



CoreLogic®

The MarketPulse

With Quarterly Executive Letter

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ACHIEVING A SUSTAINABLE NEW NORMAL

The refinancing boom of the past two years appears to be coming to an end as interest rates have jumped by more than 100 basis points since May. The anticipated tapering of the Federal Reserve's quantitative easing program toward the end of this year portends additional interest rate hikes ahead. In August, the Mortgage Bankers Association forecast a decline in the refinance share of originations from 61 percent this year to 36 percent in 2014. In addition, most published forecasts predict a contraction in overall origination volumes from 2013 to 2014 of 40 percent to 50 percent as rising purchase volumes only partially offset lower refinancing activities.

The transition from a rate-driven to a value-driven purchase market is important to achieving a healthy mortgage industry over the longer run. As purchase volumes continue to slowly rebound, we expect to see a flight to quality because borrowers value service and an end-to-end loan origination experience that is as smooth as possible.

As we transition to a purchase market, a flood of regulations are adding new layers of complexity to the mortgage finance business and a heightened emphasis on transparency and risk management that makes access to trustworthy data and solutions much more important. Here are just a few areas where better information gives managers the insights they need to adapt:

- ▶ An in-depth understanding of both home buyer needs and borrower qualifications underlies the ability to build a quality portfolio.
- ▶ An efficient process throughout the loan cycle—from origination through servicing—allows for faster closings as well as ongoing portfolio risk monitoring.
- ▶ Careful validation of customer information gives secondary market investors the ability to satisfy stringent regulatory compliance and audit requirements.

A dynamic view of value

Successfully navigating through the transition to a purchase market over the next two years, in an ever-shifting regulatory environment, will require industry participants to seek out and utilize quality data, analytics and services. Whether evaluating risk, borrower quality, loan servicing or secondary market concerns, experienced managers recognize that synergies exist throughout the business. Even a small change in one part can affect the whole. That's why a multi-dimensional view of the housing market is so fundamental to lifting quality throughout a mortgage finance business.

Trend data such as household formation, rental increases or decreases, home building starts and net in-migration shape the purchase market. For example, net in-migration trends tell us that states like California, Texas and Florida hold promise for future purchase loan activity. Further, supply chain-related shifts that occurred as a

result of the financial crisis now influence the speed with which crucial materials for new construction get to a home building site. Access to this and other types of data on a near-real-time basis can reveal additional insights and improve a lender's ability to project and plan purchase loan demand.

Another factor shaping the purchase loan market is cash sales. Driven by investor purchases over the past 24 months, cash purchase has reduced inventories and spurred higher prices. As we move forward, we expect cash purchase activity to return to historical norms with an increased demand for mortgage financing.

As the purchase market strengthens, 24/7 access and use of comprehensive information, analytics and tools will make a difference in winning or losing in the marketplace. As experts in property data content, analytics and workflow services, the CoreLogic team is prepared to equip you with a more comprehensive approach that can contribute to a sustainable business performance advantage.

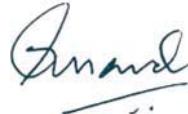
Extending the discussion

With *The MarketPulse*, our goal has been to provide content that can help you and your team refine insights on the housing market. Above all, we're focused on providing a point of view that helps you identify and manage growth opportunities as the mortgage mix transitions.

This month, CoreLogic Chief Economist Mark Fleming, Ph.D., examines the contribution of housing to GDP growth after the recession and asks whether it's time to revise expectations for that contribution. And if you've wondered whether foreclosure re-sales overestimate home prices, as some critics have contended, you'll want to read the article from CoreLogic Case-Shiller Principal Economist David Stiff, Ph.D., that explains the repeat sales home price index.

On behalf of the CoreLogic team, thank you for your business and the ongoing opportunity to share our property information, analytics and workflow solutions with you.

Sincerely,



Anand Nallathambi
President and CEO
CoreLogic

The Authors



Anand K. Nallathambi
President and Chief Executive Officer

Anand K. Nallathambi is the president and chief executive officer of CoreLogic, a leading provider of consumer, financial and property information, analytics and services to business and government. Nallathambi is responsible for all aspects of the CoreLogic business.



