurchases. After 1982, it became easier and cheaper to execute stock repurchases, and financially unconstrained firms embraced the practice.

Because of this change, Yu expected—and later confirmed—that the relationship between financial constraint and return variances would be stronger after 1982, when the legal cost of repurchasing went down.

Yu and his colleagues found additional evidence to support their intervention hypothesis when they looked at international stock-repurchase activity. Data from the world's 10 largest stock



markets (the United States, Japan, the UK, France, Germany, Canada, Italy, the Netherlands, Switzerland and Hong Kong) between 1993 and 1998 showed that the relationship between variance and constraint was strongest in the United States, the UK and Canada—the countries where repurchases were easiest to execute. In Germany and France, where repurchases were severely restricted, the relationship was much weaker.

One of the model's innovations is that it treats firms as important participants in the trading process, alongside hedge-fund managers and stock traders, underscoring a somewhat surprising connection between asset pricing/market structure and corporate finance. "We found that the behavior of firms can actively influence stock-price characteristics such as volatility," Yu says. "That means if you want to study stock-market-return volatility, you have to take corporate finance issues into account."

Read More

Hong, Harrison, Jiang Wang and Jialin Yu. "Firms as Buyers of Last Resort." *Journal of Financial Economics* (forthcoming).

Jialin Yu is assistant professor of finance and economics at Columbia Business School.

THE IDEA: Understanding and accounting for consumer replacement cycles can help companies improve their product-introduction and -design strategies.

THE RESEARCH

How often do consumers replace their computers? And what drives them to do so? Knowing the answers to these questions is crucial for firms selling high-tech consumer goods. Consumers who wait until this year to purchase their first PC, for example, are clearly different customers than those buying their third or fourth computer. These buyers, however, are treated the same way in most marketing plans because existing consumer-purchase models focus only on first-time adopters, says Professor **Brett Gordon**. This approach ignores the importance of price, quality, product obsolescence and other characteristics of the consumers' existing products that drive them to replace their goods.

Gordon developed a new, dynamic consumer-demand model that takes into account replacement decisions and demonstrates how companies can more effectively market to customers making replacement purchases. For example, if a price war spurred a group of consumers to purchase computers a few years ago, that segment of buyers are more likely to replace their PCs with a new value-oriented product than with one that offers a technological breakthrough.

Because historical sales data alone do not inherently measure replacement decisions, Gordon constructed a unique data set from the PC-processor industry that offers a snapshot of the share of consumers who own certain types of processors over time. He examined price, quality, sales and ownership of PC processors manufactured by Intel and AMD from January 1993 to June 2004 and found substantial variation in replacement behavior over time.

Replacement cycles in the PC industry are getting longer, most likely because today's first-time buyers don't have the same love of computers as the early adopters who purchased PCs at the beginning of Gordon's data set. Though many consumers are still driven to purchase every new upgrade, more first-time buyers today are tech neophytes and will therefore wait longer to make replacement purchases, Gordon found.

As a result, the industry's traditional reliance on technological innovation to spur replacement purchases



may not work going forward. Rather than expecting consumers to replace their PCs strictly for faster processing speeds, Intel and AMD have begun to diversify their offerings to boost replacement purchases. Intel is now marketing combo chips that bundle TV-tuner, wireless and graphics technologies, while AMD is promoting its processors' power efficiency.

Gordon's model shows that these types of strategies are exactly what high-tech firms need to embrace. Companies in any consumer goods market characterized by rapid innovation must alter their strategies to account for the replacement habits of a changing customer base.

PRACTICAL APPLICATIONS

Firm managers, marketers

By tracking and accounting for consumer replacement cycles, you can tailor pricing decisions and new product offerings to target consumers that are likely to make replacement purchases in the near future.

Read More

Gordon, Brett. "A Dynamic Model of Consumer Replacement Cycles in the PC Processor Industry." Working Paper, Columbia Business School, 2007.

Brett Gordon is assistant professor of marketing at Columbia Business School.

When Familiarity Breeds Connections

For young biotech firms seeking prestigious industry alliances, who their top-tier managers know may be as important as what they know.

While many industry-changing technology companies like Yahoo! and Facebook were born in college dorm rooms, start-ups in the biotech field have a hard time making it big from such modest beginnings. Because launching a new drug to fight, say, metastatic breast cancer requires substantial funding and scientific talent, entrepreneurial biotech firms face a long, capital-intensive road to get from great idea to product approval and, ultimately, onto the market.

