CHICAGO BOOTH

CRSP®
Center for Research in Security Prices

MONTHLY US TREASURY DATABASE GUIDE

ASCII, EXCEL, SAS

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CHAPTER 1: INTRODUCTION

DESCRIPTION

The Monthly CRSP US Treasury Database was developed by the Center for Research in Security Prices at the Graduate School of Business, University of Chicago. The files include complete historical descriptive information and market data including prices, returns, accrued interest, yields, and durations since 1925.

The database is updated annually and supplied in ASCII, Microsoft Excel, and SAS on CD.

SOURCES

Prior to January of 1962, prices were obtained from a number of different sources (see description of SOURCR in Section 3). These sources include the *Wall Street Journal*, Salomon Brothers, Inc., and the Bank and Quotation Record.

Beginning with January of 1962, the majority of prices came from the Composite Closing Quotations for US Government Securities compiled by the Federal Reserve Bank of New York (FRBNY). In 1984, the quotation sheets were renamed the "Composite 3:30 P.M. Quotations for US Government Securities". The time at which the quotes were compiled was related to the fedwire deadline the FRBNY set for the transfer of securities. The deadline was set for 2:30 p.m. Eastern Time, but was regularly extended as much as three-quarters of an hour. The FRBNY trading desk began a "closing run" at 3:00 p.m. The reference to "closing quotations" from 1962 to 1984 probably refers to the "closing run" at the FRBNY. With the close of the day on October 15th, 1996 the FRBNY discontinued publication of composite quotations.

The start of the day, October 16, 1996, our source for price quotations, maturity dates, and coupon rates changed to GovPX, Inc. GovPX receives its data from 5 inter-dealer bond brokers. Live, intra-day bids, offers and transactions in the active over-the-counter markets among these primary dealers are the source of GovPX's 5 p.m. End-of-day US Treasury prices.

The FRBNY described its listed bid price as "...the most widely quoted price from the range of quotations received". The ask price was determined by the FRBNY based on what they expect a typical bid-ask spread to be. The rule used to make this derivation was not public domain. GovPX describes its listed bid and ask prices as the "best price". To determine their "best price" they observe the prices from the 5 inter-dealer brokers and report the bid and ask prices that produce the smallest bid-ask spread.

The amount outstanding (IOUT1R) is obtained from the *Monthly Statement of the Public Debt of the United States* published by the Treasury Department. The amount publicly held (IOUT2R) is obtained from the quarterly US Treasury Bulletin. Money Rates are obtained from the Federal Reserve. The following non-derived data: issue date, coupon payable dates, bank eligibility, tax status and call status are obtained from the US Treasury Department.

Prior to 1990, CUSIP was obtained from Standard & Poor's CUSIP Directory. From January, 1990 through October 15th, 1996, the CUSIP was obtained from the Composite 3:30 p.m. quotations for US Government Securities. GovPX, as of October 16, 1996, provides the CUSIP number. When in question, the CUSIP is verified by *Standard & Poor's CUSIP Directory*.

All data are checked for internal consistency with each release of the file. Secondary sources, such as the *Wall Street Journal*, are used to check suspect prices.

CRSP TREASURY DATA – BID AND ASK QUOTES

GovPX provided data for the CRSP Treasury databases from 1996 until it was acquired by ICAP. Beginning in February 2009, CRSP released its daily and monthly treasury databases using the new ICAP data.

The two data sources handle bid and ask quotes differently. ICAP provides the actual bid and ask quotes, thus calculated spreads will fluctuate daily. GovPX imputed quotes from their available data. When looking at a time series of spreads, prior to February 2009, for the most part, they are constant. Beginning with the February data, fluctuation

in the spreads may be observed. In both cases the midpoints of the real and imputed spreads are very close.

DIFFERENCES BETWEEN DAILY AND MONTHLY DATABASES

The daily database is a superset of the monthly database with four exceptions:

When-issued prices are included in the Daily Files. All prices before an issue's dated date can be identified as when-issued prices.

Certificate of Deposit, Commercial Paper, and Federal Funds rates are included in the daily files.

Indexes equivalent to the Fama Files (4 total) are not included in the daily files.

C and FORTRAN programming access is provided for the daily data files, FORTRAN for the monthly data files.

Most monthly data begin December 31, 1925, and daily data begin June 14, 1961.

Certain derived data items are not stored, but can be accessed with utility functions that are provided. Other less frequent data are only stored on the observation dates. See Section 5 for information on accessing the data.

ACCURACY

All data are checked for internal consistency, and secondary sources are used to check suspect prices.

Considerable resources are expended in checking and improving the quality of the data. Errors are not common. Some of the errors found in checking the data are the results of inaccuracies in the initial data source. The inaccuracies are corrected as soon as possible. Other errors are CRSP coding errors; over time these coding errors are found and corrected. Historical corrections account for the differences in the data from update to update.

NOTATIONAL CONVENTIONS

All data items and names that occur within FORTRAN programs are printed using a constant – width (courier) font. These names can be variable names, parameter names, subroutine names or keywords. For example, CUSIP refers to the CUSIP Agency identifier, while CUSIP refers to the variable that the programs use to store this identifier.

Names of FORTRAN common blocks are delimited by slashes (/ /).

CHAPTER 2: DATABASE STRUCTURE

The underlying Monthly CRSP US Treasury Database consists of three files: the Calendar File, the Master File, and the Cross-Sectional File. These are supplemented by five derived files. Four of these were developed by Professor Eugene Fama, Robert R. McCormick Distinguished Service Professor of Finance at the University of Chicago. The fifth is the CRSP Fixed Term Index Files.

CALENDAR FILE (MBI)

The Calendar File contains monthly Quote Dates and Delivery Dates, as well as several Julian, linear, and other dates derived from these values.

The current Calendar File is composed of 11 one-dimensional arrays. JDDATE and JQDATE contain raw date values and the other arrays are derived or projected from them.

		CHARACTER	
VARIABLE	DESCRIPTION	COLUMNS	FORMAT
NQDATE(i)	Day Number of Quotation Date	2-6	I5
NDZERO(j)	Day Number of Zeroth Day of Month	8-12	I5
NDDATE(i)	Day Number of Delivery Date	14-18	I5
JAHRMO(j)	Year and Month (YYYYMM) of Quote Date	20-25	I6
IQDAY(i)	Day of Month of Quotation Date (DD)	27-28	I2
NDHFYR(j)	Linear Number of Days in a Half Year	30-32	I3
NQTOQD(i)	Number of Days from Last Quotation Date to this Quotation Date	34-36	I3
JDDATE(i)	Delivery Date (YYYYMMDD)	38-45	I8
JQDATE(i)	Quotation Date (YYYYMMDD)	47-54	I8
QDATE(i)	Quotation Date (YYMMDD)	56-61	I6
NUMDAT(i)	Number of Data Records	63-65	I3

The arrays are dimensioned to MAXMAT, which is set to 1261 in the include file BPARMFL. The i arrays contain zeros for i greater than the index of the last month of the current data. This is stored in the variable NMONS by the FORTRAN calendar load subroutines, and is 76 in the 2002 file. The j arrays contain extrapolated date information up to MAXMAT.

MASTER FILE (MBM)

The Master File contains end-of-day price data on virtually all negotiable direct obligations of the United States Treasury for the period December 31, 1925, to the present. The Master File is sorted by issue. See the Appendix for a list of issues with special provisions.

Section 3 contains detailed descriptions of the date items. For further discussion on earlier data, see Lawrence Fisher and James H. Lorie, A Half Century of Returns on Stocks and Bonds, Chicago: The University of Chicago, Graduate School of Business, 1977, Appendices A and B.

The Master File contains MBM structures. An MBM structure is made up of a header record and MFINIS - MSTART + 1 number of data records.

The following table shows the Master File variables in character MBM header records.