Dr. Mark Fleming
Chief Economist

Dr. Mark Fleming is the chief economist for CoreLogic. He leads the economics team responsible for analysis, commentary, and forecasting trends in the real estate and mortgage markets.



Dr. David Stiff
Principal Economist, CoreLogic Case-Shiller Indexes™

David Stiff is principal economist for the CoreLogic Case-Shiller Indexes. In this role, David directs the research and development of the quantitative valuation, home price index and forecasting models.



Thomas M. Vitlo
Research Analyst

Thomas M. Vitlo is a research analyst for CoreLogic with the office of the chief economist. Thomas utilizes statistical software to analyze the real estate market and uses data visualization techniques to illustrate trends.

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The MarketPulse

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 Data as of July 2013

Housing Statistics (July 2013)

HPI® YOY Chg.....12.4%
 HPI YOY Chg XD11.4%
 NegEq Share (Q2 2013)14.5%
 Shadow Inventory (04/2013) ...2.0m
 Distressed Discount..... 44.2%
 New Sales (ths, ann.)325
 Existing Sales (ths, ann.).... 4,283
 Average Sales Price\$262,948
 HPI Peak-to-Current (PTC)...-17.6%
 Foreclosure Stock PTC ... -39.2%

Rates Douse A Fire That's Hard to Put Out

By Dr. Mark Fleming

IN THIS ARTICLE:

- ♦ Long-run potential GDP growth is estimated to be approximately 1.75 percent today as opposed to 3.5 percent prior to the recession.
- ♦ Single-family housing starts have moderated recently, influenced by rising mortgage interest rates.
- ♦ Rising rates have doused the fire lit by residential investment's contribution to GDP growth since late 2011, but the fire has not been put out.

The recent rise in mortgage interest rates and the dialogue about the reduction of quantitative easing highlights the relationship between the broad economy, macroeconomic policy and the housing market. We ask ourselves what the long-run rate of economic (GDP) growth should be and how much the housing market can contribute to that growth. Furthermore, given some of the most recent housing statistics, will the housing market be able to sustain or even increase its contribution to GDP growth?

GDP has consistently grown since the end of the recession, with a couple of "close

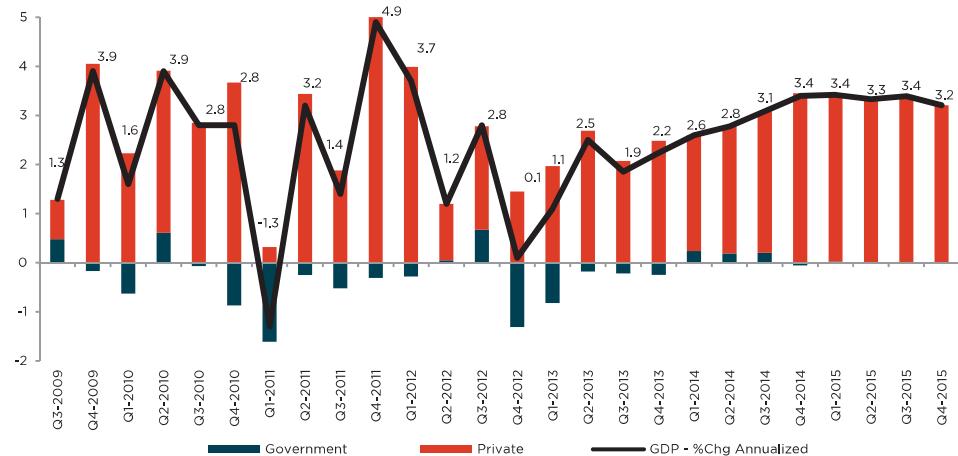
calls" in Q1 2011 and Q4 2012, where annualized GDP growth dropped below 0.5 percent (Figure 1). Though fiscal austerity by the federal government has been a negative contributor to overall growth in 2013, forecasters expect this fiscal drag to wane by the end of the year. The broader concern often voiced is that the level of overall growth is insufficient and that the economy should be growing at a 3.5 percent annualized rate, especially coming out of the recession.

