FACTSET 〉 SEE THE ADVANTAGE

FIXED INCOME CALCULATION API - VERSION 3.0

Developer's Manual and Reference

June 2023

FACTSET 〉 SEE THE ADVANTAGE

Fixed Income Calculation API – Version 3.0

Contents

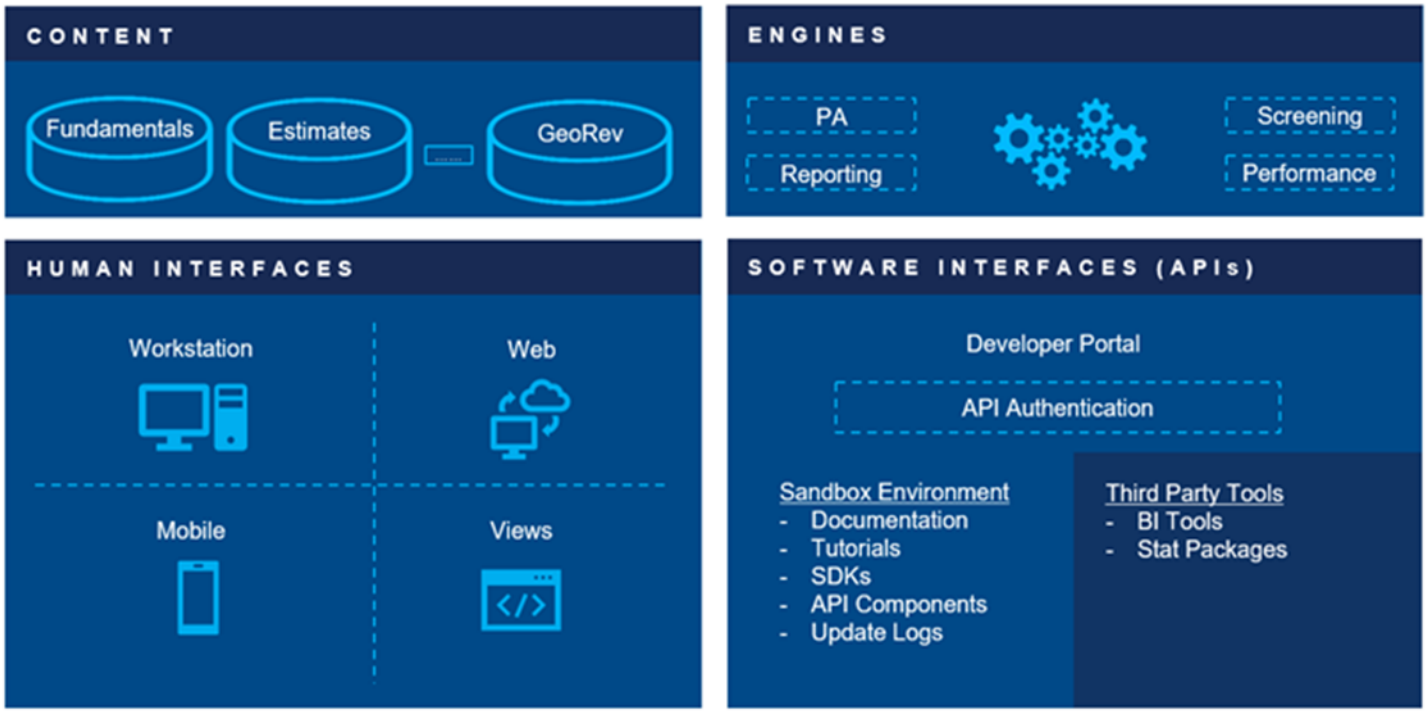
1. Motivation

In 1997, FactSet launched Portfolio Analysis 1.0, which set the foundation for Analytics. Soon after, Portfolio Analysis 2.0 integrated risk analytics from third-party vendors, and then expanded to include Fixed Income in 2004. FactSet now offers a robust suite of multi-asset portfolio analytics products that leads the market in flexibility, analytics, and breadth. Today, clients rely on FactSet for interactive analytics through various products, such as Portfolio Analysis (PA), SPAR, Alpha Testing, Optimizers, and Portfolio Dashboard, as well as the distribution of analytics through Portfolio Batcher, Publisher Flat Files, and Publisher documents.

