



# CRSP/ZIMAN REAL ESTATE DATA SERIES

**CRSP**<sup>®</sup> | CENTER FOR RESEARCH  
IN SECURITY PRICES, LLC  
An Affiliate of the University of Chicago Booth School of Business

## **CRSP CONTACT INFORMATION**

105 West Adams, Suite 1700  
Chicago, IL 60603

Phone: 312.263.6400  
Fax: 312.263.6430

Email: [support@crsp.org](mailto:support@crsp.org)

For further information, please visit our website at [www.crsp.org](http://www.crsp.org) or email [support@crsp.org](mailto:support@crsp.org)

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# Chapter 1: Overview

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## About CRSP

The Center for Research in Security Prices, LLC has been an integral part of the academic and commercial world of financial and economic research. Since its inception in 1960, CRSP has provided an unparalleled foundation as the leading source for the most comprehensive and accurate historical US databases available. CRSP is affiliated with the Booth School of Business of the University of Chicago, which has a history of being a catalyst for innovation and progress, and has been a resource for other academic institutions and corporations alike.

In 1959, Louis Engel, vice president of Merrill Lynch, Pierce, Fenner & Smith, called Professor James H. Lorie (PhD 1947; Professor of Business Administration) with an inquiry which resulted in a grant from Merrill Lynch and the establishment of CRSP.

The inquiry developed into a project which involved compiling, cleaning and codifying the prices, dividends and rates of return of all stocks listed and trading on the NYSE since 1926. It resulted in an academic research grade database that remains invaluable to empirical research due to its breadth, depth, and completeness, and includes CRSP's unique permanent identifiers, allowing for clean and accurate time-series research and events studies.

CRSP files continue to provide a strong foundation for economic forecasting, stock market research and financial analyses by academic institutions, investment banks, brokerage firms, corporations, banks and government agencies. CRSP provides the following data files: common stocks on the NYSE, NYSE MKT and NASDAQ; CRSP Indexes; NASDAQ, and S&P 500 composite indexes; NASDAQ and NYSE MKT Industry Indexes; US Treasury bonds; Survivor-Bias-Free Mutual Funds; market capitalization reports; proxy graphs for 10K SEC filings and custom datasets. Additionally, CRSP continues to develop new research resources such as the new CRSP/Ziman Real Estate Data Series.

## About the Richard S. Ziman Center for Real Estate

Since its inception in 1999, the Richard S. Ziman Center for Real Estate (John S. Long, Chairman) has provided the academic and real estate communities with leading economic and demographic research regarding an industry that is rapidly evolving. The Center continues to experience success in the advancement of the quality of real estate research, in the training of highly skilled professionals, and in bridging the gap between real estate research and practice, by capitalizing on its strengths in finance, entrepreneurial studies and technology; expert faculty; superior research, forecasting and analytical tools. Its partnership with resources throughout one of the most globally renowned universities, UCLA, provides great mutual benefit, and allows the Center to succeed in redefining the real estate industry.

## Developers of the CRSP/Ziman Real Estate Data Series

**Stephen Day Cauley** is the Director of Research for the Ziman Center at The UCLA Anderson School of Management where he taught real estate investments. His research involves the application of recent advances in economics, finance and statistics to the valuation of publicly and privately held real estate. As part of this research, he has developed innovative statistical and visualization techniques to analyze spatial variation in real estate markets. He has held academic and research positions at the UCLA Department of Economics, and at the RAND Corporation. Dr. Cauley was licensed as a real estate broker by the state of New Mexico where he was a principal of a firm that formed and managed real estate limited partnerships. Dr. Cauley earned his Ph.D. in economics from UCLA and has been a visiting scholar in finance at The Anderson School.

**Robert R. Bliss** was the F. M. Kirby Chair in Business Excellence at the Calloway School of Business and Accountancy at Wake Forest University where he taught finance. Prior to joining the faculty at Wake Forest University Professor, Bliss held positions at the Federal Reserve Bank of Chicago, the Bank of England and the Federal Reserve Bank of Atlanta. Previously, Dr. Bliss was an Assistant Professor of Finance at Indiana University. Professor Bliss's research interests include

the term structure of interest rates, interest rate derivatives, risk management, bank regulation, and the law and economics of insolvency. Professor Bliss earned his doctorate in finance from the University of Chicago. He has enjoyed a long association with Professor Fama, which includes the development of the Fama-Bliss Discount Bonds Files. His interests in database development originate in the years he spent as a senior programmer at the Center for Research in Security Prices working on the stock and bond files.

**CRSP Management & Professional Staff:** Members of the CRSP Management & Professional Staff, from a variety of disciplines, have been intimately involved in the development of this data series.

**Ziman Center Professional Staff:** Members of the Ziman Center Professional Staff have been intimately involved in the development of this data series.

# Chapter 2: CRSP/Ziman Real Estate Data Series

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## Overview

The CRSP/Ziman Real Estate Data Series represents a collaborative effort between the Richard S. Ziman Center for Real Estate at the UCLA Anderson School of Management and The Center for Research in Security Prices. The REIT data series is a unique research resource whose development merges CRSP's experience in academic-quality financial database and index creation with the Ziman Center's expertise in real estate markets and the collection of real estate data.

Combining stock price and returns data with carefully researched information regarding the population, characteristics, and history of REITs, the CRSP/Ziman database provides firm-specific information and indexes essential to analyses involving this important asset class.

Daily and monthly indexes are computed with both equal- and value-weighting for subsets defined by type of REIT and the types of properties predominately held by equity REITs. This database includes several qualitative measures detailing market capitalizations, concentrations, and changes in index composition particularly important for evaluating the information in thinly populated index series which were common during the 1980s.

By providing this information on all REITs that have traded on the three primary exchanges since 1980, the CRSP/ Ziman Real Estate Data Series allows for time series and events studies, measurement of performance, accurate benchmarking, and in-depth analysis of the individual securities.

