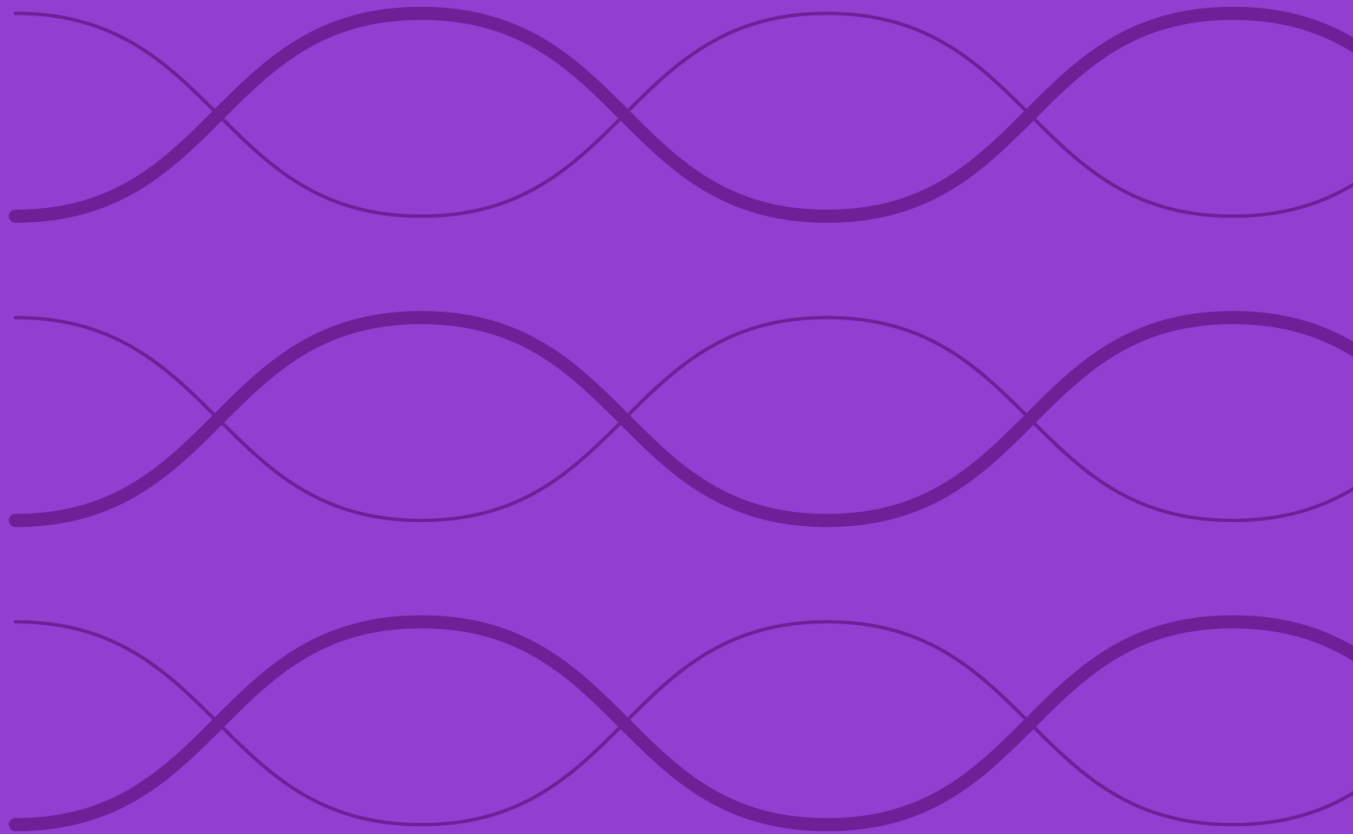


Leveraged Loan Indexes Calculation In-House Migration Frequently Asked Questions



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Overview

To improve the client experience and reduce reliance on external calculation agents, Morningstar Indexes is developing in-house calculation capabilities (program name: "LLI In-House Calculation Migration"). When LLI In-House Calculation Migration is complete, we will migrate the leveraged loan indexes currently calculated by S&P Dow Jones Indices ("SPDJII") to the Morningstar calculation platform. This is currently scheduled to occur in late April/ early May 2024. This document summarizes what you need to know about LLI In-House Calculation Migration and how it impacts you.

Why did Morningstar Indexes embark on LLI In-House Calculation Migration?