But this was no ordinary recession. Its depth and duration has been well documented, as well as the financial crisis that caused

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FIGURE 1. THE TORTOISE OR THE HARE

GDP Growth Annualized



Source: BEA Q2 - 2013, IHS Forecast

it. Additionally, the ability of our economy to grow has fundamentally changed, as is argued by JPMorgan Chase economists Michael Feroli and Robert E. Mellman in a recent special report.¹ Economists develop measures of the long-run growth potential for an economy based on expected growth in the labor force and productivity. Simply put, GDP grows as more people work and work more efficiently. The faster the labor force grows, either through growth in the working-age domestic population or through immigration, the more output is created. Census demographic trends indicate that the working-age population in the United States consistently grew at rates of 1.5 to 2 percent per year in the '70s and '80s, but since has slowed to less than 1 percent and is forecasted to decline further in the coming years.

The productivity of the workforce is also slowing. The post-war average annual rate of non-farm business productivity growth

“While certainly not a major contraction from their recent high, the tempering of housing starts will modestly reduce their contribution to GDP growth.”

was over 2 percent, and in the 10 years ending in 2005, 2.9 percent. Since the recession ended, non-farm business productivity is only growing at a rate of 0.7 percent. While this level of productivity growth is expected to increase again, overall productivity is projected to return to about 1.25 percent. Feroli and Mellman put the two together to estimate that the potential long-run growth rate for the U.S. economy is 1.75 percent. By that measure, we are currently not doing so poorly!

With this in mind, the importance of the contribution by the housing sector to economic growth cannot be understated. In addition to the decline in long-run growth potential which

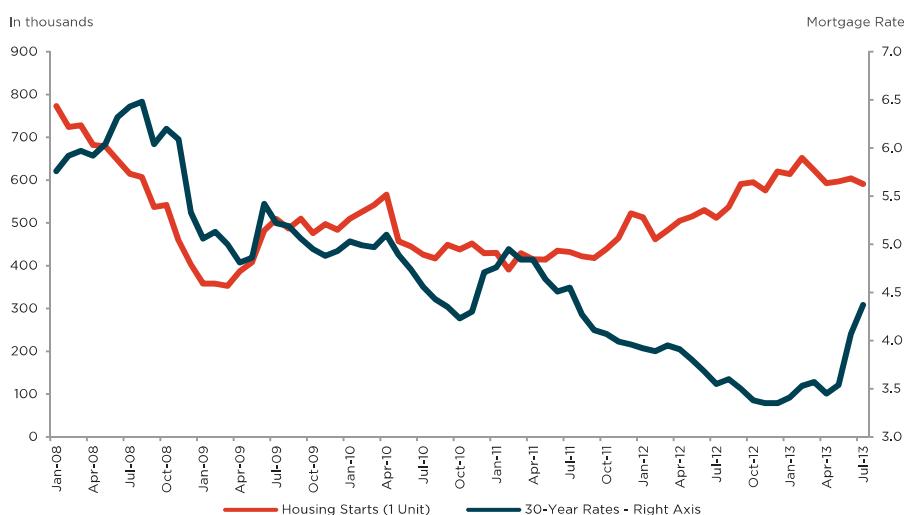
led us into recession, housing did not, for good reason, lead us out. For one thing, the decline in new home construction, a significant creator of economic activity, was particularly hard hit (Figure 2). The pace of single-family housing starts bottomed out in early 2009 at below 400,000 units annualized, but has since clawed back to a post-trough high of 652,000 units in February 2013. This has been one of the driving forces behind the increased contribution of the housing sector to economic growth, reported at 17 percent of first quarter 2013 GDP growth by the Bureau of Economic Analysis in July 2013.

The rise of almost 1 percent between May and July in the 30-year fixed-rate mortgage has had an impact on the growth of housing starts, which have slowed modestly to an annualized rate of about 600,000 single-family units. While certainly not a major contraction from their recent high, the tempering of housing starts will modestly reduce their contribution to GDP growth. Achieving long-run trend growth or better will be that much more challenging.

Expectations for expansion need to be revised to reflect the reality of the demographic and productivity trends in the economy today. The housing sector has played a pivotal role in driving GDP growth since late 2011, but rising rates will modestly temper the contribution moving forward. Nonetheless, rising rates do not pose a burden that is insurmountable. The fire has been doused but not put out.