## CRSP/Ziman Real Estate Data Series

- Includes all REITs that have traded on the NYSE, NYSE MKT and NASDAQ exchanges since 1980
- Contains series of indexes based on all REITs and subsets of REITs based on REIT type and property type
- Contains underlying individual security information for the indexes
- Includes qualitative measures important for evaluating information in thinly populated index series
- Identifies changes in REIT status for the universe of publicly-traded REITs
- Unique Aspects:
  - Indexes:
    - » Daily and monthly are available; Equal and value weighted
    - » REIT and property type
    - » Herfindahl-Hirschman Index & Concentration Ratios
  - Individual Securities:
    - » CRSP Permanent Identifier
    - » Name, price, share count, and return information
    - » REIT type, property type information
    - » Identification of changes in REIT status for publicly traded REIT universe
    - » 450+ REITs: equity, mortgage and hybrid
- The data series is available as SAS, ASCII, and R formats, and also as an access database

## CRSP/Ziman Universe

The CRSP/Ziman indexes include issues identified specifically as REITs. Further specifications of REIT type and property type are used to determine membership in the appropriate indexes. The CRSP/Ziman indexes make no restrictions by exchange, share type or other categorizations.

## CRSP/Ziman Prices

Daily and monthly price time series are available. Due to thinly populated target portfolios and the inconsistent trading nature of some of the securities, special rules were implemented to improve the continuity of the portfolios. To supplement trading prices and improve continuity a Used Price was assigned to the REIT for each time period. There are three categories of Used Prices assigned in the CRSP/Ziman time series:

- Good Price – an assigned valuation considered acceptable at the beginning of a period to use the security in a portfolio.
- Soft Price or Delisting Price – an assigned valuation considered acceptable as an ending price of a security already used in a portfolio, but not acceptable at the beginning of a period to use the security in the portfolio.
- Missing Price – no acceptable valuation is available, even though the security is listed on a targeted exchange and is otherwise valid for an index.

The specific types and precedence of Used Prices assigned based on time series frequency are:

### Monthly

- Good Price – month-end closing price or the month-end closing bid-ask average.
- Soft Price or Delisting Price
  - Delisting amount – if available within one month.
  - Last Good Price - the last non-missing daily price or bid/ask average within the month and within ten trading days prior to the month end.
    - » Assumed Price – 0 if delisted due to bankruptcy

### Daily

- Good Price – closing price, closing bid/ask average, or the interpolated price if no price is available for a trading day but a closing price or bid/ask average is available on previous and next trading days.
- Soft Price or Delisting Price
  - Delisting Amount – if available within one month.
  - Last Good Price – price carried forward from previous day. Used on the first day of a gap over 10 trading days.
  - Next Good Price – price carried back from next trading day. Used over a price gap where listing continues after gap.
    - » Assumed Price – 0 if no information and delisted due to bankruptcy.

## CRSP/Ziman Time Series

Security level time series includes price, return, shares outstanding, and adjustment factors.

- All time series are keyed by the CRSP Permanent Security Identifier, PERMNO®, and the calendar trading date. Only trading dates are included.
- Price data includes the observed price or bid/ask data as well as the used price derived for the indexes. Used prices, a price type, and the date of a used price are provided.
- Returns data includes a total return and capital appreciation based on the Used Prices. In CRSP databases, returns are only based on observed prices, and delisting return is a separate field.
- Shares outstanding data is mapped from filings and adjustment events to each time series value. A capitalization is computed based on the used shares outstanding and the used price.
- Adjustment data includes the effective ordinary dividend amount, non-ordinary dividend amount, period adjustment factor, and cumulative price adjustment factor. Prices can be divided by the cumulative price adjustment factor to get prices adjusted to the basis of the last available price.

See Section 3 for the full list of variables and used price type codes.

## REIT Index Methodology

All REIT indexes are populated from the REITs available that fit the selection criteria of that index. Value-weighted and equal-weighted indexes are formed for each set of issues. Total return, capital appreciation, income returns, and corresponding index levels are calculated for each portfolio. The returns show the change in the total dollar value of the portfolio, over some period of time, per dollar in initial investment. The index levels show the cumulative value of the portfolio relative to a fixed starting date. All REIT index levels are set to \$100 on December 30, 1994.

The procedure for calculating each index involves three steps:

- Calculating returns for individual securities
- Calculating returns for indexes
- Calculating index levels

### Calculating Returns for Individual Securities

Returns are calculated for each individual security using the formula:

$$r(t) = \frac{p(t)f(t) + d(t)}{p(t-1)} - 1$$

Where, for trading day t, t-1 is the previous trading day.

$r(t)$  = security's return for day t

$p(t)$  = last sale or closing bid/ask for day t

$f(t)$  = price adjustment factor for day t

$d(t)$  = cash adjustment for day t

In the total returns, dividends, split factors, spin-offs, rights and all other distributions are compensated for or reinvested on the ex-distribution date. Total Returns include all cash distributions in the cash adjustment, while Returns without Dividends exclude ordinary cash dividends. The time series used prices are inputs to the returns for the REIT indexes.

### Calculating Returns for Indexes

Returns for individual securities within an index are combined to create returns for the index. For a security to be eligible for index inclusion, Good Prices must be available for the previous period, but Good Prices, Soft Prices, or Delisting Prices can be used for the current period.

The sum of the weighted returns is divided by the sum of the securities' weights to arrive at the return for the index:

$$R(t) = \frac{\sum_n w_n(t)r_n(t)}{\sum_n w_n(t)}$$

Where, for trading day t,  $R(t)$  is the return for the index:

$w_n(t)$  = weight of security n for day t

$r_n(t)$  = security n's return for day t

Index total returns use security total returns for the securities that fit the selection criteria of that index. Price appreciation uses security returns without dividends. Income returns use the difference between the two. In an equal-weighted index, the weight of each security is one. In a value-weighted index, the weight assigned to each security is equal to its market capitalization at the end of the previous period, t-1.



## Calculating Index Levels

The base year for the CRSP/Ziman REIT Indexes is 12/30/1994 - at that point in time the indexes are set to 100. CRSP Market Indexes are set to 100 on 12/29/1972.

