

FMI Quarterly

2008 ISSUE 1

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This Quarter: Generating Wealth Through Innovation

Dear Reader:

Capital Ideas is our theme for this issue. We hope that within these pages you will find a few ideas that you can put into practice to increase your capital or leverage your capital further with less risk.

Our feature articles in this issue include several pairings that should make for interesting reading. Public-Private Partnerships (P3s) are covered by Matt Godwin and Hoyt Lowder for FMI. P3s' use as a needed financing vehicle is so far most frequently found in infrastructure expansion and rehabilitation. Our partner in *FMI Quarterly*, the Construction Group at Zurich in North America, is represented by Nate Espe, Nancy Simonson, and Audrey Lau with their expansion on the P3 discussion. Issues of management succession are explored in Randy Stutzman's interview of Steve Pavlik regarding his role in the sale of a special contracting firm in the Southeast and Stuart Phoenix's interview of me regarding my own segue from owner status.

Curt Young analyzes how financial market factors have influenced the historical values of publicly traded engineering and construction firms. This is a timely follow-up to *FMI Quarterly's* special issue regarding publicly owned companies. Stuart Phoenix presents the risk bucket model for analyzing a contractor's assets. Hank Harris provides his take on foreign capital activity in the U.S. construction market. Jim Nolls, a new writer for FMI, gives a rundown on the impact of the credit market to ownership transition in construction enterprises. Mark Bridgers, Mike Chase, and Dan Tracey provide their perspective on the 2008 utility growth market.

We include a departmental brief along with these feature articles. FMI's Investment Banking Group provided much of the copy for this issue. Thanks to

Will Hill, departmental editor for Investment Banking, for his work in stirring these writers.

As a point of interest (and perhaps mainly our own), *FMI Quarterly* just closed another award-winning year. We were awarded a 2007 Marcom Award. The competition is administered and judged by the Association of Marketing and Communication Professionals and is the largest of its kind in the world.

We are always interested in hearing from you. Send an e-mail to jjackson@fminet.com and let us know what topics you would like us to delve into or your suggestions for improvements in our publication.

Next quarter we take on the world as *FMI Quarterly* examines how the globalization phenomenon has impacted both the largest and smallest participants in the construction marketplace. In the meantime, keep on reading *and* acting!

Sincerely,

A handwritten signature in black ink, appearing to read "Jerry Jackson". The signature is stylized with large, overlapping loops and a cursive script.

Jerry Jackson
FMI Quarterly Publisher and Senior Editor

Departments

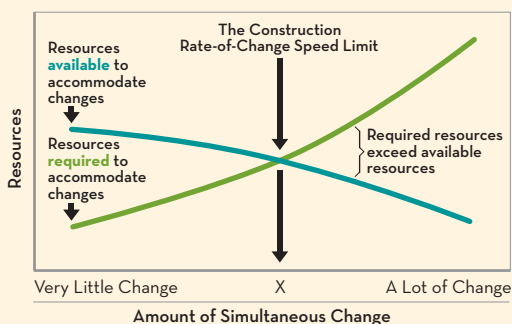
MERGERS AND ACQUISITIONS Managing Your Speed of Change

The results of FMI's study, "Why Contractors Fail," found a contributing factor to contractor failure was "pushing the rate-of-change speed limit." Exhibit 1 illustrates this concept in a construction company. You may wonder what this has to do with succession planning, especially since the study focused on companies that failed. FMI thinks it has a lot to do with it. When companies implement ownership transition and succession plans, many things are changing, and, in fact, changes are being implemented that affect all parts of the organization. The following list represents just some of the areas companies change through succession plans:

- Who owns and runs the company
- Top management incentives
- Who markets for the company, often
- Financial strength of the company
- Who makes hiring and compensation decisions
- Who plans and speaks for the business
- Who makes decisions about opportunities to pursue and how to price them
- Who interacts with the company's financial and professional partners.

Exhibit 1

Contractor Resource Equilibrium vs. Rate of Change



If you consider this list, you will realize change affects most of the organization, and, therefore, the culture of the organization is likely to change as well. Consider also that change has led to the failure of many seemingly successful large contractors, and it becomes apparent change is a potential problem that should be

managed. Putting into practice a rate-of-change speed limit starts to make sense.

FMI has helped hundreds of companies plan for ownership transition and succession. Most of these plans were implemented at an orderly speed, allowing change to be managed. Part of this is due to the fact that employees have little money to fund a buyout in a typical transition plan. This dictates a transition period where the selling owner or owners stay involved to ensure the financial where-withal for their ownership exit. During this transition period, the selling owners are participating in decision making, slowing the speed of change. This is one reason internal sales provide many of the most successful transitions in the industry.

Apply the following lessons in planning your own internal transition:

Look at the transition as a process rather than a transaction.

1. A sale that takes a number of years works in favor of the transition being successful. It provides time to:
 - Involve successors in business planning and decision making.
 - Enable successors to see how you make decisions and run the business.
 - Provide further development of successors.
 - Enable you to see successors make decisions.
 - Allow you to gradually turn over your responsibilities.
 - Help clients become comfortable with the changes.
 - Change horses if some successor candidates do not work out.
 - Stop the transition if it is not working.
 - Work with banking and bonding partners on the transition.

Plan early and implement slowly.

1. Internal transitions typically take five to 10 years, so waiting until you want out is too late for staying within the rate-of-change speed limit.
2. Implementing slowly helps to maintain a good rate of change.

A slow transition probably means more money for you.

1. Valuations of construction firms for an internal transition are typically three to five times earnings. If you sell over time, you will continue to retain some ownership, providing a typical return on investment of 20% to 33%. While selling will reduce your risk, earning a 10% return from a non-entrepreneurial investment is more likely.
2. Selling slowly allows you to continue to earn a good return, while easing out of your responsibilities.

Focus on managing your risk as well as your return.

1. You are most likely selling because you want to do something else or to reduce your risk.
2. In either case, you are probably at a point in life where keeping what you have made is more important than making more. Therefore:
 - Take yourself off the bonding and banking lines as soon as possible, and replace yourself with your new partner(s) on these credit lines.
 - Keep your hand in project selection and pricing to monitor risk.
 - Monitor your successors' business thinking.

Good luck with your transition! ■

Quarterly Interview

The Business of Selling Out:

Jerry Jackson

“These rites of passage are necessary, yet at the same time transitional issues tend to remind us of the ticking of the clock.”

— *Jerry Jackson*

Jerry Jackson has been with FMI for close to 40 years, and was one of a group of associates that bought FMI from its founder, Emol “Doc” Falls in the 1970s. He recently sold his stock to the company and is pretending to retire. **Stuart Phoenix** is a principal in FMI’s Investment Banking Group and assists construction industry firms in planning their ownership transition and mergers and acquisitions.

Stuart is one of the FMI employees buying the stock of FMI. Upon Jerry’s so-called retirement, Stuart and Jerry had the following dialogue.



FMI Quarterly: Jerry, congratulations on your 40 years with FMI, and your alleged retirement, but I understand that you are still working. Is this true? Why?

Jackson: Let’s call it a change of status rather than retirement! There are three reasons why I am continuing to work. One is that I have some long-term client situations that I cannot walk away from cold-turkey. A second reason is that I enjoy what I do ... although I don’t want to do it full-time after 40 years. The third reason is that I wanted to continue to publish and edit the *FMI Quarterly*. That role doesn’t require meeting new friends from TSA at airports across the country. In addition, this role keeps me in touch with the people of FMI and the pulse of the marketplace. My role brings me a lot of pleasure. As long as I bring value to FMI in that role, I will continue.

FMI Quarterly: You recently completed the sale of your FMI stock back to FMI for sale to other shareholders. How did that work?

Jackson: We started serious discussions about the future of firm ownership about six years ago. The mechanics of the transition involved accelerating an existing buy-back agreement, modifying the terms of that agreement such that buybacks began at age 60 rather than 65, and initiating a new management team with the three senior shareholders all becoming chairman. Not co-chairs, but chairmen. Hard to argue about status if everyone has the same title! To make significant stock available for sale to the next generation, we decided to accelerate the buy-back from all shareholders from one that involved a buyout for a note at age 65 to a five-year buy-back that ended at age 65. Even though our stock repurchase plan is clear as to age, there is no requirement that full-time work end at that point.

FMI Quarterly: What were the reasons for structuring the sale in that way?

Jackson: Three of us had concentrated ownership and were the management committee of the firm. We realized that for the firm to continue to thrive, we had to remove the glass ceiling. To make that transition meaningful in this closely held professional services firm, we had to make ownership available to other people and take ourselves out of majority control. In other words, changing titles alone would have meant very little. The power base had to change. Obviously, with acceleration as part of the deal, we felt that we had to move sooner, rather than later.

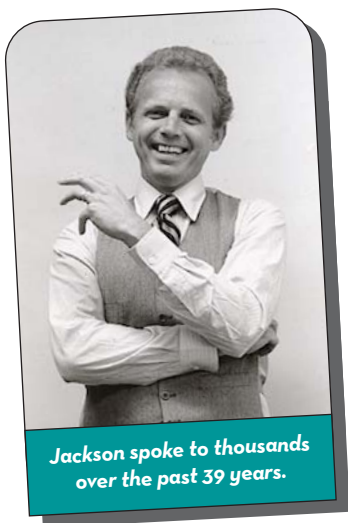
FMI Quarterly: Who came up with that structure?

Jackson: The three majority shareholders of the moment. After extended discussion between the three of us as to how best to make this change, we decided to accelerate the buy-back agreement and add a few bells-and-whistles to soften the economic impact of acceleration.

FMI Quarterly: What were your concerns about that structure from your personal economic perspective, and from a non-economic perspective?

Jackson: The real impact of this change was a reduction in participation in earnings over a five-year period. From an economic perspective, the three senior shareholders were all looking at taking an earlier and ever-diminishing portion of the earnings of the firm. Just taking straight-line projection of our historical earnings and applying a little present value theory made it easy to gauge the minimum personal impact of taking less, sooner. Clearly, some deal sweeteners were needed to make the economics tolerable. Deal sweeteners involved salary, guaranteed shareholder bonus participation, board seat, etc.

Of course, there were some offsets to the idea of giving up money and control in exchange for earlier payout. Given the ages of the three senior shareholders, without change in the rest of the ownership structure, the last man standing of the three would have had considerable concentration of ownership and consequent power. Further, other shareholders would have experienced considerable gain in economic value if they chose not to support a broadening of the ownership. We desired to create a situation where share ownership expanded rather than concentrated.



Jackson spoke to thousands over the past 39 years.

FMI Quarterly: Did you have concerns about the next generation's ability to keep the company going?

Jackson: Not in the least. If we had concern about that, I would never have accelerated my buy-back. Why should I take a bit of an

economic hit in order to provide ownership opportunity to people in whom I had no confidence? These existing and new shareholders are the ones who helped build FMI to the company that it is today. There was no risk regarding their collective ability. Doc Fails undertook much greater risk when he gave me at 20-something an opportunity to buy 25% of the company. He took a lower salary to allow his new partners to afford to pay off our personal loans financing that stock purchase.

FMI Quarterly: Did you and your other selling partners have a plan to go with the economic plan — to protect your interests during the transition as well as to help the next generation succeed?

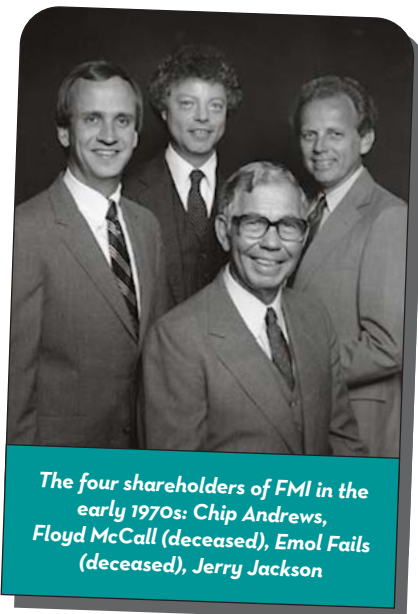
Jackson: Well, we retained board seats, and we still had control via stock for the first two years of my buy-out. But neither my fellow senior shareholders nor I had any serious concern about the need to “take it back over.” That’s the terrific thing about working with great people ... I would go tiger hunting with any of them. Insofar as helping the next generation succeed, we continued to sell, produce, and provide advice when asked. OK — occasionally when not asked, as well! I recall a notion about child-rearing that says you want to give them roots and give them wings. Shareholders are certainly not children, but the metaphor is a good one for new managers, too. We had to step aside (and occasionally on our tongue) in order to make sure the new team knew that they had wings. I don’t think you’ll find any new team members who would complain that the old guard continued to stick their noses into directing the members’ efforts. In fact, I think that we may have been perceived as somewhat indifferent when we actually cared deeply, but wanted to stay out of the way.

FMI Quarterly: How did the transition work for you and FMI?

Jackson: From an economic standpoint, FMI has flourished. That has made my economic transition better as well. The transition of management duties has also worked extremely smoothly.

FMI Quarterly: Were there rough spots?

Jackson: Not rough, but a few poignant moments. For example, strategic planning has been one of my practice areas for more than 30 years. When the new team embarked on their own strategic planning, it felt odd not being asked to participate even though logic told me that I had no business participating. Five years later, I have facilitated some of the “new” team’s strategy sessions so any angst has long healed. Most of the sensitive moments were just that: a feeling of



The four shareholders of FMI in the early 1970s: Chip Andrews, Floyd McCall (deceased), Emol Fails (deceased), Jerry Jackson

being left out, passed by, “on the shelf” so to speak. All the rough spots had to do with suddenly feeling out of the loop after all these years.

There was a period where the communication as to intent and direction wasn’t particularly clear. This may well have been tit-for-tat because I’m sure at times during my tenure that my intent and direction wasn’t communicated as well as I thought it was! This was a great lesson in how difficult it is to communicate intent and reason to people who are not personally engaged in the planning process, no matter the tenure or experience that such people may have.



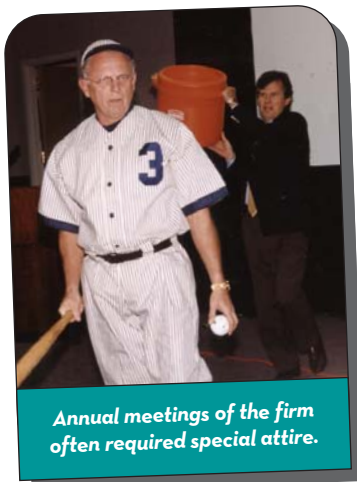
These rites of passage are necessary, yet at the same time transitional issues tend to remind us of the ticking of the clock. Now I’m enjoying the role of elder-statesman without the handicap of being the boss.

FMI Quarterly: Is there anything you would have done differently?

Jackson: Yes. I should have been more optimistic as to the method of share valuation in the shareholder agreement that I first signed in 1971. Other than that, there is little that I would change. On the whole, it has been a friction-free transfer, and I am proud of the company that we kept.

FMI Quarterly: FMI consults with construction firms in planning for their transition, and owners often opt for a third-party sale or hold on to their stock longer for economic reasons. Why did you and your selling partners choose the path you did?

Jackson: Over the years, we have been approached a number of times by potential outside acquirers, both financial shoppers and strategic buyers. Like most, we say that anything is for sale at the right price. When any of the deals approached a serious stage, however, we generally chilled to the idea of selling to a third party. Some of our hesitance was concern about changing the culture that had enabled FMI to thrive. We also knew that any successful deal would have to involve the next generation. No buyer would cut a deal with three senior owners without giving considerable attention as to how they would retain the next two layers of the organization. Could we have struck a deal for a lot more money than I’ll walk away with? Probably. However, as heretical as it may sound, money is not the sole factor in decisions regarding ownership transition.



Of course, today's financial deals typically involve an initial investment for a portion of the stock by a financial buyer, then a subsequent "bite of the apple" for all parties when a future buyer acquires the business. Strategic buyers tend to have a buy-and-hold or buy-and-integrate strategy. Now that share ownership is more widely spread, sale of the business becomes more difficult. Getting 36 people on the same page is much more difficult than getting three people to agree. Wider dispersion of ownership will likely increase the odds of continued employee ownership.

FMI Quarterly: Were there any surprises in the transition?

Jackson: Except for the occasional emotional twinges, there have been few surprises. I've already mentioned my confidence in the next generation. Perhaps the best surprise is the economic success FMI has enjoyed in the past five years and the quality of people that the new generation is recruiting and retaining in the firm.

FMI Quarterly: What advice could you provide to other sellers and buyers in employee purchases of private companies?

Jackson: Get started with your planning early. Ours actually started back in the 1970s when we put together our first shareholder agreement that provided the exit strategies for shareholders of that era. Even though we modified that agreement several times — most recently about six years ago to accommodate the transitions that are occurring now — it is far easier to modify an existing plan built by few than try to herd all the cats for the first time when the number of cats are many.

Have confidence in the employee purchaser. If you don't, why have you continued to employ them? Failure to have this confidence has caused pain and even death for a number of closely held companies. The business goes in the box with the founder.

At the risk of sounding self-serving, get a professional involved in deal-structuring. They've seen many situations and have a number of vehicles for accomplishing seller or buyer objectives. You don't have to reinvent electricity.

FMI Quarterly: What advice would you give FMI's next-generation owners?

Jackson: Stay true to the notion that your first job is to build value for the construction industry and its leading organizations. If you build value, the earnings will be there, and FMI's share value will continue to rise.

FMI Quarterly: Thank you, and enjoy your quasi-retirement, but not so much that we don't see you or that you give up your responsibilities with *FMI Quarterly*. ■



A company teambuilding event with Outward Bound in the late 1980s

An Inside Look: One E&C Company's Sale to a Private Equity Company

An interview with the former CEO of a specialty contracting firm offers a unique inside look at a sale to a private equity company.

By Randy Stutzman and Steve Pavlik

Steve Pavlik was the CEO of a specialty contractor in the Southeast. In 1999, he orchestrated the sale of the company to a private equity firm. He is currently an investment banker and consultant with FMI Corporation. Randy Stutzman is also an investment banker with FMI and has been involved in a number of transactions involving private equity firms. FMI Corporation's Investment Banking Group represented Steve's company.

Stutzman: Steve, tell me a little bit about the company you worked for and the work you performed.

Pavlik: The company is a specialty contractor that works primarily in the Southeastern United States and the Caribbean. We were incorporated in 1953 with one owner. We expanded to four owners with the first generation, and then by the 1990s with our second and third generations we had nine owners. The company has a niche in the engineering and construction market. During our peak season, we employed more than 600 individuals.

Stutzman: You had a longstanding record of profitability, isn't that right?

Pavlik: Yes. We had a unique product and good people. Together, the two produced consistent earnings growth.

Stutzman: What was the composition of ownership prior to the sale to the private equity firm?

Pavlik: We had nine owners in the business that ranged in age from 30 to 70. This included first through third generations. There were no family members among the group.

Stutzman: I imagine you looked at an internal management buyout option. What were the reasons this wasn't pursued?

Pavlik: We actually did have a buy-sell agreement in place, and it had worked for the first generation and to some extent the second. We also had a stock formula in place that was incorporated into the buy-sell agreement.

Over the years, the company became more profitable. To protect the financial integrity of the company, a limitation was placed on the amount of payout that could be made in any one year to any individual stockholder and the stockholders in the aggregate. The limitations on payouts pushed the payout period for the selling shareholders — in some cases to more than 25 years.

Stutzman: That's not a very practical plan.

Pavlik: No, it really isn't.

Stutzman: Often in transition plans, there are some real differences of opinions between the older and younger owners. Was this the case for you and your company?

Pavlik: Yes, we did experience some of that. The decision to sell the business was not unanimous, but a majority of participants agreed to enter into negotiations to sell to either a private equity or a strategic buyer. For the most part, the larger shareholders, with some exceptions, were in favor of a sale. The younger people were largely opposed. As it turns out, the deal was structured so that the younger folks participated in an option pool. The pool allocated 6% of the standing shares to the younger shareholders.

The decision to sell the business was not unanimous, but a majority of participants agreed to enter into negotiations to sell to either a private equity or a strategic buyer.

Stutzman: Did you consider selling to strategic buyers?

Pavlik: We considered selling not only to strategic buyers, but we also looked at internal transactions. We looked at ESOPs and preferred stock

recapitalizations. I actually sat down with the president of our lead bank, and I saw there was an opportunity to make an unsecured loan with the lead bank to fund a portion of the buyout for the selling shareholders. Yet, the amount the bank would loan us would only cover a fraction of the buyout, and the loan would have been for a relatively short period of time. It was amortized over many years but ballooned in five years. So while we did explore a number of options, none of them fit the bill like the private equity. Also, before we started the search for private equity partners, we were approached by two strategic buyers that expressed an interest in the company.

Stutzman: Take me and the readers of *FMI Quarterly* through the activities from the time that you started the process until the time that you closed the transaction. Give us a timeline of what happened, and when.

Pavlik: Certainly. The decision was made to select an investment banking firm to represent us in October 1999. The actual transaction to sell off a 60% interest of the company to a private equity firm occurred in September 2000. We didn't start the presentation to prospective buyers until December 1999 and that part was concluded by March 2000.

The process began with the preparation of a brief scope sheet by the investment banking firm. This included a general overview of the company, abbreviated financial information, area of operations, margins, and potential and historic growth. The investment banking firm then identified a list of prospective buyers. We reviewed that list, and the scope sheet was sent to those companies. From that, a number of people expressed interest. We narrowed that list to seven people — one strategic buyer and six private equity buyers. We visited the offices of each firm in this group and presented our case. This gave them a chance to see us face-to-face and for us to talk with them about their interest in the company. We received offers from all seven firms, and our management group narrowed that down to three offers, all of which were private equity firms. In March 2000, the three private equity firms were invited down to make a presentation to our entire stockholder group. Their talks focused on the merits of their individual companies and the advantages of doing the deal with them. We then narrowed that group down to two firms, and I obtained a list of three current portfolio companies for each of the two private equity firms. I did my own due diligence and visited the portfolio companies for each of the private equity firms. I discussed with senior management at these companies what life was like after the transaction. As a result of that discussion, we then met with our stockholder group and decided on the candidate to whom we were going to sell a partial interest.

Stutzman: How important was the chemistry between the management group and the private equity firm that you ultimately chose?

Pavlik: It was very important. We had a feeling of trust with the company and the people. We had trust in the operations side of the business as well as on the financial end. A component of the private equity deal is structured with senior debt and subordinated, or mezzanine debt as it's called, and we had a unique opportunity as sellers to participate in the mezzanine debt. Not only did the shareholders of the company participate, but also the private equity individuals participated on a 50/50

Chemistry played a huge role; the private equity firm we chose did not have the highest price.

basis in the mezzanine debt. So we were truly partners, as equity and debt partners, and there was no conflict of interest in the transaction. Chemistry played a huge role; the private equity firm we chose did not have the highest price. It was the lower of the two prices.

