

Performance and Timing of Secondary Market Investment Activity



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- Appendix A: Change in Gross Metro Product (2007 – 2011)
- Appendix B: Population Trends by Metro Statistical Area (MSA) (2002 – 2012)
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Interpretation

This report presents the findings of empirical analysis of secondary market performance to glean how its investment profile — the trends, participants, and points of inflexion — is differentiated from primary markets. Differences are apparent when contrasting primary and secondary markets as well as between secondary markets. In a few cases, these observations point to clear investment strategy implications. In most cases, they are instead suggestive of opportunities and risks for investors and lenders.

As an overview of the secondary market investment landscape, the scope of this report is ambitious. The causal drivers of commercial real estate market performance at every level will command the attention of our industry's academic and practitioner researchers far into the future. Rather than attempt to isolate causality, the empirical analysis and results presented here are both descriptive and interpretive. They survey patterns of market performance and relationships that can inform investors' evaluation of market opportunities in secondary markets.

A Distinctive Investment Landscape in Secondary Markets.

Conditions are ripe for a shift in focus to commercial real estate's secondary markets. Bolstered by the potential for more stable national economic trends, buyers' improving tolerance for risk-taking, and a widening disparity in yields across primary and secondary markets, investors are broadening their sights.

Apart from their rankings on the commercial real estate investment hierarchy, secondary markets present investors with distinct opportunities and risks. The assumptions underpinning investment strategy along the coasts are not completely portable as buyers and lenders migrate to areas of lower liquidity — secondary markets are not business as usual on a smaller scale.

Differences between primary and secondary markets — and across the diverse array of secondary markets themselves — extend well beyond a tally of each metro area's inventory of commercial properties. For an investor making a first foray into secondary markets, the landscape of market participants, properties and linkages to the real economy will be less familiar. Secondary markets also present unique issues related to the timing of property acquisitions and dispositions and the dependence of investors on the availability of financing to support a critical mass of activity.

For investors motivated by a secondary market's long-term prospects for appreciation, several factors may be important. Markets with a high concentration of skilled workers, and a track record of innovation, rank high on the list, as do supply-constrained markets. A cautionary note accompanies that endorsement. If those skilled workers are all busy doing the same thing, a downturn in a market fueled by a single knowledge industry can be particularly difficult. The notion of a creative class driving a market's long-term growth does not preclude volatility over the business cycle.

This report explores practical issues facing secondary market investors and their implications for the timing of investments and market and asset selection. Secondary market investment opportunities present unique risks. As the economy expands and the distance from the financial crisis widens, understanding secondary markets' performance patterns and their risk-return tradeoffs becomes an increasingly important task for investors, lenders and policymakers.

Secondary Markets and the Current Real Estate Cycle

In the aftermath of the financial crisis and the Great Recession, the recovery in commercial real estate investment activity has been heavily weighted to a small number of primary markets. Bifurcation came into widespread use as a descriptor of prevailing commercial real estate trends in 2009 and 2010. It has persisted longer than many investors could have anticipated. Even as compared to previous cycles, debt and equity capital flows to secondary markets have resumed slowly. After a prolonged period of imbalance in capital flows favoring a small number of prime markets, more confident investors and rising risk-free yields are now contributing to secondary markets' improving share of activity.

Super Prime Markets Lead the Recovery

Even within primary markets, the patterns of recovery have been uneven. Investment volume and asset prices in five markets — Boston, Los Angeles, New York, San Francisco and Washington, D.C. — accelerated past their peer group early in the turnaround. Well-located, high-quality properties within these “super prime” markets have subsequently recovered a significant share of lost value. By late 2013, a range of metrics, including price indices and measures of transaction and lending volume, showed activity in these markets at or near its pre-crisis peaks. Large assets have been trading routinely above their pre-crisis values, even where operating income has been anchored to slow improvements in the real economy.

What is the underlying advantage of the super prime markets? Among the various distinguishing characteristics, urban economists can point to measures of market size, such as population and economies of agglomeration within and across complementary industries. Real estate analysts may explain the advantage in terms of supply constraints or asset liquidity. These advantages, self-reinforcing in the case of asset liquidity, have proven more important for lenders and investors during the recovery thus far.

Figure 1
Primary and Secondary Market Tiers

Primary Markets	Secondary Markets
Atlanta-Sandy Springs-Marietta, GA	Austin-Round Rock-San Marcos, TX
Boston-Cambridge-Quincy, MA-NH ¹	Baltimore-Towson, MD
Chicago-Naperville-Joliet, IL-IN-WI ¹	Charlotte-Gaston-Rock Hill, NC-SC
Dallas-Fort Worth-Arlington, TX	Cincinnati-Middletown, OH-KY-IN
Denver-Aurora-Broomfield, CO	Cleveland-Elyria-Mentor, OH
Houston-Sugar Land-Baytown, TX	Columbus, OH
Los Angeles-Long Beach-Santa Ana, CA ¹	Detroit-Warren-Livonia, MI
Miami-Fort Lauderdale-Pompano Beach, FL	Greensboro-High Point, NC
New York-Northern New Jersey-Long Island, NY-NJ-PA ¹	Hartford-West Hartford-East Hartford, CT
Riverside-San Bernardino-Ontario, CA	Indianapolis-Carmel, IN
San Diego-Carlsbad-San Marcos, CA	Jacksonville, FL
San Francisco-Oakland-Fremont, CA ¹	Kansas City, MO-KS
Seattle-Tacoma-Bellevue, WA	Las Vegas-Paradise, NV
Washington-Arlington-Alexandria, DC-VA-MD-WV ¹	Louisville-Jefferson County, KY-IN
	Memphis, TN-MS-AR
	Milwaukee-Waukesha-West Allis, WI
	Minneapolis-St. Paul-Bloomington, MN-WI
	Nashville-Davidson-Murfreesboro-Franklin, TN
	New Orleans-Metairie-Kenner, LA
	Oklahoma City, OK
	Orlando-Kissimmee-Sanford, FL
	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD
	Phoenix-Mesa-Glendale, AZ
	Pittsburgh, PA
	Portland-Vancouver-Hillsboro, OR-WA
	Providence-New Bedford-Fall River, RI-MA
	Raleigh-Cary, NC
	Sacramento-Arden-Arcade-Roseville, CA
	Salt Lake City, UT
	San Antonio-New Braunfels, TX
	St. Louis, MO-IL
	Tampa-St. Petersburg-Clearwater, FL
	Virginia Beach-Norfolk-Newport News, VA-NC

Source: Market assignments by Chandan Economics.

¹ Prime markets that are also super prime markets.

Note: All other markets are designated tertiary.

Primary and secondary market designations are generally subjective, reflecting observable but qualitative differences in levels of market activity. The designation of some primary markets will meet with widespread agreement. Markets including New York, San Francisco, and Washington DC, are examples. Other large markets may not be classified consistently. For example, some investors will classify Atlanta and Dallas as primary markets while others will not. No one approach to classification is intrinsically superior to all of its alternatives. In this analysis, markets have been grouped by lender density (described on Page 11), which measures the number of active lenders relative to a market's inventory. Markets were clustered into primary, secondary, and tertiary categories based on this metric.

Lender participation in secondary markets increases as general real estate market conditions improve, though correlation and causation cannot be reliably distinguished. In secondary markets, the dominant lenders include banks and conduit lenders. Credit unions have also emerged as more visible sources of financing following the financial crisis. During the current recovery, the reemergence of CMBS lending has lagged for a variety of reasons, including a slow recovery in investor demand for bonds and unfavorable risk assessments resulting from CMBS loans' higher delinquency and default rates.

For lenders that may have already engaged in primary markets, the decision to lend in secondary markets reflects an improving appetite for risk and rising competition for high-quality lending opportunities. At the same time, smaller regional and community banks with relatively narrow geographic scopes have been constrained by the high concentration of property and construction loans on their balance sheets.

Figure 2
**RELA-Chandan Survey of Commercial Real Estate
 Lender Sentiment**
 Second Quarter 2013

	Increase	Unchanged	Decrease
Loan-to-Value Ratios	14%	80%	5%
Debt Service Coverage	18%	64%	18%
Debt Yields	20%	64%	16%
Property Quality	14%	71%	14%
Loan Sponsorship	13%	75%	13%
Property Location / Market	27%	57%	16%

Source: Real Estate Lenders Association and Chandan Economics

Note: This survey measures appetite for credit risk among U.S. based lending institutions. Respondents were asked: "As compared to the prior 12 months, my institution's appetite for risk over the next 12 months will increase, remain unchanged or decrease."

Outside of the super prime markets, investors and lenders have not reengaged consistently. The recovery in secondary markets has generally come later and has been slower to build momentum. With few exceptions, secondary market property values and transaction activity reached their pre-recession nadirs with a lag.

Figure 3
Peak to Trough Sales Volume

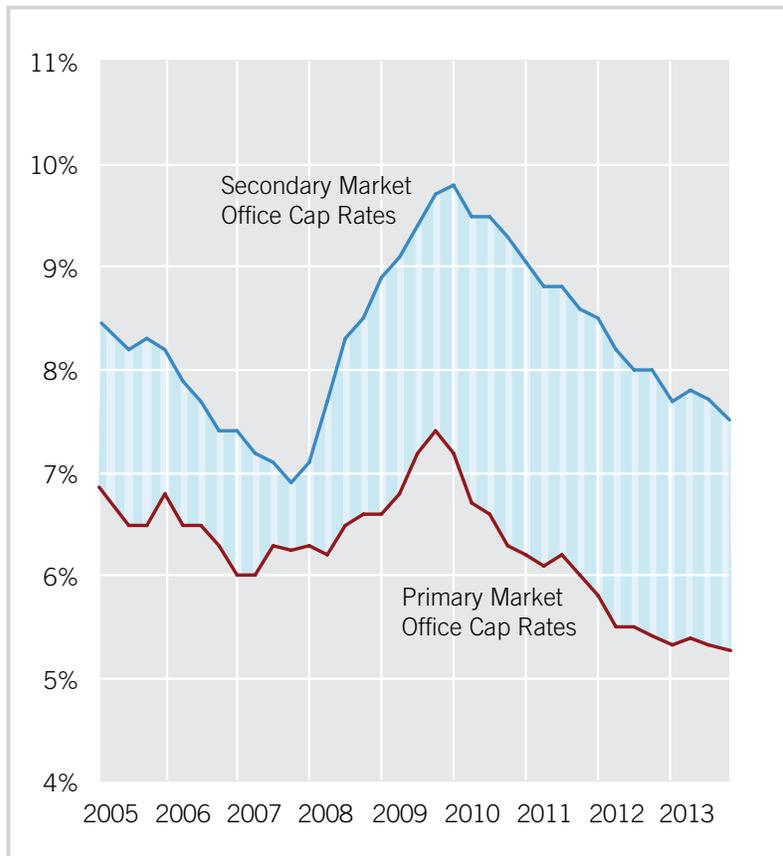
Office				
	Prime Markets	Secondary Markets	Secondary Markets Lead or Lag	Lead or Lag By Quarters
Value Peak	Q2 2007	Q1 2007	Lead	1
Value Trough	Q4 2009	Q1 2011	Lag	5
Peak to Trough in Quarters	10	16		
Retail				
	Prime Markets	Secondary Markets	Secondary Markets Lead or Lag	Lead or Lag By Quarters
Value Peak	Q1 2008	Q2 2007	Lead	3
Value Trough	Q4 2010	Q3 2011	Lag	3
Peak to Trough in Quarters	11	17		
Industrial				
	Prime Markets	Secondary Markets	Secondary Markets Lead or Lag	Lead or Lag By Quarters
Value Peak	Q1 2008	Q3 2007	Lead	2
Value Trough	Q1 2012	Q2 2012	Lag	1
Peak to Trough in Quarters	16	18		

Source: Chandan Economics

Disparate outcomes in primary and secondary market investment recoveries are not unique to the most recent cycle. However, the current cycle's lagging secondary market recovery — like the recovery in the broader economy and labor markets — is distinguished by its persistence. The convergence of risk aversion among institutional investors and exaggerated economic uncertainties are among the explanations. Differences in asset liquidity and the need for and availability of financing are interrelated constraints that have also weighed in favor of primary markets.