For that reason, forming alliances with prestigious, deep-pocketed pharmaceutical companies, research organizations, universities or other established biotech companies is essential for young biotech firms. These alliances open doors to funding, licensing, development, distribution and marketing opportunities and can lead to earlier initial public offerings. But how do start-up companies attract the attention of well-established industry leaders? The answer may lie in the status and background of young firms' top managers, finds Professor **Jerry Kim**.

Kim, along with coresearcher Monica Higgins of Harvard University, wanted to expand on existing research—which showed that forming alliances helps young biotech firms succeed—by determining what actually leads to biotechs forging these valuable partnerships. “We honed in on the idea that maybe, because it is difficult to gauge the status of young biotech firms, potential financial partners look at the career backgrounds of the start-up’s management team as a way to assess whether the company has value,” Kim says.

The extent to which the backgrounds of firms' top-tier managers (such as the CEO, COO and top scientific officer) help attract the attention of prestigious alliance partners has roots in the concept of *homophily*, the principle that organizations seek out partners that are similar along various dimensions because shared traits make it easier to trust and

understand one another. Kim and Higgins proposed that both the status and the prior roles of a young firm's senior managers provide important sources of homophily that can facilitate alliances.

Looking at the career histories of 3,200 top managers from public biotech firms as well as a data set of alliances among pharmaceutical firms, biotech companies and universities, the researchers separated the alliances into three types: upstream (alliances with research organizations and universities), downstream (alliances with pharmaceutical companies) and horizontal (alliances with other biotech firms). They found that for both downstream and horizontal alliances, the greater the number of upper-level managers with affiliations, the greater the rate at which the firms were able to form alliances.

“If a young biotech company is trying to form a downstream alliance with a firm such as Merck or Pfizer, then it helps if one of its top managers has affiliations to a downstream player,” Kim explains. “Although having a horizontal or upstream affiliation also helps boost the firm’s overall status and likelihood of forming an alliance, it is particularly beneficial if you have a match.”

Surprisingly, firms whose top managers held upstream affiliations actually had a harder time striking up an alliance with other upstream organizations, a particularly important fact because many biotech firms are spawned from scientific work done at a university or research organization. “Essentially, once you establish a tie or you come from a certain school of thought or research, you have locked yourself into that stream,” Kim says. “If you build your biotech based on research done at Columbia, you’re probably not going to be able to partner with Harvard or Stanford later on.

“This is a striking result given that having a top-tier executive who came



from Merck didn't prevent biotechs from getting downstream alliances with Pfizer or other competing firms, for example,” he adds. Indeed, such role-based homophily helped biotech firms seeking downstream and horizontal alliances. Established firms are more open to partnering with young firms that have upper-level managers who have worked in similar jobs at other comparable companies because a comfort level exists among people who understand one another's roles and “speak the same language,” Kim explains.

Established firms also look to status-based homophily when choosing companies to partner with. “A company like Merck does not want to partner with a firm whose management team comes from unknown companies,” Kim says. For that reason, biotech firms should focus not only on their technology and products but also on the people running their organization. “The key message from this research,” Kim says, “is that who you put on your top management team has a big impact on getting these crucial alliances. Attracting people with the right prestige and career background is extremely important.”

Read More

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Jerry Kim is assistant professor of management at Columbia Business School.

Climbing the Quality Ladder to Compete in the Global Marketplace

Firms in developed countries can compete with those in emerging economies by specializing at the high end of the quality scale.

When Congress approved the North American Free Trade Agreement (NAFTA) in the mid-1990s, American manufacturing workers watched uneasily, waiting for middle-class jobs to be siphoned off to developing countries, where low-cost labor would allow firms to produce goods cheaply. But Professor **Amit Khandelwal**'s new research about trade patterns suggests that U.S. firms can keep production and jobs at home while remaining competitive.

The prevailing theory about trade patterns posits that countries trade because each has uniquely abundant resources. The theory predicts that a country will export the products or services that use those resources most intensively and that this specialization allows countries to profit from trading. China, a country with abundant labor, would specialize in labor-intensive goods, like shoes and apparel, because large numbers of low-wage workers in China can make shoes more cheaply than U.S. workers. The United States would produce aircrafts and machinery, which require a more skilled workforce, at a lower cost than China since skilled labor in China is scarce.