Stutzman: So it wasn't all about the money?

Pavlik: No, it was not about the money at all. We left some money on the table because we felt more comfortable

with the management of the firm we selected. Equally important was their debt structure. The firm with the lower price also had a lower debt attached to it.

Stutzman: Horror stories circulate about the required due diligence in a sale to a private equity firm. What was your experience?

Pavlik: It was not more than we were led to believe by our investment banking firm. We set up a room within our office and pulled together the corporate minutes, historical financial statements, job costing information, etc. So when the various people came to do their due diligence, they were able to go to that room, set up, and find the documentation. We tried to keep the disruption to the operating people at a minimum. Still, there was a good deal of copying and requests for other documentation. It wasn't onerous, but due diligence was performed by the private equity firm, the lead bank, and the participating bank.

Stutzman: If you had it to do over again, would you use an electronic data room?!

Pavlik: I'm not sure I knew there was such a thing at the time, but based on what I know now, it would have been a great decision to use one. I think it makes a lot of sense and lessens the burden. It allows people to examine documents at their leisure.

Stutzman: Were there any changes in the deal structure as a result of the due diligence process?

Pavlik: No material changes. There were a few minor modifications. The pricing was essentially the same as were the terms and conditions. The private equity firm told us upfront that they were looking for a good solid core business — one with the opportunity to grow and a good management team in place, capable of taking the business to the next level. They were really looking for future earnings.

Stutzman: Sellers typically wonder about the closing process. Tell us about your experience with this aspect of the process.

Pavlik: It went extremely well. It was handled at the offices of the attorneys for the private equity firm in Manhattan. Our attorneys from Atlanta were represented along with the bank's attorneys from Ohio. We had a lot of attorneys gathered together in one room!

Also present were people from the private equity firm, lenders from the bank, and then our company. The legwork had already been done in terms of the documentation being prepared and reviewed. There was a lot of information that had to be read, reviewed, and processed. But everyone worked toward the same goal of doing the deal. I didn't feel at any time that there was any type of an adversarial relationship, nor did I feel that anyone was trying to take advantage of another. It was an open and honest process. It helped us to find qualified people with experience in structuring and completing these deals. It helped us to learn what the expectations were and also the protocol.

Stutzman: So you sold the company, the management team is in place, and you continued on as the CEO. How did your life change after the sale of the business?

Pavlik: We made certain commitments to the private equity firm about growing the business, and we tried hard to honor those commitments. There were additional reporting requirements from a financial standpoint. The board meetings were minimal at four a year, and there were five board members. The board meetings became more formal with a detailed agenda as opposed to rambling about tactical or non-strategic issues. There were reports to investors with some being given in-person at the New York offices and some through conference calls with the limited partners. These reports were not out of the ordinary, though, or anything that required us to take our eye off the ball. We had meetings with bankers and the limited partners; the investors and the lenders wanted to know what was happening with the business. It was done in a very structured and user-friendly format — that's probably a good way to explain it.

The private equity firm told us upfront that they were looking for a good solid core business — one with the opportunity to grow and a good management team in place, capable of taking the business to the next level.

Stutzman: Did you feel pressure to maximize short-term profits and forgo long-term improvements in the business?

Pavlik: No. I never felt any pressure to do something to the detriment of the business in order to enhance short-term profitability. Suggestions were made as to courses of action, but ultimately the decisions about day-to-day operations were left to the management team.

Stutzman: Were the established bank covenants difficult to meet?

Pavlik: We didn't think so when we set up the deal. But in the first quarter after we closed, we ran afoul of one or two of the covenants. So there was a little flurry of activity, but we quickly remedied those and moved forward. There was no finger-pointing or blame-placing. The bank just wanted to know what happened and what to expect. I never felt it was an adversarial relationship. The banks and private equity folks were honorable people.

Stutzman: What were some positive results of the transaction for the company?

Pavlik: One I mentioned briefly before was the added structure to our board meetings. Another positive result was the detailed plan to grow the business that was established. Also as a result of the transaction, some of our internal operational procedures were streamlined and formalized.

Stutzman: Now ... the other side of the coin ... what were the negative aspects of the transaction?

Pavlik: I mentioned earlier about the emphasis on growing the business, its earnings, and profitability. The flipside to that in the construction business is the parallel tendency to take jobs with either smaller margins or more risks. So we had to continually guard against that. And it was different. Anytime you have change, there is some resistance. All in all, though, I would say it was a positive experience.

Stutzman: Steve, you have been through the entire cycle of talking to private equity firms, selling to a private equity firm, and then managing the business after the acquisition. Looking back on it now, what, if anything, would you do differently?

I never felt any pressure to do something to the detriment of the business in order to enhance short-term profitability.

Pavlik: What we did in terms of picking the team — the investment banker, the attorney, the lead bank — I would do exactly the same again. I was very happy with the choices we made. The only thing I would have done differently is involve the bonding company earlier in our discussions. Another difficult decision is how much to communicate and when, before a deal is actually struck. At the time, I thought I was doing what was best for the individuals involved and for the company.

Stutzman: Steve, we appreciate your time and willingness to share these insights. ■

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¹ An electronic data room replaces the traditional physical data room by making due diligence materials available electronically at all times, through the use of the Internet, compact discs (CDs), or digital video discs (DVDs). Data room materials are organized, indexed, scanned, and converted into an electronic format. These files are then posted in a data room workspace or burned onto a CD or DVD.

(If You're Not Careful) There's a Hole in the Bucket

A risk bucket model provides a simple way to segregate a contractor's personal assets for analysis and management.

By Stuart Phoenix

Modern portfolio theory calls for diversification of an investor's assets as a means to protect and grow them. Economist Harry Markowitz presented modern portfolio theory about 50 years ago, and it has served as a basis for financial advice since that time. However, contractors find it difficult to work within this framework.

The difficulty for most contractors is that almost by definition, contractors' assets are not diversified. Most contractors created their net worth through concentration of their financial resources in their companies, not through diversification of their investments. In fact, diversification for many contractors would have prevented them from becoming wealthy.

Another difficulty in investment diversification stems from the fact that contractors maintain a significant exposure of their net worth to bonding companies and banks, risking catastrophic loss on a single, large project. Contractors become numb to risk; it is part of their life.

Still, the fact that many contractors have become wealthy by concentrating their investments and remaining numb to providing personal signatures does not mean it is a guarantee of continued financial success. On the contrary, the industry is littered with former contractors that signed too long or went one job too far. An article published in 2007 Issue 2 of *FMI Quarterly* entitled, "Why Contractors Fail,"

written by Hugh Rice and Art Heimbach Ph.D., details the downfall of many large and seasoned contractors.

So what is a contractor to do? First, the financial strategy that helped build wealth may not be the one that keeps you wealthy. It has been said that you concentrate to get rich and diversify to stay rich. But for the contractor, there is more to it.

In a 2006 white paper published by Merrill Lynch entitled, "Beyond Markowitz," author Ashvin Chhabra adds to the diversification model in a way that can help contractors better plan their finances.

In "Beyond Markowitz," Chhabra breaks down risk into three dimensions: personal, market, and aspirational risk. Personal risk is managed to preserve a basic standard of living. Market risk is managed similar to modern portfolio theory by seeking a market return on diversified assets. Aspirational risk is represented by get-rich investments such as private business ownership.

To facilitate financial planning, Chhabra suggests classifying assets into each risk "bucket." This provides a useful model for contractors. Into the personal risk bucket goes a contractor's cash, house, insurance, and other low-risk assets. In the market risk bucket goes market investments such as a 401(k), pension plans, and other tradable investments. Market-type assets are what financial advisors want to see accumulated as contractors progress in their careers. Contractors may resist this because they understand less about market investments, and they see greater return from their concentrated investments. Into the aspirational risk bucket goes the company along with other concentrated investments.

Real estate could go into any of the three buckets. Homes would go in the personal risk bucket. An office building or other investment real estate might go in the market risk bucket. Development real estate might go in the aspirational risk bucket.

Together, the buckets represent a risk allocation paradigm for contractors. The corresponding investment strategy is to fill each bucket and then protect each bucket from the bonding company and the banks. Exhibits 1 and 2 show the three risk buckets

Exhibit 1

Performance and Risk Measurement Basis for Each Risk Bucket

"Personal" Risk Basic Standard of Living	"Market" Risk Maintain Lifestyle	"Aspirational" Risk Enhance Lifestyle
<p style="text-align: center; color: #92d050;">Protective Assets</p> <p>Expected Performance Below market returns for below market risks</p> <p>Sample Benchmarks Consumer price inflation Three-month LIBOR</p> <p>Risk Measures Downside risk Scenario analysis</p>	<p style="text-align: center; color: #0056b3;">Market Assets</p> <p>Expected Performance Market returns Market risks</p> <p>Sample Benchmarks S&P500 Lehman Agg. Bond MSCI World Index</p> <p>Risk Measures Standard deviation Sharpe ratio Beta Scenario analysis</p>	<p style="text-align: center; color: #009682;">Aspirational Assets</p> <p>Expected Performance Above market returns with high, targeted risks</p> <p>Sample Benchmarks CLEW Index Absolute return value</p> <p>Risk Measures Upside return measures Manager alpha Scenario analysis</p>



and the “risk/return spectrum.” Exhibit 1 shows performance expectations for each bucket, and Exhibit 2 shows the types of assets collected in each bucket.

How this paradigm is used by investors will vary based on their particular asset base. For the well-paid executive, often the personal risk bucket is filled first as a home is bought and a basic savings program is started. Next, the market risk bucket is filled as investments are made in retirement

plans and more aggressive market strategies. Contributions are made to the aspirational risk bucket next as stock options or investment opportunities come along, or higher risk/return strategies are pursued.

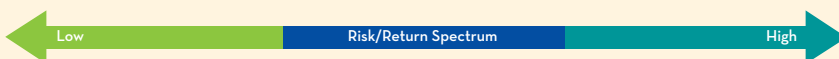
For some investors, an inheritance may fill the market risk bucket first. Next, they may fill the personal risk bucket to secure their lifestyle, before filling their aspirational risk bucket to garner greater returns or to be more active in their investments.

In another scenario, the business owner or contractor is likely to fill the aspirational risk bucket first, often jeopardizing their personal risk bucket. Once these business owners achieve a measure of success, there are several investment strategies they might pursue. First, many continue to reinvest in the business, not worrying about the other two buckets. Others are serial entrepreneurs and seek other aspirational risk opportunities. Still others may begin to fill their personal and market risk buckets.

Exhibit 2

Asset Classifications for Each Risk Bucket

“Personal” Risk Basic Standard of Living	“Market” Risk Maintain Lifestyle	“Aspirational” Risk Enhance Lifestyle
Protective Assets	Market Assets	Aspirational Assets
Cash	Equities Broad size and style and sector exposure	Alternative Investments Private equity Hedge funds
Home Purchase		
Home Mortgage	Fixed Income Credit quality and duration diversification	Investment Real Estate
Partially Protected Investments U.S. TSY (short duration) TIPS Principal protected funds	Cash (Reserved for Opportunistic Investing)	Investment Concentration
Traditional Annuities to Provide Safe Source of Income and Hedge Longevity Risk	Strategic Investment Funds of funds	Small Businesses
Hedging Through Calls/Puts/Collars	Liquid “Non-traditional” Investments e.g., commodities	Concentrated Stock and Stock Option Positions
Insurance		
Human Capital		



FINANCIAL PLANNING FOR CONTRACTORS

The risk bucket model proves useful for contractors' financial planning in several ways. First, when allocating assets strictly on return, the aspirational risk bucket always wins since expected returns in a construction business typically range from 15% to 30%. Of course, achieved returns could be far different due to risk.

FMI's Investment Banking Group experience indicates that contractors sell for three to six times pretax adjusted earnings. This means in a slow-growth industry, construction owners will get a 17% to 33% return on the expected valuation of their business. If the owner's choice is between the 17% to 33% return and a market-risk return — historically on the order of 10%, depending on the asset classes and the timing — the owner will invest in the business.

The risk bucket model can help business owners consider these questions as thinking moves beyond just reinvesting in the business regardless of the risk.

Said another way, a business owner considering a new business opportunity will seek an above-market risk return to justify that investment. Therefore, it is almost self-fulfilling that business owners will choose the aspirational risk opportunity over the market risk opportunity.

The key for contractors making the allocation decision is risk. When do you stop focusing solely on increasing wealth and work on ensuring that you stay wealthy? When do you stop putting

personal assets at risk? When do you start accumulating market risk assets to assure your lifestyle in retirement or to protect against a hit to your aspirational risk assets? When do you say “no” to the bonding company or banks or to the aggressive project manager/estimator wanting to take on a high-risk project?

The risk bucket model can help business owners consider these questions as thinking moves beyond just reinvesting in the business regardless of the risk. Another benefit is the model's use in separating out a business owner's personal balance sheet to facilitate work with advisors. For example, the business owner is responsible for the aspirational risk bucket and typically will have a chief financial officer and other employees to assist with this portion. The business owner, and perhaps other advisors, are responsible for the personal risk bucket, protecting the home, and other low-risk assets. The market risk bucket is where business owners are likely to look for help with assets accumulated beyond a retirement plan such as a 401(k). A more traditional modern portfolio theory might apply to this area of the model.

Separating the buckets in this way for management may also make sense for the business owner. Conventional thinking says

the percentages in each bucket are key, in the same way the percentages of asset allocation are for each bucket. Yet it could be argued this is less true for business owners than it is for the non-business-owner investor.

After business owners have achieved a certain level of financial success, it makes sense to secure the personal risk bucket, at a base level that protects the home and maintains a level of liquidity. This bucket may not necessarily grow in size as the owner's net worth grows; after all, its purpose is to act as a safety net of assets, not necessarily as a percentage of net worth.

As business owners mature or take money out of the business, the market risk bucket is next for securing. Again, the purpose of this bucket is to secure or provide a lifestyle at less risk than the aspirational risk bucket. Similar to personal risk, the size of the market risk bucket may not vary in proportion to the owner's net worth since the purpose of the aspirational risk bucket is return, while the purpose of the market risk bucket is to manage risk and endow a lifestyle. The aspirational risk bucket represents the owner's growth money, and growth usually requires more investment. That is especially true for serial entrepreneurs who may achieve their diversification by owning multiple aspirational risk businesses.

MARKET RISK BUCKET MANAGEMENT

Many business owners are late to the market risk bucket because of the demands and opportunities of the aspirational risk bucket. Also, owners have typically had bad experiences in smaller market investments. As with most things, larger investment capital provides more investment opportunities and generally commands more experienced, successful advisors. Exhibit 3 shows annual total returns of key asset classes, as provided by Franklin Templeton Investments. The exhibit illustrates the many choices of asset categories and the varied performance from year to year. Modern portfolio theory dictates diversification of the asset classes and within each asset class. An experienced investment advisor can help with this. Concentration in some cases may yield higher returns, but concentrated assets belong in the aspirational risk bucket.

BONDING

Not all contractors perform bonded work, but a significant portion do. Not all contractors that perform bonded work sign personally, but a significant portion do. Contractors who don't sign should keep it that way. Contractors who do sign should work towards getting away from personal indemnification as a career goal.

Personal signatures are second nature for many contractors. These contractors signed to get started in the business, and when they started, there was not much to lose. Later on, it makes sense to limit liability because bad things can happen. The risk bucket model can help contractors think through this. As contractors start out, not much

Many business owners are late to the market risk bucket because of the demands and opportunities of the aspirational risk bucket.

Exhibit 3

Annual Total Returns of Key Asset Classes — As of September 30, 2006

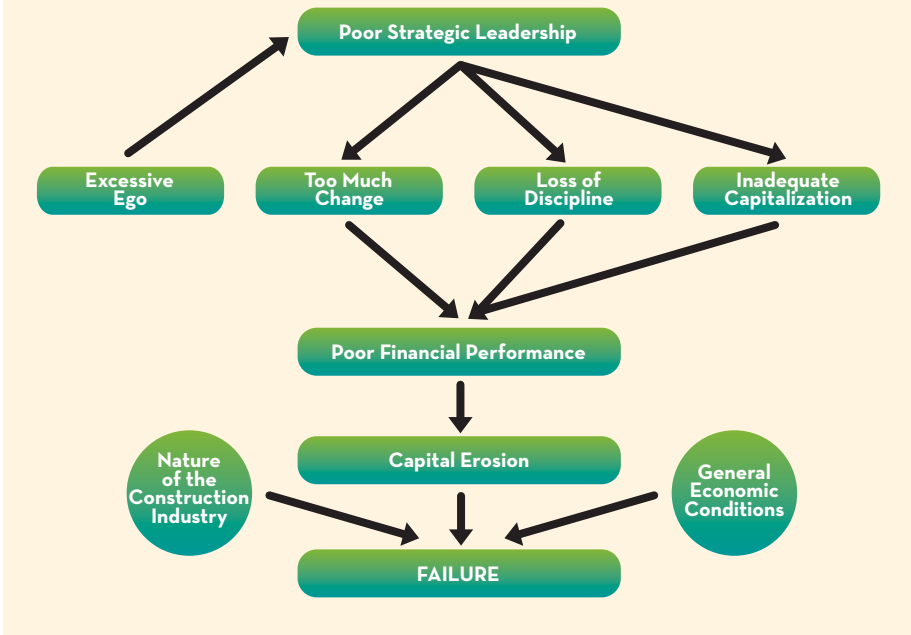
- Small Cap Growth stocks are represented by the Russell 2000® Growth Index
- Small Cap Value stocks are represented by the Russell 2000® Value Index
- S&P 500 Index
- Large Cap Growth stocks are represented by the Russell 1000® Growth Index
- Large Cap Value stocks are represented by the Russell 1000® Value Index

- Real Estate stocks are represented by the Dow Jones Wilshire RES Index
- 10-Year Treasury Bond is represented by the Lehman Brothers 10-Year Treasury Index
- International stocks are represented by the MSCI AC World ex-U.S. Index
- Emerging Markets stocks are represented by the MSCI Emerging Markets Index

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	YTD
Emerging Markets	59.91%	29.14%	74.84%	6.53%	38.35%	36.88%	35.18%	36.71%	66.41%	30.71%	14.02%	14.56%	56.28%	34.83%	34.54%	24.58%	
Small Cap Value	51.19%	13.31%	13.31%	2.66%	37.59%	23.12%	33.36%	28.58%	43.09%	22.83%	10.45%	2.66%	48.54%	25.95%	17.11%	14.34%	
Small Cap Growth	41.79%	11.40%	23.84%	1.65%	37.19%	22.96%	31.79%	15.63%	33.16%	14.45%	4.04%	-6.00%	46.03%	22.25%	14.06%	13.24%	
Large Cap Value	41.16%	7.77%	18.12%	1.32%	31.04%	21.64%	30.49%	14.46%	30.90%	7.02%	-2.37%	-11.42%	41.41%	21.36%	7.05%	13.19%	
S&P 500	30.46%	7.62%	15.23%	-1.55%	25.75%	21.37%	19.76%	12.87%	21.04%	-9.11%	-5.59%	-14.67%	37.08%	16.49%	5.26%	12.71%	
Large Cap Growth	24.61%	7.40%	13.36%	-1.99%	23.69%	11.26%	12.95%	1.23%	7.35%	-15.08%	-9.23%	-15.52%	30.03%	14.31%	4.91%	8.52%	
Real Estate	20.04%	6.56%	11.87%	-2.43%	13.65%	6.66%	11.26%	-6.45%	-1.49%	-22.43%	-11.88%	-22.10%	29.75%	10.88%	4.71%	4.21%	
10-Year Treasury Bond	17.26%	5.00%	10.06%	-7.32%	9.64%	6.03%	2.04%	-17.43%	-3.77%	-22.43%	-19.50%	-27.88%	5.00%	6.30%	4.15%	2.97%	
International Equity	13.96%	-10.67%	2.90%	-7.85%	-5.21%	0.10%	-11.58%	-25.34%	-8.43%	-30.61%	-20.42%	-30.26%	1.27%	4.90%	2.07%	0.90%	

Note: The information provided is as of 9/30/06, unless otherwise indicated, and is not intended as individual investment advice or as a recommendation of any particular security, strategy, or investment product. All indexes are unmanaged and cannot accommodate direct investment. Past performance does not guarantee future results.

Exhibit 4

Failure Chain Reaction Model: Critical Root Causes

is in any of the buckets and everything is at risk. As contractors fill the buckets, the goal should be to limit which buckets or assets are exposed to personal signatures. The company or the aspirational risk bucket may always be exposed. The first goal should be to remove exposure of the personal risk bucket, followed by the market risk bucket.

THE ICARUS EFFECT

Engineering News-Record published FMI's article, "Why Contractors Fail," and in it they named the reasons for contractor failure, "The Icarus Effect." According to the article, "A typical contractor is an individual who is driven to grow, numb to risk, extremely opportunistic, over confident, and action-oriented." That personality combined with other factors such as inadequate business practices, difficult economic conditions, and rapid change has caused many a successful contractor to fail.

Exhibit 4 illustrates the failure chain reaction model and the cycle into which too many firms fall. Contractors should pay attention to how to avoid this effect in their own business. Few firms are immune to failure so contractors should fill the personal and market risk buckets in the good times and protect them from the bad times.

Contractors assess and manage risk every day for their clients while consideration of their own financial risk often takes a backseat. The risk bucket model provides a simple way to segregate personal assets for analysis and management. While this is important for the contractor's personal financial health, it is also important to the contractor's family, employees, advisors, bonding company, bank, and ultimately, customers.

Your personal financial health prepares the way for succession planning when selling to employees or a third-party. It provides security to your family in case something happens to you. And, it helps keep the business healthy, which is good for everyone. ■

Public Private Partnerships — A Viable Infrastructure Solution?

The first article in our set on P3 deals with its development, benefits and drawbacks, and future outlook.

By Matt Godwin and Hoyt Lowder

The United States has long relied on traditional construction practices and traditional funding measures to develop, build, and maintain domestic infrastructure assets. Unfortunately, given the pace of change in the industry and the increasing deterioration of the nation's infrastructure, a status quo approach is not sufficient. The health of transportation-related infrastructure in the United States has reached a crisis level. As evidenced by the I-35 West bridge collapse in Minneapolis, Minn., and other problems with domestic infrastructure assets, the government has consistently underinvested in this country's infrastructure.

Significant funding and attention must now be focused on the nation's transportation infrastructure. Just how bad is it? According to the American Society of Civil Engineers, approximately \$1.6 trillion is needed to repair and/or rebuild current infrastructure to acceptable conditions over the next five years. Additionally, according to the American Road & Transportation Builders Association, 26% of the nation's bridges are determined to be structurally deficient or functionally obsolete,

and 17% of federal-aid road miles are reported to have conditions needing resurfacing or reconstruction.