As our collection of data and unique Intellectual Property (IP) has expanded considerably, so has its application. True to Morningstar's heritage as a trusted provider of data and research, Morningstar Indexes is committed to keeping up with the evolving needs of our clients. Implementing LLI In-House Calculation Migration enables us to:

- Modernize our infrastructure to create more reliable, cost-effective ways to serve and communicate with our clients.
- Improve speed to market so we can provide our clients and partners with products that provide timely access to emerging opportunities.
- Reduce risk, improve transparency, and provide added value and security for our clients by lessening our reliance on external service providers.
- Remedy known shortcomings with our current outsourced provider, such as inconsistencies in certain calculations.

How does this impact me?

Morningstar will maintain the same input data source and calculation methodology as SPDJI, so differences in values will be minimal to zero. That said, there will be changes to file names and file formats. Details can be found in the "Changes to File Names, Formats" section below.

If you are currently receiving Morningstar Leveraged Loan indexes via a third-party platform or product (other than file deliveries), Morningstar Indexes will work closely with these redistributors to complete the migration. You will experience minimal direct impact.

The list of impacted indexes for each client will differ based on existing deliveries. Please reach out to leveragedloanindexes@morningstar.com or your migration manager for more information.

When is this happening?

Morningstar Indexes will deliver the indexes in several phases, and parallel delivery will last for approximately 90 days or longer for each phase, up to the point of switch over early in the second quarter of 2024 to provide clients time for planning and testing before changes affect the live data delivery process. Program timelines are outlined below and may be subject to change. We are closely monitoring testing results and feedback at each stage before progressing.

Timeframe

Activity

September 2023	Client Beta Testing. For client beta testers, we delivered the new LLI In-House Calculation Migration files via your FTP for review.
October 30, 2023	Client external production testing begins for Phase 1. This will be open to all clients receiving Morningstar Leveraged Loan index files via FTP.
November/December 2023	Additional phases will be rolled out as they become available.
January 2024	Additional phases will be rolled out as they become available.
May 3, 2024	<p>The final delivery of any SPDJI calculated end of day index files (#20240503#_*_.SPLLL, .SPFIL, .SPLLC., DCR). The final effective date for any SPDJI calculation will be May 3, 2024.</p> <p>Morningstar Indexes is the official calculator for all leveraged loan indexes with the effective data May 4 and onwards. As such, the rebalance file with effective data May 4, delivered on May 3, will be delivered by Morningstar. The _PCON_20240503 with effective date 20240504 will be delivered in your live folder on May 3.</p> <p>Weekend files (Saturday and Sunday close files) for May 4 and 5, 2024 will be delivered on Sunday May 5, 2024 as Morningstar will require time to rebase certain indexes and complete calculation transition activities. After the cutover, weekend files will be delivered on Fridays as normal.</p>
May 4, 2024	<p>Morningstar Indexes is the official calculator for all leveraged loan indexes with the effective data May 4 and onwards. As such, the rebalance file with effective date May 4, delivered on May 3, will be delivered by Morningstar. The _PCON_20240503 with effective date 20240504 will be delivered in your live folder on May 3.</p> <p>All files will be delivered in the Morningstar file formats (IDX, CON, PCON).</p>
May 5, 2024	The first IDX and CON files will be delivered. This will include both the May 4 th effective and May 5 th effective files. The files that had been previously delivered to the /test folder will now be picked up from the live folder.

Changes to File Names, Formats, and Contents

Changes to file names, formats, and contents vary based on current delivery methods and file types:

File Type	Impact
SPLLL, SPFIL, DCR	SPDJI has historically provided three different levels files (SPLLL, SPFIL, DCR). Morningstar will be consolidating those files into a single levels file. This will be

	<p>the IDX file. New test files and file names will be provided by your migration manager.</p> <p>The Morningstar Indexes levels file naming convention is “MSTAR_Index Full Name_MorningstarPortfolioID_IDX_yyyymmdd.csv”</p>
SPLLC, Components	<p>SPDJ/ LCD has historically provided two different constituent files (SPLLC, Components). Morningstar will be consolidating those files into a single constituent file. This will be the CON file. New test files and file names will be provided by your migration manager.</p> <p>The Morningstar Indexes levels file naming convention is “MSTAR_Index Full Name_MorningstarPortfolioID_CON_yyyymmdd.csv”</p>
Pro Forma*	<p>In addition to replacing the SPDJ index levels and constituents, Morningstar Indexes will be introducing a pro forma file. This will allow clients a preview of the index portfolio ahead of the weekly rebalance. This will be the PCON file. *more information on this can be found below on page 6.</p>

What test files can I receive?

