

# Commercial Real Estate: Economic Cycle Analysis

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## Introduction

Since 1993, commercial real estate has gone through two full market cycles. It has yet to be seen if we have reached the trough of the current cycle.

- As measured by Standard & Poor's/GRA Commercial Real Estate Indices (SPCREX<sup>TM</sup>), most indices show that recent year-over-year (YOY) price appreciation peaked at higher rates than in the prior cycle. In addition, the rate of deceleration (decline phase) is similar to that experienced during the 1998-2002 period; however, deceleration during this most recent cycle has been quicker and steeper than that experienced during the prior cycle.
- Over time it has been shown that there are relationships between business (economic variables) and commercial real estate (price) cycles. Depending on the time period, property sector and geographic region being measured, commercial real estate price movements may lead, lag or coincide with economic indicators (employment, production, retail sales, income, etc.). Over the past two cycles, on average, SPCREX<sup>TM</sup> YOY appreciation/depreciation rates tend to lead the troughs and lag the peaks of the overall business cycle.

This report looks at the peaks and troughs across the two commercial real estate cycles; compares the speed of deceleration in the current decline-trough phase of the cycle with that of the prior cycle; analyzes the correlation and statistical significance between selected demand side economic variables and SPCREX indicators; and measures the degree of lead and lag at both the peaks and troughs of the commercial real estate cycle and that of the overall business cycle.

## Overall Comments

### Peaks/Troughs

As measured by the year-over-year (YOY) percent change in the Standard & Poor's/GRA Commercial Real Estate Indices (SPCREX™):

- Most indices in the prior commercial real estate cycle peaked around May-June 1999 (average +14.5%, median +14.7%) and troughed around May-June 2001 (average -1.0%, median -1.2%).
- Compared to the recent cycle where most indices peaked around May-Aug 2006 (average+16.3%, median +16.6%) and troughed between October 2007-April 2008 (average +1.7%, median +2.1%).

The amplitudes for peaks across the two cycles were similar, but the peak in YOY appreciation rates were roughly 185 bps higher during this most recent cycle compared to last. It has yet to be determined if the current cycle has technically hit bottom, or if the market will fall below its technical support reached in the 2001-2003 period. This analysis uses monthly YOY percent change in SPCREX index and economic data through April 2008.

The table below is a summary of index peaks and troughs for the two most recent commercial real estate cycles:

Index	1998-2002				2005-2008			
	Date	Peak	Date	Trough	Date	Peak	Date	Trough
National	May-99	13.3%	Apr-01	0.9%	Aug-06	14.7%	Apr-08	3.1%
Office	Nov-98	16.6%	Jun-03	-0.8%	Mar-07	18.8%	Apr-08	0.3%
Apartments	Jun-99	14.6%	Apr-01	-2.0%	Aug-06	16.6%	Jun-07	-3.5%
Warehouse	Jul-98	11.9%	Oct-99	-1.4%	May-05	14.2%	Apr-08	4.8%
	Oct-00	9.5%	Apr-02	-1.0%				
Retail	Nov-99	13.3%	Jun-01	-1.4%	Jun-07	15.1%	Apr-08	2.1%
Northeast	May-99	18.0%	Apr-01	0.6%	Aug-06	19.9%	Apr-08	0.8%
PacificWest	Jul-99	15.2%	Oct-99	3.1%	Jan-05	15.0%	Feb-07	5.8%
	Sep-00	16.2%	Sep-01	-2.8%				
MidAtlanticSouth	May-99	13.3%	Sep-01	-5.3%	May-06	18.3%	Nov-07	-1.9%
DesertMountainWest	Mar-99	16.9%	May-01	-3.3%	May-05	17.9%	Mar-06	4.7%
					Mar-07	18.1%	Apr-08	-0.2%
Midwest	Aug-98	14.7%	Oct-02	1.5%	Oct-06	11.1%	Jan-08	3.0%
<b>Average</b>	<b>Jun-99</b>	<b>14.5%</b>	<b>Jun-01</b>	<b>-1.0%</b>	<b>May-06</b>	<b>16.3%</b>	<b>Oct-07</b>	<b>1.7%</b>
<b>Median</b>	<b>May-99</b>	<b>14.7%</b>	<b>May-01</b>	<b>-1.2%</b>	<b>Aug-06</b>	<b>16.6%</b>	<b>Apr-08</b>	<b>2.1%</b>

### *Decline Phase Deceleration*

On average, across most indices, recent YOY deceleration in growth rates is steeper and faster than that experienced during the 1999 to 2001 period.