Despite the number of quality assets in the super prime markets, the influx of capital in search of core properties as a safe haven, has contributed to the enviable price trends among “trophy” assets. Even after accounting for the impact of unorthodox monetary policies like maturity extension that pushed U.S. Treasury yields to record lows, cap rates for the most aggressively contested office and apartment assets are inconsistent with the tenuous recovery in the real economy and labor market.

Figure 4
Office Capitalization Rates, 2005–Second Quarter 2013



Source: Chandan Economics

Spillovers and the Hunt for Yield

As yields in super-prime markets have declined, institutional investors have broadened the scope of their buying activity to include other primary markets, as well as mid-cap assets, and even non-core properties. These spillovers are supportive of secondary market activity but are more nuanced than a simple hunt for higher risk-adjusted returns. Most institutional buyers tend to purchase larger properties in primary markets. However, fewer large properties in secondary and tertiary markets translate to fewer investment opportunities for these buyers.

Figure 5
Mean Property Prices Across Super Prime and Non-Super Prime Markets by Property Type
 In Millions of Dollars

	Industrial	Office	Retail
Super Prime Markets	\$7.6	\$37.2	\$21.0
All Other Markets	\$1.9	\$4.1	\$5.5

Source: Chandan Economics, 2012 Mortgage-Financed Transactions

Note: See Figure 1 for a list of super prime, prime, secondary and tertiary markets.

Capital inflows from the largest institutional buyers might easily saturate a smaller secondary market, but historical patterns suggest this rarely happens. The largest real estate investment trusts (REITs), pension funds, and cross-border investors that dominate the super prime markets have not consistently searched for low-visibility buying opportunities in secondary markets. To the extent that larger investors and lenders in super prime markets also value the larger size and liquidity characteristics of a property, secondary markets will not allow them to deploy capital as efficiently. In cases where investors are distant, as with cross-border buyers, they may also value the information efficiency of more visible markets.²

Figure 6
Repeat Investors Through the Third Quarter of 2013

Primary Only	23%
Primary and Secondary	9%
Secondary Only	68%

Source: Chandan Economics

Note: Repeat investors includes buyers with two or more mortgage-financed commercial property acquisitions. Excludes multifamily properties.

² Ling, Naranjo, and Petrova (2013) find that geographically distant investors pay a premium relative to local buyers. They attribute this premium to higher search costs and asymmetric information favoring the proximate investor.

Principal Findings

Index Calculation: Measuring Investor and Lender Market Participation

The density of investors and lenders in each market-quarter is measured using an industry-standard Herfindahl index. The index was scaled to account for differences in market size. The index is an imperfect measure since the full extent of market participation is unobservable. Only parties to the transaction are recorded. Unsuccessful bidders for a property and financing opportunity are not observed. If one class of buyers or lenders is consistently more successful in winning a transaction opportunity, the index measure will tend to underestimate density. The index is more than a measure of transaction volume; by design, its upper bound is the scenario where there is a unique one-time buyer and one-time lender for each asset. In this scenario, there is the largest number of potential transaction participants. At the other extreme, the scenario where only one buyer and one lender are observed for all transactions, density is at its minimum.

Investor and Lender Density Matters

Investors. The number of investors in a market, both buyers and sellers, is positively related to price trends. The relationship is dynamic since investor density supports prices and improving prices draw additional investors. Buyers enter the market as prices rise; incumbent owners list and sell their assets in response to the same observation. Secondary markets with a larger number of active investors or lenders with deep knowledge of the market may be at an advantage as compared to markets with fewer embedded participants. A relative decline in yields in primary markets will push some investors into secondary markets, which should support prices. However, this anecdotal observation does not mean that all investors in primary markets decamp for opportunities in secondary markets. In fact, large institutional investors that represent a disproportionate share of super prime market activity are underrepresented in secondary markets, where investment opportunities are smaller in scale.

Figure 7

Investor and Lender Density, 2012

Number of Unique Lenders in Market			
	<10		>25
Tertiary Markets	Austin	Atlanta	Boston
	Baltimore	Dallas	Chicago
Greensboro	Charlotte	Denver	New York
Hartford	Cincinnati	Houston	Los Angeles
Milwaukee	Cleveland	Miami	San Francisco
Oklahoma City	Columbus	Philadelphia	Seattle
Pittsburgh	Detroit	Phoenix	Washington DC
Providence	Indianapolis	Inland Empire	
Research Triangle	Jacksonville		
Sacramento	Kansas City		
St Louis	Las Vegas		
	Louisville		
	Memphis		
	Minneapolis		
	Nashville		
	New Orleans		
	Orlando		
	Portland		
	Salt Lake City		
	San Antonio		
	Tampa		

Source: Chandan Economics

Note: Lenders participating in three or more transactions during the year.

The Hirfendahl Index has a range from 0 to 1 and is calculated as the sum of squares of the market shares of the most active investors (or lenders) in a market. A value of 1 indicates that there is a single, large investor in the market. Smaller values indicate more dispersed investment activity.

Hirfendahl Index Examples

Example 1: Market with a single investor

In a market with a single investor, that investor's market share is 100 percent. The sum of the squares of the market shares is 1, the upper bound on the index. This is the least competitive and most concentrated market.

Example 2: Market with several investors

In a market with five equally active investors, each has a market share of 20 percent. The sum of the squares of the market shares is 0.2. This market is more competitive and less concentrated than the market with a single investor.

Example 3: Market with a dominant investor

In a market with five investors where one accounts for half of all activity and the remaining four account for the other half in equal shares, the index is 0.31. Even though Example 2 and Example 3 have the same number of investors, the market with a dominant investor is more concentrated.

Lenders. The presence of investors implies active lenders, as well.

A healthy lending environment for small- and mid-cap properties, both in terms of the number of lenders and underwriting standards, is crucial for secondary market performance. For most buyers, the availability of secured financing is a necessary condition, but entities such as life insurance companies are not the most relevant sources of debt in secondary markets. Instead, lending is dominated by smaller regional and community banks as well as conduits. Small regional and community banks and CMBS lending account for a larger share of lending in secondary markets, where life companies and unsecured financing is less prevalent. Activity will be sensitive to changes in the regulation and oversight of banks as they relate to commercial real estate lending and the robustness of the commercial mortgage-backed securities (CMBS) market.

The Risk Premium is Not Guaranteed. Higher going-in cap rates in secondary markets reflect compensation for higher risk. But the expectation of higher returns finds ambiguous support in the data. The data show relatively large declines in secondary market prices over a longer period of time, followed by a constrained recovery. Over the last cycle, even the strongest secondary markets, such as San Jose and Austin, have lagged the value recoveries of super prime markets with relatively weaker employment trends, such as New York.

Figure 8
Peak to Trough Decline in Value

	Office	Retail	Industrial
Prime Markets	-38%	-27%	-37%
Secondary Markets	-43%	-35%	-39%
Difference in Percentage Points	5%	8%	2%

Source: Chandan Economics

Figure 9
Trough to Second Quarter 2013 Recovery in Value

	Office	Retail	Industrial
Prime Markets	45%	25%	23%
Secondary Markets	26%	18%	17%
Difference in Percentage Points	19%	7%	6%

Source: Chandan Economics

Figure 10
Value Comparison: Second Quarter 2013 to Previous Peak

	Office	Retail	Industrial
Prime Markets	-10%	-6%	-24%
Secondary Markets	-25%	-25%	-29%
Difference in Percentage Points	15%	19%	5%

Source: Chandan Economics

Flexibility Matters More. Capital outflows during downturns result in weaker investment outcomes in secondary markets. Said differently, less investor capital flows toward secondary markets during downturns. Under these conditions, investors in a hurry to sell will incur greater relative losses at sale than investors who can optimize the timing of their sales to reflect market conditions. The same is true in primary markets, but the relative loss of liquidity is greater for secondary markets.

Fundamentals Matter More. Liquidity premiums are illiquidity discounts. When asset liquidity is more important to investors, capital flows will favor super prime and primary markets. Absent the support of capital inflows, appreciation (or value retention) in secondary markets during these periods is more dependent upon fundamentals. Even as markets move from recovery to expansion, fundamentals show a stronger correlation with asset prices in secondary markets; cap rates decline more slowly and appreciation is better correlated with increasing net operating income. This may reflect higher transaction costs, which are positively related with buyers' holding periods (Collett et al. 2003).

Timing Market Shifts is No Easier. The ability to identify the peaks and troughs in the business cycle is an elusive skill, even when they are in the rearview mirror. This is not unique to commercial real estate. The economists on the Business Cycle Dating Committee of the National Bureau of Economic Research, the official arbiters of recession dating, announced in September 2010 that the last recession had ended more than a year earlier, in June 2009.

Various indicators of capital flows, financial system stress, and esoteric measures of real economic activity have been proposed as leading or coincident indicators of a slide into recession. Similar to the business cycle, there are no undisputed leading indicators of a turnaround or downturn in real estate markets, large or small. Some measures of economic and capital markets activity provide indications of peaks and troughs in business and real estate cycles; none are fully reliable.

Secondary Market Characteristics and Implications

Secondary Market Characteristics

Primary and secondary markets have distinct investor profiles, often with limited overlap.

The expansion phase of the investment cycle generally peaks in secondary markets before primary markets.

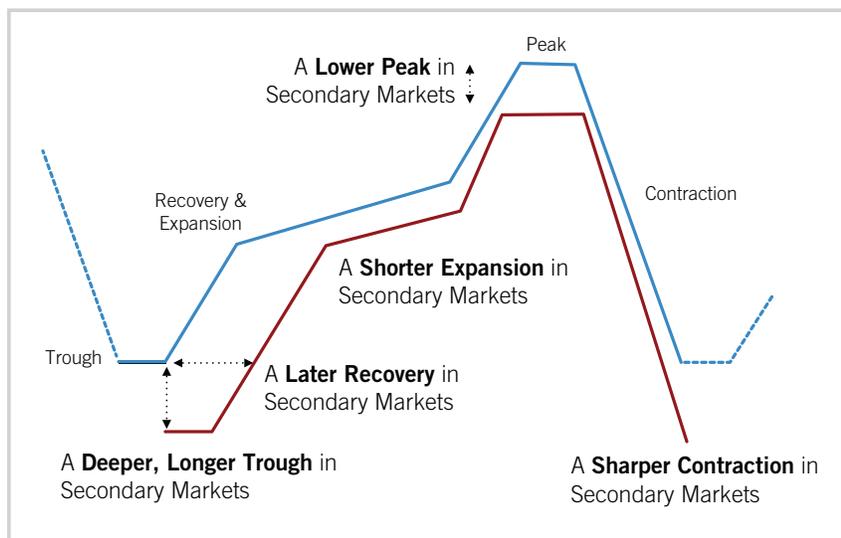
Investment Implications

The spillover from primary to secondary markets is more complex than investors moving en masse from one class of market to another. The scale and risk profile of some investors will support activity across different market tiers. For other investors, secondary markets will not be viable targets for investment. Rather than pure investor migration, investment activity in secondary markets depends on whether a range of necessary conditions is in place, such as financing.

The broader commercial real estate market is not a leading indicator of a systematic downturn across secondary markets. Instead, secondary market performance may be the canary in the coalmine for primary market investors.

Figure 11

The Secondary Market Real Estate Cycle



Source: Chandan Economics

Secondary Market Characteristics

The contraction phase of the investment cycle has a longer duration in secondary markets than in primary markets. The recovery for secondary markets begins later.

