

REAL ESTATE ISSUES

Published by THE COUNSELORS OF REAL ESTATE Volume 33, Number 1, 2008



THE ECONOMY AND THE MARKET

Leadership Roundtable: Economic and Market Trends in
Second Half of 2007 and Early 2008: An Assessment and Outlook

*Panelists: Raymond G. Torto, Ph.D., CRE; Kenneth P. Riggs, Jr., CRE;
Alan C. Billingsley, CRE; Moderator: Peter C. Burley, CRE*

Deflation Risk in Income-Property Investments and Permanent Loan Portfolios:
A 2008 Update

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Seizure in the Capital Markets and Its Impact on
Washington's Investment-Grade Office Building Deal Volume

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Home Price Indices Futures

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THE LAND

Rebuilding After Katrina: An Owner's Perspective Two Years Later

John A. Meltzer, CRE, CCIM, and Noah Shlaes, CRE, FRICS

How Major Hurricanes Impact
Housing Prices and Transaction Volume

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Published by The Counselors of Real Estate, a not-for-profit organization of the National Association of REALTORS®, 430 N. Michigan Ave., Chicago, IL 60611.

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Third class postage paid in Chicago. *Real Estate Issues* publishes three times annually. Subscription rates are: \$48 for one year (3 issues); \$80 for two years; \$96 for three years; \$42 per year to students and faculty; \$54 foreign rate, submit in U.S. currency; single copy \$15. Remittances may be made by credit card or personal check, payable to The Counselors of Real Estate. Remittances, change of address notices, undeliverable copies, orders for subscriptions and editorial material should be sent to *Real Estate Issues*, The Counselors of Real Estate, 430 N. Michigan Ave., Chicago, IL 60611. Phone: 312.329.8427; Fax: 312.329.8881; E-mail: info@cre.org; Web site: www.cre.org

Library of Congress card number LC 76-55075

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Real Estate Issues: An Assessment and Outlook

*Panelists: Raymond G. Torto, Ph.D., CRE; Kenneth P. Riggs, Jr., CRE;
Alan C. Billingsley, CRE; Moderator: Peter C. Burley, CRE*

Is the U.S. economy headed for recession? Is it already there? With home sales falling to their lowest level in decades, equity markets swinging wildly, debt markets in turmoil, and employment growth falling negative for the first time in years, economists are divided as to whether the economy is in, or headed for, recession. Whether we are headed for recession, a slowdown or otherwise, changes in the economy could have profound implications for the property markets. Looking for wise counsel and rational perspective, Associate Editor **Peter C. Burley, CRE**, turns to three of the sages in our midst for an assessment of the economy and property markets, as we begin a new year.

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Deflation Risk in Income-Property Investments and
Permanent Loan Portfolios: A 2008 Update

Marc R. Thompson, CRE

In this updated article (originally published in *Real Estate Issues*, Summer 2003), the author suggests that in recent years, the CMBS markets created a “hustle and flow” income-property loan production environment that encouraged aggressive loan underwriting standards and helped to inflate valuations of income properties—all of this leading to significant risk of income-property defaults. An analysis of CMBS loan portfolio compositions and leverage trends by the author shows there is subprime debt in the CMBS markets that has a high risk of defaulting. The rise in CMBS loan defaults, together with a tightening of CRE loan underwriting standards and the possibility of recession, may also increase deflation risk on income-property values. Commercial banks will not be immune to this potential deflation contagion, concludes the author, since many were eager to compete with CMBS, lowered their loan underwriting standards, and accepted higher property valuations to originate new loans. As a result, commercial banks will likely require tighter loan underwriting and higher risk-adjusted interest rates, which will reduce expected investment return yields for CRE property investors.

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Seizure in the Capital Markets and Its Impact on Washington's Investment-Grade Office Building Deal Volume

Oakleigh J. Thorne, CRE

The impact of defaults in the residential subprime mortgage loan market has leached into global credit markets. Market makers from New York to Los Angeles pooled these and other rated collateralized debt obligations into highly complex investment securities and sold them to Wall Street investors (both individuals and firms). Although the growth in commercial mortgage-backed securities pooling slowed in 2007, the commercial market now finds that it is an unintended victim of the underwriting failures of the residential sector.

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Home Price Indices Futures

Damir Tokic, Ph.D., and Stjepko Tokic, J.D.

This article analyzes the potential use of the Chicago Mercantile Exchange (CME) housing futures for hedging, arbitrage and speculative purposes. We argue that because of the lack of volume in listed contracts, CME housing futures are not likely to attract hedgers, arbitrageurs or speculators. However, CME housing futures can be very useful in stabilizing the housing market, at least in the short term, should home prices "free fall."

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Rebuilding After Katrina: An Owner's Perspective Two Years Later

John A. Meltzer CRE, CCIM, and Noah Shlaes, CRE, FRICS

This article examines the process of rebuilding a 360,000-square-foot commercial portfolio in Greater New Orleans post-Katrina, from securing the properties post-devastation to reconstruction and lease-up. The review focuses on the shift in skills and resources needed to work with contractors, tenants, mortgage holders, insurers, property management, and governments in a post-catastrophe environment.

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How Major Hurricanes Impact Housing Prices and Transaction Volume

Eli Beracha, Ph.D., and Robert S. Prati, Ph.D.

This study investigates the near-term effects of hurricanes on residential real estate. Specifically, the authors examine changes in sales price and transaction volume in U.S. Zip Codes directly hit by major hurricanes between August 2004 and October 2005. Evidence suggests changes in home prices and transaction volume in the affected Zip Codes experience a temporary dip during the first two quarters following a major hurricane, followed by a positive correction—a pattern exhibiting characteristics resembling a short-term reversal consistent with the overreaction hypothesis. Examining one full year following a hurricane, little evidence emerges suggesting a lingering effect on residential real estate prices.

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About Real Estate Issues

Editor's Statement

BY MAURA M. COCHRAN, CRE



*"Everything you know, I taught you.
I did not teach you everything I know."*

THESE WERE THE WORDS of an investment banker who was providing me documentation for a pool of low-income, tax credit apartments for which Bartram & Cochran was performing the due diligence. That was 12 years ago, and I remember the impact it had on me. My reaction was, "Is this guy stupid? Now I have to throw out all his market data and assumptions and start from scratch."

In talking to other CREs over the years, similar war stories are told. In part, our jobs were made easier with more market knowledge being made available. Tight timelines were (and always will be) an issue in completing assignments, and some colleagues reported buying at cap rates that were hard to justify. While we as an organization cannot set industry standards for underwriting, we do set a standard for integrity and not taking information provided to us at face value. This issue of *Real Estate Issues* (REI) examines some of the current problems and possible trends playing out in today's real estate environment and economy—hopefully, you'll find some valuable insights in the material.

"Housing markets continue to crash. Financial markets are in turmoil. Employment is slowing. Spending is starting to slow. The Federal Reserve seems a little spooked, trimming its official forecast for 2008, and aggressively easing policy. The dollar is at a new near-term low."—Peter Burley, CRE

So begins our lead article in this issue of REI, a roundtable comprised of four nationally renowned economists and forecasters: CREs **Peter Burley**, **Ray Torto**, **Ken Riggs** and **Alan Billingsley**—each giving an assessment of the economy, employment, housing, financial market implications, the dollar, and property markets. This is an article that should be circulated in your office and among your clients.

"The only difference between the chaotic stock market and income-property sales is time scale."—Marc Thompson, CRE

CRE Marc Thompson sent his article "Deflation Risk in Income-Property Investments and Permanent Loan Portfolios: A 2008 Update" just as we were going to press. It is a great add-on to the economists' roundtable, and provides more background regarding underwriting standards and the capital markets.

"Global trading in the world's foreign exchange market has jumped from about \$70 billion per day in the 1980s to over \$3.2 trillion per day in 2007."—Oakleigh Thorne, CRE

"Seizure in the Capital Markets" provides an in-depth analysis of international capital markets and their impact on real estate in the United States, as exemplified in the Washington, D.C. office market, but applicable to any of the major U.S. cities.

"CME housing futures and options are the first comprehensive financial tools that make it possible to trade U.S. real estate values."—Stijepko Tokic, J.D., and Damir Tokic, Ph.D.

This article takes a look at investing in real estate in a new light. "Home Price Indices Futures," by **Stijepko Tokic, J.D.**, and **Damir Tokic, Ph.D.**, analyzes the potential use of the Chicago Mercantile Exchange housing futures for hedging, arbitrage and speculative purposes. It is an interesting concept that might be an attractive alternative for institutional and private equity investors.

"One full year after a hurricane, little evidence emerges suggesting a lingering effect on residential real estate prices."—Eli Beracha, Ph.D., and Robert Prati, Ph.D.

In their article “How Major Hurricanes Impact Housing Prices and Transaction Volume,” authors **Eli Beracha, Ph.D.**, and **Robert Prati, Ph.D.**, provide data that defy conventional wisdom and the popular press.

“Real estate requires more; it is a result of largely people, contracts, relationships and trust.” —John Meltzer, CRE

CRE John Meltzer provides us with his firsthand and personal perspective of hurricanes in his counterpoint piece “Rebuilding after Katrina: An Owner’s Perspective Two Tears Later.”

In other news, *Real Estate Issues* is pleased to announce that **Peter C. Burley, CRE**, has accepted the position of associate editor of CRE. Peter is vice president of research for Simpson Housing Limited Partnership in Denver. His first action was to organize the roundtable in this issue. We look forward to his insights and creativity in future editions.

On a staff level, Carol Scherf has joined the CRE staff as communications manager. Among her responsibilities is the publishing of REI. This is the first edition under her direction, and on behalf of the editorial board, we want to welcome her aboard.

Before joining The Counselors, Carol worked as a reporter, and also as a communications and public relations manager at several corporations in Chicago. Please call her at (312) 329-8429 or email her at cscherf@cre.org for submissions or suggestions.

A new feature that the REI editorial board has just approved is the submission of *case studies* for inclusion in the journal. Please refer to the CRE website, *Real Estate Issues* for more details about submitting work.

The economy continues to “ping” us. How The Counselors react—and more to the point—**lead** the industry, will continue to be a focal point of this editorial board. We look forward to the dialog.



MAURA M. COCHRAN, CRE, SIOR
EDITOR IN CHIEF

To send any article and/or the complete issue of REI electronically, please visit www.cre.org and go to the Real Estate Issues web page.

REAL ESTATE ISSUES

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Economic and Market Trends in Second Half of 2007 and Early 2008: An Assessment and Outlook

Panelists:

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Moderator:

PETER C. BURLEY, CRE
Associate Editor/REI
Vice President, Research
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Peter Burley Sets the Scene

ON ANY GIVEN DAY, one can usually find me in my office “studying.” My job requires it. As the chief—and only—research executive in the building, I am the guy who monitors, analyzes, interprets and synthesizes incoming reports and data that reflect developments in U.S. economy and property markets. I write what I have learned for the various clients I serve within the company (read: the Boss, the Boss’s Boss and our investors).

A big part of my daily routine is playing host to a parade of visitors in my office (read once again: the

About the Roundtable Participants



Raymond G. Torto, Ph.D., CRE, is CB Richard Ellis’ global chief economist, and directs CBRE’s worldwide team of commercial real estate market analysts and serves as the firm’s primary spokesperson on macro economic issues and the global commercial real estate market. Torto is also one of the founding principals of Torto Wheaton Research. He is currently an adjunct professor at Harvard University’s School of Design, Office of Executive Education.



Kenneth P. Riggs, Jr., CRE, CFA®, president and CEO of Real Estate Research Corporation since 1994, focuses on providing clients and the industry overall with an analytical but practical approach to commercial real estate investment. He serves as publisher of the RERC Real Estate Report and the RERC/CCIM Investment Trends Quarterly, and is co-publisher of the annual forecast report *Expectations & Market Realities in Real Estate*. He holds an MBA with a concentration in finance and statistics from the University of Chicago Graduate School of Business.



Alan C. Billingsley, CRE, is director and head of research of RREEF’s North American research team. Currently, he serves on the San Francisco executive board and the national Commercial and Retail Development Council of the Urban Land Institute, and is past president of The Counselors of Real Estate. He holds a master’s degree in Architecture and Urban Planning from the University of California, Los Angeles.



Peter C. Burley, CRE, associate editor for Real Estate Issues, is vice president of research at Simpson Housing LLLP, Denver, where he develops and directs the company’s research effort in support of market selection, investment and divestment, and property management issues. He is a member of ULI—the Urban Land Institute, and is a Fellow of the Homer Hoyt Institute. Burley holds graduate and undergraduate degrees from the University of California in urban, economic and behavioral geography, and political science and urban geography, respectively.

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Boss), who often drop by to ask me what I have read or what I know about the latest reports on employment trends, interest rates or property market performance. Lately, say over the past few months, the visits have grown more frequent, and the questions just a bit more serious.

“So,” one visitor (er, the Boss) began, as he stood at my door, “are we there yet?”

“Where?” I asked, looking up, slightly unfocused, from my computer screen.

“Recession,” he said, matter-of-factly.

“I’m having a little trouble getting a fix on that,” I answered, “though the odds that we are headed that way seem to have increased in the past few weeks. Job growth is off. Spending over the holidays was a bit weak. And, there is simply no good news on the housing front. Debt markets are nearly frozen. And, to me, the very fact that the Fed is acting aggressively suggests that some concern may be warranted.”

“I think we’re gonna have a recession,” he said and walked down the hall.

As I said, the visits are more frequent. The questions are more serious. And lately, when I answer the questions and write about the economy and the property markets, I try to do so as honestly and in as straightforward a manner as I can without:

- injecting too much optimism into the discussion;
- scaring the bejeezus out of those who ask the questions or read my reports (i.e., the Boss).

Thinking to myself that perhaps it would be useful to inject a little fresh perspective into my daily studies, I decided that maybe I should be the one who asks the questions for a change. At the end of December, and again in mid-January, I sat down to glean some fresh, additional wisdom from three of our best known and most respected thinkers. “What might Ray or Alan or Ken say if I happened to stop by their door to ask, “Are we there yet?”

BURLEY: Housing markets continue to crash. Financial markets are in turmoil. Employment is slowing. Spending is beginning to slow. The Federal Reserve seems a little spooked, trimming its official forecast for 2008, and aggressively easing policy. The dollar is at a new near-term low.

Recent dynamics in the economy have been tipped over, first by the deep slump in the housing market, with few signs of stabilizing and additionally, by significant stress in the financial markets, with equity markets swinging wildly, and debt markets in turmoil. It seems almost as though some of the financial innovations that helped fuel expansion in the past have suddenly turned on us—I’m thinking especially about the multitude of fairly new securitized debt instruments that have entered the market in recent years, like CDOs and SIVs.

Home sales have fallen to their lowest level in 28 years. Owner home equity fell in 2007 for the first time in 16 years, suggesting weaker spending and economic growth ahead.

Additionally, there is evidence that loans of all kinds are showing stress, from home mortgages to construction loans to auto loans to consumer credit. Delinquencies and

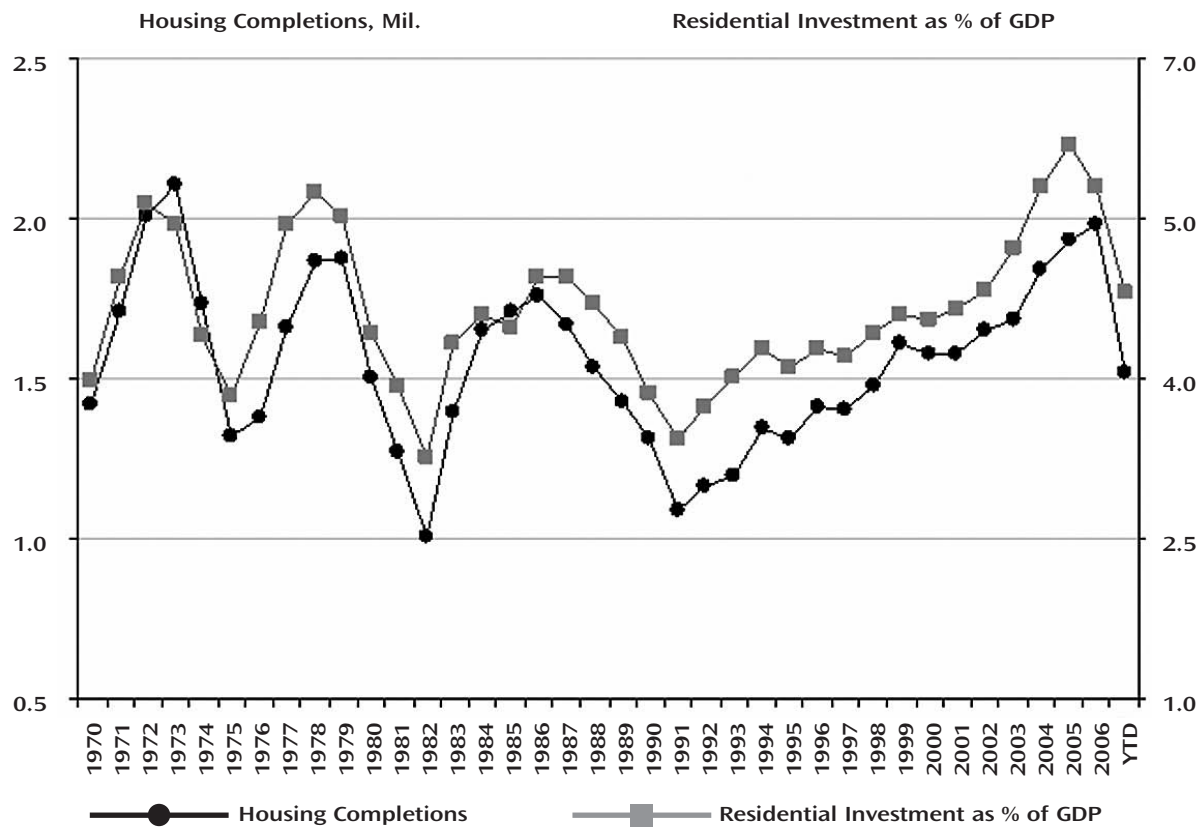
defaults are up, it seems, across the board. Even student loans appear to be on the verge of slipping into crisis.

Consumers and businesses alike are growing more pessimistic. The Moody’s Economy.com Business Confidence Index, for instance, is at its lowest level since its creation some five years ago, with components for sales, inventories and office space all deteriorating. The University of Michigan Consumer Sentiment Index dropped in early December, largely on expectations, to its lowest level since Hurricane Katrina and is at its second lowest level since the early 1990s. And, the Conference Board’s index of consumer confidence is effectively at its lowest since 2003. While confidence measures are seldom very good indicators of spending behavior, we have seen some evidence that consumers are pulling back, with rather soft retail sales reported in the fourth quarter of 2007. Consumer spending slowed in December to its weakest pace in six months...

What’s your assessment of the state of the U.S. economy, given the slumping housing market, turmoil in the financial markets, a slowdown in employment and consumer spending, and pessimism among consumers and businesses? Are we headed into a recession? Are we already in a recession?

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Housing Completions and Residential Investment as a Percent of GDP, 1970-2007



Source: CBRE/Torto Wheaton Research

TORTO: First of all, the question is not whether recession but how slow will growth be and for how long? A positive growth of .2 or a negative growth of -.2 has the same negative effects for our economy.

We are amazed at the resiliency of the U.S. economy. Consumers are still stepping up and businesses are posed to continue investments and serving the export markets. As long as we continue to create about 80,000–100,000 jobs a month, and businesses can borrow from the banks and markets, we expect to see slow but positive GDP growth.

The most insidious risk is the instability of the credit markets and whether we can get back to normalcy in first quarter of 2008 in these markets. We expect the overbuilding of the residential sector to be a drag on the economy until the end of 2009, subtracting from overall GDP growth. For 2008, we see GDP growth in the one percent range.

We will pull out of this slowdown when the housing drag is no more and as the export market for our goods and farm products continues to grow. The graph above shows the importance of housing to the overall economy, being as high as 6 percent of GDP in 2005, and now at 4 percent....as housing starts fall, it will detract from GDP growth and offset the positive stories for business investment and business exports.

RIGGS: There are quite a few signs that the economy is at risk—record high oil prices, a weak dollar, government deficits, geopolitical risk, the subprime mortgage meltdown, and the global credit crisis—but no hard evidence yet that we are in a recession. The most recent measure of GDP growth, taken Dec. 20, 2007, indicates a final estimate of 4.9 percent for third quarter 2007, which is higher than the 3.8 percent growth in second quarter. Also, productivity growth of 6 percent, solid corporate balance sheets, strong demographics, low interest rates

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and the Federal Reserve's aggressive approach to cutting rates to stay ahead of a recessionary curve, and a weak dollar, all demonstrate the strength of the U.S. economy.

That said, however, many economists are projecting slower economic growth over the next few quarters. And, with continued high oil prices and high winter heating costs, slow job growth, a reduction in home building, and the continued negative hype associated with election year politics, it will feel like a recession to many, especially those in hard-hit areas of the country or in industries with declining growth.

Main Street, or the consumer, still comprises two-thirds of our economy. If employment doesn't slow too much, and consumers keep their jobs and continue to spend, the foundation for economic growth will remain solid. Additionally, growth in exports will continue to shore up the U.S. economy. During the second quarter of 2007, imports fell 2.7 percent, while exports increased 7.5 percent, which was due in great part to the weak dollar. Business and government spending in 2008 will also help to keep the economy growing.

BILLINGSLEY: I do not believe the economic fundamentals warrant a recession. Nevertheless, there is a high probability—about 50 percent—that we will get one in 2008, as a result of what I believe are overreactions in the equity and debt markets. A market psychology is setting in that could lead to more severe job layoffs, to more restrained hiring, and to fearful consumers, pushing us into recessionary territory. In any event, the choice appears to be between our base case of very weak employment and GDP growth in the coming year, versus a mild recession, with modest negative employment and GDP growth. In either case, a needed slowdown will allow us to recover from a “bubble” we created in asset prices and over-leveraged debt markets. Renewed growth would follow in 2009 and beyond.

The current slowdown (or recession) was inevitable, something we had been expecting to happen in 2006. We were experiencing a classic bubble over consumer spending, home price increases and financing risk. I didn't fully appreciate just how bad it had gotten, but the subprime implosion was merely the pin that popped this bubble. Given how far this cycle expanded, we built way too many homes, and that is having negative implications on many aspects of the economy. All this has been made

worse by a very significant U.S. budget deficit, which places yet more pressure on the financial markets, and has had much to do with the falling value of the dollar.

On the other side of the coin, our economy retains many of its strengths. If we hadn't had this housing/consumer bubble, GDP growth would probably have been at or above trend. Corporate profits are healthy, financial institutions were the healthiest they have been in a long time—at least before the subprime write-downs—and export growth is very healthy.

We should see renewed growth at around trend in 2009 through at least 2011. The overbuilt housing market will be less of a force in 2009, while financial markets should have recovered.

A risk that I see to this relatively positive view is inflation. I am worried that the Fed, the White House and Congress are so focused on cushioning or avoiding a recession that we end up creating an environment that will fuel inflation going into 2009 or soon thereafter. The Fed would then have to hit the brakes, causing a classic recession. Some of the fiscal stimulus being discussed sounds quite reasonable, including modest near-term tax rebates, business investment incentives and infrastructure spending.