2. API Program

2.1 Overview

Clients have been moving towards building a custom solution, driven by the need to increase productivity by consolidating information into a single user experience. By exposing analytics, performance, and risk through APIs, it provides you with a sophisticated channel to interact with FactSet's leading multi-asset analytics. As the market continues to demand more transparency and data, FactSet will provide flexible options to meet those demands. APIs complement the current analytics suite offerings and facilitate partnerships by allowing you to build private experiences, integrate with third-party BI tools like Tableau, third-party stat packages like RStudio, and increase control over internal consumption of analytics from FactSet.



The first stage of exposing Analytics APIs will be focused on the portfolio analytics engine. Since inception, program has expanded to include other analytics engines, products, and APIs from other business units.

The program provides the following:

- Developer toolkit to build proof of concept

- Uniform feel across all FactSet's Enterprise scale APIs
- Adherence to industry standards
- Versioned APIs
- Extensive documentation and tutorials on the developer portal

3. FI Calculation API

Programmatically calculate advanced Fixed Income analytics on a universe of securities with FactSet's Fixed Income Calculation Engine. With an extensive inventory of analytics and automated calculations, go from data to decision first.

All APIs are hosted under https://api.factset.com. Authentication is handled using API Keys and authorization is handled using FactSet's in-house subscriptions product. You can find more information about using API Keys at https://developer.factset.com/authentication.

HTTP request and response header names should be considered case insensitive as per HTTP Standard. Please do not rely on case sensitive matching of headers in your code.

3.1 Calculation API

3.1.1 Run FI Calculation

POST /analytics/engines/fi/v3/calculations

This endpoint runs fixed income analytics calculations on a universe based on parameters specified in the POST body. It must be used first, before checking status or cancelling endpoints. A successful response will contain the results of the calculation, or a URL to check the status of the request if the calculation takes longer than 30 seconds to complete.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Content-Type	Standard HTTP header. Value needs to specify application/JSON (i.e., caller needs to specify that the body is in JSON format).

Request Body

The request body accepts a collection of calculation parameters. The parent parameters are outlined below:

Parameter name	Data type	Required	Description	Format
data	Array	Yes	List of calculations to compute for each component.	Each calculation represented by an object containing calculation inputs. See below for schema and example values.

meta	Object	Yes	Allows users to specify the response format and stachContentOrganization	Valid format values are 'JsonStach' and 'Binary'. Default is 'JsonStach'. Valid stachContentOrganization values are 'Row', 'Column, 'SimplifiedRow', and 'None'. Default is 'SimplifiedRow'. Please refer to the STACH v2 Documentation for more information on STACH v2 format types.

Below are the calculation parameters supported by data section:

Parameter name	Data type	Required	Description	Format
securities	Array	Yes	List of securities to analyze	Each security represented by an object containing calculation inputs. See below for schema and example values.
calculations	Array	Yes	List of calculations to compute for each security	See Appendix: Available Calculations for a list of available calculations
jobSettings	Object	Yes	Job settings	asOfDate should follow YYYYMMDD format

Below are the input parameters supported under securities section:

Parameter name	Data Type	Required	Description	Format
settlement	String	No	Date by which the security must be settled	YYYYMMDD or t+0, t+1
callMethod	String	No	Bond Call Exercise Method	Intrinsic Value, First Par, No Call or First Call
calcFromMethod	String	No	Method of valuation	OAS, Price, Actual Spread etc.
calcFromValue	Number	Yes	Price or Spread value	For example: Price can be 100.166, OAS can be 0 etc.
symbol	String	Yes	Security Identifier	CUSIP, SEDOL etc.
face	Number	No	Amount of principal paid to the security holder over the life of the security.	Default = 1
faceType	String	No	Face Type of the security	Current or Original. Default = Current
discountCurve	String	No	Curve for Interest Rates at different points in time	UST, LIBOR, etc.
prepay:{prepayName}	String	No	The prepay name used to calculate option adjusted analytics for the security.	For example: : FSP FH30 etc.

loss:{lossName}	String	No	The loss name assumption to be used for analytics.	For example: CDX etc.
referenceSecurity	Object	No	Security used as reference to calculate comparative analytics.	For Example: 3140JQHD etc.

