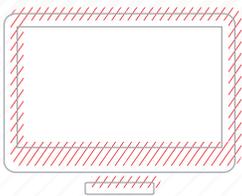
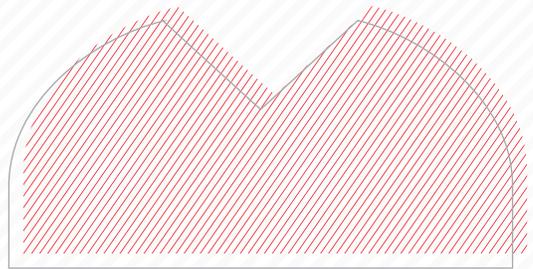
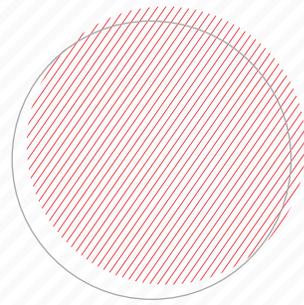
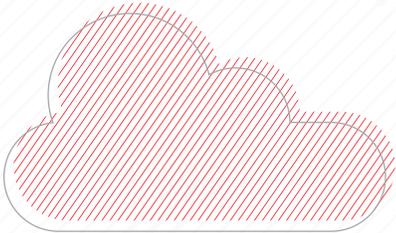
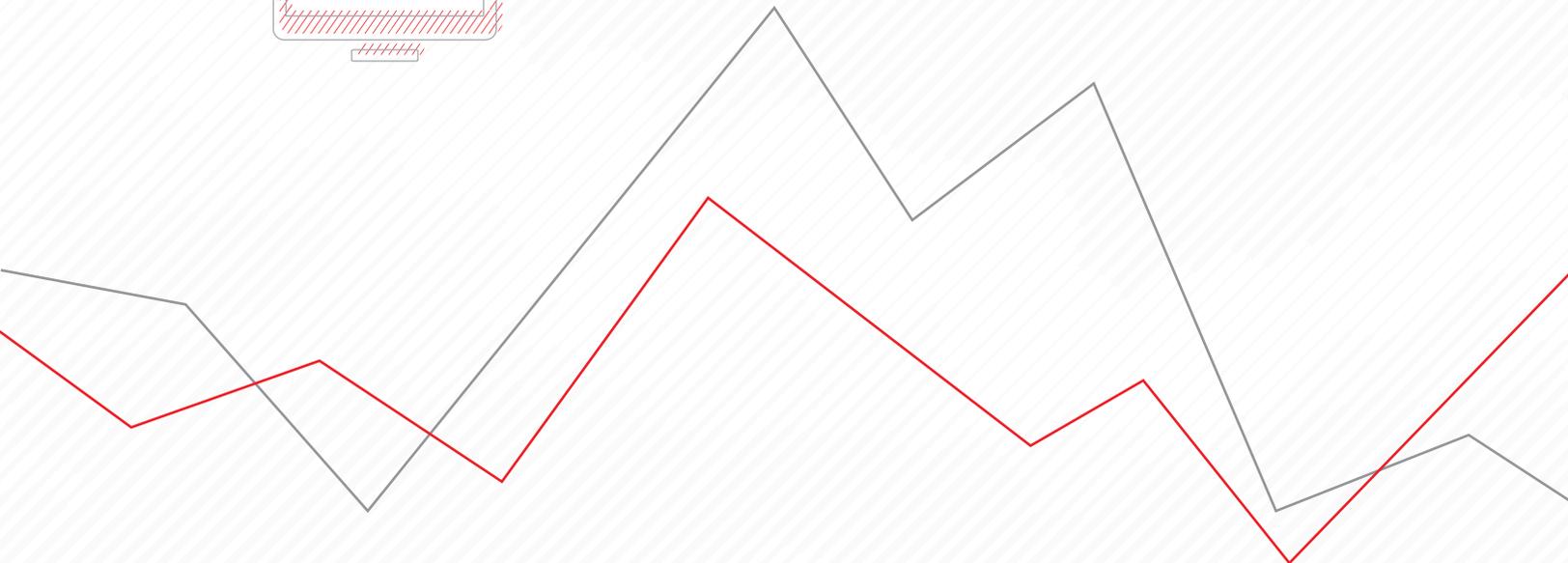


Calculating Equity Attribution to Understand a Fund's Performance

Onboarding Guide



MORNINGSTAR Direct



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Calculating Equity Attribution to Understand a Fund's Performance

The Portfolio Analysis module in Morningstar DirectSM allows users to investigate a fund's portfolio by calculating single portfolio attribution of an equity fund. (This is also sometimes referred to as micro attribution.) Reviewing equity attribution for a fund involves calculating its Active Return value. Active Return is a combination of a manager's skill in stock selection and allocation of assets to a particular grouping, such as stock sectors.

 Note: Single portfolio fixed-income attribution is not yet available in Morningstar Direct.

Calculating equity attribution values also requires comparing a fund's holdings to those of a benchmark, which is typically an index. Therefore, users need access to the index' holdings to calculate equity attribution values. If this access is not already set up for your account in the Content Catalog in Morningstar Direct, please contact your Customer Success Manager. Alternatively, users can select a Morningstar index as the attribution benchmark (because constituent holdings are automatically available for these), or a representative ETF. To learn more about the methodology used in this calculation, login to the [web-based version of Morningstar Direct](#), then read [this methodology paper](#).

The following exercises are offered:

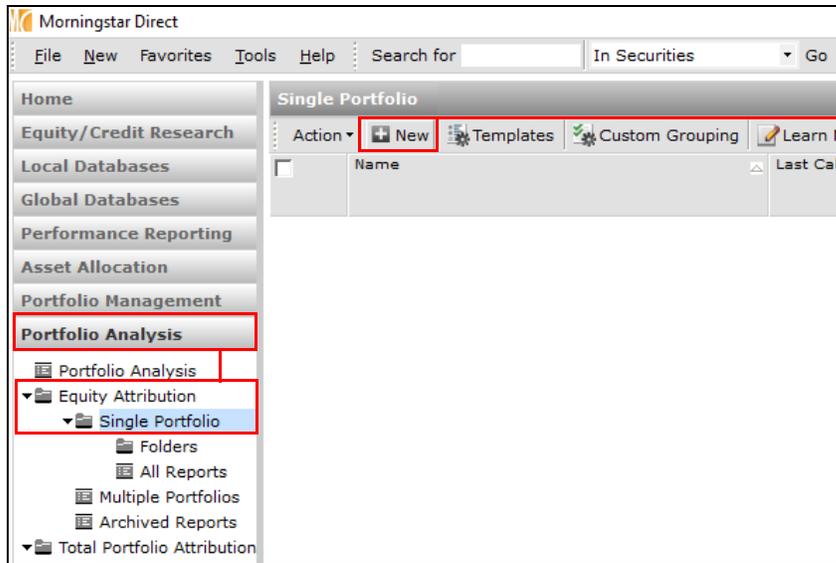
- ▶ [Exercise 1: Create a new Equity Attribution report \(page 5\)](#)
- ▶ [Exercise 2: Configure the settings for the report \(page 7\)](#)
- ▶ [Exercise 3: Evaluate the attribution report values \(page 9\)](#)
- ▶ [Exercise 4: Exclude a security from analysis \(page 11\)](#)
- ▶ [Exercise 5: Explore other important information on the report \(page 15\)](#)
- ▶ [Exercise 6: Find the largest positions by weight in the fund \(page 16\)](#)
- ▶ [Exercise 7: Find the median price-to-earnings ratio for the fund's portfolio \(page 17\)](#)
- ▶ [Exercise 8: Find the holding with the best quarter-to-date performance \(page 18\)](#)
- ▶ [Exercise 9: Find the sector with the lowest price-to-book value \(page 19\)](#)
- ▶ [Exercise 10: Find the sectors with the biggest deviations by weight from the benchmark \(page 20\)](#)
- ▶ [Exercise 11: Find the number of shares owned and YTD return of the largest stock \(page 21\)](#)
- ▶ [Exercise 12: Determine whether the data on the report reflects actual or inferred holdings \(page 21\)](#)
- ▶ [Exercise 13: Generate a PDF report for attribution \(page 22\)](#)