Clearly, the structural integrity of current infrastructure assets is challenging. Yet, the domestic infrastructure market faces numerous other challenges, including:

- *Increasing demand for new infrastructure assets.* Simply put, more roadways, bridges, dams, and other infrastructure assets are needed to support the nation's growing population. Congestion is a growing problem across the United States, especially on the roadways of many large and mid-sized U.S. cities.
- *Insufficient federal funding.* Current federal funding levels are not sufficient to build, maintain, or rebuild infrastructure. The most recent federal transportation bill, SAFE TEA-LU, signed into law in 2005, provides for \$286.4 billion in guaranteed funding for federal surface transportation projects from 2005 through 2009. However, much of this funding is for maintaining and rebuilding existing assets, not the construction of new infrastructure.
- *State transportation shortfalls.* In recent years, funding for state transportation projects has experienced a shortfall. Historically, states financed highways from gas taxes, and despite more cars and higher gas prices, the purchasing power from the tax has declined. Due to inflation, the absolute value of state-gas taxes has decreased over the long-term while the need for investment has increased. Additionally, states do not have the appropriate incentive or funding to support improvements.

These issues, along with growing public concern, are pushing government agencies to consider alternative project delivery approaches and funding measures in order to improve domestic infrastructure. One alternative, public-private partnerships, is a well-developed but potentially controversial solution that's gaining ground in the United States. For the last several decades, public agencies and the private sector of other nations have successfully used P3s to develop, operate, maintain, and control infrastructure. P3 expertise is currently being exported to and adopted in the United States through the efforts of (typically) foreign-owned engineering/construction and investment firms as well as forward-thinking public agencies. P3 offers a unique solution with notable attributes and potential drawbacks. Given the current state of the nation's infrastructure, new solutions must be considered.

The use of the private sector in developing and funding infrastructure projects can take on many forms, some more complex than others.

THE RISE OF PUBLIC PRIVATE PARTNERSHIPS

The use of the private sector in developing and funding infrastructure projects can take on many forms, some more complex than others. From a project development standpoint, P3 is the most common form of privatization and is generally defined as a long-term partnership arrangement between the

public sector and the private sector to deliver public infrastructure projects. The objective in P3 is to accelerate the building of infrastructure that is generally deemed to be impractical under traditional funding measures. There are several alternative schemes for P3. In Europe, for example, a common form of project development is

P3 can be used for any type of infrastructure, including roads, bridges, dams, schools, hospitals and is generally restricted only by individual creativity.

Build-Operate-Transfer (BOT). In BOT, a public agency contracts with a private firm or consortium of firms to design, build, maintain, and operate infrastructure such as a toll road, for a long-term period. After generating a return to investors via the collection of tolls and proper maintenance of the asset, the private firm eventually returns the asset to the public agency at the end of the term. Variations of this model are in use around the world, but this is the traditional set-up for P3 projects in the United States.

Alternatively, concessions are becoming more popular in the global market. A concession essentially is a transaction involving an existing

infrastructure asset. A concessionaire holds a long-term lease agreement for a specified period of time. This is a lease of publicly financed, previously developed infrastructure. Under the concession agreement, the concessionaire agrees to pay an upfront fee to the public agency in order to obtain the rights to collect revenue generated by the facility (typically tolls or other user fees). The concessionaire also is responsible for the operation and maintenance of the infrastructure asset, including capital improvements.

P3 can be used for any type of infrastructure, including roads, bridges, dams, schools, hospitals and is generally restricted only by individual creativity. Historically, traditional project delivery methods in the United States for new infrastructure construction included bidding work separately using general contracting or design-build methods. However with the BOT form of P3, the responsibility for developing, funding, designing, constructing, and operating infrastructure is shifted to a private entity or consortium of private entities under a long-term, comprehensive contract. This provides the potential for innovation and project integration, as well as decreasing the relative burden on taxpayers and government entities.

Private financing or P3 alternatives allow local, state, and federal governments to build infrastructure in an accelerated fashion or to put in place infrastructure out of reach under traditional funding measures. Privately financed or P3 projects remain in their infancy in the United States; however, many nations have an advanced view of P3 and a greater level of experience executing such projects. The privatization of transportation infrastructure began in the 1980s in Europe and Australia. Generally speaking, Europe has led the way in establishing and standardizing the P3 model.

Over the last several decades, numbers of successful projects have been completed around the globe, and several large engineering and construction as well as investment firms have aggressively entered the market. From an engineering, construction, and operation standpoint, firms such as Grupo Ferrovial (Spain), Bouygues (France), Grupo ACS (Spain), Transurban (Australia), and Balfour Beatty (United Kingdom) have been active. From an investor perspective, the two most active firms are CINTRA (a subsidiary of Grupo Ferrovial) and Macquarie Investment Group (Australia). In recent years, Macquarie Investment Group has grown such that the company maintains investments in more than 100 infrastructure assets around the world, including toll roads, bridges, airports, and water infrastructure assets.

These same firms are leading the effort to bring P3 to the United States. Generally, the rest of the world leads North America in its use of private finance alternatives and specific procurement methods to build needed infrastructure.

Private financing or P3 alternatives allow local, state, and federal governments to build infrastructure in an accelerated fashion or to put in place infrastructure out of reach under traditional funding measures.

PROS AND CONS OF P3 PROJECTS

Privatization breaks the tradition of how the U.S. develops, funds, maintains, and controls infrastructure. To consider the viability of P3 in the United States, its associated advantages and disadvantages must also be considered. In the United States, there is both growing public support for improving infrastructure and growing resentment toward private companies “owning” assets considered public property.

The primary benefits of P3 include immediate access to available capital, ability to shift economic and construction

risks to the private sector, and the potential to maximize resources and efficiencies via the capital market system. Essentially, the private sector offers expertise and funding alternatives and allows government agencies to build infrastructure in an accelerated manner while also reducing the financing and construction risks to public constituents. Additionally, in a concessions model where existing assets are sold to an investor, capital is freed and public agencies can use those funds for other initiatives, including the funding of new infrastructure development.

The primary benefits of P₃ are:

- Risk-sharing between public constituents and the private sector
- Enhanced innovation and efficiency in project delivery
- Creation of liquidity for public agencies
- Maximized resources and expertise
- Enabled focus on core functions by public agencies and governments
- Decreased reliance on traditional funding measures.

Although many advantages exist, certain disadvantages are evident. Most prominent is the transfer of control of infrastructure assets to another entity, sometimes a foreign-owned entity. P₃ contracts are complex and long-term in nature and must adequately deal with safety measures, increasing costs to users of infrastructure assets, quality and service guarantees, and other things. Many agreements are in effect for 30+ years, with some approaching 75 years. Locking into such a long-term contract carries risk.

The public sees this loss of control over public infrastructure as a sizeable issue. Fear exists that a private firm is motivated solely by profitability and will increase user fees to an unacceptable level in a P₃ arrangement.

Other potential disadvantages of P₃ include:

- Long-term and complex nature of contracts
- Loss of control of public infrastructure
- Potential for higher costs to infrastructure users
- Potential sacrifice of quality for profits by private companies
- Loss of public jobs (For example, Canadian unions are not fans of P₃ financing, which has replaced union workers with non-union workers in P₃-financed healthcare facilities.)
- Loss of accountability
- Dissimilar cultures of public and private sectors.

THE DEVELOPMENT OF PUBLIC PRIVATE PARTNERSHIPS IN THE UNITED STATES

The use and implementation of P₃ in the United States has been gradual, not accelerated. However, signs point to a change in implementation speed. One major reason for resistance to P₃ is the historical availability of capital for infrastructure projects. The U.S. municipal bond market has provided ample capital to finance

domestic infrastructure opportunities. Goldman Sachs alone raised over \$3 billion for their fund, eclipsing their own fund estimate. Also, CALPERS recently stated that up to 1% of their investment funds will be dedicated to investment in infrastructure-related investment vehicles. These firms are following the lead of foreign firms, such as Cintra and Macquarie Investment Group, in taking advantage of the expected growth of the domestic infrastructure market.

As shown in Exhibit 1, not all states have enabling legislation and certainly some states have been more active than others. Some of the most forward-thinking states in terms of using P3 include Virginia, Illinois, Indiana, Florida, Colorado, and California. The most high-profile “privatization” efforts in the United States, to date, include the sale of highway assets in Illinois and Indiana. In 2005, an investor group made up of Macquarie Investment Group and Cintra purchased the Chicago Skyway from the City of Chicago for \$1.8 billion. This was the first sizeable P3/concessions investment made in the United States and per the contract, the investors purchased a concession to operate the Skyway and collect tolls. On the heels of this transaction, Macquarie Investment Group and Cintra purchased the Indiana Toll Road in 2006 for \$3.8 billion, also a concession transaction. This allowed the State of Indiana to reduce debt and free up capital for future infrastructure expenditures. Another example of investment in the United States is Transurban’s acquisition of Virginia’s Pocahontas Parkway. In this transaction, Transurban is to manage, operate, maintain, and collect tolls in a 99-year-long deal.

These transactions represent specific investments in domestic infrastructure assets. In addition, active development of new infrastructure assets using P3 is afoot. Projects in Texas, Colorado, Florida, California, and Oregon are in development. Possibly the largest planned infrastructure development currently considering the use of P3 is the Trans-Texas Corridor (“TTC”). The TTC is a large-scale transportation network extending throughout Texas to include various infrastructure forms. An initial phase of this project (TTC-35) was awarded to a partnership of Cintra and Zachry Construction Company, carrying a \$1.3 billion value.

Although successful P3 examples exist in the United States, all is not well. In Texas, for example, there has been sizeable pushback regarding use of private financing and resources. The Texas Department of Transportation and government are facing increasing criticism regarding their widespread desire to use P3. Additionally, in New Jersey, Governor Jon Corzine announced earlier this year his interest in privatizing the New Jersey Turnpike. However, due to harsh criticism, Governor Corzine announced in June that no state-owned roadways would be sold to private interests or leased to a for-profit entity. Certainly, P3 projects are under development in many states; however, there are detractors and individuals and organizations that wish to keep public assets under public control.

THE USE OF PUBLIC PRIVATE PARTNERSHIPS GOING FORWARD

The U.S. infrastructure market continues to evolve. As funding shortfalls continue to exist, the use of P₃ and concessions is likely to continue to grow. P₃ has made inroads into the U.S. infrastructure market due to several key factors, including:

- The success of a few large-scale transactions
- Government support for P₃ — more U.S. state and federal acceptance
- Availability of abundant sources of investment capital for long-lived infrastructure projects
- Participation of domestic and foreign developers with records of success in undertaking P₃ globally
- The need for private involvement in the development of new and existing transportation infrastructure in the United States.

Many global firms are directly focused on infrastructure activities in the United States. In fact, many global firms have made recent acquisitions in the United States to bolster their ability to perform. In March 2007, Grupo ACS acquired a 25.1% interest in Hochtief A.G., a large German contractor that also owns Turner Construction in the United States. Companies are implementing a strategy of expansion in the U.S. transportation/civil market. Hochtief A.G. recently announced

the acquisition of Flatiron Construction, a Colorado-based civil construction firm. This provides both Grupo ACS and Hochtief with increased access to P₃ opportunities in the United States. Also, Ferrovial acquired W.L. Webber LLC, a Houston-based civil construction firm, to bolster its Texas civil-construction capabilities. These are just two examples of firms moving into the U.S. market. Many others exist.

U.S.-based firms are also getting into the act. AECOM Technology Corporation and its wholly-owned subsidiary specializing in P₃, AECOM Enterprises, seek to develop infrastructure projects in the transportation, environmental, and facilities markets.

To support this initiative, AECOM has partnered with French-based Credit Agricole in Meridiam Infrastructure Fund, an investment fund investing in infrastructure projects in the United States and Europe. Other U.S.-based contractors are participating in P₃ projects, and opportunities will continue to develop for large-scale projects.

In many circumstances, private sector firms have “pitched” project ideas to public agencies, in a reversal of traditional practices. Accordingly, to be well-positioned in this market, a firm must have a forward-thinking approach to project ideas and project development, and maintain the ability to partner or joint venture with other

The U.S. infrastructure market continues to evolve. As funding shortfalls continue to exist, the use of P₃ and concessions is likely to continue to grow.

private-sector firms in the process.

Design, construction, maintenance, toll operators, and others all have a big stake in the development of P3.

Public private partnerships and use of the private sector to fund and control the country's infrastructure is certainly a politically charged topic. This is a public issue with many stakeholders in the process — the general public (users of infrastructure), financiers, contractors, and legislatures. Political risk is inherent throughout the process, and the public must be educated on the benefits and risks of using alternative delivery methods to make it work. In general, the general public is uncomfortable with P3. It is up to government agencies and the private sector to “sell” the benefits of P3 to the public and to eventually de-politicize the issue. States that have successfully implemented P3 have done so through strong P3 leadership. Ultimately, if the risk and reward balance is refined, unlimited capital and financing capacity could exist and states would have myriad options for implementing infrastructure upgrades and development.

The opportunity for privatization of infrastructure and other assets is huge. While transportation-related infrastructure is a highly visible target, other asset types can fit into this model. The current players in P3 and privatization are continually looking for new ways to apply the model. The question exists: What other types of assets could be considered? Assets under consideration for private investment include schools, prisons, institutional projects, hospitals, water and wastewater facilities, and even state lotteries.

P3 is in its infancy in the United States. Expect to see more P3 investment and P3 participation over time. The success of its implementation will depend on political leadership, communication with the public sector, selection of the best private sector partner, and the ability to foresee and mitigate contractual issues. The next 12 to 18 months will dictate how aggressively certain states pursue the issue. As infrastructure needs increase and the speed to design and construct remains urgent, P3 will likely become an infrastructure funding and operational vehicle for the future. ■

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Expect to see more P3
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participation over time.**

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Public-Private Partnerships: Lost in the Translation?

A team of writers from Zurich in North America details public-private partnerships, including its definition, use, financing, and application in U.S. construction.

*By Nathan J. Espe,
Nancy Simonson, and Audrey Lau*

Collapsing bridges in Minnesota. Steam pipe explosions in New York City. Dramatic incidents like these point to the urgent need for the United States to repair its crumbling infrastructure. But who will foot the bill?

Increasingly, municipalities and other units of government are turning to public-private partnerships (P₃) — not only to fix what is broken, but also to build and maintain new highways, hospitals, and schools, and otherwise collaborate on big-ticket construction jobs.

In the past, these infrastructure projects were funded by taxpayers and completed by public contractors. But over the past 20 years, budget crunches and political reluctance to raise taxes have left state governments seeking alternate financing mechanisms to meet growing infrastructure needs.

Experiences with P₃ projects demonstrate cost savings, faster completion, less red-tape, and a higher quality of service. Private-sector participation also provides access to expertise and proprietary technology, and helps governments address sensitive political and labor issues.

While P₃ arrangements have been popular for years in Europe and the United Kingdom, they face some unique challenges in the United States, including risk management and insurance solutions that must accommodate many players and contracts extending as far as 50 years into the future.

P3 DEFINED

P3 refers to the broad spectrum of relationships in which private sector resources are used to deliver services or facilities for public use. P3 arrangements are common in Europe, where they are typically used in the construction of public buildings such as schools and hospitals.

In the United States, design-bid-build, private contract fee service, and design/build (or BTO) are the most common forms of P3. (See Exhibit 1.) In these arrangements, the private sector participates in construction and operations, while the public sector retains the risk and responsibility of financing and ownership.

P3 refers to the broad spectrum of relationships in which private sector resources are used to deliver services or facilities for public use.

However, recent P3 trends have focused on models to the right on the P3 spectrum: long-term lease, design build finance operate (DBFO), build own operate transfer (BOOT), and build own operate (BOO).

In these arrangements, the private sector often assumes not only the risk and responsibility for the construction and operation of a project, but also for its financing. As such, these private firms are no longer just participants through service contracts, but key stakeholders

with a financial interest in the project’s long-term success and viability.

Current U.S. interest in P3s refers almost exclusively to the newer models in which private financing or project finance plays a central role. (See Exhibit 2.) Since project financing is typically obtained and repaid based on future cash flows, revenue and financing risks can greatly influence a project’s viability. In the same way, it can easily be affected by all other project risk considerations.

Exhibit 1

Divisions of Responsibilities in P3 Models

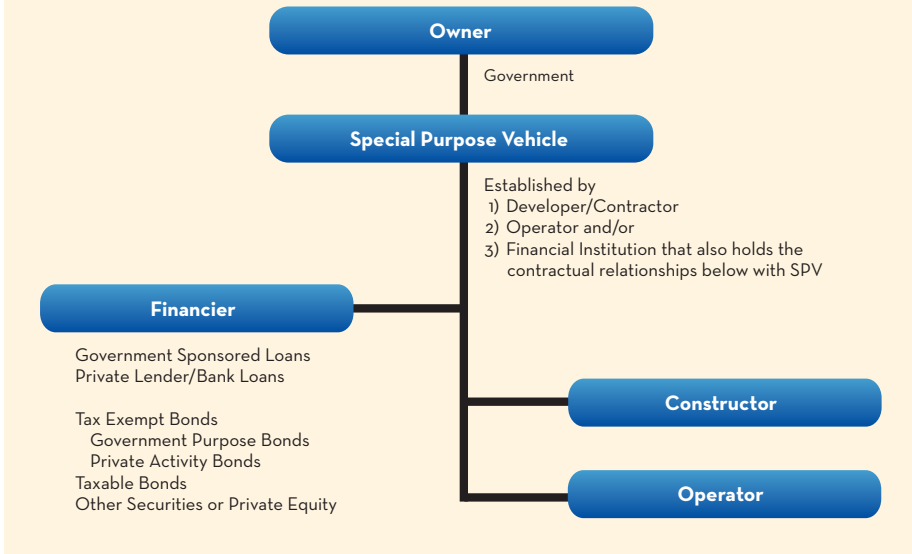
P3 Structures	Design Bid Build	Private Contract Fee Service	Design Build/Build Transfer Operate (BTO)	Build Operate Transfer (BOT)	Long Term Lease	Design Build Finance Operate (DBFO)/Build Own Operate Transfer (BOOT)	Build Own Operate (BOO)
Construction	Private	Private	Private	Private	Private	Private	Private
Operation	Public	Private	Public or Private	Private	Private	Private	Private
Financing	Public	Public	Public	Public	Private	Private	Private
Ownership	Public	Public	Public	Public	Private	Private	Private
Final Ownership	Public	Public	Public	Public	Public	Public	Private



Source: U.S. Department of Transportation

Exhibit 2

Publicly Owned and Privately Financed P3 Structure: Long Term Lease, DBFP, and BOOT Models



In financing P3 projects, investors, bond holders, and lenders put their own capital at risk under the assumption they will generate returns through future project revenues. Although some projects are guaranteed a revenue stream through purchase agreements or service contracts, many are not. While these projects provide investors higher returns, they also require investors to assume more revenue and financing risk.

Inaccurate revenue projections, missed revenue targets, and project delays can all affect P3 project lenders and investors. On bond-issuing projects, agencies such as Standard & Poor's and Fitch rate these projects based on their default risks and management's ability to control and mitigate risk factors as much as possible. A higher rating reduces the project's overall cost of capital, while a low rating will need to be offset by higher returns, thus increasing financing costs.

Monoline financial guaranty insurers such as AMBAC, FGIC, FSA, MBIA, and XL Capital provide insurance for the timely payment of principal and interest on securities. Insurance can greatly reduce investors' revenue and default risk by providing a form of credit assistance that can directly influence bond ratings. However, these insurers are selective, and they may not be able to offer sufficient limits. Additionally, if the premiums charged outweigh the financial benefits, investors will most likely keep the risk themselves.

PROJECT FINANCING

Project finance is used to finance revenue-generating, long-term infrastructure industrial projects and public services. This structure allows project financing to be paid back through the project's future cash flows, rather than the general assets or creditworthiness of the project owner or sponsor.

Under this structure, project sponsors create a special purpose vehicle (SPV) to issue project debt and operate the project and/or concession. The SPV will also enter into contracts directly with the government and maintain other contractual

relationships, allocating project risks to those best suited to appraise and control them.

The sponsors forming the SPV may include the project developer(s), project operator, and/or the financier. SPVs allow these sponsors to finance the project without putting their own corporate balance sheets at risk, protect them from insolvency risk, and allow them to assume, manage, and/or transfer all project risk, including construction, operation, financing, and revenue risks.

Every P3 project has a unique financing structure in which the project sponsors, SPV, lenders, and the government play different roles. However, the financing structure almost always requires a balance between raising capital and issuing debt, based on the availability of favorable market terms and the ability to achieve low capital costs.

Government programs created to attract private sector participation play a crucial role in the financing process by providing tools such as tax exemptions and access to more favorable borrowing terms. This includes:

- Credit assistance in the form of secured/direct loans, loan guarantees, and standby lines of credit
- The ability to issue governmental purpose or private activity bonds, and municipal securities with tax exempt status
- The ability to qualify for federal tax exemptions under a 501(c)(3) public benefit corporation status.

The ability to access these government programs is an important consideration that can significantly lower a project's cost of capital and enhance its financial viability.

Projects most commonly raise capital by issuing project bonds. In this case, the project itself, or the SPV specifically, could issue tax-exempt bonds, such as governmental purpose bonds and private activity bonds. Where the availability of these government-sponsored bonds is limited, the SPV would issue regular taxable bonds, such as revenue bonds.

In addition to raising capital, the project may also choose to issue debt or take out project loans from banks or other lenders. Recently, banks have started to securitize their loan portfolios into collateralized debt obligations that are then sold to investors. As a result, banks are able to spread their risk to increase lending and provide borrowers with more favorable terms.

P3 GLOBAL APPLICATION

Though interest in private financing for public works is growing in the United States, P3 models have been widely used abroad for years. The United Kingdom was one of the first countries to adopt the arrangement through the Private Finance

Initiative (PFI), established by the central government to provide “credits” to private sector participants on public projects.

Under the PFI scheme, the public authority makes annual payments to a private company that designs, builds, maintains, and owns the public asset. PFI projects represent 10% to 13% of all U.K. investments in public infrastructure, with most activity focused on hospitals, schools, and military installations.

Because there is no similar arrangement in the United States, P3 projects are often limited to revenue-generating infrastructure plans. U.S. public policy is limited to offering loans and tax-exempt financing tools that create incentives of reduced investment and capital costs for private companies.

A GROWING NEED FOR U.S. P3

Experts agree that the aging U.S. infrastructure is rapidly deteriorating in almost every area — waterworks, bridges, highways, and mass transit. Fatal accidents such as the August collapse of the I-35 Mississippi River bridge in Minneapolis, and the July steam pipe explosion in New York City, demonstrate how such serious incidents can affect the country’s economic growth.

