RESEARCH AT DANIELS

SPRING 2016

DANIELS FACULTY AT THE FOREFRONT

Project: EXPLORATION

Welcome to the latest edition of *Research at Daniels*.

There's considerable excitement at the Daniels College of Business this year as we embark on an innovative and comprehensive process to position the College for sustained growth, performance and impact. One of our core priorities is to strengthen the vitality of our academic community in support of our faculty's pursuit of high-quality, rigorous research that influences both the body of knowledge and the practice of business.

In this issue of *Research at Daniels*, I'm really excited to share just a sample of the pioneering, interdisciplinary and collaborative work of our faculty. Among these stories, you'll read about Melissa Akaka's research into an innovative paradigm in marketing logic called value co-creation. You'll get a sense of the influence of blockholders on the divestiture process from Don Bergh as well as an understanding of the options market as a predictor of insider trading from Peter Lung. Anthony Hayter shares his insights on the statistics behind drug expiration dates, among other topics. These and other scholarly endeavors showcase a broad range of Daniels faculty expertise across a variety of disciplines and industries, published in leading academic journals.

As the research in this edition indicates, Daniels faculty members are committed scholars in their respective fields. The generation of knowledge on the part of our faculty, combined with their resolute commitment to student development, represents the nexus of our scholar-teacher model. For Daniels faculty, research and inquiry facilitate our commitment to knowledge transfer. Their insights and theories add to the rigor and relevance of classroom discourse and the many interactions with our students. Equally important, the research of Daniels faculty contributes to the creation of innovative solutions to real-world issues faced by public and private enterprises around the globe. I hope you enjoy reading about our faculty and their research.

Sincerely,

E. LaBrent Chrite, PhD
Dean

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Melissa Akaka
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Innovating Market Innovation

New products on their own don't create value—the people developing and using those products do.

That is the argument of Assistant Professor of Marketing Melissa Archpru Akaka in her 2014 paper, "Innovation through Institutionalization: A Service Ecosystems Perspective," in *Industrial Marketing Management Journal*, co-authored with Stephen Vargo of the University of Hawaii at Manoa and Heiko Wieland of California State University Monterey Bay. Innovation, she argues, is about more than inventing new technologies or products.

"Developing a successful new product or market requires understanding how and why people do things, and then developing novel solutions," Dr. Akaka notes. "The Apple iPhone was more than a new technology; it changed the way people behave. Now, people rely on their ability to check social media 20 times a day and have a camera in their pocket. Being connected has become a social norm."

This reality should change the way businesses approach innovation if they want to increase their chances of success. Companies must systemize a process of value co-creation or risk rolling out products that customers don't relate to or understand. "The research and development and marketing (R&D) departments have traditionally been siloed, with R&D creating products and marketing selling them," Dr. Akaka asserts. "A co-creation approach brings more people into the process of value creation, namely, a wide range of organizations and individuals with different viewpoints."

For the past eight years, Dr. Akaka has studied the co-creation of value under the lens of service-dominant logic, which suggests that service is the basis for all economic exchange and goods only derive value through their use in particular contexts. She often collaborates with the co-founders of this marketing logic, Stephen Vargo and Robert Lusch.

At Daniels, Dr. Akaka teaches students about how firms can better engage with their customers to co-create a unique customer experience that makes them feel like partners in creating value. "These are topics that matter to future marketing practitioners as well as businesses," she explains. In a world that is dynamic and driven by digital technology and globalization, technological and market innovation must start with a broad understanding of the problem or opportunity. "What needs addressing, solving or improving in customers' lives? If companies can think through the usefulness of their offerings and bring multiple stakeholders together, it will lead them to better innovation."