The following files are being delivered to the Test folder:

New File Type	Description
IDX	A daily file that contains index levels. Each file includes one index.
CON	A daily snapshot of constituents. Each file includes one index.
PCON	Provides a preview of the portfolio ahead of the weekly rebalance. [Updated]: PCON is only available for the 4 parent indexes. Later this year (date TBD) we will have the capability to provide PCONs for sub-portfolios.

When are the test files delivered?

Files are typically delivered every Monday to Friday (including holidays). European files are delivered 2-3 hours after the UK market close. US files are delivered 2-3 hours after US market close. Files for Saturday and Sunday are delivered on Friday.

How long will the files be available on the SFTP site before being deleted?

Files remain in the SFTP for 21 days before they are automatically deleted, as per Morningstar network policy. To request for historical levels, clients can reach out the Morningstar Indexes service team for the data.

Are the new file formats final? Can I propose any changes?

We welcome client feedback and will consider any proposed changes for future iterations or enhancements. There is no guarantee that proposed changes will be implemented.

What are the differences between the legacy and new Index Levels Files?

- SPDJI has historically provided three different levels files (SPLLL, SPFIL, DCR). Morningstar will provide a single levels file. This will be the IDX file.
- The SPLLL file provided the full index levels history since inception. The IDX file will be a snapshot of that day's index levels.
- The SPLLL file was stated in the base currency. The IDX file will include all currency variants, both hedged and unhedged.
- The SPFIL file only included the total return and price return variants. The IDX file will include the total return, price return and interest return variants.
- The SPFIL included multiple indexes in a single file. The IDX file will only include one index per file.
- In both the SPLLL and SPFIL files, the different return variants (PR, TR and IR) populated in a horizontal orientation. In the IDX file, all return variants will be stacked vertically in the same column.

SPLLL file

index_date	index_name	interest_return	mv_return	interest_index	mv_index	index_value	amount_outstanding	avg_bid_price	total_mv	no_facilities
12/1/1996	Morningstar L	0	0	1000	1000	1000	0	0	0	0
1/1/1997	Morningstar L	0.006869195	4.15943E-05	1006.869195	1000.041594	1006.91079	5190212815	99.16857038	5147059849	36
2/1/1997	Morningstar L	0.00692895	0.000962868	1013.845742	1001.004503	1014.857147	6830945037	99.48992571	6796102143	43
3/1/1997	Morningstar L	0.006833009	0	1020.773359	1001.004503	1021.791675	7205945037	99.53305369	7172297143	47

IDX File

EffectiveDate	Rebalance	Portfolio	Portfolio	Master	IndexId	Perfo	IndexC	IndexName	Current
2023-10-22	2023-10-20	Morningst	2928560	2928560	F00001E9(0P0001P	SPLGAL		Morningstar Global Leveraged Loan TR USD	USD
2023-10-22	2023-10-20	Morningst	2928560	2928560	F00001E9(0P0001P	SPLGAL		Morningstar Global Leveraged Loan IR USD	USD
2023-10-22	2023-10-20	Morningst	2928560	2928560	F00001E9(0P0001P	SPLGAL		Morningstar Global Leveraged Loan PR USD	USD
2023-10-22	2023-10-20	Morningst	2928560	2928560	F00001E9(0P0001P	SPLGALE		Morningstar Global Leveraged Loan TR EUR	EUR

LINE COUNT: 5

What are the differences between the legacy and new Constituent Files?

- SPDJI/ LCD has historically provided two different constituent files (SPLLC, Components). Morningstar will provide a single constituent file.
- The SPLLC file did not include any identifiers at the index-level. The CON file will include the Index Code (legacy SPDJI identifier) along with Morningstar specific identifiers (PortfolioId and MasterPortfolioId).
- Morningstar will provide a pro forma constituent file PCON to replace the Components file that will be available at a later testing phase.

Will I be able to receive historical data in the new file formats?

At least initially, clients will only be able to receive historical files in the SPDJI format. Eventually, historical files will be available in the Morningstar format, but there is no definitive date on that enhancement.

Will I be able to receive a preview of new securities added to the indexes?