Overview

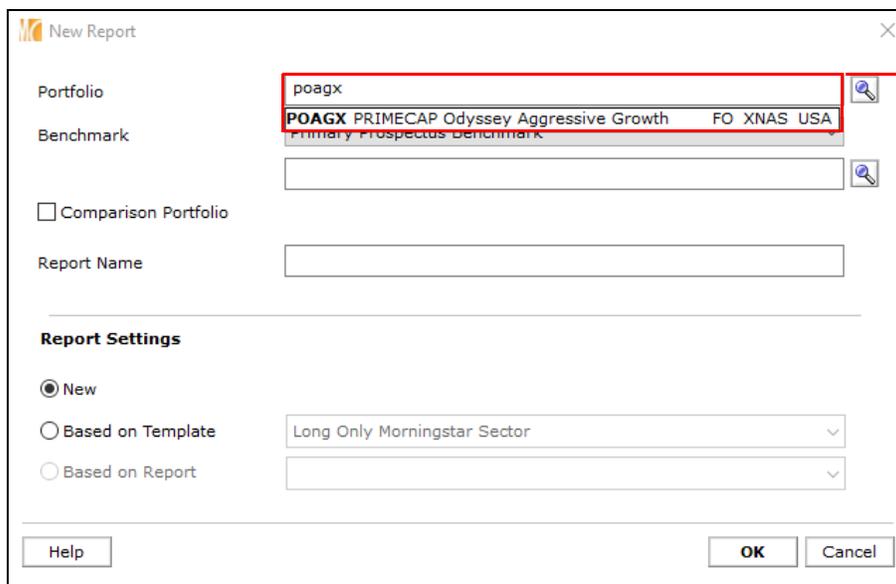
This exercise shows users the procedure for creating an on-screen equity attribution report. This involves selecting the correct investment and benchmark, and entering a name for the report to make it easy to find later. Do the following:

Exercise 1: Create a new Equity Attribution report

1. In Morningstar Direct, click the **Portfolio Analysis** module.
2. The Equity Attribution section should be expanded. Click the **Single Portfolio** folder.
3. When the tutorial window opens, click **Close**. (To see it again the next time this module is selected, click **Yes**.)
4. From the toolbar, click **New**. The New Report dialog box opens.



5. In the **Portfolio** field, type **POAGX**, then click the **PRIMECAP Odyssey Aggressive Growth** fund.



6. The Benchmark field selects the Primary Prospectus Benchmark by default, which in this instance is S&P 500 TR USD. If you do not have constituent rights to this index series, click the **Benchmark** drop-down field and select **ETF Index Proxy**.
7. In the **Report Name** field, type **PRIMECAP Odyssey Aggressive Growth Analysis**.
8. Under Report Settings, the New option should be selected. Click **OK**. The Settings dialog box opens. The Settings dialog box allows a user to decide, among other things, what time period the attribution analysis should cover, the portfolio breakdown, and the investment process.

The screenshot shows the 'New Report' dialog box with the following fields and settings:

- Portfolio:** PRIMECAP Odyssey Aggressive Growth
- Benchmark:** ETF Index Proxy (selected from a dropdown menu)
- Comparison Portfolio:** Comparison Portfolio
- Report Name:** PRIMECAP Odyssey Aggressive Growth Analysis
- Report Settings:**
 - New
 - Based on Template: Long Only Morningstar Sector
 - Based on Report

A red box highlights the Benchmark dropdown menu, the Report Name field, and the 'New' radio button in the Report Settings section. A callout box on the right contains the text: "Note the values of the highlighted fields."

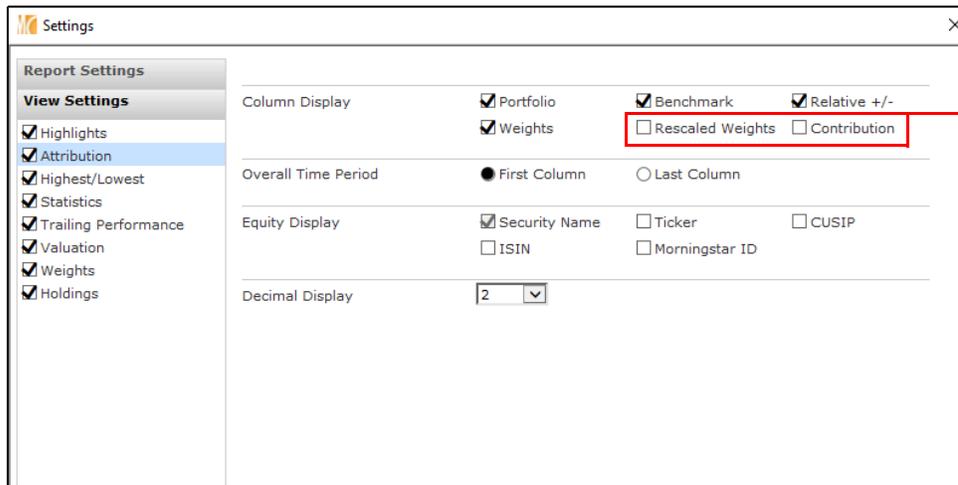
This exercise shows users how to change certain settings on the report, including how to remove information that may not be needed for attribution analysis. This report uses an option for Two-Factor: Interaction in Selection Effect. This option focuses on one or multiple Weighting allocation decisions prior to Security Selection. The Weighting Effect is primary, then, and the Selection Effect is secondary. That is, the manager's choice to weight certain stock sectors has primacy over the decision to pick any stocks. The Interaction Effect itself is incorporated in the Selection Effect. For more information on the Investment Process, refer to [this methodology paper](#). Do the following:

Exercise 2: Configure the settings for the report

1. Ensure the **Start Date** is set to **3 months ago**, and the **End Date** is **Last Quarter End**.
2. Set the **Display Frequency** to **Single**.
3. Ensure the **Calculation Frequency** is set to **Monthly**.
4. Confirm the **Grouping** option is set to **Morningstar Sector**.
5. Under the Calculation Options section confirm the **Investment Process** field is set to **Two-Factor: Interaction in Selection Effect**.

Note the values for the highlighted fields.

6. From the left navigation pane, click **View Settings**.
7. The View Settings page allows users to select each title on the left to decide what to display or hide in the report. Select **Attribution**, then **deselect** the following options in the Column Display area:
 - ▶ **Rescaled Weights**, and
 - ▶ **Contribution**.



Users can select any page to the left in order to show, hide, or change values for data shown on each page of the report.

8. Click **OK**. The report calculates and opens in a new window. Once the calculation is complete, the Highlights page is automatically displayed. It shows an overall summary of the results. The pages to the left reflect the choices made on the View Settings page.
9. Look at the Attribution Total row. Is the value under the Active Return column positive or negative? How did both the Morningstar Sector Weighting % total and the Selection % total contribute to this result?

	Weights %		Rescaled Weights %		Return %		Contribution %		Attribution Effect		
	Portfolio	Benchmark	Portfolio	Benchmark	Portfolio	Benchmark	Portfolio	Benchmark	Morningstar Sector Weighting %	Selection %	Active Return %
Basic Materials	0.11	1.55	0.11	1.55	(2.97)	1.37	(0.00)	0.02	0.10	(0.01)	0.10
Communication Services	5.17	5.23	5.17	5.23	3.99	1.92	0.21	0.10	0.01	0.12	0.12
Consumer Cyclical	7.28	14.87	7.28	14.89	21.07	4.97	1.52	0.75	0.26	1.15	1.41
Consumer Defensive	2.27	5.11	2.27	5.12	26.85	(0.60)	0.58	(0.03)	0.27	0.60	0.87
Energy	0.54	1.21	0.54	1.21	41.04	6.36	0.22	0.08	0.01	0.18	0.20
Financial Services	6.05	4.59	6.05	4.59	8.76	8.99	0.53	0.41	0.01	(0.01)	0.00
Healthcare	27.18	14.76	27.18	14.78	13.46	14.05	3.57	2.02	0.71	(0.14)	0.57
Industrials	14.21	18.70	14.21	18.72	5.57	7.34	0.80	1.38	0.04	(0.24)	(0.20)
Real Estate	0.00	3.56	0.00	3.57	1.00	0.00	0.04	0.04	0.27	0.00	0.27
Technology	31.33	30.15	31.33	30.19	14.69	11.43	4.64	3.40	0.05	1.00	1.06
Cash	5.86	0.15	5.86	0.15	0.40	0.40	0.02	0.00	(0.46)	0.00	(0.46)
Attribution Total	100.00	99.88	100.00	100.00	12.10	8.17	12.10	8.17	1.27	2.66	3.93
Missing Performance	0.00	0.13									
Total	100.00	100.00					12.10	8.17			
Reported Total					12.60	8.12					
Expense Ratio					0.18	0.06					
Residual (Reported - Attribution + Expense)					0.67	0.01					

Note the summary values here.

In this exercise, two levels of data are available on the Attribution page of the report: Level 1 is the Sector breakdown, and Level 2 is the Security breakdown. Which sectors and holdings were the best and worst for this fund during this time period? This exercise shows users how to explore this page of the report to uncover this attribution information. Do the following:

Exercise 3: Evaluate the attribution report values

1. Select the **Attribution** page.
2. **Double-click** the **Active Return** column header twice to sort this column in descending order. The sector with the best Active Return (after combining both the sector and weighting columns) is at the top.