Investment Implications

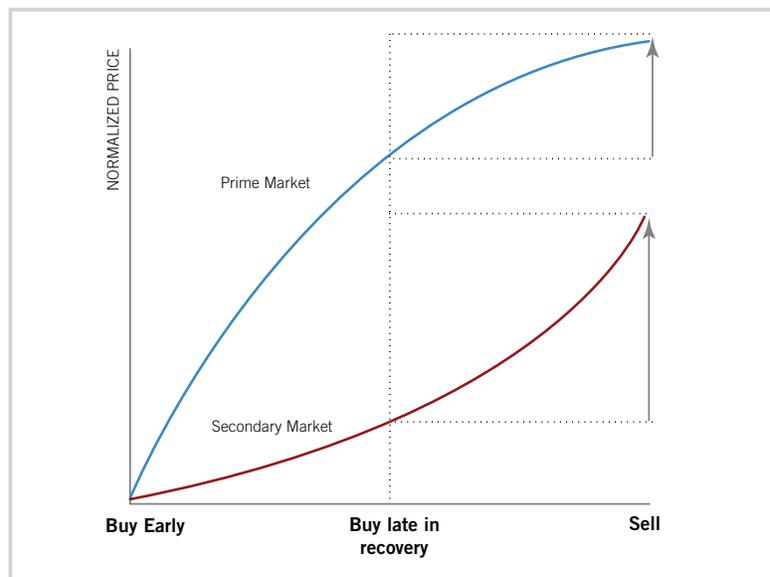
In contrast with the peak of the expansion phase, broader commercial real estate market performance is a leading indicator of the secondary market trough. Investors might capitalize on the lag in secondary markets' price recovery and paucity of competition, but cannot depend on secured financing. When investor density is low, lender density is generally low, as well.

Early in the recovery, primary market investments offer higher returns. The gap between primary and secondary market pricing widens. Later in the recovery, secondary market investments offer higher returns.

Investment returns from the point of acquisition to market peak are relatively larger in secondary markets as the recovery progresses. Investors must remain sensitive to exit timing, however, as secondary markets may experience more rapid declines in transaction activity following the market peak.

Figure 12

Upside of the Lagging Secondary Market Recovery



Source: Chandan Economics

Secondary Market Characteristics	Investment Implications
<p>Market scale matters. In support of price discovery, larger markets achieve a critical mass of transaction activity more easily.</p>	<p>Some secondary market disadvantages may be considered immutable. Fewer assets imply fewer potential trades and slower price discovery following a market shock. A spate of transactions in a particular secondary market may trigger the self-reinforcing process.</p> <p>An alternative theory of spillovers and the recovery lag, secondary markets may get a boost from activity in primary markets. If investors believe there is relevant information about a secondary market's prices embedded in primary market transaction activity, the former can benefit from improvements in the latter.</p>
<p>Larger markets have an advantage in terms of agglomeration economies, i.e. there is an inherent advantage in size.</p>	<p>Agglomeration economies relate to the co-location of firms, where the density of firms and their productivity are positively related. This means that raw market size can be trumped by scale in a particular activity. The secondary markets that also fall into the class of knowledge markets (markets with a high concentration of highly skilled professionals employed in highly creative activities) are cases in point. Relative to its size, Austin is an unusually active investment market.</p>
<p>Secondary markets with higher industry concentrations are more volatile. Strong expansions can be followed by deep contractions.</p>	<p>Be careful of the one-industry town. Secondary markets with agglomeration economies comparable to a primary market may not be well diversified. Concentration in one industry implies volatility, with greater upside offset by a deeper downside.</p>

Secondary Market Characteristics

Investment Implications

During a downturn, outflows of capital are more severe in secondary markets than in primary markets.

Investor flexibility and income resilience are advantages anywhere but may be more important in secondary markets. In a flight to quality, high quality properties should hold their value better than lower quality properties. Higher quality assets are strongly favored in the secondary market asset price inflexion.

Even after controlling for private market characteristics, local fiscal health matters.

Either through direct or indirect channels, local governments with weak long-term budgetary positions have a negative impact on secondary market performance. Large unfunded pension liabilities may have implications for local tax policy that will negatively impact the economy and asset prices.

Concluding Observations

How is the commercial real estate investment cycle different in secondary markets as compared to primary markets? Timing is even more important in the former. Drawn to appreciation in primary markets and anxious to diversify away from secondary markets, a poorly informed investor might have sold assets at a deep discount early in the commercial property recovery. Better informed, that same investor's optimal exit strategy might have shifted significantly, anticipating a later turnaround for property values in secondary locations.

As compared to primary markets, investors in secondary markets engage a different set of buyers, sellers, lenders and assets. The scale of each individual investment is smaller, as is each market's aggregate level of investment activity. Limited scale impedes price discovery following a disruption of activity. But the resulting recovery lag can be an opportunity for investors in high quality assets.

Rather than secondary markets, institutional investors are attracted to the relatively strong liquidity of the super prime markets. These are not necessarily the largest markets; they tend to be the most actively traded. The dynamic is self-reinforcing. Investors and lenders respond positively to liquidity; liquidity improves in the density of investors and lenders.

The empirical findings described in this report are based primarily on the Chandan Economics' proprietary database of commercial real estate mortgages. The database is supplemented with public and third party data relating to the socio-economic, demographic, real estate and business activity characteristics of each market. These sources include the U.S. Bureau of Labor Statistics, the U.S. Bureau of Economic Analysis, the Board of Governors of the Federal Reserve System and ratings agencies.

Chandan's mortgage database includes mortgages made in support of property acquisitions and refinancing by balance sheet lenders, including banks and life insurance companies, conduit lenders, and agency lenders in the case of the multifamily sector. For purposes of this report, multifamily loans are included in measures of lender density, i.e. the number of active lenders in a market. Multifamily properties are excluded, however, from the analysis of commercial real estate market dynamics.

As of the fourth quarter of 2013, the mortgage database included just more than \$1.9 trillion in transaction activity. One notable omission from the database and the analysis is that property class is not used as an explanatory variable. Property characteristics for which class designations may be a subjective proxy are included in property-specific regressions. As a practical consideration, the mortgage database does not capture class assignments or other subjective measures of property quality.

Leveraging the mortgage data, the analysis is undertaken on several levels. Data from individual loans was aggregated to create market-level and market-tier trends, i.e. primary and secondary markets. These trends were used in making comparisons between primary and secondary market commercial real estate property trends as well as between secondary markets. The microanalysis used loan-level data for transactions occurring in secondary markets.

Appendix A

Change in Gross Metro Product (%)

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Abilene, TX	-1.5%	0.5%
Akron, OH	-3.8	1.3
Albany, GA	-2.9	-1.5
Albany-Schenectady-Troy, NY	-0.2	0.7
Albuquerque, NM	-1.0	0.4
Alexandria, LA	-0.7	0.5
Allentown-Bethlehem-Easton, PA-NJ	-3.2	1.5
Altoona, PA	-1.8	0.8
Amarillo, TX	0.6	0.2
Ames, IA	-2.2	4.6
Anchorage, AK	2.6	-2.5
Anderson, IN	-8.1	3.9
Anderson, SC	-7.3	3.2
Ann Arbor, MI	-4.2	0.9
Anniston-Oxford, AL	-4.2	-0.4
Appleton, WI	-3.9	1.9
Asheville, NC	-1.7	-0.1
Athens-Clarke County, GA	-1.8	0.4
Atlanta-Sandy Springs-Marietta, GA	-5.7	1.4
Atlantic City-Hammonton, NJ	-6.4	0.3
Auburn-Opelika, AL	-2.0	0.2
Augusta-Richmond County, GA-SC	-1.7	1.2
Austin-Round Rock-San Marcos, TX	-2.2	2.5
Bakersfield-Delano, CA	0.6	0.4
Baltimore-Towson, MD	-1.1	1.7
Bangor, ME	-2.9	-0.2
Barnstable Town, MA	-2.7	0.4
Baton Rouge, LA	-1.7	4.2
Battle Creek, MI	-5.6	2.6
Bay City, MI	-2.1	1.1
Beaumont-Port Arthur, TX	1.3	6.5
Bellingham, WA	-1.0	6.5
Bend, OR	-7.7	-0.7
Billings, MT	-6.7	2.2
Binghamton, NY	-0.1	2.7
Birmingham-Hoover, AL	-5.1	0.5
Bismarck, ND	0.1	4.5
Blacksburg-Christiansburg-Radford, VA	-7.1	0.0
Bloomington, IN	1.1	-2.4
Bloomington-Normal, IL	-0.1	1.1
Boise City-Nampa, ID	-4.2	2.5
Boston-Cambridge-Quincy, MA-NH	-1.5	2.9
Boulder, CO	-2.8	3.8
Bowling Green, KY	-6.2	0.9
Bremerton-Silverdale, WA	-2.2	-1.0
Bridgeport-Stamford-Norwalk, CT	-6.1	3.6
Brownsville-Harlingen, TX	-0.9	0.3
Brunswick, GA	-4.7	-2.1
Buffalo-Niagara Falls, NY	-1.1	1.9
Burlington, NC	-6.9	2.8
Burlington-South Burlington, VT	-0.3	2.9
Canton-Massillon, OH	-5.9	3.7
Cape Coral-Fort Myers, FL	-8.1	-1.6

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Cape Girardeau-Jackson, MO-IL	-0.6%	-0.1%
Carson City, NV	-6.4	-0.8
Casper, WY	3.8	-0.8
Cedar Rapids, IA	-2.9	4.0
Champaign-Urbana, IL	2.5	-0.2
Charleston, WV	-0.9	3.0
Charleston-North Charleston-Summerville, SC	-3.4	0.8
Charlotte-Gastonia-Rock Hill, NC-SC	-4.6	0.7
Charlottesville, VA	-1.0	1.5
Chattanooga, TN-GA	-5.4	2.0
Cheyenne, WY	-2.1	1.5
Chicago-Joliet-Naperville, IL-IN-WI	-3.8	1.9
Chico, CA	-2.2	-1.1
Cincinnati-Middletown, OH-KY-IN	-3.5	1.2
Clarksville, TN-KY	0.6	3.4
Cleveland, TN	-4.8	2.4
Cleveland-Elyria-Mentor, OH	-4.0	2.3
Coeur d'Alene, ID	-4.7	-1.0
College Station-Bryan, TX	-0.4	1.4
Colorado Springs, CO	-2.2	1.1
Columbia, MO	-2.5	1.1
Columbia, SC	-3.5	-0.7
Columbus, GA-AL	-1.1	1.8
Columbus, IN	-9.5	12.7
Columbus, OH	-4.0	0.7
Corpus Christi, TX	0.6	3.6
Corvallis, OR	3.6	4.9
Crestview-Fort Walton Beach-Destin, FL	-1.2	-0.8
Cumberland, MD-WV	1.6	2.5
Dallas-Fort Worth-Arlington, TX	-4.0	1.8
Dalton, GA	-9.3	-2.8
Danville, IL	-1.6	1.3
Danville, VA	-4.1	2.5
Davenport-Moline-Rock Island, IA-IL	-1.8	3.0
Dayton, OH	-4.8	1.6
Decatur, AL	-3.7	-0.7
Decatur, IL	-3.5	2.2
Deltona-Daytona Beach-Ormond Beach, FL	-6.2	-0.7
Denver-Aurora-Broomfield, CO	-2.4	0.7
Des Moines-West Des Moines, IA	-6.4	2.4
Detroit-Warren-Livonia, MI	-8.4	4.8
Dothan, AL	-6.2	-0.7
Dover, DE	-0.9	-3.6
Dubuque, IA	-4.3	7.9
Duluth, MN-WI	-2.9	2.8
Durham-Chapel Hill, NC	-0.6	3.0
Eau Claire, WI	-3.2	2.2
El Centro, CA	1.9	-5.5
Elizabethtown, KY	-1.4	8.3
Elkhart-Goshen, IN	-20	10.9
Elmira, NY	-1.7	5.1
El Paso, TX	-2.5	1.9
Erie, PA	-4.0	1.8

Source: Chandan Economics

Appendix A (continued)
Change in Gross Metro Product (%)