		CHARACTER	
VARIABLE	DESCRIPTION	COLUMN(S)	FORMAT
NTYPE	Record Type Identifier = 1 for Header Records	1	I1
CRSPID	CRSPID (CRSP Issue Identification Number)	2-16	F15.6
CUSIP	CUSIP Number	18-25	A8
NAME	Name of Government Security	27-34	A8
IDTMAT	Maturity Data at Time of Issue	36-43	I8
ITYPE	Type of Issue	45	I1
COUPRT	Coupon Rate (per cent per annum)	47-53	F7.3
IUNIQ	Uniqueness Number	55	I1
MSTART	Month Number of First Price in Data Arrays	56-59	I4
MFINIS	Month Number of Last Price in Data Arrays	60-63	I4
IWHY	Reason for End of Data on File	65	I1
IDTDTD	Date Dated by Treasury	67-74	I8
IDTBNK	Bank Eligibility Date at Time of Issue	76-83	I8
IDTCP	First Call Date at Time of Issue	85-92	I8
IYMCN	Year and Month of First Call Notice	94-99	I6
NOTICE	Notice Required on Callable Issues	101	I1
ITAX	Taxability of Interest	103	I1

		CHARACTER	
VARIABLE	DESCRIPTION	COLUMN(S)	FORMAT
IFLWR	Payment of Estate Taxes Code	105	I1
NIPPY	Number of Interest Payments Per Year	107	I1
IDTFC	Date of First Coupon Payment	109-117	I9
VALFC	Amount of First Coupon Payment	119-127	F9.6
IDTEX1	Not used	129	I1
VALEX1	Not used	131-133	F3.1
IDTEX2	Not used	135	I1
VALEX2	Not used	137-139	F3.1

The following table shows the Master File variables in character MBM data records.

		CHARACTER	
VARIABLE	DESCRIPTION	COLUMN(S)	FORMAT
NTYPE	Record Type Identifier = 0 for Data Records	1	I1
CRSPID	CRSPID (CRSP Issue Identification Number)	2-16	F15.6
NMONS	Month Number of Observation	17-20	I4
PRIC1R(i)	Month-End Bid Price (where available)	22-32	F11.6
PRIC2R(i)	Month-End Ask Price (where available)	34-44	F11.6
IOUT1R(i)	Face Value Outstanding	46-51	I6
IOUT2R(i)	Face Value Publicly Held	53-58	I6
SOURCR(i)	Primary Data Source	60	A1
ACCINT(i)	Accrued Interest as of Month End	62-74	E13.6
PDINT(i)	Interest Payable During Month	76-88	E13.6
YIELD(i)	Promised Daily Yield	90-102	E13.6
RETNUA(i)	Unadjusted Return	104-116	E13.6
RETNXS(i)	Adjusted Excess Return	118-130	E13.6
PCYLD(i)	Yield Compounded Semiannually	132-144	E13.6
DURATN(i)	Duration	146-151	F6.1

Here index i can range from MSTART to MFINIS, which are values in the header record for each issue.

CROSS-SECTIONAL FILE (MBX)

The Cross-Sectional File contains the same information as the Master File, except it is sorted by Quote Date. Section 3 contains detailed descriptions of the data variables.

The Cross-Sectional File contains MBX structures, which are made up of a variable number of data records for each Quotation Date. The sample programs return this number in the variable NOBS each time a day is read. The Calendar File also contains the number of observations in a month in the array NUMDAT.

		CHARACTER	
VARIABLE	DESCRIPTION	COLUMN(S)	FORMAT
JDATE	Quotation Date (YYYYMMDD)	2-9	I8
CRSPID(i)	CRSPID (CRSP Issue Identification Number)	11-25	F15.6
PRIC1R(i)	Month-End Bid Price where available	27-36	F10.5
PRIC2R(i)	Month-End Ask Price where available	38-47	F10.5
ACCINT(i)	Accrued Interest as of Month End	49-56	F8.5
PDINT(i)	Interest Payable During Month	58-65	F8.5
ITAX(i)	Taxability of Interest	67	I1
IFLWR(i)	Payment of Estate Taxes Code	69	I1
YTM(i)	Annualized Yield to Maturity	71-79	F9.4
RETADJ(i)	1-Month Holding Period Return	81-89	F9.4
DURATN(i)	Duration	91-96	F6.1
IOUT1R(i)	Face Value Outstanding	98-103	I6
IOUT2R(i)	Par Value Publicly Held	105-110	I6

Here the index i can range from 1 to MAXNOB, which is set to 300 in include file BPARMFL.

FAMA FILES

The Fama Files are derived from the Monthly CRSP US Treasury Database. They have been made available to CRSP subscribers by Professor Eugene Fama. There are four groups of files: Treasury Bill Term Structure Files, Maturity Portfolios Returns Files, Fama-Bliss Discount Bonds Files, and Risk Free Rates File.

Treasury Bill Term Structure Files are a series of 24 files of term structures based on selected Treasury Bills. There are three series based on bid, ask and average prices. Each series has subset based on 6-month and 12-month target maturities. Each subset contains prices, yields, forward rates and holding period returns files.

Maturity Portfolios Returns Files are two files of portfolio holding period returns. Portfolios of 6 months and 1 year maturity intervals are constructed.

Fama-Bliss Discount Bonds Files contain artificial discount bonds with 1 to 5 years to maturity, constructed after first extracting the term structure from a filtered subset of the available bonds. These files are intended for users who need to extend the term structures available in the Treasury Bill files to longer maturities. This database is a refinement of the one used in E. Fama's and R. Bliss', The Information in Long-Maturity Forward Rates, American Economic Review, v.77 (September 1987). Data in these files begin in 1952.

The Risk Free Rates File contains one and three month risk free rates for use in pricing and macroeconomic models. This file provides lending and borrowing rates derived from bid, ask, and bid/ask average prices. Data in this file goes back to 1925.

FIXED TERM INDICES FILES

The monthly database includes bond indices called the CRSP Fixed Term Indices Files. These derived files offer 7 groups of indices: 30, 20, 10, 7, 5, 2 and 1 year target maturity indices sorted by term type and quote date. This index creates a sophisticated bond yield curve, allowing the selection of data items referenced by returns, prices and duration. Start dates vary based upon term types selected. Programming support is not provided for the CRSP Fixed Term Indices.

The Fixed Term Indices File contains a variable number of data records for each quotation date and term type. There are no sample programs available for this file.

		CHARACTER	
VARIABLE	**DESCRIPTION**	**COLUMN(S)**	**FORMAT**
TERMTYPE	Index Identification Number	1-4	I4
QDATE	Quotation Date (YYYYMMDD)	6-13	I8
CRSPID	CRSPID (CRSP Issue Identification Number)	15-29	A15
YEARSTM	Number of Years Left to Maturity	31-36	F6.3
RETADJ	One Month Holding Period Return	38-48	F11.6
YTM	Annualized Yield to Maturity	50-60	F11.6
ACCINT	Accrued Interest as on Month End	62-72	F11.6
DURATN	Duration	74-79	F6.1
PRIC1R	Bid Price	81-90	F10.6
PRIC2R	Ask Price	92-101	F10.6

The CRSP data are calculated based on cash transactions on the quotation date, which is the last business day of each month. Our data sources prior to GovPX assumed cash transactions on delivery date, typically two business days after the quotation date. GovPX assumes cash transactions on delivery date, typically one business day after the quotation date. CRSP takes these assumptions into account when verifying the internal consistency of the files.

For callable bonds which have been called, or are likely to be called, the original maturity date is no longer valid for computing duration and yield. In these cases the anticipated call date is used as the working maturity date. This note applies to variables promised daily yield (YIELD), yield to maturity (PCYLD), annualized yield (YTM), and duration (DURATN).

STATUS	YIELD AND DURATION COMPUTED TO:
called	next call date
callable and priced at a premium	next call date
callable and priced at a discount	maturity date
not callable	maturity date

Users should be cautious in interpreting yields based on issues close to maturity. Quotes on these instruments are not always reliable due to infrequent trading.

An ITYPE code of 9 is used to signal instruments having unusual provisions. A list of these instruments and their relevant provisions may be found in the Appendix.

DATA DEFINITIONS

Following is a list of all monthly data variables in alphabetical order:

ACCINT(I) **Accrued Interest as of Month End**

REAL

Accrued interest on U.S. Treasury marketable securities is calculated on the basis of the number of days between interest payment dates for a $100 bond or note. Interest is accrued from the last interest payment date or the dated date to quotation date.

COUPRT **Coupon Rate (Percent Per Annum)**
REAL

Coupon rate or nominal interest rate. Annual interest per $100 of face value.

CRSPID **CRSPID REAL*8**

CRSPID is the CRSP Issue Identification Number. It is in format YYYYMMDD. TCCCCE, where:

YYYY	=	Maturity Year
MM	=	Maturity Month
DD	=	Maturity Day
T	=	Type of Issue (ITYPE)
CCCC	=	Integer part of Coupon Rate (COUPRT * 100)
E	=	Uniqueness Number (IUNIQ)

For example, 19850515.504250 identifies a 4¼% callable bond which matures May 15, 1985.

CRSPID is a double precision real variable. It is CRSP's unique Identification Number for the issue. It is a composite of other variables. Therefore, mathematical operations to retrieve parts of the CRSPID are unnecessary when using the Master File.