Melissa Archpru Akaka, PhD, is an assistant professor in the Department of Marketing. Her research interests include value and value co-creation, innovation and market reformation. For more information, visit: daniels.du.edu/melissa-akaka

Donald Bergh, PhD, is the Louis D. Beaumont Chair of Business Administration and a professor in the Department of Management. He researches divestitures, mergers, diversification and business strategy. For more information, visit: daniels.du.edu/donald-bergh

Donald Bergh
PhD, Strategic Management, University of Colorado | MBA and BS, Marketing, Utah State University

Pulling Back the Curtain on Corporate Divorce

Since the early 1990s, Management Professor Donald Bergh has researched corporate breakups. That's led him to study a variety of factors and stages of the breakup process, including the role that stockholders play in corporate decision-making.

"Movies like *Wall Street*, *Working Girl*, and *Other People's Money* played out story lines where investors would accumulate controlling interests of underperforming companies, break them up and auction off business lines to make profits," explains Dr. Bergh. "We're seeing a variant of this today."

In his recent paper, "How Far Do Owners Reach Into the Divestiture Process? Blockholders and the Choice Between Spin-Off and Sell-Off," in the *Journal of Management*, May 2015, coauthored with Barton Sharp of Northern Illinois University, Dr. Bergh investigated large investors that own 5 percent or more of a firm's outstanding common stock—called blockholders—and whether they shape how firms divest. "I wanted to see if large owners influence the selection of divestiture options and whether those decisions benefitted both owners and divesting firms."

In testing 205 divestitures from 1990 to 1999, Dr. Bergh found that spin-offs are more frequently associated with large owners holding more of the divesting firm's outstanding stock. These divestitures transfer the divested unit's ownership to its shareholders, enabling the large owner to decide whether to hold or sell their interests afterward. Sell-offs (a sale of a subsidiary to another business) tended to occur when large owners held less of a divesting firm's stock. Spin-offs usually rewarded the owner, while sell-offs were generally better for the firm.

This is Dr. Bergh's tenth publication in *Journal of Management*, which is ranked third among 115 business journals in scholarly impact. He is the second most-frequently published author in the journal since its inception 40 years ago on a weighted-authorship basis. Known around the world for his work, Dr. Bergh was invited in 2015 to the Rotterdam School of Management at Erasmus University, Netherlands, to lecture on corporate restructuring and how it creates value for firms and their stakeholders.

In the end, divestiture decisions pose risks to both firms and stockholders. "Executives should be aware that blockholders' boundaries don't stop with making suggestions at shareholders meetings," Dr. Bergh notes. "But they aren't in the business of running companies. When it comes to divestitures, it's better for investors to work cooperatively with executives rather than bully their way into making strategic decisions."

Hugh Grove, DBA, is a professor in the School of Accountancy. He researches fraudulent financial reporting detection and corporate governance and teaches financial statement and forensic analysis, understanding financial statements from a user perspective, corporate governance, and business valuation. For more information, visit: daniels.du.edu/hugh-grove

Hugh Grove
DBA, Accounting, University of Southern California | MBA and BA, Accounting, University of Michigan

Using SEC Comment Letters as a Fraud Detection Tool

Protect the investor—that is the mission of the U.S. Securities and Exchange Commission (SEC). Under their rules, public companies must make certain facts about their organizations available to investors and those periodic filings are reviewed regularly to ensure transparency of the capital markets. When the SEC feels a filing could be improved or enhanced, it issues comment letters to filers, which they elected to make available to the public starting in 2005.

Accountancy Professor Hugh Grove, a renowned expert on fraudulent financial reporting detection, notes that SEC comment letters offer insightful information about a firm's valuation, financial condition and future performance. Collaborating with Daniels finance faculty Tommi Johnsen and Peter Lung, Dr. Grove studied the economic significance of the issuance of comment letters—the first research of its kind. "SEC Comment Letters: An Unlikely Secret Weapon for Forensic Accountants, Short Sellers, and Other Financial Statement Users," is forthcoming in 2016 in the *Journal of Forensic and Investigative Accounting*.