Assuming the cumulative total of these initiatives do not greatly increase the budget deficit, and do not extend into 2009, the results could be positive and help us to avoid or cushion any recession. However, I am hearing a drumbeat that suggests these efforts are too modest, and that any stimulus needs to be much more substantial, and extend beyond 2008. Suggestions are also surfacing that the Bush tax cuts be made permanent. A significant increase in the federal budget will place us in grave danger of rising inflation, once the economy begins to rebound. The Fed will have few tools that it can use—other than quickly raising the Fed Funds Rate—to combat inflation. This scenario scares me much more than the prospect of a near-term mild recession. The resultant recession in 2009 or 2010 would likely be severe, and it could end this cycle of economic expansion. As with the last time we whipped inflation in the 1990s, the adjustment would be prolonged.

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EMPLOYMENT

BURLEY: *A look at the past year to eighteen months indicates that employment growth has been steadily slowing. Do you think that's likely to continue? If it does continue, what do you see as the implications for demand in the property markets?*

TORTO: The long-term trend is down, and it would take an extraordinary event, such as a major financial institution going out of business, to push this trend down further. We have already seen declining levels or rates of absorption for all property types as a result of the slowdown.

RIGGS: The pace of job growth is obviously slowing, and is expected to continue growing at a slower pace than it has during the last few years. This is due largely to the slowdown in the housing market and in subprime lending, which includes jobs in construction, home mortgage origination/lending, construction materials, and home furnishings. But there are strong possibilities for job growth in such sectors as technology, energy, health, and educational services, and hiring in these areas will help to offset some of the weaknesses elsewhere.

The decrease in employment has already started to affect some of the commercial real estate sectors. Although the office sector remains fairly strong and vacancy rates continue to decline in some areas, RERC has begun to see reduced demand in other markets, with vacancy increasing and rental growth decreasing. Industrial warehouse space also is mixed, with demand increasing in some areas and slowing in others. Generally, warehouse demand remains particularly strong in the port cities due to the strength of exports. If non-discretionary spending takes up a significantly greater part of consumer spending, demand for retail space will decline.

Absorption Trends *(square feet)*

| | OFFICE | INDUSTRIAL | RETAIL |
|--------|--------|------------|--------|
| 2005 | 89.3 | 290m | 33.8m |
| 2006 | 79.8 | 208 | 10.1 |
| 2007 e | 49.6 | 122 | 9.5 |
| 2008 f | 20.0 | 100m | 12m |

Employment Trends in 2006 and 2007



Source: CBRE/Torto Wheaton Research

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BILLINGSLEY: Employment has been a relatively happy story, given all that has happened in the economy. The major losses have been in housing and housing related industries, most notably home mortgage companies. These jobs will not start to come back until well into 2009. However, other sectors of the economy will be employment generators. But, 2008 will not be a good year, with net new employment growing at the slowest pace since 2003. The unemployment rate will peak at of about 5.5 percent. This is still not a high level of unemployment, and is the same as in 2004. It could be a sufficient loss of job growth to push us into a mild recession, however.

Still, this slow and restrained employment growth will have a near-term impact on property markets. Office markets will experience slower absorption in 2008 than many had previously forecast. Some of this will be a holding off on adding employees until future economic conditions become clear. As a result, rent growth will also be restrained. Nevertheless, on a national basis, we are expecting rent growth to remain positive.

HOUSING MARKETS

BURLEY: *Combined new and existing home sales are off more than 33 percent from their 2005 peak. Some economists are talking about a protracted housing downturn, with little improvement through 2008, possibly through 2009 or longer. What's your outlook for housing in 2008 and beyond?*

TORTO: Current housing production has not fallen enough to let the inventory reduce. Many homebuilders are trying to keep their businesses going and this requires them to keep building. We expect we will see some big homebuilders in bankruptcy before 2008 is over.

RIGGS: The housing decline is expected to bottom out during the first half of 2008. It has been estimated that from 2005 until the trough in the residential market crisis occurs later this year, home prices will have declined about 11 percent. This sounds like alot, and if you are someone who has to sell your home right now, you will feel the pinch of lower prices. But when you think about how the price of homes nearly doubled during the past five years or so, a correction of this size is not out of line.

Even so, the overall decline in the housing market will subtract one percent from the nation's GDP during 2008. With housing starts at their lowest level in more than a decade, S&P and Global Insight expect the year-over-year decline in residential construction to bottom out in the

first quarter of 2008 at -20.8 percent, and become positive again in second quarter 2009.

BILLINGSLEY: The over-supplied housing market will take at least through 2009 to recover, meaning prices will stabilize and allow for some growth in 2010. However, some of the worst markets will take longer, while some markets will feel little impact at all. In the most heavily over-supplied markets, rental apartments will be negatively impacted as excess for-sale units are turned over to the rental market.

FINANCIAL MARKET IMPLICATIONS

BURLEY: *Against the backdrop of the mortgage meltdown and the subsequent losses hitting financial companies and banks, the government has announced mortgage interest rate freezes for some subprime loans, and the Federal Reserve has cut interest rates. Will these actions help the situation, and is the Fed walking a tightrope by lowering rates at the risk of higher inflation and a weaker dollar?*

TORTO: Yes. Yes. However, the problem here is a highly leveraged asset whose value has fallen, and given that new supply keeps rising, no one knows where the bottom is. The Fed has no choice to do what it is doing, taking the risk on inflation that it is taking. The ultimate solution is to turn off the supply spigot and allow inventories of housing (single-family and condos) to be slowly depleted. And this action is not in the Fed's control, but is driven by homebuilders and the market.

RIGGS: Given the uncertainty that the subprime crisis has created in the financial markets, any type of rescue effort has some level of benefit—real or perceived. The question is, to what degree this will help, and does the action inadvertently prolong the market correction? In the short term, the Fed clearly provided confidence to the financial markets that it is paying attention and will take action to make sure that the crisis doesn't spill over into other financial arenas. In the longer term, the government policies have helped to soften the impact, but they will result in the subprime situation taking longer to correct itself versus allowing the free market to clear itself without government intervention. I like the Fed action, but I am not a big fan of government policies that interfere with the free market clearing mechanism.

BILLINGSLEY: The interest rate freeze, as has been widely reported, only affects a minority of problem loans. Still, I do believe it will be modestly helpful. But there is a basic

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problem in that just too many homes have been built, and we really don't have enough households to stick in them regardless of how cheap they might be. In the worst-affected markets, many of these mortgages were made to investors. There is just no way that these are not foreclosures and write-offs. Investors in residential secured mortgages will take some heavy losses. This will just need to happen and we need to get it behind us. Probably most subprime borrowers will need to go into foreclosure. This is unfortunate, but at the end of the day, these borrowers will be renters, as before. And, because the subprime mortgages did not require much equity, they are not "out" that much. The aspect of this whole mess that worries me most is its impact on home values, and in turn, the impact on consumer confidence and consumer expenditures. I really don't think the government has much of a role here, other than the cuts in the Fed Funds Rate. Home values have to adjust to take into account the excess supply. The combination of the drag on the economy from the housing sector, reduced consumer expenditure growth, and turmoil in the equity and debt markets could well be sufficiently severe to throw us into recession.

The Fed is walking a difficult tightrope with inflation due to the weakening dollar, and particularly due to rising commodity prices—most spectacularly, oil. For 2008, I don't think inflation will be a serious problem. I believe that economic growth in the U.S. and globally will slow sufficiently to take the pressure off inflation while the Fed fights recession with the Funds Rate. But, it is going to be tricky, and they will need to be cautious. I guess I worry more about 2009. If you look at most growth forecasts, it should be a pretty good year for economic growth. However, the Federal budget deficit is projected to significantly ramp up, with reduced revenue due to slower growth in 2008, coinciding with reduced taxes due to AMT "reform," escalating expenditures, tax cuts, etc. In the interim, there is little chance of a strengthening dollar, and it could fall further. The danger is that in 2009, the Fed may need to slam on the brakes. Our forecast is that the rate should be back to 4.5 percent by year-end 2009, but the risk is that heavier-handed action will be necessary. That scares me more than the near-term risks.

SPEAKING OF THE DOLLAR

BURLEY: *While it has been an orderly (relatively) decline so far, the value of the dollar has weakened considerably. And financial market turmoil has not helped. The trade-weighted dollar, measured against a basket of other currencies, is off*

by around 30 percent. Even the Canadian Loonie has hit parity with the U.S. dollar. The weaker dollar helps exports. But, the U.S. export sector, which represents about 12 percent of GDP on net, can't hold the economy up alone for very long. And, much of the export boost is confined to a few regions of the country. Additionally, the weaker dollar makes imports more expensive, including the price of oil, which has surged in recent months to a \$90–\$100 range and threatens an inflationary surge.

Is the declining value of the dollar a significant inflationary risk, and could it have an effect on interest rates? Also, has the dollar's weakness attracted foreign investors who are shopping for specific property types?

TORTO: We only have anecdotal evidence on foreign buyers, and they are there in large numbers. But, there is no evidence they can fill the void either in retail sales or condo purchases.

Residential investment hit a peak of about six percent of GDP in 2005. Exports at 12 percent, and growing quickly, can help grow this economy. Although we hear of lots of inflation risk, we do not see pricing power in manufacturing and services. Rather, it seems that margins are being cut or productivity accelerated. Of course, we do see inflation in commodities and food, and this is a serious inflation risk. But I would argue it is a risk we need to take to put the financial system back to normalcy—that is, the markets and institutions are open for lending.

RIGGS: For now, inflation is less of a threat than a slowed economy, or even worse, an economy in recession. It's under control and is rising at a reasonable and manageable annual rate within Fed expectations, excluding volatile food and energy prices. There is little pricing power to pass along these increases, except in the food and energy sectors. However, as all of these factors continue to weigh in on costs, inflation becomes a bigger threat and one that the Fed will have to deal with.

The longer the confluence of a weaker dollar, high energy prices, high commodity prices, and a weakening economy persist, the greater the likelihood inflation becomes a threat. Normally, this will result in higher interest rates. However, at this point, the highest probability rests with continuing lower interest rates until we work through the global credit crisis.

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Foreign investors have been increasing their investment in commercial properties in the U.S. since 2004, and this trend has increased with the weakening of the dollar. The countries and regions investing the most in U.S. commercial real estate include Australia, Germany, Canada, and the Middle East. International investors have changed their strategy and are adding more “value-added,” riskier properties. Their investments also include off-market transactions and joint ventures.

Foreign investors also are seeking different sectors for investment, including infrastructure, resorts, senior housing, storage, and student housing. Currently, New York City ranks as the top market for foreign investment in commercial real estate. Other top markets include Los Angeles, San Francisco and Seattle.

BILLINGSLEY: The falling dollar is a significant inflationary risk. At this time, inflation is restrained due to the slowing economy. I believe the dollar has further to fall, although probably not by more than 10 percent. Other central banks are also lowering their rates, so I believe bottom should be reached in 2008. This will begin to entice foreign investment during 2008, which will help to further stabilize the U.S. economy. Still, the U.S. must get its budget deficit under control before renewed economic growth in 2009 escalates inflationary pressures. This is a risk to the recovery from the 2008 slowdown.

THE PROPERTY MARKETS

BURLEY: *What do you see as the bottom-line impact of recent developments in the economy on commercial property markets?*

TORTO: Slowing absorption will lead to higher vacancy rates in all sectors except hotels over the next few quarters. We see rent growth having general momentum and rising in line with inflation in the 2's.

RIGGS: The slowdown in the economic landscape has all investors paying attention to the demand side of the equation. The most important element to commercial real estate investors is job growth. As consumer confidence wanes and businesses become leery of expansion plans, so does the potential for job expansion, and thus the demand for space. The debt crisis put an end to cap rate compression, but improving space market fundamentals provided a boost to property values and pricing. This somber economic outlook has resulted in investors dialing back on earnings expectations for commercial properties, thus

cooling off the urgency of buying more commercial real estate.

BILLINGSLEY: Commercial properties are worth 5–10 percent less than a year ago, in spite of improving market fundamentals, with continued rent growth and restrained new supply. The capital markets are demanding greater yield from these investments. In addition, lenders are far more restrained on the terms and pricing of debt. As a result, yields are being bid upward, and pricing downward.

BURLEY: *There is some evidence that office market demand is already slowing. And, if retail performance continues the recent trend, then retail will likely slow as well. What about industrial space?*

RIGGS: This varies by industrial classification, as we have myriad of types of space from bulk warehouse, flex space, R&D and traditional industrial. Properties in the port cities, and bulk warehouse properties are doing very well; this is also true of R&D in technology-driven areas, whereas traditional industrial properties in traditional locations are experiencing the effects of the slower economy, from both the business and consumer fronts. The cheaper dollar that has triggered increased exports is favoring the industrial property sector.

BILLINGSLEY: The office market has been the strongest sector in the past couple of years—the latest to recover from the 2001 recession. Demand in most markets is declining from previous forecasts, with 2008 seen to be a particularly slow year. We expect that between slowing demand and rising supply, vacancy rates will tick up about 100 basis points during the year. Still, it's a relatively strong sector, particularly in strong supply-constrained CBD and inner suburban submarkets. We've been predicting the slowing in consumer sales growth for several years, and it's finally really starting to happen. In 2008, retail sales growth will reach a cyclical low—at or around inflation. Most retailers have been in good shape financially, with the exception of home furnishings and improvement retailers. A number of home furnishings retailers are going out of business. Most other retailers will survive the next year in a more competitive environment. However, retail center owners will have a more difficult time driving rents. Class B centers, particularly malls, will have an especially difficult time next year.

Industrial will be the steadiest of sectors, with continued import and export volumes driving demand. Rents will be

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restrained, however, given increases in supply and a weaker economic market. Some peripheral exurban big box industrial markets will feel some pain.

BURLEY: *Will apartment markets benefit from housing foreclosures, or will they suffer as employment continues to slow?*

TORTO: As people are forced out of their homes from foreclosures, we see the number of renters rising significantly. However, the biggest competition for multi is from renters going to the single-family and not moving into the institutional multi-family product.

RIGGS: The net impact will be that apartment demand will continue in a positive direction, but at a slower rate. However, as the supply of new units is expected to continue and shadow supply from unsold homes increases, vacancy will likely edge slightly higher, thus generating only moderate rent growth.

BILLINGSLEY: Residential is a tale of two markets. Highly overbuilt for-sale markets will also have weak rental apartment markets, as for-sale product is converted to rental. Many failed condos and condo conversions will also compete. However, those markets that were not overbuilt, particularly the expensive coastal markets that are still experiencing healthy job growth, will experience one of the best markets they have seen in years.

BURLEY: *In recent months we have seen a modest uptick in cap rates, as expected, in a few markets. Where are commercial property values likely to be in a year or two?*

TORTO: The lack of liquidity and struggle to do deals makes it difficult to say. That said, we think values will be within 5–10 percent of where they are now in a year or two. Not clear at the moment which way.

RIGGS: Commercial real estate is holding its own reasonably well, given the significant disruption created in the subprime market, which has resulted in a global credit market crisis. We clearly see a bifurcation in property market pricing with a flight to quality. Top-tier assets that are well leased and well located have not seen a decline in values/pricing or an increase in cap rates. But, this is not true of properties that lack strong occupancies or possess an average location. Further, we have seen that properties that traditionally fit the high leverage profile are not able to attract the capital structure that made their pricing “work” prior to the credit crisis. Overall, prices for most

property sectors in most markets will likely see flat to modest decreases over the coming years, and properties that are top-tier assets will see gains at much slower rates than have been experienced in the past; this is a trend that has already begun. Retail and hotel properties already have seen some decreases in average prices, but as the economic fears begin to subside, especially in the later part of 2008, prices in those sectors should turn around—but also at a much slower rate.

BILLINGSLEY: Cap rates have adjusted upward between 25 and 50 basis points in the past year. Over the next year to 18 months, we expect another 25–50 basis points adjustment. When the dust settles, cap rates will be up 75–100 basis points over their peak.

BURLEY: *What effects will the liquidity crunch have on property market transactions? Are investors looking at real estate today the same way they did a year ago? Has the debt crisis affected real estate as an asset class?*

TORTO: Commercial real estate as an asset class is in about the same place as before the debt crisis, relatively speaking. However, excess returns were generated by the flow of capital funded via the CMBS market, which comprised 22 percent of the \$3 trillion debt in commercial real estate, growing about 18 percent per year. With this almost gone, the transaction volume will be down, but it is anybody's guess as to how much. Of course, the portfolio lenders are filling the void a bit, but they do not have the capacity to fill it entirely. One thing we know is that CMBS did fund about 40 percent of the transactions over five million in 2007. And, for first Q 2008, it is estimated that CMBS volume will be 4–5 billion. 1Q 2007 was around 50 billion. The writing is on the wall.

RIGGS: Clearly, the level of debt capital that was available in 2006 and early 2007 was a high-water mark for our industry. There will be less and more discriminating debt and equity capital available for investment for commercial real estate. This pullback in available capital is a good thing. Capital was getting too aggressive, and pricing was getting ahead of property fundamentals with most properties priced for perfection. Therefore, the level of transactions will slow from the pace seen in 2006, but there still will be sufficient debt and equity capital available to allow for a healthy level of market transactions. The liquidity crunch saved the commercial real estate industry from following the fate of the subprime market

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and a significant market correction that was bound to happen if we kept going at the pace seen in late 2006.

BILLINGSLEY: In 2008, equity will be highly valued, given the difficulty of highly leveraging properties. Fully leased properties can be financed attractively at 65 percent LTV and at attractive yields. This will provide an opportunity for equity players, including pension funds and foreign investors.

Value-added transactions also are difficult for traditional leveraged buyers, given the lenders insistence on coverage. Again, equity buyers with conservative leverage requirements will be at a competitive advantage.

There will be less capital chasing real estate in 2008 than was the case in 2006 and 2007, both of which were banner years.

BURLEY: *Are investors looking at real estate today the same way they did a year ago?*

RIGGS: No, and we would not expect them to, given how the world has changed. In an ironic way, commercial real estate looks more stable and attractive to the investment alternatives of stocks and bonds. Investors are much more discriminate and selective in their property selection and

the markets that they will invest in. The market has become more risk averse, and there is a flight to quality. Cash investors and single-asset lenders view it as a good time to buy or lend on properties today and to be able to negotiate a fair deal on the pricing side with little pricing competition from high-leverage players or securitized lenders. The tide has shifted—cash is king, and there are more investment opportunities with fewer bidders.

BILLINGSLEY: Institutional investors appear to be maintaining or even increasing their allocations to real estate. These equity-oriented investors have been largely out of the acquisitions market the past year. With the repricing of assets, and the disappearance of highly leveraged buyers who could justify high prices, the market will once again look attractive. While they will not return right away, toward the end of 2008, we expect them to re-enter the market.

Real estate will revert to its historic role as an income vehicle, not a growth vehicle. In addition, as fears of inflation are likely return a year or two from now, it will also show its role as an inflation hedge.

BURLEY: *Thank you all for your insights.* ■

Deflation Risk in Income-Property Investments and Permanent Loan Portfolios: A 2008 Update

BY MARC THOMPSON, CRE, FRICS

Note: *These are the views of the author, and not necessarily the views of Bank of the West.*

THIS ARTICLE UPDATES A PREVIOUS ARTICLE I WROTE for the Summer 2003 issue of *Real Estate Issues* (REI) under the same title.

Since then, I've observed that the amount of leverage and collateral value of income properties have inflated largely because of high liquidity stimulated by 40-year low interest rates and the proliferation of Commercial Mortgage-Backed Securities (CMBS). As a consequence, high-loan production among CMBS conduit lenders created a "hustle and flow" loan production process. The rapid growth in the CMBS market was, in part, the result of aggressive underwriting practices that led to a 186 percent increase in loans outstanding over a five-year period. The income-property industry leverage from 2002-2007 was not entirely due to CMBS: 94 percent is attributed to leverage growth in commercial banks.⁴ These banks also participated in this high-debt growth period, and will most likely be faced with the consequences of collateral value deflation in their loan portfolios. It is my contention that the combination of a high demand for investment real estate and favorable lending market conditions for investors created a significant credit bubble. As a result, a higher risk for deflation of income-property collateral values now exists for income-property investors and owners of income-property collateralized debt, including commercial banks.

In addition to observing and lending in income-property capital markets since 2003, I have pursued studies on

adaptive complex systems at the Santa Fe Institute (SFI). The Institute's objective is to find simplicity in adaptive complex systems. Given the complexity and volume of economic data, I believe it has become more difficult for most market participants to determine where the capital and investment markets are heading. Studying complex market systems helps in understanding how markets behave, and in determining when the risk of a market correction is increasing, for the purpose of implementing effective hedging strategies.

PURPOSE

I write this article from the perspective of a career banker who works with income property. I have a vested interest in my bank and my borrowers to identify capital market issues and make recommendations to help both align for prosperous long-term growth. I hope this article will help lenders and borrowers avoid being exposed to a potentially negative capital market environment. I believe that if you understand the risk, you can hedge it. Experience also tells me that lender and investor exposure to problem loans and

About the Author



Marc Thompson, CRE, has been a member of The Counselors of Real Estate for ten years. He currently serves as senior vice president of Bank of the West, Walnut Creek, Calif., where he manages lending operations for health care properties. Thompson has served on many industry association boards and continues to be an active writer and student of credit risk in financial institutions.

He has an MBA and has served as an adjunct professor of financial management studies at California State University, East Bay.

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subsequent foreclosures can be mitigated by prudent loan underwriting. In addition, I have observed income-property real estate capital markets at both the systemic and process levels, and have made recommendations for process changes. Further research is needed to study ways of curbing “hustle and flow” loan production or capital distribution systems from naturally occurring in complex adaptive markets. But, I believe that implementing these recommendations will help stabilize real estate-collateralized capital markets in the future. The recommendations are attached as addendums for further review.

CHAOTIC REAL ESTATE MARKETS

As indicated in my 2003 REI article, the income-property real estate markets are adaptive complex markets, and susceptible to collapse. They are difficult to predict because they are non-linear, or subject to uncertain or chaotic outcomes. The only difference between chaotic stock markets and income-property markets is time scale. The difference in time scale is significant, with long cycle times for income-property real estate, and daily cycle times for the highly liquid stock market. As an example, I estimate that on average, it takes six minutes to decide to sell a stock and sell it on the stock market during an active trading session. By comparison, the sale of an income property will take an average of six months from the time a decision is made to sell and when cash is received at closing (in a good market). I estimate a six-month time frame since many income properties must be positioned to sell, and may also be subject to closing delays because of market inefficiencies, etc. Based on this six-month time scale, real estate investment cycles can range from 7–12 years. In California, the bottom of the last investment real estate cycle occurred from 1993–1996. I estimate that, nationwide, we are at the end of an 11-year investment real estate cycle collateral-value growth period. In the current income-property cycle, I expect to see U.S. income-property markets—both regional and national—deflate largely at the same time. I believe, based on my research, market observations and lending experience, that the U.S. income-property market is at significant risk of entering into a 2- to 3-year deflation period before collateral-value growth is again realized on an aggregate basis.

OVERSTIMULATION BY THE FEDERAL RESERVE

During the last income property economic cycle I experienced in California, the downward trend began in 1990, and bottomed out from 1993–1996. In 1996, most

product types were beginning to experience positive cash flows and collateral value growth. This trend continued through 2001, until the events of September 11, which devastated the economy. Central Business District office vacancy rates in San Francisco rose from two percent in October 2002 to 19 percent¹ in 18 months. Silicon Valley vacancy rates experienced a similar negative trend. But, a rise in loan default rates did not occur because of the Federal Reserve’s rate cut downward to one percent, which stimulated investment in all real estate. During this time, most income-property investors with loan difficulties were able to sell their holdings without causing lenders to incur losses. I believe this low interest rate environment, in combination with the innovative structured loan products that began to appear in 2002 from CMBS conduit lenders, helped to overstimulate investment demand.