Below settings are supported for referenceSecurity:

Parameter name	Data Type	Required	Description	Format
securityType	String	No	Type of reference security specified.	For example: FSMBS
securityName	String	No	Reference security symbol.	For Example: 3140JQHD etc
calcFromValue	Number	Yes	Price or Spread value	For example: Price can be 100.166, OAS can be 0 etc.
prepay:{prepayName}	String	No	The prepay name used to calculate option adjusted analytics for the security.	For example: : FSP FH30 etc.
Settlement	String	No	Date by which the security must be settled	YYYYMMDD or t+0, t+1
calcFromMethod	String	No	Method of valuation	OAS, Price, etc.

Below are the parameters supported in jobSettings section:

Parameter name	Data Type	Required	Description	Format
asOfDate	String	Yes	Date of your perspective. Date must not be a weekend.	YYYYMMDD
partialDurationMonth	Integer	No	Partial Duration Months.	1,12,36 etc. or [1,30,90] for multiple months.
callMethod	String	No	Bond Call Exercise Method	Intrinsic Value, First Par, No Call or First Call
Settlement	String	No	Date by which the security must be settled	YYYYMMDD or t+0, t+1
calcFromMethod	String	No	Method of valuation	OAS, Price, etc.

Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-Api-Units-Limit	Maximum units limit across all requests.
X-FactSet-Api-Units-Remaining	Number of units remaining till unit limit reached.

Location	Standard HTTP header. Contains URL to check status of the request.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
201	Expected response if calculation is completed within 30 seconds, returns JSON in the format specified in the Run Calculations endpoint.
202	Expected response, contains the URL in the Location header to check the status of the request.
400	Invalid calculation parameters.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	One or more calculation settings were unavailable.
415	Missing/Invalid Content-Type header. Header needs to be set to application/json.
429	Rate limit reached. Cancel older requests using Cancel Calculation endpoint or wait for older requests to finish / expire.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

Remarks

- Maximum 50 POST requests allowed in a 5 second window for each API. The same can be verified using the various Rate-Limit headers available in the API response.

  X-FactSet-Api-RateLimit-Limit - Number of allowed requests for the time window.

  X-FactSet-Api-RateLimit-Remaining - Number of requests left for the time window.

  X-FactSet-Api-RateLimit-Reset - Number of seconds remaining till rate limit resets.

- Maximum 1000 securities allowed per request.
- Multi-horizon calculations are not currently supported through this endpoint.
- Please refer to the STACH v2 documentation for more information on STACH v2 format types

Caching Remarks

- *All results will be cached for 12 hours by default.* This means that by default (without sending any cache-control headers), after the first request successfully completes, all subsequent requests with unchanged request parameters will return the same results for 12 hours.

- Setting the max-stale=<staleness limit in seconds> allows you to fetch pre-calculated results with any subsequent POST requests, as long as they were last calculated within the staleness limit.
    - Once set, the API will check to see if the stored results are within the staleness limit.
        - If the results are not within the limit, a brand-new calculation request will be triggered to get the latest results.
- To immediately request the latest results, override the cache by setting “max-stale=0” in the Cache-control header parameter.

Examples

Request:

POST

https://api.factset.com/analytics/engines/fi/v3/calculations

Headers:

```
content-type: application/json
Authorization: Basic RkRTX0RFTU9fVVMt******************************
Accept-Encoding:  gzip
content-length: 201
```

Body:

```
{
  "data": {
    "securities": [
      {
        "calcFromMethod": "Price",
        "calcFromValue": 110,
        "symbol": "3140JQHD",
      }
    ],
  "calculations":  ["Security Type",
       "Security Name",
       "Calc From Method",
       "Yield Curve Date",
       "Settlement Date",
       "Discount Curve",
       "Price",
       "Yield to No Call",
       "Actual Spread",
       "OAS",
       "Effective Duration",
       "Effective Convexity"
    ],
```

```
  "jobSettings": {
       "asOfDate": "20210611",
    }
  },
  "meta": {
       "contentorganization": "SimplifiedRow",
       "contenttype": "Json"
  }
}
```

Response:

HTTP 201 Accepted

Headers:

```
x-datadirect-request-key: 60d347ba13de9824
x-factset-api-calculation-id: 80ace71a755a4961a7480f49232a3912
x-factset-api-request-key: 60d347bae1cd61a8
```

Request:

POST

https://api.factset.com/analytics/engines/fi/v3/calculations

Headers:

```
content-type: application/json
Authorization: Basic RkRTX0RFTU9fVVMt******************************
Accept-Encoding:  gzip
content-length: 201
```