"We found that SEC comment letters are an excellent tool to detect financial statement fraud, earnings management and misreporting, but one that is largely overlooked by the market," reveals Dr. Grove. "The minute this information is public—within 20 days of the initial review being issued—the stock price is impacted, and analysts should take note." Dr. Grove's team analyzed 1,200 comment letters issued to companies between 2007 and 2012, using five widely recognized red-flag forensic metrics models that assess companies' financial weaknesses. Dr. Grove discovered that firms receiving comment letters scored higher on those metrics than "unquestioned" firms. They also underperformed in the market for a period of time.

Dr. Grove's study is one of a few to investigate the financial meaning of comment letters—a natural fit with his extensive research background. He has published more than 125 papers and cases and presents frequently around the world on fraudulent financial reporting, corporate governance and related topics.

"It's interesting to look back on landmark fraud cases like Enron and WorldCom and the emergence of the Sarbanes-Oxley Act, and consider whose responsibility it is to detect fraud," explains Dr. Grove. "I've long been interested in this topic, so the goal of this research was to share what we've determined to be an accurate, initial investigative method."

Corey Ciocchetti
JD, Duke University | MA, Religious Studies; BSBA, Finance; BA, Economics, University of Denver

Should Religious Freedom Trump Access to Contraceptives?

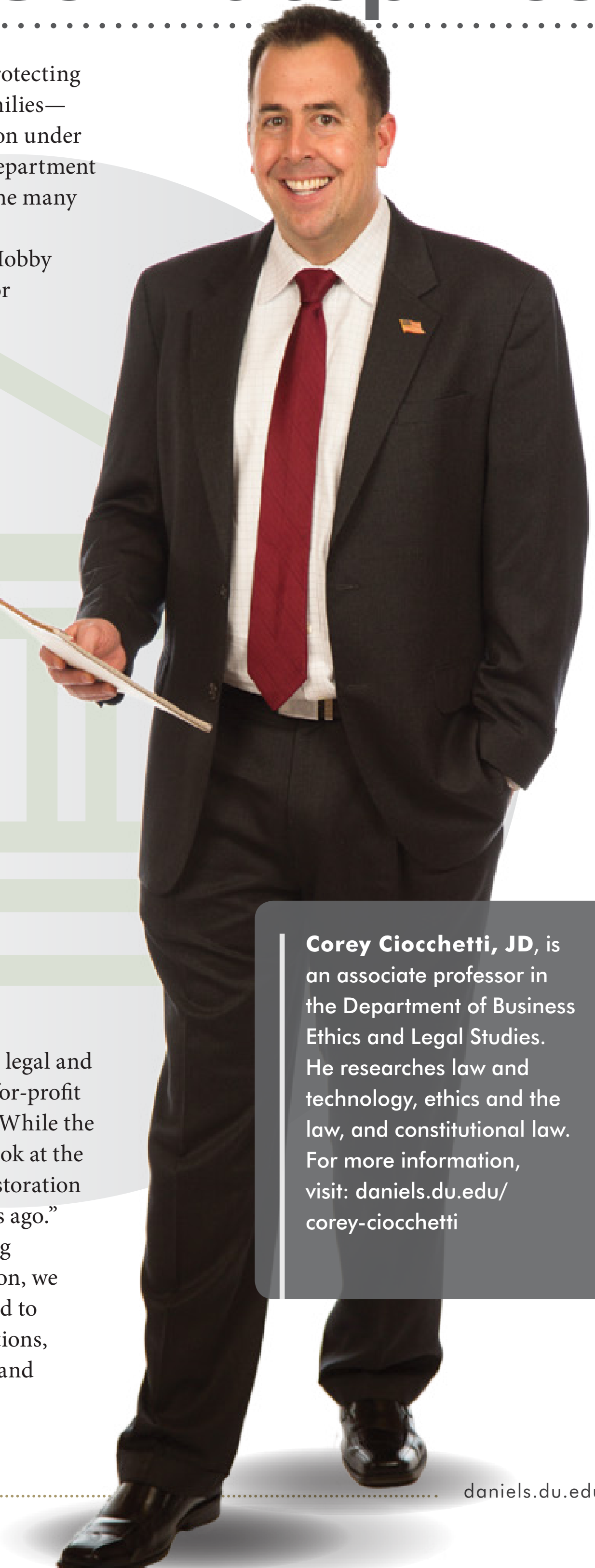
In 2014, the Supreme Court ruled that it was a violation of federal law protecting religious freedom to require corporations controlled by deeply religious families—such as the Green family, founders of Hobby Lobby—to pay for contraception under the Affordable Care Act. Associate Professor Corey Ciocchetti, JD, of the Department of Business Ethics and Legal Studies discusses the Hobby Lobby Case and the many important legal issues and ethical dilemmas this case raised.