We will be introducing a pro forma file for the Leveraged Loan Indexes, so clients will be able to see any additions ahead of the rebalance. The pro forma will be delivered Friday early afternoon. At the time of going live, there are only PCON files for the following indexes, as a replacement to the weekly components file:

- Morningstar LSTA US Leveraged Loan 100. Clients subscribing to this index will also receive a weekly email notification that summarizes the additions and deletions of the index, and that will be sent at least 1 business day prior to the rebalance effective date.
- Morningstar LSTA US Leveraged Loan
- Morningstar European Leveraged Loan
- Morningstar Global Leveraged Loan Index

What are the different testing phases?

The different testing phases are as follows. As of April 5, 2024, all Morningstar Leveraged Loan indexes are available for parallel external production testing.

- Phase 1: Parent indexes in USD and EUR currency variants
- Phase 2: Non-hedged currency variants for the parent indexes
- Phase 3: Credit rating indexes
- Phase 4: Sector/ regional indexes
- Phase 5: Hedged and non-hedged currency variants and all other remaining indexes/ variants

Why are only the base currency variants showing in the IDX file for the subindexes?

Currency variants were added in Phase 5 of the testing period for all indexes. Prior to Phase 5, the hedged and non-hedged variants are only available for the parent indexes.

How are restated files delivered?

Similar to other Morningstar indexes files, restated files that reflect updated index levels, returns and loan prices, will be delivered if a restatement has to be performed. Restated data will be sent out in the index files as of the effective date, after the restatements have been performed. The restated files will have the same file name as the "original" files, but have a publish date time in the restated file will be different from the "original file". A restatement notification will be sent to clients to alert clients of the impacted indexes and files.

Files may be reissued to correct other data points like yields if required. Files may also be reissued to correct reference data points for loans as required, or changes may be applied prospectively. The reissued files will have the same file name as the "original" files, but have a publish date time in the reissued file will be different from the "original file". A reissue notification will be sent to clients to alert clients of the impacted indexes and files.

When will the Future "F" data points in the file specs be available?

There is no specific ETA for the future data points as yet. Our primary focus now is to ensure that we take the calculations in-house successfully. The future data points are all enhancements to the existing experience, that will be gradually released over time after we complete this migration (slated for May 3rd). We will share our plans for these future data points as they become available.

I'm looking at the CON file, and a large percentage of the ref data is blank. Why is this the case?

This may be a file parsing issue if using Microsoft Excel to review the files. If you use the CONCATENATE function in Excel, this issue will be resolved. More broadly speaking, these files are meant to be ingested by a file parser where this will not be an issue.

Data and Methodology Differences

This section answers any common questions clients may have for observed data and methodology differences.

Where can I find Sector Level 1-4 data?

GICS SectorLevel 2 and 3 are available for clients with GICS licensing in place. Our estimate for GICS SectorLevel 1 is late Q2/early Q3, and we are unable to provide an estimate for GICS SectorLevel 4.

Why are there data fields (columns) with no data?

There are a few different reasons for the blank data fields:

1. This is only temporary, and the data will eventually populate later in the parallel testing period. "YieldtoMaturity" would be an example of this.
2. This column is a placeholder for a future file enhancement. "MoodyRating" would be an example of this.
3. The client is not licensed for this data point, and it is thus redacted. "CUSIP" would be an example of this.

Please refer to the [file specs](#) for further information on the above.

Why are there blank CUSIPs?

CUSIP will be provided on the best efforts basis for US loans, and not every loan will have a CUSIP attached. This is why we also provide the other IDs in the file (LIN, LoanX, FIGI) to assist clients with identifying the loans.

Why are there differences in the Original Spread and LIBOR Spread?

Please refer to the mapping file provided by your migration manager between the existing and new fields. The OriginalSpread data point in the CON file maps to the ORIGINAL_SPREAD in the Components file and not the ORIGINAL_LIBOR_SPREAD in the SPLLC file. Please note however that the numeric convention is different in that the ORIGINAL_SPREAD in the Components file is stated in bps whereas ORIGINAL_LIBOR_SPREAD in the CON file is in decimals.

There is no true equivalent to ORIGINAL_LIBOR_SPREAD in the CON file. In our integration work we learned that ORIGINAL_LIBOR_SPREAD was not actually the original spread of the loan. It represented the spread of the loan (which could be adjusted or unadjusted) at the time of entry into the index. Therefore, we decided to include Original Spread (at time of issuance), Current Spread, and Adjusted spread (if there are any adjustments on the current spread) into the new files.