The Index level,  $I(t)$ , is defined as:

$$\text{If } t = t_0, I(t) = 100$$

$$\text{If } t > t_0, I(t) = I(t-1) * (1+R(t))$$

$$\text{If } t < t_0, I(t) = I(t+1)/(1+R(t+1))$$

Where  $t_0$  = December 30, 1994:

$I(t)$  = index level for day  $t$

$R(t)$  = total return for the index for day  $t$

## Summary Statistics and Quality Measures

Total Value, TOTVAL, in the CRSP/Ziman REIT Indexes is defined as the total market value of the eligible issues with a Good or Soft Price at the beginning of the period. CRSP Market Indexes use end of period market value calculated with observed trade or the average of observed closing bid and ask. The REIT Indexes also add new summary variables including Beginning Count, Add Count, Add Value, Drop Count, Drop Value, Observed Count, Observed Value, Concentration Ratio and the HHI – Herfindahl-Hirschman Index. See the Variable Table in Section 3 for descriptions of these variables.

## Chapter 3: Data Definitions

This section describes the data tables and fields available, and installation and technical file specifications.

### Alphabetic Listing of Variables

The following tables contain all variables in the database, sorted by the variable code. See the Table Definitions for variables organized by the data set.

\* Variable Description Map:

- Column 1 – As defined by CRSP and available in CRSP stock databases
- Column 2 – Available in both CRSP and CRSP/Ziman databases with differences in definition
- Column 3 – Unique to CRSP/Ziman

VARIABLE CODE	VARIABLE NAME	DESCRIPTION	TABLE LOCATION	DATA CATEGORY	1*	2*	3*
ADDCNT	ADD COUNT	NUMBER OF ADDED SECURITIES IN THE INDEX. TO BE COUNTED, A SECURITY MUST NOT BE INCLUDED IN THE PREVIOUS PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	NUMBER			X
ADDVAL	ADD VALUE	MARKET VALUE OF THE SECURITIES IDENTIFIED IN ADD COUNT (ABOVE)	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE			X
AIND	INDEX APPRECIATION VALUE	CAPITAL APPRECIATION RETURN INDEX VALUE	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE		X	
ARET	INDEX APPRECIATION RETURN	CAPITAL APPRECIATION RETURN OF THE INDEX	CRSP/ZIMAN MONTHLY/DAILY INDEXES	RATIO	X		
BEGCNT	BEGINNING COUNT	NUMBER OF SECURITIES AVAILABLE IN THE INDEX WITH GOOD OR SOFT PRICES AT THE BEGINNING OF THE CURRENT PERIOD. THESE SECURITIES MAY BE AN UNUSED PRICE AT THE END OF THE PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	NUMBER			X
BEGDT	BEGINNING DATE (HEADER)	BEGINNING DATE FOR HEADER INFORMATION	HEADER TABLE	START DATE	X		
BEGDT	BEGINNING DATE (REIT INFO)	REIT INFORMATION BEGINNING DATE	ZIMAN REIT INFO	START DATE			X
CALDT	CALENDAR DATE	CALENDAR DATE FOR WHICH DATA APPLIES	CRSP MONTHLY/DAILY DATA, CRSP/ZIMAN MONTHLY/DAILY INDEXES	DATE	X		
CAP	MARKET CAPITALIZATION	MONTH END MARKET CAPITALIZATION CALCULATED USING USED PRICE AND CRSP SHARES OUTSTANDING	CRSP MONTHLY/DAILY DATA	VALUE		X	
COMNAM	COMPANY NAME	COMPANY NAME	HEADER TABLE, CRSP NAMES	NAME	X		
CONRATIO	CONCENTRATION RATIO	CONCENTRATION RATIO IS THE RATIO OF THE MARKET VALUE OF THE LARGEST FOUR SECURITIES IN THE PORTFOLIO VERSUS THE MARKET VALUE OF THE ENTIRE PORTFOLIO COMPUTED USING THE BEGINNING OF PERIOD MARKET CAPS.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	RATIO			X
CONVCD	RESERVED	RESERVED	CRSP NAMES	NAME	X		
CUMFP	CUMULATIVE PRICE FACTOR	CUMULATIVE PRICE FACTOR BETWEEN PERIOD AND MOST RECENT PERIOD. DIVIDE ACTUAL PRICE BY CUMULATIVE PRICE FACTOR TO CALCULATE ADJUSTED PRICE.	CRSP MONTHLY/DAILY DATA	RATIO		X	
DROPCNT	DROP COUNT	NUMBER OF DROPPED SECURITIES IN THE INDEX. TO BE COUNTED, A SECURITY MUST HAVE BEEN PRESENT IN THE INDEX IN THE PREVIOUS PERIOD, BUT NOT IN THE CURRENT PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	NUMBER			X