In his article, "Religious Freedom and Closely Held Corporations: The Hobby Lobby Case and its Ethical Implications, *Oregon Law Review*, 2015, Professor Ciocchetti studies Hobby Lobby as a company and dissects the Supreme Court case from many angles. In 2012, Hobby Lobby filed a lawsuit in district court against the enforcement of four potentially life-terminating contraceptives—two types of emergency contraception and two types of intrauterine devices—citing its rights under the Religious Freedom Restoration Act and convictions about abortion-facilitating contraceptives. That case made its way to the Supreme Court in 2014 and made international news.

"This case is an interesting combination of business, law and ethics," explains Professor Ciocchetti, who researches issues related to constitutional law, often considering moral and ethical implications. "There are strong arguments on both sides and plenty of questions with complicated answers. Whose job is it to provide contraceptives? Is it society's? A company's? And what if that company is run by religious individuals?"

Professor Ciocchetti analyzes the controversial outcome and the myriad legal and ethical implications of the Supreme Court decision, including the fact that for-profit corporations are now considered "persons" who can hold religious beliefs. "While the decision angered many, the Supreme Court's ruling was proper when you look at the statutes," he notes. "The judges were interpreting the Religious Freedom Restoration Act, which was almost unanimously passed by Congress more than 20 years ago."

Future cases that will inevitably be filed by religious nonprofits will bring additional debate to the forefront. Professor Ciocchetti adds, "As time goes on, we will see how this ruling influences other similar cases. Obamacare attempted to address our nation's desperate need for better, less expensive health care options, especially for women, by putting the costs on employers. But when religion and contraception are involved, it becomes very complicated."



Corey Ciocchetti, JD, is an associate professor in the Department of Business Ethics and Legal Studies. He researches law and technology, ethics and the law, and constitutional law. For more information, visit: daniels.du.edu/corey-ciocchetti

Peter Lung
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The Options Market: A Crystal Ball for Stock Prices?

Prosecutors frequently go after corporate employees or their "tippees" who trade stocks after learning about confidential, inside information, but Peter Lung, Associate Professor of the Reiman School of Finance reveals that informed traders often lurk in the options markets. His recent study looks at certain options market data during the days before analysts change their stock consensus recommendations to buy, hold or sell.

"I wanted to test whether information from the options markets can predict the returns of the stock market," explains Dr. Lung, who collaborated with Darren Hayunga of the University of Georgia's Terry College of Business. Using four measures—option-implied stock price, implied volatility spread, implied volatility skewness, and options-to-stock trading volume—the researchers uncovered abnormal behaviors around the time of analysts' revisions and prior to any movement in the stock market.

Dr. Lung's research, titled, "Trading in the Options Market around Financial Analysts' Consensus Revisions," was published in June 2014 in *Journal of Financial and Quantitative Analysis*, a top-tier academic journal and one of a few elite finance academic journals. This is Dr. Lung's second publication in the journal.