CAPITAL MARKETS ADAPTING

When interest rates began to rise in 2005, conduit lenders and market participants responded by creating more innovative, financially engineered lending products and more effective trading desks to sell their mortgage-backed securities. Collateralized Debt Obligations (CDOs) that bought subordinate debt or B-pieces, proliferated. For example, CDO issuances increased from \$7.8 billion in 2004 to \$21.33 billion in 2005, a 173 percent increase.⁴ In addition, CDO issuances increased another 71 percent from 2006 to \$36.6 billion.⁴ Prior to 2004, B-piece buyers more effectively controlled market risk by holding originators accountable for aggressive loan underwriting by kicking out high risk loans in CMBS pool offerings. In 2005, loss derivatives were developed for CDOs, making securities more attractive for investors to purchase.³ With CDO proliferation, many conduit lenders became complacent since they could sell down the unacceptable B-piece first-loss risk tranches to a CDO. These CDOs were structured to hedge default and repayment risk using complicated financial computer-modeling techniques based on loan default probabilities. Computer-generated risk-modeling to assess loan default and repayment risk was relied upon by the credit rating agencies. The buyers of CDOs relied upon the credit rating agencies’ assessment of risk, using their own credit ratings systems. It is my contention—to be supported by further institutional research—that capitalization rate compression was, in part, stimulated by the high income-property investor demand, armed with low-cost,

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covenant-light and aggressively underwritten debt provided by CMBS conduits. Unfortunately, most bankers competed for loans in this highly competitive marketplace and won their fair share of originations, thereby increasing deflation risk in commercial bank income-property loan portfolios.

As the CMBS markets adapted to changes in the debt market by increasing loan product offerings, production flow volumes further accelerated debt growth and subsequent deflation risk. Of the existing \$723 billion CMBS loans outstanding, 47 percent are fully amortizing, with 53 percent as interest-only loans as of June 30, 2007.⁴ Of the interest-only loans, 25.6 percent have a partial interest-only period, and 27.4 percent are interest-only for the full term of the loan. With interest-only underwriting, conversion to a conforming fully amortizing loan after an initial interest-only period may increase default risk depending on the performance of the property. In my assessment, given the aggressive composition of CMBS loan portfolios, there is increased risk of default because of their resemblance to subprime mortgage-backed securities (MBS) portfolios, if not in credit quality, then certainly in aggressive loan structuring. This is a concern since of the \$723 billion in CMBS loans outstanding as of June 30, 2007, 95.1 percent were rated as investment-grade (BBB- or better). With the recent downgrades on many types of MBS, it appears that the credit rating agencies also were out of alignment in assessing the risk of commercial real estate and multi-family collateralized loans.

I believe one strength of the CMBS industry is the relatively good reporting, which provides transparency for risk assessors. Also, standards for reporting are independently provided by CMSA Investor Reporting Portfolio Review Guidelines. For example, as reported in the *DBRS Global CMBS Newsletter* dated Nov. 26, 2007, all CMBS loans with debt service coverage below 1.10 times, (a violation code 1E) are required to be on the CMBS watch list. This newsletter reported that even though the default rate remains very low—at less than one percent—the watch list continues to grow, with recent years of vintages from 2005–2006 of concern. As reported in this newsletter, \$29.8 billion in CMBS loans, or 4.1 percent of the \$723 billion aggregate CMBS pool, is on the watch list for code violation 1E.¹² The CMBS watch list is expected to grow if the general economy weakens and the credit crunch continues.

Income Property Debt Growth Chart

| Intermediary | 2003 | 2004 | % Annual Increase |
|-------------------------|------|------|-------------------|
| Banks, & Other Bal Outs | 868 | 982 | 13% |
| CMBS Balance Outs | 361 | 423 | 17% |
| CDO Origination Growth | 5.8 | 7.8 | 34% |

| Intermediary | 2004 | 2005 | % Annual Increase |
|-------------------------|------|------|-------------------|
| Banks, & Other Bal Outs | 982 | 1133 | 15% |
| CMBS Balance Outs | 423 | 581 | 30% |
| CDO Origination Growth | 7.8 | 21.3 | 173% |

| Intermediary | 2005 | 2006 | % Annual Increase |
|-------------------------|------|------|-------------------|
| Banks, & Other Bal Outs | 1133 | 1297 | 14.5% |
| CMBS Balance Outs | 581 | 630 | 49% |
| CDO Origination Growth | 21.3 | 36.5 | 71% |

HYPER-CAPITAL MARKETS GROWTH

Since Dec. 31, 2002, CMBS market loans outstanding have grown from \$200 billion to \$723 billion as of June 30, 2007, increasing from eight to 22 percent of all commercial and multi-family mortgages outstanding.⁴ Although commercial banks have a larger amount of commercial and multi-family mortgage debt outstanding, with \$1.339 trillion or 43 percent of the total loans outstanding in the first two quarters of 2007, CMBS, CDO and asset-backed securities (ABS) issues outpaced new loan originations from commercial banks for 12 of the last 14 quarters.⁴ Since 2004, only in the first two quarters of 2005 did commercial banks produce more loan originations than CMBS, CDO and ABS issues on commercial and multi-family properties.⁴ This occurred when U.S. CMBS issuance had a banner year, originating \$168 billion in 2005 compared to \$94 billion in 2004, representing a 79 percent increase.⁴ In 2006, U.S. CMBS annual issuance increased another 21 percent to \$202 billion. Remarkably, as previously mentioned, CDO

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issuance volume increased 173 percent, from \$7.8 billion in 2004 to \$21.3 billion in 2005.⁴ In 2006, CDO issuance increased to \$36.5 billion, representing a 71 percent annual increase, and indicating a symbiotic relationship with the high growth of the U.S. CMBS issuances.⁴

This portfolio growth not only occurred with CMBS, CDO and ABS issuances, but with commercial banks as well. Although portfolio growth rate was not as high as CMBS, commercial bank, commercial real estate and multi-family loans outstanding grew 45 percent, from \$868 billion at the end of 2003 to \$1.297 trillion at the end of 2006.⁴

Where did this leverage growth come from? From other market participants? The answer is no. The growth of all debt issued by all lenders in the commercial and multi-family market increased 42 percent during this period.⁴ The total collateral value of commercial and multi-family property may have increased because of:

1. a building boom;
2. hyper-rent growth with low expense inflation and/or;
3. an already low-leveraged commercial and multi-family property base.

The short answer for number 1 is “no,” since building completions increased less than 5 percent of total inventory during this period.⁴

The answer for number 2 is more inconclusive, but doubtful. In some markets, hyper-rent growth was projected because of limited supply of new commercial and multi-family space. However, to conclude that rent increases occurred in all property types in all markets across the U.S. sufficiently to support a 48 percent increase in average aggregate investment prices per square foot over a three-year period is doubtful. This question requires more study.

The answer for number 3 is “improbable,” given that collateral values were increasing since 2002 because of capitalization rate compression.⁴ The capitalization rate variances would be 80 basis points higher in aggregate if the 2002 data were included in comparison with the 2006 data in this analysis.⁴

If none of the above occurred, the answer is hyper-collateral-value growth, resulting in concurrent hyper-leverage growth.

INVESTOR AND LENDER BEHAVIOR

After many years of observing investor behavior, I believe that most buyers of stabilized properties (some buyers are more risk-averse and will accept a lower yield in return for less risk) want to maximize leverage to increase equity yields. A banker's leverage hedge is to size the loan so that there is a high probability it will be fully repaid. Given property value inflation from 2003–2006, both investors and lenders had an overall optimistic assumption that selling for much more than the initial purchase price provided the most plausible exit strategy. Given years of collateral value inflation, this investor and lender optimism was well supported. Buyers were willing to take on more leverage risk believing that if cash flow diminished, the property's sale amount would be enough to repay the debt and all the equity. There were plenty of buyers with optimistic strategies to turn around the non-performing income properties in the market even though the sellers had purchased the same property under the same optimistic purchase assumptions. The combination of the aggressive lending market and the growing presence of CMBS conduits (some sponsored by money center banks) created a lending environment in which leverage underwriting standards gradually loosened. Commercial banks, as a balance-sheet lending group at risk of losing market share to CMBS issuances, became more aggressive at underwriting income property to remain competitive in the market. As a result, market share for commercial banks was not lost from 2003–2006, and remained at approximately 42 percent of total mortgage debt outstanding.⁴

COLLATERALIZED VALUE GROWTH

From late 2003–2006, commercial real estate and multi-family properties in aggregate were at a price-per-square-foot of \$95, with an average capitalization rate of 8.1 percent. These properties grew to a price-per-square-foot of \$141, with an average capitalization rate of 6.8 percent. The table on page 15 compares collateral value increases with loan volume growth over the three-year period from 2003–2006.

SECURITIZATION OF REAL ESTATE ISSUES

From my observation in the direct lending space, the credit markets began shifting from being disciplined by

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Collateral Value Growth Chart

| | 2003 | 2003 | Bank | CMBS | 2006 | 2006 | Bank | CMBS | Var | Var | Growth | Var |
|--------------|------|----------|-----------|-----------|------|----------|-----------|------|----------|------|--------|-----|
| Product Type | P/SF | Cap Rate | Outs 2003 | Outs 2003 | P/SF | Cap Rate | Outs 2006 | P/SF | Cap Rate | Bank | | |
| Apartment | 58 | 7.2 | | | 99 | 6.2 | | | 70% | 1.0 | | |
| Industrial | 50 | 8.4 | | | 67 | 7.4 | | | 34% | 1.0 | | |
| Office | 154 | 8.6 | | | 234 | 6.9 | | | 52% | 1.7 | | |
| Retail | 117 | 8.2 | | | 168 | 6.9 | | | 43% | 1.3 | | |
| Totals | 95 | 8.1 | 868 | 361 | 141 | 6.8 | 1,297 | 629 | 48% | 1.3 | 45% | 74% |

commercial banks and their regulators to CMBS conduits and their credit rating agencies. As a result, the foundations and principles of extending credit have deteriorated because of a lack of accountability and trust system reinforcements.

Financial intermediaries have evolved into largely “hustle and flow” sales and marketing companies or conduits to the capital markets, pitching all types of financial products to earn fees. This is in contrast to commercial banks, which derive earnings on fees and the interest spread on loans outstanding, and pay the price for aggressive loan underwriting. These “hustle and flow” practices provide incentives for loan production to maximize profits from origination fees and from the sale of collateralized pools of loans. To earn more profits, flow must steadily increase through the conduit. Because of the fierce competition for new borrowers, the lowest rate, best structure or most covenant-light lender wins the deal. CDOs became a buyer of larger amounts of the B-piece tranche market beginning in 2005.⁴ Flow through CMBS conduits grew with their own CDO or strategically aligned CDO, and were more competitive in winning new income-property loans than conduits with more conservative institutional B-piece buyers. To compete, other conduit lenders followed suit and created their own CDOs, or B-piece buyers decided to take on more risk to remain competitive for new income-property loans. Underwriting discipline and accountability slowly deteriorated over time because the system of checks and balances was no longer possible in some conduits with higher loan flow rates.

Because of this “hustle and flow” loan production system and deteriorating underwriting patterns, I contend that the CMBS production vintages from 2004–2007 hold a high number of subprime loans similar to the residential MBS securitization pools, and therefore are at the greatest risk of default.

These “hustle and flow” loan origination systems created the following off-balance-sheet portfolios (estimated current market amounts of total loans) since 1999:

- Mortgage-backed securities (MBS)—\$11.4 trillion, est.
- Commercial mortgage-backed securities (CMBS)—\$760 billion as of Sept. 30, 2007.⁴
- Asset-backed commercial paper markets—\$1.2 trillion, est.
- Consumer and commercial credit card securitizations—\$900 billion, est.
- High-yield bonds (junk bonds)—\$882 billion, Moody’s est 3rd Q 07
- Credit Default Swap market—\$45 trillion est.
- Collateralized Debt Obligations (CDOs) (some have a combination of the above)—\$70 billion, est.⁴
- Financial intermediary markets (banks, savings banks, life companies) \$2.4 trillion as of Sept. 30, 2007.⁴

MARKET RISK CONCERNS

There is significant credit risk exposure in each of these

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credit markets since poor credit quality underwriting occurs in all six separate security markets. I believe that when these securitizations are stress-tested in a recession, the poor credit quality in each capital debt market will result in higher-than-expected default rates. For example, the default rate at the savings and loan I worked for had risen to eight percent on total income-property assets in 1993, when Los Angeles County was in recession. We are still at the beginning of a potential deflation period or tipping point, even though there is a very low CMBS default rate compared to the savings and loan crisis. However, CMBS watch list amounts have increased to \$29.8 billion for failure to meet CMBS servicing code 1E (1.10x debt service coverage).² I expect that default rates will climb as the credit crunch causes a ripple effect on more income-property markets in 2008 and 2009. An example of this already occurring is with the collapse of MBS Cos., an owner of 65 multi-family complexes (17,000 units) in Texas.³ PNC Financial Services Group originated nearly all of the \$900 million in loans off-loaded in the CMBS market. Costar reported on Dec. 12, 2007 that two-thirds of the CMBS loans originated for MBS Cos. from 2000–2007 are more than 30 days delinquent.⁵ Many MBS Cos. loans that are delinquent were originated in 2006, with only one loan originated in 2007 on the watch list for not meeting CMSA violation code 1E (below 1.10x debt service coverage).

CMBS UNDERWRITING WARNINGS IGNORED

In his teachings and articles, **Bowen McCoy, CRE**, warned the capital markets in 2004 about deteriorating CMBS underwriting.⁷ Unfortunately, too few market participants listened to him. Because pundits of both positive and negative issues concerning CMBS markets flood the information channels, they collectively become “noise,” and it becomes difficult to assess risk in the CMBS market, as well as in most other markets. In my view, CMBS market information continues to create confusion for typically prudent investors who are making decisions about buying CMBS issuances. In addition, economic data is slow to be gathered and understood. Much of what I discovered in my studies of adaptive complex systems is how existing patterns of behavior between agents may influence outcomes in the future. In other words, I study how complex systems behave over time, given simple instructions. McCoy, an industry insider who helped create innovations in the capital markets, was accurate in assessing the increased leverage and under-

writing risks. It is my opinion that McCoy should have been taken much more seriously as he was knowledgeable about the real estate-secured capital markets and the potential risks if those patterns continued. McCoy reiterated those concerns in October 2007 at the annual Counselors of Real Estate conference in San Francisco.⁷

MARKET CRASH DYNAMICS

There is much to be learned about how markets crash. My concern regarding a capital markets crash increased on May 4, 2007, when I heard John Geanakoplos, Ph.D., speak at SFI.⁸ Geanakoplos addressed the robustness of capital markets and the dynamics of market crashes. I concluded from his presentation that a negative shift was at a greater risk of occurring. I shared this perspective with my clients and colleagues, and asked them to hedge this risk accordingly, if possible.

Geanakoplos shared three components of a potential market crash:

- **There is some bad news that continues to grow in significance over time.**

My interpretation: The MBS (single-family) market issues were first published as a potential concern at the beginning of 2006.

- **Collateral levels tighten.**

My interpretation: In the spring of 2007, Moody's began to increase MBS subordination levels, reducing collateralized risk exposure to AAA tranches. Since September 2007, commercial banks have tightened collateral levels and loan underwriting standards. This adverse trend is continuing as commercial banks learn increasingly negative investment news.

- **The most optimistic investors lose the most.**

My interpretation: The most optimistic investors, such as hedge funds (Bear Stearns) and investment banks (Merrill Lynch), were first to get hit with losses in the MBS securities market.

It is apparent that the CMBS market is at the tipping point where actual losses may begin to occur. The warning signs follow the same line of logic as observed in the MBS market collapse:

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- CMBS code violations 1E (DSC less than 1.10x) on those loans on the watch list are growing. Currently, the watch list is valued at \$29.8 billion.² Watch lists, consisting of higher-risk loans within commercial banks, are growing within real estate portfolios, but are mainly attributed to single family or condo development construction loans. In addition, CMBS defaults currently are still below one percent.
- Collateral levels are tightening in response to the MBS market collapse. Commercial bank lending has dropped to \$9.2 billion in 3rd Q 2007 from \$37 billion in 2nd Q 2007.⁴ This occurred while CMBS-issued debt was \$50 billion in 3rd Q 2007, up from \$45 billion in the 2nd Q 2007.⁴ This may be explained by commercial banks' sensitivity to initial market conditions, given internal credit administration influences.
- There have been no significant losses to date. However, the most optimistic borrowers and investors will lose the most once losses are realized. Income-property loans originated and leveraged from 2004–2007, I anticipate, will have the highest default rates and losses because of the rapid growth rate of leverage, and poor CMBS underwriting.

CONCERNS ABOUT SECURITIZATION SYSTEMIC SHOCK

Unfortunately, these issues have created a slowing of the commercial securitization market. On Nov. 13, 2007, Bloomberg reported on a pronouncement of Gregory Peters of Morgan Stanley:

“There’s a greater than 50 percent probability that the financial system “will come to a grinding halt” because of losses from mortgages, Gregory Peters, head of credit strategy at Morgan Stanley, said. . . .

“You have the SIVs [structured investment vehicles], you have the conduits, you have the money-market funds, you have future losses still in the dealer’s balance-sheet in the banks,” Peters said in an interview in New York. “That’s all toppling at once. The risk of systemic shock from the current subprime meltdown is quite large in the near term. It’s an overarching concern that we have,” Peters said.

“Losses stemming from the subprime mortgages have caused a seizure of a lot of other markets, especially the securitization market, Peters said. . . .

“While the near-term concern is the systemic shock of the subprime-related losses, the medium- and long-term concern is the impact on the average consumer. The ultimate irony here is that the U.S. consumer now needs readily available capital more easily than ever, but they’re going to have the most difficult time getting it.”⁹

As Peters forecasted last November, the losses from subprime residential loans in the securities markets has become a contagion that is spreading to other markets and other financial intermediaries, including banks.

Further, as reported by Al Yoon of Reuters on Tuesday, Jan. 29, 2008, it was the first month in 20 years where a CMBS market failed to price a single issue.¹⁰

INVESTOR AND LENDER OUTLOOK FOR 2008

Income-property lenders will likely experience an investment outlook shift for the following reasons:

- **Higher spreads and investor yield requirements:** CMBS, MBS and CDO conduit lenders will require higher spreads to attract investors concerned that investment risk has increased because of recent bad credit events. More bad news will beget more securitization risk aversion. This risk aversion may even require higher tranche investment yield spreads, increasing collateral value underwriting capitalization rates. This has already occurred, according to a Dec. 10, 2007, article by Norma Cohen of *The Financial Times*.¹¹ Spreads are reported to be more than 100 basis points on AAA-rated securities, up from 25 basis points earlier in the year.
- **Uncertain demand for mortgage-backed securities:** Many investors of securities will be holding tranche investments that are in default. Those investors with high exposure levels will no longer be able to buy more securities until the market stabilizes.¹⁰ The CMBS and MBS markets are in systemic shock as a result of the repricing of risk on these securities. At some point, this systemic shock should ease. But, another systemic shock could occur in CMBS market if actual loan losses

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are incurred from foreclosures, as is being reported in the MBS markets. I believe there is significant risk that losses could be high in the CMBS market because of its significant subprime component, just as in the MBS market. At this point, watch list loans in 2005–2007 have been increasing above CMSA-expected levels, indicating credit quality weakness, as reported by DBRS on Nov. 26, 2007.²

■ **Commercial banks under a microscope:**

Commercial banks may be negatively influenced in their lending activities by both federal and state examiners after evaluations or in anticipation of future examinations. Commercial banks will need to raise capital reserves for anticipated losses subject to examiners' evaluation of portfolio risk. In November 2007, Rule 157 of the Financial Accounting Standards Board (FASB) became effective. This rule states that all Tier 3 assets (assets with no liquid market) are marked to market on a current basis. This more stringent rule on capital adequacy will have a negative effect on the ability of commercial banks to continue to lend in the market. In addition, some multinational commercial banks will be subject to the adoption of Basel II reserve allocation regulations by 2010. With this change, higher-risk commercial real estate loans may be subject to higher capital costs. In turn, this regulatory change could lead to more stringent underwriting, resulting in lower collateral values and higher debt service coverage requirements. In addition, all collateral underwriting will be more highly scrutinized. Syndication risk issues are rising among commercial banks as single-family track development and condominium construction loans are now incurring increased loss exposure. Commercial banks, as a result, are being more selective about buying, and are not buying from certain commercial banks that have not lived up to syndication agreement expectations. This issue, if it proliferates, may cause larger loans to become more difficult to underwrite and close.

- **Increased litigation risk:** If loan losses in the CMBS securities markets occur, expect a great deal of litigation among all parties of interest in a

securities transaction pool. This is not unprecedented in the CMBS industry. As a consequence of the increased CMBS annual loan production from \$77 billion in 2003 to \$220 billion in 2007, underwriting error rates have possibly increased significantly. Buyers of CMBS securities with "put options" will be requiring originating conduit lenders, sponsored by many money center banks, to buy back the securities at par value. The size of this risk is as yet undetermined. In addition, conduits that had not hedged underwriting error risk will be exposed to claims of misrepresentation and fraud. I observed this problem with income-property loans in the savings and loan crisis. Many loan files that had been originated in the peak years of 1987–1989 were incomplete, including one income-property loan file that had no promissory note. However, I was still able to successfully collect from the borrower for my client through a creative legal strategy.

WILL THIS ISSUE GROW OUTSIDE U.S. MARKETS?

There are reasons for significant concern about a worldwide market correction. The difference in this CRE cycle is that it is only a part of a greater credit bubble. Because the investment world is now flatter and more interdependent, countries may be negatively affected over time since the scale of this credit crisis, in my view, is larger and could have a greater impact on the U.S. economy than the saving and loan crisis in the late '80s and '90s. According to a *Wall Street Journal* article dated Dec. 10, 2007, by Greg Ip, et al., "Over the past decade, Wall Street built a market for more than \$2 trillion in securities sold globally and backed by loans to U.S. homeowners."¹² As we are now witnessing, the United Kingdom, Europe, Australia and Asia have already been affected."

CONCLUSION

There are many reasons to be concerned about the income-property capital markets at the beginning of 2008, given the systemic shock from the securitization markets and its impact on traditional lenders and income-property investors. If an investor can hold onto a long-term income property for 7–10 years without the need to refinance, there is no reason to be concerned. If an income-property investor needs to sell or refinance an investment property for any reason, the risk of potential collateral deflation, poor investment demand

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and capital markets turmoil could create risks of high refinance costs or loan payoff shortfalls. I believe, as a result of deflation risk concerns, that financial intermediaries will be more risk averse in new loan underwriting, causing CRE property investors to face tighter lending standards for lesser loan amounts.

2008 AND 2009 MARKET ASSUMPTIONS

Market condition assumptions for the attached addendums are for a healthy traditional balance sheet lender.