VARIABLE CODE	VARIABLE NAME	DESCRIPTION	TABLE LOCATION	DATA CATEGORY	1*	2*	3*
DROPVAL	DROP VALUE	MARKET VALUE OF THE SECURITIES DROPPED FROM AN INDEX IN EACH PERIOD	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE			X
ENDDT	END DATE (HEADER)	ENDING DATE FOR HEADER INFORMATION	HEADER TABLE	END DATE	X		
ENDDT	END DATE (REIT INFO)	REIT INFORMATION ENDING DATE	ZIMAN REIT INFO	END DATE			X
ENDDT_REASON	ENDDATE REASON (REIT)	REASON FOR ENDDATE	ZIMAN REIT INFO	END DATE			X
EXCHCD	EXCHANGE CODE	EXCHANGE CODE: 1 = NYSE, 2 = NYSE MKT, 3 = NASDAQ, 31 = NYSE WHEN-ISSUED, 32 = NYSE MKT WHEN-ISSUED, 33 = NASDAQ WHEN-ISSUED, 0 = UNKNOWN, -1 = SUSPENDED, -2 = HALTED	CRSP NAMES	CODE	X		
FACPR	PRICE FACTOR	PRICE FACTOR IN PERIOD. FACTOR USED IN RETURNS FORMULA TO APPLY TO CURRENT PRICE TO PUT ON THE SAME BASIS AS PREVIOUS PERIOD.	CRSP MONTHLY/DAILY DATA	RATIO		X	
FYREND	FISCAL YEAR END	FISCAL YEAR END MONTH	ZIMAN REIT INFO	NUMBER			X
HDLSTCD	HEADER DELISTING CODE	HEADER DELISTING CODE	HEADER TABLE	CODE	X		
HHI	HERFINDAHL INDEX	HERFINDAHL-HIRSCHMAN INDEX IS THE SUM OF THE SQUARES OF THE MARKET SHARE PERCENTAGES OF ALL THE INDIVIDUAL COMPONENTS IN AN INDEX COMPUTED USING BEGINNING OF PERIOD MARKET CAPS.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	RATIO			X
IIND	INDEX INCOME VALUE	INCOME RETURN INDEX VALUE	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE		X	
INDEX LIST	INDEX LIST	LIST OF INDEXES FOR WHICH A REIT IS ELIGIBLE. SEE INDEX TYPE MAP	ZIMAN REIT INFO	DESCRIPTION			X
INDNO	INDNO®	CRSP INDEX IDENTIFIER CODE	INDEX TYPE MAP,CRSP/ZIMAN MONTHLY/DAILY INDEXES	KEY		X	
IRET	INDEX INCOME RETURN	INCOME RETURN FOR THE INDEX (DIVIDEND YIELD)	CRSP/ZIMAN MONTHLY/DAILY INDEXES	RATIO	X		
ISSUERCD	RESERVED	RESERVED	CRSP NAMES	NAME	X		
NAMEBEGDT	NAME INFO BEGIN DATE	BEGINNING DATE FOR NAME INFORMATION	CRSP NAMES	START DATE	X		
NAMEDESC	RESERVED	RESERVED	CRSP NAMES	DESCRIPTION	X		
NAMEENDDT	NAME INFO END DATE	ENDING DATE FOR NAME INFORMATION	CRSP NAMES	END DATE	X		
NDIV	NON-ORDINARY DIVIDENDS	TOTAL VALUE OF NON-ORDINARY DIVIDENDS IN PERIOD	CRSP MONTHLY/DAILY DATA	AMOUNT		X	
OBSCNT	OBSERVED COUNT	NUMBER OF SECURITIES USED IN THE INDEX WITH A GOOD PRICE AT THE BEGINNING OF THE CURRENT PERIOD AND AN OBSERVED PRICE AT THE END OF THE CURRENT PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	NUMBER			X
OBSVAL	OBSERVED VALUE	MARKET VALUE OF THE SECURITIES THAT ARE INCLUDED IN THE OBSERVED COUNT (OBSCNT)	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE			X
ODIV	ORDINARY DIVIDENDS	TOTAL VALUE OF ORDINARY DIVIDENDS IN PERIOD	CRSP MONTHLY/DAILY DATA	AMOUNT		X	
PERMCO	PERMCO®	CRSP PERMANENT COMPANY IDENTIFIER	HEADER TABLE	ID	X		
PERMNO	PERMNO®	CRSP PERMANENT SECURITY IDENTIFIER	HEADER TABLE,CRSP MONTHLY/DAILY DATA,CRSP NAMES, ZIMAN REIT INFO	KEY	X		
PRC	PRICE	CLOSING PRICE OR NEGATIVE BID/ASK AVERAGE ON CALENDAR DATE	CRSP MONTHLY/DAILY DATA	VALUE	X		

