



Neither markets nor managers accurately value investments in intangibles like R&D, studies show. The result: misallocated resources. The solution: read on.

Sharpening the Intangibles Edge

by Baruch Lev

INTANGIBLE ASSETS – a skilled workforce, patents and know-how, software, strong customer relationships, brands, unique organizational designs and processes, and the like – generate most of corporate growth and shareholder value. They account for well over half the market capitalization of public companies. They absorb a trillion dollars of corporate investment funds every year. In fact, these “soft” assets are what give today’s companies their hard competitive edge.

Yet extensive research indicates that investors systematically misprice the shares of intangibles-intensive enterprises. Sometimes the market overvalues intangibles—wildly, for some dot-coms—and wastes capital. For companies in established sectors, the reverse is more often the case: Investors undervalue intangibles. This burdens firms with an excessively high cost of capital, which in

turn leads them to underinvest in intangibles, thereby squandering opportunities for the earnings and growth investors seek.

Managers, meanwhile, often fly blind when deciding how much they should invest in intangibles or which ones offer the best rewards. In the case of investment in research and development, for instance, companies not only spend too little but also shift resources from risky next-generation innovations that could be potentially lucrative to safer modifications of current products and technologies. What ought to be the cutting edge of corporate progress is as a result blunted, to the detriment of both companies and the economy.

How do you break this vicious cycle? How do you hone rather than dull the intangibles edge? Research that I and others have done into intangible assets, particularly those related to R&D, indicate

that companies need to generate better information about their investments in intangibles and the benefits that flow from them – and then disclose at least some of that information to the capital markets. Doing so will both improve managerial decisions and give investors a sharper picture of the company and its performance, which will lead to more accurate valuations and lower the cost of capital.

The Problem of Undervaluation

Most managers are quick to acknowledge that intangible assets are crucial to their company's success. The trillion dollars that – according to research by Federal Reserve economist Leonard Nakamura – U.S. companies spend annually on intangibles is on par with the total corporate investment in physical assets. Such investments are pervasive throughout the manufacturing and service sectors of all developed economies. Financial service firms, for example, invest substantial resources in product and service innovation, even if not through the centralized R&D units found in manufacturing companies. Moreover, the share prices of intangibles-intensive companies command a large premium over book value, reflecting an apparent recognition by investors of intangibles' value.

But look carefully beneath the shiny veneer of intangibles and you will find a knotty and unattractive reality, one in which information deficiencies both at companies and in the capital markets feed negatively on one another. Take the findings of the research I conducted with colleagues Doron Nissim of Columbia University and Jacob Thomas of Yale on the market valuation of companies that invest in R&D.

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We focused on U.S. industries between 1983 and 2000 with substantial R&D: drugs, biotech and chemicals, fabricated metals, machinery and computer hardware, electrical and electronics, transportation vehicles, scientific instruments, and software. (That was roughly 750 to 1,000 companies a year.) For each company in each year, we derived a figure for “R&D capital” by treating reported R&D expenditure as if it were a capital expense and amortizing it using industry-specific rates that we computed. We then ranked the companies in each year according to the “intensity” of their R&D capital (relative to total assets), grouping them into three portfolios: those of high, medium, and low R&D intensity. Finally, we calculated, for each portfolio and year, the average risk-adjusted stock returns in the ensuing three years. Thus, for the three portfolios of companies in, for example, 1983, the actual risk-adjusted returns were computed for 1984, 1985, and 1986. (Adjusting the portfolio returns for risk – a common methodology in finance research and practice – is essential, given the above average risk, and presumably above average returns, of R&D-intensive companies.) This procedure was repeated for each year from 1983 to 2000.