1. **Deteriorating commercial lending market:** If commercial banks tighten underwriting, and with conduit lenders dropping out of the market in the next 12–24 months, deflation risk will likely rise since interest spreads will be increasing, and loan structure and terms will be tightening for investors seeking income property loans.
2. **Limited number of all-cash investors:** All-cash buyers and low-leverage investors, such as private equity funds, offshore investors and REITs, are not expected to be able to pick up enough slack in volume to eliminate deflation in income-property collateral values.
3. **Deteriorating income-property market conditions:** Income property performance fundamentals in areas of the country experiencing large numbers of single-family foreclosures will also be negatively affected. Appraisers relying upon comparable sales and income approaches will be slow to acknowledge the decline in income property or collateral values. Historically, at the tipping point in the deflation period beginning in 1990 in California, both the income and market approaches to value proved unreliable in predicting income-property loan collateral values following foreclosure.

There is significant evidence to support the idea that in early 2008, income-property markets are at the beginning of a deflation period, or a tipping point, as in 1990 and 1991 in California. The default rate at the savings and loan I worked for in 1991 was climbing from two to eight percent in 1993 in a \$4.5 billion income-property loan portfolio. We are still observing relatively low default rates, which will most likely climb as the credit crunch affects more income-property loans going into 2008 and 2009.

ADDENDUM 1: RESEARCH IDEAS

A good way to determine the overall income-property loan default risk exposure for all lenders and CMBS investors would be to separate and quantify all the high-risk income-property debt originated from the end of 2002 through October 2007. These income-property loans benefited from the reduction of capitalization rates that were fueled by hyper-liquidity as a result of 40-year-low interest rates and “hustle and flow” loan production systems. If a researcher were to pursue this task, he or she would need to remove income-property loans with a low risk of default, such as those leveraged below 65 percent, those that have existing high-debt service coverage ratios above 1.35x, or those with long-term leases with tenants with good credit. In addition, the researcher would remove those income-property loans in banks and finance companies that are owner-occupied, guaranteed or have significant secondary credit support from sponsors with a highly liquid net worth. (*Please note:* depending on the severity of the deflation risk, current high-net-worth borrowers may not be as liquid or have a high enough net worth to support all of their income-property investments.) The remaining income-property loan pool of securitized and financial intermediary loans (my estimate at over \$1 trillion) is at risk of loan default (maturity, covenant or debt service payment) in the next two to five years. I believe income-property loans originated since 2004 with aggressive interest-only payment terms are the most likely to default, beginning in 2008 and 2009.

EVALUATING AN EXISTING INCOME-PROPERTY INVESTMENT MODEL

Xudong An, Ph. D., University of Southern California, completed a paper called “Macroeconomic Conditions, Systemic Risk Factors, and Time Series Dynamics of Commercial Mortgage Credit Risk.” He studied the 10-year period from 1993–2003. Although his conclusions were insightful, his time-series dynamic analysis would be more interesting if he would revise his study from 1997–2007, since in my view, December 2006 will be considered the peak of the investment cycle. I am setting this cycle peak date even though in the first three quarters of 2007, momentum continued forward at even higher leverage and underwriting excesses. Unfortunately, the study would need to be conducted in 2010, when actual default rate results can be tabulated and analyzed, to

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determine if Dr. An's predictions of credit risk on commercial loan portfolio are correct.

Dr. An conducted a time-series analysis for the years 1993–2003. His loan composition and risk conclusions are dependent on information about loans that originated during this period. He concludes that loans in southern California (Western/Pacific) have the lowest risk across regions, while those in the south have higher risk compared to his reference group, northeast/mid-Atlantic. I disagree with his conclusion, based on my direct observation of a depression in investment real estate values from 1991–1996 in southern California. The study group was a portfolio of 60,000 CMBS loans originated from 1993–2003. Since southern California had reached the bottom in 1993–1996 in real estate values (at about 50 percent of replacement cost on multi-family, for example), investment real estate values had no where to go but up. In addition, CMBS originations did not take off in significant volume until 1997. I suspect his data pool, through 1997, was a small portion of the data loan pool sample size.

In summary, though, I found Dr. An's modeling results very interesting and think they could be modified and become useful as a credit risk assessment tool. His research shows large variations of credit risk over time in the commercial mortgage market and demonstrates that these variations are explained by two mean-reverting latent risk factors: the macroeconomic factor, and a commercial property market-specific factor. The model and the results he expects will be useful in default-risk prediction, hedging and pricing. Dr. An concludes that there is substantial variation in default hazard rate across geographic regions; maturity and amortization terms are found to be negatively correlated with default hazard rate; and certain property types such as hotels show significantly elevated default risk for the period observed. However, because of current market feedback, the high default rates experienced by lenders will likely lead to changes in future underwriting behavior. Since real estate markets are complex adaptive systems, models or studies that attempt to predict the future behavior of these markets, they must account for changes in the marketplace. I am not sure this model or any model can be helpful in predicting market behavior over a five- to ten-year period. However, there is much to be learned by continuing to try, as was observed in the study conducted by Dr. An.

ADDENDUM 2:

RECOMMENDATIONS ON HOW TO FIX THE SECURITIZATION OF REAL ESTATE

In my opinion, it is prudent to revert to traditional underwriting standards and loan structure that require recourse language, borrower portfolio risk analysis, evaluation of the applicant's character, establishment of trust, and the hedging of income-property loan risk so that both the borrower and the bank will experience a stable and profitable outcome. When a system has a process of inputs with no trail of accountability, such as was created in the securitization lending market, the outcomes become much more uncertain. Quality control in income-property loan origination is benchmarked by the lowest common denominator or the most aggressive competitor (such as a CMBS conduit with a CDO purchase of B-piece tranches) in the marketplace.

Ideas on how to make the CMBS market work better in the future are:

1. **Required B-piece ownership and servicing:** CMBS and MBS servicers, and special servicers should be required to buy a minimum of 10 percent of the first-loss piece of the loan. This policy will: (a) provide incentive for conduit lenders to become servicers and special servicers for all the debt they originate, to help control loan production flow; and, (b) prevent loan underwriting standards from loosening. When CDOs proliferated, the CMBS market grew at an accelerated pace by purchasing more first-loss pieces. CMBS market discipline was diminished when CDOs became a larger participant in the market. The growth of CDOs helped to increase deal flow and reduced the risk of rejection of income-property loans in pools by the B-piece buyers. In addition, the existing income-property loan servicing issues may be mitigated since the servicer will own the first-loss piece and will have incentive to assist existing borrowers with normal servicing issues, including minor changes in loan structure. Presently, CMBS loan servicers are third-party contractors who work under loan servicing agreements for the trustee of the bond issuances. Some B-piece owners also have special servicer agreements to protect their investment in their CMBS issuances—but not all. I am recommending a 100

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percent B-piece purchase and servicing requirement that permits no involvement with CDOs or other special investment vehicles.

2. **Higher credit quality underwriting and transparency:** Higher credit quality underwriting standards should be adopted at an CMSA-industry level, and there should be government oversight. Income-property loans with market speculation risk would be required to be identified separately. All property types that are highly correlated with the performance of the national economy or local economy (hotels, motels and resort properties) are to be allowed access to the market but at more conservative underwriting standards.
3. **Higher accountability of credit rating agencies:** Credit rating agencies should become nominally liable for ratings given on securities that experience actual loan losses. I do not think agencies should be liable for model-to-market or mark-to-market losses, but rather for actual loan losses on the “at inception rating at sale” investment-grade tranches. The liability would be limited to the amount of fees earned plus a negotiated multiple to ensure diligence by the rating agency. Also, credit rating agencies must ensure reliability in the rating given to investors so that this market can again function in a sustainable and robust manner. This change in the rating system will increase scrutiny by rating agencies since there will be an associated cost to them for not assessing credit risk appropriately. This is a concern, given that on the \$723 billion in CMBS loans outstanding as of June 30, 2007, 95.1 percent were rated as investment-grade BBB- or better. Because of the recent downgrades on many types of MBS as of this writing, it appears the credit rating agencies were out of alignment in assessing the risk of commercial real estate and multi-family collateralized loans. The credit rating agencies are not entirely at fault in this debacle, but a contributor since, in my opinion, they did not understand income-property investment cycles. In addition, I contend that during the vintage years of 2004-2007, the outdated computer-risk models used by the credit rating agencies limited their ability to properly assess the risk of default.

ADDENDUM 3: INCOME-PROPERTY INVESTMENT STRATEGIC INITIATIVES

These strategic initiatives for lending by commercial banks can be helpful to income-property investors in understanding why lenders tighten underwriting when credit risk increases. Lending into an income-property investment deflation period is a strategy with a high credit risk. Lending risk can be mitigated through the following recommendations:

- **Limit cash-out:** Refinance loans on income properties where the loans originated prior to 2002. Try to reduce leverage and provide “no cash-out” financing. There is a danger that if current values are used to support “cash-out” financing, the loan-to-value will increase to unsupportable levels as deflation moves forward in time.
- **Focus on the certainty of cash flows:** Lend on income properties with a high certainty of cash flow, even when stressed in a recession. Properties with long-term high credit quality tenants will weather any impending storm. Also, well-located properties tend to be resilient to the negative effects of deflation risk, given that these properties are supported as a first priority over properties that are less well-located. Be cautious about pursuing multi-family lending as a safe haven strategy since multi-family can be affected by the combination of high turnover of units and lower rental rates in a severe regional recession. In my 10 years of loan workouts, about 85 percent of my income-property loan foreclosures were multi-family.
- **Construction financing:** Construction loans might be a good idea if you want to be in construction through the end of a deflation and/or recession period. However, it is risky for an investor to speculate on what future rental rates will be after construction is completed. This uncertainty is based on the difficulty in determining today what purchase price or leverage amount your competitors may have when construction is completed. It is also difficult to predict what the variance in rents will be with competitors, especially if distressed sales or foreclosures reduce the property ownership

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cost and leverage amount of those competitors. In a regional recession, properties of similar quality with the lowest cost basis wins the lessee. This is most problematic when foreclosures are occurring on like-kind good-quality property during the construction period. The new buyers of the foreclosed properties usually have a lower cost and lower leverage basis, and will be able to profitably compete against a new project built at a higher cost. Depending on the severity of income-property deflation and of a possible regional recession, the income-investors with the lowest property ownership basis and/or lowest leverage in their properties have the highest survival rates. Property owners in the income-property markets have always been in a battle for the lowest cost and/or leverage of property basis to compete head-to-head on like-kind property. The hyper-liquidity of capital markets diverted many seasoned income-property investors from this way of thinking, in my opinion, and has exposed many of them to increased investment loss risk.

- **A case for recourse:** Seek secondary financial security for the loan from a guarantor with a demonstrated liquid net worth or by providing an irrevocable letter of credit. Financial institutions such as banks, savings banks and life companies are mandated to lend conservatively and be fully repaid. Market-risk losses are not factored into the yield on loans. If collateral risk increases—which increases loan default and full principal recovery risk—financial institutions must hedge it by reducing leverage and increasing debt service coverage requirements. If default risk cannot be significantly hedged because either leverage is too high or debt service coverage is uncertain, high-quality guarantor support, deposits or an irrevocable letter of credit must be obtained.
- **Evaluate total portfolio-related debt:** Lend to investor groups and investors with existing low-leveraged portfolios with an excellent debt service coverage. Doing otherwise greatly increases the risk of portfolio loan defaults that may negatively affect your income-property loan. The exception would be a portfolio with virtually all the tenants of high-credit quality and in long-term leases with all the

loans in the portfolio maturing beyond seven years. If the portfolio product types are subject to market influences or speculation, the portfolio risk could be severe and may have a negative impact on the investor or investor group. A chain reaction could occur where one or two properties in a portfolio begin a period of low liquidity for the investor. Over time, this leads to the inability of the investor to support all of the projects in the portfolio appropriately, increasing the risk of the weakest properties going into default. Depending on the dynamics of the portfolio and the behavior of the specific co-investors within each property, a lender can better determine and understand portfolio risk characteristics before making a new loan.

ENDNOTES

- 1 The CAC Group, Second Quarter 2007 Report.
- 2 *DBRS Global CMBS Newsletter* (Nov. 26, 2007).
- 3 “Betting on Bad Mortgages; Subprime derivatives market play role in credit freeze.” *The Wall Street Journal*, (Jan. 6, 2008). By Bob Irvy, Bloomberg News.
- 4 *Commercial Real Estate/Multifamily Finance Quarterly Data Book*, Mortgage Bankers Association. Data provided in CREF Quarterly Data Books beginning in 4th quarter 2004 through 3rd quarter 2007. Author has interpreted this data as it has changed over time as a basis for deflation risk concerns.
- 5 Mark Heschmeyer, “Trouble in Texas: Huge Multifamily Owner Nears Collapse,” *CoStar Group News* (Dec. 12, 2007).
- 6 Federal Reserve Statistical Release. “Unfortunately, since a rising tide floats all boats, the increase in the aggregation of all income-property collateralized real estate loans (excluding CMBS) originated since Dec. 31, 2003, was from \$1.7 trillion to \$2.4 trillion on Sept. 30, 2007, a 42 percent leverage increase over three years.”
- 7 Bowen (“Buzz”) McCoy, panelist in “Cycles Response Panel: The CRE ‘Legends’ Speak” Roundtable,” Counselors of Real Estate Annual Convention, San Francisco (Oct. 30, 2007).
- 8 John Geanakoplos, Santa Fe Institute Annual Meeting (May 4, 2007).

Deflation Risk in Income-Property Investments and Permanent Loan Portfolios: A 2008 Update

- 9 Carol Massar and Fabio Alves, "Mortgage Loan Losses Pose Risk of Systemic Shock, Peters Says," Bloomberg.com (Nov. 13, 2007).
- 10 "CMBS era issuance grinds to halt in January," Reuters.com, Jan. 29, 2008., By Al Yoon
- 11 Norma Cohen, "Commercial Real Estate Bond Values Fall Sharply," *Financial Times* (Dec. 10, 2007).
- 12 *DBRS Global CMBS Newsletter*, Ibid.
- 13 Greg Ip, Mark Whitehouse and Aaron Lucchetti, "U.S. Mortgage Crisis Rivals S&L Meltdown," *The Wall Street Journal* (Dec. 10, 2007).
- 14 Xudong An, "Macroeconomic Conditions, Systemic Risk Factors, and the Time Series Dynamics of Commercial Mortgage Credit Risk," dissertation, University of Southern California, July 2007; presented as a paper at USC's Lusk Center for Real Estate on Jan. 30, 2007. ■

CRE

Seizure in the Capital Markets and Its Impact on Washington's Investment-Grade Office Building Deal Volume

BY OAKLEIGH J. THORNE, CRE

THE LENDING CRISES THAT HIT THE U.S. ECONOMY IN THE LATE 1980s and early 1990s had their foundation in poorly underwritten commercial loans and, for the most part, the impact of this failure remained within our domestic borders. However, this time the disruption in the credit market is found in residential loans that have infected both global and domestic credit markets for all asset classes and profiles.

Thomas L. Friedman declared in his most recent book, "The World is Flat," that the globe is a level playing field and is rapidly shrinking. The concept certainly applies to global financial markets as we watch the impact of subprime loan defaults seep into the international markets, thereby reducing access to credit. The constrained flow of global funding has entered U.S. micro markets, and Washington, D.C.'s sharp decline in office building acquisitions from 2005–2007 is a good example of our flat world.

GLOBAL BANKING 101

Global trading in the world's foreign exchange market has jumped from about \$70 billion per day in the 1980s to more than \$3.2 trillion per day in 2007. The U.S. prime rate was never the global standard for foreign exchange markets as it was always considered "politically sticky." Rates published by the London-Inter-Bank-Offer-Rate (LIBOR) are the intermediary in the exchange of foreign currency. It is now common practice for a country originating funds to deposit them in one or more foreign banks to facilitate money flows. As the currency flows rise and fall between countries during the day, market traders using derivatives and future contracts seek to capture

arbitrage profits contributing to added volatility in global currency markets.

London is the capital for offshore currency deposits for almost all depositor nations that function in a global environment. Typically, these deposits are held in European banks; however, other depositories include the Bahamas, Bahrain, Canada, Hong Kong, Japan, the Netherlands Antilles and Singapore, among others.

Much of the volume in the foreign exchange market is linked to movements between LIBOR deposits and other global banking centers. However, the foreign exchange market has no physical location and no central exchange similar to the stock exchanges of London, Japan and the United States. Operations function electronically among the global banks, corporations and individuals who are constantly trading currencies. Sans a physical "place," the currency exchange market operates 24 hours a day without regard to time zones, as funds move around the globe.



About the Author

Oakleigh J. Thorne, CRE, with 42 years of real estate experience, is a principal with Thorne Consultants, Inc., in Kensington, Md. His practice area includes the Washington/Baltimore CMSA with a concentration in land use impact studies and zoning appeals, due diligence, litigation support, market studies, forensics and risk analysis.

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Gary Dorsch, editor of the *Global Money Trends* newsletter, reported in a recent edition:

“Normally, the three-month LIBOR rate trades at a small premium of around 0.15 percent above where the market thinks the European Central Bank's (ECB) repo rate will be in three months' time. But since the shocking revelations of the subprime mortgage debt crisis came to the surface in mid-July, with potential losses to global banks of anywhere from \$250 billion to up to \$1 trillion, Euro LIBOR rates have shot much higher, to 75 basis points above the ECB's 4.00 percent repo rate.

“In early December, the Euro LIBOR 3-month deposit rate jumped to 4.72 percent, far above the ECB's repo rate of 4.00 percent, the widest gap since May 2001. The size of the potential losses in the banking sector both in Europe and in the U.S. is still very uncertain and very large, and this is keeping inter-bank markets dislocated. **In other words, banks are reluctant to lend money to each other in the LIBOR market, and are hoarding cash instead, to cover probable future losses.** With more than \$1.8 trillion worth of securities backed by subprime mortgages created since 2000, banks and broker dealers are revealing new losses every week. The impact on the overall confidence in the credit markets has been devastating.”

Although the ECB has attempted to ameliorate liquidity fears, the effort has failed to convince the global banks to lend to each other at rates matching perceived risks. Consequently, LIBOR has moved higher, clearly suggesting that the cost of accessing funds will become more expensive.

Thus, higher bank lending rates reflect growing concern about the strength of financial institutions after more than \$120 billion of write-downs by several Wall Street firms and CitiBank last quarter were directly linked to subprime mortgage defaults.

LIBOR serves as the primary benchmark for global short-term rates and is used to settle many of the world's interest rates, futures contracts, hedge funds and derivative contracts including short-term commercial-paper loans used by banks—above \$3.5 trillion globally. Financial futures contracts, with values of about \$150 trillion are indexed to the LIBOR. Unknown to many, a very large

percentage of U.S. business and consumer loans, including domestically originated home mortgages, are pegged to LIBOR rates. Moreover, almost all home mortgage loans in the EU are directly linked to the performance of LIBOR.

The Feds recently lowered the funds rate based on a report that the 224,451 foreclosure filings on U.S. homes in the month of October 2007 represent an increase of 94 percent compared with foreclosures in October 2006. For the full year, RealtyTrac expects two million U.S. homes to have entered the foreclosure process; this includes bank repossessions, default notices and auction sale notices. In addition, two million more adjustable-rate mortgages are scheduled to reset in 2008, with many tied to the LIBOR rate, sending homeowners' monthly mortgage payments higher, possibly to unmanageable levels.

Before the credit crisis, global banks had various options to access funds including the commercial paper market of \$1.2 trillion, which is now effectively closed to all participants. Currently, banks have to rely on inter-bank funding where cash supply is squeezed by a year-end liquidity shortage. U.S. banks whose costs of borrowing are founded in the LIBOR market jumped to +202 basis points above U.S. Treasuries in the third quarter of 2007.

The Federal Reserve realizes that LIBOR is not clearing efficiently, and half of the total world's finance is tied to LIBOR performance (\$150 trillion including derivatives). The risk of recession and a spreading toxic infection from the defaults of subprime loans increases every week.

As Mr. Dorsch noted:

“Worse yet, U.S. corporate profits are in a recession, and the entire U.S. economy may not be far behind. Corporate profits, as measured by the Commerce department, fell \$19.3 billion in the third quarter from the second, as domestic earnings dropped to \$41.2 billion. The drag from sagging U.S. sales and huge write-downs were offset by robust earnings abroad, fueled by the weak U.S. dollar.

“Operating profits for S&P 500 companies fell 2.5 percent in the third quarter, the first drop in more than five years. Much of last quarter's damage came in the financial sector, where operating earnings fell 25 percent, as banks and brokers were hurt by losses from subprime mortgages and related investments. Financial industry profits in Q4 may also decline more than 25 percent from a year ago.”

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THE CMBS MARKET

The disruption in the credit markets began in early July 2007; however, mutations in the process to access credit began in late 2006 when residential subprime defaults first hit the newspapers. By the end of the first quarter of 2007, buyers of investment property found their access to easy money far more difficult. Investors and lenders redirected their goals and invested in risk-free Treasury notes and bills, driving prices up and interest rates down for these instruments while abandoning riskier investments. Balance sheet loans (cash generated from operations) from banks and insurance companies are still available but at far more conservative terms.

The securitization activity, including commercial mortgage-backed securities (CMBS) issuances, slowed moderately during 2006 and 2007 from the pace set between 2002 and 2005 (refer to Chart 1). Institutional and foreign investors who do not use leverage are now more active, while buyers needing high-leverage private sector money have been stalled.

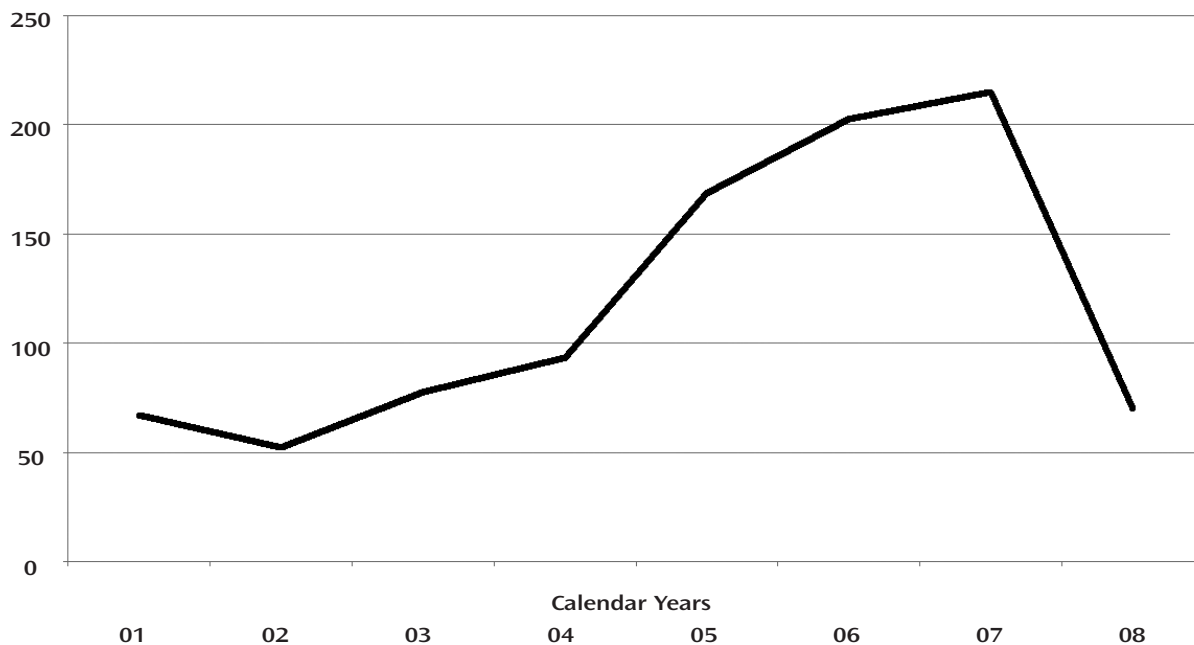
The stock and bond markets reacted to the rising rate of delinquencies among subprime residential borrowers, a result of continued deterioration in the housing sector. Investors lost confidence in subprime loans, the securities backed by subprime loans and the businesses making, holding, securitizing and purchasing subprime loans. Hedge funds managed by Bear Stearns, Merrill Lynch, Goldman Sachs and others that had purchased subprime asset-backed securities (ABS) reported huge losses. Globally, an Australian hedge fund and banks in Germany and France that invested in these subprime ABS also reported significant losses. Investors seeking to increase returns leveraged their ABS holdings which, when applied to a market decline, exponentially drove prices even lower.