Body:

```
{
  "data": {
    "securities": [
      {
        "calcFromMethod": "Price",
        "calcFromValue": 110,
        "symbol": "3140JQHD",
      }
    ],
    "calculations": [
      "Partial Duration"
```

```
    ],
    "jobSettings": {
      "asOfDate": "20210611",
      "partialDurationMonths": [1,12,36,120]
    }
  },
  "meta": {
    "contentorganization": "SimplifiedRow",
    "contenttype": "Json"
  }
}
```

Response:

```
HTTP 202 Accepted
```

Headers:

```
location:
https://api.factset.com/analytics/engines/fi/v3/calculations/0c1b6671aa364d67afae8b7817c66d9a
x-datadirect-request-key: 60d348c132a3f425
x-factset-api-request-key: 60d348c13bd693e1
```

3.1.2 Create and Update FI Calculation

PUT /analytics/engines/fi/v3/calculations/{id}

Description

This endpoint can be used to either:

- Create a new FI calculation(s) with a custom id specified in the id path parameter
- Update calculation parameters and run a pre-existing FI calculation

Like the POST endpoint, the PUT endpoint must be used first, before checking status or cancelling endpoints. A successful response will contain the URL to check the status of the request.

If the **X-FactSet-Api-Long-Running-Deadline** header is passed, then this endpoint will return calculation results in the response if the calculation completes within the specified amount of time.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Content-Type	Standard HTTP header. Value needs to specify application/JSON (i.e., caller needs to specify that the body is in JSON format).

X-FactSet-Api-Long-Running-Deadline	Long running deadline in seconds when only one unit is passed in the POST body. The endpoint will return calculation results in the response if it completes within the specified amount of time (rather than return the status polling URL) Max value is 20 seconds.
Cache-Control	Standard HTTP header that holds caching instructions. max-stale is the only supported directive. It indicates that the client will accept a stale response, the value (in seconds) denotes the upper time limit for the stale response. Note that all results are cached for 12 hours, to override the default cache and trigger a new request, set max-stale=0. Max value is 43200 seconds (12 hours). For more information on caching, see the Caching Remarks section.

Request Body

The request body accepts a collection of calculation parameters. The parent parameters are outlined below:

Parameter name	Data type	Required	Description	Format
data	Array	Yes	List of calculations to compute for each component.	Each calculation represented by an object containing calculation inputs. See below for schema and example values.
meta	Object	Yes	Allows users to specify the response format and stachContentOrganization	Valid format values are 'JsonStach' and 'Binary'. Default is 'JsonStach'. Valid stachContentOrganization values are 'Row', 'Column, 'SimplifiedRow', and 'None'. Default is 'SimplifiedRow'. Please refer to the STACH v2 Documentation for more information on STACH v2 format types.

Below are the calculation parameters supported by data section:

Parameter name	Data type	Required	Description	Format
securities	Array	Yes	List of securities to analyze	Each security represented by an object containing calculation inputs. See below for schema and example values.
calculations	Array	Yes	List of calculations to compute for each security	See Appendix: Available Calculations for a list of available calculations
jobSettings	Object	Yes	Job settings	asOfDate should follow YYYYMMDD format

Below are the input parameters supported under securities section:

Parameter name	Data Type	Required	Description	Format
settlement	String	No	Date by which the security must be settled	YYYYMMDD or t+0, t+1

callMethod	String	No	Bond Call Exercise Method	Intrinsic Value, First Par, No Call or First Call
calcFromMethod	String	No	Method of valuation	OAS, Price, Actual Spread etc.
calcFromValue	Number	Yes	Price or Spread value	For example: Price can be 100.166, OAS can be 0 etc.
symbol	String	Yes	Security Identifier	CUSIP, SEDOL etc.
face	Number	No	Amount of principal paid to the security holder over the life of the security.	Default = 1
faceType	String	No	Face Type of the security	Current or Original. Default = Current
discountCurve	String	No	Curve for Interest Rates at different points in time	UST, LIBOR, etc.
prepay:{prepayName}	String	No	The prepay name used to calculate option adjusted analytics for the security.	For example: : FSP FH30 etc.
loss:{lossName}	String	No	The loss name assumption to be used for analytics.	For example: CDX etc.
referenceSecurity	Object	No	Security used as reference to calculate comparative analytics.	For Example: 3140JQHD etc.