VARIABLE CODE	VARIABLE NAME	DESCRIPTION	TABLE LOCATION	DATA CATEGORY	1*	2*	3*
PRIMEXCH	PRIMARY EXCHANGE	PRIMARY EXCHANGE TRADED: N = NYSE, A = NYSE MKT, Q = NASDAQ	CRSP NAMES	MNEMONIC	X		
PSUB	PROPERTY SUBTYPE	PROPERTY SUBTYPE – SEE SUB PROPERTY TYPE FILE.	ZIMAN REIT INFO	CODE			X
PYPE	PROPERTY TYPE	TYPE OF PROPERTY - SEE PROPERTY TYPE FILE	ZIMAN REIT INFO	CODE			X
RTYPE	REIT TYPE	TYPE OF REIT: UNKNOWN = 0, UNCLASSIFIED = 1, EQUITY = 2, MORTGAGE = 3, HYBRID = 4	ZIMAN REIT INFO	CODE			X
SECSTAT	SECURITY STATUS	SECURITY STATUS: R = REGULAR WAY, W = WHEN-ISSUED, Q = REORGANIZATION, RECAPITALIZATION, OR BANKRUPTCY	CRSP NAMES	MNEMONIC	X		
SHRCD	SHARE CODE	SHARE CODE: FIRST DIGIT: 1 = ORDINARY COMMON SHARES, 3 = ADR, 4 = SHARES OF BENEFICIAL INTEREST, 7 = UNIT OR LIMITED PARTNERSHIP. SECOND DIGIT: 0 = NO SPECIAL STATUS FOUND, 1 = NO SPECIAL STATUS NECESSARY, 2 = FOREIGN INCORPORATED, 4 = CLOSED END FUND, 8 = REIT	CRSP NAMES	CODE	X		
SHRCLS	SHARE CLASS	SHARE CLASS	CRSP NAMES	MNEMONIC	X		
SICCD	SIC CODE	STANDARD INDUSTRIAL CLASSIFICATION CODE	CRSP NAMES	CODE	X		
TICKER	TICKER	TICKER SYMBOL	CRSP NAMES	ID	X		
TIND	INDEX TOTAL RETURN VALUE	TOTAL RETURN INDEX VALUE	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE		X	
TOTCNT	TOTAL COUNT	NUMBER OF SECURITIES ELIGIBLE FOR INCLUSION IN THE INDEX. TO BE ELIGIBLE, THE SECURITY MUST BE A VALID SECURITY AT THE BEGINNING OF THE CURRENT PERIOD, BUT NEED NOT HAVE A GOOD PRICE.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	NUMBER		X	
TOTAL	TOTAL VALUE	MARKET VALUE AT THE TIME OF PURCHASE OF ALL SECURITIES AVAILABLE IN THE INDEX. TO CONTRIBUTE TO THE TOTAL VALUE, THE SECURITY MUST BE A VALID SECURITY AND HAVE A GOOD OR SOFT PRICE AT THE BEGINNING OF THE CURRENT PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE		X	
TRDSTAT	TRADING STATUS	TRADING STATUS: A = ACTIVE, H = HALTED, S = SUSPENDED, X = UNKNOWN	CRSP NAMES	MNEMONIC	X		
TRET	INDEX TOTAL RETURN	TOTAL RETURN FOR THE INDEX	CRSP/ZIMAN MONTHLY/DAILY INDEXES	RATIO	X		
TSYMBOL	TICKER SYMBOL-PRIMARY EXCHANGE	TRADING TICKER SYMBOL ON PRIMARY EXCHANGE	CRSP NAMES	ID	X		
USDCNT	USED COUNT	COUNT OF THE SECURITIES USED IN THE INDEX. TO BE IN AN INDEX, THE SECURITY MUST BE A VALID SECURITY AND HAVE A GOOD PRICE AT THE BEGINNING OF THE CURRENT PERIOD AND AN OBSERVED OR SOFT PRICE AT THE END OF THE CURRENT PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	NUMBER		X	
USDPRC	USED PRICE	USED PRICE - COMBINATION OF VARIOUS GOOD AND SOFT PRICES USED IN AN INDEX ACCORDING TO INDEX METHODOLOGY RULES	CRSP MONTHLY/DAILY DATA	VALUE		X	
USDPRCDT	USED PRICE DATE	DATE ASSOCIATED WITH THE USED PRICE	CRSP MONTHLY/DAILY DATA	DATE		X	
USDPRCTYPE	USED PRICE TYPE	FLAG USED TO DESCRIBE THE USED PRICE - SEE PRICE TYPE TABLE FOR CODES.	CRSP MONTHLY/DAILY DATA	CODE			X
USDRET	USED PRICE TOTAL RETURN	MONTHLY TOTAL RETURN BASED ON USED PRICES AND USED DATES AND THE CRSP DISTRIBUTION HISTORY	CRSP MONTHLY/DAILY DATA	RATIO		X	
USDRETX	USED PRICE RETURN (NO DIVIDENDS)	MONTHLY RETURN WITHOUT DIVIDENDS BASED ON USED PRICES AND USED DATES AND THE CRSP DISTRIBUTION HISTORY	CRSP MONTHLY/DAILY DATA	RATIO		X	

VARIABLE CODE	VARIABLE NAME	DESCRIPTION	TABLE LOCATION	DATA CATEGORY	1*	2*	3*
USDSHR	SHARES OUTSTANDING	NUMBER OF SHARES OUTSTANDING	CRSP MONTHLY/DAILY DATA	NUMBER	X		
USDVAL	USED MARKET VALUE	MARKET VALUE AT THE BEGINNING OF THE CURRENT PERIOD OF SECURITIES USED IN THE INDEX THAT PERIOD.	CRSP/ZIMAN MONTHLY/DAILY INDEXES	VALUE		X	
VALID	VALID	FLAG INDICATING A SECURITY ELIGIBILITY FOR INDEX MEMBERSHIP	CRSP MONTHLY/DAILY DATA	CODE			X

## Data Category

Each data item in each table is associated with a Data Category. The Data Category identifies the type of item and the associated formats for use with SAS, ASCII, R, and SQL.

DATA CATEGORY	DESCRIPTION	SAS TYPE	SAS FORMAT	ASCII	SQL TYPE	R TYPE
FLAG	ONE-CHARACTER FIELD - OFTEN JUST 'Y' AND 'N'	CHARACTER	\$1.		CHAR(1)	TEXT
DESCRIPTION	WIDE CHARACTER FIELD CONTAINING TEXT INFORMATION	CHARACTER	\$W.		VARCHAR(W)	TEXT
ID	FIELD CONTAINING AN ALPHANUMERIC IDENTIFIER	CHARACTER	\$W.		VARCHAR(W)	TEXT
MNEMONIC	ALPHANUMERIC FIELD CONTAINING A CODE VALUE	CHARACTER	\$W.		VARCHAR(W)	TEXT
NAME	ALPHANUMERIC FIELD FOR NAMES	CHARACTER	\$W.		VARCHAR(W)	TEXT
DATE	DATE FIELD	NUMERIC	YYYYMMDD10.	YYYY-MM-DD	DATE	DATE
START DATE	START OF A DATE RANGE - PAIRED WITH AN END DATE	NUMERIC	YYYYMMDD10.	YYYY-MM-DD	DATE	DATE
END DATE	END OF A DATE RANGE - PAIRED WITH A START DATE	NUMERIC	YYYYMMDD10.	YYYY-MM-DD	DATE	DATE
TIMESTAMP	DATE AND TIME, INCLUDING SECONDS	NUMERIC	DATETIME	YYYY-MM-DD HH:MM:SS	DATETIME	DATETIME
AMOUNT	FIXED POINT NUMBER	NUMERIC	W.N	WW.NNNNN	DECIMAL (P,N)	FLOAT
RATIO	CALCULATED FLOATING POINT NUMBER	NUMERIC	PERCENTW.N	1.234567890123E+12	FLOAT	FLOAT
VALUE	FIELD WITH A WIDE RANGE OF VALUES	NUMERIC	E20.	1.234567890123E+12	FLOAT (OR DECIMAL)	FLOAT
CODE	INTEGER FIELD THAT REPRESENTS ONE OR MORE CHARACTERISTICS	NUMERIC	W.	NNNN	INT	INT
KEY	INTEGER FIELD THAT IS USED AS A KEY	NUMERIC	W.	NNNNNNN	INT	INT
NUMBER	INTEGER VALUE < 2,000,000,000	NUMERIC	W.	NNNNNNNNNN	INT	INT
QUANTITY	INTEGER FIELD WITH SOME VALUES IN EXCESS OF 2,000,000,000	NUMERIC	COMMAW.	NNNNNNNNNNNN	BIGINT	FLOAT

Missing values are displayed as follows:

- ASCII and Excel missing values, regardless of type, are an empty string
- SAS missing values are an empty string for character fields and SAS missing (displayed as a.) for numeric fields
- R missing values are an empty string for character fields, and 'R' missing (displayed as N/A) for float, int, date and datetime.