U.S. roads are in poor condition and are estimated to need more than \$120 billion a year in repairs. Operating costs, time wasted in traffic, and estimates on the cost of updating the U.S. infrastructure over the next five years range from \$700 billion to \$1.6 trillion, according to the Collaboratory for Research on Global Projects (CRGP), a partnership between private industry organizations and public sector sponsors, based at Stanford University.

CRGP reported there are approximately 72 new infrastructure funds in the United States, primarily for transportation-focused projects in Illinois, Virginia, Texas, and Indiana. For the 32 new P3 funds announced in the past 15 months, \$50 billion in new equity needs to be raised, mostly on the private equity model, with an average fund size of \$1.7 billion.

While P3s will not entirely replace traditional forms of infrastructure financing, governments are interested in them since past successes have proven private participation beneficial in both cost savings and faster implementation.

In the United States, certain sectors historically have benefited from greater amounts of private sector participation. A Lehman Brothers report indicates that from 1995 to 2005, the housing, airports, ports, and solid waste sectors generated the most private sector equity investment. During

While P3s will not entirely replace traditional forms of infrastructure financing, governments are interested in them since past successes have proven private participation beneficial in both cost savings and faster implementation.

this time, private funding constituted anywhere from 30% to 65% of total investments within each sector.

The prevalence of private equity in the housing and solid waste sectors is largely attributed to the availability of tax-exempt financing (governmental purpose or private activity bonds), while investments for airports and ports were largely provided by private stakeholders, such as airlines and shipping companies, that benefited from the use of the infrastructure. In addition, up to 90% of U.S. energy projects included some form of private equity participation, according to Lehman Brothers.

The remaining public sectors with historically lower private equity participation include health care, public facilities, water and wastewater, education, and surface transportation. However, recent federal and state initiatives have extended the availability of private activity bonds to surface transportation and water/wastewater. As a result, both the transportation and water sectors are attracting contractors, operators, and investors eager to participate on these projects.

This increase in activity is also attracting a “feeding frenzy” by foreign investors and construction groups. Global players including SKANSKA (Sweden), Ferrovial (Spain), Vinci (France), Babcock Engineering (U.K.), Macquarie Group (Australia), and Halcrow Group (U.K.) are jockeying for position in what they see as a lucrative U.S. market by bidding high on P3 contracts. Case in point: A recent \$1.8 billion bid by Macquarie-Cintra for the Chicago Skyway contract was \$800 million higher than the second-highest bid.

Recent high-profile U.S. P3 projects include:

- **JFK International Air Terminal, 1997** — A long-term lease agreement with the NY/NJ Port Authority, privately financed through JFK International Air Terminal LLC (JFKIAT), a joint venture of LCOR, Schiphol, and Lehman. The \$1.2 billion project was almost entirely financed through the issuance of \$934 million in private activity bonds.
- **Las Vegas Monorail, 2004** — A modified build-operate-transfer project financed privately through Las Vegas Monorail Corporation LLC (LVMC), which then entered into a management contract with Transit Systems Management LLC, a joint venture of Bombardier Transit and Granite Construction. LVMC took over the project from MGM Grand–Ballys Monorail LLC to upgrade and extend existing Bombardier Mark IV rail.
- **Trans-Texas Corridor, 2007** — A build-operate-transfer (design/build/finance/operate) project to build a portion of the Trans-Texas Corridor (SH130 segments 5 and 6), financed privately through a consortium led by Cintra Zachry, which is responsible for building and operating the toll road over a 50-year period. The project, which will not require public funds or debt, will be financed through revenue and tax-exempt bonds, Transportation Infrastructure Finance and Innovation Act (TIFIA) loans, private bank loans, and private investment.

In spite of these examples, P3's potential in the United States is still uncertain. Inadequate legislative frameworks, lack of stakeholder support, and public dissent are some of the challenges that could delay project construction or operations.

While many state governments are interested in exploring P3 options, legislation is slow and governments may hesitate due to lack of experience. The increased cash flow and credit risks that the private sector must assume make it more difficult, costly, and risky for the private sector to finance P3 projects. So while the potential for P3 in the United States may be enormous, much will depend on stakeholder reactions as P3 experience begins to develop.

WHAT'S IN IT FOR CONTRACTORS?

From a private sector perspective, contractors and developers find P3 projects attractive because they can gain access to and secure government contracts, and supplement their construction activities and investment portfolios. Particularly for P3 projects with strong revenue-generating capacities, participation ensures a steady stream of future income for the contractor/operator throughout the entire course of the concession.

However, contractors involved in P3 arrangements concede that while the rewards are high, so are the risks. Because there is no national or even state-level coordination, P3 projects in North America are unfolding on a state-by-state, sector-by-sector basis. This means every arrangement is unique, with one-off terms and conditions that, in effect, create ad hoc regulation by contract.

"It can be pretty confusing as to how P3 contracts work," said Jim Mitchell, vice president, risk management for PCL Constructors Inc., based in Denver, Colo. "You must really pay attention to back-to-back agreements, which include heavy daily liquidated damages (DLD) for not finishing on time."

PCL, in partnership with the Alberta provincial government, just completed construction on Alberta's first P3 project — a \$490 million four-lane highway partially encircling Edmonton. The project, started in January 2005, had a contract that clearly spelled out heavy DLD penalization if PCL did not meet construction deadlines — to the tune of \$69,500 per day.

Because there is so much at stake, projects like these require stringent risk management and insurance. On the Edmonton P3 project, PCL purchased project-specific general liability, professional liability, builder's risk, delayed start-up, and pollution coverage.

However, the problem rests with risks that are difficult to calculate, such as the relocation of underground utilities. This is where careful risk management is critical. In P3 arrangements, risk management must determine which risks exist and the probability of their occurrence. These risks must then be built into the job estimate

While many state governments are interested in exploring P3 options, legislation is slow and governments may hesitate due to lack of experience.

and a determination made as to who will assume the risk and whether it is insurable.

In the Edmonton P3 job, for example, although the government assumed little risk, it agreed to share liability with PCL on risks that were difficult to calculate. In these instances, PCL would share a percentage of the risk.

Another major difference between P3 and the traditional construction model is the number of stakeholders involved, said Tim Watt, vice president of corporate risk management at Zachry Construction Corp., based in San Antonio, Texas.

P3 players include not only the contractor and the government, but also a wide collection of participants, including lenders, investors, maintenance contractors, engineers, and many others. While these arrangements generate a less siloed, more collaborative and innovative way of working, they frequently bring together competitors and create challenges for risk management and insurance arrangements as well.

“Because these projects are so large, the process of integrating insurance across the team can be a real challenge,” Watt said. “Whether insurance is procured piece by piece or across the consortium varies on what is best for the project.”

Zachry has been involved in P3 projects for several years since partnering with Spanish concessionaire Cintra. Zachry American Infrastructure is a Zachry-affiliated business specializing in private development and investment into public infrastructure projects using the P3 model.

P3 players include not only the contractor and the government, but also a wide collection of participants, including lenders, investors, maintenance contractors, engineers, and many others.

The Cintra-Zachry partnership entered into an agreement to finance and construct a portion of the Texas Corridor-35, the first privately financed toll road project in Texas, SH 130 Segments 5 and 6. This portion will parallel congested I-35 from Seguin to Austin.

The project concession company, formed by Cintra Zachry, is currently in the first phase of the project, which involves procuring road right-of-way, and funding this within the project costs. This process is expected to take 12 to 18 months, followed by the actual design and construction portion, which will be completed in five years.

Finally, after construction is completed, the project will move into the 50-year operations and maintenance phase, which must meet state-mandated standards. This is the final revenue-generating part of the project, in which the concession will share a portion of revenue with the state, amounting to about 5% — that is, if the project makes money.

“Investors understand that money goes in during the five-year construction phase, and that it will typically take several years after the road is open for ridership to develop,” Watt said. “Investors must understand going in that it will take a while for them to recoup their investment.”

WHAT IT TAKES TO SUCCEED

The success of a P3 in North America depends on the commitment and support of senior public officials; the existence of a statutory foundation or legislation for the implementation of the partnership; and continued public sector involvement in the project. Consequently, overall political will is a key component and risk factor in a P3 project.

As of 2006, legislation enacted to promote and enable P3s in the United States includes:

- SAFETEA (Safe, Accountable, Flexible, Efficient Transportation Equity Act), which most notably provided \$15 billion in private active bonds
- TIFIA (Transportation Infrastructure Finance and Innovation Act) and its joint program office operating under the U.S. Department of Transit and offering loans and credit assistance to transportation projects
- Qualification under 501(c)(3) tax-exempt status of a “Private Organization in the Public Interest”.

Currently, 20 U.S. states have some form of legislation enabling P3, and the majority of these states have projects that are either active, under review, or in the pipeline. Supporters of P3 projects encourage the development of more P3 legislation, and suggest that the construction industry lobby for the creation of P3 coordination agencies that will create consistent, standardized deal-flow.

“A healthy infrastructure, whether it’s roads, ports, wastewater, air, or freight transport, creates an environment of economic prosperity for all of us,” said Tim Watt of Zachry. “We should learn from what England and other countries have done to mobilize private investment dollars and adopt a similar system in this country.” ■

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What Really Matters to the Financial Markets?

An examination of the relationships between specific economic indicators, episodic events, and financial metrics makes clear the influences driving the value of individual E&C companies.

By Curt Young

French philosopher Étienne Gilson once wrote, “History is the only laboratory we have in which to test the consequences of thought.” Gilson’s statement is wise, and yet, few people would argue that history provides a road map for the future since each experience is subject to an infinite set of variables, virtually guaranteeing its unique outcome. Nevertheless, studying history provides a better understanding of the relationships between variables and outcomes.

This article explores how specific economic indicators, episodic events, and financial metrics have influenced the historical value of publicly traded engineering and construction (E&C) companies. In addition, the article examines the correlation between the general stock market and the market for E&C companies. Examining these relationships makes apparent the influences driving the value of individual companies within the industry as well as the industry as a whole.

For this analysis, publicly traded E&C companies in the study were segmented into four groups: (1) architectural, engineering, and environmental consulting firms (“A/Es”); (2) construction contractors (“contractors”); (3) basic construction materials suppliers [construction aggregates, cement, and asphaltic and cement-based concrete]

(“materials”); and (4) residential homebuilders (“homebuilders”). Five of the E&C firms (Fluor, Foster Wheeler, Hill International, Jacobs Engineering, and The Shaw Group) were included in both the A/E and contractor groups since they have major operations in both aspects of the industry and are heavily involved in design/build services. Similarly, Centex was included in both the contractor and residential homebuilding categories.

For better comparative analysis, the contractor group was further divided into three subgroups with common types of construction activities: (1) general commercial and industrial construction (“general”); (2) heavy civil, highway, and infrastructure construction (“heavy/highway”); and (3) specialty contractors, such as electrical, mechanical, telecom, drilling, and structural steel construction (“specialty”).

Exhibit 1

Engineering and Construction Groups

Architectural/Engineering	Heavy/Highway Contractors	Materials Companies – continued
ABM Industries Inc. (NYSE:ABM) Arcadis NV (ENXT AM:ARCAD) Ecology & Environment Inc. (AMEX:EEI) ENGlobal Corp. (AMEX:ENG) Fluor Corporation (NYSE:FLR) Foster Wheeler, Ltd. (NasdaqNM:FWLT) Hill International, Inc. (NasdaqNM:HINT) Jacobs Engineering Group, Inc. (NYSE:JEC) Michael Baker Corporation (AMEX:BKR) Shaw Group Inc. (NYSE:SGR) Stantec Inc. (TSX:STN) Tetra Tech Inc. (NasdaqNM:TTEK) TRC Companies Inc. (NYSE:TRR) URS Corp. (NYSE:URS) Versar Inc. (AMEX:VSR)	Aecon Group Inc. (TSX:ARE) Alstom SA (ENXTPA:ALO) Bilfinger Berger AG (DB:GBF) Devcon International Corp. (NasdaqNM:DEVCON) Granite Construction Inc. (NYSE:GVA) Insituform Technologies Inc. (NasdaqNM:INSU) Meadow Valley Corp. (NasdaqSC:MVCO) Sterling Construction Co. Inc. (NasdaqNM:STRL) Washington Group International Inc. (NYSE:WNG) Willbros Group Inc. (NYSE:WGI)	Holcim Ltd. (VIRTX:HOLN) Lafarge SA (ENXTPA:LG) Martin Marietta Materials Inc. (NYSE:MLM) MDU Resources Group Inc. (NYSE:MDU) Monarch Cement Co. (OTCBB:MCEM) Rinker Group Ltd. Smith+Midland Corp. (OTCBB:SMID) Texas Industries Inc. (NYSE:TXI) Trinity Industries Inc. (NYSE:TRN) United States Lime & Minerals Inc. (NasdaqNM:USLM) US Concrete Inc. (NasdaqNM:RMI) Vulcan Materials Co. (NYSE:VMC)
General Contractors	Specialty Contractors	Residential Homebuilders
Apogee Enterprises Inc. (NasdaqNM:APOG) Balfour Beatty plc (LSE:BBY) Centex Corporation (NYSE:CTX) Flint Energy Services Ltd. (TSX:FES) Fluor Corporation (NYSE:FLR) Foster Wheeler, Ltd. (NasdaqNM:FWLT) Global Industries Ltd. (NasdaqNM:GLBL) Halliburton Company (NYSE:HAL) Hill International, Inc. (NasdaqNM:HINT) Horizon Offshore Inc. (NasdaqNM:HOF) Jacobs Engineering Group, Inc. (NYSE:JEC) Lend Lease Corp. Ltd. (ASX:LLC) McDermott International Inc. (NYSE:MDR) Perini Corp. (NYSE:PCR) Servidyne, Inc. (NasdaqNM:SERV) Shaw Group Inc. (NYSE:SGR) Skanska AB (OM:SKAB)	Black Box Corp. (NasdaqNM:BBBOX) Chicago Bridge & Iron Co. NV (NYSE:CBI) Comfort Systems USA Inc. (NYSE:FIX) Dycor Industries Inc. (NYSE:DY) EMCOR Group Inc. (NYSE:EME) Goldfield Corp. (AMEX:GV) InfraSource Services Inc. Integrated Electrical Services Inc. (NasdaqNM:IESC) Layne Christensen Co. (NasdaqNM:LAYN) MasTec Inc. (NYSE:MTZ) Matrix Service Co. (NasdaqNM:MTRX) Pike Electric Corp. (NYSE:PEC) Quanta Services Inc. (NYSE:PWR) Schuff International Inc. (OTCPK:SHFK) Servicemaster Co.	Avatar Holdings Inc. (NasdaqNM:AVTR) Beazer Homes USA Inc. (NYSE:BZH) Brookfield Homes Corp. (NYSE:BHS) California Coastal Communities Inc. (NasdaqNM:CALC) Centex Corporation (NYSE:CTX) Comstock Homebuilding Companies (NasdaqNM:CHC) Dominion Homes Inc. (NasdaqNM:DHOM) DR Horton Inc. (NYSE:DH) Hovnanian Enterprises Inc. (NYSE:HOV) KB Home (NYSE:KBH) Lennar Corp. (NYSE:LEN) Levitt Corp. (NYSE:LEV) M/I Homes, Inc. (NYSE:MHO) MDC Holdings Inc. (NYSE:MDC) Meritage Homes Corporation (NYSE:MTH) NVR Inc. (AMEX:NVR) Orleans Homebuilders Inc. (AMEX:OHB) Pulte Homes Inc. (NYSE:PHM) Ryland Group Inc. (NYSE:RYL) Standard Pacific Corp. (NYSE:SPF) Taylor Wimpey plc (LSE:TW) Toll Brothers Inc. (NYSE:TOL) TOUSA, Inc. (NYSE:TOA) Walter Industries Inc. (NYSE:WLT) WCI Communities Inc. (NYSE:WCI)
Materials Companies		
Ameron International Corp. (NYSE:AMN) Ashland Inc. (NYSE:ASH) Cemex S.A.B. de C.V. (NYSE:CMX) Continental Materials Corp. (AMEX:CUO) CRH plc (ISE:CRG) Eagle Materials Inc. (NYSE:EXP) Florida Rock Industries Inc. (NYSE:FRK) Hanson plc		

Exhibit 2

Quarterly Gross Domestic Product – June 1997-June 2007

Seasonally adjusted annual rates

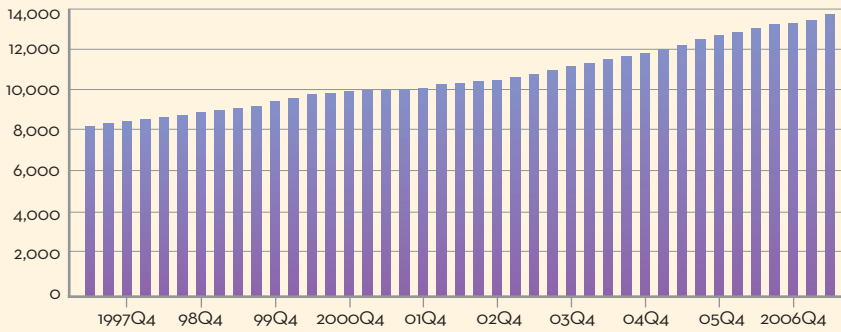
Current Dollars
\$ Billions

Exhibit 3

Quarterly Total Construction Put In Place – June 1997-June 2007

Seasonally adjusted annual rates

■ Nonresidential construction
 ■ Residential construction

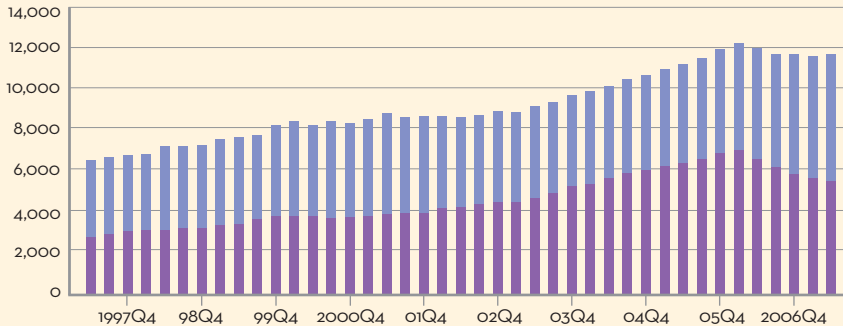
Current Dollars
\$ Billions

Exhibit 1 provides a listing of the companies included within each category.

Studying the recent, overall E&C market performance offers insight into how specific factors affect the value of these E&C companies. As measured by growth in gross domestic product (GDP) over the past 10 years, the U.S. economy has been remarkably strong and stable. Exhibit 2 shows quarterly GDP figures, based on seasonally adjusted annual rates, from the second quarter of 1997 through the second quarter of 2007. GDP has steadily risen over this time frame, climbing at an average annual rate of 5.3%. The E&C industry has benefited from this economic expansion, as the total amount of construction put in place has risen from approximately \$648 billion in June 1997 to more than \$1.1 trillion in June 2007, an average annual increase of more than 6.1%. (See Exhibit 3.) In other words, the E&C industry has been expanding at an even faster rate than the overall economy over the past 10 years, with construction put in place climbing from 7.9% of GDP in June 1997 to more than 8.5% of GDP in June 2007.

E&C companies have thrived under these conditions. The E&C industry has significantly outperformed the S&P 500 over the past 10 years. Between July 1997 and June 2007, \$1,000 invested in the S&P 500 would have returned \$1,698 (a 5.4% annual return); whereas, that same \$1,000 would have returned \$3,629 (13.8% annual return), \$3,968 (14.8% annual return), or \$6,958 (21.4% annual return), if invested in engineering and architectural firms/contractors, basic construction materials companies, or residential homebuilders, respectively, during the same period. (See Exhibit 4.)

E&C companies have also benefited from a widespread expansion in valuation multiples. Exhibit 5 displays the median value of various valuation multiples for the respective E&C groups on June 30, 1997, and June 30, 2007, as well as over the course of the entire 10-year period. In comparison to historic norms, each of the E&C groups, with the exception of residential homebuilders, is currently trading at exceptionally

Exhibit 4
E&C Indexes vs. S&P 500

- Custom Index: Residential Homebuilding Companies (equal weights)
- Custom Index: Basic Construction Materials Companies (equal weights)
- Custom Index: Engineering and Architectural Firms/Contractors (equal weights)
- S&P 500 Index

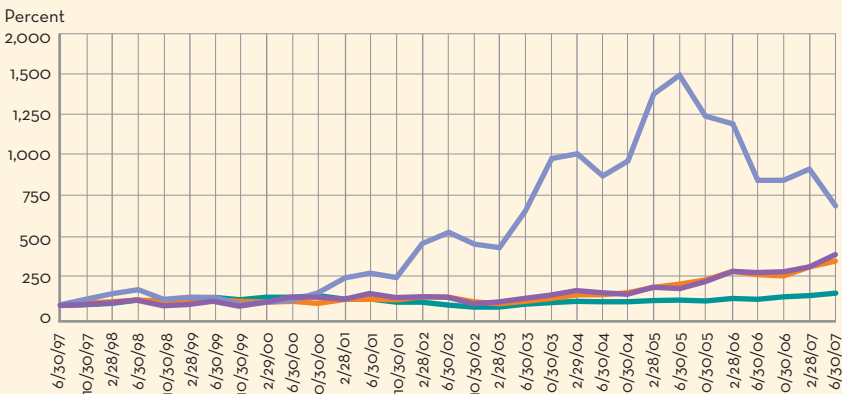


Exhibit 5
Median Valuation Multiples of
E&C Companies – June 30, 1997-June 30, 2007

Median Valuation Multiples – 1997-2007										
	(1) TEV/EBITDA			(2) Price/Book Value			TEV/Revenue			
	6/30/2007	6/30/1997	Median*	6/30/2007	6/30/1997	Median*	6/30/2007	6/30/1997	Median*	
A/E	10.2	8.9	9.5	3.3	2.0	2.1	1.0	0.6	0.5	
Contractors	General	9.3	8.8	8.8	3.1	2.4	1.9	1.0	0.7	0.5
	Heavy/Highway	13.8	6.4	6.5	2.4	1.6	1.6	0.8	0.5	0.5
	Specialty	11.0	9.6	8.9	3.2	2.8	1.8	1.0	0.8	0.6
Materials	9.7	6.0	7.7	2.3	1.7	1.5	1.9	0.8	1.5	
Homebuilders	7.1	8.9	7.3	1.0	1.3	1.3	0.8	0.7	0.8	

(1) Enterprise Value/EBITDA >15.0 not used in median

(2) Price/Book Value >5.0 or <0.5 not used in median

* Represents the median value of the specified valuation multiple during the June 30, 1997, to June 30, 2007, period for the respective E&C groups

Since continued multiple expansion is highly improbable (i.e., investors will only pay so much for a dollar of revenue or a dollar of earnings), in the near term, the value of E&C companies is more likely to be driven by the strength of the construction market and the overall economy.

investors will only pay so much for a dollar of revenue or a dollar of earnings), in the near term, the value of E&C companies is more likely to be driven by the strength of the construction market and the overall economy. In fact, some industry observers might argue that an industry trading at the upper end of its valuation range is likely to be hypersensitive to a weakening of its economic environment. A dramatic example would be the dot-com bust. In the late 1990s, technology firms were trading at outrageous revenue and earnings multiples. Yet, once the exuberance faded and the economic environment began to turn, valuation multiples of technology firms were quickly depressed. While the E&C industry will likely never be subject to the same sort of irrational exuberance, if the current economic environment significantly deteriorated, valuation multiples of E&C firms could fall to much lower levels. Consequently, it is prudent to take an entire set of circumstances into consideration. The remainder of this article presents the individual

high multiples. For example, on June 30, 2007, the median total enterprise value (TEV)/Revenue multiple for publicly traded general contractors was 0.98x, which means that investors were willing to pay \$0.98 for every \$1 of revenue generated by a general contractor. Over the past 10 years, investors, on the median, have only been willing to pay \$0.54 for every \$1 of revenue generated by a publicly traded general contractor. On the surface, this difference may seem inconsequential. However, consider that over the most recent trailing 12-month period, the average revenue of the general contractors included in our study was over \$6.8 billion — the difference becomes staggering. Applying the math, a \$6.8 billion contractor valued at 0.98x revenue would have a TEV of roughly \$6.7 billion, whereas that same contractor valued at 0.54x revenue would have a TEV of roughly \$3.7 billion, equating to a valuation difference of \$3 billion.