CUSIP **CUSIP Number**
CHARACTER*8

The Committee on Uniform Security Identification Procedures began assigning CUSIP identification numbers in 1968. Issues that matured prior to 1968 are assigned the value OXX. The earliest maturity on the file with a CUSIP is February 15, 1969.

DURATN(I) **Duration** **REAL**

Also known as Macaulay's Duration, duration is the weighted average number of days until the cash flows occur, where the present values, discounted by yield to maturity, of each payment are used as the weights.[1]

If are the present values at time t0 of payments promised at perhaps unequally spaced time intervals t_1 , t_2 , ...,t_n then the duration of that promised stream measured at t_0 is:[2]

$$D_{t_0} = \frac{\left(\sum_{j=1}^{j=n}\right)(t_j - t_0)P_{t_j}}{\left(\sum_{j=1}^{j=n}\right)P_{t_j}} = \frac{\left(\sum_{j=1}^{j=n}\right)t_j P_{t_j}}{\left(\sum_{j=1}^{j=n}\right)P_{t_j}} - t_0$$

IDTBNK **Bank Eligibility Date, in YYYYMMDD Format** **INTEGER**

Bank eligibility date at the time of issue. Contractual earliest date security was to become bank eligible. A security is bank eligible if a bank may own it. Some 2½%'s and 2¼%'s issued during and immediately after WWII had limited negotiability because of prohibitions and restrictions on bank ownership.

0 = No restrictions apply.

YYYYMMDD= restrictions removed or scheduled to have been removed on this date.

All remaining restrictions were removed on January 1, 1955. The last bank eligible CRSPID in the file is dated November 15, 1945 and matured on December 15, 1972.

IDTCP **First Call Date, in YYYYMMDD Format** **INTEGER**

First call date at time of issue if callable.

IDTCP is 0 if not callable.

All interest payment dates beginning with the first call date are possible future call dates.

IDTDTD **Date Dated by Treasury, in YYYYMMDD Format** **INTEGER**

Coupon issues accrue interest beginning on the dated date. This may result in a modified first coupon payment if the dated date is not a regular interest payment date.

IDTDTD is 0 if not available or not applicable.

IDTEX1 **Date of First Exchange Offer, in YYYYMMDD Format** **INTEGER**

(not currently on file)

IDTEX2 **Date of Second Exchange Offer, in YYYYMMDD Format** **INTEGER**

(not currently on file)

IDTFC **First Coupon Payment Date, in YYYYMMDD Format** **INTEGER**

Negative dates are estimated from the normal coupon payment cycle. Positive dates have been verified in the Treasury Offering Circular.

IDTFC is 0 if not applicable.

IDTMAT **Maturity Date at Time of Issue, in YYYYMMDD Format** **INTEGER**

The maturity date at the time of issue is in a YYYYMMDD format in the files for all securities except for the consol bond, which is set to 20990401.

IFLWR **Payment of Estate Tax Code** **INTEGER**

1 = No special status.

2 = Acceptable at par and accrued interest if owned by decedent at time of death: a flower bond.

3 = Acceptable at par and accrued interest if owned by decedent during entire 6 month period preceding death: a flower bond.

IOUT1R(I) **Face Value Outstanding** **INTEGER**

Amount (face value) issued and still outstanding in millions of dollars. Set to 0 for unknown values.

IOUT2R(I) **Publicly Held Face Value Outstanding** **INTEGER**

Amount (face value) held by the public in millions of dollars. This is the total amount outstanding (IOUT1R) minus the amount held in U.S. Government accounts and Federal Reserve Banks. This amount is not available for Treasury Bills and is always set to 0. For other issues, it is set to 0 After December 31, 1982, these numbers are reported quarterly instead of monthly and the reported values are carried forward for the next two months.

IQDAY(I) **Day of Month of Quotation Date, in DD Format** **INTEGER**

ITAX **Taxability of Interest** **INTEGER**

1 = Fully taxable for federal income tax purposes.

2 = Partially tax exempt, i.e. interest of first $3000 of bonds of this class, at par value, exempt from tax subject to surtax but not to normal tax.

3 = Wholly tax exempt.

ITYPE **Type of Issue** **INTEGER**

1 = Noncallable bond

2 = Noncallable note

3 = Certificate of indebtedness

4 = Treasury Bill

5 = Callable bond

6 = Callable note

7 = Tax Anticipation Certificate of Indebtedness

8 = Tax Anticipation Bill

9 = Other, flags issues with unusual provisions

IUNIQ **Uniqueness Number** **INTEGER**

Uniqueness number assigned to CRSPID if maturity date, coupon rate and type are not sufficient to distinguish between two securities; zero otherwise.

IWHY **Reason for End of Data on File** **INTEGER**

0 = Still quoted on last update of file.

1 = Matured.

2 = Called for redemption.

3 = All exchanged.

4 = Sources no longer quote issue.

IYMCN **Year and Month of First Call Notice, in YYYYMM Format** **INTEGER**

`IYMCN` is 0 if not called or not callable.

JAHRMO(I) **Year and Month of Quotation Date, in YYYYMM Format** **INTEGER**

`JAHRMO(1)` is equal to 192512.

JDATE **Current Quotation Date, in YYYYMMDD Format** **INTEGER**

JDDATE(I) **Delivery Date, in YYYYMMDD Format** **INTEGER**

JQDATE(I) **Quotation Date, in YYYYMMDD Format** **INTEGER**

MFINIS **Month Number of Last Price** **INTEGER**

`PRIC1R(MFINIS)` is the last bid price for a security. `MFINIS` is 1 for December, 1925 and 889 for December, 1999.

MSTART **Month Number of First Price** **INTEGER**

`PRIC1R(MSTART)` is the first bid price for a security. `MSTART` is 1 for December, 1925 and 889 for December, 1999.

NAME **Name of Government Security** **CHARACTER*8**

NAME	ITYPE	EXPLANATION
BILL	4	
T_A_BILL	8	Tax Anticipation
T_A_CTF	7	Tax Anticipation
BOND	1, 5, 9	
CNV_BOND	1	Convertible
CONSOL	9	Consol
CTF	3, 7, 9	Certificate of Deposit
NOTE	2, 6, 9	
1LL_BOND	5	First Liberty Loan
1LL_CV	5	1LL First Conversion
1LL_2CNV	5	1LL Second Conversion

NAME	ITYPE	EXPLANATION
2LL_BOND	5	Second Liberty Loan
2LL_CNV	5	2LL First Loan Conversion
3LL_BOND	1	Third Liberty
4LL_BOND	9	Fourth Liberty Loan
4LL_CALL	9	Fourth Liberty Loan Called
PLC_BOND	1, 5	Panama Canal Loan

NDDATE(I) **Day Number of Delivery Date** **INTEGER**

Number of days from January 1, 1900 to delivery date.

NDHFYR(I) **Number of Days in the Preceding Half Year** **INTEGER**

NDHFYR(I) = NDZERO(I) – NDZERO(I-6)

NDZERO(I) **Day Number of Zeroth Day of Month** **INTEGER**

NDZERO expressed as the number of days from January 1, 1900 to the day before the first day of this month. NDZERO(1) is the number of days to the day before December 1, 1925.

NIPPY **Number of Interest Payments Per Year** **INTEGER**

0 = Treasury bill or certificate paying interest only at maturity

1 = Annual interest

2 = Semi-annual interest

4 = Quarterly interest

All interest-bearing negotiable Treasury securities issued since the beginning of WWI have paid interest semi-annually. The last outstanding issue that paid interest quarterly was the Panama Canal Loan 3%'s due June 1, 1961.

NOBS **Number of Securities Listed in Current Cross-Sectional Month** **INTEGER**

NMONS **Number of Months with Data in Current Calendar** **INTEGER**

NOTICE **Notice Required on Callable Issues** **INTEGER**

0 = No notice required or not callable

3 = 3 months notice

4 = 4 months notice

6 = 6 months notice

NQDATE(I) **Day Number of Quotation Date** **INTEGER**

NQDATE is expressed as the number of days from January 1, 1900 to quotation date.

NQTOQD(I) **Number of Days from Last Quote Date to this Quote Date** **INTEGER**

NTYPE **Record Type Identifier** **INTEGER**

NTYPE = 1 for a header file and 0 for a data file.