According to Bloomberg News, a dozen of the largest investment firms headquartered in New York and Los Angeles pooled subprime residential asset-back securities (ASB) totaling \$383 billion and sold the paper to investors in 2006. As of September 2007, 21 percent or about \$80 billion is in default. The impact is worse as Bloomberg did not report the lesser known firms issuing less than \$20 billion in securities. There are about 18 trillion global

Chart 1

Domestic CMBS Issuance by Year in \$ Billions and a 2008 Estimate by Morgan Stanley

Source: CMSA and Morgan Stanley



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dollars in all forms of outstanding ASBs, and market analysts claim that losses will be in the range of \$400 to \$600 billion. Published articles in newspapers had reported only about \$150 billion as of the end of 2007. The trough remains in the future despite the current Federal Reserve's rate reductions.

Prior to July, it appeared that the primary impact of the housing downturn on the office market would be restricted to buildings whose tenant rolls included mortgage lenders, title companies, builders and other housing-related businesses which were downsizing or closing. The retail sector also seemed at risk as strapped homeowners cut back on discretionary spending, and sliding home construction reduced opportunities for shopping center developers. The upheaval in the credit markets has been called by Fitch Rating Ltd. (a rating agency with offices in New York and London) "a global re-pricing of risk." There is now a negative reaction to lending practices that had become too aggressive using highly engineered and complex debt instruments impacting all asset classes and economic sectors including commercial real estate (CRE) in the global sphere.

Easy access to all forms of credit instruments has driven cap rates down and deal volumes up to record levels every year since 2002. Analysts are still debating whether this behavior is a bubble waiting to burst or a rational re-pricing of assets from the depressed levels of the 1990s. Market participants are confident that the chronic overbuilding that consistently plagued some markets has slowed or stopped.

Institutional-grade assets have been priced using future assumptions based on upward-bending parabolic curves (the use of exponents in cash flow projections as an example); however, when global credit markets turn downward, the response is an equal and negative parabolic curve.

Aggressive lending conditions prevailing in the commercial sector from early mid-2004 to mid-2007 offered opportunities for real estate developers, lenders and property owners to use a menu of complex financial instruments to gain access to low cost capital and shift risk. Expectations by all participants were that increases in both rents and prices would cure the poor underwriting

standards. Pricing for all income-producing assets has risen in the last five years to the equivalent of the heady days of the 1980s. Major cities like New York, Washington, Boston, Chicago and Los Angeles have exceptionally strong office markets. However, by mid-2007, evidence of the significant change in both deal volume and prices became obvious.

The Center for Real Estate at MIT published in September 2007 a set of indices for trading real estate based on Real Capital Analytics transaction database. Its website (mit.edu/cre/research) offers a 75-page PDF on the construction of the indices to measure demand for real estate investments and price changes over time. The authors, Messrs. Geltner and Pollakowski, reported that both demand and price indices turned negative in the third quarter of 2007 for the first time since the third quarter of 2003.

Some market observers (appraisers and real estate analysts) expect that commercial real estate prices in the U.S. could fall as much as 12%–15% during 2008. Active buyers of investment-grade real estate in July 2007 bought the fewest commercial properties since August 2006, and apartment acquisitions were down 50 percent from June data compiled by industry consultants Real Capital Analytics, Inc.

New issuance of U.S.-based CMBS in 2007 (\$215 billion projected by Morgan Stanley), although higher than in 2006 (\$203 billion), has been more difficult to obtain this year, which has slowed deal activity and rendered debt more expensive to obtain. In 1990, financial institutions held about \$1.1 trillion of the commercial and multi-family loans. The public Government Sponsored Enterprises (GSE) and private sectors (real estate developers and investors) shifted their focus to the capital markets (investors on the street) after the credit crunch in the early 1990s. By the first quarter of 2007, the aggregate CMBS paper held by all investor profiles was slightly more than \$3.0 trillion. The chart below depicts the annual growth in issuance activity from 2001 to about Dec. 8, 2007. Morgan Stanley projects domestic CMBS issuance to drop to \$70 billion in 2008 due to "weakening real estate fundamentals."

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According to Morgan Stanley, the global market for CMBS approximated \$300 billion in 2007, and will drop to about \$100 billion in 2008.

ASSET-BACKED SECURITIES

CMBS are only one component of all asset-backed securities; however, the CRE securities are not responsible for the current seizure in the credit markets. The financing of commercial property (defined as office, retail, industrial, multi-family and lodging properties) is an unintended victim in this collapse.

The website abalert.com compiles statistics on rated issues including residential mortgage-backed issues and collateralized bond (CBO) and debt (CDO) placements anywhere in the world. The database includes only those securities that are:

- 1) rated by at least one major rating agency;
- 2) under the control of a Trustee; and

- 3) collateralized by assets of some kind; synthetic CDOs and catastrophic bonds are also included.

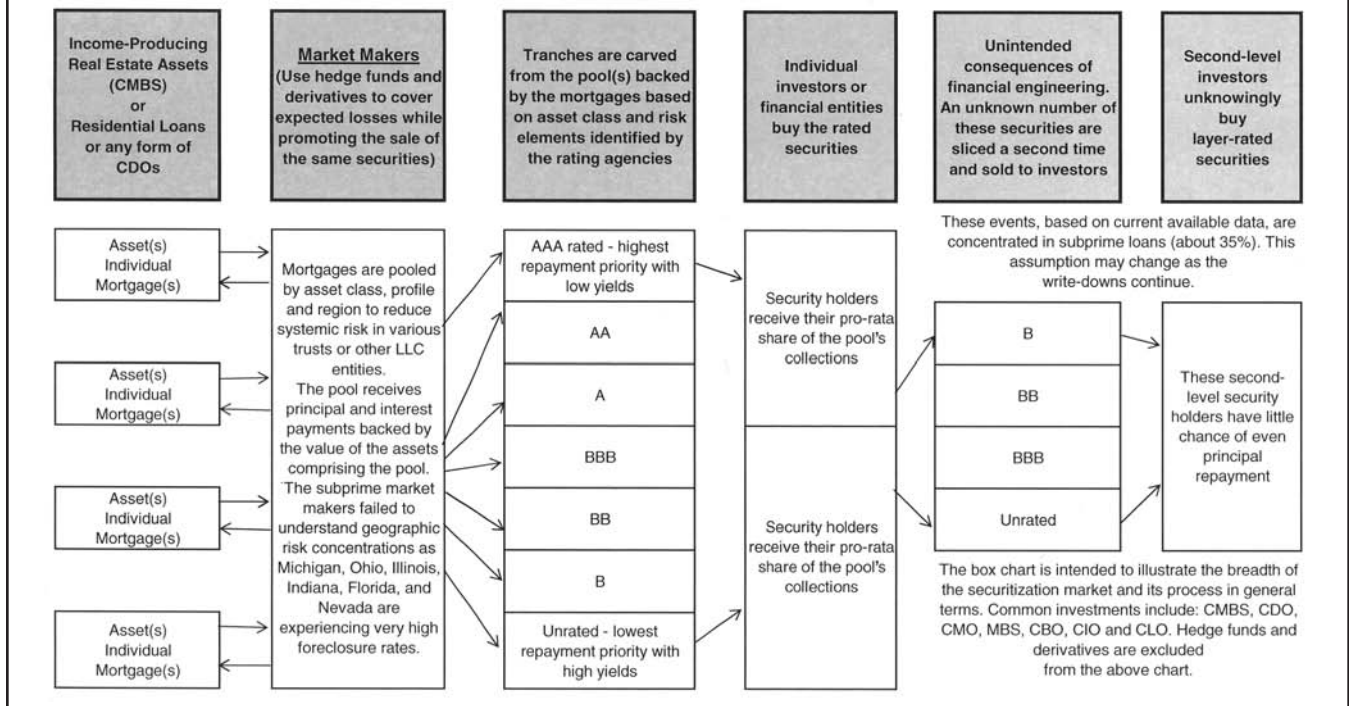
The database excludes CMBS, GSE, and municipality and tax-exempt issues.

The financial engineering mechanism or process behind the issuance of both ABS and CMBS begins with an originator of a loan or credit instrument. Market makers, using their lender or originator network, pool multiple debt obligations (CBO, CDO and other fungible assets). The goal of the originator is to factor and sell the debt instruments to an investment firm, which in turn collects a fee to package the loans. The shift from the original lender to the asset pool enables the originating entity to free up capital to capture new deals.

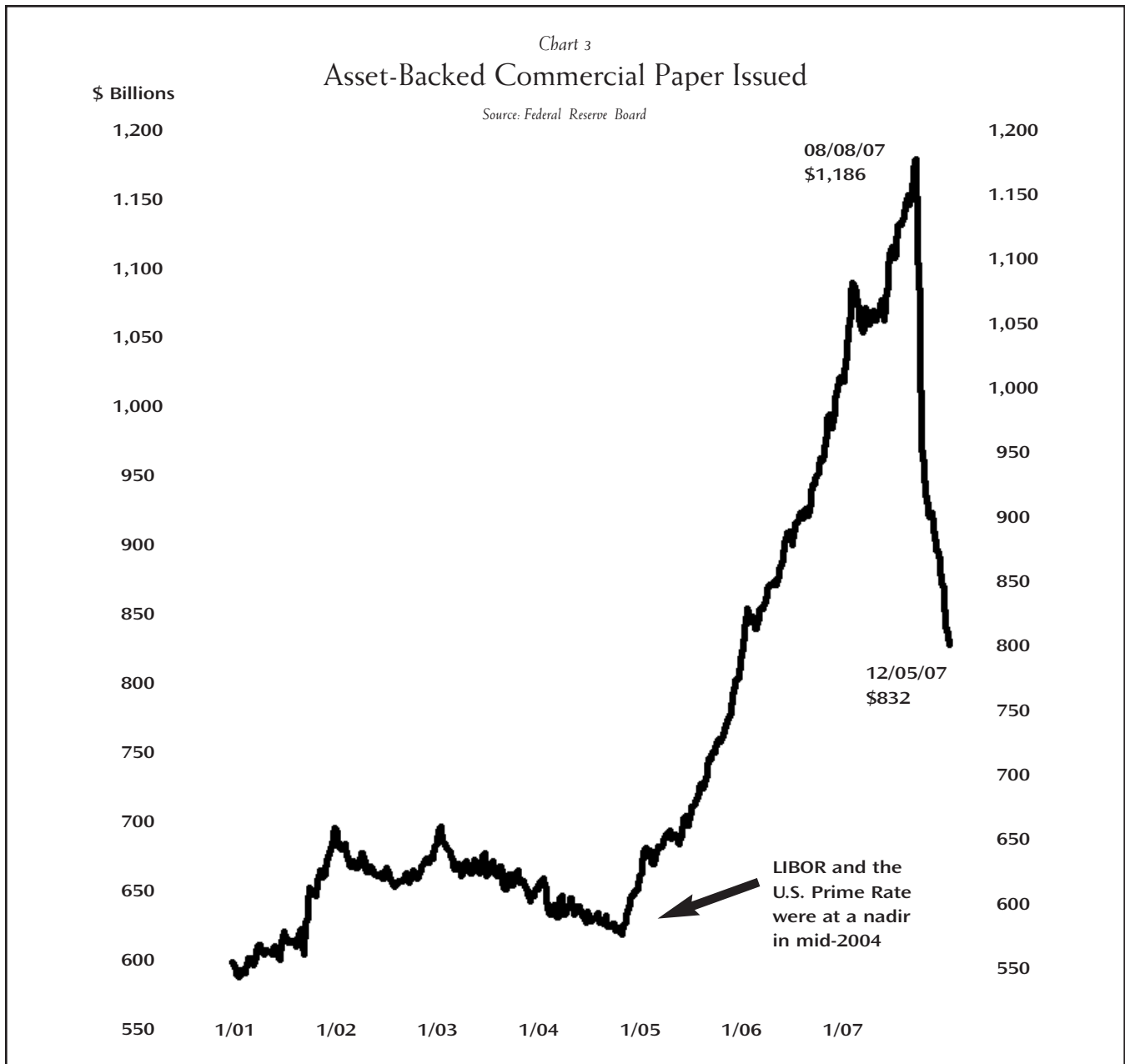
Based on assets comprising the pool's future income (repayment of principal and interest or other payment forms), portions are carved into tranches. "Tranche" is the French word for "slice." Slices of these highly complex structured investment vehicles (SIV) are sold based on

Chart 2

Asset-Backed Securities (ABS) and the Financial Engineering Used to Structure Highly Complex Investments



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several different factors relating to risks, rewards and/or maturities (varying terms). The slices are then rated by one or sometimes two rating agencies such as Fitch, Moodys and S & P. When rated, the tranches are offered for sale to individuals or firms. The process is illustrated in Chart 2.

The impact of the subprime defaults is magnified, as we are now learning, as a number of unknown firms, for a fee, purchased slices of these original-rated pools and re-packaged the assets a second time, rated them a second

time, and later sold them as lower-tiered units to other investor market participants. The impact has been global as most banking members of the EU have offices in New York, and they acquired both the original-rated and second-tier rated ABS.

The line graph illustrated in Chart 3 reports ABS issuance from Jan. 3, 2001 to Dec. 5, 2007. The rise in activity was initiated when both the U.S. prime rate and LIBOR were at a nadir in mid-2004.

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Chart 4

ABS Issuance From Jan. 3 to Dec. 5, 2007

Source: Federal Reserve Board

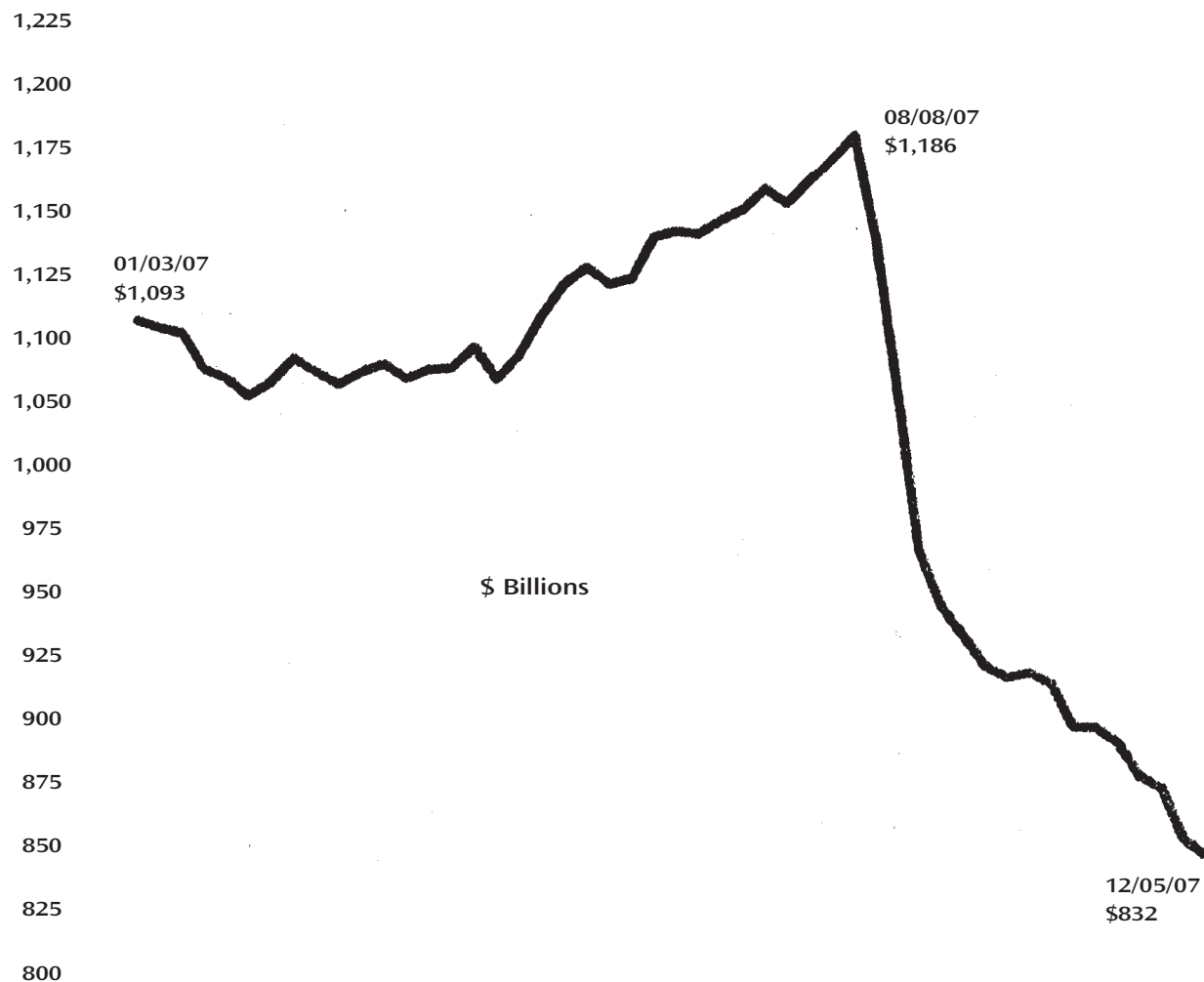


Table 1

ABS Breakdown as of Nov. 29, 2007

| SECURITY | (\$BIL.) | (%) |
|---------------------------|--------------|--------------|
| Other | 211.4 | 36.7 |
| U.S. Subprime Residential | 202.1 | 35.1 |
| Credit Cards | 90.3 | 15.7 |
| Non-U.S. Residential | 72.7 | 12.6 |
| TOTAL | 576.6 | 100.0 |

Issues originated only in the U.S. for about eleven months of 2007

Source: abalert.com

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Table 2

Yield Margin Comparisons

| INVESTMENT | 3Q07 | 3Q06 | 3Q05 | 3Q04 | 3Q03 |
|----------------|------------|------------|------------|------------|------------|
| R. E. Yields | 8.1 | 8.9 | 8.9 | 10.1 | 10.6 |
| 10-Yo. T-Bills | <u>4.8</u> | <u>5.0</u> | <u>4.3</u> | <u>4.4</u> | <u>4.1</u> |
| Margin | 3.3 | 3.9 | 4.6 | 5.7 | 6.5 |

Source: Real Estate Research Corporation

Of the total \$832 billion of ABS issued during the first eleven months, about \$577 billion were domestically pooled and sold. About 35 percent (\$202 billion) of the total securities issued are backed by questionable loans in the residential subprime market. The subprime ratios for 2005 and 2006 are unknown but can only be added to this year's volume. Assuming a total of about \$600 billion in subprime outstanding securities are placed as of the end of 2007 (Table 1), and applying the default ratio reported by the top dozen market makers of about 20 percent, possible loans in default by the first quarter of 2008 could approach \$120 billion.

The monthly issuance volume in 2007 (depicted in Chart 4) illustrates a precipitous fall from early August to early December 2007. The reduced activity is the result of limited to no demand for the securities as well as the originators' inability to raise their own funds for use by end users of credit.

OFFICE BUILDING INVESTMENT ACTIVITY IN WASHINGTON, D. C.

The District's office market in the past five years has rushed headlong into an unmovable wall. First-generation tenants renting space in Class A product have experienced full-service rent increases of about 3.0%–3.5% per year during this period. Prices for Class A to Class B+ office products have been escalating at about 8%–9% per year since 2002. However, total operating expenses during the same five-year period (due primarily to increases in terrorism insurance, real estate taxes and energy costs) are escalating at an alarming rate of 11%–15% per year. While standard tenant fit-up above shell space stood at about \$45 per foot in 2002, the standard work letter in 2007 (if there is one in place for the building) ranges \$55–\$60 per

foot. Obviously, the changes in these parabolic curves should curtail the aggressive attitudes of investors.

Office investors nationwide have been willing to accept lower real estate yields since the third quarter of 2003. The margin between real estate yields and those available from risk-free Treasuries has declined steadily from 2003 to the present (refer to Table 2).

Yields and the inherent risks in commercial real estate investment demand higher spreads above Treasuries than those illustrated between 2006 and 2007. The declining margin over the reported time period is a result of the availability of easily acquired debt for acquisitions and/or the cost of funds for operations. With more conservative lending standards in place, the yield margin will increase to levels reported in 2003 and 2004, implying that asset prices should turn lower during 2008 and 2009.

Market observers in Washington concluded that the intersection of these parabolic curves would prompt an adjustment in prices moving cap rates higher. However, the seizure in the credit markets trumped the evolutionary curve theory. Investment activity for the District's office buildings came to almost a standstill in 2007.

Recently, investment sales activity in the Washington, D.C., office market fell dramatically. The decline became evident in the third quarter of 2007 when the District recorded \$398 million in office sales, according to Cushman & Wakefield, which was equivalent to a 40 percent fall from the same period a year earlier, and the lowest quarterly volume since 2002.

Washington has always been one of those cities where there is an irrational disconnect among the financial indices of cap rates, prices per foot of rentable area, and

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Table 3

Office Building Investment Activity in Washington, D. C. From 2004 to 2007

| CALENDAR PERIOD | DEALS # | DELTA (%) | DEAL VOL. (\$ MILLIONS) | DELTA (%) | MEDIAN \$/FT. | DELTA (%) |
|-----------------|---------|-----------|-------------------------|-----------|---------------|-----------|
| 2004 | 25 | - | 2,474 | - | 363 | - |
| 2005 | 34 | 36.0 | 4,020 | 62.5 | 455 | 125.6 |
| 2006 | 34 | 0.0 | 3,863 | (3.9) | 463 | 1.6 |
| 2007 | 14 | (58.8) | 935 | (75.8) | 440 | (5.0) |

Note: Includes only investment-grade office buildings with prices at or exceeding \$30 million.

Source: CoStar Group, Inc., District's Taxpayer Service Center Web Site, and Thorne Consultants, Inc.

expense burdens. Full-service rents for Class A locations and buildings in New York City fall in the range of \$75–\$90 per foot, and prices are commonly found in a range of \$600–\$900 per foot. Office rents in Washington for similar class structures range \$45–\$60 per foot; however, prices are about \$600–\$750 per foot.

This article concentrates on only Class A and Class B+ product with a selling price equal to or greater than \$30 million. A determination was made that office investments priced below \$30 million, although remaining investor-grade, are not investment-grade real estate. At this dollar scale and higher (\$30 million), both the asset class and tenant profiles (credit ranking and lease terms) are more apt to be favorably received by the rating agencies in New York, thereby decreasing the potential for pooling friction. Leasehold, portfolio and 1031 exchange sales were eliminated from the database. The results of the analysis, using two complementary information sources, are depicted in Table 3. Over a 48-month period from 2004 to the end of 2007, \$11.3 billion worth of investment-grade assets were acquired in 107 deals in Washington.