Since continued multiple expansion is highly improbable (i.e.,

economic factors, financial metrics, and episodic events that influenced the historical value of publicly traded E&C companies.

For the 10-year period beginning July 1, 2007, and ending June 30, 2007, FMI contrasted quarterly changes in the total enterprise value (TEV)¹ of publicly traded E&C companies against a series of economic indicators, including changes in GDP, changes in interest rates, and changes in the total amount of construction put in place. As shown in Exhibit 6, each group's TEV correlated positively with GDP and the amount of construction put in place in the United States. However, the degree of correlation varied substantially between the groups. Residential homebuilders exhibited the highest degree of correlation to these economic indicators, suggesting that homebuilders are particularly sensitive to the health of the overall economy as well as fluctuations in the construction cycle. Specifically, analysis of the relationship between TEV of homebuilders and GDP revealed a median correlation coefficient² of 0.89. As illustrated in Exhibit 7, a correlation coefficient of this magnitude suggests that

Exhibit 6

Correlation of TEV to Various Economic Indicators

Correlation of Economic Indicators*						
	TEV to GDP	Interest Rates		Construction Put in Place		
		TEV to Prime Rate	TEV to Mortgage Rate**	TEV to Total	TEV to Residential	TEV to Highway/Street
A/E	0.80	-0.06	-0.42	0.76	0.62	n/a
Contractors	General	0.67	0.43	0.05	0.56	0.41
	Heavy/Highway	0.86	0.30	-0.18	0.79	0.59
	Specialty	0.50	0.19	0.16	0.45	0.30
Materials	0.88	0.08	-0.33	0.84	0.69	0.87
Homebuilders	0.89	-0.30	-0.69	0.90	0.95	n/a

* Based on the median correlation coefficient of the companies comprising the respective E&C groups

** Conventional, conforming 30-year fixed-rate mortgage rate (reported by Freddie Mac)

Exhibit 7

Proportion of Variation Explained by Various Economic Indicators

Proportion of Explained Variation (Economic Indicators)*						
	TEV to GDP	Interest Rates		Construction Put in Place		
		TEV to Prime Rate	TEV to Mortgage Rate**	TEV to Total	TEV to Residential	TEV to Highway/Street
A/E	0.64	0.00	0.18	0.58	0.39	n/a
Contractors	General	0.45	0.19	0.00	0.32	0.17
	Heavy/Highway	0.74	0.09	0.03	0.63	0.35
	Specialty	0.25	0.04	0.03	0.20	0.09
Materials	0.77	0.01	0.11	0.71	0.47	0.76
Homebuilders	0.80	0.09	0.48	0.82	0.90	n/a

* Based on the proportion of explained variation of the companies comprising the respective E&C groups

** Conventional, conforming 30-year fixed-rate mortgage rate (reported by Freddie Mac)

approximately 80% of the variance in homebuilders' enterprise values can be explained by changes in GDP. Analysis uncovered an even stronger relationship between the TEV of homebuilders and the amount of total residential construction put in place.

In comparison to other E&C companies, changes in the economic environment had little effect on the TEV of specialty contractors. A weak relationship between these variables suggests that, over the period examined, changes in the value of specialty contractors were relatively independent from changes in the economy.

With the exception of residential homebuilders, the TEV of E&C companies did not correlate strongly with changes in interest rates. So fluctuations in interest rates do not materially influence the value of non-homebuilding E&C companies. Analysis uncovered a relatively strong inverse relationship between mortgage rates and the value of residential homebuilders, suggesting that homebuilders will benefit when interest rates decrease and suffer when interest rates increase.

To determine how much the overall stock market influences E&C stocks, FMI contrasted the quarterly share prices of each publicly traded E&C company with the S&P500 and the Dow Jones Industrial Average (DJIA) from June 30, 1997, to June 30, 2007. Each of the E&C groups exhibited a higher degree of correlation with the DJIA than with the S&P500. (See Exhibit 8.) Yet, fluctuations in these indices explained only a small amount of movement in the share prices of E&C companies. For example, the basic construction-materials group exhibited the highest degree of correlation with the DJIA; however, only 44% of the quarterly change in the share prices could be explained through changes in the DJIA. Thus, the E&C industry

Exhibit 8

Correlation of E&C Share Prices to Market Indexes

Correlation to Market Indexes*				
	DJIA		S&P 500	
	Correlation Coefficient	Explained Variation	Correlation Coefficient	Explained Variation
A/E	0.59	0.35	0.31	0.10
Contractors	General	0.61	0.37	0.18
	Heavy/Highway	0.62	0.38	0.14
	Specialty	0.51	0.26	0.41
Materials	0.67	0.44	0.47	0.22
Homebuilders	0.45	0.20	0.12	0.01

* Based on the median correlation coefficient of the companies comprising the respective E&C groups

moves relatively independently from the stock market as a whole.

In order to determine the financial metrics that have had the greatest influence on the value of publicly traded E&C firms over the past 10 years, FMI studied the relationship between the following sets of variables: TEV/Revenue, TEV/EBITDA (earnings before interest, taxes, depreciation, and amortization), TEV/EBIT (earnings before interest and taxes), Price/Net Income, and Price/Book

Value (P/BV). As depicted in Exhibits 9 and 10, analysis revealed that changes in revenue were highly correlated with changes in TEV, and changes in share price were highly correlated with changes in book value. This suggests that changes in an E&C company's revenue base and book value influence the valuation of the company to a greater degree than changes in earnings.

A number of reasons explain why the financial markets rely heavily on book value

Exhibit 9

Correlation of Value to Various Financial Metrics

Correlation to Financial Metrics*						
		TEV/Revenue	TEV/EBITDA	TEV/EBIT	Price/Net Income	Price/Book Value
A/E		0.79	0.48	0.46	0.45	0.84
Contractors	General	0.79	0.67	0.60	0.44	0.73
	Heavy/Highway	0.72	0.39	0.33	0.27	0.82
	Specialty	0.58	0.59	0.54	0.28	0.37
Materials		0.84	0.63	0.61	0.56	0.77
Homebuilders		0.91	0.75	0.75	0.51	0.85

* Based on the median correlation coefficient of the companies comprising the respective E&C groups

Exhibit 10

Proportion of Variation Explained by Various Financial Metrics

Proportion of Explained Variation (Financial Metrics)*						
		TEV/Revenue	TEV/EBITDA	TEV/EBIT	Price/Net Income	Price/Book Value
A/E		0.63	0.23	0.21	0.20	0.70
Contractors	General	0.62	0.45	0.36	0.19	0.53
	Heavy/Highway	0.52	0.15	0.11	0.07	0.67
	Specialty	0.33	0.35	0.30	0.08	0.14
Materials		0.70	0.40	0.37	0.32	0.60
Homebuilders		0.83	0.56	0.56	0.26	0.72

* Based on the median correlation coefficient of the companies comprising the respective E&C groups

and revenue in determining the market value of E&C companies. First, P/BV is widely regarded as a good metric to value stocks of companies in capital-intensive industries, such as E&C, which have a large amount of tangible assets on their books. Second, P/BV provides an indication of the inherent value of a company and, as such, can be used as a proxy for the price that investors are willing to pay for a company experiencing negligible growth. Since E&C is a relatively slow-growth industry, analysts consider P/BV to be a reliable measure of valuation. Price/BVs dependability as a measure of valuation is further enhanced by the low utilization of debt in the typical capital structure of an E&C company.

This is because low debt levels do not marginalize a company's asset base.

Third, in highly cyclical and competitive industries, such as E&C, earnings are commonly subject to a higher degree of variance than revenue. Accordingly, revenue growth is weighted heavier than earnings in the determination of value. Lastly, earnings figures rely heavily on accounting estimates, which can be manipulated to inflate or deflate earnings. As a consequence, analysts often view revenue as a more reliable measure of performance than earnings.

Out of the three earnings measures analyzed by FMI, EBITDA consistently exhibited the highest degree of correlation with TEV. Such consistency suggests that the financial markets rely heavily upon EBITDA, contrasted with EBIT or net income, in determining the value of E&C companies. This finding agrees with EBITDA's increased use as an indicator of profitability throughout the financial community. Most investment professionals consider EBITDA to be a cleaner measure of income generation since it is not subject to the vagaries of depreciation methodologies and nonoperating financial income and expense charges.

Finally, FMI studied two different types of episodic events expected to influence the share prices of E&C companies. Specifically, FMI studied data on acquisitions and stock buybacks involving publicly traded E&C companies in order to determine the

Since E&C is a relatively slow-growth industry, analysts consider P/BV to be a reliable measure of valuation.

degree of impact that these activities have on a company's share price. FMI studied only acquisitions with transaction values greater than \$100 million that were made by publicly traded E&C companies between June 30, 1997, and June 30, 2007. Additionally, transactions were considered only if they represented more than 2% of an acquiring firm's revenue base at the time of acquisition. In order to determine the relative effect of the acquisition, the acquiring firm's

share price was measured at different intervals before and after the transaction closing date. Changes in the acquiring firm's share price were then contrasted against the average change in share price of the most comparable segment of the E&C market. The resulting differences in share price, as displayed in Exhibit 11, provide an indication of

Small transactions had a relatively minor impact on the share prices of acquirers, while large transactions tended to result in share-price gains immediately before and after a transaction closing date.

the effect acquisitions have on the equity value of an acquirer. FMI segmented the results into six different categories to illustrate the effect of transaction size.

Small transactions had a relatively minor impact on the share prices of acquirers, while large transactions tended to result in share-price gains immediately before and after a transaction closing date. One year after the close of a major transaction, the acquiring firm's share prices tended to trail that of its respective peer groups. However, it is difficult to determine whether this phenomenon was a result of the acquisition, or if it was due to factors completely independent of this analysis.

Using this same approach, FMI analyzed the effect of stock buybacks on the share prices of E&C companies. FMI gathered information on stock buybacks made by publicly traded E&C companies between June 30, 1997, and

June 30, 2007. Only buybacks greater than \$25 million were considered. The results of the analysis were not segmented by size, due to the limited number of data points available. Furthermore, residential homebuilders represented a highly disproportionate number of the buybacks studied, making the results of the analysis most applicable to this particular segment of the E&C industry.

The study did not find a substantial effect on the share prices of E&C companies that bought back a sizeable portion of their shares. So on a short-term basis, stock

Exhibit 11

Relative Change in the Share Price of Acquirers Before and After an Acquisition

Acquisition Activity: Affect on Short-Term Share Prices						
Time Frame	Acquisition Size (Percentage of Revenue of Acquiror)					
	>5%	5% < >10%	10% < >20%	20% < >30%	30% < >50%	<50%
30 Days before close	0.0%	3.2%	4.0%	1.4%	-1.1%	6.5%
30 Days after close	1.8%	-4.8%	0.0%	-3.5%	5.6%	2.6%
90 Days after close	-3.1%	-5.8%	-7.4%	-0.7%	-2.9%	1.7%
1 Year after close	-4.5%	-0.6%	-28.2%	-2.0%	-24.1%	-3.1%

buybacks do not significantly influence the value of E&C companies. The lack of effect also suggests that management generally does not possess greater insight than the overall market as to when their shares are undervalued. Analysis did show a modest 2.0% difference one year after the buyback between the buyback companies and their peers.

History undoubtedly provides some insight into factors that drive the value of E&C companies; however, the interaction between infinite numbers of variables limits our ability to predict the future through past events.

While the quantitative nature of the factors discussed lends itself to analysis, another more qualitative set of factors could have an even greater impact on the value of E&C companies. Qualities such as leadership, vision, reputation, organizational depth and breadth, and the ability to attract and retain talent are undeniably critical value drivers as well. In highly competitive industries, such as E&C, these qualities may be even more important than many of the quantitative factors. In short, the future value of E&C companies will be driven by the measurable, the immeasurable, and the unknown. ■

Exhibit 12

Relative Change in Share Price Before and After a Stock Buyback

Stock Buybacks: Affect on Short-Term E&C Company Share Prices	
Time Period	Difference in Stock Performance (Percentage)
30 Days before close	0.9
30 Days after close	-0.6
90 Days after close	0.8
1 Year after close	2.0

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¹ Total enterprise value represents the total economic value of a company. Total enterprise value is calculated as: market capitalization + total debt + minority interest - cash.

² A correlation coefficient represents the degree of association or strength between two variables. A value of +1 indicates a perfectly positive relationship, -1 indicates a perfectly inverse relationship, and 0 indicates no relationship between the variables.

Credit Markets and the Impact on Construction M&A

Construction owners shouldn't fear the shrinking market for corporate credit. It will still be possible and desirable to close a deal.

By Jim Nollsch

In June 2007, The Home Depot reached an agreement to sell a stake in its building supply business to a group of private equity firms for \$10.3 billion. In the months that followed, the subprime mortgage crisis emerged and led to less availability of corporate credit — making large leveraged buyout (LBO) transactions more difficult and costly to execute.

Extensive renegotiations between The Home Depot and the private-equity firms led to uncertainty as to whether the transaction would close. On Aug. 27, 2007, The Home Depot accepted dramatically different terms for a unit of its supply business, selling an 87.5% stake at an \$8.8 billion valuation, representing a 17% discount on the original deal price.

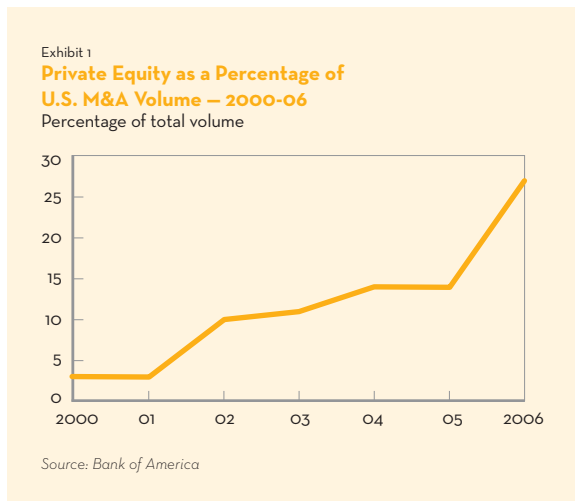
WHAT HAPPENED?

The Home Depot's efforts to sell its supply unit were hindered by the shrinking market for corporate credit. The deal was announced when liquidity was plentiful, making the potential deal straightforward like many of the earlier LBOs in 2007. But credit availability dried up quickly, and the buyer consortium (Bain Capital Partners; The Carlyle Group; and Clayton, Dubilier & Rice) threatened to walk away from the deal due to the rapidly deteriorating market conditions. Faced with the choice of accepting the concessions or forgoing the deal entirely, The Home Depot agreed to the discount.

The construction industry will feel some of the same effects that led to The Home Depot accepting a discount. While construction industry owners should be aware of these new market conditions, they shouldn't fear them since even with these new dynamics, it will still be possible and desirable to close a deal. Smaller transactions that do not rely on a significant debt component may face increased challenges, but healthy companies will still be able to get a deal done.

HISTORY

Over the past two years, hearty investor appetite for syndicated debt has helped to fuel the most robust mergers and acquisitions (M&A) market in history. In 2006, total worldwide deal volume was \$3.9 trillion, and through Aug. 30, 2007, volume reached \$3.65 trillion, putting this year on pace to be the largest ever.¹ Much of this boom was



fueled by the abundance of cheap debt financing that enabled private equity firms to execute an increasing percentage of overall transactions.

Private equity's deal share rose from less than 5% in 2000 to more than 25% in 2006. (See Exhibit 1.)

Banks and their investors appeared to be a never-ending source of capital. They supplied billions of dollars to support leveraged buyouts.

This enabled private-equity firms and other financial buyers to borrow heavily to finance buyouts. Private equity offered attractive price premiums to shareholders, and later sold off their investments to capture attractive returns.

Participants in the buyout boom made it look easy. Banks enjoyed profitable returns and showed no signs of slowing the frenetic pace of lending. As long as investors continued to fund the banks' debt commitments, the lending continued. Borrower-friendly loan terms were abundant, and common measures to protect lenders became scarce.

Covenant-lite transactions, which lacked performance requirements or asset pledges by the issuer, were common. Payment-in-kind ("PIK") toggles, or "toggle notes," allowed borrowers to use more debt to meet interest payments. Provisions such as material-adverse-change clauses ("MACs"), which give lenders the right to terminate a loan if specified conditions change, were mostly done away with. All of the mechanisms to hold borrowers more accountable became rare.

Buyers found it hard not to take advantage of such generous lending terms. With borrowing costs at historical lows, the universe of buyout targets was inversely large. David Rubenstein, co-founder of private-equity firm Carlyle Group, asked, "How could buyers resist taking those terms, knowing the results would be better returns for their investors?"²

When the subprime mortgage crisis emerged, banks' enthusiasm for lending plunged dramatically — effectively shutting off the spigot for private-equity-backed M&A.

But when the subprime mortgage crisis emerged, banks' enthusiasm for lending plunged dramatically — effectively shutting off the spigot for private-equity-backed M&A. Investors for bank debt, which was often syndicated and sold to secondary loan markets, started to become hard to find. Many of the investors for these securitized loans (often hedge funds) were holding mortgages in their loan portfolios in addition to corporate credit.

As these deteriorating mortgage portfolios began to work their way through the broader credit markets, a significant readjustment of liquidity for the corporate credit market occurred — resulting in a debt-financing squeeze as banks reacted. This squeeze has led to a

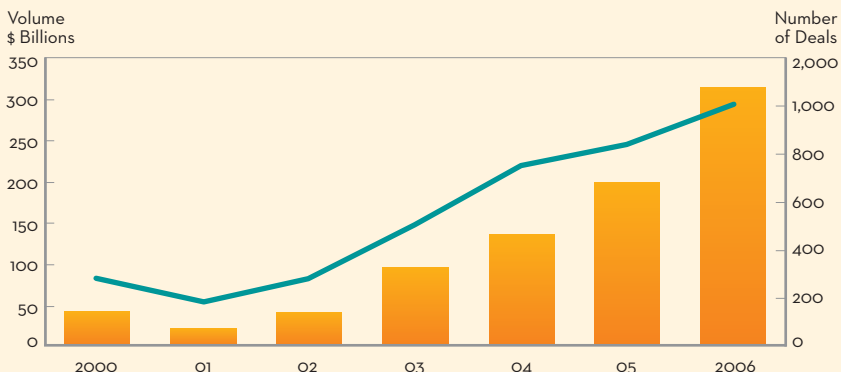
significant slowdown in the overall M&A market, especially with regard to LBOs. Given the high percentage of LBOs as a percentage of overall M&A, August 2007 deal volume fell 25% compared with the same period last year. This marked the lowest monthly total since July 2005 and the lowest August since 2004.³ (See Exhibit 2.)

DEBT OVERHANG

Significant attention will be paid to those LBO transactions that have been announced, but not completed. These transactions will be watched, but not as industry benchmarks. That is, it is not important whether they are construction or engineering firms. They will be watched as a gauge of capital availability to fund forthcoming M&A.

Exhibit 2
Total Completed U.S. Private Equity Deals — 2000-06

■ Volume
— Number of deals



Source: Bank of America

Over the summer, banks pledged to fund many LBO transactions. Sponsors were required to find investors before the debt would be issued. Bank pledges lacking actual investor capital are referred to as unfunded loan obligations. Through mid-September 2007, these obligations stood at over \$200 billion.⁴ If the bulk of these transactions close, the impact on the markets will be minimal. If investors choose to walk away, the effect will be much greater.

There is encouraging news: Kohlberg Kravis Roberts & Co.'s acquisition of First Data was largely viewed as a bellwether as to the real impact of the credit crunch. After months of speculation, the deal closed on September 25. First Data did not suffer the same valuation drop as The Home Depot's supply business. First Data's deal closed at the announced price of \$29 billion. However, concessions were made: The \$2.4 billion in debt did include performance covenants not present when the deal was announced in April. These covenants require the firm to maintain a baseline level of earnings to avoid default⁵ and are likely indicators of future terms for debt transactions.

More good news came when the debt for the First Data deal was brought to market, as investors were oversubscribed by nearly two to one. The reaction to the \$5 billion loan offering⁶ prompted the issuing banks to sell an additional \$2 billion to \$3 billion of the paper.⁷ Some industry observers viewed this reaction as a major turning point.

On the downside, some deals have fallen apart. Goldman Sachs and Kohlberg Kravis Roberts & Co. walked away from its \$8 billion buyout of stereo-equipment maker Harmon Kardon on September 21, citing the material adverse-change clause that was included in the original transaction agreement.⁸ After Harmon threatened legal action for abandoning the deal, the parties agreed to accept a \$400 million investment instead of an outright acquisition.

Another fallout was the \$25 billion buyout of Sallie Mae by J.C. Flowers & Co., which was scuttled on September 26.⁹ And mortgage issuers MDIC and Radian called off their \$4.9 billion merger on September 6, issuing a joint statement that, "Current market conditions have made combining the companies significantly more challenging."¹⁰

Some private equity buyers are looking to use reverse termination fees as a tool to renegotiate deals. These fees typically call for a penalty of 3% to 4% of deal value to be paid if the private-equity firm walks away from the deal. However, some firms may view this as a small amount to pay relative to the financial risk of executing a levered transaction.