NUMDAT(I) **Number of Securities Active During a Specific Month** **INTEGER**

PCYLD(I) **Yield to Maturity Compounded Semi-Annually** **REAL**

$PCYLD(I) = 2.0[e^{YIELD(I) \times 182.5} - 1.0]$

Yield can be converted to an annual rate compounding at some other frequency, f, assuming a 365 day year, using the formula:

$f\,[e^{YIELD(I)(365/f)} - 1.0]$

If a yield is missing, PCYLD(I) is coded as -99.

PDINT(I) **Interest Payable During Month** **REAL**

PDINT(I) **is the coupon payable in month I.**

PRIC1R(I)& PRIC2R(I) **Prices** **REAL**

Arrays PRIC1R and PRIC2R contain month-end bid and ask information when available for each month prior to maturity.

Arrays PRIC1R and PRIC2R contain day-end bid and ask information, when available for each quote date prior to maturity. If PRIC1R and PRIC2R are not available, whatever quote information is available is used and coded using the following conventions:

INFORMATION IN DATA SOURCE	PRIC1R	PRIC2R
Bid and Ask	Bid	Ask
Mean of Bid and Ask	Mean	Mean
Bid only	Bid	-Bid
Ask only	-Ask	Ask
Sale (last trading price)	Sale	0
No price Sale	0	0

PRIC1R(MSTART) through PRIC1R(MFINIS) and PRIC2R(MSTART) through PRIC2R(MFINIS) are the available prices for a given issue.

QDATE(I) **Quote Date, in YYMMDD Format** **INTEGER**

RETADJ(I) **One Month Adjusted Holding Period Return** **REAL**

RETADJ is the one month holding period return expressed as a percentage.

```
RETADJ(I) = 100 x RETNUA(I)
```

If RETNUA(I) is missing, RETADJ(I) is set to -999.

RETNUA(I) **One Month Unadjusted Holding Period Return** **REAL**

RETNUA is price change plus interest, divided by last month's price. It is set to a large negative number for months in which a return cannot be calculated, i.e. if the price is missing for either this month or last month. Missing returns are set to -99.where

$$RETNUA\left(1 = \frac{XNUM}{XDEN}\right)$$ where, when Bid and Ask available:

$$XNUM = \frac{PRIC1R(I) + PRIC2R(I)}{2} - \frac{PRIC1R(I-1) + PRIC2R(I-1)}{2} + YINT$$

$$XDEN = \frac{PRIC1R(I-1) + PRIC2R(I-1)}{2} + ACCINT(I-1)$$

$$YINT = PDINT(I) + ACCINT(I) - ACCINT(I-1)$$

For all other cases:

$$XNUM = PRIC1R(I) - PRIC1R(I-1) + YINT$$

$$XDEN = PRIC1R(I-1) + ACCINT(I-1)$$

$$YINT = PDINT(I) + ACCINT(I) - ACCINT(I-1)$$

RETNXS(I) **Excess Return** **REAL**

RETNXS is the return in excess of what would have been computed if the promised yield from last month on a security had remained constant throughout the month. Although RETNUA is the price equivalent of total return on a common stock, the variability in the time between quotation dates may contribute an appreciable part of the time-series variance of return because, even without taking holidays into consideration, the time between quotation dates ranges from 28 to 33 days. For an issue yielding 8 percent per annum, the variability of return introduced by the variation in the time between quotation dates is roughly equivalent to random errors in price of 1/32 of a point. Such errors and some other equalizing differences among returns may be minimized by using RETNXS.

RETNXS is set to -99 for months in which it cannot be calculated, i.e. if the price is missing for either the current or previous month.

```
RETNXS(I) = RETNUA(I) - RETXP(I)
```

Calculation of constant yield (expected) return RETXP(I) in periods when no coupon is due:

```
RETXP(I) = e^YIELD(I-1)¥NQTODQ(I) - 1.0
```

This computation of RETXP assumes that interest payments received are not reinvested between quotation dates. In a period when interest is received, constant yield return is:

$$RETXP(I) = (e^{YIELD(I-1) \times NQTODQ(I)} - 1.0) - PDINT(I)\left(\frac{e^{YIELD(I-1)TP} - 1.0}{XDEN}\right)$$

where: TP is the number of days from interest payment date to quotation date for month I and NQTODQ(I) is the number of linear days between quotation dates.

XDEN is defined under RETNUA.

SOURCR(I) **Primary Data Source** **CHARACTER*1**

F First Boston

G Government actuary

M	Morgan Guaranty
Q	Bank and Quotation Record
R	Federal Reserve Bank of New York
S	Salomon Brothers
T	New York Times
W	Wall Street Journal
X	GovPX, Inc./ICAP
Z	Multiple sources

TERMTYPE **Index Identification Number** **INTEGER**

Fixed term index identification number links all results in the Fixed-Term Indices File. The identification is typically in the form YYYYMM, where YYYY is the number of years to maturity of issues selected in the index and MM is the number of months an issue is held once selected before another is chosen.

VALEX1 **Value at Date of First Exchange Offer** **REAL**

(not currently on file)

VALEX2 **Value at Date of Second Exchange Offer** **REAL**

(not currently on file)

VALFC **Amount of First Coupon Per $100 Face Value** **REAL**

(not currently on file)

YEARSTM **Number of Years Left to Maturity** **REAL**

In the fixed term index files, YEARSTM contains the time left to maturity of the selected issue as of the quote date, expressed as an annual decimal amount.

YIELD(I) **Promised Daily Yield** **REAL**

YIELD is the promised yield daily rate, also called daily yield to maturity.

At any date, the promised yield of a security is the single interest or discount rate which makes the sum of the present values of the principle at maturity and future interest payments be precisely equal to the full price of the security. The full price is the nominal price, e.g., mean of PRIC1R and PRIC2R (flat prices), plus the accrued interest on the date in question. If a price is missing, the YIELD for that month is set to -99.

YTM(I) **Annualized Yield to Maturity** **REAL**

YTM is the annualized yield to maturity expressed as a percent per annum.

$$\text{YTM} = 100 \times (\text{YIELD(I)} \times 365)$$

If yield is missing, YTM for that month is set to -999.

FAMA TREASURY BILL TERM STRUCTURE FILES

There are three sets of Treasury Bill Files. These sets differ only in the value used for the price on which computations are based. The three alternatives are the mean of the bid and ask quotes (TBILLAVE), bid quotes (TBILLBID) and ask quotes (TBILLASK).

Each set of Treasury Bill Term Structure Files consists of eight files containing term structure information derived from 6-month and 12-month Treasury Bills. For each of the two types of bills there is a Forward Rate File, a Holding Period Return File, a Price File, and a Yield File.

Each set of four files is built by selecting for each month the bill closest to either 6 or 12 months to maturity, and then following that bill to maturity. The 6-month files have been extended back in time so that prior to 6-month Treasury Bills being available, 3-month bills were used, and before that one month bills. In the 6-month file the closest bill to the target maturity was used with a maximum mismatch of 4 days either way. In the 12-month file, the 12-month bill was the longest bill with more than 11 months and 10 days to maturity. This results in a larger variation between target and actual maturities. See the Price Files for actual maturities. Users interested in short maturities should use the 6-month or Risk Free Rates file rather than the 12-month files.

The 6-month files all have 7 columns, a date and 6 data columns. The 12-month files have 13 columns.

The four files for each type of bill are described as follows:

FORWARD RATE FILE

The Forward Rate File gives the one month forward rates. Column 1 contains the quotation date. Column 2 contains the forward rate from zero to 1 month, column 3 the forward rate from 1 to 2 months, etc.

HOLDING PERIOD RETURN FILE

The Holding Period Return File contains ex-post one-month holding period returns. Column 1 contains the date the position was initiated. Column 2 contains the return from purchasing a one month bill on that date and then holding it to maturity. Column 3 contains the return from purchasing a two month bill on that date and selling it one month later, etc.

PRICE FILE

The Price File identifies each bill in the term structure each month, with such additional information as price, exact time to maturity, and yield. This is essentially a descriptive file, and so is not suitable for statistical analysis. When printed out, the data will appear as follows:

19650129 (a)	19650228 (c)	19650331 . . .	
23770 (b)	23800 (d)	23861 . . .	
	1 30 (e)	2 61 . . .	etc.
	99.679200 (f)	99.362900 . . .	
	0.003256 (g)	0.003185 . . .	

1. Quote Date
2. Linear Quote Date
3. Maturity Date
4. Linear Maturity Date
5. Months and Days to Maturity
6. Price (bid, ask or mean)
7. Yield to Maturity (30.4 day basis)

YIELD FILE

The Yield File contains the yield to maturity for each bill in the term structure, with column 1 containing the quotation date, column 2 the yield to maturity of the one month bill, column 3 the yield to maturity of the two month bill, etc.

