

REFINITIV MARKETPSYCH INDICES

USER GUIDE

MARKETPSYCH INDICES VERSION 3.3

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ABOUT THIS DOCUMENT

INTENDED READERSHIP

This guide is primarily intended for individuals with responsibility to develop applications to consume Refinitiv MarketPsych Indices (MI) messages. The information contained within this document is applicable to anyone working with the associated archive files.

IN THIS GUIDE

This document describes the format of MarketPsych output images. It is applicable to both the recent and historical data files. Except for cryptocurrencies, all assets referenced in this guide are generated using TRMI version 3.2. The cryptocurrencies asset class is reflective of updates to TRMI version 3.3.

FEEDBACK

If you have any comments on this document, please contact the Refinitiv Machine Readable News team at mrn-product@thomsonreuters.com.

CHAPTER 1 INTRODUCTION

OVERVIEW

Refinitiv MarketPsych Indices (MI) analyze news and social media in real-time to convert the volume and variety of professional news and the internet into manageable information flows that drive sharper decisions. The indices are delivered as real-time data series that can easily be incorporated into your investment and trading decision processes – quantitative or qualitative.

Three types of indicators are provided:

- Emotional indicators such as **Anger, Fear and Joy**
- Macroeconomic metrics including **Earnings Forecast, Interest Rate Forecast, Long vs. Short**
- Buzz metrics on the asset level, i.e., **Buzz**, and on market-moving topics for that asset, such as **Litigation, Regulatory Crackdown, Mergers and Volatility**

The indicators are updated every minute for companies, sectors, regions, countries, commodities and energy topics, indices and currencies. They can be translated directly into spreadsheets or charts that can be monitored by traders, risk managers or analysts – or they can be plugged straight into your algorithms for low frequency or longer term asset allocation or sector rotation decisions.

CONTACT INFORMATION

For Production Customers

Production customers should direct their TRMI questions or support issues via one of the following:


- Phone: Call +1 877-814-3571 and choose option 2.
- Electronic: Visit the “Contact Us” or “RAISE A CASE” link on [My Refinitiv](#). In filling out the form, type in “MarketPsych Indices” as the product name.


For Trial Customers

Trial customers are assigned a dedicated Presales Technical Engineer to assist with technical questions during the trial. During the trial, all questions should be sent directly to the Presales Technical Engineer.

DOCUMENTATION AND NOTIFICATIONS

Client-facing documentation may be found on the My Refinitiv page, located [here](#). Other information may be found on the MRN (Machine Readable News) SFTP site, as described in Chapter 15.

Clients are advised to subscribe to service alerts regarding the live and archive MarketPsych Indices services. To subscribe, go the Service Alert-Edit Subscriptions page, [here](#). Then check the box at Application -> Financial Information Applications -> Enterprise Information Products -> Thomson Reuters Machine Readable News -> Refinitiv MarketPsych Indices. Then click the  button at bottom right.

For updates on releases of new versions of MarketPsych Indices, clients should sign up for Product Client Notifications (PCNs). This will send advance email notifications on relevant releases and updates. To sign up for PCNs on MarketPsych Indices, go to the PCN subscription page, [here](#). Check the box at All Products -> Reuters Enterprise Information -> Refinitiv MarketPsych Indices. Toward the bottom, make sure that the box for “All Client impacts”, or at least “For Action” under that, is checked. Then click the **submit**  link in the lower or upper right to confirm your selection.

CHAPTER 2 WINDOW LENGTHS AND UPDATE FREQUENCIES

OVERVIEW

TRMIs are asset-level scores on a collection of content. There are two time-related metrics that determine TRMI scores. The **window length** determines what range of content is scored in generating a set of TRMIs. For live content, all content collected by MarketPsych within that time period will be incorporated into the corresponding window. The **update frequency** determines the time between consecutive TRMI scores. (See Chapter 5 for more information on content types.)

FILE NAMING CONVENTION

For files on the SFTP site, the convention for denoting the combination of window length and update frequency shall be

W[*Period Length*]*_U*[*Period Length*], where *W* denotes window length and *U* denotes update frequency.

Period lengths can be any of the following:

- 01M: 1 minute
- HOU: hourly (60 minutes)
- DAI: daily (1440 minutes)

AVAILABLE COMBINATIONS

Window Length	Update Frequency	SFTP File Abbreviation
1 minute	1 minute	W01M_U01M
1440 minutes / 24 hours	1 hour	WDAI_UHOU
1440 minutes / 24 hours	Daily, at 3:30 Eastern time	WDAI_UDAI

EXAMPLE

To illustrate with the WDAI_UHOU data, one series of TRMI scores occurs with data collected between December 22, 2016 15:00:00 UTC and December 23, 2016 15:00:00 UTC, a 1440-minute / 24-hour **window length**. The next set of scores would occur with data collected between December 22, 2016 16:00:00 UTC and December 23, 2016 16:00:00 UTC, because of the 60-minute **update frequency**.

DAILY UPDATE FREQUENCY ANOMALY

Daily update frequency refers to TRMI windows that end at 3:30pm Eastern time. Because this time zone is subject to daylight savings time adjustments, there is a biannual anomaly around the 24-hour / 1440-minute window length. When a daylight savings hour is added or subtracted in the previous 24 hours, the time since the last update can be 25 or 23 hours, respectively. As a result, the window length also changes to 25 or 23 hours.

CHAPTER 3 GENERAL COMMENTS ABOUT INDEX VALUES

”NA” INDEX VALUES

As mentioned in Chapter 2, all TRMIs are based on relevant text collected over a window of content.

If over that window there was no relevant text identified for a particular index, then the correct index value is “NA”, not zero, and the index will appear blank. For example, this could happen for the carryTrade index on the AUD (Australian Dollar) in news if there were no discussions of the carry trade with the Australian dollar found in news-based text over the content collected in that window.

NA differs in meaning from true zero in that true zero represents the presence of text corresponding to positive and negative values that add up to zero. In other words, a zero value reflects that relevant text was found and its sentiment implications net to zero. In contrast, NA represents the absence of any relevant text and of any resultant measurement.

Note that when the Buzz is zero, this means that no values were detected for any of the indices and thus all index values necessarily will be NA. See Chapter 5 for more information on Buzz.

NEGATIVE VALUES IN UNIPOLAR INDICES

The indices are marked as ranging from either -1 to 1 or 0 to 1, corresponding to bipolar and unipolar indices, respectively. In practice, those denoted as “unipolar” can in fact range below 0, although not below -1. This occurs because unipolar indices reflect the orthogonal nature of many single emotions and topics. A negative comment such as, “I don’t enjoy owning this stock” is not emotively equivalent to, “I am pessimistic about the stock’s prospects” or “I am angry with the company’s management.” The initial statement is specifically one of negative Joy, which decreases the overall Joy index for assets related to that company. When there are many such negative Joy comments for an asset, the Joy index itself may show negative values.

Nonetheless, in practice unipolar indices are positive over 90% of the time, because language typically reflects positive assertions.

Thus, in the sections below we will mark this range as “0 to 1*”.

CHAPTER 4 UNDERLYING CONTENT SOURCES

OVERVIEW

TRMIs are evaluated on three different content sets: news, social media, and the combined content. History on all content dates back to the beginning of 1998 for all assets except cryptocurrencies. Cryptocurrency history extends back to 2009. Only English-language text is used.

NEWS

Reuters news is present in the entire historical news dataset, as are a host of mainstream news sources collected by MarketPsych Data. During 2005, the archive began including Internet news content collected by LexisNexis. The LexisNexis content is restricted to those from top international and business news sources, top regional news sources, and leading industry sources. In 2017 MarketPsych Data added additional cryptocurrency specific sources to the cryptocurrencies asset class feed.

SOCIAL MEDIA

The social media collection process is more diverse. It begins in 1998 with Internet forum and message board content. Starting in late 2008, LexisNexis social media content was added. Starting in late 2009, tweets were included. Using popularity ranks measured by incoming links, this includes generally the top 20% of blogs, microblogs, and other financial social media content. MarketPsych Data also includes content from hundreds of less-popular asset-specific blogs and forums.

Note that the entire LexisNexis social media content set for top source ranks is included in the country (COU) social media dataset, while other assets contain specifically selected social media content sources.