And here comes the crux of the exercise. If investors value fairly – that is, if they do not systematically under- or overvalue – the stocks of R&D-intensive companies, fully reflecting in stock prices the potential of R&D, then risk-adjusted portfolio returns in subsequent years should average to zero. But if investors consistently undervalue those stocks, subsequent portfolio returns should be significantly positive. Investors will bid up the prices of the erstwhile undervalued shares as they realize their valuation mistake when R&D-generated revenues and earnings turn out to be higher than expected. Our findings indicate just

Delayed Reaction

An analysis of the stock price of companies that invest heavily in R&D demonstrates how investors frequently underprice the shares of intangibles-intensive enterprises. The return on a portfolio of such companies increasingly outperforms the market (on a risk-adjusted basis) as time passes, suggesting that investors are slow to realize the full value of the R&D investments.

Future Risk-Adjusted Stock Returns to R&D Capital-Intensive Companies



so: R&D-intensive companies were systematically underpriced by the market, as evidenced by the protracted large and positive returns over several years following portfolio formation. (For a depiction of this phenomenon, see the exhibit “Delayed Reaction.”) A variety of studies – using different samples, time periods, and statistical tools – by myself and others have reached similar conclusions. Together, they demonstrate that investors are slow to recognize the full value of investments in R&D.

Investors don't undervalue these investments on a whim. They know that many R&D projects are iffy propositions, subject to both technological risk (Will it work?) and commercial uncertainty (Will it sell?). They've seen highly touted technologies turn into massive flops. But research clearly shows that their perceptions of the risk surrounding R&D investments are, on the whole, exaggerated.

Researchers can empirically demonstrate the unduly high uncertainty dis-

count that investors apply to R&D-intensive companies because R&D expenditures are reported in corporate financial statements. Most other types of investments in intangibles—employee training, brand enhancement, the development of new organizational processes—are usually not fleshed out publicly or even systematically tracked within a company. But it stands to reason—reason supported by preliminary research—that such investments are also subject to the undervaluation syndrome, particularly because they are even less visible and less conspicuously linked to positive outcomes than R&D spending.

A Misallocation of Resources

What are the consequences of this syndrome? The high capital costs with which investors burden R&D-intensive companies when they persistently undervalue them can be very harmful. At the extreme, high cost of capital prevents such companies from raising funds in capital markets—a situation familiar to managers of science-based and high-tech companies during the post-bubble years. While undervaluation might not hamper the Microsofts or the Pfizers of the world—companies with a proven record of turning intangibles into tangible results—it is a serious impediment to the multitude of smaller, younger, and far less profitable enterprises that are in dire need of affordable financing.

Just as worrisome is managers' reaction when markets offer a cold shoulder to R&D. For the most part, companies clamp down on R&D investment and move resources from basic research, aimed at creating next-generation technologies and products, to safer but far less rewarding incremental improvements in current technologies. This shift from "R" to "D" shows up clearly in recent annual surveys of the R&D investment plans for members of the Industrial Research Institute. The allocation of R&D funds to directed basic research declined every year from 1993 to 2003 in favor of modification and extension of current products.

This is a troubling development for business and the economy. Researchers consistently have found that the returns from basic research are, on average, substantially higher than those from product line extensions. More broadly, there are signs that companies have long been underinvesting in R&D. Annual rates of return on R&D have in recent decades hovered in the range of 25% to 30%, according to various studies I and others have done. This is substantially above the returns on physical assets and, just as telling, above firms' cost of capital, even after accounting for the relatively high risk of R&D. Investment returns exceeding cost of capital imply that the

amount of funds firms have invested in these assets is less than optimal. Indeed, economists Charles Jones of Stanford and John Williams of the San Francisco Federal Reserve Bank have concluded that the level of R&D spending in the United States is roughly one-third of what it should be.

What's Going On Here?

Underpricing securities and misallocating corporate resources mean that both companies and investors are leaving substantial value on the table. Why would rational people give up large potential gains from optimal investments in intangibles? Simply put: The



information they need to make better decisions is hard to get at.