COMPUTATION OF FAMA T-BILL FILES

Let:

$P_{t,\tau}$ = price of bill with τ months to maturity observed at time *t*

$N_{t,\tau}$ = number of days to maturity of a τ month bill at time *t*

Then:

$Y_{t,\tau}$ = yield to maturity of a τ month bill observed at time *t*

$$Y_{t,\tau} = \left[\ln\left(\frac{100}{P_{t,\tau}}\right)\right]\left(\frac{30.4}{N_{t,\tau}}\right)$$

$F_{t,\tau}$ = forward rate from $F_{t,\tau}$ to $t+\tau$ observed at time *t*

$$F_{t,\tau} = \left[\ln\left(\frac{P_{t,\tau-1}}{P_{t,\tau}}\right)\right]\left(\frac{30.4}{(N_{t,\tau}-N_{r,\tau-1})}\right)$$

Ht, τ = one month holding period return for a τ month bill bought at time *t* and sold at time *t*+1 (when it has τ–1 months remaining to maturity). And note that in the return files, the date for $H_{t,\tau}$ is the purchase month *t*.

$$H_{t,\tau} = \left[\ln\left(\frac{P_{t+1,\tau-1}}{P_{t,\tau}}\right)\right]\left(\frac{30.4}{N_{t,\tau}-N_{t+1,\tau-1}}\right)$$

By convention, $\tau = 0$ at maturity. Therefore, when $P_{t,0} = 100$, $Y_{t,1} = F_{t,1} = H_{t,1}$.

The computations do not include transaction costs. All yields, rates and returns have been standardized to a 30.4 day basis and are therefore directly comparable.

FAMA MATURITY PORTFOLIOS RETURNS FILE

The Maturity Portfolios Returns File (BONDPORT) consists of two sections. One section uses six month maturity intervals to define the portfolios, the other uses one year intervals. Only callable, non-callable, non-flower notes and bonds are included in the portfolios. Partially or fully tax-exempt issues are excluded. The returns are an equal weighted average of the unadjusted holding period return (RETNUA) for each bond in the portfolio.

The section of the file with 12 month maturity intervals has nine columns. Column 2 is the quote date for the end of the period over which the return is measured. Column 1 is the month number from the Calendar File, which corresponds to the quote date in column 2. Column 3 through 8 contain the one month returns for portfolios holding securities which mature: (column 3) from 1 to 12 months from the quote date, (4) from 13 to 24 months, (5) from 25 to 36 months, (6) from 37 to 48 months. (7) from 49 to 60 months, and (8) from 61 to 120 months. Column 9 contains the portfolio returns for securities with greater than 120 months to maturity.

The section of the file with 6 month maturity intervals has 14 columns. Columns 1 and 2 are the same in both sections of the file. Columns 3 through 12 contain one month returns for portfolios holding securities which mature: (column 3) from 1 to 6 months from the quote date, (4) from 7 to 12 months, (5) from 13 to 18 months, (6) from 19 to 24 months, (7) from 25 to 30 months, (8) from 31 to 36 months, (9) from 37 to 42 months, (10) from 43 to 48 months, (11) from 49 to 54 months, (12) from 55 to 60 months. Column 13 contains the return on a portfolio of securities maturing from 61 to 120 months from the quote date and column 14 contains the return of a portfolio of securities maturing greater than 120 months from the quote date.

FAMA-BLISS DISCOUNT BONDS FILE

The Fama-Bliss (FAMABLIS) File uses only fully taxable, non-callable, non-flower bonds.

BOND SELECTION FOR TERM STRUCTURE

Four filters are used to select from the remaining bonds a subset from which to construct a term structure.

FIRST PASS: INITIAL CHOICE OF INSTRUMENTS

The screen on the first pass is based on two moving averages of CRSP yields to maturity on the 3 longer and 3 shorter maturity instruments surrounding the bond being considered for inclusion. Issues with the same maturity may form part of the window. Whether

they are considered shorter or longer depends on the relative CRSP coupon rates. Also, 1.5% notes are excluded from windows, since these are subject to large spurious errors.

A bond is included if its yield is within 0.2% (an absolute not relative yield difference) of either average, or if its yield is between either average. The latter rule allows rapid changes in the yield curve. Multiple issues with the same maturity are permitted. Included instruments with different maturities must have maturities at least 7 days apart. Conflicts are resolved using issues in this order of preference: bill with smallest spread, bills, maturity dates with multiple issues, or issue trading closest to par.

There are refinements of the rules used to form the moving average yield windows that improve the screen.

1. The moving windows are restricted to bills as long as they are available. There are well-known liquidity problems that affect the pricing of short bonds.

2. Windows are bounded below by 0.0%.

3. The longest maturity issue is always included.

SECOND PASS: CLEAN UP BIG YIELD REVERSALS

The second pass begins to refine the discount yield term structure by deleting suspicious bonds which cause large reversals in the discount yields generated from the set of bonds included in the first pass.

A reversal is defined as a sequence of changes in the discount yield function greater than 0.2% and opposite in sign. A reversal sequence ends when there is a change less than 0.2% in the discount yield function.

When there are multiple bonds at a given maturity, they are examined separately in looking for reversals. That is, first one bond is included in the sequence of yields. Then it is dropped and the other is included. Bonds at the same maturity tend to be priced the same way, so they will break reversal sequences if they are not treated separately.

To determine which bonds in a reversal sequence are to be deleted, we go to the end of the sequence. The change in yield less than 0.2% at the end of the sequence is assumed to mean that the last change greater than 0.2% is good. Thus, we delete the second from the last in the sequence, the fourth from last, etc.

THIRD PASS: RECONSIDER EXCLUDED BONDS

With the bonds included after the second pass, a new term structure of discount yields can be calculated. The next step is to re-examine bonds excluded on the first and second passes for possible inclusion. Pass Three adds selected bonds from those previously excluded to the set of bonds included after Pass Two.

The inclusion criteria are similar to Pass One with the criteria applied to the discount yield rather than the yield to maturity.

1. The mean yields of each of two moving windows of three strictly longer and three strictly shorter maturity bonds are computed.

2. Bonds of the same maturity as the one being tested are excluded from the windows.

3. Only bonds previously included, either on Pass Two or earlier in Pass Three, may form part of the window. The 1.5% notes are no longer specifically excluded.

4. An excluded bond is put back if the discount yield at its maturity date which would result from its inclusion is within 0.2% of the mean of either the shorter or the longer window, or if it is between the two means.

FOURTH PASS: LAST CHECK FOR REVERSALS

Repeat reversal tests of Pass Two, using yields calculated from bonds included after Pass Three.

CALCULATION OF FORWARD RATES, DISCOUNT PRICES AND YIELDS

The bills and bonds that survive Pass Four allow us to calculate monthly term structures of forward rates and yields for adjacent accepted maturities. Each successively longer maturity accepted allows us to calculate an additional forward rate. When there are multiple accepted bonds on a single quote date, the forward rates for each of them are calculated and the average is used as the rate for the quote date. Forward rates calculated from shorter maturity bonds are used to price the coupons for the subsequent available maturity. The coupon dates are unlikely to correspond exactly to the forward rate dates. To price coupons that fall within the period covered by a forward rate, the forward rate (always continuously compounded) is assumed to be constant during the period, so that it can be used for any subinterval. Likewise, there may be coupons as well as a principal payment during the period from the maturity date of the last included bond to the maturity of the next longer bond. In this case, the incremental forward rate is assumed to cover the whole incremental period to the maturity of the next longer bond.

The forward rates described above cover unevenly spaced periods between the maturities of accepted bills and bonds. Under the assumption that a forward rate applies to each day of the period it covers, the forward rates can be used to calculate implied prices of artificial discount securities for maturities corresponding to future end-of-month quote dates. Equivalently, one can think of the calculations as generating daily forward rates, which are then grouped to get implied forward rates for annual intervals.

These forward rates are used to calculate prices and yields on artificial discount securities for the maturities corresponding to end-of-month quote dates one through five years in the future. To avoid having single bonds introduce spurious results only annual maturity intervals were used. This increases the signal to noise ratio. Extension of the term structure beyond 5 years is impractical due to the scarcity of qualified issues and the erratic results produced by those quotes which are available.

CRSP RISK FREE RATES FILE

The CRSP Risk Free Rates File (RISKFREE) contains nominal one and three month risk free rates from December 1925 through the present. Three yields are provided for each series based on the bid, asked and average prices. Yields are continuously compounded 365 day rates. The CRSP identifier of the security used and the number of days to maturity of that issue are also provided.