But import data from the 1990s contradict this standard framework, Khandelwal explains: both developed and undeveloped countries were producing the same broadly classified sets of goods and exporting them to both developed and undeveloped countries. Rich countries were exporting expensive shoes and poor countries were exporting cheap shoes to the United States and other developed nations. These data suggest specialization was occurring, not across markets, as the theory says it should, but rather within markets, where specialization is reflected in differences in quality. Khandelwal theorized that the degree of quality specialization might be different across markets.

But what is the measure of quality?

Khandelwal defined quality, not by price alone, but by price and market share when the prices of two goods were equalized. "Suppose Germany and China manufactured the exact same shirt, but the German shirt cost more to produce because the imported raw materials and labor cost more. The objective quality is the same," he says. If quality were measured only by price, the German shirt would sit higher on a quality scale. "Now, suppose you price the German shirt and the Chinese shirt the same. Higher quality should be assigned in this scenario to the shirt that achieves a higher market share."

Khandelwal next compared *quality ladders* for different products. A product with a long quality ladder will have many different rungs of quality between the highest and lowest levels of quality. Certain products, like machinery, have long quality ladders. Other products, like apparel, have short quality ladders, with only a few rungs separating the highest level of quality from the lowest. While a consumer may perceive a great difference between an Armani T-shirt and a T-shirt from Wal-Mart, for example, the actual difference in the materials used to make both shirts is not very great compared to the difference between the materials used to make low-end machinery and high-end machinery.

Khandelwal found that developing countries produce goods at most levels of quality for products with shorter quality ladders but produce closer to the bottom



rungs for products with long quality ladders. Developed nations, in contrast, position themselves on the uppermost rungs of all ladders. This means that for products with short quality ladders, both developed countries and developing countries compete with one another to occupy the

top rungs of the ladder. For goods that have longer quality ladders, there is less competition at the top. In rich countries, industries with long quality ladders experience fewer decreases in employment than those with short ladders, and it's in the former industries that Khandelwal found firms in developed nations concentrating their production.

Overall, companies in developed nations that manufacture goods at the highest rungs of quality ladders in industries with long ladders will be more competitive—and their labor forces less susceptible to outsourcing—than those that stick to industries with shorter quality ladders. "The problem for an American firm producing footwear and apparel is that there is nowhere to go," Khandelwal explains. "You hit the top rung of the ladder and China is right next to you. You've run out of space."

Read More

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Amit Khandelwal is assistant professor of finance and economics at Columbia Business School.

Behind the Small-Package Success Story

Their popularity with low-income buyers may not be the only reason single-serve packages sell so well.

Single-serve packages are a hit in India and other poor nations, where shoppers buy sachets of shampoo for just pennies per day. Such purchases are popular because they allow low-income consumers to meet their immediate household and hygiene needs. But because per unit profit margins for single-serve packages are higher than those for larger packages, critics complain that these products impose a *poverty penalty*.

But not all experts agree that catering to low-income consumers is the only reason companies should sell daily portions of products. Taking a cue from C. K. Prahalad, author of the best-seller *Fortune at the Bottom of the Pyramid*, which salutes the single-serve practice, Professors **Rajeev Kohli** and **Oded Koenigsberg** and PhD student Ricardo Montoya asked if only low prices lured consumers toward smaller-size packages. If not, they hypothesized, the single-serve model might produce profits over the long run in certain markets.

One example of the single-serve trend can be found in Brazil, where roving makeup saleswomen sell daily portions of lotions with higher per unit prices to women of all wage levels. The fact that such single servings are popular irrespective of buyers' incomes, the researchers surmised, suggested that package sizes closely matching consumers' daily needs might prove more popular than supersize ones in emerging economies.

The fact that these products sold well at all wage levels refutes the poverty-penalty accusation, says Kohli, because it suggests that consumers care less about paying the lowest cost and more about finding products that best meet their immediate, tangible needs. Thus, though a premium may be imposed for single-serve purchases, the prevalence of these smaller-size, higher-margin packages does not necessarily translate

to exploitation of the poor. "Wealth does not necessarily dictate lower-cost purchases," Kohli explains.