CHAPTER 5 FIELDS GENERIC TO ALL TRMI ASSET CLASSES

ID

The id field identifies the data row. It is composed according to the following:

```
{feedFamilyCode}:{windowTimestamp in yyyy-mm-dd_hh.mm.ss}.{dataType}.{assetClass}
```

Feed Family Code

The feedFamilyCode field describes the “feed” that delivers the raw content being scored by the TRMI system. For TRMI it is “mp”, because MarketPsych Data centrally collects and filters the content scored by TRMI.

Other Components

See Incoming Sources section below on the dataType field and the Asset Code section for a list of assetClass values.

ASSET CODE

The assetCode field represents the code used to denote the asset scored, where the asset code type varies by Asset Class.

Asset Class	Asset Class Abbreviation	Type of Asset Code Identifier
Individual companies	CMPNY CMPNY_AMER CMPNY_APAC CMPNY_EMEA	Refinitiv organizational PermID
Company groups	CMPNY_GRP	MarketPsych-originated code
Currencies	CUR	Three-character ISO-4217 code
Agricultural commodities	COM_AGR	Refinitiv topic code
Energy & material commodities	COM_ENM	
Countries	COU	Refinitiv topic code, referring to the home country. Also corresponds to ISO 3166-1 code.
Country markets	COU_MKT	
Cryptocurrencies	CRYPTO	The coinmarketcap.com ticker identifier

WINDOW TIMESTAMP

As mentioned in Chapter 2, TRMIs are based on content aggregated over a trailing window. The windowTimestamp field represents the endpoint of that period.

It is expressed in ISO-8601 format: “yyyymmddThh:mm:ss.000Z”, where “000” represents the milliseconds and “Z” represents the time zone. The time zone is GMT/UTC.

INCOMING SOURCES

The dataType field represents the type of content source(s) on which these TRMIs are based.

There are three possible values:

- “News” for news
- “Social” for social media
- “News_Social” for the combined content

See Chapter 4 for more information on these sources.

SYSTEM VERSION

The systemVersion field represents an overall build for the MarketPsych Indices. Different versions may lead to different scores as enhancements are made and bugs are fixed. It is thus used for version control.

It consists of a three-level version string preceded by an “MP” prefix denoting the MarketPsych scoring engine, e.g., “MP:3.2.09”.

The third digit of the System Version increases by one, for all asset classes, in conjunction with monthly updates to the companies coverage list.

BUZZ

The buzz field represents a sum of entity-specific words and phrases used in TRMI computations. It can be non-integer when any of the words/phrases are described with a “minimizer”, which reduces the intensity of the primary word or phrase. For example, in the phrase “less concerned” the score of the word “concerned” is minimized by “less”. Additionally, common words such as “new” may have a minor but significant contribution to the Innovation TRMI. As a result, the scores of common words/phrases with minor TRMI contributions can be minimized.

CHAPTER 7 COMPANIES AND COMPANY GROUPS

COMPANIES ASSETS

TRMI Companies data covers more than 12,000 active companies from over 75 countries, across the feeds and archives. In general, these companies were selected for inclusion based on domicile, listed market capitalization, and/or economic/industry significance. Coverage includes all companies that are or were constituents of a company groups asset. Coverage is updated monthly.

A list of the covered companies and monthly changes in coverage is available on the MRN SFTP site. See Chapter 15 for information on the files and how to access them.

COMPANY GROUPS ASSETS

TRMI Company Groups data covers 61 assets corresponding to groups of companies assembled according to domicile, market capitalization, and/or business classification.

Many of these correspond to grouping in the hierarchical Thomson Reuters Business Classification (TRBC) system. In descending order of hierarchy, the four levels are economic sector, business sector, industry group and industry. For more information on TRBC, please see http://thomsonreuters.com/products_services/financial/thomson_reuters_indices/trbc/. All TRBC codes below are extant in the TRBC 2012 system.

The 61 assets can be characterized in a few ways. 26 are composed of US-based companies, while 17 are for non-US companies and another 18 are global. 21 resemble equity indices and are filtered chiefly by market cap ranks, while the other 40 are composed according to a combination of TRBC code, domicile, and market cap above \$100 million USD.

Note that because these groups are calculated with approximate point-in-time composition, all the asset codes used here were invented for this application. They are not RICs.

US-based Company Groups (26)

Index-oriented Assets (4)

All internal rankings are by market capitalization.

Asset Code	Description	Resembling Index
MPTRXUS30	Top 30 US-based companies	Dow Jones Industrial Average
MPTRXUS500	Top 500 US-based companies	S&P 500
MPTRXUSMID2000	Ranks 1001-3000 of US-based companies	Russell 2000
MPTRXUSNAS100	Top 100 Nasdaq-based companies	Nasdaq 100

TRBC Economic Sector-based Assets (10)

Asset Code	TRBC Description	TRBC Code
MPTRXUSENE	Energy	50
MPTRXUSMAT	Basic Materials	51
MPTRXUSIND	Industrials	52
MPTRXUSYCY	Cyclical Consumer Goods & Services	53
MPTRXUSNCY	Non-Cyclical Consumer Goods & Services	54
MPTRXUSFIN	Financials	55
MPTRXUSHLC	Healthcare	56
MPTRXUSTEC	Technology	57

MPTRXUSCOM	Telecommunications Services	58
MPTRXUSUTL	Utilities	59

TRBC Business Sector-based Assets (5)

Asset Code	TRBC Description	TRBC Code
MPTRXUSI4	Transportation	5240
MPTRXUSY3	Cyclical Consumer Services	5330
MPTRXUSY4	Retailers	5340
MPTRXUSN1	Food & Beverages	5410
MPTRXUSF4	Real Estate	5540

TRBC Industry Group-based Assets (2)

Asset Code	TRBC Description	TRBC Code
MPTRXUSOILS	Oil & Gas Related Equipment and Services	501030
MPTRXUSAERO	Aerospace & Defense	521010

TRBC Industry-based Assets (5)

Asset Code	TRBC Description	TRBC Code
MPTRXUSOILE	Oil & Gas Exploration and Production	50102020
MPTRXUSWAST	Environmental Services	52203010
MPTRXUSAIRL	Airlines	52406010
MPTRXUSHBLD	Homebuilding & Construction Supplies	53203010
MPTRXUSBANK	Banks	55101010

Non-US- based Company Groups (17)

Index-oriented Assets (17)

All internal rankings are by market capitalization.

Asset Code	Description	Resembling Index
MPTRXAU500	Top 500 Australia-based companies	ASX All Ordinaries
MPTRXBR50	Top 50 Brazil-based companies	IBRX 50
MPTRXCA250	Top 250 Canada-based & Toronto-listed companies	S&P/TSX Composite
MPTRXCH20	Top 20 Switzerland-based companies	Swiss Market
MPTRXCN300	Top 300 China-based companies	CSI 300
MPTRXDE30	Top 30 Germany-based companies	Deutsche Börse DAX 30
MPTRXEM50	Top 50 emerging markets companies	MSCI 50
MPTRXES35	Top 35 Spain-based companies	IBEX 35
MPTRXEU50	Top 50 pan-European companies	EURO STOXX 50
MPTRXFR40	Top 40 France-based companies	CAC 40
MPTRXGB100	Top 100 UK-based & LSE-listed companies	FTSE 100
MPTRXGBMID250	Ranks 101-350 of UK-based & LSE-listed companies	FTSE Mid 250
MPTRXHK50	Top 50 Hong Kong-listed companies based in Hong Kong and China	Hang Seng

MPTRXIN50	Top 50 India-based companies	Nifty 50
MPTRXJP225	Top 225 Japan-based companies	Nikkei 225
MPTRXRU50	Top 50 Russia-based companies	RTS
MPTRXSG30	Top 30 Singapore-based companies	FTSE Straits Times

Global Company Groups (18)

TRBC Economic Sector-based Assets (10)

Asset Code	TRBC Description	TRBC Code
MPTRXENE	Energy	50
MPTRXMAT	Basic Materials	51
MPTRXIND	Industrials	52
MPTRXYCY	Cyclical Consumer Goods & Services	53
MPTRXNCY	Non-Cyclical Consumer Goods & Services	54
MPTRXFIN	Financials	55
MPTRXHLC	Healthcare	56
MPTRXTEC	Technology	57
MPTRXCOM	Telecommunications Services	58
MPTRXUTL	Utilities	59

TRBC Business Sector-based Assets (1)

Asset Code	TRBC Description	TRBC Code
MPTRXE14	Renewable Energy	5020

TRBC Industry Group-based Assets (3)

Asset Code	TRBC Description	TRBC Code
MPTRXCOAL	Coal	501010
MPTRXBIOT	Biotechnology & Medical Research	562020
MPTRXT11	Semiconductors & Semiconductor Equipment	571010

TRBC Industry-based Assets (2)

Asset Code	TRBC Description	TRBC Code
MPTRXGOLD	Precious Metals & Minerals	51201010
MPTRXGAMI	Casinos & Gaming	53301030

TRBC Hybrid-driven Assets (2)

Asset Code	TRBC Description	TRBC Code
MPTRXPKB	Construction Materials	512020
	Construction & Engineering	522010
	Homebuilding & Construction Supplies	532030
MPTRXPEJ	Leisure Products	532050
	Hotels & Entertainment Services	533010

Constitution of AMER, APAC, and EMEA Regional Groups

The CMPNY asset class consists of companies domiciled in the following countries. Clients who subscribe to a regional asset class receive companies domiciled in the respective region.