The Treasury Bill selected in the one month series that is chosen has a minimum of 30 days to maturity, and is the closest T-Bill to 30 days to maturity. The three month series used a 90 day target. Where bills were not available, certificates, and in a few cases notes, were used.

The selection among alternatives was, at times, subjective in early periods. The issue with the maturity closest to target was sometimes rejected because the quotes were suspicious. In no case was an issue used which did not mature on its next coupon payment date. Also excluded were issues with bid quotations implying negative yields. This resulted in some very short nominally three month maturities prior to 1942. Similarly, scarcity of available issues results in some very long nominal one month issues being used prior to 1937. The range of maturities of both series after 1942 is within a few days of the targets. Users may wish to restrict their usage to this period.

Prior to 1938 bids and asks were not always available. In these cases the available data is a trade price. The bid and average yields are set to the trade yield and the ask yield is set to a missing code of -9.0. Bid and average yields are never missing. Valid ask and average yields may actually be negative.

CRSP FIXED TERM INDICES FILES

The CRSP Fixed Term Indices Files contain 1, 2, 5, 7, 10, 20 and 30 year Fixed Term Indices. These indices are identified and sorted by TERMTYPE, which distinguishes the length of maturity. A valid issue that best represents each term is chosen at the end of each month for each of the above referenced fixed terms

and held through the next month. Valid issues are least six months from the target maturity date and fully taxable. The selection process selects a representative bond from each of the fixed term groups by filtering available issues on the basis of their characteristics. The selection criteria first tries to find a fully taxable, non-callable, non-flower bond that is closest to the target maturity of its group. If there is more than one security, the one most recently issued is used. If there is no other suitable issue, a second pass is made where flower bonds are accepted.

These values were designed to plot a sophisticated yield curve and the yields, returns, accrued interest, prices and durations are provided on each quote date.

The Fixed Term Indices Daily Files begin June 14, 1961. The Fixed Term Indices vary by index as follows:

TERMTYPE	INDEX	MONTHLY FILE START DATE
3012	30 Year Bonds	November 29, 1941
2012	20 Year Bonds	January 31, 1942
1012	10 Year Bonds	May 31, 1941
712	7 Year Bonds	April 30, 1941
512	5 Year Bonds	April 30, 1941
212	2 Year Bonds	January 31, 1941
112	1 Year Bonds	January 31, 1941

CHAPTER 5: ACCESSING THE DATA

This section provides general information needed to access the Monthly CRSP US Treasury Database. The data files are available in three formats: ASCII, Excel, and SAS.

The ASCII files, closely structured to the format formerly provided on the tape, work with the included FORTRAN sample programs and subroutines and can be used to load into various other programs. These files were used to create the Excel and SAS files. See Section 2.1 for details about the ASCII file specifications for the Master (MBM) File, the associated Header File, Cross Sectional (MBX) File and the Fixed Term Indices File, and 5.2 for the ASCII file layout and the FORTRAN Format of the Supplemental Fama Files. Section 5.1 contains descriptions of the sample programs and subroutines.

The Excel Workbook files may contain multiple worksheets per file. The large master and cross sectional files were not converted into Excel because of their size. See "Excel Files" on page 24.

The SAS files are standalone data sets. They should be readable on any supported SAS platform. See "SAS Files" on page 24.

USE OF THE CRSP SAMPLE PROGRAMS

Sample programs were developed on an Open VMS system, tested and supported on Sun Solaris, Windows, and Linux Redhat. Make files are provided and can be run on all three CRSP-supported platforms.

Sample programs, make files, subroutine source files, and include files all reside in the /src directory. Source files have the extension F90 and include files have the extension txt. CRSP recommends that you compile and run these sample programs in a working directory to which you have set as your default.

Copy all files from your installed data and src subdirectories into the working directory. Once copied, to execute:

Windows	NMAKE /F monthly_bond_samp.mak
Sun	make –f monthly_bond_samp.mk
Linux – g95	make –f monthly_bond_samp.mkg5
Linux – Lahey	make –f monthly_bond_samp.mk5

The make files will automatically compile the needed subroutines before compiling the main programs.

To run the programs, issue the following commands:

WINDOWS:	LINUX & SUN:
.\mbmcha.exe	./mbmcha
.\mbxcha.exe	./mbxcha
.\mbmbin.exe	./mbmbin
.\mbxbin.exe	./mbxbin

MBMCHA and MBXCHA will create three .bin files, binary versions the Calendar, Master, and Cross_Sectional files into your working directory. The remaining three commands will process the new binary files. Note that MKBCAL is an optional file. If MBMCHA is run before MBXCHA, it is not needed.

DESCRIPTION OF PROGRAMS

This section provides general information needed to convert the Master and Cross-Sectional data from character format to binary format and to use the sample programs CRSP provides to access the data. These files are provided in ASCII.

- Compile and run MBMCHA to create the binary Calendar File and the binary Master File.
- Compile and run MBXCHA to create the binary Cross-Sectional File.
- Modify, compile and run the binary programs MBMBIN and MBXBIN on the binary files.

SAMPLE PROGRAMS

The sample programs are written in FORTRAN-95.

The user is advised to read Section 3 to become familiar with the names and definitions of the variables.

MBMCHA Program MBMCHA reads the character calendar file and the character master file and creates the binary calendar file and the binary master file. MBMCHA first calls subroutine CALGTC to read the character calendar file into the common block /BCAL/ and CALPTC to write the character calendar file. MBMCHA then makes successive calls to MBMGTC, each call reading all the data for one issue from the data file into the common block /MBMREC/. As soon as MBMGTC loads an issue, a call to MKMBMB writes all the issue's data to a binary file.

MBXCHA Program MBXCHA reads the binary calendar file and the character cross-sectional file and creates the cross-sectional file in binary format. MBXCHA first calls subroutine CALGTB to read the binary calendar file into the common block /BCAL/. MBXCHA then makes successive calls to MBXGTC, each call reading all the data for one quote date, from the data file into the common block /MBXREC/. As soon as MBXGTC loads a quote date a call to MKMBXB writes all the quote date data to a binary file.

The binary calendar file may be created from running MBMCHA or MKBCAL. If MBMCHA is run before MBXCHA, MKBCAL does not need to be run before running MBXCHA.

MBMBIN Program MBMBIN reads the binary calendar file and the binary master file. MBMBIN first calls subroutine CALGTB to read the binary calendar file. MBMBIN then makes successive calls to MBMGTB, each call reading all the data for one issue from the data file into the common blocks /MBMREC/.

MBXBIN Program MBXBIN reads the binary calendar file and the binary cross-sectional file. MBXBIN first calls subroutine CALGTB to read the binary calendar file into the common block /BCAL/. MBXBIN then makes successive calls to MBXGTB, each reading all the data for one quote date from the data file into the common block /MBXREC/.

MKBCAL Program MKBCAL reads the character calendar file and creates the binary calendar file. MKBCAL first calls CALGTC to read the character calendar file into the common block /BCAL/ and then calls CALPTB to write the binary calendar file. MKBCAL is not needed if MBMCHA is run before MBXCHA is run.

SUBROUTINES

Subroutine source is included in the file SUBR.F90.

CALGTB(JUNIT,*)

Subroutine CALGTB reads the binary calendar file into the /BCAL/ common block. JUNIT is the unit number of the previously opened binary calendar file.

CALGTC(JUNIT,*)

Subroutine CALGTC reads the character calendar file into the /BCAL/ common block. JUNIT is the unit number of the previously opened character calendar file.

CALPRT (JUNT)

Subroutine CALPRT writes a formatted version of the calendar to a file opened as unit number MUNIT. This file is suitable for printing.

CALPTB (LUNIT,*)

Subroutine CALPTB writes the calendar to a binary file. LUNIT is the unit number of the previously opened binary calendar file.

CALPTC (LUNIT,*)

Subroutine CALPTC writes the calendar to a character file. LUNIT is the unit number of the previously opened character calendar file.

CLJL(IDTCAL, IDTJUL,*)

Subroutine CLJL converts a calendar date to its linear (julian) date equivalent. IDTCAL is the integer YYYYMMDD date which CLJL should convert, IDTJUL is the converted linear (julian) date which CLJL returns. The alternative return is used if IDTCAL is an illegal date.