Name	Weights %			Return %			Attribution Effect		Active Ret%-
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Morningstar Sector Weighting %	Selection %	
Consumer Cyclical	7.28	14.87	(7.59)	21.07	4.97	16.11	0.26	1.15	1.41
Technology	31.33	30.15	1.18	14.69	11.43	3.25	0.05	1.00	1.06
Consumer Defensive	2.27	5.11	(2.84)	26.85	(0.60)	27.45	0.27	0.60	0.87
Healthcare	27.18	14.76	12.42	13.46	14.05	(0.59)	0.71	(0.14)	0.57
Real Estate	0.00	3.56	(3.56)		1.00		0.27	0.00	0.27
Energy	0.54	1.21	(0.67)	41.04	6.36	34.68	0.01	0.18	0.20
Communication Services	5.17	5.23	(0.06)	3.99	1.92	2.07	0.01	0.12	0.32
Basic Materials	0.11	1.55	(1.44)	(2.97)	1.37	(4.33)	0.10	(0.01)	0.10
Financial Services	6.05	4.59	1.46	8.76	8.99	(0.23)	0.01	(0.01)	0.00
Industrials	14.21	18.70	(4.49)	5.57	7.34	(1.78)	0.04	(0.24)	(0.20)
Cash	5.86	0.15	5.71	0.40	0.00	(0.46)	(0.46)	0.00	(0.46)
Attribution Total	100.00	99.88	0.12	12.10	8.17	3.93	1.27	2.66	3.93
Missing Performance	0.00	0.13	(0.13)						
Total	100.00	100.00	(0.00)						
Reported Total				12.60	8.12	4.48			
Expense Ratio				0.18	0.06	0.11			
Residual(Reported - Attrib...				0.67	0.01	0.66			

Double-click this column header twice to sort the data in the correct order.

3. Click the **arrow** to the left of the top sector to expand it. The stock in this sector contributing the best return relative to the index is shown at the top. What was its return over the past quarter? Does this stock stand out in driving the Selection Effect for this sector, or do other stocks also contribute significantly?

Name	Weights %			Return %			Attribution Effect		Active Ret%-
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Morningstar Sector Weighting %	Selection %	
Consumer Cyclical	7.28	14.87	(7.59)	21.07	4.97	16.11	0.26	1.15	1.41
Tesla Inc	0.74	0.00	0.74	73.67				0.44	0.44
Alibaba Group Holding Ltd ...	1.79	0.00	1.79	26.83				0.38	0.38
Royal Caribbean Cruises Ltd	1.82	0.00	1.82	24.00				0.34	0.34
Ball Corp	0.00	0.76	(0.76)		(10.98)			0.06	0.06

Click the arrow to the left of a sector's name to expand it.

4. Click the **arrow** to the left of the top sector to collapse it.

5. **Double-click** the **Active Return** column header to sort it in ascending order.
6. **Expand** the stock sector now at the top. Which holding here has the largest negative Selection Effect due to under performance? Do any stocks in this sector offer a positive return relative to the index for the time period?

Name	Weights %			Return %			Attribution Effect		Active Ret%
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Morningstar Sector Weighting %	Selection %	
Level 1 2									
► Cash	5.86	0.15	5.71	0.40	0.40	0.00	(0.46)	0.00	(0.46)
► Industrials	14.21	18.70	(4.49)	5.57	7.34	(1.78)	0.04	(0.24)	(0.20)
United Airlines Holdings Inc	3.24	0.15	3.09	(0.36)	(0.36)	0.00		(0.24)	(0.24)
Delta Air Lines Inc	2.29	0.00	2.29	2.29				(0.13)	(0.13)
Jacobs Engineering Group L...	1.05	0.00	1.05	(1.64)				(0.10)	(0.10)

Note the new sort order for this column.

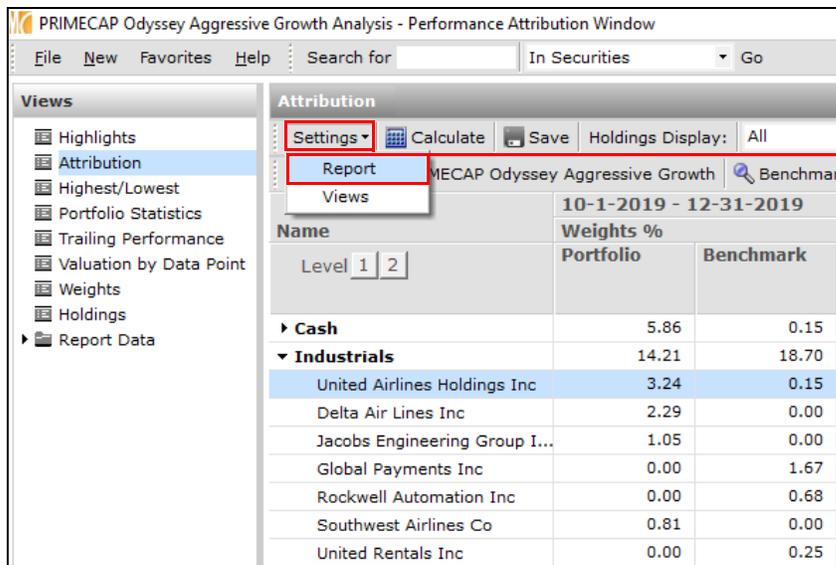
When calculating Equity Attribution, it is possible to exclude a security from the report to see the effect on the Active Return value over the time period had the fund manager not invested in that security. Use the following table to compare these values for the current settings seen versus those seen after removing the worst-performing stock from the worst-performing sector in this exercise:

Exercise 4: Exclude a security from analysis

Statistic	Original Value	Value after Exclusion
Active Return Total		
Worst-Performing Sector		
Morningstar Sector Weighting %		
Selection % Effect		

To exclude an underlying position for a fund, do the following:

1. Take note of the stock sector to which the worst-performing stock belongs.
2. From the toolbar, click **Settings > Report Settings**. The Settings dialog box opens.



Select this option to exclude a security from the report.

- Click the **icon** next to the **Exclusions** field. The Exclusions dialog box opens.

The screenshot shows the 'Settings' dialog box with the following details:

- Report Name:** PRIMECAP Odyssey Aggressive Growth Analysis
- Time Period:** Start Date (3 months ago, 10-01-2019), End Date (Last Quarter End, 12-31-2019), Display Frequency (Single), Calculation Frequency (Monthly). Results for time periods greater than one year: Cumulative, Annualized.
- Grouping:** Level Grouping. 1. Morningstar Sector.
- Calculation Options:** Investment Process (Two-Factor: Interaction in Selection Effect), Multi-period Linking Method (Arithmetic, Geometric), Infer Portfolio Holdings (Forward in Time, Backward in Time), Expand Composite Asset, All levels, Specific Levels [1].
- Exclusions:** USTREAS T-Bill Auction Ave 3 Mon, Morningstar - Daily Market Return, Morningstar.

Click this icon to select stocks to exclude.

- Expand** the worst-performing sector, then select the **stock** with the worst performance noted earlier.
- Click **Exclude**, then click **OK**.

The screenshot shows the 'Exclusions' dialog box with the following details:

- Exclusion Name:** (Empty text field)
- Available Data:** List of stocks including TransDigm Group Inc, TransUnion, United Rentals Inc, Verisk Analytics Inc, W.W. Grainger Inc, Westinghouse Air Brake Technologies Corp, WillScot Corp, and Woodward Inc.
- Select Exclusions:** 'Industrials' is selected, showing 'United Airlines Holdings Inc' below it.
- Buttons:** 'Include', 'Include All', 'Exclude', 'OK', and 'Cancel'.

Once a stock is excluded, it no longer appears in the Available Data area.

- Click **OK** again to return to the attribution report, which automatically calculates.
- Select the **Attribution** page, then fill out the Value after Exclusion column in the table on page 11 with the new data.

Note: The report displays a section for any bonds or stocks missing performance, and "other" securities which are not taken into account in the Equity Attribution report. It also now includes the Excluded section, where users can see any excluded securities.

Name	Weights %			Return %			Attribution Effect			Active Ret%
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Morningstar Sector Weighting %	Selection %		
Cash	5.85	0.15	5.71	0.40	0.40	0.00	(0.48)	0.00	(0.48)	
Financial Services	6.04	4.59	1.46	8.76	8.99	(0.23)	0.02	(0.01)	0.00	
Industrials	10.96	18.54	(7.58)	7.35	7.41	(0.06)	0.06	0.01	0.06	
Basic Materials	0.11	1.55	(1.44)	(2.97)	1.37	(4.33)	0.10	(0.01)	0.10	
Communication Services	5.16	5.23	(0.06)	3.99	1.92	2.07	(0.01)	0.12	0.12	
Energy	0.54	1.21	(0.67)	41.04	6.36	34.68	0.01	0.19	0.21	
Real Estate	0.00	3.56	(3.56)		1.00		0.27	0.00	0.27	
Healthcare	27.16	14.76	12.40	13.46	14.05	(0.59)	0.76	(0.14)	0.62	
Consumer Defensive	2.27	5.11	(2.84)	26.85	(0.60)	27.45	0.27	0.62	0.89	
Technology	31.31	30.15	1.16	14.69	11.43	3.25	0.09	1.04	1.12	
Consumer Cyclical	7.27	14.87	(7.60)	21.07	4.97	16.11	0.25	1.20	1.44	
Attribution Total	96.69	99.72	(3.03)	12.53	8.18	4.34	1.34	3.01	4.34	
Missing Performance	0.00	0.13	(0.13)							
Excluded	3.31	0.15	3.15							
Total	100.00	100.00	(0.00)							
Reported Total				12.60	8.12	4.48				
Expense Ratio				0.18	0.06	0.11				
Residual(Reported - Attrib...)				0.25	0.00	0.25				

Note the new values and order of sectors with just one stock excluded.