CMPNY_AMER

Companies included in the Americas (CMPNY_AMER) sub-grouping include those domiciled in the following countries.

Asset Code	Country
AR	Argentina
BB	Barbados
BR	Brazil
CA	Canada
CL	Chile
CO	Colombia
CW	Curacao
EC	Ecuador
JM	Jamaica
KY	Cayman Islands
MX	Mexico
PA	Panama
PE	Peru
PR	Puerto Rico
PY	Paraguay
US	United States
VE	Venezuela
VG	Virgin Islands (British)

CMPNY_APAC

Companies included in the Asia and Pacific (CMPNY_APAC) sub-grouping includes those domiciled in the following countries.

Asset Code	Country
AU	Australia
AZ	Azerbaijan
BD	Bangladesh
CN	China
FJ	Fiji
GE	Georgia
HK	Hong Kong
ID	Indonesia
IN	India
JP	Japan
KG	Kyrgyzstan
KR	South Korea

KZ	Kazakhstan
LK	Sri Lanka
MH	Marshall Islands
MN	Mongolia
MO	Macau
MY	Malaysia
NZ	New Zealand
PG	Papua New Guinea
PH	Philippines
PK	Pakistan
SG	Singapore
TH	Thailand
TW	Taiwan
VN	Vietnam

CMPNY_EMEA

Companies included in the Europe, Middle East, and Africa (CMPNY_EMEA) sub-grouping includes those domiciled in the following countries.

Asset Code	Country
AE	United Arab Emirates
AT	Austria
BE	Belgium
BH	Bahrain
BM	Bermuda
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EG	Egypt
ES	Spain
FI	Finland
FR	France
GB	United Kingdom
GG	Guernsey
GI	Gibraltar
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IL	Israel
IM	Isle of Man
IQ	Iraq
IS	Iceland
IT	Italy
JE	Jersey
KE	Kenya

KW	Kuwait
LB	Lebanon
LU	Luxembourg
MA	Morocco
MC	Monaco
MT	Malta
NG	Nigeria
NL	Netherlands
NO	Norway
OM	Oman
PL	Poland
PT	Portugal
QA	Qatar
RO	Romania
RU	Russia
SA	Saudi Arabia
SE	Sweden
SK	Slovakia
TG	Togo
TR	Turkey
TZ	Tanzania
UA	Ukraine
ZA	South Africa
ZM	Zambia

Constitution of Company Groups Assets in the TRMI Archives and Feed

The constituent companies of these assets change over time. In the archives, the TRBC-based constituent lists are refreshed quarterly starting on January 1, 2006. The remaining groups are refreshed quarterly since the beginning of the archives, January 1, 1998. All groups have their constituents update monthly starting from September 2014.

In the live data, the systemVersion value will increase with each monthly update.

COMPANIES AND COMPANY GROUP TRMI INDICES

The 34 TRMI indices for the companies and company groups carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range "0 to 1*", see Chapter 3 above.

Index	Description: <i>references in news and social media to...</i>	Range
sentiment	overall positive references, net of negative references	-1 to 1
optimism	optimism, net of references to pessimism	-1 to 1
joy	happiness and affection	0 to 1*
loveHate	love, net of references to hate	-1 to 1
trust	trustworthiness, net of references connoting corruption	-1 to 1
anger	anger and disgust	0 to 1*
conflict	disagreement and swearing net of agreement and conciliation	-1 to 1

fear	fear and anxiety	0 to 1*
gloom	gloom and negative future outlook	0 to 1*
stress	arousal and intensity, weighted towards distress	0 to 1*
surprise	unexpected events and surprise	0 to 1*
timeUrgency	urgency and timeliness, net of references to tardiness and delays	-1 to 1
uncertainty	uncertainty and confusion	0 to 1*
violence	violent crime, terrorism, and war	0 to 1*
emotionVsFact	all emotional sentiments, net of all factual and topical references	-1 to 1
marketRisk	positive emotionality and positive expectations net of negative emotionality and negative expectations. Includes factors from social media found characteristic of speculative bubbles – higher values indicate greater bubble risk. Also known as the “Bubbleometer.”	-1 to 1
longShort	buying, net of references to shorting or selling	-1 to 1
longShortForecast	forecasts of buying, net of references to forecasts of shorting or selling	-1 to 1
priceDirection	price increases, net of references to price decreases	-1 to 1
priceForecast	forecasts of asset price rises, net of references to forecasts of asset price drops	-1 to 1
volatility	volatility in market prices or business conditions	0 to 1*
analystRating	upgrade activity, net of references to downgrade activity	-1 to 1
cyberCrime	Cyber attacks and data breaches	0 to 1*
debtDefault	debt defaults and bankruptcies	0 to 1*
dividends	dividends rising, net of references to dividends falling	-1 to 1
innovation	innovativeness	0 to 1*
earningsForecast	expectations about improving earnings, less those of worsening earnings	-1 to 1
fundamentalStrength	positivity about accounting fundamentals, net of references to negativity about accounting fundamentals	-1 to 1
laborDispute	labor unrest and work stoppages	0 to 1*
layoffs	staff reductions and layoffs	0 to 1*
litigation	litigation and legal activity	0 to 1*
managementChange	changes in a company's management team, net of references to stability in the management team	-1 to 1
managementTrust	trust expressed in a company's management team, net of references to reports of unethical behavior amongst the management team	-1 to 1
Mergers	merger or acquisition activity	0 to 1*

CHAPTER 8 CURRENCIES

CURRENCIES ASSETS

There are 45 currencies, listed in the table below.

Asset Code	Currency	Asset Code	Currency
ARS	Argentine Peso	NOK	Norwegian Krone
AUD	Australian Dollar	PKR	Pakistani Rupee
BDT	Bangladeshi Taka	PEN	Peruvian Sol
BTC	Bitcoin	PHP	Philippine Peso
BRL	Brazilian Real	PLN	Polish Zloty
CAD	Canadian Dollar	RON	Romanian Leu
CLP	Chilean Peso	RUB	Russian Ruble
CNY	Chinese Yuan Renminbi	SAR	Saudi Riyal
COP	Colombian Peso	SGD	Singapore Dollar
CZK	Czech Koruna	ZAR	South African Rand
EGP	Egyptian Pound	KRW	South Korean Won
EUR	Euro	SEK	Swedish Krona
HKD	Hong Kong Dollar	CHF	Swiss Franc
HUF	Hungarian Forint	TWD	Taiwanese Dollar
INR	Indian Rupee	THB	Thai Baht
IDR	Indonesian Rupiah	TRY	Turkish Lira
IRR	Iranian Rial	USD	U.S. Dollar
ILS	Israeli Shekel	UAH	Ukrainian hryvnia
JPY	Japanese Yen	AED	United Arab Emirates Dirham
MYR	Malaysian Ringgit	GBP	United Kingdom Pound Sterling
MXN	Mexican Peso	VEF	Venezuelan Bolívar
NZD	New Zealand Dollar	VND	Vietnam Dong
NGN	Nigerian Naira		

CURRENCIES TRMI INDICES

The 24 TRMI indices for the currencies asset class carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range “0 to 1*”, see Chapter 3 above.