Below settings are supported for referenceSecurity:

Parameter name	Data Type	Required	Description	Format
securityType	String	No	Type of reference security specified.	For example: FSMBS
securityName	String	No	Reference security symbol.	For Example: 3140JQHD etc
calcFromValue	Number	Yes	Price or Spread value	For example: Price can be 100.166, OAS can be 0 etc.
prepay:{prepayName}	String	No	The prepay name used to calculate option adjusted analytics for the security.	For example: : FSP FH30 etc.
Settlement	String	No	Date by which the security must be settled	YYYYMMDD or t+0, t+1
calcFromMethod	String	No	Method of valuation	OAS, Price, etc.

Below are the parameters supported in jobSettings section:

Parameter name	Data Type	Required	Description	Format
asOfDate	String	Yes	Date of your perspective. Date must not be a weekend.	YYYYMMDD

partialDurationMonth	Integer	No	Partial Duration Months.	1,12,36 etc. or [1,30,90] for multiple months.
callMethod	String	No	Bond Call Exercise Method	Intrinsic Value, First Par, No Call or First Call
Settlement	String	No	Date by which the security must be settled	YYYYMMDD or t+0, t+1
calcFromMethod	String	No	Method of valuation	OAS, Price, etc.

Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Location	URL to poll for the resulting calculation
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
201	Expected response once calculation is completed, returns JSON in the format specified in the Calculation parameters
202	Expected response, contains the poll URL in the Location header.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	One or more calculation settings were unavailable.
409	Duplicate calculation exists with same parameters.
415	Missing/Invalid Content-Type header. Header needs to be set to application/json.
429	Rate limit reached. Cancel older requests using Cancel Calculation endpoint or wait for older requests to finish/expire.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

Examples

Request:

PUT https://api.factset.com/analytics/engines/fi/v3/calculations/custom-id

Headers:

```
content-type: application/json
Authorization: Basic RkRTX0RFTU9fVVMt******************************
Accept-Encoding:  gzip
content-length: 201
```

Body:

```
{
  "data": {
    "securities": [
      {
        "calcFromMethod": "OAS",
        "calcFromValue": 110,
        "symbol": "3140JQHD",
      }
    ],
  "calculations":  ["Security Type",
       "Security Name",
       "Calc From Method",
       "Yield Curve Date",
       "Settlement Date",
       "Discount Curve",
       "Price",
       "Yield to No Call",
       "Actual Spread",
       "OAS",
       "Effective Duration",
       "Effective Convexity"
    ],
    "jobSettings": {
      "asOfDate": "20210611",
    }
  },
  "meta": {
    "contentorganization": "SimplifiedRow",
    "contenttype": "Json"
  }
}
```

```
Response:
HTTP 201 Accepted

Headers:
x-datadirect-request-key: 60d4398c38dfa698
x-factset-api-calculation-id: custom-id
x-factset-api-request-key: 60d4398c90f2fa1d
```

3.1.3 Get Calculation Status By ID

GET /analytics/engines/fi/v3/calculations/{id}/status

Description

This is the endpoint to check on the progress of a previous request that was submitted using Run Multiple FI Calculation endpoint. The response body contains status information of the calculation. If the calculation has finished computing, the response body will contain the result in JSON, otherwise, the calculation is still running, and the **X-FactSet-Api-PickUp-Progress** header will contain a progress percentage.

Request Headers

Header name	Description
Accept	(Optional) Standard HTTP header. Value can be gzip, compress, deflate, br, identity and/or

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run FI calculation endpoint

Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Cache-Control	Standard HTTP header. Header will specify max-age in seconds. Polling can be adjusted based on the max-age value.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
201	Expected response once calculation is completed, returns JSON in the format specified in the Calculation parameters
202	Expected response returned if the calculation is not yet completed, should contain X-FactSet-Api-PickUp-Progress header.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Calculation was already returned, provided id was not a requested calculation, or the calculation was cancelled.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

Examples

Request:

GET
https://api.factset.com/analytics/engines/fi/v3/calculations/df565588e22e4ee297fb83c314eb82b1

Headers:

Authorization: Basic RkRTX0RFTU9fVVMt**********

Response:

HTTP 201 Success

Headers:

x-datadirect-request-key: 60d2e27a2ed1c73d
x-factset-api-request-key: 60d2e27a7506f6eb