## Table Definitions

All tables are available in SAS, ASCII, and R formats. ASCII files contain variable-width records, ending with line-feeds, with fields pipe-delimited. There are no header records.

Additionally, one Microsoft Access database is provided named `reit_db.mdb` containing all data tables. Databases are in Access 2000 file format. The design view menu within Access can be used to view available fields, data types, and descriptions.

FILE NAME	DESCRIPTION	FILE EXTENSIONS
CRSP_DAILY_DATA	DAILY REIT SECURITY DATA	SAS: *.SAS7BDAT ASCII: *.DAT R: *.RDS
CRSP_HEADER	SECURITY REIT HEADER DATA	
CRSP_MONTHLY_DATA	MONTHLY REIT SECURITY DATA	
CRSP_NAMES	SECURITY NAME HISTORY OF REITS	
CRSP_ZIMAN_DAILY_INDEX*	DAILY INDEX RESULTS	
CRSP_ZIMAN_MONTHLY_INDEX	MONTHLY INDEX RESULTS	
INDEX_TYPE_MAP	DEFINITIONS OF AVAILABLE INDEXES AND THEIR COMPOSITION	
PRICE_TYPE	DEFINITIONS OF AVAILABLE PRICE TYPES	
PROPERTY_TYPE	DEFINITIONS OF AVAILABLE REIT PROPERTY TYPES	
REIT_TYPE	DEFINITIONS OF AVAILABLE REIT CATEGORIES	
SUB_PROPERTY_TYPE	DEFINITIONS OF AVAILABLE REIT PROPERTY SUBTYPES	
ZIMAN_REIT_INFO	REIT INFORMATION	

In these tables variables are listed in the order they appear in datasets.

\* Variable Description Map:

- Column 1 – As defined by CRSP and available in CRSP stock databases
- Column 2 – Available in both CRSP and CRSP/Ziman databases with differences in definition
- Column 3 – Unique to CRSP/Ziman

### CRSP HEADER TABLE

SORT	VARIABLE CODE	VARIABLE NAME	OTHER TABLE LOCATIONS	DATA CATEGORY	1*	2*	3*
1	PERMNO	PERMNO	CRSP MONTHLY/DAILY DATA, CRSP NAMES, ZIMAN REIT INFO	KEY	X		
	PERMCO	PERMCO		ID	X		
	BEGDT	BEGINNING DATE (HEADER)		START DATE	X		
	ENDDT	END DATE (HEADER)		END DATE	X		
	COMNAM	COMPANY NAME	CRSP NAMES	NAME	X		
	HDLSTCD	HEADER DELISTING CODE		CODE	X		

### CRSP NAMES TABLE

SORT	VARIABLE CODE	VARIABLE NAME	OTHER TABLE LOCATIONS	DATA CATEGORY	1*	2*	3*
1	PERMNO	PERMNO	CRSP HEADER, CRSP MONTHLY/DAILY DATA, ZIMAN REIT INFO	KEY	X		
2	NAMEBEGDT	NAME INFO BEGIN DATE		START DATE	X		
	NAMEENDDT	NAME INFO END DATE		END DATE	X		
	TICKER	TICKER		ID	X		
	SHRCLS	SHARE CLASS		MNEMONIC	X		
	COMNAM	COMPANY NAME	CRSP HEADER	NAME	X		
	EXCHCD	EXCHANGE CODE		CODE	X		
	SHRCD	SHARE CODE		CODE	X		

	SICCD	SIC CODE		CODE	X		
	PRIMEXCH	PRIMARY EXCHANGE		MNEMONIC	X		
	TSYMBOL	TICKER SYMBOL- PRIMARY EXCHANGE		ID	X		
	SECSTAT	SECURITY STATUS		MNEMONIC	X		
	TRDSTAT	TRADING STATUS		MNEMONIC	X		
	NAMEDESC	RESERVED		DESCRIPTION	X		
	ISSUERCD	RESERVED		MNEMONIC	X		
	CONVCD	RESERVED		MNEMONIC	X		

## CRSP MONTHLY/DAILY DATA

SORT	VARIABLE CODE	VARIABLE NAME	OTHER TABLE LOCATIONS	DATA CATEGORY	1*	2*	3*
1	PERMNO	PERMNO	CRSP HEADER, CRSP/ZIMAN MONTHLY/DAILY INDEXES, ZIMAN REIT INFO	KEY	X		
2	CALDT	CALENDAR DATE	CRSP/ZIMAN MONTHLY/DAILY INDEXES	DATE	X		
	PRC	PRICE		VALUE	X		
	USDPRC	USED PRICE		VALUE		X	
	USDPRCDT	USED PRICE DATE		DATE		X	
	USDPRCTYPE	USED PRICE TYPE		CODE			X
	VALID	VALID		CODE			X
	USDSHR	SHARES OUTSTANDING		NUMBER		X	
	CAP	MARKET CAPITALIZATION		VALUE		X	
	USDRET	USED PRICE TOTAL RETURN		RATIO		X	
	USDRETX	USED PRICE RETURN (NO DIVIDENDS)		RATIO		X	
	ODIV	ORDINARY DIVIDENDS		AMOUNT		X	
	NDIV	NON-ORDINARY DIVIDENDS		AMOUNT		X	
	FACPR	PRICE FACTOR		RATIO		X	
	CUMFP	CUMULATIVE PRICE FACTOR		RATIO		X	