Investors learn about an enterprise not only from its own public disclosures but also from observing its competitors. Thus, when a retailer, a financial service provider, or an oil and gas company publishes its financial reports, investors draw inferences from those reports about the performance and economic conditions of other firms in the industry. Indeed, a positive earnings surprise at a given company will often trigger simultaneous share price increases throughout the industry. Investors can generalize in this way because, in many industries, economic conditions and the state of technology affect all companies more-or-less equally. Interest rate changes affect, to varying degrees, all financial service firms; oil prices and the threat of terrorism affect all airlines, resorts, and theme parks.

Generalizations about intangibles-intensive companies, on the other hand, are hard to come by, for two reasons. First, for intangibles such as brands and patents to be productive, they have to be unique. So, for instance, a successful clinical trial at Pfizer does not furnish any information about what's going on inside Merck or Novartis. Second, intangible assets, unlike many physical and financial assets, are not traded in active and transparent markets. Prices are aggregators of information: Oil prices enable investors to predict the performance of energy companies; commodities futures tell investors about the performance of agribusinesses. But there are no markets generating visible prices for intellectual capital, brands, or human capital to assist investors in correctly valuing intangibles-intensive companies.

Such an uninformative environment naturally calls for enhanced public disclosure about the amounts of and, insofar as possible, outcomes produced by investments in intangibles. But generally accepted accounting principles perpetuate the information deficiency. GAAP treats practically all internally generated intangibles not as investments but as costs that must be imme-

Calculating the ROI of R&D at DuPont

With \$12 billion in annual sales, DuPont's textiles and interiors division has long spent considerable resources on R&D, aimed at both creating new products and enhancing the efficiency of chemical production processes. The latter is divided into efforts to decrease variable operating costs, such as raw materials and labor, and efforts to reduce fixed production costs, particularly through the design of more efficient production facilities. Although certain R&D investments are obviously warranted, it isn't clear how much to spend on each of these three R&D categories: product R&D, variable-cost process R&D, and fixed-cost process R&D.

To guide its resource allocation, DuPont asked me to come up with reliable estimates of the return on investment for each type of R&D. I focused first on data concerning inputs (the costs): primarily annual R&D spending in each category for the years 1985 to 2000. These data had to be carefully sanitized of various general cost allocations

and other accounting artifacts in order to focus on real cash flows. Then I identified the outputs (the benefits) that flowed from the investments. The outputs of product R&D are, of course, revenues from the new products and improvements to existing products that emerge from the various R&D programs. I converted these revenue streams to free cash flows by subtracting all associated costs and capital expenditures. The outputs of the two types of process R&D were identified from detailed data on decreases in variable and fixed production costs attributed to R&D. Having thus obtained the cost and benefit streams for each type of R&D—and having purged the data and analysis of double counting, noncash items, and other “noise” factors—I was able to work out the ROI for each type of investment. That led to a number of fruitful insights.

I found, for example, that two-thirds of the value that new and improved products created for the division throughout the period could be attributed to product R&D—value amounting to hundreds

diately expensed, thereby seriously distorting enterprise profitability and asset values. Furthermore, GAAP does not require firms to disclose any meaningful information about intangibles investments, except for aggregate R&D expenditures, lumping the rest of them in with general expenses. This keeps investors in the dark about, for example, how companies allocate R&D budgets to basic research, product development, and process improvements—not to mention the amounts being invested in a host of other intangibles, including software development and acquisition, brand enhancement, and employee training. The financial reports likewise provide no information on revenue gen-

erated by these investments, such as patent-licensing fees or the share of revenues coming specifically from new products. No wonder, then, that investors, trapped in their forced ignorance about intangibles, apply an excessive uncertainty discount to the shares of intangibles-intensive enterprises. In capital markets, no news is bad news.

So why don't managers allay investors' concerns by voluntarily disclosing information about intangibles? The answer will surprise some: With few exceptions (primarily in the pharmaceutical industry), managers don't have the information because GAAP doesn't oblige companies to report it. For instance, few companies have the data

of millions of dollars. The other third stemmed from brand enhancement activities. (Calculating this latter portion enabled me to estimate, as a byproduct, the ROI of the division's brand-building activities.) I also found that given the relatively large expenditures on product R&D, its ROI was only marginally above the cost of capital, indicating that its funding level was roughly adequate.