The table below is a summary of growth peaks and troughs for the indices, along with the total absolute drop from peak to trough, and rate of drop per month in basis points:

Geo/Sector	Peak		Trough		Decline from Peak to Trough		
	Month	YOY % Change	Month	YOY % Change	Total Change (in bps)	Months	Bps per Month
<b>National</b>	Aug-06	14.7%	Apr-08	3.1%	1160	20	58
	May-99	13.3%	Apr-01	0.9%	1240	23	54
<b>Office</b>	Mar-07	18.8%	Apr-08	0.3%	1850	13	142
	Nov-98	16.6%	Jun-03	-0.8%	1740	55	32
<b>Apartment</b>	Aug-06	16.6%	Jun-07	-3.5%	2010	16	126
	Jun-99	14.6%	Apr-01	-2.0%	1660	22	75
<b>Warehouse</b>	May-05	14.2%	Apr-08	4.8%	940	35	27
	Oct-00	9.5%	Apr-02	-1.0%	1050	18	58
	Jul-98	11.9%	Oct-99	-1.4%	1330	15	89
<b>Retail</b>	Jun-07	15.1%	Apr-08	2.1%	1300	10	130
	Nov-99	13.3%	Jun-01	-1.4%	1470	19	77
<b>Northeast</b>	Aug-06	19.9%	Apr-08	0.8%	1910	20	96
	May-99	18.0%	Apr-01	0.6%	1740	23	76
<b>PacificWest</b>	Jan-05	15.0%	Feb-07	5.8%	920	25	37
	Sep-00	16.2%	Sep-01	-2.8%	1900	12	158
<b>MidAtlanticSouth</b>	May-06	18.3%	Nov-07	-1.9%	2020	18	112
	May-99	13.3%	Sep-01	-5.3%	1860	33	56
<b>DesertMountainWest</b>	Mar-07	18.1%	Apr-08	-0.2%	1830	13	141
	May-05	17.9%	Mar-06	4.7%	1320	10	132
	Mar-99	16.9%	May-01	-3.3%	2020	26	78
<b>Midwest</b>	Oct-06	11.1%	Jan-08	3.0%	810	15	54
	Aug-01	8.7%	Oct-02	1.5%	720	14	51
	Aug-98	14.7%	Sep-00	1.9%	1280	25	51

In the most recent decline phase of the commercial real estate cycle, SPCREX indices showing the quickest rate of deceleration per month were:

- Office (-142 bps), Desert Mountain West (-141 bps), Retail (-130 bps), Apartment (-126 bps) and Mid-Atlantic South (-112 bps).

Indices showing the most resilience during the current decline phase were:

- Warehouse (-27 bps), Pacific West (-37 bps), Midwest (-54 bps), and National (-58 bps).

## *Index Economic Relationships*

Due to the importance of commercial real estate as an input into the production of goods and services in the economy, movements in commercial real estates prices have been correlated with the over all business cycle, as measured by movements in economic indicators (employment, industrial production, trade flows, construction, retail sales, income, etc.).

Growth rates for national commercial real estate prices are moderately correlated (but statistically significant) with total non-farm employment growth rates. This makes sense theoretically, in that job growth/contraction would have an impact on rising/falling demand for space (net absorption), vacancy (occupancy) rates, rental rates (net operating income), and intrinsic values (closed transaction prices).

The measurement and strength of the relationships between change in index levels and change in economic variables can be improved by focusing in on sector specific drivers of demand. For example, there is a strong relationship between YOY changes in office employment and SPCREX office indices. Other indices showing relationships with economic indicators are: apartment with total non-farm employment; warehouse with gross import-export trade flows, wholesale trade and total non-farm employment; and retail with retail sales and personal income.

At the regional level, the annual percent change in total non-farm employment (metro weighted) has been moderately related (but statistically significant) to commercial real estate price movements. In many cases, moving from changes at the national employment level -- to regional or metro group levels -- show moderately stronger (and statistically significant) relationships.

These relationships are important for monetary and fiscal policy makers, and real estate portfolio managers and developers, in that SPCREX sector and regional indices can be used for economic research and econometric modeling, and commercial real estate research and price forecasting. This simple analysis could be extended and improved by including other economic, demographic and commercial real estate specific variables; adjusting the time-series data for leads and lags; and including supply side variables (permits, starts, and completions, for example).

The tables below show a summary of statistics measuring the relationship between YOY change in index levels and selected economic variables. These relationships are measured by using correlation (Multiple R) and regression (simple -t-) statistics.