End.

FIGURE 2. HOUSING COOLS WITH WARMER RATES



Source: CoreLogic, Census July 2013

Footnote

¹ Feroli, Michael, and Mellman, Robert E. "U.S. future isn't what it used to be: potential growth falls below 2 percent." JP Morgan Special Report, August 12, 2013.

Why Use Repeat Sales?

By Dr. David Stiff

IN THIS ARTICLE:

- ♦ Repeat sales is a simple, yet accurate method of estimating home price changes.
- ♦ Repeat sales methods require few data inputs, and therefore use data efficiently.
- ♦ While repeat sales models are influenced by foreclosure resales, the impact is reflective of market dynamics.

Simple Models Rule

“It is futile to do with more things that which can be done with fewer.”

– WILLIAM OF OCCAM, 14TH-CENTURY LOGICIAN

“Everything should be kept as simple as possible, but no simpler.”

– ALBERT EINSTEIN

Occam's razor" is the philosophical principle that simpler explanations should be preferred to more complex ones. This principle is often applied by scientists when formulating models or hypotheses about how the world works. Occam's razor is also applied when economists develop mathematical and statistical models, since a model is more likely to perform well when it requires fewer assumptions and variables. This doesn't mean that a modeler should prefer simplicity over accuracy, however. More carefully stated, Occam's razor says that if two models generate estimates with similar accuracy, the less complex model should be used. Why? Because it requires fewer assumptions and variables, the simpler model gives us a clearer picture of economic trends. Furthermore, sources of error in simpler models are easier to identify since there are fewer moving parts. Finally, because they rely on fewer assumptions, simpler models tend to maintain accuracy even when underlying economic conditions change.

TABLE 1. REPEAT SALE PAIR COUNTS FOR SELECTED CASE-SHILLER HOME PRICE INDEXES

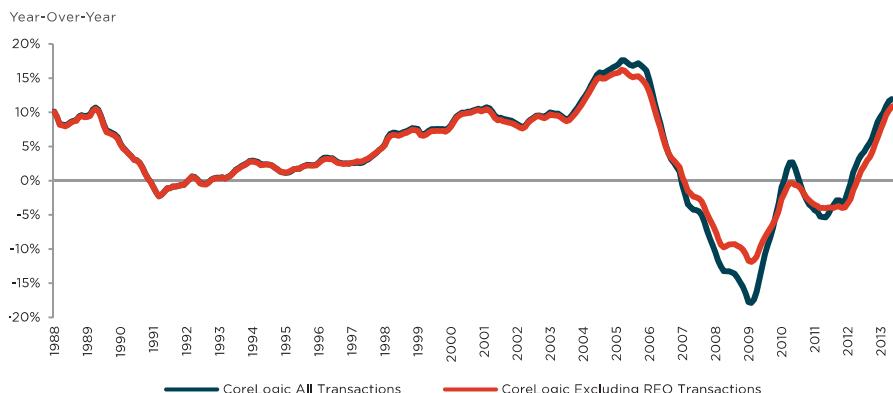
Metro Area	Population (2012)	Index Span	Number of Repeat Sale Pairs
Los Angeles-Long Beach-Glendale, CA Metropolitan Division	9,962,789	1970:Q3 to 2013:Q1	1,760,184
Phoenix-Mesa-Glendale, AZ Metropolitan Statistical Area	4,329,534	1982:Q1 to 2013:Q1	735,515
Cleveland-Elyria-Mentor, OH Metropolitan Statistical Area	2,063,535	1977:Q1 to 2013:Q1	245,958
Tucson, AZ Metropolitan Statistical Area	992,394	1977:Q1 to 2013:Q1	199,660
Modesto, CA Metropolitan Statistical Area	521,726	1983:Q1 to 2013:Q1	77,345
Olympia, WA Metropolitan Statistical Area	258,332	1988:Q1 to 2013:Q1	35,883

Home prices must be tracked with statistical models because houses trade infrequently. If every house were bought and sold every day, then home price trends within a geographic market could be tracked by a daily average of the individual prices, just like stock market indexes. Statistical home price trend models allow us to infer price levels, or the rate of price appreciation, for a market based on individual transactions that may be years apart. The simplest statistical model for accurately tracking home price trends is repeat sales. In a repeat sales model, sale pairs—two transactions for the same house—are collected within a market for all properties with multiple transactions.