This line of thinking also suggests that the continued availability of single-serve packages in poor countries might be wise, even if household incomes rise and a desire for convenience or variety of package sizes grows. Other successful examples of the single-serve trend include 100-calorie snack packs in the United States and Europe's practice of selling goods perceived as harmful—cigarettes, for example—in smaller quantities.

Offering single-serve packages may be a profitable strategy for manufacturers, the researchers found, as long as ordering and order-processing costs remain low and the volume of sales of single servings offset what companies typically save by selling fewer, larger-size packages. Finally, by projecting demand over time, the researchers determined that some consumers of smaller-size packages will continue to purchase them for some time, based on this buy-only-what-you-will-use rationale. Other consumers may trade up to larger packages, in line with their larger salaries, if their behavior follows the observed Western norm.

To pinpoint other reasons consumers might buy single servings, the researchers built a model based on a monopolist selling a product with a limited shelf life. The study assumed buyers would pay a premium price for a small quantity of a perishable good to avoid wasting money on a portion of a product that might ultimately be unusable. Kohli, Koenigsberg and Montoya factored in consumption rates and consumers' willingness to pay. Doing so, they theorized, might point to a profit penalty, or the possibility that single-serve packages would not sell as well if their per unit prices were high.

Overall, the researchers found that demand for a given quantity of a



single-serve package falls with its price and size, increases with its shelf life and grows for consumers needing a smaller volume of a certain good. In addition, profits from products sold to those buying no more than they needed could more than make up for profits lost from those buying more than they could use. As a result, if transaction costs—such as product storage, transport and travel or delivery time—remain low in markets where small-size packages sell well, manufacturers may want to continue serving that niche, even when incomes rise.

Selling in small quantities can also increase total sales of a given good, decrease product waste and result in higher profit because of the higher per unit prices of smaller-size units, the research showed. "Convenience, quality and assortment may be more important than cost for some consumers," Kohli says. "Poverty is not the only reason that small packages make sense."

Read More

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Rajeev Kohli is professor of marketing and **Oded Koenigsberg** is associate professor of marketing at Columbia Business School.



Gauging the Credit Crunch: A Do-It-Yourself Guide

Charles Jones offers some simple advice for appraising the state of the ongoing credit crisis.

Having trouble keeping up with developments in the credit crisis? It's not surprising if you are—there is no Dow Jones Industrial Average for the bond market. Most press articles focus on just one market segment—subprime, high-yield or structured investment vehicles, for example—so we read about the ABX Index, a credit-default swap index or another equally opaque benchmark.

To judge whether the crisis is getting better or worse, you needn't wait for a pronouncement from your favorite financial journalist. Just look at the three-month London Interbank Offered Rate (LIBOR) versus Treasury-bill yield spread.

LIBOR measures the unsecured borrowing rate for a financial institution with a high credit rating (AA, to be precise). Unlike the T-bill, which has the full faith and credit of the U.S. government behind it, LIBOR has bank credit risk embedded in it. LIBOR yield spreads widen if investors raise their assessment of bank default risk or become more averse to bearing that default risk.

Both rates are published in major newspapers every day; focus on the difference between the two to see how investors are viewing the credit-worthiness of financial firms.

Examining the two rates during 2007 (figure 1) shows that a flight to quality—where investors move their capital away from risky investments to safer options—is still in full swing. Investors are worried about which bank will be next to announce a big bond-market or mortgage-lending loss. Mid-August was the worst; conditions improved in September and October but eroded again in November. As I write in late November, the LIBOR versus T-bill yield spread is back up to about 190 basis points, far from a healthy norm of around 50 basis points and not far from its recent extreme of 250 basis points.

How does this compare historically? The last big flight-to-quality event in the bond market surrounded the collapse of prominent hedge fund Long-Term Capital Management in September 1998. As figure 2 shows, during that crisis the LIBOR versus T-bill yield spread widened, came back in and then widened again a year or two later. Judging from the yield-spread metric, the current crisis is even worse. In fact, you have to go back to the stock market crash of 1987 to find LIBOR versus T-bill yield spreads matching those that transpired last summer and fall. And if 1998 is any indication, the dislocations we saw in the bond market in 2007 are likely to take a long time to resolve.