Index	Description: <i>references in news and social media to...</i>	Range
sentiment	overall positive references, net of negative references	-1 to 1
optimism	optimism, net of references to pessimism	-1 to 1
joy	happiness and affection	0 to 1*
loveHate	love, net of references to hate	-1 to 1
trust	trustworthiness, net of references connoting corruption	-1 to 1
anger	anger and disgust	0 to 1*

conflict	disagreement and swearing net of agreement and conciliation	-1 to 1
fear	fear and anxiety	0 to 1*
gloom	gloom and negative future outlook	0 to 1*
stress	arousal and intensity, weighted towards distress	0 to 1*
surprise	unexpected events and surprise	0 to 1*
timeUrgency	urgency and timeliness, net of references to tardiness and delays	-1 to 1
uncertainty	uncertainty and confusion	0 to 1*
violence	violent crime, terrorism, and war	0 to 1*
emotionVsFact	all emotional sentiments, net of all factual and topical references	-1 to 1
marketRisk	positive emotionality and positive expectations net of negative emotionality and negative expectations. Includes factors from social media found characteristic of speculative bubbles – higher values indicate greater bubble risk. Also known as the “Bubbleometer.”	-1 to 1
longShort	buying, net of references to shorting or selling	-1 to 1
longShortForecast	forecasts of buying, net of references to forecasts of shorting or selling	-1 to 1
priceDirection	price increases, net of references to price decreases	-1 to 1
priceForecast	forecasts of asset price rises, net of references to forecasts of asset price drops	-1 to 1
volatility	volatility in market prices or business conditions	0 to 1*
carryTrade	carry trade	0 to 1*
currencyPegInstability	the instability of a currency peg, net of references to the stability of a currency peg	-1 to 1
priceMomentum	currency price trend strength, net of references to trend weakness	-1 to 1

CHAPTER 9 AGRICULTURAL COMMODITIES

AGRICULTURAL COMMODITIES ASSETS

There are 14 agricultural commodities being scored. The asset codes correspond to Refinitiv topic codes found in news stories.

Asset Code	Commodity
RAPOIL	Canola
CTTL	Cattle
COC	Cocoa
COF	Coffee
COR	Corn
COT	Cotton
HOGS	Hogs
ORJ	Orange Juice
POIL	Palm Oil
RICE1	Rice
SOIL	Soybean Oil
SOY1	Soybeans
SUG	Sugar
WHT	Wheat

AGRICULTURAL COMMODITIES TRMI INDICES

The 31 TRMI indices for the agricultural commodities asset class carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range “0 to 1*”, see Chapter 3 above.

Index	Description: <i>references in news and social media to...</i>	Range
sentiment	overall positive references, net of negative references	-1 to 1
optimism	optimism, net of references to pessimism	-1 to 1
joy	happiness and affection	0 to 1*
loveHate	love, net of references to hate	-1 to 1
trust	trustworthiness, net of references connoting corruption	-1 to 1
anger	anger and disgust	0 to 1*
conflict	disagreement and swearing net of agreement and conciliation	-1 to 1
fear	fear and anxiety	0 to 1*
gloom	gloom and negative future outlook	0 to 1*
stress	arousal and intensity, weighted towards distress	0 to 1*
surprise	unexpected events and surprise	0 to 1*
timeUrgency	urgency and timeliness, net of references to tardiness and delays	-1 to 1

uncertainty	uncertainty and confusion	0 to 1*
violence	violent crime, terrorism, and war	0 to 1*
emotionVsFact	all emotional sentiments, net of all factual and topical references	-1 to 1
longShort	buying, net of references to shorting or selling	-1 to 1
longShortForecast	forecasts of buying, net of references to forecasts of shorting or selling	-1 to 1
priceDirection	price increases, net of references to price decreases	-1 to 1
priceForecast	forecasts of asset price rises, net of references to forecasts of asset price drops	-1 to 1
volatility	volatility in market prices or business conditions	0 to 1*
consumptionVolume	Increasing, net of decreasing, commodity consumption	-1 to 1
productionVolume	Increasing, net of decreasing, commodity production	-1 to 1
regulatoryIssues	regulatory changes affecting the commodity	0 to 1*
supplyVsDemand	surplus supply and lack of demand, net of references to supply shortage and high demand	-1 to 1
supplyVsDemandForecast	expectations of supply outstripping demand, net of references to expectations of demand outstripping supply	-1 to 1
acreageCultivated	increases in acreage and crop cultivation, net or references to decreases in acreage and crop cultivation	-1 to 1
agDisease	commodity disease	0 to 1*
agStress	production stress related to disease, water, or weather	0 to 1*
subsidies	subsidies affecting commodity prices	0 to 1*
subsidiesSentiment	increases in subsidies, net of references to decreases in subsidies	-1 to 1
weatherDamage	commodity weather risk and damage	0 to 1*

CHAPTER 10 ENERGY & MATERIAL COMMODITIES

ENERGY & MATERIAL COMMODITIES ASSETS

There are 22 energy & material commodities being scored. The asset codes correspond to Refinitiv topic codes found in news stories.

Asset Code	Commodity
ALU	Aluminum
BIOF	Biofuels
COA	Coal
CPPR	Copper
CRU	Crude Oil
BIOETH	Ethanol
MOG	Gasoline
GOL	Gold
HOIL	Heating Oil
IRN	Iron
JET	Jet Fuel
LNG	Liquefied Natural Gas
NAP	Naphtha
NGS	Natural Gas
NKL	Nickel
NSEA	North Sea Oil
PALL	Palladium
PLAT	Platinum
RAREE	Rare Earths
SLVR	Silver
STEE	Steel
URAN	Uranium

ENERGY & MATERIAL COMMODITIES TRMI INDICES

The 27 TRMI indices for the energy & material commodities asset class carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range "0 to 1*", see Chapter 3 above.

Index	Description: <i>references in news and social media to...</i>	Range
sentiment	overall positive references, net of negative references	-1 to 1
optimism	optimism, net of references to pessimism	-1 to 1
joy	happiness and affection	0 to 1*
loveHate	love, net of references to hate	-1 to 1
trust	trustworthiness, net of references connoting corruption	-1 to 1
anger	anger and disgust	0 to 1*
conflict	disagreement and swearing net of agreement and conciliation	-1 to 1

fear	fear and anxiety	0 to 1*
gloom	gloom and negative future outlook	0 to 1*
stress	arousal and intensity, weighted towards distress	0 to 1*
surprise	unexpected events and surprise	0 to 1*
timeUrgency	urgency and timeliness, net of references to tardiness and delays	-1 to 1
uncertainty	uncertainty and confusion	0 to 1*
violence	violent crime, terrorism, and war	0 to 1*
emotionVsFact	all emotional sentiments, net of all factual and topical references	-1 to 1
longShort	buying, net of references to shorting or selling	-1 to 1
longShortForecast	forecasts of buying, net of references to forecasts of shorting or selling	-1 to 1
priceDirection	price increases, net of references to price decreases	-1 to 1
priceForecast	forecasts of asset price rises, net of references to forecasts of asset price drops	-1 to 1
volatility	volatility in market prices or business conditions	0 to 1*
consumptionVolume	Increasing, net of decreasing, commodity consumption	-1 to 1
productionVolume	Increasing, net of decreasing, commodity production	-1 to 1
regulatoryIssues	regulatory changes affecting the commodity	0 to 1*
supplyVsDemand	surplus supply and lack of demand, net of references to supply shortage and high demand	-1 to 1
supplyVsDemandForecast	expectations of supply outstripping demand, net of references to expectations of demand outstripping supply	-1 to 1
newExploration	new ventures/exploration	0 to 1*
safetyAccident	safety accidents	0 to 1*

CHAPTER 11 COUNTRIES

COUNTRIES ASSETS

There are 187 countries or regions being scored. Note that these scores are based on text not only of the country/region, but also based on cities and other place names inside those geographies.

The asset codes correspond to Refinitiv topic codes for geopolitical units. The table below is sorted by Country/Region.

