API Manual
Calculation

The Thai Bond Market Association

November 11,2023

Calculations

POST /api/v1/bond-calculation

Description: Bond calculation follows by ThaiBMA market convention, calculation methodology, and rounding.

Frequency: Daily.

Release schedule: Immediately after calculation bond.

Remark for calculation:

1. Traded yield is based on 30/360 basis (on coupon payment) which might be different from yield calculated on actual payment.

2. Yield to Call (%) is calculated based on the next call date that is scheduled not less than 30 days after the settlement date.

3. BEY (%) is Bond Equivalent Yield (calculated with semi-annually compounded yield).

4. Coupon rate/K (%) is the estimated coupon rate for THOR bond (FRN) if the trade date is not in the XI/XA period.

5. The following formula is used to calculate accrued interest in the XI period of the THOR Bond:

$$AI(\%) = -\left[\left(Coupon * \frac{DCS + DSC}{365}\right) - \left((THOR_{AI} + QM) * \frac{DCS}{365}\right)\right]$$

6. Foreign currency-denominated bonds and perpetual bonds calculated on this page by using the ThaiBMA market convention which might be different from yield calculated on actual payment.

7. Perpetual bonds calculated to first call date only.

Remark for LB/BOT FRN Re-Open:

1. The Re-Open calculation option is applicable for only the floating rate note issued by the Thai government (LB FRN) or the Bank of Thailand (BOT FRN).

2. If the "Re-Open (LB/BOT FRN)" box is checked:

   2.1 The calculation for LB/BOT FRN will use a set of BIBOR interest rates after 11:00 A.M. as of 2 business days before the trade date (T-2).

   2.2 The calculation for THOR FRN will use the THOR rate at 5:00 P.M. as of 1 business day before the trade date (T-1).

3. The Re-Open calculation option is only available for trade dates from the day after the issue date to the fixing date of the last coupon payment.

Remark for Inflation-Linked Bond:

1. The input yield (%) must be the real yield (%)

2. Duration and convexity measures are calculated based on real YTM.

Remark for Actual Cash Flow Calculation:

1. The calculation for each bond price on this page is calculated based on the actual coupon payment calculation stated in the bond subscription form or prospectus or information memorandum or any such official documents filed by issuers with the ThaiBMA as per the Registration requirements.

2. Current calendar holidays incorporated in the calculation are based on Financial Institutions' Holidays announced by the Bank of Thailand.

3. For an Inflation-linked bond, coupon (%) is a real coupon (%), and all the yields (%) shown are real YTM (%). The clean price (%) and accrued interest (%) are all in unadjusted terms. The gross value (THB) and total gross value (THB) are in unadjusted terms. The corresponding adjusted terms can be obtained by multiplying the unadjusted price or accrued interest by the index ratio shown in the last column. modified duration and convexity are calculated based on real YTM (%).

4. The calculation on this page must not be used nor defined as any references for mark-to-market price.

5. Yield to Call (%) is calculated based on the next call date that is scheduled not less than 30 days after the settlement date.

6. BEY (%) is Bond Equivalent Yield (calculated with semi-annually compounded yield).

Request Body (Method: POST)

Parameter Name	Data Type	Description	Format
symbol	string	ThaiBMA bond symbol	CBF24212A
settlement_date	string	Settlement date	2023-11-14
trade_date	string	The date and time of trading transactions	2023-11-13
yield	number	Yield (%) or DM (%) (In the case of ILB means real yield (%))	3.05
yield_type	string	Type of yield (YTM, YTC, YTP, or DM)	DM
unit	integer	Unit	1
is_reopen	boolean	Bond is a re-open bond or not? (True/False)	false
is_ilb	boolean	Bond is ilb bond or not? (True/False)	false
is_yield_2_price	boolean	Bond is yield to price or not? (True/False)	true
is_callput_option	boolean	Bond is yield to put/call calculation or not? (True/False)	false
option_date	string	Put/Call date (In the case of yield to put/call calculation or not)	null
percent_price	number	Price (%), in case of ILB = Undajusted Price (%)	null
price_type	string	Classify price type between gross price, clean price (Clean, or Gross)	null

Example Value:


```
{
  "symbol": "string",
  "settlement_date": "2023-11-29T09:38:42.633Z",
  "trade_date": "2023-11-29T09:38:42.633Z",
  "yield": 0,
  "yield_type": "string",
  "unit": 0,
  "is_reopen": true,
  "is_ilb": true,
  "is_yield_2_price": true,
  "is_callput_option": true,
  "option_date": "2023-11-29T09:38:42.633Z",
  "percent_price": 0,
  "price_type": "string"
}
```


Response:

Code	Description
200	Success
400	Bad request
401	Unauthorized
500	Internal server error

Output: Return - Calculation Result

Parameter name	Data Type	Length	Description	Example
symbol	string	15	ThaiBMA bond symbol	CBF24212A
settlement_date	datetime	19	Settlement date	2023-11-14T00:00:00
trade_date	datetime	19	The date and time of the trading transaction	2023-11-13T00:00:00
unit	number	12	Unit	1
yield_percent	number	(2,6)	YTM (%)	5.54014
bey_percent	number	(2,6)	YTM (%) semi-annualized	5.579037
dm_percent	number	(2,6)	DM (%) discount margin	3.05
gross_price_percent	number	(18,10)	The price of a bond including accrued interest (%)	100.813292