The big opportunities from R&D expenditures came from cost savings. The total value created by process R&D during the decade (in net present value) was roughly twice that of product R&D, and the ROIs were substantially higher. Most illuminating, the estimated return on the total R&D effort of the division was roughly three times the cost of capital, suggesting that DuPont's investment in the division's R&D fell short of the optimum. Being able to estimate returns for each type of R&D improved the division's resource allocation decisions and, in the words of the senior R&D executive, "brought real credibility to the value of R&D."

needed to decide questions as basic as "Should we increase or decrease R&D spending?" or "Should we acquire technology rather than develop it in-house?" Answering these questions requires reliable information about the returns on R&D expenditures (realized and projected), classified by type of R&D (for new products, for improving processes) and evaluated against the cost of outsourcing. I have yet to encounter an organization that systematically develops this information.

The information brownout leaves companies only dimly aware of the relevant facts when making an array of important decisions, from whether they should outsource employee-training pro-

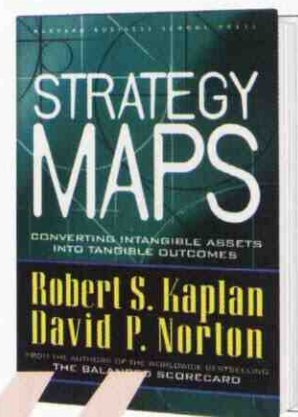
grams to whether they should increase their advertising budget or market products in collaboration with other enterprises. Granted, information about returns on intangibles that are not related to R&D, such as brands or employee training, is often difficult to determine. But most companies don't even have at hand reliable data on the investments themselves.

The Solution and Its Challenges

Much of the squandered value that intangible assets could generate can be recovered by both companies and investors if firms made more formal efforts to compile and report the information relating to intangibles that currently falls through the cracks of conventional accounting. Specifically, such efforts need to be aimed at producing two vital streams of information, one involving productivity, the other asset values.

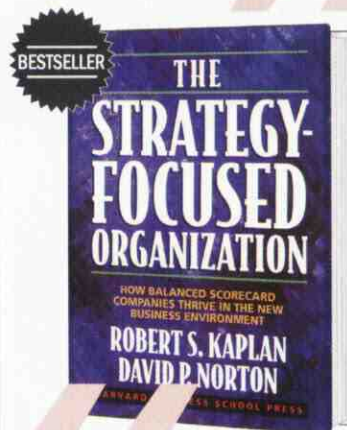
The first information stream focuses on identifying the return on a company's investment in intangibles. The simplest case is probably R&D: Because benefits can be frequently attributed to investments in research and development, returns can be determined with some confidence and evaluated against alternatives. (For a description of how I did this at DuPont's textiles and interiors division, see the sidebar "Calculating the ROI of R&D at DuPont.") But even informally relating expenditures on product R&D to the subsequent share of revenues emanating from new products would highlight the company's ability to innovate and bring products expeditiously to market.

Calculating ROI is trickier in other areas, where the relationship between intangibles investments and their outcomes is more complex. For example, while there are a number of increasingly accepted methodologies for computing the returns on brand-building investments, there is less consensus about how to determine returns on investment in human capital. Even where there is an apparent link between, say, employee training and productivity, it isn't always possible to confirm a causal relationship



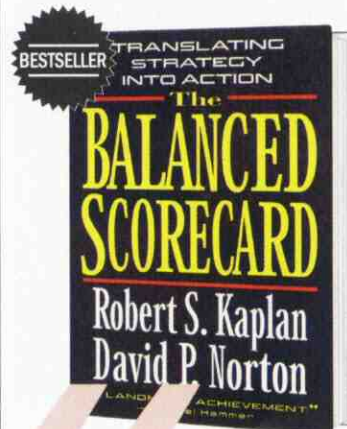
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Valuing a Company's Intangible Capital

If investors don't fully recognize the value of your company's intangible assets, they may be undervaluing your stock. But how can you tell? By estimating the aggregate value of your company's intangible capital, you can determine if your company suffers from an intangibles-related undervaluation—or, perhaps, an overvaluation.