This study is the first to investigate options trading around revision events. "Other studies focus on options trading volume around scheduled corporate events like earning announcements, but few investigate unplanned events such as mergers and acquisitions or takeovers," he notes. Furthermore, Dr. Lung found that investors were very profitable using a zero-cost trading strategy, wherein they held a long position in firms with high abnormal option-implied returns and a short position in firms with low abnormal option-implied pricing returns.

Prior to his academic career, Dr. Lung was a currency options trader for Citigroup. All of his research focuses on informational content in the derivatives market. Specifically, he is interested in the information flow from the options market to the stock market—or, how the stock market behaves after changes and volatility in the options market. "The options market movement proves to be a reliable predictor of stock prices."

Institutional traders can use this information to develop or improve a trading strategy, and the Securities Exchange Commission (SEC) would also be interested in the study. Dr. Lung adds, "The SEC's job is to protect the investor. This research could help them identify insider trading."

Pei "Peter" Lung, PhD, is an associate professor in the Reiman School of Finance and the Denver Clearing House Chair in Finance. He researches equity mispricing and derivative investment strategies. For more information, visit: daniels.du.edu/peter-lung

Anthony Hayter, PhD, is a professor in the Department of Business Information and Analytics. His expertise includes business analytics, statistics, surveys, data analysis, reliability and forecasting. For more information, visit: daniels.du.edu/anthony-hayter

Anthony Hayter
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What Those Drug Expiration Dates Really Mean

Many people have grabbed a bottle of cough syrup or ibuprofen from their medicine cabinet only to discover that the expiration date has passed. But is that date a clean cutoff at which the medicine becomes ineffective? Anthony Hayter, Professor in the Department of Business Information and Analytics, explains that the way pharmaceutical companies determine expiration dates is a matter of statistics—and one that always has room for improvement.

Dr. Hayter and colleagues from Mahidol University and Chulanlongkorn University in Thailand and University of Southampton in the United Kingdom set out to study the standard method of drug shelf-life estimation used by the U.S. Food and Drug Administration and compare it to new methodologies. Their article, "Estimating Drug Shelf-life with Unknown Lot-to-lot Variability," was published by *Communications in Statistics – Simulation and Computation* in 2015.

"Regulatory bodies that mandate this say that an expiration date should be the date that a drug becomes 90 percent effective," states Dr. Hayter. "The pharmaceutical industry spends millions of dollars every year running stability studies to estimate that effectiveness the best they can." The calculation is complicated, Dr. Hayter adds, especially when taking into account any variability between different doses of a drug. "There is no way to determine with 100 percent confidence that all 30 tablets in a prescription bottle magically become 90 percent effective on the same date—each dose might be slightly different."

Outside of the pharmaceutical industry, Dr. Hayter has coordinated teams of researchers all around the world to study the banking, health care, microfinance, timber, and other industries. Much of the work for his latest article was conducted as a Fulbright scholar in Thailand in 2014, where Dr. Hayter collaborated with faculty from two of Thailand's leading universities. He has also researched and analyzed clinical trials to assert the efficacy of new drug treatments.

As for the implications of Dr. Hayter's research, his main interest is to improve efficiency and minimize waste for companies disposing of drugs that are indeed still effective. "If we can come up with better ways to estimate drug shelf-life, consumers are safer, pharmaceutical companies are more profitable and the industry is more effective all around."

Lijia "Karen" Xie, PhD, is an assistant professor in the Fritz Knoebel School of Hospitality Management. Her research focuses on digital marketing, managerial intervention in social media, and customer conversion on the path to purchase through the lens of big data analytics. For more information, visit: daniels.du.edu/lijia-karen-xie

Karen Xie
PhD, Business Administration, Temple University | MPhil, Management, Hong Kong Polytechnic University | BMgmt, Fudan University

Big Data and Hotel Searches:

Convincing Customers to Click and Book

When it comes to online travel planning, what exactly convinces someone to move from the browsing to the booking stage? Karen Xie, Assistant Professor in the Fritz Knoebel School of Hospitality Management, states that there are certain "informational cues" that are shown during the online hotel search process that influence a customer to move further down the path to purchase.