The charts on page 20 illustrate the annual deal volume and median per foot prices in a column format. The second line graph charts the deal volume in millions of dollars for calendar years 2006 and 2007 on a monthly basis.

The drop in activity (using the database criteria) dovetails consistently with the fall in ABS issuances and the ongoing impact of residential subprime defaults. Note also that the

growth in CMBS pooling activities slowed as well. The drop in deal volume from 2005 to 2007 was more than 76 percent. The number of deals fell from a high of 34 acquisitions in 2005 to a meager 14 deals in 2007.

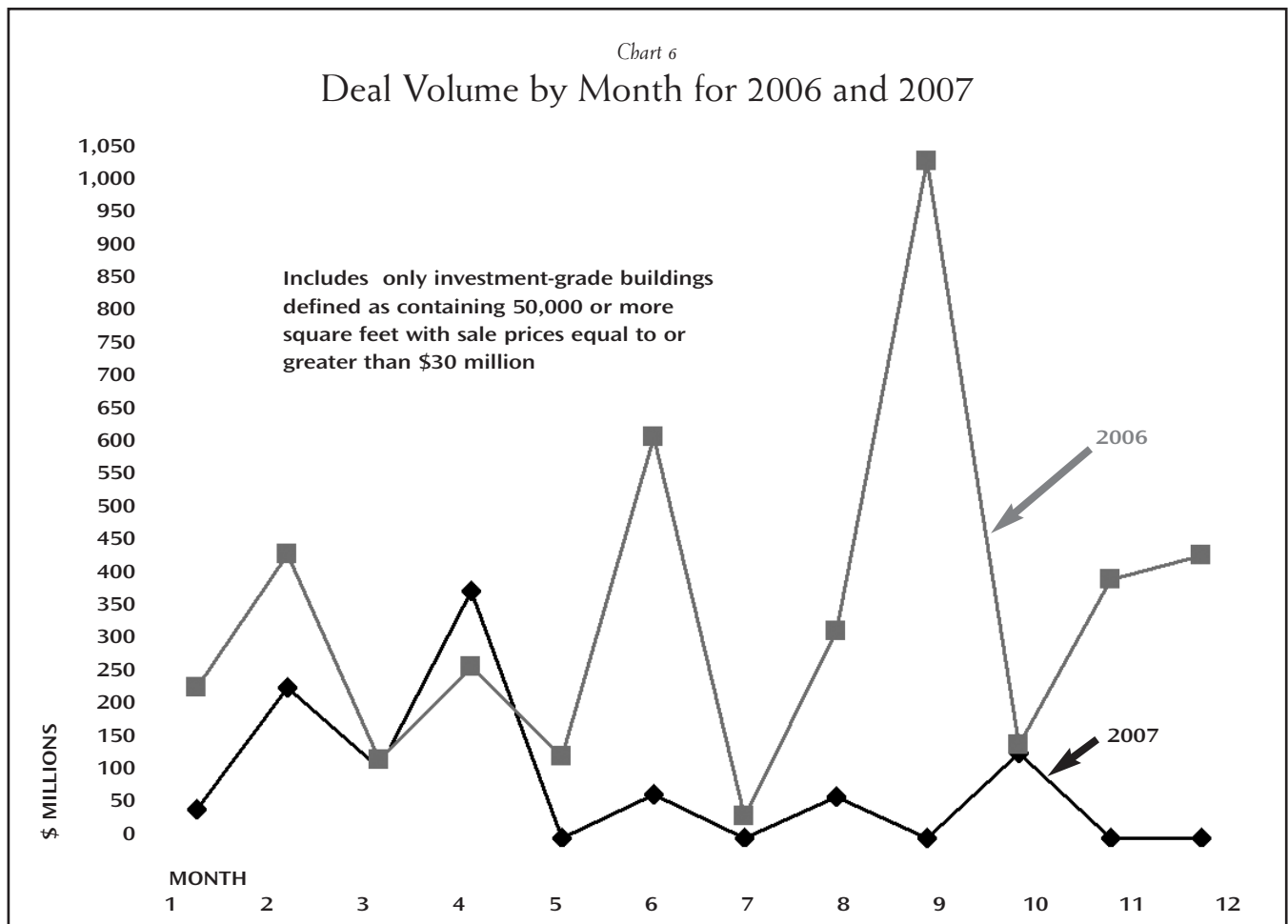
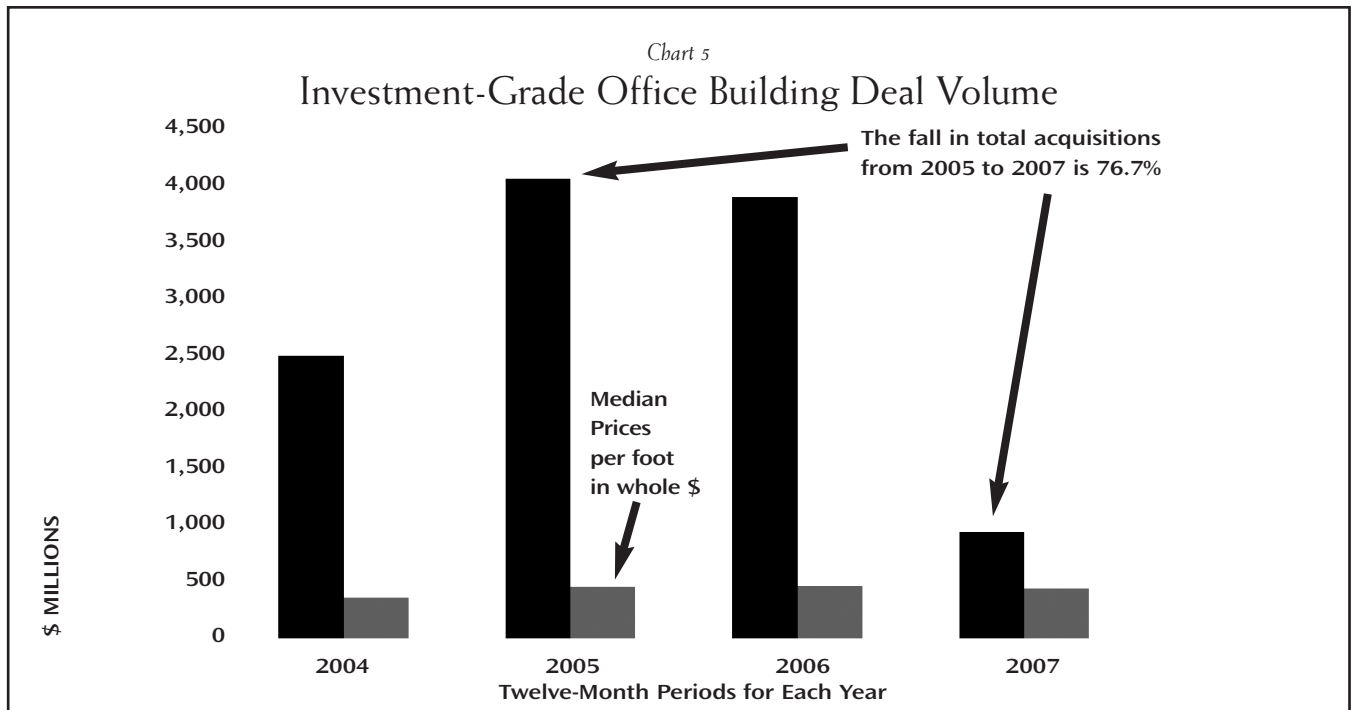
The line chart illustrates the market's poor acquisition performance for each month in 2007. April was the only period in 2007 when deal volume exceeded the amount earned in the same month in 2006. There were five months of 2007 during which not a single sale fit the identified criteria.

The median price per net rentable foot fell in 2007 a modest 5.0 percent from its high in 2006. A review of average prices is equally supportive of a possible decline in prices. For each year, these are as follows:

| YEAR | AVG. \$ PER FOOT |
|------------|------------------|
| 2004 | 379 |
| 2005 | 472 |
| 2006 | 474 |
| 2007 | 436 |

Drawing up or down conclusions about prices derived from the use of medians and averages may not be reliable. In order to develop accurate conclusions from a series of data using averages, the samples in the database must have product homogeneity in all years of the study. A disproportionate ratio of asset class sales (mix of Class A and B

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product from one year to the next) during one or more of the periods could impact the result.

Multiple acquisitions within a sub-market which is part of a larger economic unit will skew the findings, especially if there are no representative sales of comparable class assets in the remaining micro-geographic units comprising the larger market area.

Regardless, informational "noise" leeches into every database analysis due to either unidentifiable elements within the market or by extrinsic factors. Washington's office buildings, many leased to GSA, have consistently been viewed as a low-risk investment. However, Washington competes with other cities for the same investors. How changes in the relative competitive matrix affect sales activity in these other regions during the four-year study period are unknown; the element can be classified as potential "noise" in the database.

Culling from the larger database, only the office building sales with a floor price of \$30 million (investment-grade assets) may ameliorate some of the issues surrounding the simplistic approach; however, it is not foolproof. It is too early to confirm that Washington's office building prices declined in 2007. Sans access to cap rates for the transactions occurring during 2006 and 2007, it is impossible to offer any conclusions about the market.

Linear or multiple regression approaches offer no solution either, as statistical credence is only obtained when the sample exceeds 200 data points. Even if all office building

sales above \$5 million were included in the analysis, there are inadequate data points to use regression.

CONCLUSIONS

Despite the lack of any determinative evidence about asset pricing, Washington's office building investment activity has illustrated a dramatic change from its peak in 2005. We suspect that the impact of the collapse in the credit markets is not endemic to Washington. According to the research efforts of the national firms, deal volumes across all asset types throughout the country declined during 2007.

Although buyers of most of the larger deals (above \$50 million) seldom rely on traditional mortgage funds, access to capital is a strategic component to maintain asset churning. The firms need access to capital as none are funding acquisition costs using cumulative balance sheet income from operations to buy additional assets. Even if some leverage is used on these very large deals, equity amounts are substantial.

Demand for office space and the number of leasing deals in Washington since early in the second quarter of 2007 have all but stopped. The need of potential office tenants to access funds to create and expand their enterprises may explain the sharp decline in leasing activity.

Calendar years 2008 and 2009 may be correction periods as the spread between real estate yields and treasuries returns to a respectable margin. However, the depth and length of the subprime market's continuing impact on the capital markets are presently unknown. The economic nadir remains in the future. ■

CRE

Home Price Indices Futures

BY DAMIR TOKIC, PH.D., AND STIJEPKO TOKIC, J.D.

THIS ARTICLE ANALYZES THE POTENTIAL USE OF Chicago Mercantile Exchange (CME) housing futures for hedging, arbitrage and speculative purposes. The quote from the CME web page on housing futures reads: "CME Housing futures and options are the first comprehensive financial tools that make it possible to trade U.S. real estate values. These products provide opportunities for protection or profit in up or down markets, and extend to the housing industry the same tools for risk management and investment that previous CME innovations have brought to agriculture and finance. In addition, they create a new means of risk transfer to a broad range of investors, have the potential for fostering stability in the housing industry, and provide an innovative way to participate in the real estate market without having to buy and sell properties." The following markets are tradable: Composite Index (CUS), Boston (BOS), Chicago (CHI), Denver (DEN), Las Vegas (LAV), Los Angeles (LAX), Miami (MIA), New York (NYM), San Diego (SDG), San Francisco (SFR), and Washington, D.C. (WDC).

In this article, we explain how futures contracts can be used for hedging, arbitrage and speculative purposes in other more traditional markets, such as copper. We consequently analyze whether housing futures can be used similarly and effectively to participate in the residential real estate market.

FUTURES AS HEDGING TOOL

Producers of commodities such as copper can use futures contracts to lock in the selling price in the near future. For example, a copper mining company can produce copper today at given cost, and immediately sell copper futures at

a higher price to ensure profits. Consequently, copper producers can hedge the risk of a sudden, sharp drop in the price of copper.

Similarly, copper consumers such as industries that use copper as raw material, can use futures contracts to lock in the buying price of copper in the near future. For example, a homebuilder can buy copper futures today at a certain price, for construction planned for months ahead. Consequently, a homebuilder hedges the risk of a sudden, sharp increase in the price of copper, which would significantly affect profit margins.



About the Authors

Stjepko Tokic, J.D., is an LL.M. candidate at the New York University School of Law, specializing in trade regulation issues. He currently serves as a graduate editor on the NYU's *Journal of International Law and Politics*. Following the completion of his studies at NYU, Mr. Tokic will join Northeastern Illinois University as an assistant professor of business law.



Damir Tokic, Ph.D., is an assistant professor of finance at the University of Houston-Downtown and an active futures trader. He has published articles in the *Journal of Trading*, the *Journal of Investing*, the *Journal of Asset Management*, and others.

Home Price Indices Futures

The interaction of copper producers and consumers in the futures markets sets the price of copper futures with different expiration dates. Rising copper futures prices indicate increased demand by consumers, while falling futures prices could indicate rising inventories by producers.

CAN CME HOUSING FUTURES BE USED AS A HEDGING TOOL?

A homebuilder could build a house today and sell housing futures expiring several months ahead to hedge the risk of falling home prices. Similarly, a homeowner concerned about falling home values and/or wanting to sell his/her house could sell housing futures. In both cases, potential losses on home sales as a result of falling home prices are offset by gains on housing futures.

The major problem with this strategy is that individual home values are affected by home-specific variables such as location, shape, size, property maintenance, and age, in addition to macroeconomic international, national and regional variables. Consequently, a poorly maintained home located in an undesirable neighborhood can significantly decrease in value, while the housing index by which futures value is derived might not decrease as much.

A more significant problem with hedging housing values with futures is the availability of housing futures buyers. A potential homebuyer who wants to buy a house in the near future but is concerned that housing values will appreciate could theoretically buy housing futures today to hedge the risk of rising home values. In this way, a gain in housing futures offsets the higher home price in the near future. Unfortunately, this is an unlikely scenario because futures trading requires a cash account with the broker *and* sophistication, both of which are not typical characteristics of first-time homebuyers. In addition, easy credit availability discourages delay in home-purchasing decisions. Further, a potential gain in housing futures does not guarantee that the desired home or neighborhood would still be available for sale in the future. It is clear that the interaction between producers/consumers or buyers/sellers in the housing futures market is not as clear as in the copper futures market. As a result, housing futures are not likely to attract heavy volumes from hedgers, and as such, are not likely to be used as a hedging tool.

FUTURES ARE AN ARBITRAGE TOOL

Occasionally the spot price of copper can momentarily decouple from the futures contract price of copper as a result of interaction mechanisms in one of the markets. For example, the price of copper futures can suddenly increase sharply because of a short squeeze (margin call) by a large speculator. At that point, an arbitrageur buys copper in the spot market and sells copper futures until the spot price of copper and the price of copper futures return to theoretical equilibrium. It is a strategy without risk since gains are locked in at the time of the position initiation.

CAN CME HOUSING FUTURES BE USED AS AN ARBITRAGE TOOL?

An arbitrageur in CME housing futures would have to offset the short (long) position in housing futures by buying (selling) a real house or houses. It is an unlikely scenario because purchasing or selling a house takes time and requires significant fees, from closing costs to commissions. Further, individual home prices depend on other home-specific variables, in addition to general macroeconomic variables, that affect a housing index. Consequently, it would be extremely difficult to arbitrage a housing index with a real house unless a large portfolio of houses is constructed, which is impossible because of high transaction costs.

FUTURES AS SPECULATIVE TOOLS

The interaction between consumers and producers hedging their risks sets the price in futures markets. A class of market participants called speculators tries to anticipate price changes resulting in supply/demand shifts in, for example, copper markets, and consequently tries to profit by betting on price direction by taking a one-directional position in the futures markets. For example, a speculator would open a long position in copper futures if copper consumers anticipate a shortage of copper, which in turn, would trigger significant hedging. As a result, the price of copper would rise until the supply met the demand, and a speculator would make a significant profit.

CAN CME HOUSING FUTURES BE USED FOR SPECULATION?

A speculator anticipating rising inventories of unsold homes and falling demand could profit by shorting CME housing futures. Given the current situation of falling housing starts, falling building permits, falling new and existing home sales, rising inventories, significantly higher

Home Price Indices Futures

short-term rates, and expected adjustment of super-low ARMs from 2003–2005, it seems a sure bet that home prices would significantly decline in 2007.

However, speculators need liquid markets to exit their bets. Because of a lack of participation of hedgers and arbitragers, CME housing futures do not offer the necessary liquidity to speculate. In addition to low volumes, the bid-ask spread on CME housing futures contracts is too large for speculators to profit. As a result, CME housing futures are not likely to attract significant speculation.

SO, WHAT'S BEHIND S&P/CASE-SCHILLER® HOME PRICE INDICES FUTURES?

CME housing futures are not likely to attract hedgers, arbitragers or speculators. So what is the justification of housing futures trading on the CME? One has to understand the importance of U.S. housing to global economic and political situations. Since the dot-com bubble burst in 2000, the housing industry has carried the U.S. economy with significant jobs creation in construction, mortgage finance and other housing-related industries. In addition, rising home values have significantly boosted consumption as a result of home equity extraction. This has

supported growth overseas where goods consumed in the U.S. are produced.

A sudden and sharp drop in U.S. home values is likely to cause a worldwide recession because of the resulting drop in U.S. consumption. In addition, a loss of housing and housing-related jobs would create a significant rise in U.S. unemployment, further exacerbating a slowdown in consumption.

Although CME housing futures have not attracted significant volumes, it is still comforting to know there is a tool that could prevent a sharp drop in housing values and potentially bail out the U.S. economy. In a low probability scenario where panic liquidation of home inventory would crash home values nationally, an “invisible hand” could intervene by buying housing futures, thus preventing housing prices from dropping further—at least temporarily—until a better solution is available.

It is still unclear how such a mechanism would work in reality. Perhaps, a sort of arbitrage opportunity could arise between the price of real houses and housing futures. However, these opportunities would be limited strictly to institutional investors and private equity investors. ■

CRE

FOCUS ON REAL ESTATE ANALYSIS

Rebuilding After Katrina: An Owner's Perspective Two Years Later

BY JOHN A. MELTZER CRE, CCIM, AND NOAH SHLAES, CRE, FRICS

WE ARE TAUGHT TO THINK OF REAL ESTATE AS A STABLE INVESTMENT, with predictable behavior. Two years after Katrina struck, the rebuilding of our seven New Orleans properties is finally complete, and I have learned just how much I had taken for granted. I once thought that the portfolio was a convergence of location, bricks and mortar, and cash flow. After two years of hard work, I am now convinced that real estate requires more; it is a result largely of people, contracts, relationships and trust.

THE STORM

My own Katrina survival is another story, and to be sure, 360,000-square-feet of local real estate was not at the front of mind at the time of the storm. But once family members were safe and accounted for, company personnel and their families safe, I turned to the portfolio.

Roads were closed and access impossible. So starting with satellite photos, I learned what was still standing. When we finally got to the properties, we had gone from 100 percent occupied to completely vacant. Every roof was damaged by water, wind or tornado. The water and wind damage was obvious and clearly visible, but the separation of layers in the roofs lifted by tornadoes had destroyed the structural integrity of most of our roofs. One lightweight concrete decked roof required total replacement. Of a seven-property local portfolio, only parts of one small strip center and parts of one larger center were in good enough shape to reopen.

Even so, it was clear that we should rebuild. Our properties were recoverable, and they were located in areas that were not completely devastated. We decided to move forward as fast as we could. Would first completed and open win?

CONTRACTORS AND SUBCONTRACTORS

In the confusion that followed the storm, we were concerned that contractors would take shortcuts and take advantage of the situation, and that backlogs would build quickly. We needed someone we could trust—and fast. Even more, to get to the front of the backlog, we needed someone who trusted us.

My first call was to a former partner. A few years ago, we had sold our general construction business, Dana Corp., to Danny Chartier, now Chartier Construction. I called him a week after the storm and asked him if he was ready to go back to work. We prevailed on our 15-year history as partners.

About the Authors



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Noah Shlaes, CRE, FRICS, is managing director-strategic consulting for Grubb and Ellis. His work focuses on real estate decision-making inside corporations, universities and government.

Rebuilding After Katrina: An Owner's Perspective Two Years Later

Competition for contractors and subcontractors was intense. At this time, many owners had not yet settled on rebuilding, and they were waiting for word from insurers, government and other users. Decisiveness and a commitment to rebuild put us ahead of other builders when dealing with our general contractor, and our subcontractors as well. Past business relationships played heavily in our success. Most of our subcontractors knew us to be fast payers who understood construction. We had a history of success and the resources to back it up.

As a result, they committed to our projects. It took two weeks to arrange demolition crews to clear out wet sheetrock, doors, light fixtures, glass, etc. Demolition, normally the cheapest labor, had gone from \$8 an hour to as much as \$18 an hour in just two or three months after the storm.

Materials were at a premium. Our largest need would be gypsum board, and we concluded that due to the magnitude of the devastation, a shortage was coming. My brother Jeff ended up being our connection. Through his neighbor in Chicago, we were able to obtain two tractor trailers of gypsum board out of a Houston supply house. The move not only saved us substantial reconstruction time, but gypsum board prices skyrocketed shortly thereafter.

THE TENANTS

But what good is a finished product without tenants? Retenancing empty properties after devastation is scary. There are paragraphs in leases that most of us skim—paragraphs concerning disasters and business interruption and occupiable property.

In the month that followed the storm, some 40 percent of our tenants contacted us by telephone, email and written notice to cancel their leases pursuant to these clauses. Constant communication was the key to holding on to the rest.

Rebuilding was going to take longer than the leases allowed, so we had to brief tenants on a regular basis about the progress of reconstruction. While some tenants' spaces were not badly damaged, the businesses had no personnel. In spaces that were not completely damaged, some tenants asked us to move or store their furniture, to protect property, and much later to move it back in when work was complete. Their former employees were scattered across the country, and we did our part to keep the tenants'

headquarters offices in Texas, Minnesota, or wherever, confident and contented. They worked on restaffing, and we made sure they had a place to restaff.

MORTGAGE HOLDERS

During this period of devastation and uncertainty, I needed to preserve cash and credit so that recovery could move as fast as possible. At the time, almost all rental income had stopped, with no clear indication of who, what, when, where and how businesses would start again. So I contacted each lender to request two to three months of loan payment deferral.

Due to the utter devastation, they all were willing to discuss a grace period, but none for more than a few months so that everyone had time to assess the situation. Local banks, with their firsthand knowledge, were first to offer several months of zero payments, which, it was agreed, would be paid back upon insurance reimbursements.

Not all lenders were as understanding. One loan, originally made through a conduit, was eventually granted a few months of loan payment deferral. In my naiveté, I had assumed that this would simplify my situation. I hadn't considered that the respite in payments came at a high price: the loan was transferred to Special Assets, which is a whole different animal. The documentation requirements, mandatory inspections at my expense and constant communication required under the deferral provision, were an enormous drain on my time and resources. Had I known the depth of time, expense and effort it would take to satisfy the CMBC requirements for a classified Special Asset, I would have borrowed the money elsewhere to make those payments.

INSURERS

Devastation on this scale overwhelmed the insurers. Even so, as the insured (and the victim), my most important communication was with my insurers and their adjusters.