These sale pairs are then fed into a simple regression model, where the dependent variable is the change in individual home prices between transactions and the independent variables are dummies indicating whether or not a house transacted within a time period. A repeat sales model can be enhanced by assigning weights to the sale pairs to account for differing distributions of home prices and/or time-varying errors in sale pairs, but the underlying regression model is basically a period-to-period average of the pair price changes.

Why not use a simpler model than repeat sales to track home prices? It is very easy to calculate the median price for all houses that transact in each time

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FIGURE 1. U.S. HOME PRICE CHANGES


Source: CoreLogic June 2013

period, and then use a series of these medians to track price trends within a region, but median price series can be inaccurate, especially when the types of homes sold changes between time periods. For example, three- and four-bedroom houses are more likely to be sold in the summer since households with children do not like to move during the school year. In many markets, these seasonal shifts in the sales activity of larger, more expensive homes generate unrealistic seasonal volatility in the median price series. But shifts in the quality of homes sold are not just seasonal, they can occur over both shorter and longer time periods, generating non-seasonal volatility as well. This “quality mix” problem reduces the accuracy of the median price series. Compared to the repeat sales model, which controls for quality mix by making calculations based on price changes for the same house, the median price series model is too simple.

The Efficiency of Repeat Sales

Repeat sales models use data efficiently because of the simplicity of pairing sales. For each sale pair, only three types of information are required: two sale prices, two transaction dates and a geographic

identifier (property address or parcel number) for matching the two transactions. More complicated home price tracking models, such as indexes based on hedonic regression models or AVM value estimates, require property characteristics data from either tax assessment databases and/or multiple listing services in addition to sale transaction records. In general, methods that use both transaction and characteristics data rely on two separate models, one that converts property characteristics data into home value estimates and another that combines the value estimates into a price index. (Note: These types of models are not directly tracking home prices; they are tracking estimates of home prices.) This makes these methods more complex than repeat sales, from both a data and model perspective, and if the separate value estimation and aggregation models are not constructed carefully, the resulting home price index may be less accurate than desired.

But one consequence of using sale pairs is that houses that only transact once are excluded from a repeat sales model. This means that newly constructed houses are not included in a repeat sales index until they are sold for a second time. Houses that don't transact frequently or with

transactions that can't be matched with a consistent geographic identifier will also be excluded. So unlike the median sale price model, which can utilize all sales transaction data, a repeat sales model will use a subset of that data. For most geographic regions, the subsets of paired transaction data have thousands of observations (see Table 1), so the loss of single and non-pairable transactions is not an issue. Furthermore, the repeat sales method gets more mileage out of a single data point (pair) than other home price tracking methods, since a pair's information is incorporated into all of the index points spanned between its first and second transactions.

Repeat Sales and Changing Transaction Mix

A house only influences a repeat sales index point if it has two transactions that span the time period of that index point. Since houses do not transact in every time period, this leads to a natural question: Can a repeat sales index suffer from the quality mix problem that afflicts the median price model? The simple answer is no. Because the repeat sales model calculates index points based on price changes for the same houses, it automatically controls for shifts in the quality of homes sold in different time periods. If three- and four-bedroom houses are appreciating at the same rate as two-bedroom houses, it doesn't matter if larger, more expensive homes have higher sales volumes in the summer—the repeat sales model calculations are based on (identical) appreciation rates, not the price levels of larger or smaller homes.

A more subtle issue can affect repeat sales, though, if the appreciation rates for different types of homes are not identical.