Asset Code	Country/Region
AF	Afghanistan
AL	Albania
DZ	Algeria
AS	American Samoa
AD	Andorra
AO	Angola
AR	Argentina
AM	Armenia
AU	Australia
AT	Austria
AZ	Azerbaijan
BH	Bahrain
BD	Bangladesh
BY	Belarus
BE	Belgium
BJ	Benin
BT	Bhutan
BO	Bolivia
BA	Bosnia and Herzegovina
BW	Botswana
BR	Brazil
BG	Bulgaria
BF	Burkina Faso
BI	Burundi
KH	Cambodia
CM	Cameroon
CA	Canada
CV	Cape Verde
KY	Cayman Islands
CF	Central African Republic
TD	Chad
CL	Chile
CN	China
CO	Colombia
KM	Comoros
CD	Congo, Democratic Republic of the
CR	Costa Rica
CI	Côte d'Ivoire
HR	Croatia

Asset Code	Country/Region
CU	Cuba
CY	Cyprus
CZ	Czech Republic
DK	Denmark
DJ	Djibouti
DO	Dominican Republic
EC	Ecuador
EG	Egypt
SV	El Salvador
GQ	Equatorial Guinea
ER	Eritrea
EE	Estonia
ET	Ethiopia
EZ	Euro-zone
FJ	Fiji
FI	Finland
FR	France
PF	French Polynesia
GA	Gabon
GM	Gambia
GE	Georgia
DE	Germany
GH	Ghana
GR	Greece
GU	Guam
GT	Guatemala
GN	Guinea
GW	Guinea-Bissau
GY	Guyana
HT	Haiti
HN	Honduras
HK	Hong Kong
HU	Hungary
IS	Iceland
IN	India
ID	Indonesia
IR	Iran
IQ	Iraq
IE	Ireland

Asset Code	Country/Region
IL	Israel
IT	Italy
JP	Japan
JO	Jordan
KZ	Kazakhstan
KE	Kenya
KI	Kiribati
XK	Kosovo
KW	Kuwait
KG	Kyrgyzstan
LA	Laos
LV	Latvia
LB	Lebanon
LS	Lesotho
LR	Liberia
LY	Libya
LT	Lithuania
LU	Luxembourg
MO	Macau
MK	Macedonia
MG	Madagascar
MW	Malawi
MY	Malaysia
ML	Mali
MT	Malta
MH	Marshall Islands
MR	Mauritania
MU	Mauritius
MX	Mexico
FM	Micronesia
MD	Moldova
MN	Mongolia
ME	Montenegro
MA	Morocco
MZ	Mozambique
MM	Myanmar
NA	Namibia
NR	Nauru
NP	Nepal
NL	Netherlands
NZ	New Zealand
NI	Nicaragua
NE	Niger
NG	Nigeria
KP	North Korea
NO	Norway
OM	Oman

Asset Code	Country/Region
PK	Pakistan
PW	Palau
PS	Palestinian Territories
PA	Panama
PG	Papua New Guinea
PY	Paraguay
PE	Peru
PH	Philippines
PL	Poland
PT	Portugal
QA	Qatar
CG	Republic of the Congo
RO	Romania
RU	Russia
RW	Rwanda
WS	Samoa
ST	Sao Tome And Principe
SA	Saudi Arabia
SN	Senegal
RS	Serbia
SC	Seychelles
SL	Sierra Leone
SG	Singapore
SK	Slovakia
SI	Slovenia
SB	Solomon Islands
SO	Somalia
ZA	South Africa
KR	South Korea
SS	South Sudan
ES	Spain
LK	Sri Lanka
SD	Sudan
SR	Suriname
SZ	Swaziland
SE	Sweden
CH	Switzerland
SY	Syria
TW	Taiwan
TJ	Tajikistan
TZ	Tanzania
TH	Thailand
TG	Togo
TO	Tonga
TN	Tunisia
TR	Turkey
TM	Turkmenistan

Asset Code	Country/Region
TV	Tuvalu
UG	Uganda
UA	Ukraine
AE	United Arab Emirates
GB	United Kingdom
US	United States
UY	Uruguay
UZ	Uzbekistan

Asset Code	Country/Region
VU	Vanuatu
VA	Vatican
VE	Venezuela
VN	Vietnam
YE	Yemen
ZM	Zambia
ZW	Zimbabwe

COUNTRIES TRMI INDICES

The 48 TRMI indices for the countries asset class carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range “0 to 1*”, see Chapter 3 above.

Index	Description: <i>references in news and social media to...</i>	Range
sentiment	overall positive references, net of negative references	-1 to 1
optimism	optimism, net of references to pessimism	-1 to 1
joy	happiness and affection	0 to 1*
loveHate	love, net of references to hate	-1 to 1
trust	trustworthiness, net of references connoting corruption	-1 to 1
anger	anger and disgust	0 to 1*
conflict	disagreement and swearing net of agreement and conciliation	-1 to 1
fear	fear and anxiety	0 to 1*
gloom	gloom and negative future outlook	0 to 1*
stress	arousal and intensity, weighted towards distress	0 to 1*
surprise	unexpected events and surprise	0 to 1*
timeUrgency	urgency and timeliness, net of references to tardiness and delays	-1 to 1
uncertainty	uncertainty and confusion	0 to 1*
emotionVsFact	all emotional sentiments, net of all factual and topical references	-1 to 1
marketRisk	positive emotionality and positive expectations net of negative emotionality and negative expectations. Includes factors from social media found characteristic of speculative bubbles – higher values indicate greater bubble risk. Also known as the “Bubbleometer.”	-1 to 1
budgetDeficit	a budget deficit, net of references to a surplus	-1 to 1
businessExpansion	businesses expanding, net of references to contraction	-1 to 1

commercialRealEstateSentiment	positive references to commercial real estate, net of negative references	-1 to 1
consumerSentiment	positive consumer sentiment, net of references to negative consumer sentiment	-1 to 1
creditEasyVsTight	credit conditions being easy, net of references to credit conditions being tight	-1 to 1
economicGrowth	increased business activity, net of references to decreased business activity	-1 to 1
economicUncertainty	uncertainty about business climate net of confidence and certainty	-1 to 1
economicVolatility	increasing economic volatility, net of economic stability	-1 to 1
financialSystemInstability	financial system instability, net of references to financial system stability	-1 to 1
fiscalPolicyLooseVsTight	fiscal policy being loose, net of references to fiscal policy being tight	-1 to 1
inflation	consumer price increases, net of references to consumer price decreases	-1 to 1
inflationForecast	forecasts of consumer price increases, net of forecasts of consumer price decreases (deflation)	-1 to 1
infrastructureSentiment	Positive net of negative references to institutions, facilities, transportation, and industry	-1 to 1
innovation	innovativeness	0 to 1*
investmentFlows	investment inflows, net of references to investment outflows	-1 to 1
residentialRealEstateGrowth	residential real estate expansion, net of references to contraction	-1 to 1
residentialRealEstateSales	residential real estate sales rising, net of references to sales decreasing	-1 to 1
residentialRealEstateSentiment	positive references to residential real estate, net of negative references	-1 to 1
residentialRealEstateValues	residential real estate values rising, net of references to declining values	-1 to 1
tradeBalance	exports, net of references to imports	-1 to 1
unemployment	unemployment rising, net of references to unemployment falling	-1 to 1
unemploymentForecast	unemployment rising, net of references to unemployment falling in the future tense	-1 to 1
governmentAnger	anger and disgust about government officials and departments	0 to 1*
governmentCorruption	Fraud, deceit, and corruption in government	0 to 1*
governmentInstability	governmental instability, net of references to governmental stability	-1 to 1
politicalSentiment	positive sentiment expressed about political parties and institutions net of negative sentiment	-1 to 1

regimeChange	regime change	0 to 1*
sanctions	sanctions or embargoes emanating from or against a country	0 to 1*
socialInequality	social inequality	0 to 1*
socialUnrest	social unrest and calls for political change	0 to 1*
cyberCrime	cyberattacks, data leaks, and electronic espionage	0 to 1*
terrorism	terrorist threats and activities	0 to 1*
violentCrime	criminal violence	0 to 1*
war	war and militant activity	0 to 1*
agriculturalStress	agricultural failures and production deficiencies	0 to 1*
coldWave	unusually cold weather	0 to 1*
drought	lack of rain with environmental consequences	0 to 1*
earthquake	seismic activity	0 to 1*
famine	human caloric deficiency	0 to 1*
fire	forest, brush, and structural fires	0 to 1*
flood	rising water levels with economic consequences	0 to 1*
heatwave	unusually hot weather	0 to 1*
humanInfectiousDisease	presence and outbreaks of contagious or epidemic diseases	0 to 1*
tsunami	tidal wave activity	0 to 1*
volcanicActivity	volcanic eruption	0 to 1*
windStorm	cyclonic storms and extreme wind weather events	0 to 1*

CHAPTER 12 COUNTRY MARKETS

COUNTRY MARKETS ASSETS

There are 62 countries or regions with the largest economic output being distributed. The asset codes correspond to Refinitiv topic codes for geopolitical units.