We start from an assumption that the enterprise's performance, as reflected by operating earnings, is generated by its physical and financial assets, enabled by intangibles: Well-trained employees enhance department store sales, for example, and process R&D cuts a plant's production costs. Since most tangible and financial assets are commodities, it is unlikely that by themselves they can contribute to above average earnings performance. So the value of intangible capital is derived by subtracting from earnings the average contribution of physical and financial assets in the company's industry. What remains is a figure that indicates the contribution of intangible assets to the company's performance and provides the basis for the valuation of intangible capital.

Thus, for example, if the annual operating earnings of the enterprise total \$1,000, its physical assets are valued at \$7,500, and the average return, or yield, on physical assets in the industry is 10%, then the normal contribution of physical assets to earnings is \$750 (10% of 7,500). Assuming no financial assets, the residual earnings of \$250 reflect the contribution of the enabling intangibles—what I call *intangibles-driven earnings*. Intangible capital is then calculated by computing the present value of the forecasted stream of intangibles-driven earnings. The detailed estimates and procedures underlying the computation of intangible capital are, of course, more involved than the simple process described in this stylized example. Among other things, enterprise performance is estimated from past and forecasted earnings to fully reflect the future contribution of intangibles, and historical asset values are converted to current values.

Using the chart "Undervalued or Overvalued?" at right, which lists data for ten leading companies operating in diverse sectors, we may see how powerful the intangible capital measure can be. Although the estimated value of GE's intangible capital, a whopping \$324 billion, comes as no surprise, the hefty intangible capital figures for two "old economy" companies—Exxon and Altria (Philip Morris)—are noteworthy. Clearly, intangible capital is an indicator of any well-run competitive enterprise, not just those in so intangibles-intensive a field as high tech.

More telling, however, is how the market perceives a company's intangibles and your ability to measure the gap between the company's market value and its true value, which takes into account those intangibles. With an estimate of a company's intangible capital, you can calculate what I call a company's *comprehensive value*: the net value of its physical and financial assets (derived from the balance sheet) plus the missing piece—the value of its intangible capital. Then you can compare this comprehensive value with the company's market value. In GE's case, the ratio of market-to-comprehensive value at the beginning of 2003 was 0.79, meaning that GE, according to my methodology, was undervalued by 21%. Pfizer, by contrast, was overvalued by 29%, Exxon fairly valued, and Altria undervalued by 45%. For investors, this market-to-comprehensive-value indicator is a more reliable measure of investment value than the widely used but flawed market-to-book ratio.

If my valuation of intangible capital is valid, then the shares of undervalued companies (those with comprehensive ratios below 1) should over time outperform the shares of overvalued companies (those with ratios above 1), as investors gradually realize their pricing error and adjust stock prices. Research I have done with Feng Gu, an accounting professor at Boston University, shows that this is indeed the case: During the 1980s and 1990s, low market-to-comprehensive-value stocks outperformed high market-to-comprehensive-value stocks by an average of 8.6% annually.

Undervalued or Overvalued?

By calculating a company's "comprehensive value," which takes into account its intangible assets as well as its physical and financial assets, you can assess whether the enterprise is undervalued or overvalued by investors. By our calculations, for instance, GE shares were undervalued by 21%, whereas Pfizer was overvalued by 29% in the same period.

| Company | Estimated intangible capital (in \$ billions) | Ratio of market value to comprehensive value |
|--------------------|---|--|
| General Electric | 324 | 0.79 |
| Pfizer | 200 | 1.29 |
| Exxon Mobil | 164 | 1.04 |
| Altria Group | 143 | 0.55 |
| IBM | 134 | 0.93 |
| Merck | 124 | 0.99 |
| Microsoft | 123 | 1.59 |
| Verizon | 105 | 0.80 |
| Intel | 95 | 1.09 |
| SBC Communications | 62 | 0.90 |

Values and ratios calculated as of January 2003.

between the investment and the positive result, given the variety of factors—information technology and so on—that affect employee productivity.