I learned to call early, call often, and document every phone call, every piece of wet sheetrock and every new nail. If I made their jobs easier, my financial future would reap the results. In the high-pressure, post-Katrina environment, adjusters were overloaded initially, so insurers moved them around.

On some properties I worked with two or three adjusters over the course of the claim. This meant providing duplicate documentation with each change.

Rebuilding After Katrina: An Owner's Perspective Two Years Later

| The Portfolio | | |
|--|-------------------|---|
| | TOTAL SQUARE FEET | DAMAGE |
| 4621 West Napoleon Building | 43,000 sq. ft. | \$2.6MM Rebuilt. Sold November 2007 |
| Woodmere Square Shopping Center | 79,700 sq.ft. | \$3.4MM |
| Northlake Shopping Center | 163,000 sq.ft. | \$1.2MM |
| Terry Parkway Shopping Center | 17,700 sq.ft. | \$1.1MM |
| Willowbend Shopping Center | 48,800 sq.ft. | \$2.5MM Not rebuilt. Sold January 2008 |
| 518 Conti - French Quarter residential | 3,532 sq.ft. | \$10,000 |
| 3005 Tolmas – Residential | 2500 sq.ft. | \$127,000 |

Anything I could do to make their job easier, I did. As frustrating as it might have been, if they lost an invoice or a bid, I sent it again, sometimes several times. Their problems were my problems.

PROPERTY MANAGEMENT

Operating properties during reconstruction and after completion took on different emphasis, skills and analysis. Since police protection was in short supply, we were required to put fencing around our tractor trailers in the parking lot, so gypsum board and other building materials would not be stolen. Before the storm, unemptied trash cans or uneven HVAC temperatures were typically addressed within one day. A year after the storm though, some of the properties were occupied, but perfect management was not yet obtainable because of janitorial labor shortages or plumbing technician shortages. Though it did not happen often, we occasionally had to remind tenants and their headquarters of the depth of the devastation. Communication is at the core of good property management, but it was crucial post-Katrina. Even today, quality labor and technical support in many areas of sales, service or construction is still not up to pre-storm levels.

Keeping properties clean was a constant problem. Most of our product is strip retail, and big parking lots were magnets for trash. We kept one of our subs busy weekly, but it was important for our retailers.

Mold analysis and remediation was a constant concern. These contractors were also in short supply. Here, the squeaky wheel theory and our GC got their attention to address our issues.

PERMITTING AND ZONING

As a result of Katrina, the rules had changed for permitting and zoning. All this new work called for new reconstruction drawings, but architectural and engineering services were in great demand and short supply. Governmental approvals of those plans were in even shorter supply. Successful approvals called for hand delivery of everything, and a wait of hours or days for simple permits.

At the beginning, where time was essential and we had no idea how long approvals would take, we let the permitting office know what we were up to, but commenced demolition without the required documentation.

THE RESULT

Now that the reconstruction is all but complete, and we are back to 100 percent occupancy, I have time to think.

What have I learned?

First, the things that I had taken for granted were the things that mattered most—old friendships; our reputation with contractors, lenders and tenants; the obscure and seldom-used clauses in leases. All of these things took on new prominence and dictated whether we would succeed or fail.

Next on my “lessons learned” list was how important it was to keep a continuous focus on prioritization. The balance between time and money had shifted, and anything that created time or accelerated construction was usually worth the cost. Money was a jigsaw puzzle, and the few properties that still had paying tenants were my edge pieces. They got consistent, sometimes daily visits, focus, and resources.

Rebuilding After Katrina: An Owner's Perspective Two Years Later

Information and communication were crucial.

Backups, cell phones, radios and multiple copies of everything are crucial.

Lastly, it was important to focus on the real concerns of others. Their problems were our problems. Money and

contracts work well in a stable world, but when the wind hits and the water rises, you're not the only one thinking about survival. If your employees, contractors, lenders and tenants are convinced that helping you and working with you is their best path to safety, that's what they'll do. ■

FOCUS ON REAL ESTATE ANALYSIS

How Major Hurricanes Impact Housing Prices and Transaction Volume

BY ELI BERACHA, PH.D., AND ROBERT S. PRATI, PH.D.

WE SEEK TO INVESTIGATE THE EXTENT TO WHICH COASTAL impacts of major¹ hurricanes may affect short- and medium-term housing prices. Our investigation is largely motivated by the increased strength and frequency of storms threatening the eastern and southeastern United States. Namely, several major hurricanes have recently impacted the Gulf of Mexico region and the Eastern Seaboard causing billions of dollars in damages. Escalating worldwide focus on global warming and other potential causes of this increased meteorological activity has not altered the contention by meteorologists that this is not an aberration. On the contrary, widespread expectation of future storm seasons characterized by above-average frequency, strength and duration of hurricane-level storms remains the consensus. It follows then that a better understanding of the economic impact of these storms is a beneficial contribution to real estate literature.

CONVENTIONAL WISDOM AND THE POPULAR PRESS

Conventional wisdom and the popular press suggest that a noticeable shock to the housing industry is to be expected after a major hurricane. How that shock plays out, however, is not so clear. Following the recent sequence of highly active storm seasons, the popular press published mixed opinions regarding the repercussions these storms might have on real estate markets sustaining substantial damage. Generally speaking, press articles imply the reaction in residential real estate to major storms takes the form of a bubble. That is, markets surge from a housing shortage immediately following a storm, and then correct in the medium term as supply gradually returns to prior

About the Authors

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levels. For example, Katrina, the most notorious of these recent storms hit New Orleans in August 2005. Rich (2005) suggests that storms like Katrina are a stimulus to local real estate. Pointing to frenzied buying activity as people left homeless scramble to secure a residence, the shortage of building supplies driving up housing costs, and out-of-state investors buying in droves, Rich paints a rosy picture of real estate markets impacted by a major storm.

Roney (2007) also points to an initial surge in residential real estate, quoting the National Association of REALTORS® (NAR) as her source for median home sale prices jumping more than 8.7 percent in the New Orleans area immediately following Katrina. Roney then backtracks, however, suggesting that home prices rose only as a direct result of federal and state aid for the multi-billion dollar damage left in the wake of the storm. She cites a subsequent price correction of 6.7 percent as evidence of the unpredictability of home values. Bajaj (2007) explains this drop by quoting Jan Hatzius, a Goldman Sachs economist, as saying that prices have fallen in the past year to correct for a surge immediately after Katrina, again suggestive of a bubble pattern.

Not all press articles project a bubble reaction, however. Keegan (2005) points to his personal experience with Hugo in 1989 and its impact on the Charleston, S.C. region, observing a massive and lengthy recovery effort after substantial devastation in the region. He also points to panhandle and central communities in Florida “still reeling” a year after storms ravaged these areas. Nonetheless, even if it belies conventional wisdom, practitioners and academics alike might be interested to know what the data collected surrounding these events do suggest.

PRIOR ACADEMIC RESEARCH

Conventional wisdom and popular press articles aside, existing academic research on this subject is sparse. In fact, very little in academic or practitioner real estate journals has addressed natural disasters and their impact on residential prices.

Hallstrom and Smith (2005) hypothesize that housing values respond to information about new hurricanes. Using a difference-in-differences framework based on the 1992 storm, Andrew (one of the strongest storms to ever hit the U.S.), they find a proximity effect where

homeowners respond to information conveyed by storms passing nearby and subsequently observe prices dip as much as 19 percent, in spite of missing that residential area. Bin and Polasky (2004) conduct a highly regionalized study examining the home price differential for Pitt County, N.C. homes located in flood zones ex-ante and ex-post hurricane Floyd. They find the discount of residential property values for homes located in floodplains significantly increased after the 1999 major storm and its associated flood damage to those homes.

Counter to Bin and Polasky, however, Speyrer and Ragas (1991) find repeated flooding does not continue to reduce prices, suggesting the market is relatively efficient in discounting the risk of repeat floods. Consistent with prior studies, Speyrer and Ragas find homes located in floodplains do experience lower property values than comparable homes not located in floodplains. New to their study, however, they determine that a large part of the price reduction is a direct result of mandated flood insurance as required by The Flood Disaster Protection Act of 1973. This Act requires Federal Standard Flood Insurance coverage for homes in certain zones. Accordingly, real estate pricing in our study should not be sensitive to zones, as this information should already be incorporated in price data.

A DIFFERENT APPROACH

Our contribution to this area of research is unique, first, because of our ability to look at Zip Code-level data. Most prior studies employ MSA-level (Metropolitan Statistical Area) or state-level data, neither of which allows for the precision obtained by a Zip Code-level analysis. Second, by examining the impact from several major hurricanes in a relatively constrained time period, we eliminate some of the variability of macroeconomic factors over time that could potentially affect results. Conversely, where some studies have considered only data from one or two storms during a brief interval (or even two unrelated intervals) taking our data from several hurricanes over a continual, but longer period generates less bias in the data. Finally, by considering several measures (price per square foot and transaction volume, in addition to raw price change differences), we aim to generate more comprehensive and definitive results.

In sum, we explore the sensitivity of median U.S. home prices and volume to the impact of major hurricanes, at the Zip Code level. Specifically, we examine quarterly

How Major Hurricanes Impact Housing Prices and Transaction Volume

changes in residential real estate price and volume following a major hurricane impact, and we test whether these particular Zip Code quarterly changes differ significantly from changes occurring in the rest of the state over the same time periods. In this way, we account for the rapid growth in population and associated increasing price trend occurring over this timeframe in the coastal states we examine.

We find some evidence from our three measures suggesting that during the first two quarters following a major hurricane, changes in home prices and transaction volume in the affected Zip Codes experience a temporary relative decline, followed by a positive correction. This temporary dip and bounce-back pattern exhibits characteristics resembling a short-term reversal consistent with the overreaction hypothesis, as often applied to financial market events. When looking at one full year following a hurricane, however, we see some evidence that areas hit by hurricanes outperform comparable areas not affected by the storm, a counterintuitive result.

DATA COLLECTION

To glean impacts on pricing and volume, we utilize quarterly median sales prices for single-family homes reported by U.S. postal Zip Code. Our Zip Code level data set was purchased from American Real Estate Solutions and includes over 3,000 Zip Codes. For each Zip Code, at least 20 quarterly median home price observations are available between the fourth quarter of 2000 and the fourth quarter of 2006, or a total of over 60,000 individual quarterly observations. Such a powerful data set permits greater precision than many prior real estate studies which are often limited to the use of MSA-level or state-level data. Further, the frequent observations allow a better time-lapse reflection of what actually happens with prices over time as opposed to yearly observations as is typically seen in real estate research.

Our use of quarterly data also imposes some burdens, however, in terms of the data's time series properties and resulting implications for estimation. First, our dependent variable is likely to display significant autocorrelation. Observed autocorrelation can be due to both fundamental factors and measurement biases. Fundamental factors include the tendency for some housing markets to display short-term momentum in home price movements, while others show fundamental mean reversion.

In addition to fundamental autocorrelation in "true" home price movements or in home price index changes measured by carefully constructed repeat-sales methods, autocorrelation in changes in observed median home prices could be induced by changes in the characteristics of home sales and their cross-sectional composition within a Zip Code. Specifically, if the distribution of homes sold within a Zip Code for a particular calendar quarter were skewed positively in terms of unobserved quality dimensions (e.g., date and quality of construction) relative to all homes within the Zip Code, the current quarter's observed median home price and price change relative to the prior quarter would be biased upwardly, and the subsequent period's observed price change would be biased downwardly. The opposite would occur if a quarter's sample of home sales were skewed negatively relative to average quality of all homes within a Zip Code. This kind of measurement-error induced autocorrelation, similar to so-called bid-ask price bounce errors in observed stock prices, would tend to induce negative autocorrelation in home price changes across calendar quarters.²

A further limitation of using quarterly home price data is that homes are sold throughout a calendar quarter with identification of the median price of all home sales based on all such sales within a quarter. The six major hurricanes we examine impact the coastline at different times during the quarter. Consequently, our Zip Code level median home prices for the quarter in which the natural event occurs are likely to be inclusive of home price changes surrounding the date of the hurricane impact. We define impacted Zip Codes as those where the eye of the major storm crossed directly through the region, retaining sustained winds measuring at least 55 knots.³

We identify major hurricanes impacting the U.S. coastline during the period for which we have Zip Code-level data using National Oceanic and Atmospheric Administration (NOAA) hurricane data, available on its website. As a part of NOAA, the National Hurricane Center is the central authority in predicting, monitoring and tracking tropical depressions, storms, and hurricanes in the North Atlantic basin. Of all the Atlantic-based storms originating between 2001 and 2005, only six storms qualify for our study due to Zip Code data limitations. In chronological order, these are Charley, Frances, Jeanne, Dennis, Katrina, and Wilma, all of which struck between August 2004 and October 2005. Damage from these hurricanes ranged from just over \$2 billion (Dennis) to over \$80 billion

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(Katrina). Geographically, these storms limit our study to Florida impacts in 2004 (Charley⁴, Frances and Jeanne) and 2005 (Dennis and Wilma), and the one big gulf-coast storm, Katrina, in 2005.

To maximize accuracy in identifying affected Zip Codes, we recreate unique detailed storm tracks and overlay these on Google Earth images of the impact zones. To recreate these tracks and gauge intensity levels with precision, we use the exact geographical coordinates of these storms as tracked and measured by NOAA at fixed time intervals, as well as multiple records of sustained wind speeds detected at various weather stations. The Google Earth images from U.S. military satellite imaging also show Zip Code border outlines. Thus, with geographically precise storm tracks and associated sustained wind speeds, we can then employ a duplicate-matching method to locate and confirm those Zip Codes directly under the path of the eye of the storm. The result is a unique set of hand-compiled data which, although limited in scope, makes a detailed examination possible for several natural and unpredictable events. After imposing the 55-knot minimum sustained wind-speed condition on available matching data, the final set includes 52 Zip Codes from our Zip Code-level data set.

Table I displays some descriptive statistics on this sample of Zip Codes. The six major hurricanes in our sample are distributed across 52 Zip Codes encompassing nearly

11,000 transactions over our study period. Of the 52 Zip Codes, four were impacted twice as a result of Frances and Jeanne in 2004. We matched each of these Zip Codes with their respective states using the www.zip-code.com website.

METHODOLOGY

To gauge the effect that hurricanes included in our study have on the housing market, we employ three core variables taken from our Zip Code-level data set. These variables are median sales price (PRICE), median sales price per square foot (PPSF) and transaction volume (VOL), as measured on a quarterly basis. Changes in these variables around the natural event should indicate any significant positive or negative deviations over time, when the changes for Zip Codes affected by the hurricanes are compared to changes for a control group.

Specifically, we adjust the quarterly changes in these three variables to control for seasonality effects as well as the overall housing trend in the surrounding areas during a given time period. Our adjustments are made by first pairing each hurricane-affected Zip Code with its particular state. Then, we find the difference between the variable change (percentage change from the previous quarter) in each affected Zip Code and the variable change in its paired state data. We refer to this difference in quarterly changes as the *adjusted difference* (denoted) for each of our three price and transaction volume variables.

Table I

Descriptive Statistics

| | |
|--|------------------------------------|
| Number of affected Zip Codes | 52 (4 were hit twice) |
| Total number of transactions * | 10,759 |
| Number of hurricanes | 6 |
| Average median home price across Zip Codes * | \$239,016 (\$148,982) |
| Range of median home price * | \$60,750 – \$889,450 |
| Average median price per square foot across Zip Codes * | \$123.68 (69.10) |
| Range of median price per square foot * | \$59.37 – \$432.43 |
| Average number of sales per Zip Code * | 206.90 (176.62) |
| Range of number of sales per Zip Code * | 14 – 779 |
| Hurricanes time span | August 2004 to October 2005 |

Note: This table shows descriptive statistics of the major data items we use in this study. The notation * next to a variable indicates that the statistics is for the quarter in which the hurricane occurred. Figures in parenthesis are the standard deviations of the variable.

How Major Hurricanes Impact Housing Prices and Transaction Volume

Finally, to derive the adjusted difference for each variable, we average these adjusted differences across all Zip Codes. These state-adjusted values draw a direct comparison of quarterly sales price and transaction volume changes in the affected Zip Codes with quarterly changes in Zip Codes statewide. More formally, we measure:

$$ADJ\Delta PRICE_{t,i} = \Delta PRICE_{t,i} - \Delta ST_PRICE_{t,i} \quad (1)$$

$$ADJ\Delta PPSF_{t,i} = \Delta PPSF_{t,i} - \Delta ST_PPSF_{t,i} \quad (2)$$

$$ADJ\Delta VOL_{t,i} = \Delta VOL_{t,i} - \Delta ST_VOL_{t,i} \quad (3)$$

where $ADJ\Delta PRICE_{t,i}$, $\Delta PPSF_{t,i}$, and $\Delta VOL_{t,i}$ are the quarterly changes in median sales price, median sales price per square foot and transaction volume, respectively, for Zip Code i , from time $t-1$ to $t-0$. Similarly, $\Delta PRICE_{t,i}$, $\Delta ST_PPSF_{t,i}$ and $\Delta ST_VOL_{t,i}$ are the quarterly changes in median sales price, median sales price per square foot and transaction volume, respectively, for the state including Zip Code i , from time $t-1$ to $t-0$. Time $t-0$ is defined as the quarter in which the hurricane occurred. Thus, a $\Delta PRICE_{t,i}$ value measures from the prior quarter to the current quarter, t . Using the adjusted differences for each of these variables found with equations (1), (2) and (3), we evaluate five subsequent quarters beginning with the quarter in which the major hurricane hit ($t-0$) and ending four quarters later (time $t+4$). In this way, we examine both short and medium term effects.

To capture the short-term impact of these major hurricanes on residential properties directly affected, we first compare the arithmetic average of all the adjusted differences generated by equations (1), (2) and (3) across time periods using a two-sample mean comparison test. This quickly allows us to observe any statistically significant increase or decrease in the average adjusted difference for each variable, around the event date.

To further assess short term impact on residential property markets, we also use linear regression analysis to observe adjusted differences for each of our three variables around the hurricane event. Linear regression analysis allows us to emphasize changes in differences for each of the affected Zip Codes rather than changes in differences across all 52 Zip Codes in our sample. Accordingly, for each variable, we regress percentage changes in adjusted differences during a given quarter (dependent variable) on the previous quarter's percentage changes in adjusted differences (independent variable) to identify significant

differences over time. More formally, we define these regressions as:

$$ADJ\Delta PRICE_{t+1,i} = a + \beta ADJ\Delta PRICE_{t,i} \quad (4)$$

$$ADJ\Delta PPSF_{t+1,i} = a + \beta ADJ\Delta PPSF_{t,i} \quad (5)$$

$$ADJ\Delta VOL_{t+1,i} = a + \beta ADJ\Delta VOL_{t,i} \quad (6)$$

where a statistically significant positive or negative beta coefficient in any of the equations (4), (5) or (6) may suggest a significant increase or decrease in the adjusted difference in median sales price, median sales price per square foot, or transaction volume from one period to the next, near the major hurricane event.

Finally, to capture the medium term effects of the hurricanes on residential real estate, we compare adjusted differences in median sales price and median sales price per square foot over the full year following the hurricane.⁵ We accomplish this in a manner similar to equations (1) and (2). Rather than quarterly, however, this time we calculate the *annual* post-event percentage change in median sales price and median sales price per square foot, for each Zip Code, as:

$$\Delta PRICE_{t_t+4,i} = ((PRICE_{t+4,i} / PRICE_{t,i}) - 1) * 100 \quad (7)$$

$$\Delta PPSF_{t_t+4,i} = ((PPSF_{t+4,i} / PPSF_{t,i}) * 100 \quad (8)$$

where $PRICE_{t,i}$ and $PPSF_{t,i}$ are the median sales price and median sales price per square foot, respectively, for Zip Code i , at time t . Correspondingly, for the state including Zip Code i , we define the one year change in median sales price ($\Delta ST_PRICE_{t_t+4,i}$) and median sales price per square foot ($\Delta ST_PPSF_{t_t+4,i}$) in a manner similar to equations (7) and (8). Again, we use the two-sample mean comparison test to contrast the arithmetic average of all values generated by equations (7) and (8) from the 52 Zip Codes with their associated states' average values, respectively. A statistically significant difference between the changes in the values for affected Zip Codes and those of their surrounding state would suggest some medium-term effect on the residential real estate within those Zip Codes struck by major hurricanes.

HYPOTHESES

While the colloquial concept of market overreaction as a manifestation of normal psychological behavior has been observed for generations, its formal documentation and analysis is a relatively modern development. DeBondt and Thaler (1985) define the overreaction hypothesis simply as

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a hyper-response to new information. The hypothesis suggests both that extreme movements in stock prices are followed by movements in the opposite direction to “correct” the initial overreaction and that greater magnitudes of the initial price change are generally offset by increasingly extreme reactions.

Evidence of overreaction has primarily been found in analysis of stock returns following large one-day stock price declines. Brown, Harlow and Tinic (1988) as well as Atkins and Dyl (1990) find significant reversals for stocks experiencing one-day price declines. Many differences between investments in marketable securities versus homes exist, however. Exposure to housing price risk is largely non-diversifiable for individual homeowners. Home prices and changes in home prices vary by location. Arbitrage is costly and largely infeasible. Further, real estate markets do not have the liquidity of financial markets. As a result, the residential real estate market is often characterized as relatively inefficient relative to markets for financial securities. Still, similarities remain.

Bremer and Sweeney (1991) examine common stock returns following one-day price declines of 10 percent or more over nearly a quarter century, finding significant positive abnormal returns extend three days immediately following the declines. They further note that this prolonged recovery period is inconsistent with prices fully and quickly reflecting relevant information and suggest that market illiquidity may partially explain their findings, as also supported by Capozza, Hendershott, and Mack, (2004). The real estate market, as one of the more illiquid asset markets, consequently provides a vehicle to help maintain the idea that prolonged recovery periods may indeed be associated with illiquid markets. The reaction in real estate may remain analogous, but the timeframe may also be extended as a result of a relatively slower and more illiquid marketplace.

Accordingly, as we are interested in how major hurricanes affect observed changes in median home prices, median price per residential square foot, and residential transaction volume across our sample of 52 affected Zip Codes, we expect to see reactions resembling some form of overreaction, as a hurricane clearly is viewed as a natural (unforeseen) event with negative implications. Consequently, we test hypotheses gauging any reaction to six natural events in these three variables. Specifically, we

look first at quarterly movements, and then reaction over a one-year period.

We expect quarterly changes in our price and volume variables across the state will differ significantly from changes occurring in those Zip Codes impacted by a major hurricane. Our method tests consecutive null hypotheses that the state-adjusted difference for each volume and price variable at times $t-1$, $t-0$, $t+1$, $t+2$ and $t+3$ is not significantly different than the adjusted difference for each variable at time $t-0$, $t+1$, $t+2$, $t+3$ and $t+4$, respectively.

Further, when looking specifically at how these differ, we expect to see some evidence of a decline in the quarter or quarters immediately following the hurricane event, and then we anticipate some form of rebound as a correction to the initial negative impact. Should there be these results, this should also break out as evident in basic regressions, showing as negative correlation between periods. That is, if the initial reaction is lower, then subsequent results should be higher. Conversely, if higher initially, then lower subsequently.

While Rich (2005) suggests post-storm growth “could come at the expense of building in other regions” in the state, we expect our findings to suggest otherwise. Substantial and rapidly occurring negative shocks to the market are likely to be associated with a substantial drop in demand, leading selling pressures to temporarily lower prices. As the public perception is that hurricanes spur growth and investment, any market drop should indeed be a temporary effect.