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Eugene-Springfield, OR	-5.6%	2.3%
Evansville, IN-KY	-3.7	2.1
Fairbanks, AK	-2.0	-0.1
Fargo, ND-MN	1.4	3.7
Farmington, NM	-1.1	-1.4
Fayetteville, NC	2.9	0.4
Fayetteville-Springdale-Rogers, AR-MO	-2.2	1.5
Flagstaff, AZ	-4.0	-0.5
Flint, MI	-8.9	3.9
Florence, SC	-4.8	-0.6
Florence-Muscle Shoals, AL	-1.7	1.7
Fond du Lac, WI	-6.3	3.9
Fort Collins-Loveland, CO	-3.7	2.7
Fort Smith, AR-OK	-4.0	0.0
Fort Wayne, IN	-5.7	3.6
Fresno, CA	-2.2	-1.3
Gadsden, AL	-2.7	0.7
Gainesville, FL	-2.0	-0.2
Gainesville, GA	-6.9	2.5
Glens Falls, NY	-0.9	2.8
Goldsboro, NC	-2.6	0.4
Grand Forks, ND-MN	0.1	2.5
Grand Junction, CO	-1.7	-0.1
Grand Rapids-Wyoming, MI	-6.8	3.6
Great Falls, MT	0.0	0.2
Greeley, CO	-4.2	-0.5
Green Bay, WI	-4.2	1.8
Greensboro-High Point, NC	-4.6	1.4
Greenville, NC	-1.8	-0.1
Greenville-Mauldin-Easley, SC	-4.5	2.3
Gulfport-Biloxi, MS	-2.8	-1.0
Hagerstown-Martinsburg, MD-WV	-3.5	2.4
Hanford-Corcoran, CA	-7.5	2.8
Harrisburg-Carlisle, PA	-2.4	0.0
Harrisonburg, VA	-1.8	2.2
Hartford-West Hartford-East Hartford, CT	-3.4	2.0
Hattiesburg, MS	-1.0	-0.9
Hickory-Lenoir-Morganton, NC	-6.8	3.4
Hinesville-Fort Stewart, GA	1.8	6.9
Holland-Grand Haven, MI	-10.4	4.8
Honolulu, HI	-1.8	0.4
Hot Springs, AR	-2.1	0.6
Houma-Bayou Cane-Thibodaux, LA	6.4	0.4
Houston-Sugar Land-Baytown, TX	-3.5	2.2
Huntington-Ashland, WV-KY-OH	1.0	1.0
Huntsville, AL	-1.2	1.6
Idaho Falls, ID	-2.2	-1.0
Indianapolis-Carmel, IN	-4.4	0.8
Iowa City, IA	-1.0	1.3
Ithaca, NY	-0.4	-1.0
Jackson, MI	-5.7	3.3
Jackson, MS	-1.5	0.4
Jackson, TN	-2.6	3.1

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Jacksonville, FL	-5.6%	0.5%
Jacksonville, NC	6.7	0.5
Janesville, WI	-8.7	3.1
Jefferson City, MO	-1.4	-0.2
Johnson City, TN	0.5	1.8
Johnstown, PA	-0.7	0.5
Jonesboro, AR	-0.3	1.2
Joplin, MO	-3.3	2.4
Kalamazoo-Portage, MI	-3.0	0.4
Kankakee-Bradley, IL	-1.3	0.0
Kansas City, MO-KS	-2.6	0.9
Kennewick-Pasco-Richland, WA	0.8	-0.8
Killeen-Temple-Fort Hood, TX	2.5	-1.5
Kingsport-Bristol-Bristol, TN-VA	-3.3	3.3
Kingston, NY	-2.4	0.6
Knoxville, TN	-0.8	2.7
Kokomo, IN	-25.0	16.6
La Crosse, WI-MN	-0.4	2.1
Lafayette, IN	-5.4	4.5
Lafayette, LA	6.1	4.5
Lake Charles, LA	-8.6	11.7
Lake Havasu City-Kingman, AZ	-7.3	-0.6
Lakeland-Winter Haven, FL	-4.2	-1.9
Lancaster, PA	-3.1	1.6
Lansing-East Lansing, MI	-4.6	2.5
Laredo, TX	-2.7	2.8
Las Cruces, NM	1.5	-1.6
Las Vegas-Paradise, NV	-7.5	-1.2
Lawrence, KS	-0.7	-2.9
Lawton, OK	2.9	-0.3
Lebanon, PA	-1.2	3.2
Lewiston, ID-WA	-1.6	0.3
Lewiston-Auburn, ME	-0.8	-1.5
Lexington-Fayette, KY	-5.3	0.7
Lima, OH	-4.1	3.6
Lincoln, NE	-2.2	0.6
Little Rock-North Little Rock-Conway, AR	-2.7	-1.1
Logan, UT-ID	-0.5	1.7
Longview, TX	-0.3	6.0
Longview, WA	-4.9	1.4
Los Angeles-Long Beach-Santa Ana, CA	-3.1	0.0
Louisville-Jefferson County, KY-IN	-4.2	1.8
Lubbock, TX	0.2	0.1
Lynchburg, VA	-4.0	1.3
Macon, GA	-2.4	0.7
Madera-Chowchilla, CA	-5.3	2.3
Madison, WI	-2.2	1.7
Manchester-Nashua, NH	0.2	2.7
Manhattan, KS	2.1	2.3
Mankato-North Mankato, MN	-1.6	2.6
Mansfield, OH	-8.8	3.1
McAllen-Edinburg-Mission, TX	-1.2	0.9
Medford, OR	-6.5	-0.3

Source: Chandan Economics

Appendix A (continued)
Change in Gross Metro Product (%)

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Memphis, TN-MS-AR	-4.9%	0.6%
Merced, CA	-6.7	-2.3
Miami-Fort Lauderdale-Pompano Beach, FL	-5.2	-0.5
Michigan City-La Porte, IN	-5.2	3.7
Midland, TX	12.8	4.3
Milwaukee-Waukesha-West Allis, WI	-2.4	1.5
Minneapolis-St. Paul-Bloomington, MN-WI	-2.5	1.9
Missoula, MT	-3.9	-1.1
Mobile, AL	1.2	0.0
Modesto, CA	-4.0	-0.7
Monroe, LA	-3.0	0.5
Monroe, MI	-8.2	2.1
Montgomery, AL	-2.6	-0.7
Morgantown, WV	2.7	0.8
Morristown, TN	-6.6	3.4
Mount Vernon-Anacortes, WA	-5.0	8.0
Muncie, IN	-3.6	2.0
Muskegon-Norton Shores, MI	-5.0	3.8
Myrtle Beach-North Myrtle Beach-Conway, SC	-6.9	-1.6
Napa, CA	-4.6	-3.6
Naples-Marco Island, FL	-10.2	1.1
Nashville-Davidson-Murfreesboro-Franklin, TN	-3.2	2.7
New Haven-Milford, CT	-4.3	1.1
New Orleans-Metairie-Kenner, LA	-3.7	2.6
New York-Northern New Jersey-Long Island, NY-NJ-PA	-3.2	1.7
Niles-Benton Harbor, MI	-3.7	0.1
North Port-Bradenton-Sarasota, FL	-6.3	-1.0
Norwich-New London, CT	-5.1	-2.4
Ocala, FL	-8.1	-0.6
Ocean City, NJ	-0.6	-0.9
Odessa, TX	-3.9	10.5
Ogden-Clearfield, UT	-1.9	2.8
Oklahoma City, OK	-0.8	0.5
Olympia, WA	-3.4	-1.7
Omaha-Council Bluffs, NE-IA	-2.2	0.2
Orlando-Kissimmee-Sanford, FL	-6.0	-0.9
Oshkosh-Neenah, WI	-5.3	4.8
Owensboro, KY	0.6	0.7
Oxnard-Thousand Oaks-Ventura, CA	-4.5	2.4
Palm Bay-Melbourne-Titusville, FL	-2.2	0.6
Palm Coast, FL	-5.7	-5.7
Panama City-Lynn Haven-Panama City Beach, FL	-1.5	-2.6
Parkersburg-Marietta-Vienna, WV-OH	-0.9	-1.0
Pascagoula, MS	3.5	-5.0
Pensacola-Ferry Pass-Brent, FL	-3.5	1.0
Peoria, IL	-2.7	7.0
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	-1.7	1.2
Phoenix-Mesa-Glendale, AZ	-6.7	0.5
Pine Bluff, AR	-1.5	0.4
Pittsburgh, PA	-2.7	3.4

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Pittsfield, MA	-2.9%	1.0%
Pocatello, ID	-4.3	1.0
Portland-South Portland-Biddeford, ME	-1.1	0.6
Portland-Vancouver-Hillsboro, OR-WA	0.7	6.9
Port St. Lucie, FL	-8.4	-1.5
Poughkeepsie-Newburgh-Middletown, NY	-1.0	2.3
Prescott, AZ	-6.9	-2.8
Providence-New Bedford-Fall River, RI-MA	-1.7	1.2
Provo-Orem, UT	-3.8	1.0
Pueblo, CO	0.6	-0.7
Pueblo, CO	0.6	-0.7
Punta Gorda, FL	-7.3	0.4
Racine, WI	-7.2	2.7
Raleigh-Cary, NC	-4.0	1.1
Rapid City, SD	-2.9	0.9
Reading, PA	-3.3	0.0
Redding, CA	-8.3	0.2
Reno-Sparks, NV	-7.0	-0.3
Richmond, VA	-2.3	1.0
Riverside-San Bernardino-Ontario, CA	-7.4	-0.3
Roanoke, VA	-2.7	-0.2
Rochester, MN	-1.9	2.9
Rochester, NY	-2.6	1.5
Rockford, IL	-6.1	4.6
Rocky Mount, NC	-2.7	-0.9
Rome, GA	-3.6	0.0
Sacramento-Arden-Arcade-Roseville, CA	-5.5	-0.7
Saginaw-Saginaw Township North, MI	-5.8	4.2
St. Cloud, MN	-2.1	0.8
St. George, UT	-5.4	-1.6
St. Joseph, MO-KS	-2.2	2.2
St. Louis, MO-IL	-2.4	0.7
Salem, OR	-1.9	-2.3
Salinas, CA	-3.5	-4.1
Salisbury, MD	-2.6	-0.7
Salt Lake City, UT	-1.4	1.6
San Angelo, TX	-0.2	1.9
San Antonio-New Braunfels, TX	-3.8	2.4
San Diego-Carlsbad-San Marcos, CA	-3.7	-0.1
Sandusky, OH	-8.1	7.1
San Francisco-Oakland-Fremont, CA	-2.7	1.1
San Jose-Sunnyvale-Santa Clara, CA	-3.3	9.6
San Luis Obispo-Paso Robles, CA	-5.4	0.4
Santa Barbara-Santa Maria-Goleta, CA	-2.3	0.5
Santa Cruz-Watsonville, CA	-6.6	-1.7
Santa Fe, NM	-5.6	-2.9
Santa Rosa-Petaluma, CA	-6.5	1.8
Savannah, GA	-5.5	-0.5
Scranton-Wilkes-Barre, PA	-0.9	-3.6
Seattle-Tacoma-Bellevue, WA	-4.3	7.9
Sebastian-Vero Beach, FL	-2.9	2.8
Sheboygan, WI	-0.6	3.0
Sherman-Denison, TX	-3.2	2.2

Source: Chandan Economics

Appendix A (continued)
Change in Gross Metro Product (%)