- To include the worst-performing stock again in the attribution report, from the toolbar, click **Settings > Report Settings**. The Settings dialog box opens.
- Click the icon next to the **Exclusions** field. The Exclusions dialog box opens.

Settings

Report Settings

Report Name: PRIMECAP Odyssey Aggressive Growth Analysis

Time Period

Start Date: 3 months ago (10-01-2019)

End Date: Last Quarter End (12-31-2019)

Display Frequency: Single

Calculation Frequency: Monthly

Results for time periods greater than one year: Cumulative Annualized

Grouping

Level: 1. Morningstar Sector

Add New

Calculation Options

Investment Process: Two-Factor: Interaction in Selection Effect

Multi-period Linking Method: Arithmetic Geometric

Infer Portfolio Holdings: Forward in Time Backward in Time

Expand Composite Asset

All Levels Specific Levels (1)

Exclusions

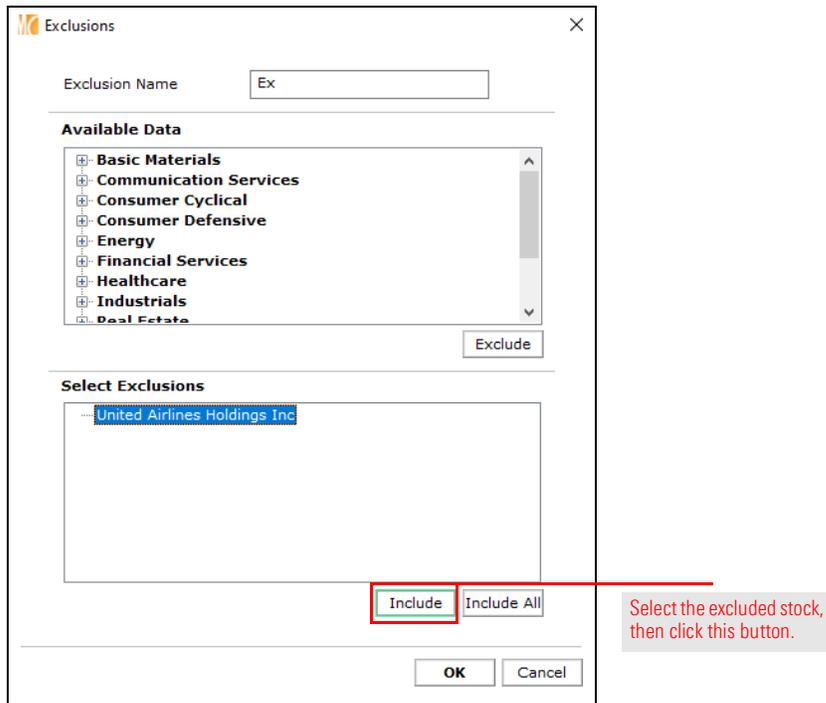
Ex: [icon]

Cash Proxy: USTREAS T-Bill Auction Ave 3 Mon [icon]

Return Sources: Morningstar - Daily Market Return [icon]

Fundamentals: Morningstar [icon]

10. In the Select Exclusions area, select the **stock**, then click **Include**.



11. Click **OK** to close the dialog box, then click **OK** again to recalculate the report.

The Reported Total value seen on the report is the actual return of the investment reported to Morningstar. For a mutual fund, this is the NAV return. For an index, it is the actual return of the index. This differs from the Attribution Total which is the weighted average returns of the underlying stocks calculated using the beginning of the period weight assuming a buy-and-hold approach. In other words, the Attribution Total is a hypothetical return. This hypothetical return is gross of fees and expenses.

Exercise 5: Explore other important information on the report

Name	10-1-2019 - 12-31-2019			Return %		
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-
Basic Materials	0.11	1.55	(1.44)	(2.97)	1.37	(4.33)
Communication Services	5.17	5.23	(0.06)	3.99	1.92	2.07
Consumer Cyclical	7.28	14.87	(7.59)	21.07	4.97	16.11
Consumer Defensive	2.27	5.11	(2.84)	26.85	(0.60)	27.45
Energy	0.54	1.21	(0.67)	41.04	6.36	34.68
Financial Services	6.05	4.59	1.46	8.76	8.99	(0.23)
Healthcare	27.18	14.76	12.42	13.46	14.05	(0.59)
Industrials	14.21	18.70	(4.49)	5.57	7.34	(1.78)
Real Estate	0.00	3.56	(3.56)		1.00	
Technology	31.33	30.15	1.18	14.69	11.43	3.25
Cash	5.86	0.15	5.71	0.40	0.40	0.00
Attribution Total	100.00	99.88	0.12	12.10	8.17	3.93
Missing Performance	0.00	0.13	(0.13)			
Total	100.00	100.00	(0.00)			
Reported Total				12.60	8.12	4.48
Expense Ratio				0.18	0.06	0.11
Residual(Reported - Attrib...				0.67	0.01	0.66

Note the discrepancy that can exist between these two values.

To be consistent with how index returns are calculated, the hypothetical return currently assumes dividend reinvestment on the ex-date, when in reality some portfolios may receive dividends in cash. The hypothetical return also excludes any securities shown below the Attribution Total row.

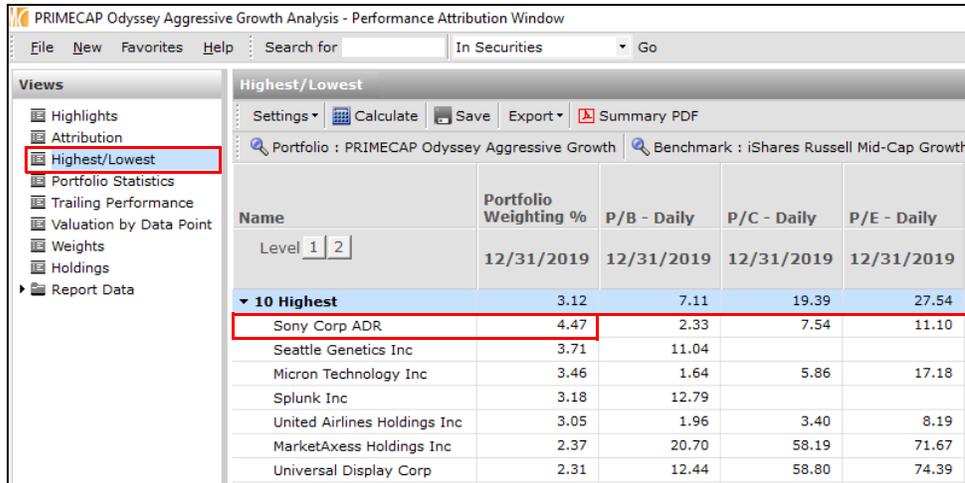
The Residual value is the difference between the Reported Total row and the Attribution Total row after accounting for a fund's Expense Ratio. This Residual value is a standard industry term, but it can often be confused with "Interaction," which is the third factor when conducting three-factor attribution analysis.

The Highest/Lowest page displays fundamental data for those securities with the highest and lowest weights in the portfolio. Note that the information on this page is a weighted average of each stock's position, while the weights on the Attribution page are as of the end of the time period being shown on the report.

Exercise 6: Find the largest positions by weight in the fund

To see which holding had the largest average weight and determine if it had a positive or negative impact on the fund, do the following:

1. Select the **Highest/Lowest** page.
2. **Expand** the **10 Highest** section. The holdings are automatically sorted by the Portfolio Weighting % column.



Name	Portfolio Weighting %	P/B - Daily	P/C - Daily	P/E - Daily
Level 1 2	12/31/2019	12/31/2019	12/31/2019	12/31/2019
10 Highest	3.12	7.11	19.39	27.54
Sony Corp ADR	4.47	2.33	7.54	11.10
Seattle Genetics Inc	3.71	11.04		
Micron Technology Inc	3.46	1.64	5.86	17.18
Splunk Inc	3.18	12.79		
United Airlines Holdings Inc	3.05	1.96	3.40	8.19
MarketAxess Holdings Inc	2.37	20.70	58.19	71.67
Universal Display Corp	2.31	12.44	58.80	74.39

3. Select the **Attribution** page. Expand the appropriate sector to find the largest stock.

Note: If it is not apparent which stock sector the largest holding belongs to, return to the **Highest/Lowest** page, **expand** the **Highest** section, then **double-click** the **name** of the largest stock to open the Morningstar Report for that holding in a browser. **Scroll** to the bottom of the Morningstar Report to see its Sector classification.