Other recovery signs may be found in the pending public debuts of the many Special Purpose Acquisition Companies (SPACs) and Business Development Companies (BDCs) that have registered their public offerings.¹¹ These firms raise

money from the public with the expressed intent of acquiring operating businesses within a specified time frame, often 18 months. Strong market performance by these firms will indicate a recovering appetite for M&A. If their stock prices drop, deal activity will continue to slow.

With so many deals in limbo, activity at the high end of the market — defined as deals greater than \$1 billion — has slowed to a crawl. Additionally, the prospect of failing to close many of the deals already in the pipeline has put the financial markets in limbo. During fall 2007, Bernanke and the Fed have shown a willingness to take action to soothe the markets through interest-rate cuts in the federal funds and discount rates. The long-term impact of these cuts has yet to be determined, but M&A activity at the high end is not expected to pick up until the \$200 billion debt backlog works its way through the system.

The exact impact on the construction industry by the overall M&A slowdown remains to be seen.

WHAT'S NEXT?

The exact impact on the construction industry by the overall M&A slowdown remains to be seen. While some market turmoil and uncertainty will spill over into the smaller, middle-market deals, exactly how much will depend on many different factors. Regardless, industry deal making will not disappear, and owners and investors who pay attention and respond to the changing market conditions will greatly improve their chances of executing a successful transaction.

DEAL MAKING WILL CONTINUE

High-quality firms with strong financials and cash flow will still be desirable deal targets and should be able to find buyers. Transaction structures will contain larger equity components and lower leverage levels with more restricted covenants attached, and higher front-end fees.

With financing costs no longer offering financial acquirers a significant pricing advantage, strategic buyers will start to compete for more deals. Many engineering and construction firms performed well in the recent strong economic environment, putting them in an excellent position to grow via the addition of smaller businesses to their portfolios. Some of the largest firms are holding substantial cash balances and will be pressured by shareholders to put these assets to use to generate growth. (See Exhibit 3.)

Private-equity buyers have temporarily retreated from the market, but with active funds, they won't be able

Exhibit 3

Large Firm Cash Balances

Company	Cash as of 6/30/07 \$ Millions
KBR	2,016.00
Fluor	1,454.00
SAIC*	1,131.00
Jacobs	473.00
AECOM	303.00

* As of 7/31/07

to stay on the sidelines forever. Capital will need to be deployed and deal flow will have to pick up, albeit on different terms than in the past. Major lenders, needing deal flow themselves, will continue to give these firms market preference. The likely emergence of “flex-pricing” clauses for private-equity-sponsored deals will give lenders some flexibility. That is, if a deal cannot be syndicated at some level, banks can increase pricing and fees to help attract investors.

Deal activity in the middle market has not stopped altogether. Several transactions completed in early September 2007, which wouldn't have been noticed three months earlier, made headlines. One “Merger Monday” (merger announcements are commonly made on Mondays) in late September saw two metals and mining deals announced: Australia's Sims Group's \$1.5 billion offer for U.S. recycling firm Metal Management and Orica's \$670 million purchase of Excel Mining

Systems.¹² Near-term market conditions may resemble those that were seen three to four years ago — still a good market by historical comparison.

Deals most likely to be impacted by the current market conditions are borderline or aggressive deals. Firms with these types of deals will likely benefit by backing away from the current environment and returning when market conditions improve. Owners will need to take an honest look at their individual situation and assess the best timing for them.

The accelerated deal activity over the past few years has resulted in many acquirers speeding through the due diligence process. Owners will need to be more prepared now, as deal screening will almost certainly become much more rigorous as investors seek to quantify the risk in a more volatile environment. More attention will be paid to downside scenarios and pro forma financials.

NEW LOAN PRICING

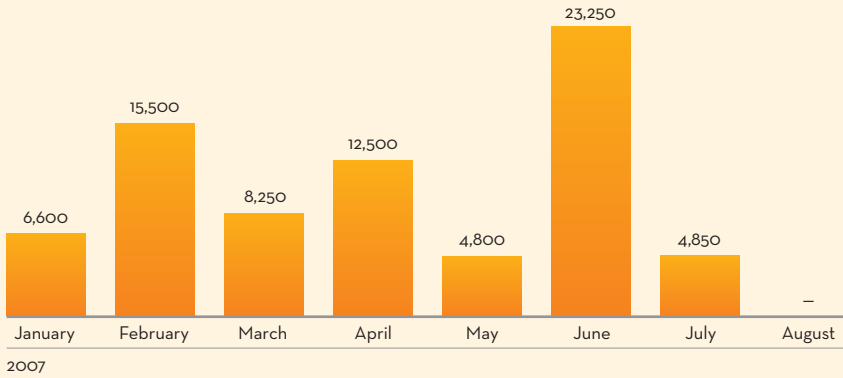
After a long period of buyer friendly loan terms, banks are responding to the recent market events by pushing terms that are more favorable to them and that reflect new risk/reward demands. Expect to see increased LIBOR-spread pricing. Borrowers can also expect higher front-end, lender fees to structure and syndicate transactions. In a recent LoanConnector poll, 62% of respondents said they expect

Owners will need to be more prepared now, as deal screening will almost certainly become much more rigorous as investors seek to quantify the risk in a more volatile environment.

Exhibit 4

Covenant-Lite Debt Issuance in Middle-Market Transactions

Volume — \$ Millions



Source: Reuters Loan Pricing Corporation/Dealscan

collateralized loan obligation (CLO) spreads to widen¹³ — indicating higher costs for borrowers.

Covenant-lite debt will become rare as banks seek to hold borrowers more accountable, and towards that end, will tighten financial covenants. (See Exhibit 4.) In the middle market, covenant-lite issuance dropped dramatically from a 12-month high in June 2007 to its virtual absence in August 2007.

A positive for construction firms is that many will not feel a large impact from these stricter lending requirements, given the industry's long-standing conservative financial management. Construction firms are used to being held accountable to leverage covenants, and due to the complexities involved, banks typically have not allowed significant pledges of receivables, which are often a contractor's largest asset. Firms with heavy bonding requirements have had to keep clean balance sheets with sureties discouraging heavy leverage. Because of this, loan pricing has always been priced more conservatively for the industry. This will not change, as lenders will continue to demand lower leverage levels and insert industry-specific covenants in most transactions.

The overall impact on middle-market loan pricing is expected to be more muted than for the larger deals. A main reason for this is that middle-market lenders (usually banks) typically hold on to loans rather than shipping them off to hedge funds or other non-traditional lenders, lessening the impact of the liquidity crunch. "We're not hung with billions of dollars of paper," said a middle-market loan arranger.¹⁴ The large corporate deals (from \$100 million to \$500 million) are more reliant on the institutional market, which is much more volatile.

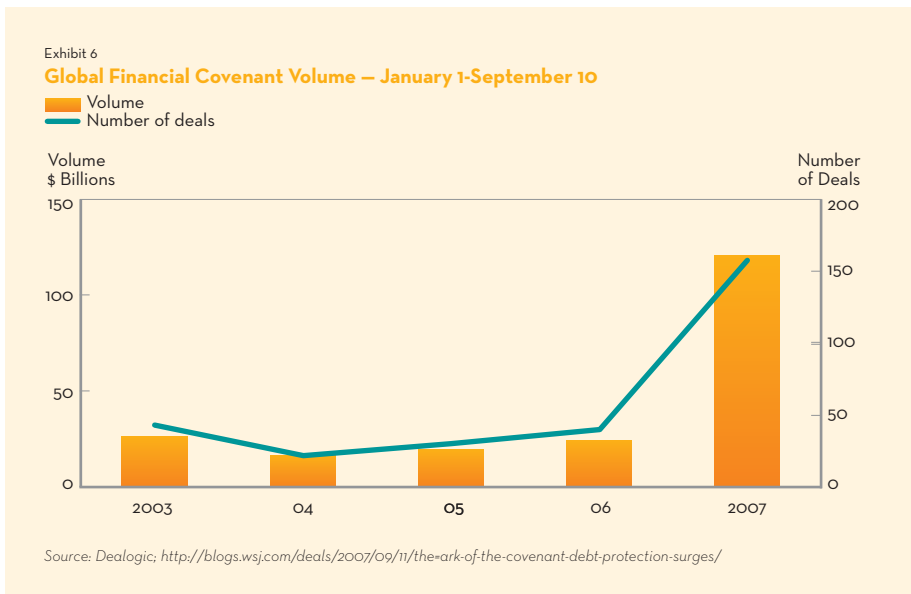
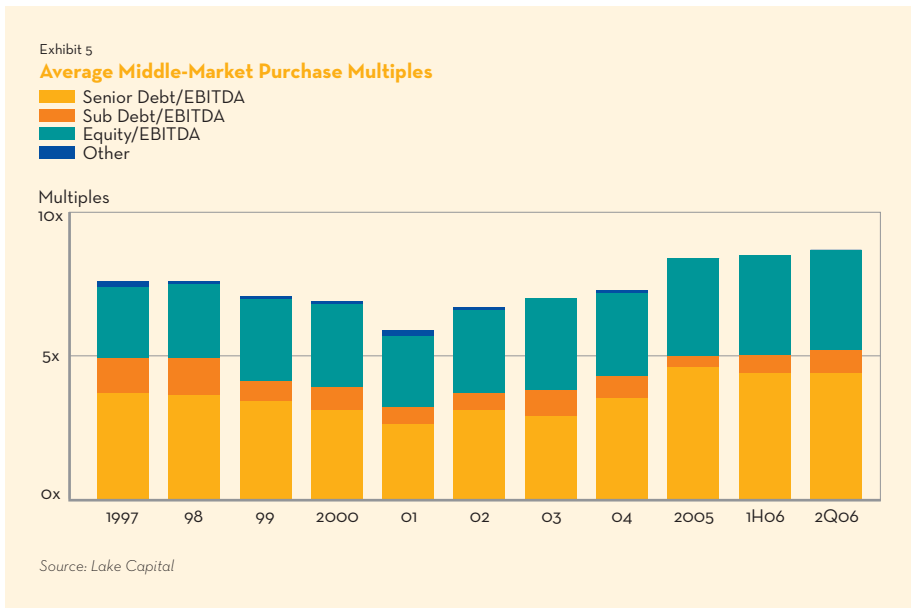
A RETURN TO NORMAL

Borrower friendly lending terms for the largest deals of the boom gave financial buyers a significant pricing advantage relative to their strategic counterparts. Carlyle's Rubenstein noted that favorable financing over the past five years led to, "almost no penalty for overpaying by 5% to 10%." The result was a significant jump in valuation multiples as financial and strategic acquirers tried to outbid each other, with the

financial buyers often winning out and strategic buyers unable to compete.

Such aggressive financing techniques were common in deals greater than \$100 million. These transactions were financed with significant covenant-lite debt and toggle-notes with limited equity components. Now, as borrowing costs go up, expect to see downward pressure on valuations. Discounts like The Home Depot's will be common but most prevalent in the high end of the market.

Valuations did not experience the same level of acceleration, especially when bonding was involved, because the middle market's participation in aggressive, covenant-lite financing was limited. (See Exhibit 5.) Valuation expectations going forward will need to be adjusted, but by historical comparison, they may resemble a return to a healthier market.



GENERAL ECONOMIC IMPACTS

The biggest impact to the industry regarding M&A activity will be the extent to which the larger economy is impacted by the credit squeeze and its affiliated effects. (See Exhibit 6.) Many current economic indicators point to a general slowdown, as housing prices fall and the inventory of unsold homes on the market rises. The impact on consumer spending and residential construction could be significant. The subprime mortgage defaults that led to the emergence of the credit crunch will continue to have an impact.

Other segments, however, have been performing well and have favorable outlooks. The recent focus on infrastructure following the Minneapolis bridge collapse could benefit many firms. Core inflation measures have been kept in check, and the Fed's September 2007 decision to cut interest rates by a half-point followed by a quarter-point cut at the end of October signals the Fed's willingness to act in the best interests of the general economy.

One reason the sub-prime fallout had such a dramatic impact is the degree of financial sophistication in today's market.

LOOKING AHEAD

One reason the subprime fallout had such a dramatic impact is the degree of financial sophistication in today's market. Market conditions in this environment are changing faster than ever. Exactly when deal flow will start to recover is uncertain, but even as discouraging as many market indicators are, encouraging news exists. As fast as the liquidity crunch developed, banks and other players in the M&A world are ultimately after deal flow so execution of sound transactions will still take place. ■

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¹⁴ Madhur, Smitta. "Being in the middle can be comforting: How the MM has weathered credit market blows." Gold Sheets, August 2007.

U.S. Construction Markets Penetration via Mergers, Acquisitions, and Ventures

Foreign entry into the U.S. construction market by M&A activity has a long history, with several success stories offering lessons learned.

By Hank Harris

The U.S. construction market is by far the largest in the world. At more than \$1 trillion dollars, it exceeds 9% of the U.S. gross domestic product. It is also a highly fragmented and pyramidally shaped industry. Any outside contracting organization or company contemplating penetrating the U.S. construction industry will benefit from a basic understanding of the U.S. industry and its dynamics.

THE CONSTRUCTION PYRAMID

Conceptualizing the industry in terms of its shape and fragmentation offers some insight into the industry's relationships. At the top of the pyramid, representing industry participants, are the giant engineer constructors, or what Wall Street refers to as "the E&C companies." The majority of these 25 or so companies are public and therefore, tracked by Wall Street and its stock analysts. These companies are leading-edge companies, extremely well-financed, and industry trend-setters. The trends set by these companies take five to 10 years to work their way to midmarket contracting firms and at least a decade to work down to firms at the base of the pyramid. While these large firms both engineer and construct, they are dominated by engineering expertise and engineering culture. Some of their work is performed at-risk and some is contracted on other bases. These firms all use highly sophisticated capabilities to

perform some of the most complex construction. Most of these E&C companies operate globally.

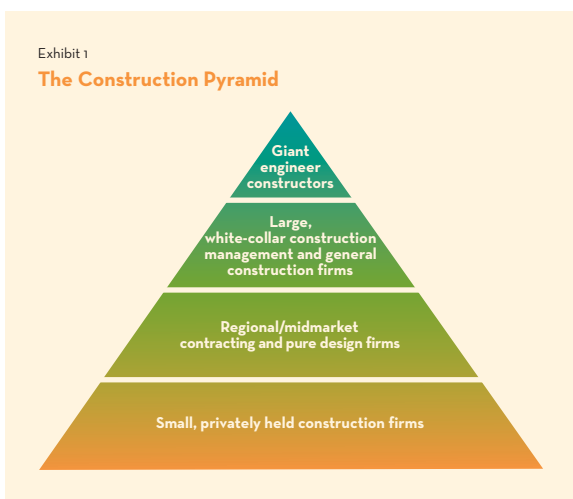
The next level on the contracting side of the industry is made up of large, white-collar construction management and general contracting firms. These firms all have a national footprint, and many of them operate on the basis of vertical market expertise. Some are public, but many are privately held. This group includes marquee names like Turner, Gilbane, J.E. Dunn, PCL, etc. All of these firms perform more than \$1 billion in revenue and have sophisticated project management capabilities. Their counterparts on the design side of the industry are the large, pure architectural/engineering firms. At this level, these firms are populated largely by engineers and designers, and they generally do not take construction risks. This level performs almost one-half of the industry's volume. *Engineering News-Record* identifies these firms as the Top 400 Contractors and Top 500 Design Firms in any given year.

Below this level of player is the more common regional or midmarket contracting or pure design firm. On the contractor side, this level is typically made up of general contractors or heavy civil firms performing \$50 million to \$200 million annually. Most of these firms have a regional footprint, although a few operate nationally. (See Exhibit 1.)

At the base of the pyramid is a huge volume of small, privately held firms that lack critical mass, financial strength, and/or large project capability. Yet, these firms dominate local construction markets. Together with the midmarket firms, this section of the construction pyramid will perform almost one-half of the industry's volume. Conceptualizing the industry in this way makes apparent the industry's fragmented nature.

More than 30 years ago, noted Harvard strategist Michael Porter defined what makes an industry fragmented and, therefore, potentially unattractive. His criteria

included things like low barriers to entry, lack of bargaining power with suppliers, lack of bargaining power with customers, ease of substitution, and what he termed "the degree of rivalry" among industry players. Contracting in the United States matches Porter's description. Most contractors are intensely competitive. Entry barriers are virtually nonexistent.



And construction is one of the last bastions of free enterprise in terms of the ease with which players move in and out of the market. As a result of this fragmentation, even the industry's largest firm (Bechtel, at approximately \$16 billion in reported annual revenue) has virtually no significant market share. In this climate, the pressure on margins is intense, with firms involved in general construction or project management reporting average margins between 1% and 2% annually, pretax. Clearly, this is not a business for the un-bold.

U.S. CHALLENGES PRESENT OPPORTUNITY FOR FOREIGN FIRMS

Constraints on capital are key challenges facing U.S. firms as well as the entire industry. Construction companies generally operate with thin balance sheets, and many look to their surety companies as a de facto governor on their volume and work capacity. Surety credit tends to ebb and flow with the state of the reinsurance market, but underwriting criteria have been high over the last several years, constraining many firms in a market that is abundant with project opportunity. Oddly, more constraints exist for large projects and large-volume contractors than is the case for the smaller ones. Compounding this, most U.S. banks are not interested in lending to contracting organizations. Ample credit is available for projects and/or real estate-based lending, but little credit is available for the actual contracting entity. For large foreign and/or global companies contemplating U.S. entry, this presents a significant opportunity. Many of these large or mid-sized domestic firms have more work than they can possibly bond or, in some cases, manage. U.S. project-delivery requirements are at record-high levels; yet firms do not have access to capital, and the number of indigenous players has not changed substantially. Foreign companies with plenty of capital or greater access to credit and capital markets may find ready venture partners, alliance partners, or even willing sellers.

Besides offering a potential solution to this constraint on capital, foreign or global companies offer other assets, such as specialized technology and engineering capabilities, to U.S. players. Despite these needs, relationships that do little more than inject foreign capital into U.S. contracting firms will be short-term.

The talent dearth in the U.S. market makes foreign project management talent important. Over the long term, many U.S. companies will need this talent and labor to execute on available market opportunities. Large foreign or global firms have the inherent capacity to work across geography. While this is not the case for small or mid-sized U.S. firms, many of these smaller firms would likely be interested in developing

The talent dearth in the U.S. market makes foreign project management talent important. Over the long term, many U.S. companies will need this talent and labor to execute on available market opportunities.

national or even global capacity through a working alliance or relationship. Since many global prospects are headquartered in the United States, potential U.S. entrants may have prospect contacts synergistic with U.S. contractors.

REASONS FOR FOREIGN INTEREST

Significant numbers of foreign firms have entered the U.S. markets over the last decade, making foreign interest in the U.S. markets apparent. One draw is the United States' status as home for several global companies' headquarters. In addition, it is often difficult to be considered a true "global company" without a U.S. presence, making it an unofficial mandate for some organizations to establish U.S. contracting operations. Compounding this is the fact that many companies in Europe and elsewhere have developed a "me-too mentality," watching their large competitors enter the U.S. market and feeling compelled to join.

Reasons central to the nature of the U.S. markets include its relatively safe working conditions, first-world-country position, strong rule of law, strong orientation

toward safety, ease of repatriation of earnings or cash flow, and human rights. Also, depending on the type of contracting, relatively low capital is required to enter the business. Finally, the risk-reward ratio is such that well-managed risk is rewarded with significant returns on invested capital.

Significant numbers of foreign firms have entered the U.S. markets over the last decade, making foreign interest in the U.S. markets apparent.

HISTORY OF M&A ACTIVITY IN THE U.S. CONSTRUCTION MARKET

Mergers and acquisitions (M&A) activity in the U.S. construction market is relatively young. One of the first flagship transactions occurred in the 1960s with the sale of a specialty contractor, Fishbach and Moore, to the public. In the 1980s, an initial consolidator, JWP (now Emcor), began

to acquire and attempt a consolidation of electrical and mechanical contractors. Then, another wave of this activity happened in the late 1990s, with rollups put together by financiers and subsequently taken public. Also occurring during this time was the acquisition of specialty, mechanical, and electrical contractors by utility companies. A relatively modest amount of this activity succeeded and endures today. For general building contractors, this activity occurred later, starting with the acquisition of Daniel by publicly held Fluor in the 1970s.

FOREIGN ENTRY BY ACQUISITION

Foreign companies entering the U.S. construction market now are likely to do so by acquisition of a U.S.-based contractor. In the 1970s, European firms began to aggressively enter the United States via acquisition of U.S. contractors. Notable examples of this include the acquisition of J.A. Jones by Philip Holzman of Germany,

the acquisition of Turner by Hochtief, the acquisition of Bovis by Australian Lend Lease, and the acquisition of several general contractors throughout the United States by Swedish giant Skanska. All of this activity was groundbreaking and led to an accelerated amount of acquisition activity by private contracting firms in the United States. Over time, these trends continued and converged, leading to a bifurcated market, especially among general contractors. While a continual influx of new market entrants makes complete consolidation a virtual impossibility for the construction industry, a general trend has developed of large firms with a national or global footprint, small local firms, and fewer midsized firms dominating regional markets.

U.S.-based contractors can be motivated sellers, especially with the right circumstances. Since many U.S. contractors are privately held, their owners often lack diversity of wealth accumulation. As these owners approach retirement age, they often find that a disproportionate amount of their money is tied up in the construction entity with no good way to extract it. Many of these owners do a poor job planning for the firm's management succession or long-term ownership continuity and find themselves in the late stages of their careers with limited options. Also, a number of owners find that their personal plans and interests begin to diverge from the company's strategic plans. For example, owners in this group may want to diversify or eliminate personal risk, but not for their companies. In this case, the company may need to grow beyond what their personal risk profile will allow. Generally speaking, most of these companies are managed by CEOs from the baby-boomer generation. This generation tends to be more informed and realistic about valuations and sale options than their generational predecessors. They also tend to be more interested in the concept of exit strategy.

On the buyer side, the types of contracting entities that are desirable fluctuate in the short term. Yet, buyers have common interests as they look at the value drivers of potential acquisition targets. For example, buyers are attracted to negotiated work; design/build; turnkey forms of project delivery; service work that constitutes an annuity stream; and work that allows the firm to be paid directly by owners.

U.S. MARKET SPECIFICS

In the U.S. M&A market, most contractors are purchased almost exclusively by other contractors for strategic reasons. The business of construction is unique and especially so in the United States. While ranges vary with the market, private firms generally trade for three to six times pretax

adjusted earnings. The multiples of book equity range from .8 to about 1.2. Earnouts are frequently used to bridge gaps or differences in value expectations between buyer and seller. Few purchases of stock are made, with the overwhelming majority of these transactions being asset purchases. Liability and tax reasons compel buyers to structure these transactions accordingly. As with most transactions, successful execution requires strong motivation and leadership on both sides.