Knowing as much as possible about customer behaviors is essential for the online travel agency industry—think Expedia, Travelocity and Priceline—which sees hundreds of millions of web visitors each month. According to Dr. Xie, "Agencies obviously want to increase the percentage of customers who book hotels, so they constantly seek new approaches to understanding what makes them buy."

Working with Young Jin Lee, assistant professor in the Department of Business Information and Analytics, Dr. Xie studied data provided by one of the big players in the online travel agency industry. The clickstream dataset of nearly 40,000 search queries for almost 82,000 hotels (between late 2012 and mid-2013) represented the first time that the "electronic trail" of digital travel behavior has been used in hospitality research.

Dr. Xie's article, "Hotels at Our Fingertips: Understanding Consumer Conversion from Search, Click-through to Book," currently under review, offers fresh insights into how a potential customer becomes a customer. "This entirely new data source—actual clicks of customers searching for hotels—is far more reliable than data sources like surveys or interviews, which are subject to measurement errors."

The findings confirm that consumers rely on a hotel's search position, ratings, price and promotional incentives, and brand affiliation to make their decisions. Consumer-generated ratings are far more convincing than industry-endorsed ratings in consumer conversion and even subtle price differences can make a major difference in a consumer's likelihood to purchase. Unlike previous studies of online hotel and travel searches, Drs. Xie and Lee offer an integrated perspective—from search through booking—on consumer response to a sequential, connected decision-making process.

The professors' interdisciplinary approach used big data analytics to make sense of a large sample of activities-based behavior metrics. "In the online travel agency industry, customer conversion is the primary goal," Dr. Xie explains. "Business analytics can offer these companies the tools to understand their customers' behaviors. With that knowledge, they can optimize the online search process."

Glenn Mueller
PhD, Real Estate and Finance, Georgia State University | MBA, Babson College | BSBA, Finance, University of Denver

Where are we in the Real Estate Cycle?

Every investor knows that real estate, like the economy, goes through cycles—but Glenn Mueller, Professor in the Franklin L. Burns School of Real Estate and Construction Management, has long purported that there are two separate cycles: physical and financial.