4. Look at its **Selection % value**. Did the largest holding offer a positive or negative value for the fund?

The Portfolio Statistics page compares the overall valuation results of the portfolio to its benchmark. Both Historical and Latest Data are available. To find the median price-to-earnings ratio for the fund, do the following:

Exercise 7: Find the median price-to-earnings ratio for the fund's portfolio

1. Select the **Portfolio Statistics** page.
2. Expand the **P/E - Daily** section.
3. Find the **Median** value for the latest portfolio, and compare it to the benchmark. Are the holdings of the fund cheaper or more expensive than those in the benchmark?

The screenshot shows the 'Portfolio Statistics' window for PRIMECAP Odyssey Aggressive Growth. The 'P/E - Daily' section is expanded, showing a comparison between the Portfolio and Benchmark across various metrics. The 'Median' row is highlighted with red boxes around the values 20.59 for the Portfolio and 25.47 for the Benchmark. A callout box points to these two values with the text 'Compare these two values.'

12/31/2019				
Data Point	Portfolio		Benchmark	
	Asset Coverage %	Position	Asset Coverage %	Position
▶ P/B - Daily	92.96		84.44	
▶ P/C - Daily	62.66		78.78	
▼ P/E - Daily	53.06		74.02	
Average		23.81		27.45
Count		83.00		294.00
Geometric Average		19.86		24.08
Harmonic Average		16.42		20.08
Maximum		58.73		59.10
Median		20.59		25.47
Minimum		4.17		1.51
Standard Deviation		14.24		13.21
Sum		1,976.00		8,079.46

Compare these two values.

The Trailing Performance page displays the performance of various time periods by the chosen grouping and security levels. To see which holding had the best performance in the quarter being examined on the report and what its weight in the portfolio is, do the following:

Exercise 8: Find the holding with the best quarter-to-date performance

1. Select the **Trailing Performance** page.
2. Click the **Level 2** button to expand all sectors.

PRIMECAP Odyssey Aggressive Growth Analysis - Performance Attribution Window

File New Favorites Help Search for In Securities Go

Views: Highlights, Attribution, Highest/Lowest, Portfolio Statistics, **Trailing Performance**, Valuation by Data Point, Weights, Holdings, Report Data

Trailing Performance: Settings Calculate Save Export Summary PDF

Portfolio: PRIMECAP Odyssey Aggressive Growth Benchmark: iShares Russell Mid-Cap Growth

As of: 12/31/2019	1 Day	Week-to-date	Month-to-date	Quarter-to-date
Level 1 2	Portfolio	Portfolio	Portfolio	Portfolio
	Return %	Return %	Return %	Return %
Basic Materials	1.42	0.58	7.74	(0.73)
Albemarle Corp	1.54	1.43	12.32	5.63
Ingevity Corp	1.17	0.48	(3.24)	2.99
Marrone Bio Innovations Inc	1.00	(2.88)	(6.48)	(28.37)
Communication Services	0.60	(0.26)	1.02	10.41
Alphabet Inc A	(0.02)	(1.13)	2.71	9.68
Alphabet Inc Class C	0.07	(1.10)	2.46	9.68
ANGI Homeservices Inc A	3.42	1.32	9.29	19.55

Click this button to expand all sectors at once.

3. **Double-click** the **Quarter-to-Date Portfolio Return %** column header to sort the column in descending order.

PRIMECAP Odyssey Aggressive Growth Analysis - Performance Attribution Window

File New Favorites Help Search for In Securities Go

Views: Highlights, Attribution, Highest/Lowest, Portfolio Statistics, **Trailing Performance**, Valuation by Data Point, Weights, Holdings, Report Data

Trailing Performance: Settings Calculate Save Export Summary PDF

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Marrone Bio Innovations Inc	1.00	(2.88)	(6.48)	(28.37)
Communication Services	0.60	(0.26)	1.02	10.41
comScore Inc	1.02	0.00	20.78	158.64
Tribune Publishing Co	1.70	0.92	5.11	56.33
Keywords Studios PLC	0.69	(0.39)	9.04	40.47

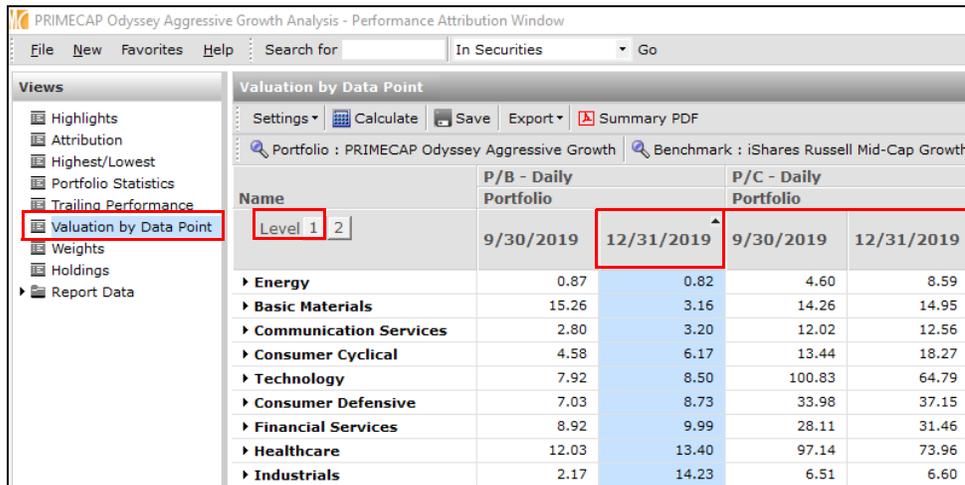
Review every sector to ensure the correct stock with the highest return has been found.

4. **Scroll down** to find the stock with the best return in this column, and take note of the sector to which it belongs.
5. Select the **Attribution** page.
6. **Expand** the **sector** to which the stock belongs.
7. What was the stock's **weight** in the portfolio?

The Valuation by Data Point page displays the portfolio's valuation results by the chosen grouping and security levels. Both Historical and Latest Data are available. To see which stock sector has the lowest price-to-book value, do the following:

Exercise 9: Find the sector with the lowest price-to-book value

1. Select the **Valuation by Data Point** page.
2. Click the **Level 1** button.
3. Under the P/B - Daily section, double-click the column header for the **most recent time period**.



Name	P/B - Daily Portfolio		P/C - Daily Portfolio	
	9/30/2019	12/31/2019	9/30/2019	12/31/2019
▶ Energy	0.87	0.82	4.60	8.59
▶ Basic Materials	15.26	3.16	14.26	14.95
▶ Communication Services	2.80	3.20	12.02	12.56
▶ Consumer Cyclical	4.58	6.17	13.44	18.27
▶ Technology	7.92	8.50	100.83	64.79
▶ Consumer Defensive	7.03	8.73	33.98	37.15
▶ Financial Services	8.92	9.99	28.11	31.46
▶ Healthcare	12.03	13.40	97.14	73.96
▶ Industrials	2.17	14.23	6.51	6.60

4. Which sector had the lowest price-to-book value at the end of the time period, and which had the highest?

The Weights page compares the weights of the portfolio versus the benchmark by the chosen grouping and security levels. To easily see where the portfolio differs most from the benchmark in this regard, do the following:

Exercise 10: Find the sectors with the biggest deviations by weight from the benchmark

1. Select the **Weights** page.
2. **Double-click** the **+/-** column header for the most recent time period twice to sort it in descending order.

Name	9/30/2019			12/31/2019		
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-
Healthcare	26.53	14.48	12.05	28.08	15.18	12.90
Technology	31.61	29.80	1.80	33.15	30.83	2.32
Cash	6.12	0.15	5.97	2.26	0.22	2.04
Financial Services	6.06	4.52	1.54	6.23	4.54	1.70
Unclassified	0.00	0.00	0.00	0.00	0.00	0.00
Communication Services	5.32	5.42	(0.10)	4.97	5.13	(0.16)
Energy	0.55	1.27	(0.72)	0.71	1.23	(0.52)
Basic Materials	0.12	1.61	(1.49)	0.11	1.55	(1.44)
Consumer Defensive	2.16	5.29	(3.13)	2.51	4.86	(2.35)
Real Estate	0.00	3.66	(3.66)	0.00	3.41	(3.41)
Industrials	14.32	18.71	(4.39)	14.01	18.46	(4.44)
Consumer Cyclical	7.22	15.09	(7.87)	7.96	14.59	(6.63)
Attribution Total	100.00	100.00	0.00	100.00	100.00	(0.00)
Total	100.00	100.00	0.00	100.00	100.00	(0.00)

Note the sort order for this column.

3. Which sector is most **overweight** for the fund compared to the benchmark (it has the highest positive number)?
4. **Expand** that sector to see its holdings.
5. **Double-click** the **Portfolio** column header for the **most recent time period** to sort the weights in descending order.
6. How many of the top 10 holdings for the fund in this sector are not even present in the benchmark's portfolio?