But some information is better than none, both for managers, as they make resource allocation decisions, and for investors, as they evaluate a company. Even where returns on investments in intangibles can't be calculated with precision, companies can at least track and disclose the investments themselves. Breaking out a company's expenditures in training, brand enhancement, information technology, and the like from general cost figures would let managers and investors see how those investments change over time and how they compare with those made at related companies.

And in some cases, computing ROI of intangibles may simply involve analyzing previously unexamined investments—for example, determining the additional costs and revenues generated by new business capabilities, such as an Internet-based distribution channel or online banking activity.

The second dimension of information that companies can quantify and disclose involves their "intangible capital." (A methodology for calculating intangible capital is summarized in the sidebar "Valuing a Company's Intangible Capital.") Developing this second stream of information requires a change in mindset. Unlike capital or plant and equipment, intangibles are rarely considered assets whose performance must be continually monitored. But the expense mentality toward intangibles (derived, no doubt, from the fact that accountants universally expense all internally generated intangibles) should be replaced by an asset mentality.

Characterizing intangibles as assets that create future benefits can radically change how managers and investors see a business and make key decisions about it. Because a brand-building outlay, for instance, is thought of as a cost and is immediately expensed under GAAP, managers rarely ask the kinds of questions about it they would if it were considered an investment. They rarely monitor

its effectiveness or ask what the proper amortization pattern should be. Must outlays in brand-building efforts be made every year (100% amortization), or is the promotion campaign sufficiently effective to last three years (33% amortization)? In the case of spending on information technology, an important question is whether an IT investment is a response to an immediate

Why don't managers allay investors' concerns by voluntarily disclosing information about intangibles? They don't have the information because GAAP doesn't oblige firms to report it.

and temporary problem such as Y2K concerns. If so, it is a true expense. But if it represents a platform for long-term improvement, it really is an asset that should be amortized over the extent of its useful life. Similarly, managers need to determine when the revenue generated by "in-process R&D," an acquired company's ongoing R&D projects, will start to accrue, how much it will be, and how long it is likely to flow, and then compare those expectations to subsequent realizations.

The primary benefit of having an asset mentality is that it drives management to structure the intangibles-related investments for maximum productivity and longevity. It may be advisable, for example, to spend somewhat more on an IT system so that it can, after a while, be used by several divisions, rather than just one. Viewing intangibles as assets also helps ensure that adequate property rights (such as patents and trademarks) have been secured for them; that they are sufficient for the task at hand (that the sales force, for instance, is adequately trained to meet the organization's growth plans); and that the company extracts maximal benefits from them (by, say, preventing competitors from infringing on intellectual property).

Investors, too, will benefit from this asset-based information. Comprehensive data on a company's intangible investments give investors a more com-

plete picture of the company's capital than the one GAAP provides. These data, reflecting both tangible and intangible assets, will yield better metrics than such widely used measures of investment value as the market-to-book ratio. GAAP already requires that certain identifiable intangibles acquired from other entities be reported as assets but not those developed in-house.

There is no difference, in principle, between acquired intangibles and the internally generated intangibles we've been discussing here.

Will the proposed disclosures result in immediate benefits? Highly likely. Various research projects demonstrate that improved disclosure—particularly about innovation-related intangibles—is associated with reduced stock price volatility, narrower bid-ask spreads, and higher stock prices. ([For a description of research showing that improved disclosure of intellectual property benefited companies in the biotech industry, see the sidebar "Prudent and Credible Disclosure."](#))

I am aware that such a call for enhanced disclosure is likely to trigger in the minds of managers two concerns: that competitors will benefit from access to proprietary information and that companies' exposure to litigation will increase. The first is obviously a valid concern, although one that is often exaggerated to thwart new SEC or FASB reporting requirements. Consider that pharmaceutical and biotech companies, operating in an intensely competitive environment, have for years disclosed certain elements of the information suggested by my proposal—the products in their pipeline, the prospective launch dates of new drugs, the life remaining on patents, and the like—without apparent competitive harm. Certainly, care and judgment should be exercised when

communicating competitively sensitive information, but rarely is it optimal to keep mum.