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If, in our example, the appreciation rate for larger homes is 2 percentage points greater than the rate for smaller homes, a repeat sales index will tend to overestimate overall market price gains in the summer, when the relative sales volume for larger homes increases, and underestimate market appreciation in the winter. For repeat sales models, this data sampling issue is called the “transaction mix” problem. It is important to note that the transaction mix problem has only small effects on the accuracy of repeat sales indexes compared to the effect that changing quality mix has on a median price series. This is because houses tend to appreciate at roughly the same rate within a geographic market, especially over medium- to long-term time horizons. Even if there are persistent differences in the rate of appreciation for different types of homes, the repeat sales model is averaging price changes across pairs that span multiple, overlapping time periods. Any errors introduced by shifts in the transaction mix, therefore, will be smaller than the differences in the relative rates of appreciation of different types of houses, as long as there is overlap in the type of homes transacted.

But what about cases where there are large differences between the rates of appreciation for two different types of houses? During the housing market crash, sales volumes for real estate owned (REO) foreclosed properties soared to record levels. Since properties with foreclosure transactions tend to be of lower quality than properties without foreclosure transactions, and banks may have an incentive to quickly clear REO inventories

from their balance sheets, some have claimed that there is a persistent difference in the rates of appreciation for foreclosed and non-foreclosed properties. Foreclosed properties sell at a discount, so it could be the case that subsequent non-foreclosure sales of REO properties generate sale pairs with unrealistic, above-market appreciation rates. Additionally, because repeat sales indexes use all arms-length transactions, including REO sales, like the CoreLogic Case-Shiller IndexesTM and the CoreLogic all-transactions home price indexes (HPI), there have been concerns that the transaction-mix problem has caused these measurements to substantially overstate home price declines during the crash and to overestimate the rebounds in prices.

While it is true that shifts in the transaction mix of foreclosed/non-foreclosed sales have influenced repeat sales indexes that include REO sales, the magnitude of the effect of foreclosure resales is much smaller than some claim (see Figure 1) for a number of reasons. First, the actual price discount for foreclosed properties is substantially smaller than most published estimates because most of these estimates do not control for differences in the property and neighborhood quality of foreclosed versus non-foreclosed homes.² Second, the differential rate of appreciation for foreclosed and non-foreclosed homes is not very large, probably less than 2 percentage points, on average.³ In fact, there is some evidence that the excess appreciation of properties following an REO sale may be more related to flipping (buying, then selling quickly)

instead of any persistently higher rate of appreciation for foreclosed properties. For longer holding periods, differences between appreciation rates for foreclosed and non-foreclosed properties drop to about 1 percentage point and eventually dissipate. Since both the CoreLogic Case-Shiller Indexes and CoreLogic HPITM have procedures to screen out property flips, any excess appreciation generated by the flipping of REO properties will have a limited effect on estimated repeat sales index values.

Summary

A repeat sales model is the most direct method for accurately tracking market-level home price trends. By pairing transactions for the same houses, the repeat sales model ensures that shifts in the quality of homes bought and sold does not reduce the accuracy of estimated home price indexes. Repeat sales models are more data efficient and less complicated than home price tracking methods that rely on property characteristics data. Some critics have claimed that the surge in foreclosure resales during the housing market crash and the current shift back toward a more normal market, not dominated by REO sales, caused repeat sales models to substantially over-estimate both the plunge and current rebound in home prices, but these claims are exaggerated. Although repeat sales indexes that include all arms-length transactions have been influenced by foreclosure resales, the magnitude of these effects is small and representative of actual market dynamics.

End.

Footnotes

² See Harding, J.P., E. Rosenblatt, and V. Yao. 2011. “The Foreclosure Discount: Myth or Reality?” Forthcoming Journal of Urban Economics, for a description of how foreclosure discounts are often over-estimated. The authors use a paired sales approach to estimate average foreclosure discounts. It is important to use a paired sales approach because properties that experience a foreclosure tend to be of lower quality than properties without a foreclosure. But more importantly, these properties have lower quality both before and after foreclosure—defaulting mortgage borrowers do not usually trash their homes, despite a few anecdotal stories in the media. This means that to properly estimate foreclosure discounts a modeler must control for the same quality mix problem that also reduces the accuracy of median price series.

³ See Harding, J.P., E. Rosenblatt, and V. Yao. 2011. “The Foreclosure Discount: Myth or Reality?” Forthcoming Journal of Urban Economics.