Metropolitan Statistical Area (MSA)	2007-2009	2009-2011
Shreveport-Bossier City, LA	1.9%	-5.5%
Sioux City, IA-NE-SD	-1.4	8.3
Sioux Falls, SD	-20	10.9
South Bend-Mishawaka, IN-MI	-1.7	5.1
Spartanburg, SC	-2.5	1.9
Spokane, WA	-4.0	1.8
Springfield, IL	-5.6	2.3
Springfield, MA	-3.7	2.1
Springfield, MO	-2.0	-0.1
Springfield, OH	1.4	3.7
State College, PA	0.5	2.7
Steubenville-Weirton, OH-WV	-3.0	-1.8
Tampa-St. Petersburg-Clearwater, FL	-4.3	0.1
Terre Haute, IN	-3.9	1.5
Texarkana, TX-Texarkana, AR	-2.3	2.5
Toledo, OH	-5.0	3.5
Topeka, KS	-0.5	-0.1
Trenton-Ewing, NJ	-1.5	2.9
Tucson, AZ	-5.0	-0.9
Tulsa, OK	-1.6	-0.6
Tuscaloosa, AL	-3.0	-0.7
Tyler, TX	-0.3	2.2
Utica-Rome, NY	-1.6	1.8
Valdosta, GA	-0.2	-2.6
Vallejo-Fairfield, CA	-0.2	-2.3
Victoria, TX	-2.0	7.8
Vineland-Millville-Bridgeton, NJ	-0.8	-0.4
Virginia Beach-Norfolk-Newport News, VA-NC	-0.8	-0.9
Visalia-Porterville, CA	-6.7	0.5
Waco, TX	-1.0	1.4
Warner Robins, GA	-1.5	-0.8
Washington-Arlington-Alexandria, DC-VA-MD-WV	-0.9	0.3
Waterloo-Cedar Falls, IA	-3.0	5.4
Wausau, WI	-5.4	2.0
Wenatchee-East Wenatchee, WA	-0.3	-3.6
Wheeling, WV-OH	2.4	3.2
Wichita, KS	-6.6	0.4
Wichita Falls, TX	-0.7	0.3
Williamsport, PA	-2.8	8.0
Wilmington, NC	-2.4	-0.5
Winchester, VA-WV	-4.5	2.9
Winston-Salem, NC	-4.4	0.5
Worcester, MA	-2.6	3.3
Yakima, WA	-0.3	-3.2
York-Hanover, PA	-3.2	1.2
Youngstown-Warren-Boardman, OH-PA	-7.2	3.8
Yuba City, CA	0.8	-3.2
Yuma, AZ	-2.6	-3.6

Source: Chandan Economics

Appendix B

Population Trends by Metropolitan Statistical Area (MSA)

Metropolitan Statistical Area (MSA)	2012 Population	Percent Change from 2002
New York-Northern New Jersey-Long Island, NY-NJ-PA	19,831,858	6.7%
Los Angeles-Long Beach-Santa Ana, CA	13,052,921	3.3
Chicago-Naperville-Joliet, IL-IN-WI	9,522,434	3.0
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,860,342	16.9
San Francisco-Oakland-Fremont, CA	4,455,560	7.0
Boston-Cambridge-Quincy, MA-NH	4,640,802	4.1
Dallas-Fort Worth-Arlington, TX	6,700,991	22.4
Miami-Fort Lauderdale-Pompano Beach, FL	5,762,717	10.6
Houston-Sugar Land-Baytown, TX	6,177,035	24.1
Atlanta-Sandy Springs-Marietta, GA	5,457,831	19.8
Seattle-Tacoma-Bellevue, WA	3,552,157	13.8
Riverside-San Bernardino-Ontario, CA	4,350,096	24.9
San Diego-Carlsbad-San Marcos, CA	3,177,063	9.5
Denver-Aurora-Broomfield, CO	2,645,209	16.2
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	6,018,800	4.6
Detroit-Warren-Livonia, MI	4,292,060	-4.3
Phoenix-Mesa-Glendale, AZ	4,329,534	23.8
Minneapolis-St. Paul-Bloomington, MN-WI	3,422,264	12.1
Cleveland-Elyria-Mentor, OH	2,063,535	-3.6
Portland-Vancouver-Hillsboro, OR-WA	2,289,800	13.9
Orlando-Kissimmee-Sanford, FL	2,223,674	26.6
St. Louis, MO-IL	2,795,794	2.3
Tampa-St. Petersburg-Clearwater, FL	2,842,878	14.5
Baltimore-Towson, MD	2,753,149	5.9
Pittsburgh, PA	2,360,733	-2.0
Sacramento-Arden-Arcade-Roseville, CA	2,196,482	14.3
Charlotte-Gastonia-Rock Hill, NC-SC	2,296,569	63.3
Kansas City, MO-KS	2,038,724	7.8
Salt Lake City, UT	1,123,712	12.2
Columbus, OH	1,944,002	17.2
Indianapolis-Carmel, IN	1,928,982	22.2
Las Vegas-Paradise, NV	2,000,759	32.0
San Antonio-New Braunfels, TX	2,234,003	25.7
Cincinnati-Middletown, OH-KY-IN	2,128,603	3.8
Milwaukee-Waukesha-West Allis, WI	1,566,981	3.0
Raleigh-Cary, NC	1,188,564	37.6
Nashville-Davidson--Murfreesboro--Franklin, TN	1,726,693	26.6
Austin-Round Rock-San Marcos, TX	1,834,303	35.6
Virginia Beach-Norfolk-Newport News, VA-NC	1,699,925	5.6
Greensboro-High Point, NC	736,065	12.1
Providence-New Bedford-Fall River, RI-MA	1,601,374	-0.5
Jacksonville, FL	1,377,850	17.5
Hartford-West Hartford-East Hartford, CT	1,214,400	4.2
Louisville-Jefferson County, KY-IN	1,251,351	6.0
New Orleans-Metairie-Kenner, LA	1,227,096	-6.4
Oklahoma City, OK	1,296,565	15.7
Memphis, TN-MS-AR	1,341,690	9.4

Source: Chandan Economics

Appendix C Employment Correlations by MSA (1992–2012)

20 year	National	Primary	Secondary	New York-Northern Long Island, NY-NJ-PA	Los Angeles-Long Beach-Santa Ana, CA	Chicago-Naperville-Joliet, IL-IN-WI	Washington-Arlington-Alexandria, DC-VA-MD-WV	San Francisco-Oakland-Fremont, CA	Boston-Cambridge-Quincy, MA-NH	Dallas-Fort Worth-Arlington, TX	Miami-Fort Lauderdale-Pompano Beach, FL	Houston-Sugar Land-Baytown, TX	Atlanta-Sandy Springs-Marietta, GA	Seattle-Tacoma-Bellevue, WA	Riverside-San Bernardino-Ontario, CA	San Diego-Carlsbad-San Marcos, CA
National	1.0000	0.9943	0.9994	0.9813	0.9047	0.8096	0.9121	0.7899	0.8364	0.9560	0.9816	0.8828	0.9977	0.9682	0.9310	0.9744
Primary		1.0000	0.9934	0.9938	0.8776	0.7614	0.9401	0.7656	0.8359	0.9755	0.9793	0.9181	0.9940	0.9795	0.9402	0.9809
Secondary			1.0000	0.9791	0.9016	0.8031	0.9158	0.7799	0.8276	0.9554	0.9839	0.8838	0.9971	0.9654	0.9352	0.9767
New York-Northern Long Island, NY-NJ-PA				1.0000	0.8538	0.7432	0.9367	0.7739	0.8591	0.9795	0.9566	0.9230	0.9820	0.9762	0.9163	0.9685
Los Angeles-Long Beach-Santa Ana, CA					1.0000	0.9101	0.7097	0.8784	0.7245	0.7552	0.8927	0.6267	0.8870	0.8151	0.8185	0.8826
Chicago-Naperville-Joliet, IL-IN-WI						1.0000	0.5015	0.9496	0.8197	0.6548	0.7349	0.4823	0.7965	0.7313	0.5904	0.7044
Washington-Arlington-Alexandria, DC-VA-MD-WV							1.0000	0.5160	0.6663	0.9548	0.9381	0.9655	0.9167	0.9192	0.9647	0.9521
San Francisco-Oakland-Fremont, CA								1.0000	0.8830	0.6810	0.6981	0.5086	0.7821	0.7401	0.5576	0.7039
Boston-Cambridge-Quincy, MA-NH									1.0000	0.8489	0.7292	0.7392	0.8456	0.8572	0.6031	0.7337
Dallas-Fort Worth-Arlington, TX										1.0000	0.9311	0.9727	0.9644	0.9817	0.9013	0.9385
Miami-Fort Lauderdale-Pompano Beach, FL											1.0000	0.8812	0.9761	0.9383	0.9774	0.9863
Houston-Sugar Land-Baytown, TX												1.0000	0.8934	0.9380	0.8881	0.8890
Atlanta-Sandy Springs-Marietta, GA													1.0000	0.9722	0.9263	0.9715
Seattle-Tacoma-Bellevue, WA														1.0000	0.8945	0.9338
Riverside-San Bernardino-Ontario, CA															1.0000	0.9745
San Diego-Carlsbad-San Marcos, CA																1.0000

Source: *Chandan Economics*

Appendix C (continued) Employment Correlations by MSA (1992–2012)

20 year	Denver- Aurora- Broomfield, CO	Philadelphia- Camden- Wilmington, PA-NJ-DE-MD	Detroit- Warren- Livonia, MI	Phoenix- Mesa- Glendale, AZ	Minneapolis- St. Paul- Bloomington, MN-WI	Cleveland- Elyria-Mentor, OH	Portland- Vancouver- Hillsboro, OR-WA	Orlando- Kissimmee- Sanford, FL	St. Louis, MO-IL	Tampa-St. Petersburg- Clearwater, FL	Baltimore- Towson, MD	Pittsburgh, PA	Sacramento- Arden- Arcade- Roseville, CA	Charlotte- Gastonia- Rock Hill, NC-SC	Kansas City, MO-KS
National	0.9810	0.9869	-0.1230	0.9765	0.9946	0.1322	0.9775	0.9660	0.9288	0.9869	0.9680	0.9507	0.9585	0.9657	0.9754
Primary	0.9882	0.9784	-0.2001	0.9781	0.9872	0.0541	0.9718	0.9768	0.8930	0.9736	0.9850	0.9592	0.9539	0.9824	0.9669
Secondary	0.9791	0.9863	-0.1273	0.9789	0.9947	0.1243	0.9775	0.9685	0.9261	0.9884	0.9687	0.9485	0.9607	0.9655	0.9745
New York-Northern New Jersey-Long Island, NY-NJ-PA	0.9905	0.9657	-0.2115	0.9547	0.9781	0.0401	0.9549	0.9614	0.8692	0.9513	0.9823	0.9746	0.9298	0.9791	0.9525
Los Angeles-Long Beach-Santa Ana, CA	0.8315	0.9398	0.2132	0.8485	0.9070	0.4249	0.8355	0.8028	0.9602	0.9285	0.8080	0.8446	0.9109	0.7826	0.8534
Chicago-Naperville-Joliet, IL-IN-WI	0.7607	0.8337	0.4503	0.6938	0.8265	0.6787	0.7857	0.6424	0.9476	0.8102	0.6512	0.7792	0.7213	0.6545	0.8218
Washington-Arlington-Alexandria, DC-VA- MD-WV	0.9193	0.8791	-0.4886	0.9558	0.8952	-0.2749	0.8908	0.9764	0.7101	0.8926	0.9784	0.8696	0.9152	0.9690	0.8625
San Francisco-Oakland-Fremont, CA	0.7823	0.8265	0.4030	0.6531	0.8140	0.6254	0.7496	0.6218	0.8954	0.7694	0.6625	0.8308	0.6904	0.6588	0.7897
Boston-Cambridge-Quincy, MA-NH	0.8941	0.8167	0.0671	0.7261	0.8538	0.3291	0.8578	0.7322	0.8174	0.7670	0.7769	0.9053	0.6674	0.8045	0.8776
Dallas-Fort Worth-Arlington, TX	0.9862	0.9188	-0.3451	0.9498	0.9468	-0.0846	0.9613	0.9691	0.8002	0.9118	0.9804	0.9425	0.8842	0.9917	0.9501
Miami-Fort Lauderdale-Pompano Beach, FL	0.9423	0.9682	-0.1991	0.9918	0.9699	0.0304	0.9494	0.9782	0.8875	0.9873	0.9712	0.9047	0.9838	0.9569	0.9342
Houston-Sugar Land-Baytown, TX	0.9230	0.8257	-0.5386	0.9158	0.8635	-0.2977	0.9007	0.9488	0.6616	0.8321	0.9561	0.8616	0.8261	0.9717	0.8771
Atlanta-Sandy Springs-Marietta, GA	0.9861	0.9834	-0.1469	0.9756	0.9914	0.1129	0.9798	0.9681	0.9206	0.9793	0.9685	0.9510	0.9514	0.9706	0.9777
Seattle-Tacoma-Bellevue, WA	0.9815	0.9384	-0.2642	0.9557	0.9517	0.0193	0.9785	0.9656	0.8500	0.9290	0.9640	0.9267	0.8922	0.9803	0.9765
Riverside-San Bernardino-Ontario, CA	0.8892	0.9158	-0.3511	0.9786	0.9101	-0.1456	0.8882	0.9729	0.7890	0.9424	0.9588	0.8385	0.9756	0.9381	0.8633
San Diego-Carlsbad-San Marcos, CA	0.9493	0.9747	-0.2229	0.9774	0.9663	-0.0008	0.9242	0.9718	0.8702	0.9728	0.9751	0.9270	0.9869	0.9573	0.9169
Denver-Aurora-Broomfield, CO	1.0000	0.9593	-0.1952	0.9480	0.9787	0.0697	0.9735	0.9548	0.8780	0.9434	0.9691	0.9707	0.9064	0.9767	0.9725
Philadelphia-Camden-Wilmington, PA-NJ- DE-MD	1.0000	1.0000	-0.0437	0.9522	0.9838	0.2009	0.9428	0.9358	0.9507	0.9820	0.9391	0.9444	0.9666	0.9283	0.9506
Detroit-Warren-Livonia, MI	1.0000	1.0000	1.0000	-0.2831	-0.0700	0.9431	-0.1731	-0.3573	0.2161	-0.0714	-0.3336	-0.0819	-0.1624	-0.3573	-0.1165
Phoenix-Mesa-Glendale, AZ	1.0000	1.0000	1.0000	1.0000	0.9580	-0.0382	0.9618	0.9934	0.8577	0.9719	0.9765	0.8878	0.9684	0.9737	0.9444
Minneapolis-St. Paul-Bloomington, MN-WI	1.0000	1.0000	1.0000	1.0000	1.0000	0.1735	0.9667	0.9464	0.9318	0.9830	0.9584	0.9654	0.9468	0.9506	0.9657
Cleveland-Elyria-Mentor, OH	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	-0.1100	0.4561	0.1617	-0.0981	0.1479	0.0489	-0.1019	0.1682
Portland-Vancouver-Hillsboro, OR-WA	1.0000	1.0000	1.0000	1.0000	1.0000	0.9574	1.0000	0.9574	0.8923	0.9498	0.9465	0.9157	0.8964	0.9630	0.9918
Orlando-Kissimmee-Sanford, FL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8165	0.9523	0.9861	0.8921	0.9477	0.9858	0.9384
St. Louis, MO-IL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9311	0.8136	0.8734	0.8860	0.8121	0.9134
Tampa-St. Petersburg-Clearwater, FL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9473	0.9151	0.9733	0.9307	0.9442
Baltimore-Towson, MD	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9366	0.9403	0.9901	0.9286
Pittsburgh, PA	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8785	0.9284	0.9209
Sacramento-Arden-Arcade-Roseville, CA	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9176	0.8891
Charlotte-Gastonia-Rock Hill, NC-SC	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9485
Kansas City, MO-KS	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Source: Chardan Economics