Why are there differences in Yield?

There may be Yield mismatches due to the treatment of certain loans in the index, in particular loans that might have matured but not yet repaid and/or are at risk of . Morningstar Indexes is calculating Yield using the the same yield calculation as outlined in the S&P methodology. However, our integration work uncovered that SPDJI may have treated some loans differently, where they have excluded them in the yield calculation or applied a capping during Yield calculation. We will continue to have these mismatches until the loan defaults and the loan is no longer considered for yield calculation.

Why are there differences in hedged levels and hedging methodology?

Morningstar Indexes will be updating the hedge methodology applied to hedged variants of the Leveraged Loan indexes. For more details, please refer to the methodology change announcement [here](#). The test files reflect the Morningstar Hedge Methodology that will go live after the migration, as such they differ from the live files.

What data points are impacted by the change in hedging methodology?

The hedge methodology change only impacts the return for hedged indexes. Hence, the only data points impacted would be the IndexLevel and Return shared in the index level files for hedged currency variants. These values will now be calculated as per the [Morningstar Indexes Currency Hedge Index Methodology](#).

Why are there differences in the CURRENT_OUTSTANDING amount in the Morningstar LSTA US Leveraged LoanSelect Equal Par Value index?

This index assumes that all constituents must have an equal par value. This results in the Market Value of loans in this index simply depending only on the Price + Accrued Interest, as $\text{Market Value} = \text{Par} \times (\text{Price} + \text{Accrued Interest})$. The weights to each constituent which are derived from the equal Par are simply the price weights. The weights in the Mstar file and the SPDJ file are exactly the same. From the weights, we generate the alternate weighting factor and adjust the Actual Par amount by this factor. While Mstar and SPDJ both assign all loans the same Par, it is just that our calculation results in a different value for the exact Par value. The index levels, returns and constituent weights are not impacted by this in any manner.

Why are there differences in the values between SPDJI and Morningstar for the Morningstar Global Leveraged Loan 150 Issuers?

The reason is attributed to following the stated methodology document which does not take into account repricing scenarios. However, SPDJ relies on a manual process to send the rebalanced securities which may not follow the stated rules. Morningstar has noticed that SPDJI's approach results in inconsistencies.

We may not be prepared for the May 3rd cutover. Is it possible to get an extension on this?

Unfortunately, we cannot accommodate this request. There are many implications from both an index maintenance perspective and tech perspective that require us to perform a hard cutover.

There was a loan in the index with an amount outstanding of zero. It appears that it has been removed at the rebalance, but how was it there in the first place?

Amount outstanding of zero can only happen on Fridays when repayments are entered. Thus, it is expected to see the zero on Friday and not see the loan in the index on Saturday when the index rebalances. This treatment should be considered normal and expected.

According to the mapping doc, there is no equivalent to "INDEX KEY" in the Morningstar files. Is that right?

Yes, there is not an exact equivalent for "INDEX KEY" in the Morningstar files. However, for the single sector indexes (eg. Morningstar LSTA US Food Beverage & Tobacco Loan), you can use "IndexSector" in the IDX files. This

data point will only populate for the single sector indexes, and it will be blank for the multi sector indexes. This data point is estimated to be available later in Q2 2024.

Why am I automatically receiving prices for US loan facilities in my index deliveries but I am not automatically receiving prices for European loan facilities?

LSTA/LSEG Mark-to-Market Pricing is the vendor used for US loan facilities and S&P Global (formerly IHS Markit) is the loan pricing provider for European loan facilities. For US loan facilities, Morningstar is authorized under its agreement with LSEG to provide constituent prices through our standard index files or through a third party format to our clients licensed for constituent data. These prices are intended solely for the end client's internal use to illustrate index calculations. For European loan facilities, Morningstar is authorized under its agreement with S&P Global to only redistribute loan prices and LXIDs to Morningstar clients licensed for constituent data who are also clients of S&P Global and are licensed by S&P Global for LXIDs and/or prices. Such clients may use the price data for illustration of the index calculations and for other purposes set forth in the customer's specific agreement with S&P Global.

If your firm is licensed with S&P Global for the European loan facilities data, and the data is not populating in the files, please reach out to MorningstarIndexesImplementation@morningstar.com so that your implementation manager can verify your license and turn on the data for you.

I've noticed a difference in constituent count between the Components file and the SPLLC/ CON file. Why is that the case?