Body:


```
{
  "data": {
    "tables": {
      "4a18b87d3cbc435fad85a21976ee3f8a:": {
        "definition": {
          "columns": [
            {
              "id": "col_0",
```

```
            "name": "InputSecurity",
            "description": "InputSecurity",
            "type": "string"
          },
          {
            "id": "col_1",
            "name": "Scenario",
            "description": "Scenario",
            "type": "string"
          },
          {
            "id": "col_2",
            "name": "Horizon",
            "description": "Horizon",
            "type": "string"
          },
          {
            "id": "col_3",
            "name": "Run Status",
            "description": "Run Status",
            "type": "string"
          },
          {
            "id": "col_4",
            "name": "Effective Duration",
            "description": "Effective Duration",
            "type": "real"
          }
        ]
      },
      "data": {
        "rows": [
          {
            "values": {
              "col_0": "3140JQHD",
              "col_1": "Base",
              "col_2": "Base",
              "col_3": "",
              "col_4": 3.05451135480572
            }
          }
        ],
```

```
          "tableMetadata": {
            "CalculationId": {
              "value": "4a18b87d3cbc435fad85a21976ee3f8a:"
            }
          }
        }
      }
    }
  }
}
```


3.1.4 Get Calculation Result By ID

GET /analytics/engines/fi/v3/calculations/{id}/result

Description

This is the endpoint to get the result of a previously requested calculation. If the calculation has finished computing, the body of the response will contain the requested document in JSON.

Request Headers

Header name	Description
Accept	(Optional) Standard HTTP header. Value can be gzip, compress, deflate, br, identity and/or

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run FI calculation endpoint

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.

X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
200	Expected response once calculation is completed, returns JSON in the format specified in the Calculation parameters.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Calculation was already returned, provided id was not a requested calculation, or the calculation was cancelled.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

Examples

Request:

GET
https://api.factset.com/analytics/engines/fi/v3/calculations/b44364c365094889a24d5a38fae294b6/result

Headers:

```
Authorization: Basic RkRTX0RFTU9fVVMt******************************
```

Response:

HTTP 200 Success

Headers:

```
x-datadirect-request-key: 60d2e27a2ed1c73d
x-factset-api-request-key: 60d2e27a7506f6eb
```

Body:

```
{
  "data": {
    "tables": {
      "4a18b87d3cbc435fad85a21976ee3f8a:": {
        "definition": {
          "columns": [
            {
```

```
            "id": "col_0",
            "name": "InputSecurity",
            "description": "InputSecurity",
            "type": "string"
          },
          {
            "id": "col_1",
            "name": "Scenario",
            "description": "Scenario",
            "type": "string"
          },
          {
            "id": "col_2",
            "name": "Horizon",
            "description": "Horizon",
            "type": "string"
          },
          {
            "id": "col_3",
            "name": "Run Status",
            "description": "Run Status",
            "type": "string"
          },
          {
            "id": "col_4",
            "name": "Effective Duration",
            "description": "Effective Duration",
            "type": "real"
          }
        ]
      },
      "data": {
        "rows": [
          {
            "values": {
              "col_0": "3140JQHD",
              "col_1": "Base",
              "col_2": "Base",
              "col_3": "",
              "col_4": 3.05451135480572
            }
          }
```

```
          ],
          "tableMetadata": {
            "CalculationId": {
              "value": "4a18b87d3cbc435fad85a21976ee3f8a:"
            }
          }
        }
      }
    }
  }
}
```


3.1.5 Get Calculation Parameters By ID

GET /analytics/engines/fi/v3/calculations/{id}

Description

This endpoint that returns the calculation parameters passed for a calculation

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run FI calculation endpoint

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
200	Expected response, returns the FI calculation parameters.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Calculation id not found.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in sometime.

Examples

Request:

GET
https://api.factset.com/analytics/engines/fi/v3/calculations/b44364c365094889a24d5a38fae294b6

Headers:

```
Authorization: Basic RkRTX0RFTU9fVVMt******************************
```

Response:

HTTP 200 Success

Headers:

```
x-datadirect-request-key: 60d43ea438e79a4b
x-factset-api-request-key: 60d43ea4500d8fbe
```

Response Body:


```
{
  "data": {
    "securities": [
      {
        "settlement": null,
        "calcfrommethod": "price",
        "calcfromvalue": 110,
        "symbol": "3140jqhd"
      }
    ],
    "calculations": [
      "effective duration"
```

```
    ],
    "jobsettings": {
      "asofdate": "20210611"
    }
  },
  "meta": {
    "contentorganization": "simplifiedrow",
    "stachcontentorganization": "simplifiedrow",
    "contenttype": "json",
    "format": "jsonstach"
  }
}
```

3.1.6 Cancel Calculation

DELETE /analytics/engines/fi/v3/calculations/{id}

Description

This endpoint is used to cancel a previously submitted request. Instead of doing a HTTP GET on the status URL, cancel the request by doing a HTTP DELETE.