## ZIMAN REIT INFO

SORT	VARIABLE CODE	VARIABLE NAME	OTHER TABLE LOCATIONS	DATA CATEGORY	1*	2*	3*
1	PERMNO	PERMNO	HEADER TABLE, CRSP MONTHLY/DAILY DATA, CRSP NAMES	KEY	X		
2	BEGDT	BEGINNING DATE (REIT INFO)		START DATE			X
	ENDDT	END DATE (REIT INFO)		END DATE			X
	ENDDT REASON	ENDDATE REASON (REIT)		DESCRIPTION			X
	RTYPE	REIT TYPE		CODE			X
	PTYPE	PROPERTY TYPE		CODE			X
	PSUB	PROPERTY SUBTYPE		CODE			X
	INDEX LIST	INDEX LIST		DESCRIPTION			X
	FYREND	FISCAL YEAR END		NUMBER			X

## CRSP/ZIMAN MONTHLY/DAILY INDEXES

SORT	VARIABLE CODE	VARIABLE NAME	OTHER TABLE LOCATIONS	DATA CATEGORY	1*	2*	3*
1	INDNO	INDNO		KEY		X	
2	CALDT	CALENDAR DATE	CRSP MONTHLY/DAILY DATA	DATE	X		
	TRET	INDEX TOTAL RETURN		RATIO	X		

SORT	VARIABLE CODE	VARIABLE NAME	OTHER TABLE LOCATIONS	DATA CATEGORY	1*	2*	3*
	TIND	INDEX TOTAL RETURN VALUE		VALUE		X	
	ARET	INDEX APPRECIATION RETURN		RATIO	X		
	AIND	INDEX APPRECIATION VALUE		VALUE		X	
	IRET	INDEX INCOME RETURN		NUMBER	X		
	IIND	INDEX INCOME VALUE		VALUE		X	
	USDCNT	USED COUNT		NUMBER		X	
	USDVAL	USED MARKET VALUE		VALUE		X	
	TOTCNT	TOTAL COUNT		NUMBER		X	
	TOTVAL	TOTAL VALUE		VALUE		X	
	ADDCNT	ADD COUNT		NUMBER			X
	ADDVAL	ADD VALUE		VALUE			X
	DROPCNT	DROP COUNT		NUMBER			X
	DROPVAL	DROP VALUE		VALUE			X
	OBSCNT	OBSERVED COUNT		NUMBER			X
	OBSVAL	OBSERVED VALUE		VALUE			X
	BEGCNT	BEGINNING COUNT		NUMBER			X
	HHI	HERFINDAHL HIRSCHMAN INDEX		VALUE			X
	CONRATIO	CONCENTRATION RATIO		RATIO			X

## Type Table Definitions

The following five tables contain type and index definitions used in the CRSP-ZIMAN indexes and their definitions. A data set is provided for each type. The column headers in the tables below describe the data items in these data sets.

### PROPERTY TYPE

PROPERTY TYPE	LONG DESCRIPTION	SHORT DESCRIPTION
0	UNKNOWN	UNKNOWN
1	UNCLASSIFIED	UNCLASSIFIED
2	DIVERSIFIED	DIVERSIFIED
3	HEALTH CARE	HEALTH CARE
4	INDUSTRIAL/OFFICE	INDUSTRIAL/OFFICE
5	LODGING/RESORTS	LODGING/RESORTS
6	MORTGAGE	MORTGAGE
7	MORTGAGE BACKED SECURITIES	MORTGAGE BACKED SECURITIES
8	RESIDENTIAL	RESIDENTIAL
9	RETAIL	RETAIL
10	SELF STORAGE	SELF STORAGE

### REIT TYPE

REIT TYPE	LONG DESCRIPTION	SHORT DESCRIPTION
0	UNKNOWN	UNKNOWN
1	UNCLASSIFIED	UNCLASSIFIED
2	EQUITY	EQUITY
3	MORTGAGE	MORTGAGE
4	HYBRID	HYBRID



## SUB-PROPERTY TYPE

SUB-PROPERTY TYPE	LONG DESCRIPTION	SHORT DESCRIPTION
0	UNKNOWN	UNKNOWN
1	UNCLASSIFIED	UNCLASSIFIED
2	APARTMENTS	APARTMENTS
3	COMMERCIAL FINANCING	COMMERCIAL FINANCING
4	DIVERSIFIED	DIVERSIFIED
5	FREESTANDING	FREESTANDING
6	HEALTH CARE	HEALTH CARE
7	HOME FINANCING	HOME FINANCING
8	INDUSTRIAL	INDUSTRIAL
9	LODGING/RESORTS	LODGING/RESORTS
10	MANUFACTURED HOMES	MANUFACTURED HOMES
11	MIXED	MIXED
12	MORTGAGE BACKED SECURITIES	MORTGAGE BACKED SECURITIES
13	OFFICE	OFFICE
14	OUTLET CENTERS	OUTLET CENTERS
15	REGIONAL MALLS	REGIONAL MALLS
16	SELF STORAGE	SELF STORAGE
17	SHOPPING CENTERS	SHOPPING CENTERS
18	STRIP CENTERS	STRIP CENTERS

## PRICE TYPE

Values for the Used Price Type field found in the CRSP Monthly/Daily Data.