Worse yet, a wide LIBOR versus T-bill yield spread is not just a marker for stress in the banking system. LIBOR's moves have big effects on the economy because many corporate and individual borrowers pay a floating interest rate tied to LIBOR. And LIBOR isn't coming down, despite the Fed's efforts to ease the crunch. That means bigger interest payments on loans for everyone from auto manufacturers to subprime mortgage borrowers.

For example, after the initial teaser rate expires, a typical subprime mortgage rate might be LIBOR plus 500 basis points, or an interest rate of more than 10 percent at the moment. It's no wonder observers predict mortgage defaults will get far worse before they get better. What doesn't receive as much press is that even some industrial and corporate borrowers who have high credit ratings and are far removed from the mortgage mess are feeling the pain as well.

Whether you're a floating-rate borrower or not, it is important to keep a watchful eye on the LIBOR versus T-bill yield spread. The topic may be a bit dry for cocktail-party chitchat, but you will be very well informed about the progress of the ongoing credit crunch.

Charles Jones is professor of finance and economics at Columbia Business School.

Figure 1. Flight to Quality: Summer of 2007

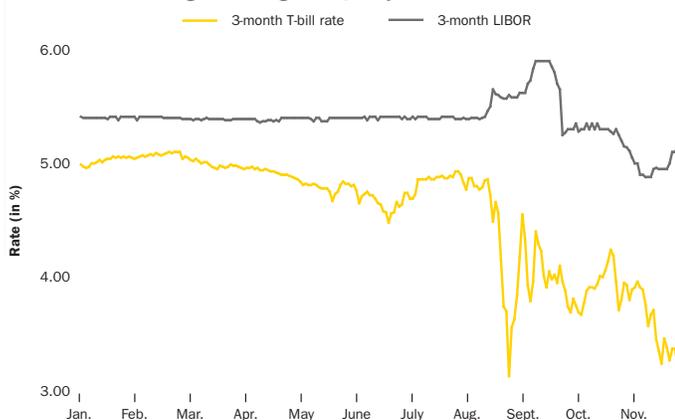
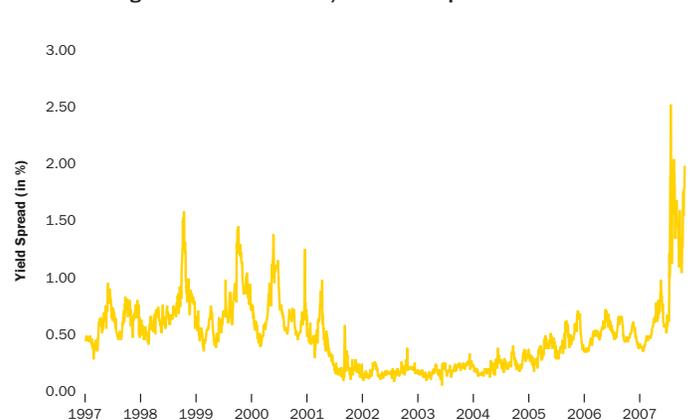


Figure 2. 3-month LIBOR/T-bill Yield Spreads 1997–2007



Media Concentration in an Era of Digital Convergence

Q&A with Eli Noam

In his new book, **Eli Noam** measures market share in the information and entertainment industries to gauge how the media industry has evolved and to determine which companies will win and lose in the digital infotainment age.

What is media concentration and why is it important?

The concentration of an industry simply means the market shares accounted for by the industry's top firms. There are different ways to measure and to create various indices of market concentration. Why is this important? For centuries major economic powers have struggled for control of their central productive assets. Under feudalism, people fought over land ownership. In the industrial age, revolutions and nationalizations took place over the control of steel and railroads. Today, as we move to a postindustrial, information-based economy, people are fighting over how and by whom entertainment, information and their enabling technologies are delivered.

and culture and partly about the ability of new and innovative companies to enter and compete in the marketplace. Pessimists point to larger companies that, having absorbed smaller businesses, now control a shrinking pool of information outlets, while optimists celebrate the Internet for multiplying the number and sorts of information sources.

But the Internet is much more concentrated than its image suggests. Many of its major components—broadband access, backbones, portals, search engines, etc.—are highly concentrated. Concentration in the Internet industry, while lower than it was 20 years ago during the Web's infancy, is much higher than it was 10 years ago.