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run FI calculation endpoint

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.

Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
204	Expected response, request was cancelled successfully.
400	Invalid identifier parameter provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	There was no request for the identifier provided, or the request was already canceled for the provided identifier.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

Examples

Request:
DELETE
https://api.factset.com/analytics/engines/fi/v3/calculations/313c8a00f97a48559ccfddfa5d777a71

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt**********

Response:
HTTP 204 No Content

Headers:
x-datadirect-request-key: 60d44a150b8ab0b7
x-factset-api-request-key: 60d44a1552490830

3.2 Lookup APIs

3.2.1 Discount Curve

GET /analytics/engines/fi/v3/discount-curves

Description

This endpoint lists all the discount curves that can be applied to a FI calculation.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

Request Query Parameters

Parameter name	Data type	Description	Format
currency	String	Discount curve currency	Example – USD, EUR etc.

Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

Returns

HTTP status code	Description
200	Expected response, returns a list of FI discount curves.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Not found
406	Unsupported Accept header. Header needs to be set to application/json.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

Examples

Request:
DELETE https://api.factset.com/analytics/engines/fi/v3/discount-curves?currency=(Currency Code)

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt**********

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 6221ca041ae613ee

```
x-factset-api-request-key: 6221ca04b89d4518

Body:
{
  "data": {
    "LIBOR": {
      "category": "default",
      "name": "USD LIBOR 3m",
      "currency": "USD"
    },
    "SOFR": {
      "category": "default",
      "name": "USD SOFR",
      "currency": "USD"
    },
    "US MUNI GOAAA": {
      "category": "muni",
      "name": "US Muni G.O. AAA",
      "currency": "USD"
    },
    "US OIS": {
      "category": "default",
      "name": "USD OIS",
      "currency": "USD"
    },
    "UST": {
      "category": "default",
      "name": "US Government",
      "currency": "USD"
    }
  }
}
```

4. Troubleshooting

Following steps are recommended to troubleshoot errors from any of the different APIs:

- Record the X-DataDirect-Request-Key response header so that FactSet's API engineering team can analyze your specific request/response.
- Record the response body when the response is an error response. All HTTP status codes equal to and greater than 400 are considered error responses.
- Reach out to your account team with the above information for assistance.

5. Version Upgrade

FactSet will support old API versions for a limited time. The actual support time will depend on the API and the release stage (i.e., beta or production). All breaking changes, functionality additions, and bug fixes across earlier versions will be documented in the changelog.

FactSet's API engineering team will work with the clients to ensure smooth transition to newer versions.

6. Appendix: Available Calculations

Below table lists down the currently available calculations

Calculation Identifier
Accrued Interest
Actual Spread
Actual Spread to Worst Call
Average Life
Book Value
Bullet Spread
Call Date Spreads
Call Date Yields
Call Dates
Call Schedule Dates,
Call Schedule Price % Par,
Call Schedule Prices,
Callable?
Called Date
Calls
CF Calls
CF Count
CF Coupon
CF Date
CF Discount Factors (Spot Curve plus Spread)
CF Discount Factors (Yield)
CF Interest
CF Maturity
CF Month
CF NonBDC Date
CF Prepaid Principal
CF Principal

CF Principal Balance
CF Principal Factor
CF Puts
CF Rate Paths,
CF Recovered Losses
CF Scheduled Principal
CF Sinks
CF Term Structure,
CF to Horizon
CF Total Cashflow
Clean Price
Collateral Issuer Main
Conversion Parity
Convexity
Country
Coupon Curve Convexity
Coupon Curve Duration
Coupon Payment Dates
Coupon Payment Dates From Issue To Original Maturity
Coupon Payment Rates From Issue To Original Maturity
Current Face
Current WAM
Current Yield
Daily Coupon Return (Numerator Only)
Default Prob,
Delay Days
Discount Curve
Discount Factors (Spot Curve plus Spread)
Discount Factors (Yield)
dP/dCDS
Effective Convexity
Effective Coupon
Effective Duration
Effective Yield
Ex-dividend Type
Expected Maturity
Factor for PA
Floating Index
Gain or Loss to Horiz Book