Name	9/30/2019			12/31/2019		
	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-
Technology	31.61	29.80	1.80	33.15	30.83	2.32
Healthcare	26.53	14.48	12.05	28.08	15.18	12.90
Seattle Genetics Inc	3.73	0.33	3.39	3.71	0.41	3.30
Nektar Therapeutics Inc	2.07	0.02	2.06	2.30	0.02	2.28
Insulet Corp	2.95	0.33	2.62	1.99	0.32	1.67
Abiomed Inc	2.22	0.27	1.95	1.97	0.24	1.73
Epizyme Inc	0.71			1.93		
Eli Lilly and Co	1.60			1.74		
Xencor Inc	1.72			1.61		
Biogen Inc	0.66			1.54		
Biomarin Pharmaceutical Inc	1.04	0.41	0.63	1.40	0.47	0.93
Exact Sciences Corp	1.24	0.39	0.85	1.17	0.40	0.77
Qiagen NV	1.19			1.13		
Alkermes PLC	1.23			0.92		

Note the gaps where certain stocks are held by the fund, but not the index.

The Holdings page displays the shares, market value, market capitalization, and weightings broken down by the grouping and security levels. Both Historical and Latest Data are available. To find the number of shares owned of the largest stock position and its return in the current year to date, do the following:

Exercise 11: Find the number of shares owned and YTD return of the largest stock

1. Refer to [Exercise 6 on page 16](#) for the largest stock by weight in the portfolio.
2. Select the **Holdings** page.
3. **Expand the sector** for the largest stock by weight.

Level	Ticker	Portfolio Weighting %	Shares	Position Market Value	Market Cap (mil) (Daily)	P/E Ratio Current	P/E Ratio Forward	P/B Ratio Current	Price 52 Wk High	Price 52 Wk Low	Total Ret YTD (Daily)
Basic Materials		0.11	11,761,000.00	11,421,376.00	5,510.72	13.10	13.26	2.41	83.04	46.09	(12.73)
Communication Services		4.97	41,235,627.00	520,136,708.00	370,757.48	22.00	22.67	2.71	678.72	451.57	(8.09)
Consumer Cyclical		7.96	8,232,790.00	833,921,166.00	160,602.81	11.56	17.93	4.49	276.58	103.16	(32.73)
Consumer Defensive		2.51	8,691,300.00	263,178,423.00	3,926.94	32.40	31.35	7.82	52.39	26.79	(5.07)
Energy		0.71	9,526,832.00	74,809,864.00	2,885.99	10.31	17.11	0.57	16.63	4.07	(65.17)
Financial Services		6.23	11,771,485.00	652,800,922.00	15,821.92	12.57	30.16	8.03	208.03	116.19	(19.93)
Healthcare		28.08	93,625,485.00	2,941,573,462.00	25,460.62	29.42	27.49	5.20	127.45	63.62	(12.96)
Industrials		14.01	39,179,075.00	1,467,765,971.00	10,449.38	7.34	6.55	1.40	66.36	31.70	(38.74)
Technology		33.15	93,715,076.00	3,471,941,353.00	35,280.30	24.48	20.69	5.89	119.36	66.68	(23.02)
Sony Corp ADR	SNE	4.47	6,887,600.00	468,356,800.00	68,072.63	11.35	11.78	1.71	73.86	41.91	17.18
Nikon Technology Inc	NJ	3.46	6,746,000.00	362,756,856.00	47,756.45	13.73	17.61	1.31	61.19	32.14	(20.09)
Splunk Inc	SPLK	3.18	2,222,000.00	332,788,940.00	17,866.12	1,111.11	8.99	176.31	109.00	(23.09)	
Universal Display Corp	OLED	2.31	1,176,431.00	242,427,136.00	6,866.77	49.84	43.67	8.46	230.32	132.82	(29.38)
Pros Holdings Inc	PRO	1.77	3,092,100.00	185,278,632.00	1,342.23			8.13	78.40	28.42	(47.91)
Adobe Inc	ADBE	1.75	555,700.00	183,275,417.00	162,136.49	50.83	34.25	15.49	386.75	232.03	1.73

Look for the values in the highlighted cells.

4. Find the stock, then look at the number of **Shares** owned.
5. What is its value in the **Total Ret YTD (Daily)** column?

The Report Data folder offers pages for Attribution Holdings Data, Excluded Equities, and Missing Performance. The Attribution Holdings page displays whether the data for the portfolio is using actual or inferred returns, based on when a fund last submitted a portfolio to Morningstar and the start date for the report. For example, if the start date for the equity attribution report is 09/30/2019, and the fund last submitted a portfolio on 08/31/2019, then the holdings on the report would be inferred from that date.

Exercise 12: Determine whether the data on the report reflects actual or inferred holdings

To see whether a report is using actual or inferred data, do the following:

1. **Expand the Report Data** folder.
2. Select the **Attribution Holdings Data** page.
3. Look at the **Holdings Data** column. Is the value here Actual, or Inferred?

Display Period	Portfolio Single Period	Weight Based on	Holdings data
10-1-2019 - 12-31-2019	10-1-2019 - 10-31-2019	9-30-2019	Actual

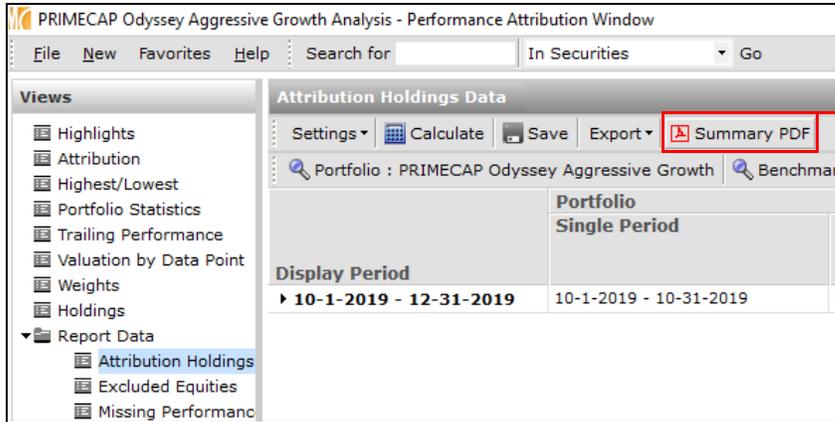
Note the value of this cell.

The Equity Attribution report also offers users a ready-made PDF report, which can be used to communicate the results of an analysis.

Exercise 13: Generate a PDF report for attribution

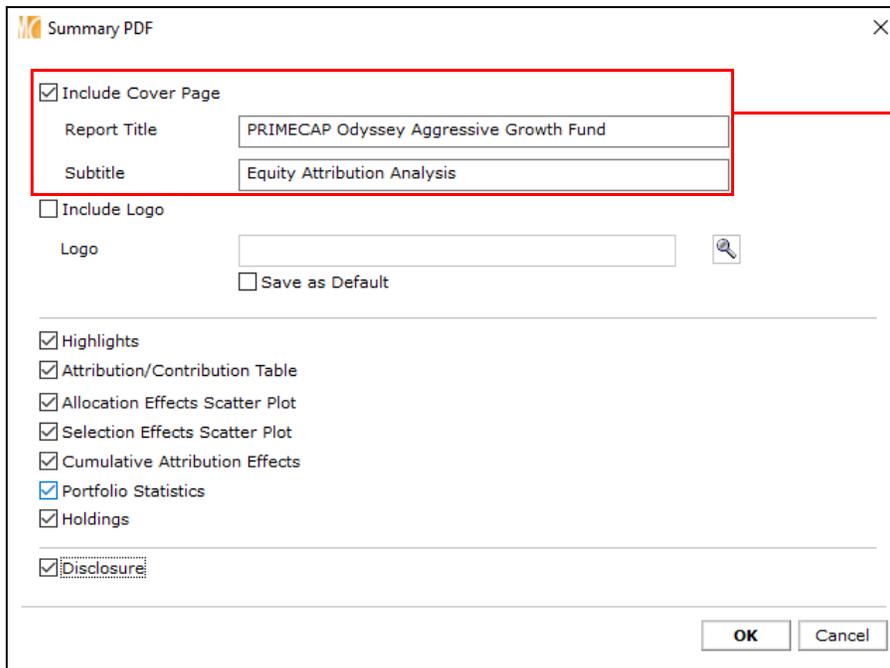
To generate this report, do the following:

1. From the toolbar, click **Summary PDF**. The Summary PDF dialog box opens on screen.



Use this icon to generate the report.

2. Select the **Include Cover Page** checkbox.
3. Change the **Report Title** to **PRIMECAP Odyssey Aggressive Growth Fund**.
4. Change the Subtitle to **Equity Attribution Analysis**.
5. Select all additional options, including **Holdings** and **Disclosure**.

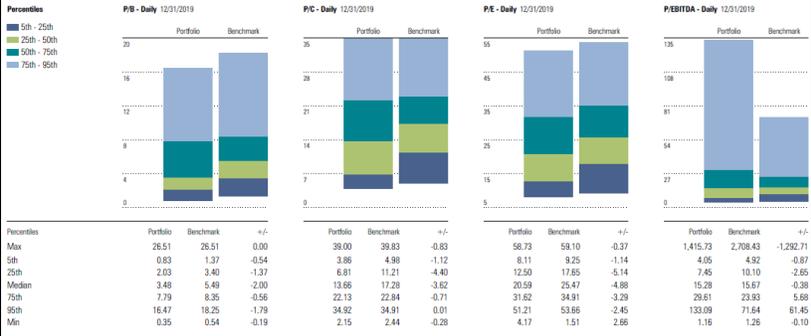


Note the values entered here.