It is easier to counter concerns about litigation exposure. The threat of lawsuits charging that a company has misled investors with overly optimistic statements exists mainly in the context of forward-looking information. But the disclosures I have proposed do not involve forecasts. Rather, they report factual information about investments that have already been made and the benefits that have flowed from them, such as revenues from recently introduced products. I don't propose that managers value individual intangible assets (just as individual physical assets aren't valued in financial reports), nor do I suggest indulging in speculation about future outcomes. Investors can make their own forecasts based on the facts the company reports. Short of fraud, disclosure of facts does not increase exposure to litigation.

Work Still to Be Done

In an era when physical assets have essentially become commodities, the benefits intangible investments yield – increased productivity, improved margins, and, most important, innovative products and processes – are the only means companies can use to escape intensifying competitive pressures. Yet the information deficiencies surrounding intangibles cause serious share price distortions and misallocations of corporate resources that hinder performance and growth.

The proposals I have outlined for overcoming those problems are only a beginning. Corporations and accounting bodies should make systematic efforts to develop information and valuation templates that are capable of reliably reflecting the unique characteristics of intangible assets. These attributes include

- the enormous potential benefits intangibles can produce, which are typically realized only after extended periods of investment and development;
- the uncertainty surrounding the outcome of investing in intangibles;

Prudent and Credible Disclosure

Disclosure of information to capital markets is a sensitive issue, fraught with hazards but also with opportunities. It raises important questions for executives: Should we engage at all in nonrequired disclosure? How should we balance investors' insatiable demand for information with the risk of aiding competitors? What sort of litigation exposure is created by voluntary disclosure? And, at the heart of the matter, will disclosure boost our stock prices and decrease our cost of capital?

To address some of these questions, I and colleagues Re-Jin Guo of the University of Illinois at Chicago and Nan Zhou of SUNY Binghamton examined in considerable detail the voluntary disclosure of intellectual property and product-related information made by 49 biotech companies at the time of their initial public offerings. We then looked at the capital market consequences of these disclosures. The focus on product development data, which GAAP does not require, was aimed at examining information that is both highly relevant to investors and very sensitive competitively. We chose the biotech industry because of its low barriers to entry and fierce competition.

For each of the 265 products under development at the 49 companies, we computed a disclosure score, reflecting the extent of information provided in five key categories: therapeutic specifications of the product, details of the target disease, results of clinical trials, future development plans, and market projections for the product. The degree of disclosure varied from product to product: More information, for instance, was released about products protected by patents, those at an advanced development stage, and those backed by venture capitalists. Still, our first observation was that practically all companies made extensive product-related information publically available, despite the competitive hazards.

But more important, the extent of product-related disclosure was strongly and positively associated with important capital market variables. Fuller disclosure was related to narrower bid-ask spread of stocks (implying lower cost of capital), as well as to lower volatility in the company's stock price. Even in a fiercely competitive industry like biotech, the benefits of disclosure were considerable.

- the exposure to infringement by competitors, due to the limited scope of property rights protection afforded to intangibles;

- the absence of active markets to guide valuation of intangibles and provide investors with exit strategies.

Capturing these attributes in an accounting system is a tall order, but some important steps have already been taken. For example, the FASB has recently stipulated that acquired intangibles be presented in financial reports at fair market value. The international accounting standards, which will become manda-

tory in Europe next year, call for the capitalization of certain internally generated intangibles. In Denmark, the Ministry of Trade, in conjunction with academics and a large number of companies, has developed innovative blueprints for disclosing information about intangible assets. The serious resource misallocations I have identified and discussed here should provide businesses with sufficient incentives to join – and even lead – such efforts. 

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