INDBDT (DATE, CODE, ARRAY, MAXARR)

Function INDBDT can be used to locate the index of a date in a given a date array. DATE is the value to be located in array ARRAY with MAXARR sorted values. CODE is one of -1, 0, or 1, depending on what action is taken when the exact date given is not found. If CODE = 0 and the exact date is not found, 0 is returned. If CODE = -1 and the exact date is not found, the index of the first date less than DATE is returned, or 0 is returned if DATE is less than any date in the array. If CODE = 1 and the exact date is not found, the index of the first date greater than DATE is returned, or 0 is returned if DATE is greater than any date in the array. For example, INDBDT (19900115,1,JQDATE,NMONS) will return the index of 19900131 = 770.

MBMGTB(IUNIT,*,*)

Subroutine MBMGTB first calls RESETM to erase the previous record's data and then reads a binary MBM structure for unit number IUNIT. MBMGTB reads a header record and then reads MFINIS - MSTART + 1 number of data records. The first alternate return is taken at the end of file. The second alternate return is taken if there is an error.

MBMGTC(IUNIT,*,*)

Subroutine MBMGTC first calls RESETM to erase the previous record's data and then reads a character MBM structure. MBMGTC first reads a header record and then reads MFINIS - MSTART + 1 number of data records. The first alternate return is taken at the end of file. The second alternate return is taken if there is an error.

MBMGTC ensures that:

1. the record types for the header and the data records are correct
2. the CRSPID from the header and the data records are the same
3. there are MFINIS - MSTART + 1 number of data records and NMON increments by 1

MBXGTB(IUNIT, THEDAY, NUMREC,*)

Subroutine MBXGTB first calls RESETX to erase the previous record's data and then reads NUMREC number of binary MBX data records from IUNIT. MBXGTB makes sure that the quote dates match and the expected number of data records are read. THEDAY is the next expected quote date. The alternate return is taken if there is an error.

MBXGTC(IUNIT, THEDAY, NUMREC,*)

Subroutine MBXGTC first calls RESETX to erase the previous record's data and then reads NUMREC number of binary MBX data records from IUNIT. MBXGTC makes sure that the quote dates match and the expected number of data records are read. THEDAY is the next expected quote date. The alternate return is taken if there is an error.

MKMBMB(KUNIT)

Subroutine MKMBMB writes a binary MBM structure to file KUNIT, consisting of a header record and MFINIS - MSTART + 1 number of data records.

MKMBMC(KUNIT)

Subroutine MKMBMC writes a character MBM structure to file KUNIT, consisting of a header record and MFINIS - MSTART + 1 number of data records to file KUNIT.

MKMBXB(KUNIT)

Subroutine MKMBXB writes NOBS number of binary MBX data records to file KUNIT.

MKMBXC(KUNIT)

Subroutine MKMBXC writes NOBS number of character MBX data records to file KUNIT.

RESETM

Subroutine RESETM resets the vectors belonging to the previous MBM structure.

RESETX

Subroutine RESETX resets the vectors belonging to the previous MBX structure.

INCLUDE FILES

Include files are used in FORTRAN as a convenient way to replace long, often-used blocks of code with single statements. There are four include files used by the sample programs and subroutines. The same include files are used by the character and binary sample programs. Each declares a set of parameters or one of the common blocks. The compiler replaces include statements with the contents of the corresponding include file. If an include file is modified, all programs or subroutines that use the include file must be recompiled.

BCALFL Include file `BCALFL` contains the variable declarations for common block `/BCAL/`.

MBMFL Include file `MBMFL` contains the variable declarations for common block `/MBMREC/`.

MBXFL Include file `MBXFL` contains the variable declarations for common block `/MBXREC/`.

BPARMFL Include file `BPARMFL` contains the constant values used to set the dimensions of the vectors in the common blocks. `BPARMFL` must precede the other include files in the program.

ASCII FILES

The Monthly CRSP US Treasury Database files are provided in ASCII on CD-ROMs with fixed length records. The following table lists the files. All files, listed below, are included in the `/DATA/` folder. Each of the Fama Files have between 1 and 4 header lines except the Price files, which are formatted for printing, not for use in a FORTRAN program.

FILES NAMES	DOCUMENTATION REFERENCE	FORTRAN FORMAT
Bond Portfolios See "Fama Maturity Portfolios Returns File" on page 15		
bondport12.dat	12-month intervals	1X, I3, I9, 7F10.5
bondport6.dat	6-month intervals	1X, I3, I9, 12F10.5
Fixed Term Indices See "CRSP Fixed Term Indices Files" on page 17		
bxmthind.dat		page 5
bxmthind_1yr.dat		page 5
bxmthind_2yr.dat		page 5
bxmthind_5yr.dat		page 5
bxmthind_7yr.dat		page 5
bxmthind_10yr.dat		page 5
bxmthind_20yr.dat		page 5

FILES NAMES	DOCUMENTATION REFERENCE	FORTRAN FORMAT
bxmthind_30yr.dat		page 5
Fama-Bliss Discount Bonds See "Fama-Bliss Discount Bonds File" on page 15		
famablispri.dat	Discount bond prices	1X, I8, 5F8.3
famablisyld.dat	Discount bond yields	1X, I8, 5F8.3
Primary Files		
mbi.dat	Chapter 2 Calendar file	page 3
mbm.dat	Chapter 2 Master file	page 3
mbx.dat	Chapter 2 Cross-sectional file	page 4
Risk-free Rates		
riskfree.dat	Chapter 4 Risk Free Rates	1X, I8, 2(1X, 3F7.3, I4, 1X, F15.6)
T-Bill Files Based on Ask Price See "Fama Treasury Bill Term Structure Files" on page 14		
ffwdask12.dat	12-month forward rates	1X, I9, 12F10.6
ffwdask6.dat	6-month forward rates	1X, I9, 6F10.6
fhldask12.dat	12-month holding period returns	1X, I9, 12F10.6
fhldask6.dat	6-month holding period returns	1X, I9, 6F10.6
fpriask12.dat	12-month prices	N/A - 132 columns
fpriask6.dat	6-month prices	N/A - 72 columns
fyldask12.dat	12-month yield	1X, I9, 12F10.6
fyldask6.dat	6-month yield	1X, I9, 12F10.6
T-Bill Files Based on Average Price See "Fama Treasury Bill Term Structure Files" on page 14		
ffwdave12.dat	12-month forward rates	1X, I9, 12F10.6
ffwdave6.dat	6-month forward rates	1X, I9, 6F10.6
fhldave12.dat	12-month holding period returns	1X, I9, 12F10.6
fhldave6.dat	6-month holding period returns	1X, I9, 6F10.6
fpriave12.dat	12-month prices	N/A - 132 columns
fpriave6.dat	6-month prices	N/A - 72 columns
fyldave12.dat	12-month yield	1X, I9, 12F10.6
fyldave6.dat	6-month yield	1X, I9, 12F10.6
T-Bill Files Based on Bid Price See "Fama Treasury Bill Term Structure Files" on page 14		
ffwdbid12.dat	12-month forward rates	1X, I9, 12F10.6
ffwdbid6.dat	6-month forward rates	1X, I9, 6F10.6
fhldbid12.dat	12-month holding period returns	1X, I9, 12F10.6
fhldbid6.dat	6-month holding period returns	1X, I9, 6F10.6
fpribid12.dat	12-month prices	N/A - 132 columns
fpribid6.dat	6-month prices	N/A - 72 columns
fyldbid12.dat	12-month yield	1X, I9, 12F10.6
fyldbid6.dat	6-month yield	1X, I9, 12F10.6

EXCEL FILES

DESCRIPTION

The Excel Workbook files, do not contain the large Master and Cross-Sectional Files. These files are too large to be supported in Excel. The Excel files were imported from the ASCII files. The number of decimal places matches those in the original ACSII files. Therefore, adding decimal places in the cell formatting will not improve accuracy in data output. The dates are stored as Excel dates and displayed in a MM/DD/YYYY format. The first worksheet in each file is a readme worksheet that outlines the contents of the rest of the sheets.

The following table contains the file name, the work sheet names within them and the section of the documentation, which describes them. File names for the Excel and SAS files are the same.