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But before firms can execute a successful deal, consideration must be given to the profile of potential acquisition target(s). Questions to consider include: What kinds of markets and customers does the target serve? What are their distinctive capabilities, and what services do they offer? What is their geographic footprint, and how competitive is the market in which they seek to operate? What about the size, stability, and strength of their backlog?

How will the acquisition be handled? Who will manage it? Another big issue with contractors is whether they are union. While union construction is only about 17% of the national volume, big cities like New York, Chicago, Philadelphia, and several others are almost exclusively dominated by unions, and working in a union environment is entirely different from a nonunion environment. Another issue stems from a cross-border relationship. The associated cultural gap can be hard to work with, even between two U.S.-based firms. Ultimately, both the acquiring firm and acquired firm's managements must be compatible in terms of their overarching business philosophies and conduct. While there is a big tendency to focus on terms and price during the transaction, the real issue is whether the acquisition target will be able to sustain its earnings, grow them, and ultimately represent a good return for the acquiring firm. In simple terms, a firm valued at \$10 million but purchased for \$9 million does not represent a good deal if it cannot do this. Conversely, the \$10 million valuation purchased for \$11 million might be a great deal with sustained earnings growth.

SUCCESSFUL ACQUISITIONS

Historically, a number of foreign companies have entered the United States. Some have been successful; some have not. The following section describes a few of the success stories and the associated lessons learned.

Skanska

Skanska first came to the United States via joint venture in 1971. In 1982, Skanska made its first acquisition of a New York company called Karl Koch Erecting Company. This was followed by the acquisition of a major New York-based heavy civil firm called Slattery in 1987. In 1989, Skanska added a building construction firm in the form of New Jersey-based Sordoni, which had a heavy presence in the burgeoning pharmaceutical marketplace. All of these acquisitions were engineered and directed by

Skanska's then-chief U.S. executive, Claes Bjork, with FMI acting as his primary M&A advisor and intermediary. Throughout the 1990s, Skanska added significantly to its portfolio of U.S. companies. By 2002 Skanska's U.S.-based revenues approached \$6 billion. Up to that point, integration efforts had been limited. The companies were largely operated as a portfolio of independent entities, with limited synergies and/or cost reductions. Essentially, a "holding company" model was at work. In late 2002, the company began its first serious integration efforts, presenting a single brand and more consistent systems and processes to the market.

Hochtief

Hochtief is one of the largest contracting firms in Germany and first began studying the U.S. market in about 1980. In 1983, the firm attempted to buy three different U.S. companies, but all attempts were unsuccessful. In 1986, Hochtief decided to enter the United States via engineering in lieu of construction, ultimately purchasing a 45% interest in Dames and Moore. In 1997, Dames and Moore went public and was subsequently purchased by URS in 1999. Hochtief made a gain on the investment, but its involvement remained largely passive. Then in 2000 Hochtief acquired Turner for \$350 million. Prior to that acquisition, Turner had been operating as a public company. Turner continues to operate independently; integration is relatively modest with its German parent.

Bovis Lend Lease

Bovis was a major U.K.-based operation that came about through Bovis' acquisition of a U.S. company called Lehrer McGovern in 1986. Bovis also acquired a major contractor in the Southeast, McDevitt & Street, in 1991 and a major Chicago contractor, Schal, in 1992. In the late 1990s Lend Lease, a global project development company based in Australia, hired McKinsey to help the company develop its strategic plan. As a result, the United States was targeted for acquisition, and McKinsey suggested that Lend Lease hire FMI as an advisor and intermediary to help it execute successfully. Lend Lease's ideal profile was difficult to find, but it ultimately decided to purchase a large firm, which led to the Bovis acquisition.

Japanese Construction Companies

A few Japanese construction companies have successfully penetrated the U.S. marketplace. These companies first entered the United States in the late 1980s and early 1990s, when many Japanese companies were also beginning to buy up U.S. real estate. The Japanese construction market is dominated by their "Big Nine" construction companies. Several of these companies have attempted U.S. penetration, with Obayashi and Kajima being the two most successful. Obayashi acquired Webcor, a major general contractor based in

San Francisco. It has also acquired a significant North Carolina-based general contractor, the John S. Clark Company.

Kajima acquired Hawaiian Dredging in the throes of the Dillingham bankruptcy. It also acquired the Austin Co. and has set in place numerous joint ventures with U.S. partners.

The Maeda Corporation attempted a U.S.-based startup, known as MKK Technologies and based in Detroit, in the 1990s. Maeda also put several joint ventures in place but was not ultimately successful, as the company depended mostly on Japanese clients and attempted to grow the U.S. operation organically.

LESSONS LEARNED

The activity of these success stories offers some common themes and “lessons learned,” including:

- Providing capital only is a good short-term strategy for a joint venture, but it will not cement the relationship over the long term. Ultimately, the small, U.S.-based partner will need something more than capital. Most will also need their talent and project-management capabilities augmented to feel that an ongoing relationship is worthwhile.
- While acquisitions are fraught with challenges and risks, they represent the fastest and perhaps best course of action in mounting a serious U.S. construction-market penetration effort.
- The use of earnouts to bridge valuation perspectives can lead to suboptimization of the long-term profitability of the enterprise on behalf of earnout maximization. Prior management tends to be “let-down” after the earnout period is completed. Further, if the earnout is successful over this period, it can be difficult to replace the incentive of the earnout.
- Creating synergy and instilling operating discipline between sister companies can be problematic for the acquiring parent.
- Success depends on predefining an integration strategy. Some of the success examples illustrated previously used a pure “operator” strategy, meaning limited integration with a holding company model. Others implemented “integrator” strategies, attempting to create a single brand, execute cost-reduction synergies, and leverage revenue synergies through their respective portfolios quickly.
- Since entrepreneurial talent can be fragile and most U.S. contracting firms depend on it, a slow cultural exchange as part of the integration strategy is probably best.
- Incentives shouldn’t be left just with upper management; instead, incentivize management down to the operating level at an aggressive pace.
- Strong leadership is a key factor in any successful acquisition.

Providing capital only is a good short-term strategy for a joint venture, but it will not cement the relationship over the long-term.

Ultimately, the U.S. construction marketplace represents a bit of a conundrum to senior executives of foreign construction entities. On the one hand, the opportunities in the United States are abundant, with more projects than project-delivery capacity. This is likely to be the case in many core markets for the next several years. On the other hand, the industry's fragmentation and structure mean that the risks associated with U.S. construction activity are numerous and real. Attempting to greenfield a construction company in the U.S. marketplace is at best a suspect strategy for the foreign company. It makes much more sense to create relationships and partnerships or perhaps even make acquisitions, in order to employ the individuals who know how to manage construction risks in the United States successfully. Notwithstanding the relentless focus of the U.S. surety industry on financial ratios, the real litmus test for success in U.S.-based construction is being able to manage the risk successfully and stay out of trouble. Foreign investors who understand this will significantly improve their odds at any penetration strategy. ■

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Growth and Stress Fractures: The Look Ahead for the U.S. Utility Market

FMI's 2008 forecast for the U.S. utility market bears good news: contractors' services will continue to be in high demand. A growing focus is environmentally sensitive trends.

*By Mark Bridgers, Mike Chase,
and Dan Tracey*

The utility construction market can expect growth rates in every segment in 2008 that will exceed both gross domestic product (GDP) and inflation. (See Exhibit 1.)

Despite the decidedly positive outlook, financing remains a constraint on utilities' capital spending as debt markets tighten and the global economy slows its growth. The aging work force problem in utility contracting will remain critical in 2008, and the movement toward green and renewable construction techniques and technologies will continue to change the dynamic of this market.

Demand for capital spending in all utility segments is strong due to aging infrastructure, the increasingly complex regulatory environment, and continued U.S. population growth. However, capital spending on infrastructure will again fall short of identified needs despite the strains placed on existing systems. The July 2007 steam pipe explosion in New York City dramatically illustrates the need for additional funding. Overall, water/wastewater and sewer infrastructure are among the oldest, most in need of upgrade, and pose the highest risk of failure. Mounting pressure for government funding and the use of public-private partnerships (P3s) as an alternative

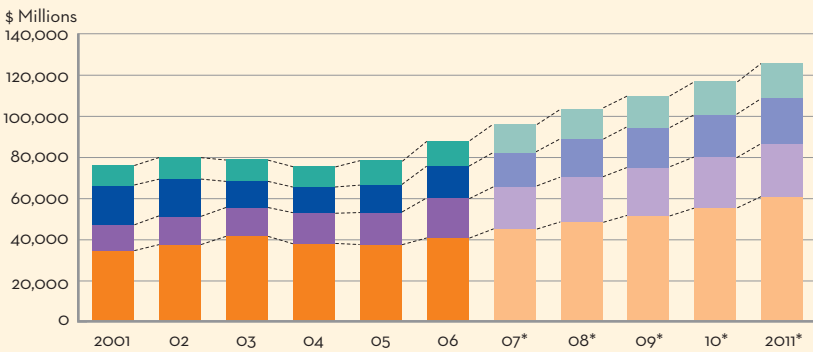
financing mechanism will also contribute to a changing 2008 landscape. Construction demand in the telecommunications sector will remain high as sweeping technological enhancements outpace construction activity.

POWER GENERATION FORECAST

FMI forecasts growth of 13% for electric-power-generation utilities during 2008. At more than twice the general economy’s growth, power generation remains strong, although it did moderate from the 21% advance in 2007. (See Exhibit 2.) Tempering FMI’s 2008 forecast are climate change and public pressure for renewable energy sources that will demand innovative solutions from utilities and contractors. Pending

Exhibit 1
Utility Construction Put in Place
Historical Figures and Forecasts

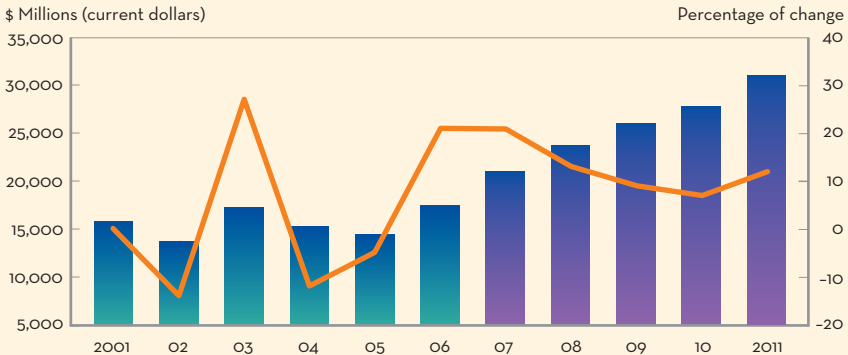
- Water Supply
- Communication
- Sewage and Waste Disposal
- Power Generation, Transmission, and Distribution



* FMI prepared forecasts for 2007-2011
 Source: Building permits, construction put in place, and trade sources.

Exhibit 2
Power Generation Construction Put in Place
Historical Figures and Forecasts

- Power generation
- Power generation forecasts
- Power generation spending change



Source: Building permits, construction put in place, and trade sources. FMI prepared forecasts for 2007-2011

legislation will continue to place limits on utilities' sulfur, nitrogen, and carbon emissions; the questions now being asked are when and how the reductions will be mandated vis à vis a carbon tax,¹ new incentive programs, or "cap and trade" systems.² Although the upcoming presidential election makes any significant political action during 2008 unlikely, many contractors are already seeing an increase in retrofit work as forward-looking utilities prepare for the more stringent emission standards.

With legislation around emissions on the political horizon and natural gas prices steadying, high spend numbers in generation will continue to be seen in the relatively clean-burning natural gas sector and in other renewable fuels. Perhaps even more cutting-edge than clean-burning fuels are renewable energy sources. Worldwide generation spending continues to grow rapidly thanks in part to increasing wind energy budgets with utilities and governments in the United States, China, and Europe. International spending on wind is expected to reach \$150 billion over the next five years, according to CLSA Research. U.S. lawmakers are providing financial incentives because windmills emit zero air pollution and cost less than solar projects. TXU's failed bid to build 11 new coal power plants last summer illustrates the changing landscape that utility owners must face. Twenty-five states have enacted Renewable Portfolio Standards (RPS) that set mandatory dates and percentages to reach renewable fuels. (See Exhibit 3.) In August 2006, for example, Illinois Gov. Rod Blagojevich signed the Renewable Energy Standard into law. It mandates that Illinois-based utilities must produce a certain percentage of their power from renewable sources, beginning with 2% by 2008, and escalating each subsequent year.

Wind power is likely to see the greatest capital inflows among renewable energy sources. During 2006 and 2007 wind power generation grew by more than 40%. (See Exhibit 4.) Moreover, the American Wind Energy Association forecasts an additional 27% growth during 2007 and 2008 fueled by more than \$4.5 billion in new investments during the 2007 fiscal year. The corresponding trend toward larger wind-power projects allows utilities to exploit any economies of scale that emerge. (See Exhibit 5.)

Other renewable energy sources, such as solar and geothermal, continue to receive outsized attention relative to their actual generation capacity. For example, increased silicon production

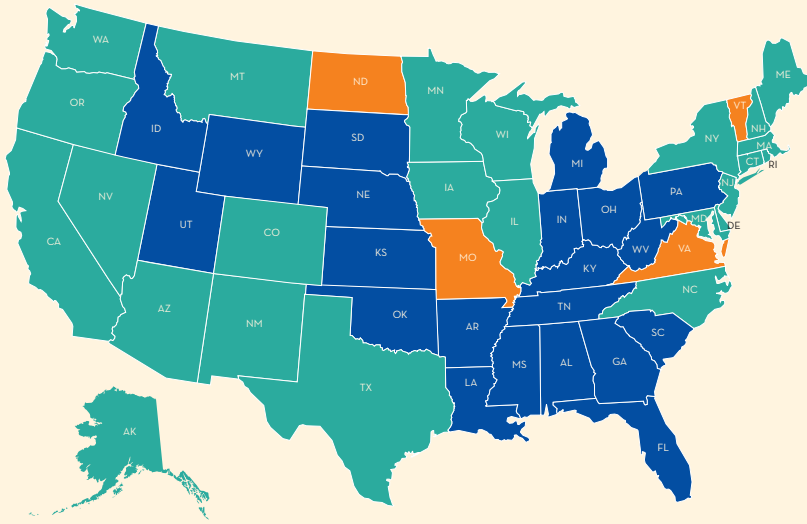
"The increase in CO₂ emissions from the operation of [coal-fired electric generating plants] will subject [power utilities] to increased financial, regulatory, and litigation risks."

— Andrew Cuomo,
Attorney General of New York

Exhibit 3

U.S. State Renewable Portfolio Standards (RPS) and Goals

- State RPS
- State Goal
- No Goal or Standard



State	RPS Standard or Goal	State	RPS Standard or Goal	State	RPS Standard or Goal	State	RPS Standard or Goal
AZ	15% by 2025	HI	20% by 2020	MN	20% by 2025	NJ	22.5% by 2021
CA	20% by 2010	IA	105 MW	MO	11% by 2020	NM	20% by 2020
CO	20% by 2020	IL	25% by 2025	MT	15% by 2015	NV	20% by 2015
CT	23% by 2020	MA	4% by 2009	NC	12.5% by 2021	NY	2.4% by 2013
DC	11% by 2022	MD	9.5% by 2022	ND	10% by 2015	OR	25% by 2025
DE	20% by 2019	ME	10% by 2017	NH	23.8% by 2025	PA	18% by 2020
						RI	16% by 2020
						TX	5,880 MW by 2015
						VA	12% by 2022
						VT	RE meets load growth by 2012
						WA	15% by 2020
						WI	10% by 2015

Note: State RPS standard refers to legislation requiring compliance over some time period. State Goal refers to described target levels with no legislative backing. RE in table refers to renewable energy.

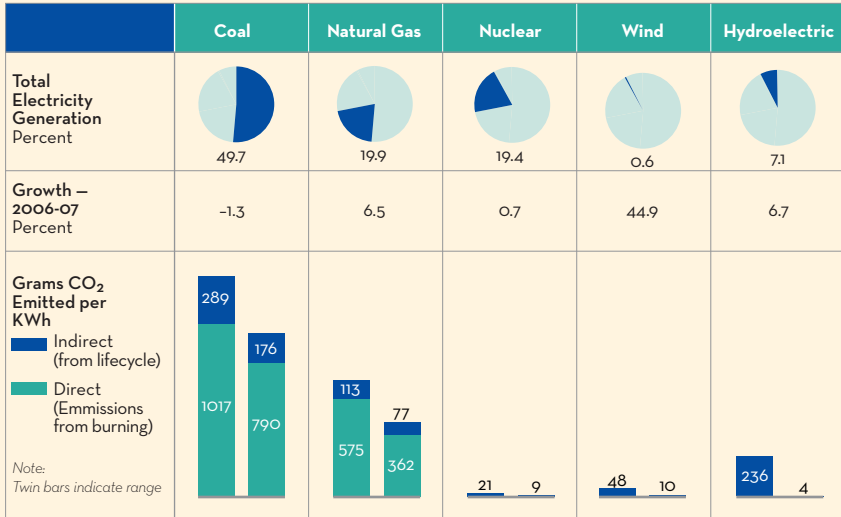
Source: North Carolina Solar Center

will facilitate the growth of solar energy in 2008 and beyond. Hemlock Semiconductor, a leading producer of hyperpure polycrystalline silicon for the semiconductor and solar industries, expects the solar energy industry to grow at a 20% to 25% pace over the next 10 years. Yet even with aggressive growth, solar energy accounts for only 10% of the global renewable energy portfolio, far behind wind, nuclear, and other non-emission energy sources.³

After more than a decade since the last nuclear reactor began operation, U.S. utilities may begin construction on as many as 17 new nuclear-powered plants by 2012. Worldwide, the pace of nuclear-related, power-generation-powered construction is accelerating. (See Exhibit 6.) A resurging nuclear energy program in the United States will pose both a serious challenge and a tremendous opportunity for contractors. As U.S.-based contractors look to bring nuclear-related supplies and resources back to North America, international firms with overseas nuclear experience will possess a

Exhibit 4

U.S. Electricity Generation Facts and Figures



Note: Total generation percentages exclude 3.3% in generation from various other sources
 Source: Adapted by FMI from the Energy Information Administration

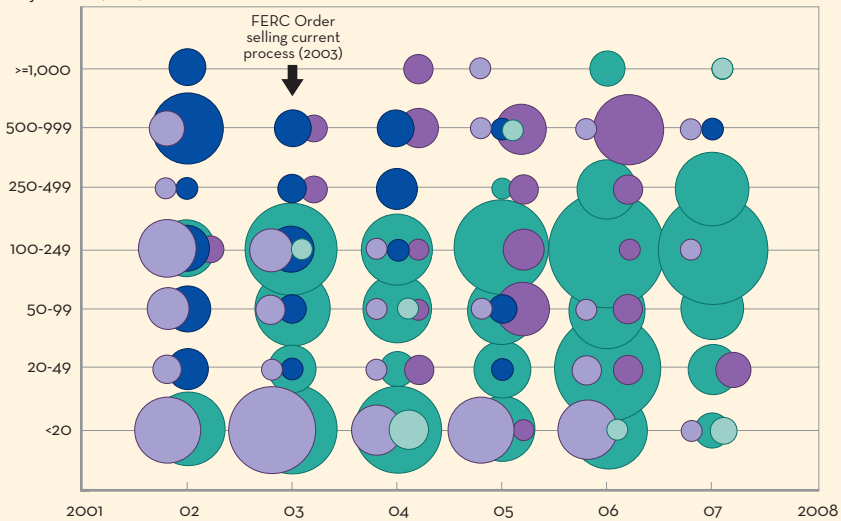
Exhibit 5

Midwest ISO Project Queue

Size of bubble indicates number of requests: Queue as of May 1, 2007

- Wind
- Coal
- Natural Gas
- Nuclear
- Other

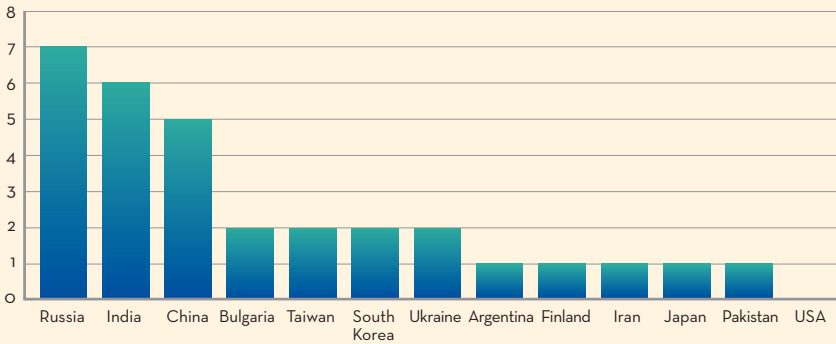
Project Size (MW)



Interpretation Note: Chart depicts both number and size of power generation projects planned over the years 2002 through 2007 within the Midwest ISO. The size and number of projects, particularly wind and coal power generation, are increasing.

Source: "Proposed Modifications to Generation Interconnect Queue Process," Midwest ISO, June 19, 2007, pg 15

Exhibit 6

Nuclear Units Under Construction Worldwide

Source: Nuclear Energy Institute

significant competitive advantage. An internal study at the Nuclear Energy Institute (NEI) identified the challenges facing the U.S. domestic nuclear effort:⁴

- Timely Component Design and Engineering
- Limited Raw Material and Subcomponent Supply
- Lack of Training and Supervision of the Manufacturing Work Force
- Limited Suppliers of Nuclear Components
- Limited Forging Capability

Utilities face arduous permitting and lengthy design processes, making any significant construction work in the next two to three years unlikely. Forward-thinking contractors will begin positioning and building their capabilities in the nuclear sector.

POWER TRANSMISSION AND DISTRIBUTION FORECAST

The 2003 power blackout made salient a festering problem: The transmission and distribution (T&D) grid is old, overloaded, and in need of significant enhancements. The prospect of additional work stemming from capital improvement campaigns is

“We need to invest \$5 billion over the next five years to update our aging power generating and delivery infrastructure and to increase our focus on energy efficiency and renewable energy.

We believe we have the solution. As you may have heard, we have announced merger plans with [Macquarie] who is focused on the long term.”