Parameter name	Data Type	Length	Description	Example
clean_price_percent	number	(10,6)	The price of a bond without accrued interest (%)	99.28805
ai_percent	number	(10,6)	Accrued interest (%)	1.525242
gross_value_thb	number	(10,6)	The price of a bond including accrued interest (Baht)	1008.13
clean_value_thb	number	(10,6)	The price of a bond without accrued interest (Baht)	992.88
ai_value	number	(10,6)	Accrued interest (Baht)	15.25
dsc	number	10	Days from settlement date to next coupon date	90
dcs	number	10	Days from the previous coupon date to the settlement date	274
int_percent	number	(10,6)	Reference interest rate	2.49014
THORai_percent	number	(10,6)	THOR	2.0318
THOR_date	datetime	19	Reference THOR date	2023-11-10T00:00:00
ytc_percent	number	(10,6)	Yield to Call (%)	
nextcall_date	datetime	19	Next call date	
call_price	number	(10,6)	Call price	
pvbp	number	(10,6)	The price value of a basis point	0.000033
macaulay_duration	number	(10,6)	Macaulay duration	
modified_duration	number	(10,6)	Modified duration	0.003769
convexity	number	(10,6)	A measure of the sensitivity of a bond's price to changing interest rates	9.919327
coupon_rate_k_percent	number	(10,6)	Coupon rate or K (%)	2.16856
coupon_type	string	20	Type of coupon (Fixed, or Floated)	FLOAT
par	number	10	Current par (Baht)	1000
xi_period	number	10	The number of days during the registration period (before the coupon payment date)	5
coupon_payment_frequency	number	2	Coupon payment frequency per year	0

Parameter name	Data Type	Length	Description	Example
current_coupon_freq	number	2	Coupon payment frequency in the current period will be 1. Positive integer (0,1,2,4,12) in case of Bond that can specify the coupon payment frequency. 2. -1 in case of "Not specify" the coupon payment frequency of Bond in the ThaiBMA system ** current_coupon_freq will have value since the issue date of Bond (For auction period value = 1)	2
ttm	number	(6,6)	Time to maturity during settlement T+1 (calendar day) until expiration (years)	0.246575342465753
call_put_date	datetime	19	Call date or put date (In the case of yield to put/call calculation)	
distribution_type	string	10	Distribution type (HNW, II, PG, PO, PP10, PP13, PP13e, P/P, PP17, PPEXX, PPCC, or RO)	PG
percent_realyield	number	(2,6)	YTM (%) real yield to maturity	5.54014
index_ratio	number	(6,6)	Index ratio	
settlement_amount	number	(18,10)	The price of the ILB bond including accrued interest (Baht, unadjusted with index ratio)	
unadj_gross_price	number	(10,6)	The price of the ILB bond including accrued interest (%, unadjusted with index ratio)	1008.13292
unadj_clean_price	number	(10,6)	The price of an ILB bond without accrued interest (%, unadjusted with index ratio)	992.8805
unadj_ai	number	(10,6)	Accrued interest of ILB bond (%, unadjusted with index ratio)	15.25242
unadj_par	number	10	Current par of iLB bond (unadjusted with index ratio)	1000
remark	string	255	Calculation remark	

Output: Return - Calculation error

Parameter name	Data type	Length	Description
symbol	string	255	Message error about ThaiBMA symbol
settlement_date	datetime	255	Message error about bond is re-open bond or not?

Parameter name	Data type	Length	Description
trade_date	datetime	255	Message error about bond is ilb bond or not?
settlement_date	string	255	Message error about the settlement date
trade_date	string	255	Message error about trade date and time
yield	string	255	Message error about yield (%) or DM (%)
yield_type	string	255	Message error about yield type
is_callputoption	string	255	Message error about yield to put/call calculation
option_type	string	255	Message error about option type
option_date	string	255	Message error about put/call date (In the case of yield to put/call calculation or not)
unit	string	255	Message error about unit
percent_price	string	255	Message error about price (%)
price_type	string	255	Message error about price type between gross price, clean price
oth	string	255	Others message error

Example Calculation error:


```
{
    "success": false,
    "status": 400,
    "message": "Calculation Error",
    "info": {
        "api_code": "B01",
        "api_name": "Bond Calculation",
        "api_description": "Bond calculation follow by ThaiBMA market convention, calculation methodology and rounding method. Calculation condition same as calculation page on iBond"
    },
    "timestamp": "2022-07-13T10:18:25.6696055+07:00",
    "calculation_error": {
        "symbol": "",
        "is_reopen_botfrn": "",
        "is_ilb": "",
        "settlement_date": "",
        "trade_date": "",
        "yield": "",
        "yield_type": "",
        "is_callputoption": "Call/Put Date is not valid.",
        "option_type": "",
        "option_date": "",
        "unit": "",
        "percent_price": "",
        "price_type": "",
        "oth": "DA213A"
    }
```