The daily constituents file (SPLLC in live environment and CON in testing) will never be an exact match to the Components file. The reason for this is there are some loans that are not priced in the secondary and do not contribute to the index returns. Therefore, these loans are only available in Components file and are not available in the SPLLC/ Morningstar CON files.

Who should I contact if I have any questions?

If you have any questions during testing, please send your query to LeveragedLoanIndexes@morningstar.com.

From May 4, 2023 onwards, all queries should be routed to Indexes@morningstar.com to reach our 24 by 5 servicepar team. If applicable, please clearly indicate the index, file name, data fields and values in question.

Changes on Third Party Platforms

Are there any changes expected to access on these indexes on third party platforms?

Morningstar Indexes have been working very closely with third party platforms like Aladdin, Bloomberg, FactSet, LSEG, RIMEs and others on the transition. There should be minimal impact to how you access the leveraged loan indexes on the third party platforms. For LSEG (Refinitiv), they will be migrating the existing RICs to the new RICs created for Morningstar. More information will be shared as it becomes available.

Go Live Plan

What is the plan for go-live?

May 3, 2024 will be the last day clients will receive SPDJI files. After the close on May 3, 2024 (for effective dates May 4, 2024 onwards), the Morningstar files will be delivered to your production folder (where the SPDJI files currently are). Please see below table for a detailed breakdown of the expected files on the cutover weekend.

Date	Description
[New] May 2, 2024	Last day of parallel test files
May 3, 2024	<p>The final delivery of any SPDJI calculated end of day index files (#20240503#*_*.SPLLL, .SPFIL, .SPLLC., DCR). The final effective date for any SPDJI calculation will be May 3, 2024.</p> <p>Morningstar Indexes is the official calculator for all leveraged loan indexes with the effective data May 4 and onwards. As such, the rebalance file with effective data May 4, delivered on May 3, will be delivered by Morningstar. The _PCON_20240503 with effective date 20240504 will be delivered in your live folder on May 3.</p> <p>Weekend files for May 4 and 5, 2024 will be delivered on May 5, 2024. There will be no weekend files delivered on May 3 and 4, 2024 for the cutover weekend as Morningstar will require time to for any rebase and calculation activities.</p>
May 4, 2024	<p>Morningstar Indexes is the official calculator for all leveraged loan indexes with the effective data May 4 and onwards. As such, the rebalance file with effective data May 4, delivered on May 3, will be delivered by Morningstar. The _PCON_20240503 with effective date 20240504 will be delivered in your live folder on May 3.</p> <p>All files will be delivered in the Morningstar file formats (IDX, CON, PCON). The files that had been previously delivered to the /test folder will now be picked up from the live folder. Files with effective date 20240504 and 20240505 will be delivered on Sunday May 5, 2024.</p>
[New] May 5, 2024	The first delivery of Morningstar files. IDX and CON files with effective date 20240504 and 20240505 will be delivered on Sunday May 5, 2024.

[New] What time can we expect the files on go live weekend?

The weekend May 4, 2024 and May 5, 2024 Morningstar files will be delivered to your production folder on Sunday May 5, around 2:00 pm CST. After the go-live weekend, the regular delivery schedule will resume, where the Friday and weekend files will all be published on Friday.

What should I do if I have any questions about my files or data?

If you have any questions during testing, please send your query leveragedloanindexes@morningstar.com. Please clearly indicate the index, file name, data fields and values in question.

[Updated] From May 4, 2023 onwards, all queries should be routed to Indexes@morningstar.com to reach our 24 by 5 service team. If applicable, please clearly indicate the index, file name, data fields and values in question.

Version History

Version	Date	Description
1	September 2023	Initial version for beta test
2	October 2023	Updated for parallel test
3	January 2024	Updated timelines
4	March 2024	New entries, and Data and Methodology Differences and Go Live Plan sections as indicated
5	April 2024	Updates as indicated

About Morningstar Indexes

Morningstar Indexes was built to keep up with the evolving needs of investors—and to be a leading-edge advocate for them. Our rich heritage as a transparent, investor-focused leader in data and research uniquely equips us to support individuals, institutions, wealth managers and advisors in navigating investment opportunities across major asset classes, styles and strategies. From traditional benchmarks and unique IP-driven indexes, to index design, calculation and distribution services, our solutions span an investment landscape as diverse as investors themselves.

indexes.morningstar.com

Contact Us

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