Gross WAC
Horizon Book Price
Horizon Book Value
Horizon CF Month
Horizon Face
Horizon Investment
Horizon Market Value
Horizon Monthly CF Calls
Horizon Monthly CF Coupon
Horizon Monthly CF Date
Horizon Monthly CF Interest
Horizon Monthly CF Maturity
Horizon Monthly CF Prepaid Principal
Horizon Monthly CF Principal
Horizon Monthly CF Principal Balance
Horizon Monthly CF Puts
Horizon Monthly CF Recovered Losses
Horizon Monthly CF Scheduled Principal
Horizon Monthly CF Sinks
Interest to Horizon
Interest Type
Investment Type
Last Known Factor
Market Value
Market Value Change
Maturity
Mod Duration Floater
Modified Duration
Modified Duration to First Call
Modified Duration to Worst Call
Month
Monthly CF Calls
Monthly CF CDR,
Monthly CF Coupon
Monthly CF Coupon Payment Dates
Monthly CF CPR,
Monthly CF Date
Monthly CF Delinquencies
Monthly CF Discount Factors (Spot Curve plus Spread)

Monthly CF Discount Factors (Yield)
Monthly CF Effective Coupon
Monthly CF Interest
Monthly CF Maturity
Monthly CF Prepaid Principal
Monthly CF Principal
Monthly CF Principal Balance
Monthly CF Principal Factor
Monthly CF Puts
Monthly CF Rate Paths Display,
Monthly CF Rate Paths,
Monthly CF Recovered Losses
Monthly CF Scheduled Principal
Monthly CF Severity,
Monthly CF Sinks
Monthly CF Sinks,
Monthly CF Total Cashflow
Natural Calls
Natural CF Count
Natural CF Date
Natural Coupon
Natural Discount Factors (Spot Curve plus Spread)
Natural Discount Factors (Yield)
Natural Interest
Natural NonBDC CF Date
Natural Prepaid Principal
Natural Prin Balance
Natural Principal
Natural Principal Factor
Natural Puts
Natural Recovered Losses
Natural Scheduled Principal
Natural Sinks
Natural Total CF
Net WAC
Next Month Cashflow
Next Month Interest
Next Month Prin Bal
Next Month Principal

Number Of Days Accrued
OAS
OAS Convexity
Original Face
Original Maturity
Par CDS Spreads,
Partial Convexity
Partial Duration
Payment Date Used For Tomorrow's Principal/Interest
Payment Day Used For Tomorrow's Principal/Interest
PB Wavg CPR
PB Wavg PSA
Prepaid Principal
Prepay Name
Price
Price Adjustment Factor
Prin Balance
Principal Factor
Principal Paydown %
Principal to Horizon
Principal Type
Production Year
Proj CPR 1mo
Proj CPR 1yr
Proj CPR 3mo
Proj CPR 5yr
Proj CPR 6mo
Put Date Spreads
Put Date Yields
Put Dates
Put Schedule Dates,
Put Schedule Price % Par,
Put Schedule Prices,
Puts
Real CF Coupon
Real CF Date
Real CF Interest
Real CF Principal
Real CF Principal Balance

Real CF Term Structure,
Real CF Total Cashflow
Real Coupon
Real Interest
Real Modified Duration
Real Prin Balance
Real Principal
Real Total CF
Real Yield
Recovered Losses
Scheduled Principal
Sector
Sector Industry
Sector Sub-group
Sink Schedule Amounts,
Sink Schedule Dates,
Sink Schedule Price % Par,
Spread dP/dY
Spread Duration
Strip Yield
Today's Interest (% of Current Face)
Today's Other Income- % of Current Face
Today's Principal (% of Current Face)
Tomorrow's Accrued Interest
Tomorrow's Interest (% of Current Face)
Tomorrow's Other Income- % of Current Face
Tomorrow's Principal (% of Current Face)
Total CF
WALA
Worst Call Date
Worst Call Price
Yield
Yield to First Call
Yield to No Call
Yield to Worst Call
Zero PV Premium