The table below is sorted by Country/Region.

Asset Code	Country/Region
DZ	Algeria
AR	Argentina
AU	Australia
AT	Austria
BD	Bangladesh
BE	Belgium
BR	Brazil
CA	Canada
CL	Chile
CN	China
CO	Colombia
CZ	Czech Republic
DK	Denmark
EG	Egypt
EZ	Euro-zone
FI	Finland
FR	France
DE	Germany
GR	Greece
HK	Hong Kong
HU	Hungary
IN	India
ID	Indonesia
IR	Iran
IQ	Iraq
IE	Ireland
IL	Israel
IT	Italy
JP	Japan
KZ	Kazakhstan
KW	Kuwait
MY	Malaysia

Asset Code	Country/Region
MX	Mexico
MA	Morocco
NL	Netherlands
NZ	New Zealand
NG	Nigeria
NO	Norway
PK	Pakistan
PE	Peru
PH	Philippines
PL	Poland
PT	Portugal
QA	Qatar
RO	Romania
RU	Russia
SA	Saudi Arabia
SG	Singapore
ZA	South Africa
KR	South Korea
ES	Spain
SE	Sweden
CH	Switzerland
TW	Taiwan
TH	Thailand
TR	Turkey
UA	Ukraine
AE	United Arab Emirates
GB	United Kingdom
US	United States
VE	Venezuela
VN	Vietnam

COUNTRY MARKETS TRMI INDICES

The 30 TRMI indices for the country markets asset class carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range "0 to 1*", see Chapter 3 above.

The table below is broken into three sections: stocks, bonds, and rates. Each has its own buzz.

Index	Description: <i>references in news and social media to the country's major stock indexes and shares traded in that country...</i>	Range
stockIndexBuzz	sum of all relevant references feeding into the TRMI	
bondBuzz	sum of all references to the country's bonds and debt (excluding corporate debt) in that country	
ratesBuzz	sum of all references underlying the centralBank, debtDefault, interestRates, interestRatesForecast, and monetaryPolicyLooseVsTight TRMI	
stockIndexSentiment	overall positive references, net of negative references	-1 to 1
stockIndexOptimism	optimism, net of references to pessimism	-1 to 1
stockIndexTrust	trustworthiness, net of references connoting mistrust	-1 to 1
stockIndexFear	fear and anxiety	0 to 1*
stockIndexStress	arousal and intensity, weighted towards distress	0 to 1*
stockIndexSurprise	unexpected events and surprise	0 to 1*
stockIndexUncertainty	uncertainty and confusion	0 to 1*
stockIndexMarketRisk	positive emotionality and positive expectations net of negative emotionality and negative expectations. Includes factors from social media found characteristic of speculative bubbles – higher values indicate greater bubble risk. Also known as the "Bubbleometer."	-1 to 1
stockIndexPriceDirection	stock price increases, net of references to price decreases	-1 to 1
stockIndexPriceForecast	forecasts of stock price rises, net of references to forecasts of asset price drops	-1 to 1
stockIndexVolatility	volatility in stock market prices	0 to 1*
bondSentiment	overall positive references, net of negative references	-1 to 1
bondOptimism	optimism, net of references to pessimism	-1 to 1
bondTrust	trustworthiness, net of references connoting mistrust	-1 to 1
bondFear	fear and anxiety	0 to 1*
bondStress	arousal and intensity, weighted towards distress	0 to 1*
bondSurprise	unexpected events and surprise	0 to 1*
bondUncertainty	uncertainty and confusion	0 to 1*
bondDefault	debt defaults, late payments, and bankruptcy	-1 to 1
bondPriceDirection	bond price increase, net of references to price decrease	-1 to 1
bondPriceForecast	forecasts of bond price rises, net of references to forecasts of asset price drops	-1 to 1
bondVolatility	volatility in bond and debt values	0 to 1*
centralBank	country central bank references	0 to 1*
debtDefault	debt defaults and bankruptcies in a country	0 to 1*
interestRates	interest rates rising, net of references to rates falling	-1 to 1

interestRatesForecast	forecasts of interest rates rising, net of forecasts of rates falling	-1 to 1
monetaryPolicyLooseVsTight	monetary policy being loose, net of references to monetary policy being tight	-1 to 1

CHAPTER 13 CRYPTOCURRENCIES

CRYPTOCURRENCY ASSETS

TRMI Cryptocurrencies data covers more than 150 active cryptocurrencies. Cryptocurrencies were selected for inclusion based on listed market capitalization and/or technological significance. Coverage includes all cryptocurrencies present in the coinmarketcap.com ranking of the top 100 cryptocurrencies by market capitalization starting in November 2017. Coverage is updated monthly to include new entrants from the top 100 list. Once covered, cryptocurrencies remain in the feed until trading activity ceases.

A list of the covered cryptocurrencies and monthly changes in coverage is available on the MRN SFTP site. See Chapter 15 for information on the files and how to access them.

CRYPTOCURRENCY TRMI INDICES

The 43 TRMI indices for the cryptocurrency asset class carry six significant digits past the decimal point. Negative numbers have a leading minus (-) sign. The table below summarizes these fields. For more information on those with range “0 to 1*”, see Chapter 3 above.

Index	Description: references in news and social media to...	Range
sentiment	overall positive references, net of negative references	-1 to 1
optimism	optimism, net of references to pessimism	-1 to 1
joy	happiness and affection	0 to 1*
loveHate	love, net of references to hate	-1 to 1
trust	trustworthiness, net of references connoting corruption	-1 to 1
anger	anger and disgust	0 to 1*
conflict	disagreement and swearing net of agreement and conciliation	-1 to 1
fear	fear and anxiety	0 to 1*
gloom	gloom and negative future outlook	0 to 1*
stress	arousal and intensity, weighted towards distress	0 to 1*
surprise	unexpected events and surprise	0 to 1*
timeUrgency	urgency and timeliness, net of references to tardiness and delays	-1 to 1
uncertainty	uncertainty and confusion	0 to 1*
violence	violent crime, terrorism, and war	0 to 1*
emotionVsFact	all emotional sentiments, net of all factual and topical references	-1 to 1
marketRisk	positive emotionality and positive expectations net of negative emotionality and negative expectations. Includes factors from social media found characteristic of speculative bubbles – higher values indicate greater bubble risk. Also known as the “Bubbleometer.”	-1 to 1
longShort	buying, net of references to shorting or selling	-1 to 1
longShortForecast	forecasts of buying, net of references to forecasts of shorting or selling	-1 to 1

priceDirection	price increases, net of references to price decreases	-1 to 1
priceForecast	forecasts of asset price rises, net of references to forecasts of asset price drops	-1 to 1
volatility	volatility in market prices or business conditions	0 to 1*
priceMomentum	currency price trend strength, net of references to trend weakness	-1 to 1
adoption	acceptance and widespread adoption	0 to 1*
adoptionForecast	forecasts of acceptance and widespread adoption	0 to 1*
anonymity	user anonymity in transactions	0 to 1*
attack	hacks and other cyberattacks related to the coin	0 to 1*
codeSentiment	overall positive references to the code base, net of negative references	-1 to 1
codeUpgrade	planned code upgrades and enhancements	0 to 1*
criminalActivity	criminal activity involving the cryptocurrency or community	0 to 1*
developerSentiment	overall positive references to the development team, net of negative references	0 to 1*
FOMO	fear of missing out	0 to 1*
fork	fork in the blockchain	0 to 1*
forkForecast	forecasts of a fork in the blockchain	0 to 1*
hodl	holding on for dear life	0 to 1*
innovation	innovativeness	0 to 1*
litigation	litigation and lawsuits involving the cryptocurrency or community	0 to 1*
majorityAttack	majority of miners attacking the blockchain	0 to 1*
noobs	amateur and naive investor activity	0 to 1*
regulatoryCrackdown	regulatory crackdown on cryptocurrency-related activities	0 to 1*
regulatoryIssues	tax or securities authorities intervention or legislation	0 to 1*
scam	fraudulent activity or references to scams associated with the cryptocurrency	0 to 1*
transactionSpeed	fast versus slow transactions speeds for the cryptocurrency	-1 to 1
vulnerability	vulnerabilities or weaknesses in the code	0 to 1*

CHAPTER 14 CONSTRUCTING TRMI WITH GREATER WINDOW LENGTHS

BACKGROUND

TRMIs are constructed internally as Buzz-weighted averages across various news and social media content sources. Custom TRMI on greater window lengths can be constructed based on TRMI of shorter window lengths.