MONTHLY CRSP US TREASURY DATABASE IN EXCEL

FILES	DOCUMENTATION REFERENCE
bndprt12.xls	See "Fama Maturity Portfolios Returns File" on page 15
bndprt06.xls	
bxmthind.xls	See "CRSP Fixed Term Indices Files" on page 17
fbpri.xls	See "Fama-Bliss Discount Bonds File" on page 15
fbyld.xls	
yldask12.xls	See "Yield File" on page 14
yldask06.xls	
yldbid12.xls	
yldbid06.xls	
yldave12.xls	
yldave06.xls	
fwdask12.xls	See "Forward Rate File" on page 14
fwdask06.xls	
fwdbid12.xls	
fwdbid06.xls	
fwdave12.xls	
fwdave06.xls	
hldask12.xls	See "Holding Period Return File" on page 14
hldask06.xls	
hldbid12.xls	
hldbid06.xls	
hldave12.xls	
hldave06.xls	
priask12.xls	See "Price File" on page 14
priask06.xls	
pribid12.xls	
pribid06.xls	
priave12.xls	
priave06.xls	
riskfree.xls	See "CRSP Risk Free Rates File" on page 17

MICROSOFT EXCEL SUPPORT DISCLAIMER

CRSP does not support Microsoft Excel. These files have been included in this format as a courtesy. If you are unable to load the files or to use the software, please contact Microsoft or your System Administrator for support. These files are in ASCII in the \DATA\ directory if you want to convert them yourself.

SAS FILES

DESCRIPTION

The table below lists SAS data sets available in the SAS directory. These data sets can be used with no additional conversions needed.

MONTHLY CRSP US TREASURY DATABASE IN SAS (EXTRACTED)

EXTRACTED FILE NAMES	DOCUMENTATION REFERENCE
bndprt06.sas7bdat	See "Fama Maturity Portfolios Returns File" on page 15
bndprt12.sas7bdat	
bxmthind.sas7bdat	See "CRSP Fixed Term Indices Files" on page 17
fbpri.sas7bdat	See "Fama-Bliss Discount Bonds File" on page 15
fbyld.sas7bdat	
fwdask06.sas7bdat	See "Forward Rate File" on page 14
fwdask12.sas7bdat	
fwdave06.sas7bdat	
fwdave12.sas7bdat	
fwdbid06.sas7bdat	
fwdbid12.sas7bdat	
hldask06.sas7bdat	See "Holding Period Return File" on page 14
hldask12.sas7bdat	
hldave06.sas7bdat	
hldave12.sas7bdat	
hldbid06.sas7bdat	
hldbid12.sas7bdat	
mbi.sas7bdat	See "Calendar File (MBI)" on page 3
mbmdat.sas7bdat	See "Master File (MBM)" on page 3
mbmdat.sas7bndx	CRSPID index for mbmdat.sas7bdat dataset

EXTRACTED FILE NAMES	DOCUMENTATION REFERENCE
mbmhdr.sas7bdat	See “Master File (MBM)” on page 3
mbmhdr.sas7bndx	CRSPID index for mbmhdr.sas7bdat dataset
mbx.sas7bdat	See “Cross-Sectional File (MBX)” on page 4
mbx.sas7bndx	QDATE index for mbx.sas7bdat dataset
mbxid.sas7bdat	See “Cross-Sectional File (MBX)” on page 4
mbxid.sas7bndx	CRSPID index for mbxid.sas7bdat dataset
priask06.sas7bdat	See “Price File” on page 14
priask12.sas7bdat	
priave06.sas7bdat	
priave12.sas7bdat	
pribid06.sas7bdat	
pribid12.sas7bdat	
riskfree.sas7bdat	See “CRSP Risk Free Rates File” on page 17
yldask06.sas7bdat	See “Yield File” on page 14
yldask12.sas7bdat	
yldave06.sas7bdat	
yldave12.sas7bdat	
yldbid06.sas7bdat	
yldbid12.sas7bdat	

SAS SUPPORT DISCLAIMER

CRSP does not support SAS. These files have been included in this format as a courtesy. If you are unable to load the files or to use the software, please contact SAS or your System Administrator for support. The files are in ASCII in the \DATA\ directory if you want to convert them yourself.

APPENDIX A: SPECIAL ISSUES

ISSUES WITH SPECIAL PROVISIONS

The following is a list of issues having special provisions and coded with `ITYPE = 9`. You may wish to consider these provisions before using the data from these issues.

19330315.902000	Redeemable at option of holder at par plus accrued interest with 60 days notice. Principal and interest payable in United States gold coin.
19340415.904250	Issue created by early call of 19381015.904250. Similar numbers selected to be called for redemption on 19340415 were promulgated by the Treasury effectively creating a new issue which was quoted separately up to the call date.
19341015.904250	Issue created by early call of 19381015.904250. Similar to 19340415.904250.
19350415.904250	Issue related by early call of 19381015.904250. Similar to 19340415.904250.
19381015.904250	Principal and interest payable in United Sates gold coin.
19451015.903250	Accrued interest at the rate of 41/4% up to 19341015 and at 31/4% thereafter.
19590801.904000	Issue created from 19610801.904000 (see below).
19600215.904000	Issue created from 19620815.904000 (see below).
19610801.904000	Redeemable at the option of the holder at par and accrued interest on August 1, 1959. Notice of intent to redeem must be made by May 1, 1959 and certificates to be redeemed to be stamped. Once stamped, certificates mature on August 1, 1959 (not August 1, 1961 as issued). These stamped certificates were traded and quoted under the new CRSPID, even though no such security was actually issued by the treasury.
19620815.904000	Similar to 19610801.904000. Redeemable at option of holder on February 15, 1960, written notice and surrender required on or before November 16, 1959. Issue thus created was 19600215.904000.
99990401.902000	Consol bond, paid interest quarterly in perpetuity. Principal returned only if called. Issue actually called in 1935.

These issues are also traded as normal notes and bonds and are quoted as such in the files.

STRIPPED NOTES AND BONDS

Stripped notes and bonds are issues, which have been broken into their component cash flows, each of which is then traded separately. This was originally done by various financial institutions who issued treasury backed securities (e.g., CATS, TIGERS etc.). A fully-constituted Treasury note of bond consists of a principal payment and semiannual interest payments. In 1985 the treasury began participating in this market by designating certain issues as eligible to be stripped. All 10 year notes and all bonds issued since November 15, 1984 have been made eligible for the STRIPS program either upon their original issue or after their first interest payment date. Issues so designated could be broken up and the individual cash flows registered separately. **As of September 1999, all new Treasury marketable fixed-rate notes and bonds issued on and after September 30, 1997 are eligible for STRIPS.** The Treasury itself did not sell the individual payments, this being done by dealers who first purchased eligible securities.

The following issues have been designated as eligible for stripping by the Treasury:

19941115.211620	20000815.208750	20050815.206500	20200815.108750
19950215.211250	20001115.205750	20051115.205870	20210215.107870
19950515.211250	20001115.208500	20060215.109370	20210515.108120
19950815.210500	20010215.207750	20060515.206870	20210815.108120
19951115.209500	20010515.208000	20060715.207000	20211115.108000
19960215.208870	20010815.207870	20061015.206500	20220815.107250

19960515.207370	20011115.207500	20060215.205620	20221115.107620
19961115.207250	20011115.208500	20070215.206250	20230215.107120
19970515.208500	20020515.207500	20070515.206620	20230815.106250
19970815.208620	20020815.206370	20070815.206120	20241115.107500
19971115.208870	20020930.205870	20141115.511750	20250215.107620
19980215.208120	20021031.205750	20150215.111250	20250815.106870
19980515.209000	20021130.205750	20150815.110620	20260215.106000
19980815.209250	20021231.205620	20151115.109870	20260815.106750
19981115.208870	20030215.206250	20160215.109250	20261115.106500
19990215.208870	20030815.205750	20160515.107250	20270215.106620
19990515.209120	20040215.205870	20161115.107500	20270815.106370
19990815.208000	20040515.207250	20170515.108750	20271115.106120
19990930.205750	20040815.207250	20170815.108870	20280815.105500
19991031.205620	20041115.111620	20180515.109120	20281115.105250
19991115.207870	20041115.207870	20181115.109000	20290215.105250
19991130.205620	20050215.207500	20190215.108870	20290815.106120
19991231.205620	20050515.112000	20190815.108120	
20000215.208500	20050515.206500	20200215.108500	
20000515.208870	20050815.110750	20200515.108750	

FOREIGN TARGETED SECURITIES

Foreign targeted issues are not included in the CRSP US Treasury Database. Certain recent notes have been issued in pairs with identical coupon rates, maturities and dated dates. One issue of the pair is intended for domestic holders and is normal in all respects. The other issue is intended for United States aliens. These "Foreign Targeted Securities" are exempt from certain federal taxes when held by eligible foreigners. They pay interest annually and may be converted into their domestic equivalent or sale to domestic holders. The converse is not true.

The following notes which are included are known to have Foreign Targeted equivalents:

19880930.211370	dated 19841031
19900215.211000	dated 19841203
19900815.209870	dated 19850604
19960215.208870	dated 19860215