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Many Cyclical Markets Share Common Underlying Structure

Pork production, engineering student enrollments, the oil tanker industry, real estate. What do they all have in common? They experience "boom and bust" cycles at regular intervals. Why is that important? Because if managers understand that widely diverse phenomena often share the same underlying structure, they can transfer learning from one situation to another more easily and make better, more consistent decisions. That's the theory proposed by Bent Bakken, a Ph.D. candidate at the MIT Sloan School of Management, who is studying how system dynamics can facilitate the transfer of learning between different settings.

The tanker industry is typical of any cyclical market, says Bakken. "People invest in new ships when times

are good and demand is high, but they don't sufficiently take into account that other investors are doing the same. So during good times everyone orders more ships and, quite predictably, four to five years later there is an overabundance. Then there is a five to ten year period of low demand for ships, and many old ones are scrapped. Eventually the market goes back up and the same thing happens all over again."

Over a forty year period, he or she decides how many ships (or buildings) to buy, sell, and build. The game keeps score of the player's net profit. The real estate game adds an extra touch of reality—the developer begins in the midst of the currently depressed Boston market, and must navigate his or her firm through the tough times ahead.

Both games—simplified versions of the actual industries—share the same

"The period between peaks in the commercial real estate industry is 18 years; for tankers, 15-20. What takes years to experience in real time takes just minutes in the games."

The basic structure behind the cycle is a negative feedback loop with delays (see *Toolbox*, page 5). When graphed over time, the market shows a series of peaks and valleys.

Bakken has created simulation games of both the oil tanker and the commercial real estate markets. His purpose is two-fold: to help managers better understand long-term cyclical dynamics, and to study their ability to transfer learning from one setting to another. Why these particular markets? "I chose markets that had the same underlying structure, but I wanted them to be different enough so that the similarities would not be immediately apparent to the players" Bakken explains.

In both games, the player assumes the role of a shipping magnate or commercial real estate developer.

core system dynamics model and the same basic lesson: the markets are cyclical because of over-investment in boom years. Although it may sound simple, Bakken cautions that the lesson is not easily learned in the real world, since the period between peaks in the commercial real estate industry is 12-18 years; for tankers, 15-20. What takes years to experience in real time takes just minutes in the games. And, Bakken adds, experiencing a sharp downturn and possibly even going bankrupt gives players a vivid experience of the dangers—and potential opportunities—such cycles create.

What do people in the tanker and real estate industries have to say about the similarities between their businesses? When Bakken presented the

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tanker game to a group of real estate professionals they were enthusiastic about the idea. "As we discussed the game they realized that the long-term

now incorporating the games into systems thinking workshops that will help managers pull out the core lesson and apply it to wide-ranging situations. His work is part of the MIT Systems Thinking and Organizational Learning

the industry just about the time the market began its downturn, so all they have seen is bad times. The game shows them that the market will turn up eventually."

Generic Structures

Bakken's work on the real estate and tanker games is part of an effort to create a broad-based system dynamics management education. "There's a big difference between just telling people that there are a set of 15-20 generic structures that produce most business dynamics and letting them experience it for themselves," he believes.

"If you only show people examples of generic structures and don't let them interact with systems where those structures are working, their understanding will be very abstract. It is unlikely that their behavior will change. But if managers experience the same structure working in various settings, they gain confidence in the existence of such core structures. Then if they learn how to recognize that particular underlying structure they will be able to

dynamics are similar in the two industries and they also realized why they are similar—because of construction lags in the real estate industry and building lags in the tanker industry."

Transferring Learning

As part of his research, Bakken compares players' scores from each game to gauge their ability to transfer learning from one setting to another. His preliminary results have shown that people who play the real estate game first have higher net profits in the tanker game than those who have only played the tanker version. He has also compared the results of players who were similar in all respects except for their knowledge of system dynamics. The result: People with system dynamics experience seem to learn faster and have higher profits.

The reason, Bakken believes, is that "people need access to what I call a 'higher level language' in order to see the common elements between different situations. System dynamics is such a language—it allows people to abstract from the case at hand a core insight that can be transferred to another situation."

The Big Picture

To help facilitate the transfer of learning into the workplace, Bakken is

Research project. As part of the MIT Sloan School's curriculum development, he is also creating stand-alone "management flight simulator" versions of the games to be used at MIT and other business schools.

Bakken feels that much of the benefit that managers derive from the games will stem from the opportunity to step back and think about the system in which they work. "People in the industry are so caught up in day-to-day decisions and information," he ex-

"If managers learn how to recognize a particular underlying structure they will be able to understand what is happening in a new situation and can make better decisions."

plains. "But in order to see the structure they have to take the time to go outside the system to think and reflect."

The games will also help people see the "big picture," which is especially important for younger professionals who have only been in the industry for a few years. "One overwhelming comment from the real estate professionals who have played the game is that it is morale-boosting," Bakken says. "These people entered

understand what's happening in a new situation and can make better decisions." 

Further reading: "For Supertankers, Super Profits," New York Times, December 5, 1989. Also, "Crumbling Castles," Barron's, December 18, 1989.

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