PRICE TYPE	LONG DESCRIPTION
1	TRADE REPORTED (PRICE > 0)
2	QUOTED BUT NO TRADE (BID/ASK AVERAGE)
3	NO TRADE
4	MISSING PRICE MONTH END (ALTERNATE)
5	ALTERNATE IN-INDEX
6	LAST GOOD
7	NEXT GOOD
8	INTERPOLATED
9	FIRST DAY OFF-EXCHANGE
10	DELISTING AMOUNT WITHIN 10 DAYS
11	ASSUMED
12	FUTURE DELISTING
13	MIDDLE OF GAP
14	OFF EXCHANGE
15	NEAREST GOOD PRICE
16	SOFT DELISTING PRICE

## INDEX TYPE MAP

The index type position variable refers to the Index Type field in the ZIMAN REIT Info table. If that character position is a 1, then that security is a member of this index. The mask fields describe REIT types, property types, and property subtypes that comprise the index. If the nth position of a mask field is a 1, then that nth REIT type, property type, or sub-property type is included in the index. For example, indno 1000805 allows Equity, Hybrid, and Mortgage REIT types, Diversified Property Types, and all Property Subtypes.

INDEX TYPE POSITION	LONG DESCRIPTION	SHORT DESCRIPTION	INDNO	RTYPE MASK	PTYPE MASK	PSUB MASK
1	CRSP ZIMAN REIT VALUE WEIGHTED INDEX	CRSP ZIMAN REIT VW INDEX	1000800	00111	11111111111111111111	11111111111111111111
2	CRSP ZIMAN EQUITY REIT VALUE WEIGHTED INDEX	EQUITY REIT VW INDEX	1000801	00100	11111111111111111111	11111111111111111111
3	CRSP ZIMAN MORTGAGE REIT VALUE WEIGHTED INDEX	MORTGAGE REIT VW INDEX	1000802	00010	11111111111111111111	11111111111111111111
4	CRSP ZIMAN HYBRID REIT VALUE WEIGHTED INDEX	HYBRID REIT VW INDEX	1000803	00001	11111111111111111111	11111111111111111111
5	CRSP ZIMAN UNCLASSIFIED PTYPE REIT VALUE WEIGHTED INDEX	UNCLAS'D PTPY REIT VW IND	1000804	00111	01000000000000000000	11111111111111111111
6	CRSP ZIMAN DIVERSIFIED PTYPE REIT VALUE WEIGHTED INDEX	DIV'D PTYPE REIT VW INDEX	1000805	00111	00100000000000000000	11111111111111111111
7	CRSP ZIMAN HEALTH CARE PTYPE REIT VALUE WEIGHTED INDEX	HEALTH CARE PTPY VW INDEX	1000806	00111	00010000000000000000	11111111111111111111
8	CRSP ZIMAN INDUSTRIAL/OFFICE PTYPE REIT VALUE WEIGHTED INDEX	INDSTR'L/OFFC PTPY VW INDX	1000807	00111	00001000000000000000	11111111111111111111
9	CRSP ZIMAN LODGING/RESORTS PTYPE REIT VALUE WEIGHTED INDEX	LODG/RESORT PTPY VW INDEX	1000808	00111	00000100000000000000	11111111111111111111
10	CRSP ZIMAN RESIDENTIAL PTYPE REIT VALUE WEIGHTED INDEX	RESIDNT'L PTYPE VW INDX	1000811	00111	00000000100000000000	11111111111111111111
11	CRSP ZIMAN RETAIL PTYPE REIT VALUE WEIGHTED INDEX	RETAIL PTYPE VW INDEX	1000812	00111	00000000010000000000	11111111111111111111
12	CRSP ZIMAN SELF STORAGE PTYPE REIT VALUE WEIGHTED INDEX	SELF STRG PTYPE VW INDEX	1000813	00111	00000000001000000000	11111111111111111111
13	CRSP ZIMAN REIT EQUAL WEIGHTED INDEX	CRSP ZIMAN REIT EW INDEX	1000850	00111	11111111111111111111	11111111111111111111
14	CRSP ZIMAN EQUITY REIT EQUAL WEIGHTED INDEX	EQUITY REIT EW INDEX	1000851	00100	11111111111111111111	11111111111111111111
15	CRSP ZIMAN MORTGAGE REIT EQUAL WEIGHTED INDEX	MORTGAGE REIT EW INDEX	1000852	00010	11111111111111111111	11111111111111111111
16	CRSP ZIMAN HYBRID REIT EQUAL WEIGHTED INDEX	HYBRID REIT EW INDEX	1000853	00001	11111111111111111111	11111111111111111111
17	CRSP ZIMAN UNCLASSIFIED PTYPE REIT EQUAL WEIGHTED INDEX	UNCLAS'D PTPY REIT EW IND	1000854	00111	01000000000000000000	11111111111111111111
18	CRSP ZIMAN DIVERSIFIED PTYPE REIT EQUAL WEIGHTED INDEX	DIV'D PTYPE REIT EW INDEX	1000855	00111	00100000000000000000	11111111111111111111
19	CRSP ZIMAN HEALTH CARE PTYPE REIT EQUAL WEIGHTED INDEX	HEALTH CARE PTPY EW INDEX	1000856	00111	00010000000000000000	11111111111111111111

INDEX TYPE POSITION	LONG DESCRIPTION	SHORT DESCRIPTION	INDNO	RTYPE MASK	PTYPE MASK	PSUB MASK
20	CRSP ZIMAN INDUSTRIAL/OFFICE PTYPE REIT EQUAL WEIGHTED INDEX	INDSTRL/OFFC PTYP EW INDX	1000857	00111	00001000000000000000	111111111111111111111111
21	CRSP ZIMAN LODGING/RESORTS PTYPE REIT EQUAL WEIGHTED INDEX	LODG/RESORT PTYP EW INDX	1000858	00111	00000100000000000000	111111111111111111111111
22	CRSP ZIMAN RESIDENTIAL PTYPE REIT EQUAL WEIGHTED INDEX	RESIDNT'L PTYP EW INDX	1000861	00111	00000000100000000000	111111111111111111111111
23	CRSP ZIMAN RETAIL PTYPE REIT EQUAL WEIGHTED INDEX	RETAIL PTYPE EW INDEX	1000862	00111	00000000010000000000	111111111111111111111111
24	CRSP ZIMAN SELF STORAGE PTYPE REIT EQUAL WEIGHTED INDEX	SELF STRG PTYP EW INDEX	1000863	00111	00000000001000000000	111111111111111111111111