CREATING CUSTOM TRMI WINDOW LENGTHS

Users may construct custom TRMIs of varying window lengths from Buzz-weighted averages of minutely TRMI data.

For example, for a given company (*assetCode*), content source (*dataType*) and datetime (*windowTimestamp*), let $Buzz_0, Buzz_{-1}, \dots, Buzz_{-(N-1)}$ and $TRMI_0, TRMI_{-1}, \dots, TRMI_{-(N-1)}$ represent the corresponding Buzz and TRMI minutely data over the trailing N minutes. Then the Buzz-weighted average TRMI over the trailing N -minute window length may be explicitly calculated as:

$$(Buzz_0 * TRMI_0 + Buzz_{-1} * TRMI_{-1} + \dots + Buzz_{-(N-1)} * TRMI_{-(N-1)}) / (Buzz_0 + Buzz_{-1} + \dots + Buzz_{-(N-1)})$$

COMPARING CONSTRUCTED TRMI DATA TO ACTUAL TRMI DATA

Note that the daily (WDAI_UDAI) and hourly (WDAI_UHOU) TRMI data, which use a 24-hour/1440-minute trailing window¹, cannot be reproduced perfectly using minutely TRMI data (W01M_U01M). This is because textual content is aggregated in the daily and hourly feeds based in part on their online availability (*publication timestamp*). Articles are excluded from the daily and hourly feeds 24 hours after publication, whereas content in the minutely feed is aggregated solely by its time of acquisition by MarketPsych crawlers (*crawl timestamp*). See “Timing of Social Media Articles in Archive” for more information about timestamps. The greater the delay between the publication and crawl timestamps, the fewer 1440-minute TRMI windows will include that content. As a result, the Buzz of the artificially reconstructed 24-hour TRMI will always match or exceed that of the actual 24-hour TRMI.

¹ See “Daily Update Frequency Anomaly” section above for exceptions to when WDAI_UDAI data does not cover a 24-hour window.

CHAPTER 15 MRN SFTP SITE: DATA AND REFERENCE FILES

OVERVIEW

Refinitiv provides live and archive TRMI data over SFTP.

Data is formatted as tab-delimited text files. Archive files are compressed, in .zip format.

Production clients can access the full history, while trial clients may access a more limited period. Files for the two client types are stored in different directories.

The SFTP site also contains useful reference files for the Companies and Cryptocurrencies offerings:

- Listings of live and obsolete assets
- Mappings to common identifiers, including CUSIP, ISIN, and SEDOL for companies and coinmarketcap.com tickers and name identifiers for cryptocurrencies.
- Changes in coverage

ACCESS

Production and most trial users are granted access to the SFTP site. Trial users who convert to paid customers should have their credentials upgraded to full-history access. Users should contact their sales specialist or account manager to obtain login credentials.

Clients may use their credentials to connect to the MRN SFTP service.

The SFTP details are as follows:

URL: sftp-prod.mrn.thomsonreuters.com

IPs: 3.225.149.227 / 3.222.233.255

Port: 22

Authentication Method: Key file

WINDOW LENGTHS AND UPDATE FREQUENCIES

Chapter 2 explained that TRMI are produced over varying window lengths and update frequencies. The excerpted table below shows which combinations are available.

Window Length	Update Frequency	FTP File Abbreviation
1 minute	1 minute	W01M_U01M
1440 minutes / 24 hours	1 hour	WDAI_UHOU
1440 minutes / 24 hours	Daily, at 3:30 Eastern time	WDAI_UDAI

Timing of Social Media Articles in Archive

As background, there are three timestamps used in assigning timestamps to content.

- **Publication time:** a timestamp from the data itself that may be assumed to represent when the content was published
- **Acquisition time:** MarketPsych-assigned timestamp, for when MarketPsych obtained the data. For some content sources, the difference between the publication time and acquisition time is consistently ~1 second or less, but for certain significant social media sources this can average in the tens of minutes. This large difference is especially problematic for certain sources that MarketPsych did not collect live.
- **Aggregation time:** MarketPsych-assigned timestamp describing when the component TRMI scores from content are finalized. For aligning live feed data and pro forma archives, aggregation time showed the best performance.

For all asset classes except cryptocurrencies, over different periods, the timestamp used for archive calculation changed.

- 1998 - February 2013: publication time
- March 2013 - August 2015: acquisition time. For TRMI data that uses a 1440-minute/24-hour window length, the live feed and all archives are aggregated from article acquisition time to publication time plus 24 hours.
- September 2015 - present: aggregation time.

For cryptocurrencies, the publication time was used until April 1, 2018, at which time aggregation time is used for archive calculation.

Using aggregation time, although single-minute differences between the live feed and archive buzz remain, they affect well under 1% of buzz scores in the minute-window data.

Archive Backfills

As might be expected for data derived from numerous textual sources, the processing of MarketPsych Indices undergoes intermittent changes to its content inputs and filtering algorithms. These changes generally are introduced in the minutely data and in monthly archive updates, on a pro forma basis. Full-history TRMI archives are backfilled to reflect these content changes on an occasional basis, often in tandem with a major version upgrade.

Non-zero Buzz Records

Only rows with non-zero Buzz appear in these files, except for daily updating files (WDAI_UDAI) for non-Companies data.

Standard and Bulk Archive Files

Archive files come in two types. Standard archive files were designed so that they can be viewed in Microsoft Excel 2007, which supports 1,048,576 rows. These files are stored in the “Historical” and “Recent” subdirectories described in the next section.

For users who prefer to work with fewer files, archive files are also being provided in a small number of large files, according to the capacity of what can be zipped. These files are stored in the “Bulk” subdirectory.

Bulk files contain scores on an entire asset class over a given time period. Standard files may cover only a single asset, depending on the window length and update frequency.

Directory Structure

Because of the large number of Companies assets, the directory structure for Companies adds two or three extra levels for organization.

{User Type}/MI/{Asset Class}/{Time Abbreviation}/[Historical/Recent/Bulk] [/{Country}]{Economic Sector code}

YYYY/MM/DD is available under Recent folder

- *{User Type}* can take one of the following values
 - PRO: Professional
 - PVT: Private
 - FTA: Free to Air
 - MI: Mapping files
- *{Asset Class}* can take one of the following values:
 - CMPNY: all individual companies
 - CMPNY_AMER: individual companies domiciled in the Americas
 - CMPNY_EMEA: individual companies domiciled in Europe, the Middle East, and Africa
 - CMPNY_APAC: individual companies domiciled in Asia and the Pacific

- CMPNY_GRP: company groups
- COM_AGR: agricultural commodities
- COM_ENM: energy & material commodities
- COU: countries
- COU_MKT: country markets
- CRYPTO: cryptocurrencies
- CUR: currencies
- *{Time Abbreviation}* describes the combination of window length and update frequency, as per the table above
 - W01M_U01M
 - WDAI_UHOU
 - WDAI_UDAI
- *[Historical/Recent/Bulk]*
 - Historical contains all files from the current calendar year, generally. Files are monthly in duration.
 - Recent contains files from the current month. Files are provided under daily subdirectories.
 - Exception to the previous/current year rule: Recent will continue to hold files from the previous year that just passed, until that year's archives have been regenerated based on the most recent TRMI build.
 - Bulk is an option for most asset class / time abbreviation combinations, as per the table below. This directory contains larger files than the Historical and Recent directories. As a result, it has none of the subdirectories listed below, and the files are different from the standard archive files. Note that 2017 files shall be standalone just as 2016 files are.