<b>Sector Index Correlation</b>				
<b>YOY % Change</b>				
<b>SPCREX Index</b>	<b>Economic Indicator</b>	<b>Multiple R</b>	<b>T-statistic</b>	<b>Correlation</b>
<b>National</b>	Total Non-farm Employment	<b>0.35</b>	4.7	<b>Moderate</b>
<b>Office</b>	Office Employment	<b>0.54</b>	8.2	<b>Strong</b>
<b>Apartment</b>	Total Non-farm Employment	<b>0.27</b>	3.5	<b>Moderate</b>
<b>Warehouse</b>	Gross Trade Flows	<b>0.32</b>	4.2	<b>Moderate</b>
	Wholesale Trade Employment	<b>0.30</b>	4.0	<b>Moderate</b>
	Total Non-farm Employment	<b>0.15</b>	1.9	<b>Weak</b>
<b>Retail</b>	Retail Sales	<b>0.25</b>	3.3	<b>Moderate</b>
	Personal Income	<b>0.19</b>	2.5	<b>Weak-to-Moderate</b>

<b>Sector Index Correlation</b>				
<b>YOY % Change</b>				
<b>SPCREX Index</b>	<b>Non-farm Employment</b>	<b>Multiple R</b>	<b>T-statistic</b>	<b>Correlation</b>
<b>Northeast</b>	National	<b>0.17</b>	2.1	<b>Weak-to-Moderate</b>
	Northeast Region	<b>0.28</b>	3.7	<b>Moderate</b>
	New York-Boston Metro Group	<b>0.24</b>	3.2	<b>Moderate</b>
	Wash-Balt-Rich-Phili Metro Group	<b>0.31</b>	4.1	<b>Moderate</b>
<b>PacificWest</b>	National	<b>0.29</b>	3.9	<b>Moderate</b>
	PacificWest Region	<b>0.41</b>	5.7	<b>Moderate-to-Strong</b>
	Northern California Metro Group	<b>0.36</b>	4.9	<b>Moderate</b>
	SouthernCalifornia Metro Group	<b>0.38</b>	5.2	<b>Moderate-to-Strong</b>
	Pacific Northwest Metro Group	<b>0.41</b>	5.7	<b>Moderate-to-Strong</b>
<b>MidAtlanticSouth</b>	National	<b>0.51</b>	7.6	<b>Strong</b>
	MidAtlanticSouth Region	<b>0.52</b>	7.7	<b>Strong</b>
	South Florida Metro Group	<b>0.49</b>	7.1	<b>Strong</b>
	Atlanta et al. Metro Group	<b>0.47</b>	6.7	<b>Strong</b>
<b>DesertMountainWest</b>	National	<b>0.45</b>	6.4	<b>Moderate-to-Strong</b>
	DesertMountainWest Region	<b>0.42</b>	5.8	<b>Moderate-to-Strong</b>
<b>Midwest</b>	National	<b>0.27</b>	3.5	<b>Moderate</b>
	Midwest Region	<b>0.15</b>	2.0	<b>Weak</b>
	Chicago Metro Group	<b>0.30</b>	3.9	<b>Moderate</b>
	Other Metro Group	<b>0.05</b>	0.6	<b>Weak</b>

## *Index Leads and Lags*

Overall, SPCREX indices appear to lead the troughs and lag the peaks of the overall business cycle.

### National Index

The national index was more of a leading indicator in the prior cycle and seems to be more of a coincident-leading indicator at this point in the current business cycle. When looking at industrial production, the national index also appears to lag at the peaks and lead at the troughs.

<b>Index Cycle Phase</b>	<b>National-to-Non-farm Employment Date Variance</b>	<b>National-to-Industrial Production Date Variance</b>
Peak (May 1999)	-8 months	+2 months
Trough (Apr 2001)	-11 months	-3 months
Peak (Aug 2006)	+5 months	+11 months
Trough (Apr 2008)	0 months	0 months

### Office Index

The office index was a leading indicator at the peak of the prior cycle and lagging indicator a peak of the current cycle, and could be more of a leading-coincident indicator in the decline-trough phase of the current business cycle. When looking at office employment, the office index appears to lag at the peaks and troughs.

<b>Index Cycle Phase</b>	<b>Office-to-Office Employment Date Variance</b>	<b>Office-to-Non-farm Employment Date Variance</b>
Peak (Nov 1998)	+ 10 months	-14 months
Trough (Jun 2003)	+15 months	+15 months
Peak (Mar 2007)	+11 month	+12 months
Trough (Mar 2008)	+2 months	0 months

### Apartment Index

The apartment index was a leading indicator at both the peak and trough of the prior business cycle, and coincident-leading indicator at the peak and trough of the current business cycle. When looking at multifamily permits, they appear to lead the apartment index at its peaks and troughs.