What concentration trends are happening in the media industry's other major sectors?

Concentration in the telecommunications and information technology sectors is also lower than it was 20 years ago but higher than 10 years ago. It has declined a bit recently.

By contrast, concentration in the

mass-media sector—which includes film, television, music, print and electronic entertainment and information—has continuously increased over the last 20 years, especially for the industry's top five firms. However, mass-media market concentration is much lower than what most critics



Mass-media market concentration is much lower

than what most critics believe and is usually well below the U.S. Justice Department's definition of high concentration.

— Eli Noam

believe and is usually well below the U.S. Justice Department's definition of high concentration.

Overall, the move toward greater media concentration is a by-product of digital convergence—the coming together of several different media such as voice, video or text.

Do you think the mass-media industry will consolidate or fragment in the coming years?

I believe a two-tier network structure will emerge. At the top will be a few big “tent-pole” companies that will coordinate and distribute the production efforts of the second tier, which will comprise thousands of smaller specialist companies. The major firms will produce far less content themselves and assume a larger “storefront” branding role.

How have powerful conglomerates such as Time Warner, General Electric and Disney fared in the face of media concentration?

The conglomerate media structure is actually not working well. Time Warner is under pressure to divest itself of some of its divisions, Viacom has already split itself in several ways and Disney has sold some of its media holdings, including radio stations. Focused media companies such as Comcast, which specializes in local TV distribution, have fared better. In

Consumers devour an ever-increasing number of bits, bytes and minutes of all kinds of media, yet the information sector faces a steady price deflation.

The Internet's arrival in the mid-1990s augured the democratization of information, with the promise of many small and varied media outlets vying for the public's attention. Has that media fragmentation actually happened?

Many people have strong opinions about media ownership and concentration. The debate is partly about politics

the future, major media firms will increasingly assume an integrator role instead of producing content or owning film- or TV-distribution facilities.

What does increasing media concentration mean for the diversification of information? How do you think the public and government will react if they believe more information is coming from fewer sources?

The First Amendment dictates that the government cannot intervene in content. As a result, the government has historically tended to intervene in the underlying structure and ownership of media markets. Media concentration—both real and imagined—has therefore generated significant agitation in Washington. For example, protests from activists on the left and the right derailed the Federal Communications Commission's efforts to deregulate media-ownership restrictions. Similar issues of access to and diversity within media are being raised around the world as part of an emerging information-activist movement. Media companies need to address these concerns.

Your book identifies some fundamental economic problems occurring in media industries. How do these problems affect media companies' ability to make money?

One basic problem is that when it comes to media production and networks, fixed costs such as installing cell-phone towers or laying fiber lines for fast Internet access are very high, while marginal costs—those incurred to add each new user—are low. In the highly competitive media environment, companies have dropped prices to low levels that often do not cover their overall operating costs. Therefore, the industry operates in an interesting landscape: consumers devour an ever-increasing number of bits, bytes and minutes of all kinds of media, yet the information sector faces a steady price deflation which causes media producers and distributors to make less money.

In response, media companies consolidate and concentrate in order to regain control over pricing. This works for a while, until a new wave of



innovation starts a new cycle. The boom and bust of the dot-com sector in the late 1990s is a perfect example. Looking to the future, it is important to recognize that as all parts of the information sector become increasingly interrelated, the whole information economy becomes more volatile and less stable than the industrial economy.

Who will be the winners and losers in this new media world and why?

Generally, companies that provide scarce elements will fare best. Today, there are three segments of companies in that category: first, suppliers of premium blockbuster content, such as Hollywood film distributors; second, distributors of high-speed residential distribution pipes, such as last-mile fiber and cable networks; and third, makers of essential, interoperable computer software such as Microsoft Windows.

What about Web 2.0 companies such as YouTube and Facebook? Do their early moves suggest a path that is similar to or different from the one the mass-media industry has followed?

The new-media industry is showing tendencies similar to those exhibited by the information technology, Internet and telecommunications sectors. High concentration comes first as innovators enter the market; then, competitors emerge, and prices and profitability drop. But soon consolidation follows.

Read More

Noam, Eli. *Media Ownership and Concentration in America*. New York and Oxford: Oxford University Press, 2007.

Eli Noam is professor of finance and economics at Columbia Business School and director of the Columbia Institute for Tele-Information.



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