6. Click **OK** to generate the report. The following table describes various parts of this report.

Page	Description																																																																																																																																																																																																															
<p>Highlights</p>	<div data-bbox="589 323 1297 590"> </div> <p data-bbox="589 617 1396 709">The chart at the top of the page visualizes the portfolio weights and return relative to the benchmark, the contribution to the return, as well as the Allocation Effect, Selection Effect and Active Return over the chosen time period.</p> <div data-bbox="589 741 1370 1073"> <table border="1"> <thead> <tr> <th colspan="4">Leading Contributors</th> <th colspan="3">Leading Detractors</th> <th colspan="2">Exposure</th> </tr> <tr> <th></th> <th>Weight</th> <th>Return</th> <th>Contri</th> <th></th> <th>Weight</th> <th>Return</th> <th>Contri</th> <th></th> </tr> </thead> <tbody> <tr> <td>Technology</td> <td>31.33</td> <td>14.69</td> <td>4.54</td> <td>Basic Materials</td> <td>0.11</td> <td>-2.97</td> <td>0.00</td> <td>Top 10 Portfolio Holdings</td> </tr> <tr> <td>Healthcare</td> <td>27.18</td> <td>13.46</td> <td>3.57</td> <td>Cash</td> <td>5.86</td> <td>0.40</td> <td>0.02</td> <td>Insulet Corp</td> </tr> <tr> <td>Consumer Cyclical</td> <td>7.28</td> <td>21.07</td> <td>1.52</td> <td>Communication Services</td> <td>5.17</td> <td>3.99</td> <td>0.21</td> <td>Splunk Inc</td> </tr> <tr> <td>Industrials</td> <td>14.21</td> <td>5.57</td> <td>0.80</td> <td>Energy</td> <td>0.54</td> <td>41.04</td> <td>0.22</td> <td>Universal Display Corp</td> </tr> <tr> <td>Consumer Defensive</td> <td>2.27</td> <td>26.85</td> <td>0.58</td> <td>Financial Services</td> <td>6.05</td> <td>8.76</td> <td>0.53</td> <td>MarketAxess Holdings Inc</td> </tr> <tr> <td colspan="4">Holdings</td> <td colspan="3">Holdings</td> <td colspan="2">Top 10 Benchmark Holdings</td> </tr> <tr> <td>Seattle Genetics Inc</td> <td>4.33</td> <td>33.79</td> <td>1.26</td> <td>Spectrum Pharmaceuticals Inc</td> <td>0.88</td> <td>-56.12</td> <td>-0.50</td> <td>American Airlines Group Inc</td> </tr> <tr> <td>Eli Lilly and Co</td> <td>0.84</td> <td>138.49</td> <td>0.98</td> <td>Sprint Corp Registered Shs Series -1</td> <td>1.35</td> <td>-15.56</td> <td>-0.22</td> <td>Global Payments Inc</td> </tr> <tr> <td>Micron Technology Inc</td> <td>3.05</td> <td>25.51</td> <td>0.76</td> <td>iRobot Corp</td> <td>0.68</td> <td>-17.90</td> <td>-0.15</td> <td>Dollar General Corp</td> </tr> <tr> <td>Splunk Inc</td> <td>2.82</td> <td>27.07</td> <td>0.73</td> <td>Corus Corp</td> <td>0.52</td> <td>-18.14</td> <td>-0.11</td> <td>Advanced Micro Devices Inc</td> </tr> <tr> <td>VeriSign Inc</td> <td>4.15</td> <td>15.00</td> <td>0.63</td> <td>MANVE Life Sciences Ltd</td> <td>0.29</td> <td>-60.96</td> <td>-0.10</td> <td>Lam Research Corp</td> </tr> <tr> <td>Universal Display Corp</td> <td>2.46</td> <td>22.88</td> <td>0.53</td> <td>Alkermes Inc</td> <td>2.31</td> <td>-4.10</td> <td>-0.09</td> <td>Finis Inc</td> </tr> <tr> <td>Chegg Inc</td> <td>1.91</td> <td>26.58</td> <td>0.48</td> <td>Fluidigm Corp</td> <td>0.19</td> <td>-24.84</td> <td>-0.06</td> <td>Global Payments Inc</td> </tr> <tr> <td>Fieldt Inc</td> <td>0.74</td> <td>73.67</td> <td>0.47</td> <td>Crece Inc</td> <td>0.83</td> <td>-5.82</td> <td>-0.05</td> <td>Dollar General Corp</td> </tr> <tr> <td>Mitabba Group Holding Ltd ADR</td> <td>1.79</td> <td>26.83</td> <td>0.46</td> <td>Imax Corp</td> <td>0.88</td> <td>-6.92</td> <td>-0.05</td> <td>Advanced Micro Devices Inc</td> </tr> <tr> <td>Royal Caribbean Cruises Ltd</td> <td>1.82</td> <td>24.00</td> <td>0.44</td> <td>ForeScout Technologies Inc</td> <td>0.25</td> <td>-13.50</td> <td>-0.04</td> <td>Lam Research Corp</td> </tr> <tr> <td>Vertex Pharmaceuticals Inc</td> <td>2.01</td> <td>18.50</td> <td>0.38</td> <td>Federal Home Loan Mortgage Corp 9/3/8*</td> <td>0.30</td> <td>-8.47</td> <td>-0.03</td> <td>O'Reilly Automotive Inc</td> </tr> <tr> <td>MarketAxess Holdings Inc</td> <td>2.26</td> <td>15.90</td> <td>0.36</td> <td>MindLine Inc A</td> <td>0.53</td> <td>-6.18</td> <td>-0.03</td> <td>Amphenol Corp Class A</td> </tr> <tr> <td>Adobe Inc</td> <td>1.76</td> <td>19.39</td> <td>0.34</td> <td>Stratysys Ltd</td> <td>0.48</td> <td>-5.07</td> <td>-0.03</td> <td>Ingersoll Rand PLC</td> </tr> <tr> <td>BlackBerry Ltd</td> <td>1.25</td> <td>22.85</td> <td>0.29</td> <td>Fannie Mae FMS Shs Ser S</td> <td>0.22</td> <td>-10.49</td> <td>-0.03</td> <td>Hilton Worldwide Holdings Inc</td> </tr> <tr> <td>Eli Lilly and Co</td> <td>1.56</td> <td>18.21</td> <td>0.29</td> <td>Digimarc Corp</td> <td>0.13</td> <td>-14.15</td> <td>-0.02</td> <td>AutoZone Inc</td> </tr> </tbody> </table> </div> <p data-bbox="589 1100 1396 1192">The table at the bottom of the page displays the top five contributors and bottom five detractors, the top and bottom 15 contributing stocks, as well as the top 10 portfolio and benchmark holdings.</p> <p data-bbox="589 1213 1396 1266">Note: Contribution is merely a stock's weight multiplied by its return. Unlike Attribution, it does not take into account whether a security is also held by an index.</p>	Leading Contributors				Leading Detractors			Exposure			Weight	Return	Contri		Weight	Return	Contri		Technology	31.33	14.69	4.54	Basic Materials	0.11	-2.97	0.00	Top 10 Portfolio Holdings	Healthcare	27.18	13.46	3.57	Cash	5.86	0.40	0.02	Insulet Corp	Consumer Cyclical	7.28	21.07	1.52	Communication Services	5.17	3.99	0.21	Splunk Inc	Industrials	14.21	5.57	0.80	Energy	0.54	41.04	0.22	Universal Display Corp	Consumer Defensive	2.27	26.85	0.58	Financial Services	6.05	8.76	0.53	MarketAxess Holdings Inc	Holdings				Holdings			Top 10 Benchmark Holdings		Seattle Genetics Inc	4.33	33.79	1.26	Spectrum Pharmaceuticals Inc	0.88	-56.12	-0.50	American Airlines Group Inc	Eli Lilly and Co	0.84	138.49	0.98	Sprint Corp Registered Shs Series -1	1.35	-15.56	-0.22	Global Payments Inc	Micron Technology Inc	3.05	25.51	0.76	iRobot Corp	0.68	-17.90	-0.15	Dollar General Corp	Splunk Inc	2.82	27.07	0.73	Corus Corp	0.52	-18.14	-0.11	Advanced Micro Devices Inc	VeriSign Inc	4.15	15.00	0.63	MANVE Life Sciences Ltd	0.29	-60.96	-0.10	Lam Research Corp	Universal Display Corp	2.46	22.88	0.53	Alkermes Inc	2.31	-4.10	-0.09	Finis Inc	Chegg Inc	1.91	26.58	0.48	Fluidigm Corp	0.19	-24.84	-0.06	Global Payments Inc	Fieldt Inc	0.74	73.67	0.47	Crece Inc	0.83	-5.82	-0.05	Dollar General Corp	Mitabba Group Holding Ltd ADR	1.79	26.83	0.46	Imax Corp	0.88	-6.92	-0.05	Advanced Micro Devices Inc	Royal Caribbean Cruises Ltd	1.82	24.00	0.44	ForeScout Technologies Inc	0.25	-13.50	-0.04	Lam Research Corp	Vertex Pharmaceuticals Inc	2.01	18.50	0.38	Federal Home Loan Mortgage Corp 9/3/8*	0.30	-8.47	-0.03	O'Reilly Automotive Inc	MarketAxess Holdings Inc	2.26	15.90	0.36	MindLine Inc A	0.53	-6.18	-0.03	Amphenol Corp Class A	Adobe Inc	1.76	19.39	0.34	Stratysys Ltd	0.48	-5.07	-0.03	Ingersoll Rand PLC	BlackBerry Ltd	1.25	22.85	0.29	Fannie Mae FMS Shs Ser S	0.22	-10.49	-0.03	Hilton Worldwide Holdings Inc	Eli Lilly and Co	1.56	18.21	0.29	Digimarc Corp	0.13	-14.15	-0.02	AutoZone Inc
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Healthcare	27.18	13.46	3.57	Cash	5.86	0.40	0.02	Insulet Corp																																																																																																																																																																																																								
Consumer Cyclical	7.28	21.07	1.52	Communication Services	5.17	3.99	0.21	Splunk Inc																																																																																																																																																																																																								
Industrials	14.21	5.57	0.80	Energy	0.54	41.04	0.22	Universal Display Corp																																																																																																																																																																																																								