Appendix C (continued)
Employment Correlations by MSA (1992-2012)

20 year	Salt Lake City, UT	Columbus, OH	Indianapolis-Carmel, IN	Las Vegas-Paradise, NV	San Antonio-New Braunfels, TX	Cincinnati-Middletown, OH-KY-IN	Milwaukee-Waukesha-West Allis, WI	Raleigh-Cary, NC	Nashville-Davidson--Murfreesboro--Franklin, TN	Austin-Round Rock-San Marcos, TX	Virginia Beach-Norfolk-Newsport News, VA-NC	Greensboro-High Point, NC	Providence-New Bedford-Fall River, RI-MA	Jacksonville, FL	Hartford-West Hartford-East Hartford, CT
National	0.9496	0.9852	0.9777	0.9572	0.8938	0.9672	0.7464	0.9192	0.9429	0.8959	0.9811	0.7817	0.7731	0.9826	0.7414
Primary	0.9659	0.9881	0.9861	0.9612	0.9244	0.9407	0.6936	0.9438	0.9590	0.9279	0.9800	0.7243	0.7238	0.9839	0.7237
Secondary	0.9500	0.9858	0.9799	0.9606	0.8957	0.9681	0.7381	0.9208	0.9460	0.8969	0.9841	0.7762	0.7735	0.9840	0.7256
New York-Northern New Jersey-Long Island, NY-NJ-PA	0.9599	0.9869	0.9786	0.9362	0.9259	0.9175	0.6773	0.9392	0.9547	0.9356	0.9598	0.6954	0.6940	0.9639	0.7263
Los Angeles-Long Beach-Santa Ana, CA	0.7372	0.8556	0.8241	0.8284	0.6353	0.9580	0.8711	0.6855	0.7323	0.6374	0.8838	0.9062	0.9452	0.8515	0.8208
Chicago-Naperville-Joliet, IL-IN-WI	0.6286	0.7624	0.6846	0.6417	0.4916	0.8929	0.9846	0.5437	0.6107	0.5081	0.7239	0.9815	0.8835	0.7084	0.8710
Washington-Arlington-Alexandria, DC-VA-MD-WV	0.9597	0.9256	0.9674	0.9644	0.9734	0.8057	0.4166	0.9744	0.9645	0.9673	0.9441	0.4687	0.5342	0.9550	0.4965
San Francisco-Oakland-Fremont, CA	0.6240	0.7706	0.6730	0.5985	0.5084	0.8421	0.9382	0.5446	0.6004	0.5399	0.6961	0.9066	0.8194	0.6732	0.8861
Boston-Cambridge-Quincy, MA-NH	0.8055	0.8567	0.7798	0.6664	0.7363	0.7927	0.7835	0.7435	0.7755	0.7699	0.7337	0.7414	0.5800	0.7520	0.7947
Dallas-Fort Worth-Arlington, TX	0.9912	0.9703	0.9740	0.9304	0.9759	0.8599	0.5823	0.9799	0.9809	0.9821	0.9368	0.6006	0.5641	0.9580	0.6454
Miami-Fort Lauderdale-Pompano Beach, FL	0.9379	0.9606	0.9772	0.9867	0.8933	0.9435	0.6604	0.9206	0.9396	0.8856	0.9927	0.7195	0.7671	0.9912	0.6679
Houston-Sugar Land-Baytown, TX	0.9792	0.9061	0.9412	0.9074	0.9959	0.7477	0.9369	0.9901	0.9732	0.9946	0.8849	0.4225	0.4040	0.9189	0.5169
Atlanta-Sandy Springs-Marietta, GA	0.9575	0.9855	0.9775	0.9552	0.9056	0.9578	0.7350	0.9285	0.9458	0.9082	0.9784	0.7681	0.7489	0.9818	0.7298
Seattle-Tacoma-Bellevue, WA	0.9753	0.9558	0.9568	0.9301	0.9382	0.8956	0.6736	0.9594	0.9572	0.9424	0.9366	0.6869	0.6204	0.9615	0.7436
Riverside-San Bernardino-Ontario, CA	0.9167	0.9124	0.9583	0.9917	0.9012	0.8719	0.5109	0.9222	0.9230	0.8855	0.9748	0.5854	0.6836	0.9719	0.5502
San Diego-Carlsbad-San Marcos, CA	0.9304	0.9680	0.9781	0.9761	0.9001	0.9337	0.6321	0.9181	0.9321	0.8958	0.9934	0.6831	0.7542	0.9772	0.6392
Denver-Aurora-Broomfield, CO	0.9686	0.9875	0.9710	0.9229	0.9301	0.9182	0.6978	0.9417	0.9557	0.9404	0.9491	0.7129	0.6699	0.9589	0.7205
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	0.9007	0.9674	0.9482	0.9353	0.8394	0.9798	0.7806	0.8677	0.8913	0.8415	0.9750	0.8153	0.8302	0.9567	0.7526
Detroit-Warren-Livonia, MI	-0.3904	-0.1602	-0.2853	-0.3274	-0.5279	0.0890	0.5080	-0.4871	-0.3794	-0.5028	-0.2088	0.4730	0.4297	-0.2678	0.2532
Phoenix-Mesa-Glendale, AZ	0.9632	0.9541	0.9812	0.9947	0.9283	0.9213	0.6211	0.9537	0.9587	0.9183	0.9876	0.6787	0.6994	0.9975	0.6438
Minneapolis-St. Paul-Bloomington, MN-WI	0.9335	0.9899	0.9716	0.9360	0.8745	0.9686	0.7602	0.8964	0.9343	0.8816	0.9704	0.7909	0.7911	0.9665	0.7349
Cleveland-Elyria-Mentor, OH	-0.1294	0.0785	-0.0509	-0.0972	-0.2867	0.3272	0.7370	-0.2335	-0.1403	-0.2604	0.0205	0.6918	0.5719	-0.0206	0.5043
Portland-Vancouver-Hillsboro, OR-WA	0.9667	0.9595	0.9554	0.9334	0.9110	0.9275	0.7230	0.9373	0.9512	0.9120	0.9428	0.7521	0.6772	0.9675	0.7313
Orlando-Kissimmee-Sanford, FL	0.9783	0.9541	0.9840	0.9887	0.9591	0.8906	0.5695	0.9774	0.9760	0.9515	0.9770	0.6195	0.6351	0.9924	0.6142
St. Louis, MO-IL	0.7843	0.8879	0.8416	0.8263	0.6800	0.9782	0.9142	0.7233	0.7651	0.6833	0.8872	0.9432	0.9036	0.8658	0.8183
Tampa-St. Petersburg-Clearwater, FL	0.9091	0.9618	0.9594	0.9584	0.8468	0.9736	0.7480	0.8787	0.9150	0.8454	0.9817	0.7975	0.8289	0.9761	0.7149
Baltimore-Towson, MD	0.9778	0.9744	0.9917	0.9693	0.9603	0.8837	0.5712	0.9700	0.9806	0.9612	0.9702	0.6087	0.6406	0.9813	0.6388
Pittsburgh, PA	0.9066	0.9779	0.9391	0.8606	0.8640	0.9038	0.7135	0.8691	0.9063	0.8835	0.9130	0.7162	0.7161	0.9031	0.7251
Sacramento-Arden-Arcade-Roseville, CA	0.8854	0.9340	0.9505	0.9731	0.8422	0.9420	0.6536	0.8703	0.8847	0.8316	0.9869	0.7200	0.8095	0.9646	0.6389
Charlotte-Gastonia-Rock Hill, NC-SC	0.9932	0.9691	0.9866	0.9604	0.9752	0.8755	0.5794	0.9859	0.9841	0.9752	0.9576	0.6123	0.5978	0.9780	0.6485
Kansas City, MO-KS	0.9479	0.9561	0.9413	0.9116	0.8852	0.9417	0.7665	0.9137	0.9288	0.8881	0.9345	0.7853	0.6988	0.9508	0.7598
Salt Lake City, UT	1.0000	0.9546	0.9750	0.9475	0.9836	0.8488	0.5502	0.9918	0.9875	0.9828	0.9379	0.5816	0.5427	0.9678	0.6193
Columbus, OH	1.0000	1.0000	0.9838	0.9348	0.9151	0.9365	0.6887	0.9253	0.9566	0.9231	0.9661	0.7163	0.7241	0.9633	0.6800
Indianapolis-Carmel, IN	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.6026	0.9613	0.9799	0.9490	0.9796	0.6465	0.6757	0.9853	0.6284
Las Vegas-Paradise, NV	1.0000	0.9546	1.0000	1.0000	0.9223	0.9998	0.5661	0.9459	0.9453	0.9082	0.9847	0.6338	0.6848	0.9898	0.5948
San Antonio-New Braunfels, TX	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
San Antonio-New Braunfels, TX	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Cincinnati-Middletown, OH-KY-IN	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Milwaukee-Waukesha-West Allis, WI	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Raleigh-Cary, NC	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Nashville-Davidson--Murfreesboro--Franklin, TN	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Austin-Round Rock-San Marcos, TX	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Virginia Beach-Norfolk-Newsport News, VA-NC	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Greensboro-High Point, NC	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Providence-New Bedford-Fall River, RI-MA	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Jacksonville, FL	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038
Hartford-West Hartford-East Hartford, CT	1.0000	0.9546	1.0000	0.9735	0.9496	0.9106	0.4090	0.9943	0.9766	0.9666	0.8994	0.4418	0.4256	0.9312	0.5038