<b>Index Cycle Phase</b>	<b>Apartment-to-5+ unit permits Date Variance</b>	<b>Apartment-to-Non-farm Employment Date Variance</b>
Peak (Jun 1999)	+5 months	-7 months
Trough (Apr 2001)	+3 months	-13 months
Peak (Aug 2006)	+16 months	+5 months
Trough (Jun 2007)	0 months	-10 months

## Northeast Index

The Northeast index was a leading indicator in the prior cycles and could be more of a leading-coincident indicator in the current business cycle.

<b>Index Cycle Phase</b>	<b>NE-to-Non-farm Employment Date Variance</b>	<b>NE-to-NE Region Employment Date Variance</b>	<b>NE-to-NE-NY-Boston Employment Date Variance</b>	<b>NE-to-NE-Wash et al Employment Date Variance</b>
Peak (May 1999)	-8 months	-13 months	-12 months	-13 months
Trough (Apr 2001)	-11 months	-8 months	-9 months	-8 months
Peak (Aug 2006)	+5 months	-4 months	-4 months	+5 months
Trough (Apr 2008)	0 months	0 months	TBD	TBD

## Pacific West Index

The Pacific West index was more of a lagging-coincident indicator in the prior cycles and could be more of a leading-coincident indicator in the current business cycle.

<b>Index Cycle Phase</b>	<b>PW-to-Non-farm Employment Date Variance</b>	<b>PW-to-PW Region Employment Date Variance</b>	<b>PW-to-PW-NorCal Employment Date Variance</b>	<b>PW-to-PW-Seattle Employment Date Variance</b>	<b>PW-to-PW-SoCal Employment Date Variance</b>
Peak (Jul 1999)	N/A	+24 months	+19 months	+32 months	+8 months
Trough (Oct 1999)	N/A	N/A	+10 months	N/A	N/A
Peak (Sep 2000)	+8 months	N/A	+3 months	N/A	N/A
Trough (Sep 2001)	-6 months	-6 months	-5 months	-3 months	-4 months
Peak (Jan 2005)	-14 month	-16 months	-16 months	-19 months	-13 months
Trough (Feb 2007)	-14 months	-13 months	TBD	TBD	TBD

## Conclusion

This research analyzed the peaks and troughs across the two commercial real estate cycles; rates at which SPCREX indices decelerated in the current decline phase of the commercial real estate cycle; the correlation and statistical significance between the indices and selected economic indicators; and the degree of lead-lag at the peaks and troughs of the commercial real estate cycle compared to the overall business cycle.

Commercial real estate, like the economy, goes through cycles, and we have been through two full cycles since 1993, as measured by the Standard & Poor's/GRA Commercial Real Estate Indices. Amplitude in YOY percent change peaked at higher levels than those seen in the previous cycle, and the rate of deceleration in appreciation rates during the most recent decline phase was faster and steeper than the previous cycle.

- Indices showing the fastest rate of deceleration were Office, Desert Mountain West, Retail, Apartment and Mid-Atlantic South.

Commercial real estate price cycles have also been correlated with the overall business cycle. The degree of correlation and significance is dependent on the economic-sector indicator-index and their lead-lag characteristics.

- Over the past two commercial real estate cycles, on average, SPCREX™ year-over-year (YOY) appreciation/depreciation rates tend to lead the troughs and lag the peaks of the overall business cycle.

The measurement and strength of commercial real estate price and economic fundamental relationships can be improved by analyzing sector specific commercial real estate variables (employment, trade, sales, income, etc.) and granulating down by geography to more regional-metro group (weighted) local economic and employment factors.

- For example: office or wholesales trade employment, gross import-export trade flows, retail sales, personal income, etc.

Overall, SPCREX indices appear to lead the troughs and lag the peaks of the overall business cycle. The national index appeared to be more of a leading indicator in the prior cycle and appears to be more of a coincident-leading indicator at this point in the current business cycle.

- When looking at industrial production, the national index appears to lag at the peaks and lead at the troughs of the business cycle.

The SPCREX indices are important indicators for monitoring the health of commercial real estate markets across the nation; conducting national and regional monetary and fiscal policy; and for commercial real estate portfolio managers and developers who conduct economic and commercial real estate research, market forecasting, portfolio benchmarking, and property derivatives trading.

*Larry Souza is a Managing Director with Charles Schwab Investment Management, and works closely with Standard and Poor's on the methodology and maintenance of the S&P/GRA commercial indices ('SPCREX'). The views expressed here reflect those of the author, and not necessarily those of Standard and Poor's.*