— Stephen P. Reynolds, Chairman,
President and CEO, Puget Sound Energy

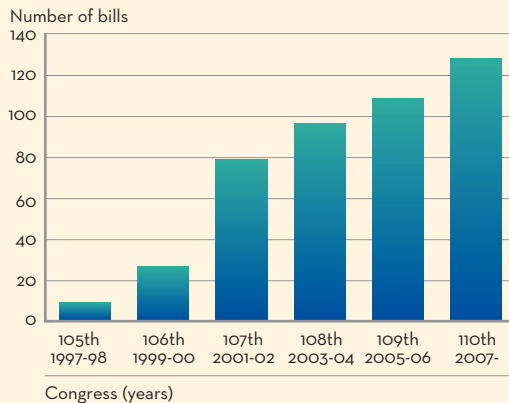
balanced in 2008 by the recently depressed domestic housing market and rising construction costs, both of which are slowing some distribution-related spending. The confluence of factors leads FMI to a modest growth forecast of 4% for T&D spending in 2008, though this still marks an improvement over 2007. According to the Edison Electric Institute, U.S. transmission capacity has not kept up with rising electricity demand, which has increased 20% over the

last decade. If legislative mandates included in the 2005 Energy Policy Act can maintain the pressure on utilities to invest in their T&D infrastructure, then T&D construction work will be abundant. Despite the mounting political opinion for utilities to reduce emissions — the 110th Congress introduced more climate-related bills in 2007 than any previous Congress has over a two-year term — little legislation has been passed to mandate significant changes. In part due to the impending election, political grandstanding once again trumps environmental action. (See Exhibit 7.)

On Aug. 15, 2007, the National Association of Home Builders (NAHB) reported that the NAHB/Wells Fargo Housing Market Index had reached its lowest level since January 1991, a recessionary time period. The index gauges builder perceptions of current single-family home sales and sales expectations for the next six months. Despite the poor housing market, both high demand for infrastructure improvements, and commercial and municipal market expenditures remain strong. Capital spending on T&D is still forecast to increase in 2008. (See Exhibit 8.)

The cost of T&D work continues to rise. According to the Handy-Whitman Index of Public

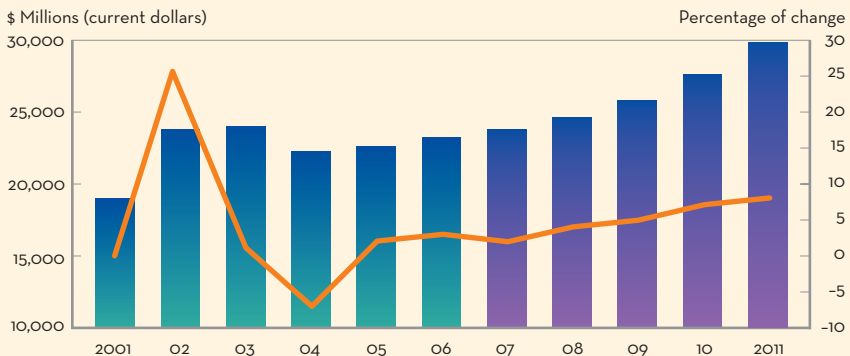
Exhibit 7
Climate-Change Bills Introduced in Congress — 1997-2007



Source: 2007 Congressional Record

Exhibit 8
Electric/Gas Transmission and Distribution Construction Put in Place Historical Figures and Forecasts

■ Electric/gas transmission/distribution
■ Electric/gas transmission/distribution forecasts
— Electric/gas transmission/distribution spending change



Source: Building permits, construction put in place, and trade sources. FMI prepared forecasts for 2007-2011

“Our priorities are to upgrade our energy-delivery network and invest in transmission projects that will strengthen the grid within our adjoining footprint ... and to continue to improve our existing facilities.”

— Michael G. Morris, CEO of AEP

Utility Construction Costs, T&D costs have increased an average of 4.8% and 5.4% per year, respectively, since 2003. Factors that will continue to drive construction costs upward in 2008 include increased competition for crucial resources such as steel, aluminum, and labor. Copper prices averaged 10% higher in the first three quarters of 2007 as compared with the same period of

2006 and are forecast to grow by 6% in 2007 and 5% in 2008.⁵ Analysts agree that copper prices will remain high, likely more than \$3/lb, through 2008, but no consensus exists after that. International demand from the likes of China, India, and Brazil will dictate copper and most commodity prices moving forward to the next decade.

Even with some analysts predicting an economic downturn, FMI's forecast remains optimistic for all power utilities due to the industry's stellar debt rating and steady returns over the last half-century. Standard and Poor suggests utilities will have access to more capital as lenders compete for their high credit-quality business. Capital inflows from mergers and acquisitions activity and international investors will also contribute to the sector's growth. According to a KPMG survey that solicited input from 40 utility and power executives, 87% of those polled expect to see consolidation in their national markets during the next three years.⁶

Increased competition and emissions regulation mean that utilities are taking advantage of both new funding and technological advancements as they continue to update their aging infrastructure:

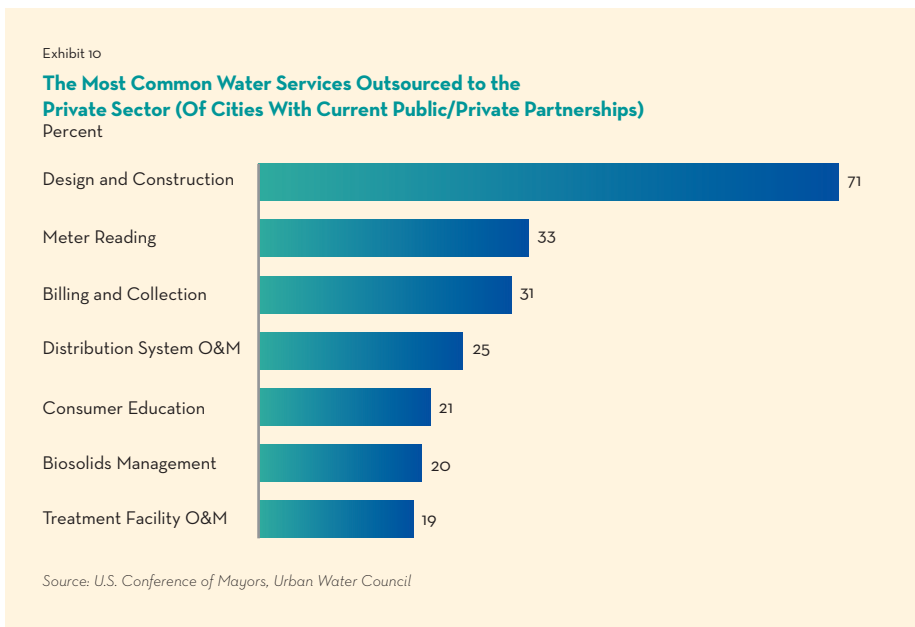
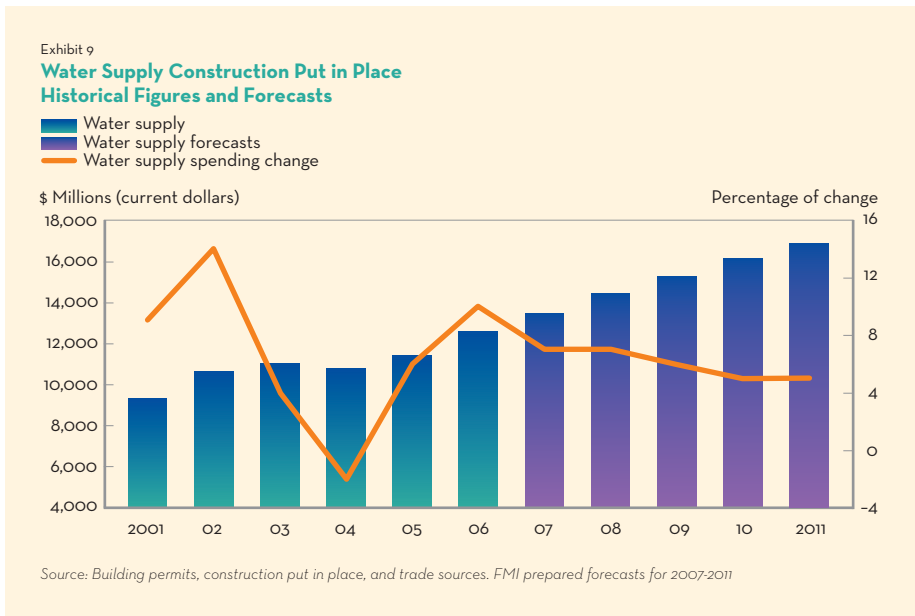
- The superefficient High Temperature Superconductor (HTS) wire will make its debut in an urban environment during 2008 when Consolidated Edison, the U.S. Department of Homeland Security, and the American Superconductor team install HTS in New York City's grid. The \$40 million project is scheduled for a system demonstration by the end of 2008 since new cables can be placed into the existing underground tunnels and ductwork.
- Ameren announced last year that it would commit \$1 billion (over and above the \$500 million budgeted) toward reliability and environmental performance through 2008.

WATER SUPPLY FORECAST

While water supply spending is expected to increase 7% in 2007, growth now and over the next four years is forecast at the lowest levels since 2004. FMI expects water supply construction growth to be limited by residential construction setbacks; the need for updated processing facilities to increase delivery capabilities; and a lack of funding. Since 2005, water construction spending has been trending up, but the bottoming-out of the housing market and the lack of funding have curbed FMI's outlook for both water-supply and wastewater-construction spending. (See Exhibit 9.)

Water-supply spending is already facing significant capital shortfalls so its slowed growth does not bode well for the continuing need for infrastructure maintenance and new infrastructure construction related to water. According to a report released by the

Water Infrastructure Network, the United States spends upwards of \$15 billion to \$20 billion on new water and wastewater construction annually.⁷ An additional \$23 billion a year is needed to replace aging infrastructure and comply with federal water regulations;⁸ it is this replacement funding that is largely absent. One solution to the dearth of funds — privatization — has been gaining ground. Currently, 40% of cities have at least some form of outsourcing or public/private partnership for water services, and an additional 14% are considering the option of a partnering agreement.⁹ Of those 40% that do employ the private sector, most cities buy design and construction services while other services are used much less frequently. (See Exhibit 10.) The use, however, of these outsourced services is trending up.



Three main criteria are driving the move to privatize:

- *Lack of funding:* Plans exist for much of the necessary capital infrastructure upgrades and expansion, but a financing shortfall prevents spending.
- *Environmental regulation:* Compliance with federal, state, and municipal regulation will also drive the use of privatization as an alternative to tax increases. Consent decrees¹⁰ are being used with greater frequency in order to force municipalities to address inappropriate discharges.
- *Perspective shift:* The driver with the most potential to influence privatization is the change in ideology among the nation's leaders. These leaders are recognizing that the way water problems have been handled will not resolve future problems. New ideas must solve old problems.

The use of alternative financing solutions is one part of the answer to the nation's deteriorating water infrastructure, but success ultimately hinges on the emergence of sustainability thinking in the construction industry. Water restrictions are becoming a fact of life for many Americans, even in relatively wet East Coast and Northwest geographies. Many of the green products currently used by the water industry focus on conservation, such as waterless urinals in corporate skyscrapers and rainwater reclamation systems for irrigation. Water customers are seeking new solutions. Mike Floyd, president of Charlotte, N.C.-based McCall Brothers, one of the state's largest well-drillers, reported a recent dramatic increase in well drilling by customers attempting to offset municipal water restrictions. "They may already draw water from a municipal source, but don't want to have to pay rates or comply with water restrictions," he said.¹¹ In order for significant gains in efficiency, and in turn capacity, to be made, the water supply sector will require technological advances focused on material composition as well as conservation.

SEWAGE AND WASTE DISPOSAL FORECAST

The sewage and waste disposal sector faces many of the same issues as water supply. Both markets demand considerable amounts of capital funding to care for their old and overcapacity systems. As public pressure mounts to upgrade the aging and inefficient systems, wastewater plants and pump station construction will experience capital expenditure growth between 7% and 10% over the next five years. Forecasted new or replacement wastewater pipeline construction growth is more conservative at 4% to 6% through 2011 due to a repeated lack of action in replacing sewer pipelines. Total spending in this segment should grow at 6% to 7% annually. (See Exhibit 11.)

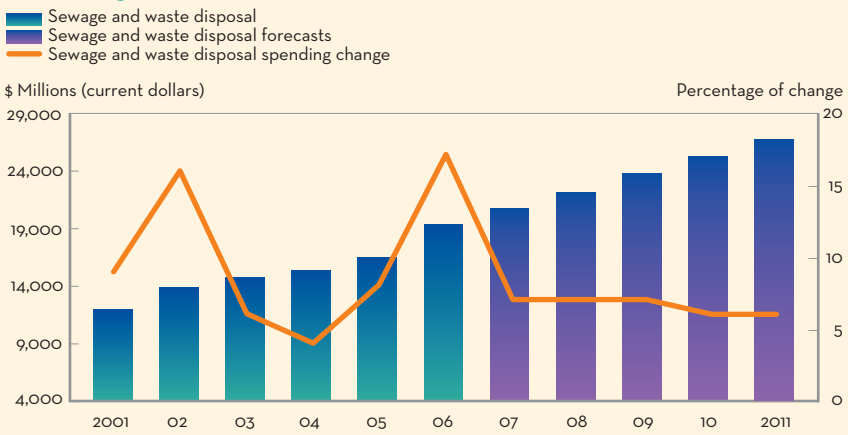
As high-profile system failures and waste releases bring public attention to the ailing sewage and waste disposal infrastructure, the sector's next hurdle is financial. The funding gap is large, and many organizations have tried to estimate the size of it over the next 20 years:

- The Environmental Protection Agency (EPA): \$76 billion to \$534 billion
- The Congressional Budget Office (CBO): \$292 billion to \$822 billion
- The U.S. Government Accountability Office (GAO): \$300 billion to \$1 trillion
- The Water Infrastructure Network (WIN): \$1 trillion

On a local level, the continued increases in federal regulations and mandates, coupled with a decreased allotment of federal funding to wastewater infrastructure, have placed huge strains on local governments to meet these new guidelines on their own. Currently, states' clean water revolving loans account for less than 10% of spending for wastewater infrastructure projects.

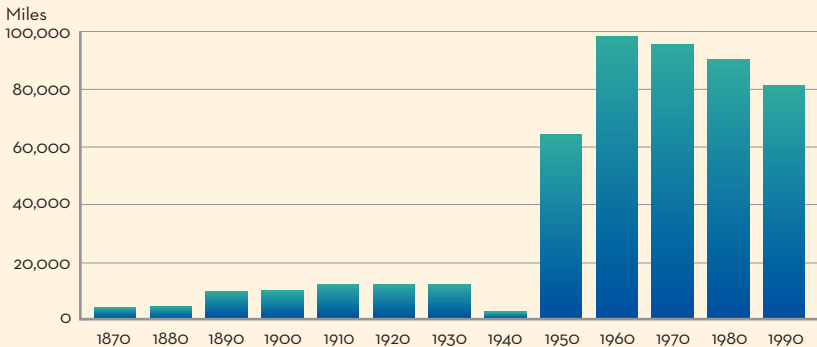
Funding issues aside, construction of new sewer pipe continues. The EPA estimated that between 1960 and 1990 more than 80,000 miles of sewer pipe were installed annually. (See Exhibit 12.) The EPA used population, urban density, and public

Exhibit 11
Sewage and Waste Disposal Construction Put in Place
Historical Figures and Forecasts



Source: Building permits, construction put in place, and trade sources. FMI prepared forecasts for 2007-2011

Exhibit 12
Miles of Installed Sanitary Sewer Pipe



Source: Environmental Protection Agency (EPA) 2002. "The Clean Water and Drinking Water Infrastructure Gap Analysis"

sewerage systems data reported by the U.S. Census Bureau to reach these estimates.

Although construction of new wastewater pipes is increasing, it cannot keep pace or make a dent in the increasing average age of the wastewater pipe network.

According to the EPA, even if the U.S. invests in the replacement of all pipe at the end of its useful life, the average age of pipe will continue to increase through 2050. (See Exhibit 13.)

While the likelihood of a catastrophic failure is low in this construction type, the “slow bleeding” of minor failures is accumulating. Rate increases and operating efficiencies, such as economies of scale and asset management, alone will not provide the needed funds for the current backlog of capital improvement projects. Novel approaches and new funding streams must be recognized and successfully implemented to stabilize wastewater infrastructure.

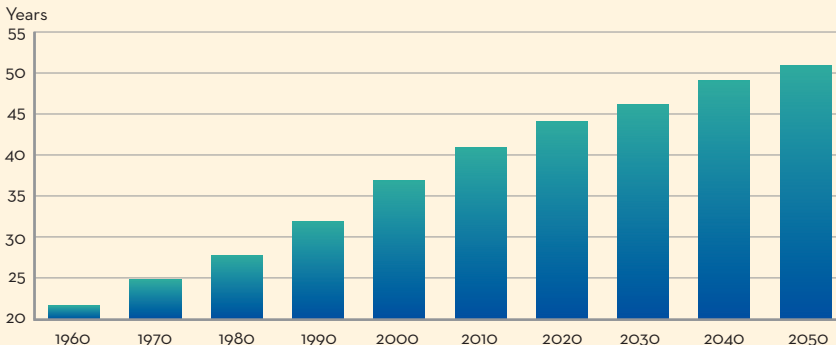
COMMUNICATIONS FORECAST

During 2006, spending on communications-related construction experienced its largest increase since the dot-com era, reaching more than \$15 billion. The cyclical nature of communication spending indicates 2001’s record levels will again be reached in 2009. Spending growth is expected to level off after 2007’s strong 12% rise to a more modest 5% to 8% annual rate through 2011. (See Exhibit 14.)

The following factors will drive the communication sector’s capital construction in 2008 and beyond: increasing usage, access, and storage capacity; security requirements; and infrastructure upgrade demands. Spending growth will be focused primarily on enhancing existing infrastructure. Communication service providers have invested

Exhibit 13

Average Age of Wastewater Pipe Network

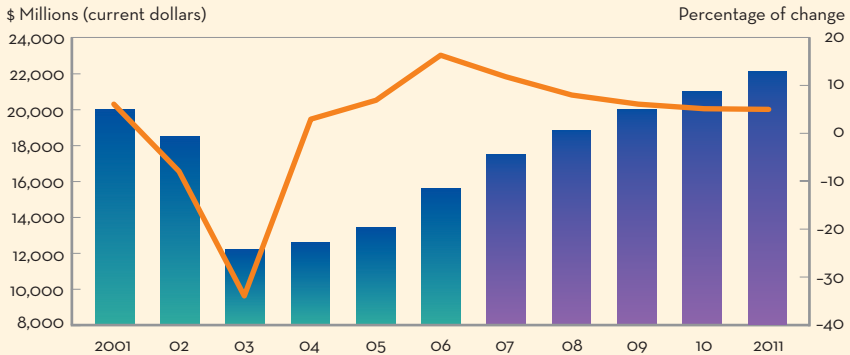


Source: Environmental Protection Agency (EPA) 2002. “The Clean Water and Drinking Water Infrastructure Gap Analysis”

Exhibit 14

Communication Construction Put in Place Historical Figures and Forecasts

- Communication construction
- Communication construction forecasts
- Communication construction spending change



Source: Building permits, construction put in place, and trade sources. FMI prepared forecasts for 2007-2011

more than \$110 billion in network upgrades over the last decade. Experts agree that this investment will increase over the next decade as technologies become more complex and services require equipment that is more sophisticated in order to operate effectively.

Wireless infrastructure continues to absorb a majority of new communications construction spending. Estimates put worldwide mobile phone users at three billion by year-end. The recent bandwidth-intensive trend to bundle voice and data transmissions will fuel the demand for infrastructure growth. According to In-Stat, a leading market research firm for communications services, the number of cellular base stations installed in the United States jumped 15% in 2007, after several years of single-digit growth. Every major wireless service provider is enhancing networks to provide faster service and higher-performance connection speeds, as demand for 4G services takes precedence over 3G.

Government regulation looms as one check on the sector's capital spending. Many providers are opting to rely on existing infrastructure as more stringent regulatory standards require expensive disaster protection and security upgrades that eat up capital spending. IDC, a telecommunications industry research company, estimates that businesses worldwide spent \$70 billion on communication, security, and business continuity technology systems in 2003, and IDC predicts that number will increase to more than \$120 billion by 2010.

CONCLUSIONS AND IMPLICATIONS

Utility contractors can be confident that their services will continue to be in high demand. Many of FMI's contractor clients report record backlogs, and owner clients report increasing capital spending budgets. FMI's 2008 forecast indicates that capital

"The world we have created today as a result of our thinking thus far has problems that cannot be solved by thinking the way we thought when we created them."

— Albert Einstein

spending by utilities will continue to outpace virtually all other industries. FMI expects an increasing number of utilities to look to outside service providers to fill the talent void and to support the growing demand for capital construction spending. The shifting regulatory climate will favor those contractors that can stay abreast of legislation on both a federal and state

level (where the pace of change is much faster). Renewable energy, green building, and other climate or environmentally sensitive trends will win favor in the short term and dominate in the long term. Contractors that embrace renewable and green technologies to design and construct will build competitive advantage and find a wider scope of work and resources available to them.

That said, "It isn't easy being green" [Kermit the Frog]; but it will be profitable! ■

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¹ Carbon tax is a type of environmental tax, which is imposed on energy sources that emit carbon dioxide. This carbon dioxide is released through the consumption of fossil fuels, such as coal, oil, and natural gases. It is an example of a pollution tax, which some economists favor because they tax a "negative" (emission of carbon dioxide) rather than a "positive" (income).

² Cap-and-trade systems create a financial incentive for emission reductions by assigning a cost to polluting. An environmental regulator establishes a "cap" that limits emissions from a designated group of polluters, such as power plants, to a level lower than their current emissions.

³ "Demand in Solar Energy Industry Drives \$400 Million Hemlock Semiconductor Expansion," Dow Corning Press Release, November 15, 2005.

⁴ "Expanded Manufacturing Capacity Needed to Support New Nuclear Plant Construction," Nuclear Energy Institute Fact Sheet, April 2007, pg 1-3.

⁵ Adapted by FMI from London Metal Exchange pricing history and forecasts prepared by The Australian Bureau of Agricultural and Resource Economics.

⁶ "Powering Ahead: Mergers and Acquisitions in the Global Power and Utilities Industry," KPMG International, 2007, pg. 2.

⁷ "Clean & Safe Water for the 21st Century, A Renewed National Commitment to Water & Wastewater Infrastructure," Water Infrastructure Network, 2000, pg. FS-1.

⁸ "Water Infrastructure Now, Recommendations for Clean and Safe Water in the 21st Century," Water Infrastructure Network, 2007, pg. 1.

⁹ U.S. Conference of Mayors, Urban Water Council

¹⁰ A consent decree is a judicial decree expressing a voluntary agreement between parties to a suit, especially an agreement by a defendant to cease activities alleged by the government to be illegal in return for an end to the charges. Utilities operating under a consent decree are required to address the activity in question, typically the release of effluent, pollution etc.

¹¹ Lim, Peggy, "Wells Begin to Come Up Dry," *The News & Observer*, The News & Observer Publishing Company, August 20, 2007, pg A1.

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