Source: Chardan Economics

Appendix C (continued)
Employment Correlations by MSA (1992–2012)

20 year	Louisville- Jefferson County, KY-IN	New Orleans- Metairie-Kenner, LA	Oklahoma City, OK	Memphis, TN- MS-AR
National	0.9495	-0.2782	0.9486	0.9343
Primary	0.9283	-0.3210	0.9690	0.8954
Secondary	0.9459	-0.2752	0.9497	0.9335
New York-Northern New Jersey-Long Island, NY-NJ-PA	0.9197	-0.2944	0.9692	0.8669
Los Angeles-Long Beach-Santa Ana, CA	0.8855	-0.0794	0.7387	0.9450
Chicago-Naperville-Joliet, IL-IN-WI	0.9074	0.1438	0.6194	0.9363
Washington-Arlington-Alexandria, DC-VA-MD-WV	0.7668	-0.5055	0.9686	0.7223
San Francisco-Oakland-Fremont, CA	0.8794	0.1839	0.6347	0.8690
Boston-Cambridge-Quincy, MA-NH	0.9098	-0.0013	0.8110	0.8059
Dallas-Fort Worth-Arlington, TX	0.8888	-0.3797	0.9944	0.8094
Miami-Fort Lauderdale-Pompano Beach, FL	0.8858	-0.3736	0.9361	0.8944
Houston-Sugar Land-Baytown, TX	0.7775	-0.5182	0.9795	0.6760
Atlanta-Sandy Springs-Marietta, GA	0.9463	-0.2845	0.9563	0.9266
Seattle-Tacoma-Bellevue, WA	0.9270	-0.3709	0.9672	0.8556
Riverside-San Bernardino-Ontario, CA	0.7837	-0.4842	0.9177	0.7991
San Diego-Carlsbad-San Marcos, CA	0.8651	-0.3272	0.9412	0.8728
Denver-Aurora-Broomfield, CO	0.9397	-0.2700	0.9736	0.8831
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	0.9336	-0.1976	0.9069	0.9475
Detroit-Warren-Livonia, MI	0.0802	0.7367	-0.3820	0.1936
Phoenix-Mesa-Glendale, AZ	0.8798	-0.4357	0.9552	0.8715
Minneapolis-St. Paul-Bloomington, MN-WI	0.9535	-0.2219	0.9399	0.9376
Cleveland-Elyria-Mentor, OH	0.3524	0.6410	-0.1349	0.4381
Portland-Vancouver-Hillsboro, OR-WA	0.9507	-0.3269	0.9529	0.9060
Orlando-Kissimmee-Sanford, FL	0.8643	-0.4621	0.9734	0.8319
St. Louis, MO-IL	0.9407	-0.0268	0.7788	0.9893
Tampa-St. Petersburg-Clearwater, FL	0.9275	-0.2745	0.9089	0.9403
Baltimore-Towson, MD	0.8690	-0.4208	0.9843	0.8192
Pittsburgh, PA	0.9151	-0.1365	0.9296	0.8625
Sacramento-Arden-Arcade-Roseville, CA	0.8429	-0.3253	0.8901	0.8891
Charlotte-Gastonia-Rock Hill, NC-SC	0.8819	-0.4257	0.9910	0.8201
Kansas City, MO-KS	0.9660	-0.2527	0.9350	0.9258
Salt Lake City, UT	0.8728	-0.4491	0.9928	0.7991
Columbus, OH	0.9266	-0.2431	0.9666	0.8941
Indianapolis-Carmel, IN	0.8872	-0.3677	0.9801	0.8530
Las Vegas-Paradise, NV	0.8354	-0.4644	0.9418	0.8402
San Antonio-New Braunfels, TX	0.7849	-0.5110	0.9835	0.6975
Cincinnati-Middletown, OH-KY-IN	0.9467	-0.1118	0.8478	0.9839
Milwaukee-Waukesha-West Allis, WI	0.8669	0.1966	0.5371	0.8997
Raleigh-Cary, NC	0.8187	-0.5134	0.9848	0.7404
Nashville-Davidson--Murfreesboro--Franklin, TN	0.8643	-0.4418	0.9880	0.7864
Austin-Round Rock-San Marcos, TX	0.7989	-0.4769	0.9861	0.6986
Virginia Beach-Norfolk-Newport News, VA-NC	0.8814	-0.3297	0.9410	0.8958
Greensboro-High Point, NC	0.8699	0.1394	0.5661	0.9343
Providence-New Bedford-Fall River, RI-MA	0.7719	0.1200	0.5501	0.8911
Jacksonville, FL	0.8943	-0.4200	0.9610	0.8779
Hartford-West Hartford-East Hartford, CT	0.8280	-0.0626	0.6031	0.7756
Louisville-Jefferson County, KY-IN	1.0000	-0.1215	0.8622	0.9508
New Orleans-Metairie-Kenner, LA		1.0000	-0.4142	-0.0461
Oklahoma City, OK			1.0000	0.7897
Memphis, TN-MS-AR				1.0000

Source: Chandan Economics

Appendix D

Location Quotients (LQ) by MSA

	New York-Northern New Jersey-Long Island, NY-NJ-PA		Los Angeles-Long Beach-Santa Ana, CA		Chicago-Naperville-Joliet, IL-IN-WI		Washington-Arlington-Alexandria, DC-VA-MD-WV	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	ND	ND	0.16	-0.06	0.09	-0.04	ND	ND
Construction	0.82	0.07	0.76	-0.03	0.76	-0.05	ND	ND
Manufacturing	ND	ND	1.03	0	1.04	0.01	0.21	-0.02
TT&U	0.95	-0.02	0.93	-0.02	1.01	0.01	0.73	-0.02
Information	1.51	0.04	1.89	0.07	ND	ND	ND	ND
Financial Activities	1.48	-0.06	1	-0.05	1.1	-0.06	ND	ND
Professional & Business Services	1.12	-0.02	1.08	-0.05	1.17	-0.01	1.85	0
Education & Health Services	1.22	-0.05	0.84	0.03	1.01	0.03	0.9	0
Leisure & Hospitality	0.85	0.07	1.02	0.04	0.91	0.01	1	0.04
Other Services	1.13	0	1.68	0.16	ND	ND	1.75	0.01

	San Francisco-Oakland-Fremont, CA		Boston-Cambridge-Quincy, MA-NH		Dallas-Fort Worth-Arlington, TX		Miami-Fort Lauderdale-Pompano Beach, FL	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.16	-0.04	0.11	-0.02	0.69	0.14	0.47	-0.12
Construction	1	-0.02	0.76	0.06	ND	ND	0.88	-0.26
Manufacturing	0.62	-0.03	0.78	-0.02	ND	ND	0.37	-0.03
TT&U	0.84	-0.05	0.8	-0.02	1.05	-0.02	1.18	0.05
Information	1.62	0.14	1.47	0.16	ND	ND	0.94	-0.01
Financial Activities	1.08	-0.14	1.2	-0.05	1.37	0.07	1.2	-0.02
Professional & Business Services	1.41	0.08	1.2	-0.02	1.14	0.03	1.06	-0.06
Education & Health Services	0.83	-0.02	1.28	-0.06	0.78	0.03	1	0.02
Leisure & Hospitality	1.05	0	0.9	0.02	0.94	ND	1.15	0.07
Other Services	1.67	0.19	1.11	0.06	ND	ND	1.07	-0.01

Source: Chandan Economics

Appendix D (continued)
Location Quotients (LQ) by MSA

	Houston-Sugar Land-Baytown, TX		Atlanta-Sandy Springs-Marietta, GA		Seattle-Tacoma-Bellevue, WA		Riverside-San Bernardino-Ontario, CA	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	2.47	-0.09	0.08	ND	0.2	-0.06	0.94	-0.11
Construction	1.55	0.17	0.87	ND	1.08	-0.14	1.28	-0.3
Manufacturing	0.99	0.1	0.71	-0.01	1.18	0.13	0.83	-0.08
TT&U	1.05	0.01	1.16	0	0.95	0.01	1.28	0.08
Information	ND	ND	ND	ND	2.58	0.39	0.49	-0.06
Financial Activities	0.89	-0.03	1.07	-0.01	0.88	-0.1	0.63	-0.02
Professional & Business Services	1.1	-0.03	1.25	0.03	1.01	-0.01	0.83	-0.05
Education & Health Services	0.76	-0.01	0.81	ND	0.83	0.01	0.85	0.08
Leisure & Hospitality	0.9	-0.01	0.98	-0.01	0.91	-0.03	1.09	0.03
Other Services	0.84	ND	0.72	-0.05	1.31	0.13	1.49	0.23

	San Diego-Carlsbad-San Marcos, CA		Denver-Aurora-Broomfield, CO		Philadelphia-Camden-Wilmington, PA-NJ-DE-MD		Detroit-Warren-Livonia, MI	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.53	-0.11	0.69	0.09	ND	ND	0.1	0
Construction	1.06	-0.13	1.17	-0.04	ND	ND	0.68	0.06
Manufacturing	0.82	0.05	0.56	0	ND	ND	1.29	0.01
TT&U	0.86	-0.01	0.97	-0.02	0.93	-0.01	0.92	0.01
Information	0.96	-0.34	ND	ND	0.85	-0.05	0.66	-0.1
Financial Activities	0.97	-0.05	ND	ND	1.25	-0.03	0.86	-0.03
Professional & Business Services	1.26	0.01	1.31	0.03	1.08	-0.03	1.3	0
Education & Health Services	0.84	0.08	0.82	0.04	1.36	-0.02	1.04	-0.02
Leisure & Hospitality	1.22	-0.02	1.04	0	0.83	0.02	0.9	-0.03
Other Services	1.43	0.13	0.88	0	0.95	-0.02	0.86	-0.02

Source: Chandan Economics

Appendix D (continued)
Location Quotients (LQ) by MSA

	Phoenix-Mesa-Glendale, AZ		Minneapolis-St. Paul-Bloomington, MN-WI		Cleveland-Elyria-Mentor, OH		Portland-Vancouver-Hillsboro, OR-WA	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.42	-0.06	0.2	0	0.2	-0.02	0.83	-0.21
Construction	1.16	-0.38	0.75	0	0.74	0.08	1.09	0.01
Manufacturing	0.72	0.03	1.12	0.04	1.35	0.05	1.22	0.06
TT&U	1.02	0.01	0.91	-0.04	0.9	-0.03	0.97	-0.02
Information	0.79	0.08	1.07	0.03	0.72	-0.04	1.08	0.03
Financial Activities	1.41	0.12	1.36	0.08	1.02	-0.07	0.95	-0.02
Professional & Business Services	1.15	-0.09	1.12	0.01	1	0.01	0.99	0.02
Education & Health Services	0.96	0.16	1.04	0.01	1.25	0.02	0.92	0.02
Leisure & Hospitality	0.98	0.02	0.88	-0.03	0.86	-0.02	0.93	-0.01
Other Services	0.78	-0.02	0.94	-0.04	0.84	-0.06	1.16	0.03

	Orlando-Kissimmee-Sanford, FL		St. Louis, MO-IL		Tampa-St. Petersburg-Clearwater, FL		Baltimore-Towson, MD	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.35	-0.13	ND	ND	0.64	-0.14	0.12	0.02
Construction	1	-0.29	ND	ND	1.07	-0.05	1.28	0.08
Manufacturing	0.39	0.01	0.93	ND	0.57	0.01	0.54	-0.02
TT&U	0.94	0.01	0.96	0.02	0.96	0.06	0.97	-0.02
Information	1.06	-0.02	1.07	ND	1.06	-0.05	0.65	-0.15
Financial Activities	1.08	0.09	ND	ND	1.38	0.1	1	-0.05
Professional & Business Services	1.1	-0.1	ND	ND	1.14	-0.28	1.16	0.05
Education & Health Services	0.8	0.04	1.14	0.01	1.05	0.09	1.29	-0.03
Leisure & Hospitality	1.9	0.12	1.02	-0.04	1.07	0.11	0.94	-0.02
Other Services	0.76	-0.07	1.02	ND	0.83	-0.03	1	-0.03