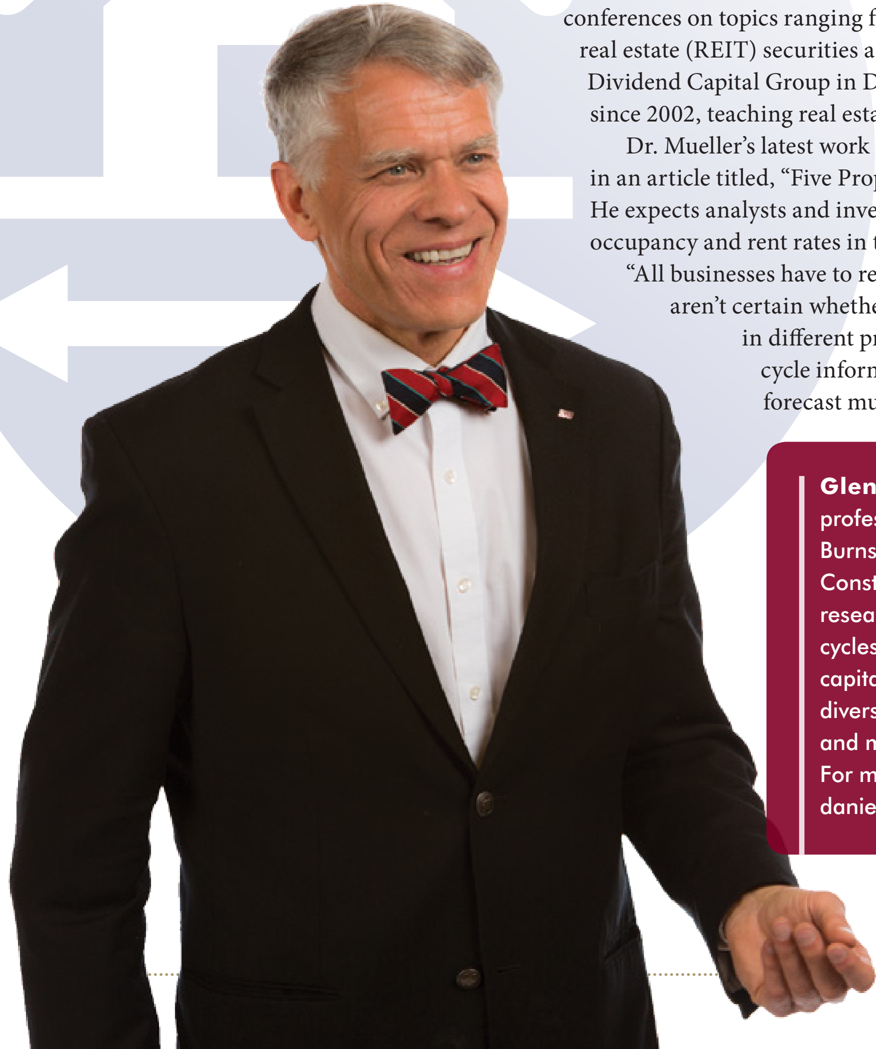
Over the past two and a half decades, Dr. Mueller has earned a reputation as a top expert in commercial real estate on the topics of supply and demand driving occupancy and rent (the physical cycle) and capital flows driving prices (the financial cycle). Since 1992, he's produced a quarterly market cycle report on the five major commercial property types—office, industrial, retail, apartment, and hotel—which now covers 54 major U.S. metropolitan markets. He speaks frequently around the country on market cycles. In addition, Dr. Mueller has also produced a quarterly Market Cycle Forecast report since 2008.

Recently, Dr. Mueller and Richard Evans of the University of Memphis used Markov chains—sequences of random events whose probabilities are not dependent on past actions—to analyze 23 years' worth of historical data from Mueller's Cycle Monitor reports. "Andrey Markov was an academic who came up with a way to analyze any process—from the economy to the stock market," states Dr. Mueller. "Before this paper, applying his model to real estate cycles hadn't been done. The goal is to increase the accuracy of my forecasts to better predict future real estate cycle movements."

Outside Daniels, Dr. Mueller presents his research at national and international conferences on topics ranging from market cycle analysis to portfolio strategies and real estate (REIT) securities analysis. He's the real estate investment strategist for Dividend Capital Group in Denver and a visiting professor at Harvard University since 2002, teaching real estate finance and development.

Dr. Mueller's latest work is forthcoming in the *International Real Estate Review* in an article titled, "Five Property Types' Real Estate Cycles as Markov Chains." He expects analysts and investors to use the research to better estimate future occupancy and rent rates in the cities where they invest.

"All businesses have to rent or buy space as a part of doing business, but most aren't certain whether it is better to rent or buy—and the answer is different in different property markets," he claims. "Using this model, historic cycle information and forecasted macro-economic factors help us forecast much more accurately for all decision makers."



Glenn Mueller, PhD, is a professor in the Franklin L. Burns School of Real Estate and Construction Management. He researches real estate market-cycles, REIT securities, real estate capital markets, portfolios and diversification, seniors housing, and market-investment strategies. For more information, visit: daniels.du.edu/glenn-mueller

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What is the Institute for Enterprise Ethics?

The Institute for Enterprise Ethics was established at the Daniels College of Business as the vehicle to extend the College's expertise and resources in business ethics to the practitioner community of executives, officers and directors of commercial and social enterprises in the region. With its focus on enterprise ethics and compliance, enterprise leadership and governance, and enterprise social responsibility and sustainability, the Institute's mission is to help executives, officers and directors keep their organizations at the forefront of business ethics.

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