Bulk File Details

Asset Class	Minutely: W01M_U01M	Hourly: WDAI_UHOU	Daily: WDAI_UDAI
CMPNY	Annual with monthly YTD updates	Quarterly with monthly YTD updates	1998-2004, 2005-2009, 2010-2011, 2013-2015, 2016, 2017 with monthly YTD updates
CMPNY_GRP	None [keep]	1998-2000, 2001-2002, 2003-2004, 2005-2006, 2007-2008, 2009-2010, 2011-2012, 2013, 2014-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017
COM_AGR	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017
COM_ENM	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017
COU	None	None [keep]	1998-2012, 2013-2015, 2016, 2017
COU_MKT	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017
CRYPTO	2009-2017	2009-2017	2009-2017
CUR	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017	1998-2012, 2013-2015, 2016, 2017

- Two intermediate subdirectory levels apply only to Companies non-bulk data
 - *{Country}* is the two-letter ISO 3166-1 country code
 - *{Economic Sector}* is a three-letter code corresponding to the TRBC Economic Sector.
 - ENE: Energy
 - MAT: Basic Materials
 - IND: Industrials
 - YCY: Cyclical Consumer Goods & Services
 - NCY: Non-Cyclical Consumer Goods & Services

- FIN: Financials
- HLC: Healthcare
- TEC: Technology
- COM: Telecommunications Services
- UTL: Utilities
- *{Asset Code}*. This level only applies to Companies non-bulk data.
 - This level is used for the minutely data only, due to the amount of data

File Naming

User Type.Archive.{Asset Class}.[.{Country}.{Economic Sector code}]/.{Asset Code}]{Time Abbreviation}.{Time Period}.{System Version, converted}.zip/txt, such that

- *{User Type}* can be (PRO, PVT, FTA)
- *{Asset Class}* as per above
- *{Country}.{Economic Sector code}* as per above. This applies only to CMPNY WDAI_UHOU and WDAI_UDAI Historical/Recent files.
- *{Asset Code}*. This level is only present for CMPNY W01M_U01M non-Bulk.
- *{Time Abbreviation}* as per above
- *{Time Period}* can take one of the following values, depending on its directory:
 - Bulk: “yyyy-yyyy” for multi-year data, as per “Bulk File Details” table above
 - Historical:
 - “yyy” format for annual data.
 - “yyyyQq” format for quarterly data. This applies only to hourly (WDAI_UHOU) data.
 - Recent: “yyyymm” format for monthly data
- *{System Version, converted}*. The systemVersion value, “MP:3.0.0” will be converted to “0300”. Note that this string’s length reaches five characters when the third number in the systemVersion exceeds 9, e.g., “3.2.10” will be converted to “03210”.

Archive File Structure

Each .zip file holds one .txt file that contains relevant archive data for that asset and time period, across all three Data Types (News, Social, and combined).

Fields

See Chapter 5 for information on fields that are generic to all TRMI asset classes.

- id
- assetCode
- ticker: only for Companies. Note that ticker is generally not point-in-time, although it can vary across System Version values.
- windowTimestamp
- dataType: “News”, “Social”, or “News_Social”
- systemVersion, excluding its prefix
- buzz
- non-generic indices: sentiment, optimism, et al.

Sort Order, Single-asset Files

- windowTimestamp
- dataType

Sort Order, Multi-asset Files

- windowTimestamp
- assetCode
- dataType

VERSION UPDATES

The file system version is updated in one of three digits. The first digit of the version is updated (e.g., from version 2 to 3) approximately every three years due to advancements in the NLP and overhauls in source constituents. Such major versions are run in production in parallel while customers upgrade over 12 to 18 months. For the most recent major versions, version 2 NLP was frozen in March 2014, and version 3 NLP was frozen in March 2017.

The second digits in the version number are updated if an urgent patch is made. For example, between versions 3.0/3.1 and 3.2/3.3 a source-level change affecting media acquisition led to excessive buzz in some assets. The change was identified, its effect was quantified, and a minor version update restores the feed to regain consistency from that source. The second digits are also updated when a forked sub-feed is launched. For example, the cryptocurrency sentiment feed was forked off of v3.0 and launched as v3.1 due to minor NLP changes to account for cryptocurrency source-specific linguistic differences.

The third digits of the version number are updated monthly to reflect the inclusion of IPOs, company additions, corporate name changes, mergers, and buyout activity. These minor version updates include additional corporate aliases and changes in corporate aliasing. Updates reflected in second and third version number digits do not reflect NLP or text analysis alterations.

COMPANIES AND CRYPTOCURRENCIES REFERENCE FILES

Companies and cryptocurrencies reference files serve several purposes. The files list companies and cryptocurrencies that can be found in the recent or archive scores. The files add supporting information on the company or cryptocurrency and on its primary quote. In addition, for companies only, third-party identifiers – CUSIP, ISIN, and SEDOL – are also available. CUSIP requires a license with Standard & Poor's. ISINs are included because some ISINs are CUSIP-based. SEDOL access requires a license with the London Stock Exchange.

Please contact your Account Manager or Sales Specialist if you are interested in viewing these third-party identifiers for companies and have a requisite license. Refinitiv will contact the identifier issuer(s) to verify the license(s).

Directories

Companies

/MI/CMPNY_REF/[BASIC/CUSIPISIN/CUSIPISINSEDOL/ISIN/SEDOL]/

Notes:

- The third level directory is permissioned according to user's combination of licenses for third-party identifiers. Access will be given to exactly one such directory. By default, users are granted access to the BASIC directory.

Cryptocurrencies

/MI/CRYPTO_REF/[BASIC]/

Asset Lists and Mappings Files

Companies

MI.Companies.[BASIC/CUSIPISIN/SEDOL/CUSIPISINSEDOL].{System Version, converted}.txt

Notes:

- *{System Version, converted}*. The systemVersion value, "MP:3.0.0" will be converted to "0300". Note that this string's length reaches five characters when the third number in the systemVersion exceeds 9, e.g., "3.0.10" will be converted to "03010".

Fields:

- PermID: Refinitiv organizational identifier.
- companyName
- countryOfDomicile: two-character ISO 3166-1 country code
- TRBCEconomicSector: plain-text description of Thomson Reuters Business Classification (TRBC) economic sector
- status: "active" if the PermID may be scored in a live feed. Otherwise, "inactive".
- RIC: main RIC for this company.
- ticker: Because ticker is in the score files, it shall be populated for all companies. Private companies shall have a MarketPsych-designated ticker beginning with "PVT-".
- marketMIC: ISO 10383 code for market or exchange identification. Value may differ from similar value maintained by London Stock Exchange.
- CUSIP: only available in files with "CUSIPISIN" in the file name
- ISIN: only available in files with "CUSIPISIN" in the file name
- SEDOL: only available in files with "SEDOL" in the file name

Values on inactive companies shall attempt to represent their most recent values, including after delisting. Some values may be blank.

Cryptocurrencies

MI.Crypto.[BASIC].{System Version, converted}.txt

Notes:

- *{System Version, converted}*. The systemVersion value, "MP:3.0.0" will be converted to "0300". Note that this string's length reaches five characters when the third number in the systemVersion exceeds 9, e.g., "3.0.10" will be converted to "03010".
- For cryptocurrencies, the System Version begins at MP:3.1.05.

Fields:

- assetCode
- cryptocurrencyName
- status: "active" if the cryptocurrency may be scored in a live feed; otherwise "inactive".

Changes File

The second is a file of changes since the previous System Version.

Companies

TRMI.Companies.Changes.{System Version, converted}.txt, such that

- *{System Version, converted}*. The systemVersion value, “MP:3.0.0” will be converted to “0300”. Note that this string’s length reaches five characters when the third number in the systemVersion exceeds 9, e.g., “3.0.10” will be converted to “03010”.

File contents:

- First line: “TRMI Companies list for systemVersion [*systemVersion*] was created on [*yyyy-mm-dd*].”
- Further lines:
 - “PermID [*xxxxxxxxxxx*], [*companyName*], became active.”
 - “PermID [*xxxxxxxxxxx*], [*companyName*], became inactive.”

Cryptocurrencies

TRMI.Crypto.Changes.{System Version, converted}.txt, such that

- *{System Version, converted}*. The systemVersion value, “MP:3.0.0” will be converted to “0300”. Note that this string’s length reaches five characters when the third number in the systemVersion exceeds 9, e.g., “3.0.10” will be converted to “03010”.

File contents:

- First line: “MI Cryptocurrencies list for systemVersion [*systemVersion*] was created on [*yyyy-mm-dd*].”
- Further lines:
 - “assetCode [*xxxxxxxxxxx*], [*cryptocurrencyName*], became active.”
 - “assetCode [*xxxxxxxxxxx*], [*cryptocurrencyName*], became inactive.”

TRIAL ACCESS COMPARED TO PRODUCTION ACCESS

As mentioned in the overview to this chapter, trial clients can access less data than can production clients, and from a different directory. Thus the files are the same, but the time duration is less.

Following are the key differences in directory structure for trial clients compared to production clients:

- Root directory is User Type/MI/TRIAL, instead of User Type/MI
- The third-level directory denotes the Time Abbreviation
- The directory level of Bulk is absent

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