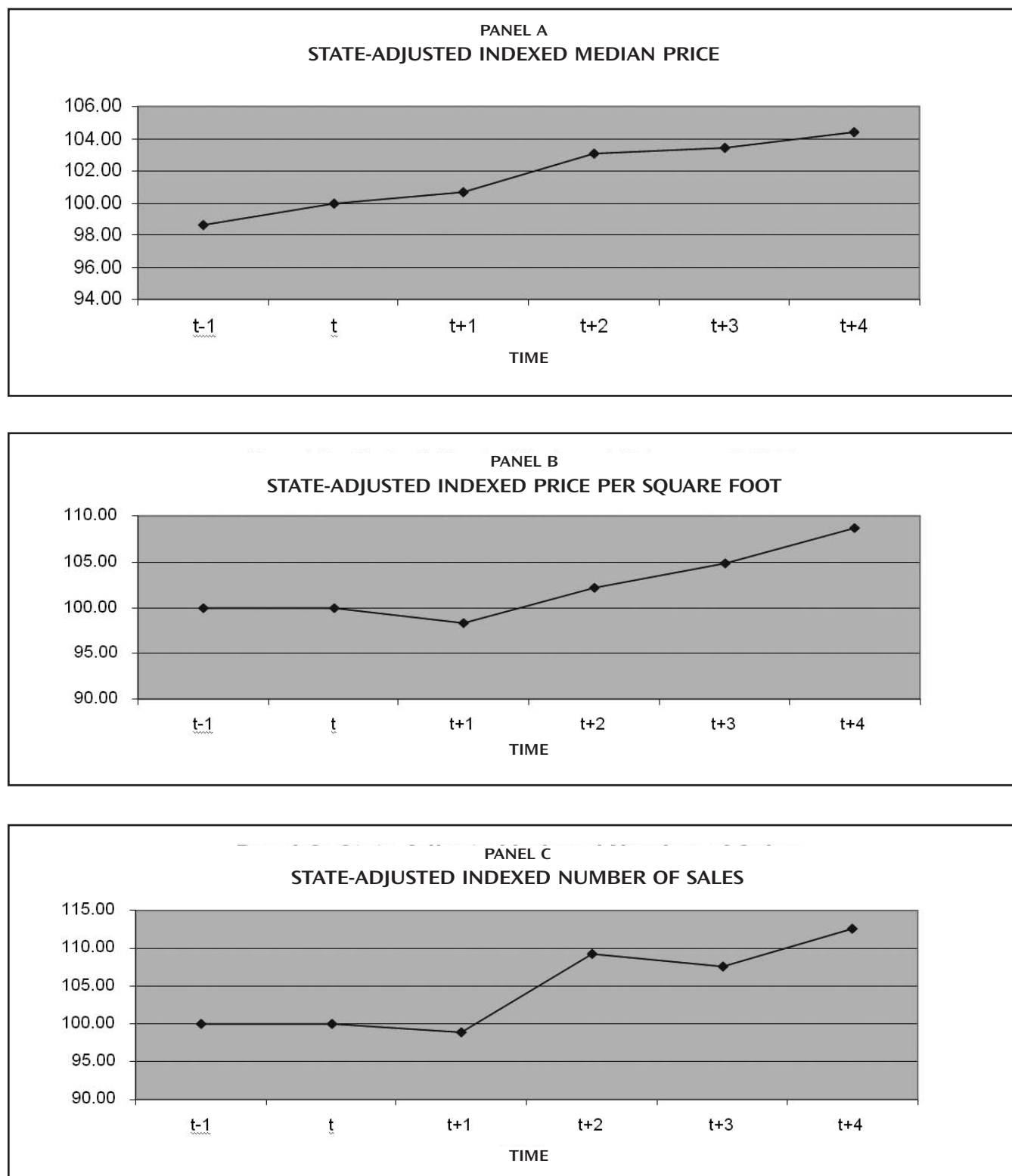
RESULTS

Benchmarking the adjusted differences at time $t-0$ as an index of 100, Figure 1 shows the adjusted differences for each of the three variables over the five sequential quarters, first from $t-1$ to $t-0$ (the quarter prior to that containing the hurricane) through $t+3$ to $t+4$ (the last quarterly change one year after the hurricane). The state adjusted median sales price, which is presented in panel A, does not initially decline (during $t+1$). It does increase slower than all other quarters, however, before sharply rising during quarter $t+2$. On the other hand, panels B and C clearly illustrate the adjusted difference in both median sales price per square foot and transaction volume decline during the quarter following the hurricane and increase sharply in the subsequent quarter. This is consistent with our hypothesized expectations.

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Figure 1

Trend of State-Adjusted Housing Price and Sales Volume



Note: These figures present the trends of the indexed state-adjusted median price, median price per square foot, and sales volume. Time t is defined as the quarter in which the hurricane occurred. At time t we also define the index as 100. The state-adjusted variables are the difference between the average indexed value of the affected Zip Code variables and the average indexed value of their matched state.

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To emphasize the changes in the adjusted differences, in Figure 2, we present the derivative of Figure 1. That is, Figure 2 shows the rate of change in differences from each time period to the next. All three panels illustrate a sharp decline from time $t-0$ to $t+1$ as well as a sharp increase from time $t+1$ to $t+2$. This is again consistent with our hypothesized expectations. Yet, while differences in changes across time are visible to the eye for both volume and prices, we do test the statistical significance of these differences in Table II.

Table II documents a quarter-to-quarter comparison of the change in adjusted difference for median price, median price per square foot, and transaction volume. Panel A presents the results of a two-sample mean comparison, in which we compare average adjusted differences in one quarter to the quarter that follows. The first row in this

panel indicates a positive, but insignificant, statistical difference between variable changes during the quarter the hurricane hit and the subsequent quarter. The second row, however, indicates a negative and significant statistical difference between changes during the quarter that immediately followed the hurricane and its subsequent quarter. This significant difference is observed for all three variables with test-statistics of -1.96, -1.98 and -2.85 for median sales price, median sales price per square foot and transaction volume, respectively. The results of these two comparisons suggest that changes in prices and volume dip during the quarter following the hurricane, correcting soon thereafter, roughly during the second quarter that follows the hurricane ($t+2$). This supports the contention that illiquid markets lag the overreaction effect.

Table II

Panel A: Short and Medium Term Effects – A Two Sample Test Comparison

| Null Hypothesis | X = PRICE Probability (t-stat) | X = PPSF Probability (t-stat) | X = VOL Probability (t-stat) |
|---|--------------------------------------|-------------------------------------|------------------------------------|
| $ADJ\Delta X_{t,i} > ADJ\Delta X_{t+1,i}$ | 64.31% (0.37) | 73.19% (0.62) | 62.65% (0.32) |
| $ADJ\Delta X_{t+1,i} > ADJ\Delta X_{t+2,i}$ | 2.67% ** (-1.96) | 2.56% ** (-1.98) | 0.27% ** (-2.85) |
| $ADJ\Delta X_{t+2,i} > ADJ\Delta X_{t+3,i}$ | 93.12% ** (1.90) | 62.31% ** (0.31) | 99.55% ** (2.67) |
| $ADJ\Delta X_{t+3,i} > ADJ\Delta X_{t+4,i}$ | 34.37% ** (-0.40) | 39.85% ** (-0.26) | 7.35% ** (-1.46) |

Panel B: Medium Term Effects

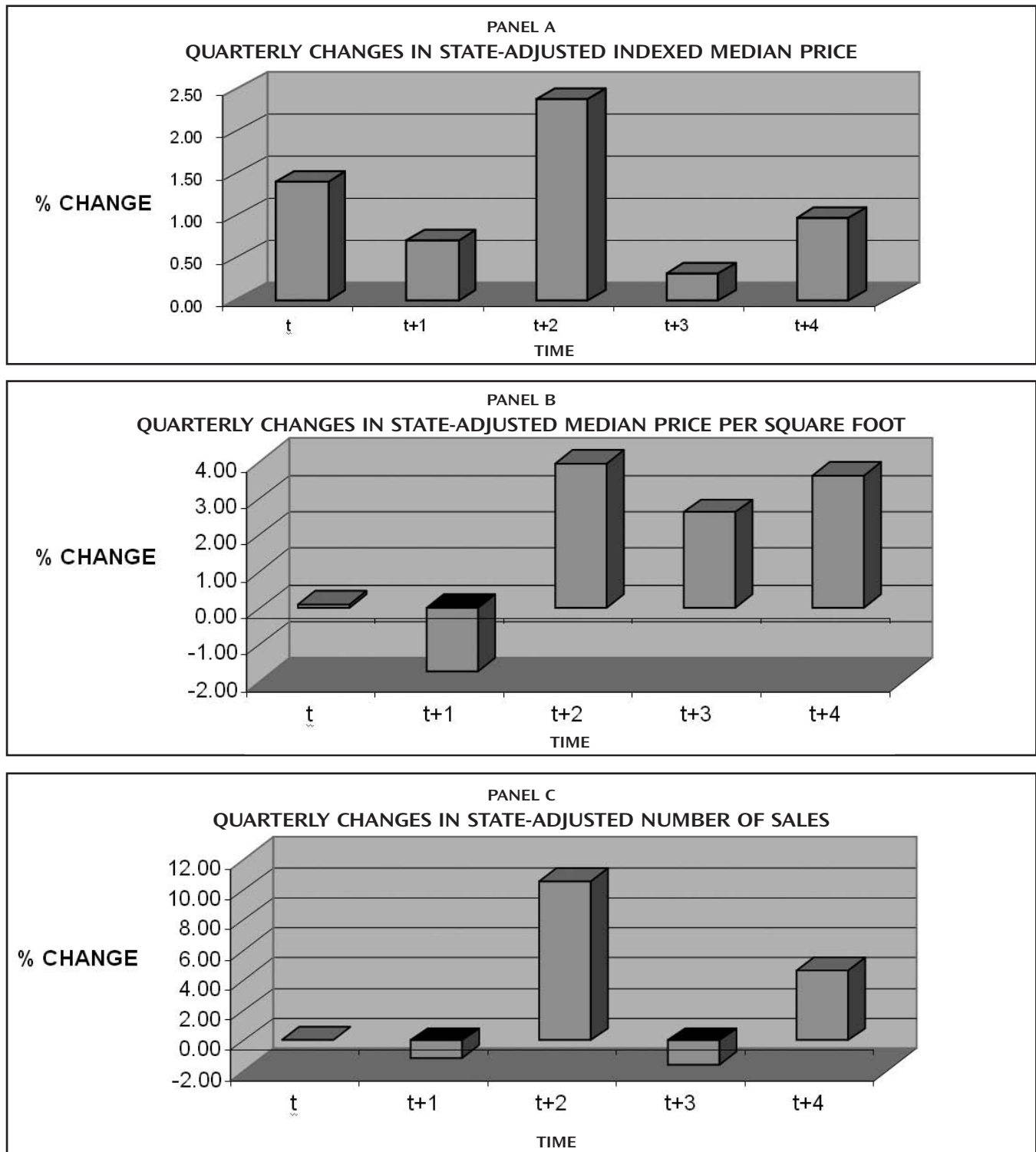
| Null Hypothesis | X = PRICE Probability (t-stat) | X = PPSF Probability (t-stat) | X = VOL Probability (t-stat) |
|--|--------------------------------------|-------------------------------------|------------------------------------|
| $\Delta X_{t_t+4} > \Delta X_{ST} - X_{t_t+4}$ | 97.24%* (1.95) | 92.45% (1.46) | NMF% |

In panel B we measure the statistical significance of the difference between the change in median price and median price per sqft for the affected zip codes and their matched states during the full year following the hurricane. In both panels we use a two sample test comparison in order to measure the significance of the differences. We use ** and * to denote significance at the 5% and 10% level respectively.

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Figure 2

Quarterly Changes in State-Adjusted Housing Price and Sales Volume



Note: These figures present the quarterly changes of the state-adjusted median price, median price per square foot, and sales volume. Time t is defined as the quarter in which the hurricane occurred. The changes in state-adjusted variables are defined as:

$$ADJ\Delta PRICE_{t,i} = \Delta PRICE_{t,i} - \Delta ST_PRICE_{t,i} \quad (1)$$

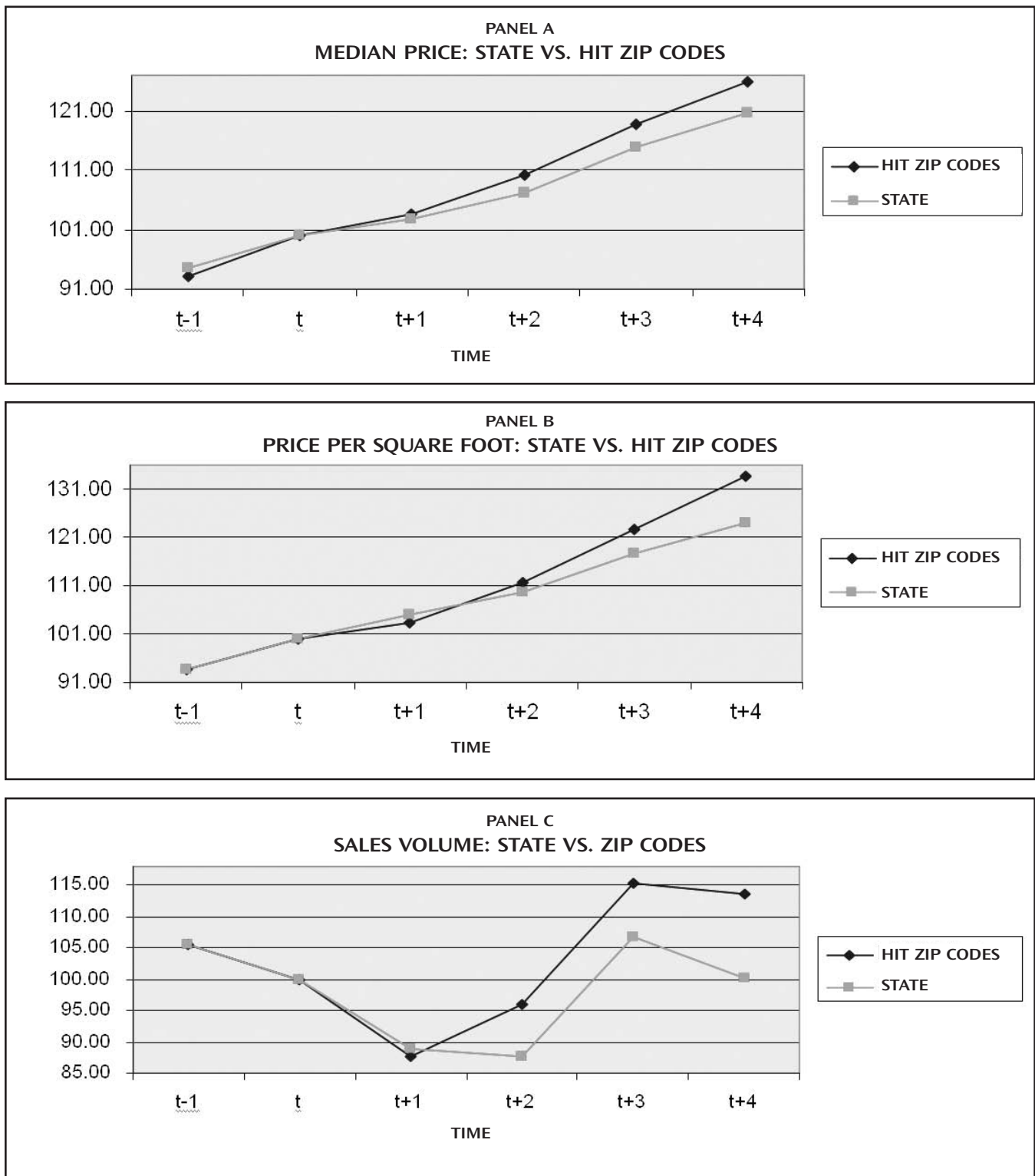
$$ADJ\Delta PPSF_{t,i} = \Delta PPSF_{t,i} - \Delta ST_PPSF_{t,i} \quad (2)$$

$$ADJ\Delta VOL_{t,i} = \Delta VOL_{t,i} - \Delta ST_VOL_{t,i} \quad (3)$$

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Figure 3

Housing Price and Sales Volume Trends of Hit Zip Codes Versus their Matched State



Note: These figures present the trends of the indexed median price, median price per square foot, and sales volume for the affected Zip Codes versus their matched state. Time t is defined as the quarter in which the hurricane occurred. At time t we also define the index as 100.

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Figure 3 portrays results for prices and volume over the medium term, in the form of an indexed horse-race comparison between the affected Zip Codes and statewide Zip Codes. A visible difference between the changes in values for the affected Zip Codes and their statewide counterparts is counterintuitive. It suggests that over a course of one year, in spite of the direct and indirect negative effects brought to these Zip Codes by the hurricane, the prices of residential real estate in the affected Zip Codes rose faster than the median prices in the rest of the state (panel A and B). Similarly, panel C suggests that the relative number of transactions made in the affected areas increased over the course of the year more rapidly than at the rest of the state. This could explain the generalized conclusions drawn by the popular press in suggesting that housing markets experience a boom following hurricane impacts.

The second panel of Table II shows the statistical significance of the results presented in Figure 3. When comparing the change in median sales prices and median sales price per square foot between the affected Zip Codes and those statewide, we generate test-statistics of 1.95 and 1.46, respectively. Both of these values suggest price measures rose faster in the affected Zip Codes, with the median sales price measure bordering on statistical significance.

Finally, Table III presents the beta coefficient results for equations (4), (5) and (6). Negative and statistically significant beta coefficients appear in the first two rows, suggesting negative autocorrelation between changes in quarters $t-0$, $t+1$, and $t+2$. These results further support the results shown in panel A, but with stronger statistical significance. In summary then, our results for the short term suggest that a dip in changes for each of our three variables during quarter $t+1$ is statistically significant and is followed by a statistically significant upside correction

Table III
Short Term Effects – Regression Analysis

| Regression Specification | X = PRICE Beta (t-stat) | X = PPSF Beta (t-stat) | X = VOL Beta (t-stat) |
|---|-------------------------------|------------------------------|-----------------------------|
| $ADJ\Delta X_{t+1,i} = a + \beta ADJ\Delta X_{t,i}$ | -0.27 ** (-2.50) | -0.43 ** (-3.69) | -0.68 ** (-5.22) |
| $ADJ\Delta X_{t+2,i} = a + \beta ADJ\Delta X_{t+1,i}$ | -0.44 ** (-4.61) | -0.75 ** (-3.41) | -0.49 ** (-3.53) |
| $ADJ\Delta X_{t+3,i} = a + \beta ADJ\Delta X_{t+2,i}$ | 0.03 (0.14) | 0.02 (0.11) | -0.20 (-1.29) |
| $ADJ\Delta X_{t+4,i} = a + \beta ADJ\Delta X_{t+3,i}$ | -0.17 (-1.84) | 0.04 (0.70) | -0.14 (-1.31) |

We use ** and * to denote significance at the 5% and 10% level respectively.

Note: This table presents the results of the $\hat{\alpha}$ coefficient from the autoregression in which we regress the change in state-adjusted median price, median price per square foot, and sales volume on their value from the previous quarter. The changes in the state-adjusted variables are defined as per equations (1), (2), and (3):

$$ADJ\Delta PRICE_{t,i} = \Delta PRICE_{t,i} - \Delta ST_PRICE_{t,i} \quad (1)$$

$$ADJ\Delta PPSF_{t,i} = \Delta PPSF_{t,i} - \Delta ST_PPSF_{t,i} \quad (2)$$

$$ADJ\Delta VOL_{t,i} = \Delta VOL_{t,i} - \Delta ST_VOL_{t,i} \quad (3)$$

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during quarter $t+2$, again consistent with our hypothesized market reaction.

CONCLUSION

We investigate subsequent changes in quarterly housing prices and volume for 52 U.S. Zip Codes impacted by six major hurricanes from 2004–2005, for one year following the natural event. We obtain results that are consistent with home price changes following an overreaction pattern, similar to that found in financial markets after an unforeseen negative shock to the market. During the first two quarters following a major hurricane, our data suggest that changes in home prices and transaction volume in the affected Zip Codes experience a temporary dip, followed by a positive correction. Thus, some evidence emerges that a transitory price decline presents a buying opportunity, providing some support for a short-term reversal. A time-extended form of a short-term reversal (a few months as opposed to a few days) as we find, is consistent with Bremer and Sweeney (1991) who suggest that illiquid markets may partially explain the inefficiency of a prolonged recovery period.

When examining changes in our measures one full year following a hurricane, little evidence emerges suggesting a lingering effect on residential real estate prices, as prices have generally corrected back to their prior trend-line. Still, a nominal positive difference is found. Although statistically insignificant, this presents some evidence that areas hit by hurricanes outperform comparable areas not affected by the storm, a counterintuitive result. This leaves the door open to further research in this area, something presently in development.

Our study is unique compared to prior work in this area. First, we look at Zip Code-level data where most prior studies employ MSA-level (Metropolitan Statistical Area) or state-level data, neither of which allows for the precision obtained by a Zip Code-level analysis. Second, by examining the impact from several major hurricanes in a relatively constrained time period, we have less bias in our data than data from only one or two hurricanes and we eliminate some of the variability of macroeconomic factors that could potentially affect results. Finally, we use several measures to generate more definitive results.

Contrary to popular opinion, our results do not present evidence of an immediate surge in prices from a housing supply reduction and capital infusions to drive demand as

prior popular press articles have implied. Thus, the housing market reaction to a major hurricane impact does not seem to exhibit behavior indicative of a bubble. That is, while it may be possible that a housing shortage immediately follows major storms and later corrects as supply returns to prior levels, overshadowing this possible outcome seems to be a short-term precipitous drop in demand. This might be due to large quantities of people relocating after a major storm, but all such reasoning would be entirely speculative. We do not seek to explain our results, only to present them.

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NOTES:

1. Hurricanes rated at 3 or greater on the Saffir-Simpson scale are technically defined as Major Hurricanes. The Saffir-Simpson scale categorizes hurricane strength from 1 to 5, the strongest being 5. A category 3 storm has sustained winds of 111-130mph.
2. The problem would appear to be endemic in annual data, too, but to a lesser degree given more observations over longer time horizons.
3. While each hurricane in our study is categorized at 3 or greater, this categorization stems from *maximum* sustained wind speed. It is understood that storms will weaken over land. Although a 55 knot

threshold, or nearly 64 mph, falls about 8 knots short of hurricane-status sustained winds, this level still ranks in the upper quartile of tropical storm strength and is a minimum speed, exclusive of gusts. Accordingly, with continual data unavailable, measurements of sustained winds exceeding 55 knots maintain enough power in the storm area for continued property damage, fatalities, and extensive flooding from the storm surge.

4. Charley hit Port Charlotte, FL with 150mph winds (category 4) and then crossed the state to re-emerge in the Atlantic before looping back into Myrtle Beach, SC where it only briefly sustained winds over 55 knots.
5. Transaction volume difference would have no meaning at this stage because it is not a continuous variable; accordingly, we omit this measure here.

The authors would like to thank Professors Surendra Singh and George Bittlingmayer from the University of Kansas School of Business for generous financial assistance in securing the home price data used in this study, and gratefully express appreciation to ECU-MBA students, Derek Vestal and Denise Thompson, for their diligent Zip Code matching efforts.

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