Source: Chandan Economics

Appendix D (continued)
Location Quotients (LQ) by MSA

	Pittsburgh, PA		Sacramento-Arden-Arcade-Roseville, CA		Charlotte-Gastonia-Rock Hill, NC-SC		Kansas City, MO-KS	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.56	0.16	0.8	0.02	0.22	-0.03	0.15	-0.02
Construction	1.01	0.16	1.21	-0.26	1.05	-0.15	0.92	-0.01
Manufacturing	0.85	0	0.5	0.02	0.92	0.01	0.83	0.02
TT&U	0.93	-0.04	0.96	0	1.05	0	1.05	-0.01
Information	0.74	-0.09	0.95	-0.16	1.26	0.13	ND	ND
Financial Activities	1.04	0.08	1.12	-0.16	1.47	0.03	1.28	0.05
Professional & Business Services	1.01	0.05	1.1	0.06	1.22	0.07	1.15	0.04
Education & Health Services	1.31	-0.11	0.96	0.04	0.67	0.01	ND	ND
Leisure & Hospitality	0.91	-0.03	1.08	0	1.05	0.08	0.98	0
Other Services	0.97	-0.09	1.68	0.19	0.69	-0.11	0.84	0

	Salt Lake City, UT		Columbus, OH		Indianapolis-Carmel, IN		Las Vegas-Paradise, NV	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.44	0.09	0.18	0.01	ND	ND	0.03	-0.02
Construction	1.2	-0.09	0.74	0.01	1.05	ND	1.02	-0.85
Manufacturing	0.95	0.07	0.81	-0.02	ND	ND	0.26	-0.01
TT&U	1.06	0.01	1.02	-0.05	1.07	0	0.93	0.09
Information	ND	ND	0.88	-0.02	ND	ND	0.55	0.02
Financial Activities	1.34	-0.01	1.3	-0.01	1.08	-0.02	0.81	-0.04
Professional & Business Services	1.19	0.01	1.24	0.03	1.04	0.01	0.91	0.01
Education & Health Services	0.74	0.03	0.98	ND	0.96	0.06	0.59	0.09
Leisure & Hospitality	0.9	-0.01	0.99	-0.01	0.98	-0.02	2.91	0.08
Other Services	ND	ND	0.84	ND	ND	ND	0.69	0.04

Source: Chandan Economics

Appendix D (continued)
Location Quotients (LQ) by MSA

	San Antonio-New Braunfels, TX		Cincinnati-Middletown, OH-KY-IN		Milwaukee-Waukesha-West Allis, WI		Raleigh-Cary, NC	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.49	-0.02	0.08	ND	0.1	-0.01	0.28	-0.13
Construction	1.14	0.02	0.86	ND	0.66	-0.05	1.37	-0.08
Manufacturing	0.61	0.01	1.16	ND	1.58	0.11	0.59	-0.06
TT&U	0.93	-0.03	0.99	-0.02	0.87	-0.02	0.96	-0.02
Information	1.17	-0.04	0.65	0	0.87	-0.02	1.73	0.21
Financial Activities	1.45	0.12	1.05	0.05	1.07	-0.01	0.89	0.02
Professional & Business Services	0.94	-0.06	ND	ND	1.01	0.02	1.41	0.05
Education & Health Services	1.04	0	1	-0.03	1.13	-0.03	0.83	0.07
Leisure & Hospitality	1.27	0.03	ND	ND	0.81	-0.03	1.06	0.08
Other Services	0.95	0.02	ND	ND	1.03	0.1	0.9	-0.11

	Nashville-Davidson-Murfreesboro-Franklin, TN		Austin-Round Rock-San Marcos, TX		Virginia Beach-Norfolk-Newport News, VA-NC		Greensboro-High Point, NC	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	0.13	0	0.37	-0.02	0.1	ND	0.15	-0.02
Construction	0.91	-0.05	1.18	-0.01	1.2	ND	0.88	-0.03
Manufacturing	0.96	-0.05	0.73	-0.1	0.9	0.1	1.67	0.04
TT&U	1.04	0.01	0.99	0.01	0.98	-0.04	1.05	0
Information	1.18	ND	1.39	0.01	0.85	-0.13	0.76	0.02
Financial Activities	1.02	0.04	1.07	0.03	0.93	-0.02	0.9	-0.02
Professional & Business Services	1.02	0.02	1.18	0.01	1.06	-0.01	1.01	0.08
Education & Health Services	1.05	-0.01	0.81	0.03	0.98	0.05	0.89	0.01
Leisure & Hospitality	1.05	-0.01	1.16	0.04	1.22	-0.01	0.86	-0.02
Other Services	0.87	ND	1.09	-0.01	ND	ND	0.68	0

Source: Chandan Economics

Appendix D (continued)
Location Quotients (LQ) by MSA

	Providence-New Bedford-Fall River, RI-MA		Hartford-West Hartford-East Hartford, CT		Louisville-Jefferson County, KY-IN		New Orleans-Metairie-Kenner, LA	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	ND	ND	ND	ND	0.15	-0.03	1.02	-0.25
Construction	ND	ND	ND	ND	ND	ND	1.39	0.25
Manufacturing	ND	ND	ND	ND	ND	ND	0.64	-0.06
TT&U	0.94	0	ND	ND	1.11	-0.01	1.05	-0.05
Information	0.9	0.01	ND	ND	0.76	0.01	0.74	ND
Financial Activities	0.9	-0.04	ND	ND	1.17	0.03	0.85	-0.02
Professional & Business Services	0.77	0.01	ND	ND	0.89	0	0.97	-0.05
Education & Health Services	1.36	-0.05	ND	ND	ND	ND	0.94	0.05
Leisure & Hospitality	1.05	0.02	ND	ND	0.98	0	1.4	0.08
Other Services	1.24	0.04	ND	ND	ND	ND	0.77	-0.05

	Oklahoma City, OK		Memphis, TN-MS-AR	
	Location Quotient	Change in LQ 2007-2012	Location Quotient	Change in LQ 2007-2012
Mining	2.51	0.32	0.17	ND
Construction	1.15	0.24	0.8	ND
Manufacturing	0.72	0.03	0.83	0.02
TT&U	0.99	-0.01	1.39	-0.01
Information	0.81	ND	0.49	ND
Financial Activities	1.05	-0.02	0.77	-0.04
Professional & Business Services	1.03	-0.04	1.01	0.04
Education & Health Services	0.96	-0.07	0.95	0.05
Leisure & Hospitality	1.1	0.01	1.02	-0.14
Other Services	0.75	-0.06	0.74	ND

Source: Chandan Economics

Appendix E

Credit Ratings by MSA

	2010			2007		
	Standard & Poor's	Moody's	Fitch	Standard & Poor's	Moody's	Fitch
Tier Markets						
New York-Northern New Jersey-Long Island, NY-NJ-PA	AA	Aa3	AA	AA	Aa3	AA-
Los Angeles-Long Beach-Santa Ana, CA	AA-	Aa2	AA-	AA	Aa2	AA
Washington-Arlington-Alexandria, DC-VA-MD-WV	A+	A1	AA-	A+	A1	(NA)
San Francisco-Oakland-Fremont, CA	AA	Aa2	AA	AA	Aa3	AA-
Boston-Cambridge-Quincy, MA-NH	AA+	Aa1	AA+	AA+	Aa1	AA
Primary Markets						
New York-Northern New Jersey-Long Island, NY-NJ-PA	AA	Aa3	AA	AA	Aa3	AA-
Los Angeles-Long Beach-Santa Ana, CA	AA-	Aa2	AA-	AA	Aa2	AA
Chicago-Naperville-Joliet, IL-IN-WI	A+	Aa3	AA-	AA-	Aa3	AA
Washington-Arlington-Alexandria, DC-VA-MD-WV	A+	A1	AA-	A+	A1	(NA)
San Francisco-Oakland-Fremont, CA	AA	Aa2	AA	AA	Aa3	AA-
Boston-Cambridge-Quincy, MA-NH	AA+	Aa1	AA+	AA+	Aa1	AA
Dallas-Fort Worth-Arlington, TX	AA+	Aa1	(NA)	AA+	Aa1	(NA)
Miami-Fort Lauderdale-Pompano Beach, FL	A-	A2	A	A+	A2	A
Houston-Sugar Land-Baytown, TX	AA	Aa3	AA	AA	Aa3	AA-
Atlanta-Sandy Springs-Marietta, GA	A	A1	(NA)	AA-	Aa3	(NA)
Seattle-Tacoma-Bellevue, WA	AAA	Aaa	AA+	AAA	Aaa	AAA
Riverside-San Bernardino-Ontario, CA	AA-	Issuer rating/no general obligation	AA+	AA-	Not reviewed	AA
San Diego-Carlsbad-San Marcos, CA	A	A2	AA-	Not reviewed	A3	BBB+
Denver-Aurora-Broomfield, CO	AAA	Aa1	AAA	AA+	Aa1	AA+
Secondary Markets						
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	BBB	Baa1	A-	BBB	Baa1	BBB+
Detroit-Warren-Livonia, MI	BB	Ba3	BB	BBB	Baa2	BBB
Phoenix-Mesa-Glendale, AZ	AAA	Aa1	(NA)	AA	Aa1	(NA)
Minneapolis-St. Paul-Bloomington, MN-WI	AAA	Aa1	AAA	AAA	Aa1	AAA
Cleveland-Elyria-Mentor, OH	A	A2	AA-	A-	A2	A+
Portland-Vancouver-Hillsboro, OR-WA	Not reviewed	Aaa	(NA)	Not reviewed	Aaa	(NA)
Orlando-Kissimmee-Sanford, FL		Aa2			Aa1	
St. Louis, MO-IL	A+	A2	(NA)	A	A3	(NA)
Tampa-St. Petersburg-Clearwater, FL	Not reviewed	Aa2	(NA)	Not reviewed	Aa2	(NA)
Baltimore-Towson, MD	AA-	Aa3	(WD)	AA-	Aa3	A+
Pittsburgh, PA	BBB	Baa1	A	BBB	Baa2	BBB
Sacramento-Arden-Arcade-Roseville, CA	A+	Aa3	(NA)	AA	Aa2	(NA)
Charlotte-Gastonia-Rock Hill, NC-SC	AAA	Aaa	AAA	AAA	Aaa	AAA
Kansas City, MO-KS	AA	Aa3	AA	AA	Aa3	AAA
Salt Lake City, UT		Aaa			Aaa	
Columbus, OH	AAA	Aaa	AAA	AAA	Aaa	AAA
Indianapolis-Carmel, IN	AA	Aa1	(NA)	AAA	Aa1	(NA)
Las Vegas-Paradise, NV	AA	Aa2	AA	AA	Aa2	AA
San Antonio-New Braunfels, TX	AAA	Aa1	AAA	AA+	Aa1	AA+
Cincinnati-Middletown, OH-KY-IN	AA+	Aa1	(NA)	AA+	Aa1	(NA)
Milwaukee-Waukesha-West Allis, WI	AA	Aa2	AA+	AA	Aa2	AA+
Raleigh-Cary, NC	AA+	Aaa	AAA	AAA	Aaa	AAA
Nashville-Davidson-Murfreesboro-Franklin, TN	AA	Aa2	AA	AA	Aa2	AA
Austin-Round Rock-San Marcos, TX	AAA	Aa1	(NA)	AAA	Aa1	(NA)
Virginia Beach-Norfolk-Newport News, VA-NC	AAA	Aa1	AAA	AAA	Aa1	AA+
Greensboro-High Point, NC	AAA	Aaa	AAA	AAA	Aaa	AAA
Providence-New Bedford-Fall River, RI-MA		A3			A1	
Jacksonville, FL	AA-	Aa2	AA+	Not reviewed	Aa2	(NA)
Hartford-West Hartford-East Hartford, CT		A1			A2	
Louisville-Jefferson County, KY-IN	Not reviewed	Aa2	(NA)	Not reviewed	Aa2	(NA)
New Orleans-Metairie-Kenner, LA	BBB	Baa3	A-	BB	Baa3	BBB-
Oklahoma City, OK	AAA	Aa1	(NA)	AA	Aa1	(NA)
Memphis, TN-MS-AR	AA	A1	AA-	A	A1	A+

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