Consumer Defensive	2.27	26.85	0.58	Financial Services	6.05	8.76	0.53	MarketAxess Holdings Inc																																																																																																																																																																																																								
Holdings				Holdings			Top 10 Benchmark Holdings																																																																																																																																																																																																									
Seattle Genetics Inc	4.33	33.79	1.26	Spectrum Pharmaceuticals Inc	0.88	-56.12	-0.50	American Airlines Group Inc																																																																																																																																																																																																								
Eli Lilly and Co	0.84	138.49	0.98	Sprint Corp Registered Shs Series -1	1.35	-15.56	-0.22	Global Payments Inc																																																																																																																																																																																																								
Micron Technology Inc	3.05	25.51	0.76	iRobot Corp	0.68	-17.90	-0.15	Dollar General Corp																																																																																																																																																																																																								
Splunk Inc	2.82	27.07	0.73	Corus Corp	0.52	-18.14	-0.11	Advanced Micro Devices Inc																																																																																																																																																																																																								
VeriSign Inc	4.15	15.00	0.63	MANVE Life Sciences Ltd	0.29	-60.96	-0.10	Lam Research Corp																																																																																																																																																																																																								
Universal Display Corp	2.46	22.88	0.53	Alkermes Inc	2.31	-4.10	-0.09	Finis Inc																																																																																																																																																																																																								
Chegg Inc	1.91	26.58	0.48	Fluidigm Corp	0.19	-24.84	-0.06	Global Payments Inc																																																																																																																																																																																																								
Fieldt Inc	0.74	73.67	0.47	Crece Inc	0.83	-5.82	-0.05	Dollar General Corp																																																																																																																																																																																																								
Mitabba Group Holding Ltd ADR	1.79	26.83	0.46	Imax Corp	0.88	-6.92	-0.05	Advanced Micro Devices Inc																																																																																																																																																																																																								
Royal Caribbean Cruises Ltd	1.82	24.00	0.44	ForeScout Technologies Inc	0.25	-13.50	-0.04	Lam Research Corp																																																																																																																																																																																																								
Vertex Pharmaceuticals Inc	2.01	18.50	0.38	Federal Home Loan Mortgage Corp 9/3/8*	0.30	-8.47	-0.03	O'Reilly Automotive Inc																																																																																																																																																																																																								
MarketAxess Holdings Inc	2.26	15.90	0.36	MindLine Inc A	0.53	-6.18	-0.03	Amphenol Corp Class A																																																																																																																																																																																																								
Adobe Inc	1.76	19.39	0.34	Stratysys Ltd	0.48	-5.07	-0.03	Ingersoll Rand PLC																																																																																																																																																																																																								
BlackBerry Ltd	1.25	22.85	0.29	Fannie Mae FMS Shs Ser S	0.22	-10.49	-0.03	Hilton Worldwide Holdings Inc																																																																																																																																																																																																								
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<p>Attribution/Contribution</p>	<div data-bbox="589 1297 1370 1688"> <p>Attribution/Contribution 10/1/2019 to 12/31/2019</p> <table border="1"> <thead> <tr> <th rowspan="3">Morningstar Sector</th> <th colspan="3">Weights %</th> <th colspan="3">Return %</th> <th colspan="3">Attribution Effects %</th> </tr> <tr> <th rowspan="2">Portfolio</th> <th rowspan="2">Benchmark</th> <th rowspan="2">+/-</th> <th rowspan="2">Portfolio</th> <th rowspan="2">Benchmark</th> <th rowspan="2">+/-</th> <th colspan="2">Morningstar Sector</th> </tr> <tr> <th>Weighting</th> <th>Selection</th> </tr> </thead> <tbody> <tr> <td>Basic Materials</td> <td>0.11</td> <td>1.55</td> <td>-1.44</td> <td>-2.97</td> <td>1.37</td> <td>-4.33</td> <td>0.10</td> <td>-0.01</td> </tr> <tr> <td>Communication Services</td> <td>5.17</td> <td>5.23</td> <td>-0.06</td> <td>3.99</td> <td>1.92</td> <td>2.07</td> <td>0.01</td> <td>0.12</td> </tr> <tr> <td>Consumer Cyclical</td> <td>7.28</td> <td>14.87</td> <td>-7.59</td> <td>21.07</td> <td>4.97</td> <td>16.11</td> <td>0.26</td> <td>1.15</td> </tr> <tr> <td>Consumer Defensive</td> <td>2.27</td> <td>5.11</td> <td>-2.84</td> <td>26.85</td> <td>-0.60</td> <td>27.45</td> <td>0.27</td> <td>0.60</td> </tr> <tr> <td>Energy</td> <td>0.54</td> <td>1.21</td> <td>-0.67</td> <td>41.04</td> <td>6.36</td> <td>34.68</td> <td>0.01</td> <td>0.18</td> </tr> <tr> <td>Financial Services</td> <td>6.05</td> <td>4.59</td> <td>1.46</td> <td>8.76</td> <td>8.99</td> <td>-0.23</td> <td>0.01</td> <td>-0.01</td> </tr> <tr> <td>Healthcare</td> <td>27.18</td> <td>14.76</td> <td>12.42</td> <td>13.46</td> <td>14.05</td> <td>-0.59</td> <td>0.71</td> <td>-0.14</td> </tr> <tr> <td>Industrials</td> <td>14.21</td> <td>18.70</td> <td>-4.49</td> <td>5.57</td> <td>7.34</td> <td>-1.78</td> <td>0.04</td> <td>-0.24</td> </tr> <tr> <td>Real Estate</td> <td>0.00</td> <td>3.56</td> <td>-3.56</td> <td>—</td> <td>1.00</td> <td>—</td> <td>0.27</td> <td>0.00</td> </tr> <tr> <td>Technology</td> <td>31.33</td> <td>30.15</td> <td>1.18</td> <td>14.69</td> <td>11.43</td> <td>3.25</td> <td>0.05</td> <td>1.00</td> </tr> <tr> <td>Cash</td> <td>5.86</td> <td>0.15</td> <td>5.71</td> <td>0.40</td> <td>0.40</td> <td>0.00</td> <td>-0.46</td> <td>0.00</td> </tr> <tr> <td>Attribution Total</td> <td>100.00</td> <td>99.88</td> <td>0.12</td> <td>12.10</td> <td>8.17</td> <td>3.93</td> <td>1.27</td> <td>2.66</td> </tr> <tr> <td>Missing Performance</td> <td>0.00</td> <td>0.13</td> <td>-0.13</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>Total</td> <td>100.00</td> <td>100.00</td> <td>0.00</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>Reported Total</td> <td>—</td> <td>—</td> <td>—</td> <td>12.60</td> <td>8.12</td> <td>4.48</td> <td>—</td> <td>—</td> </tr> <tr> <td>Expense Ratio</td> <td>—</td> <td>—</td> <td>—</td> <td>0.18</td> <td>0.06</td> <td>0.11</td> <td>—</td> <td>—</td> </tr> <tr> <td>Residual(Reported - Attribution + Expense)</td> <td>—</td> <td>—</td> <td>—</td> <td>0.67</td> <td>0.01</td> <td>0.66</td> <td>—</td> <td>—</td> </tr> </tbody> </table> </div> <p data-bbox="589 1717 1396 1770">This page provides a summary of the same data seen in the Attribution view of the Equity Attribution report in Morningstar Direct.</p>	Morningstar Sector	Weights %			Return %			Attribution Effects %			Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Morningstar Sector		Weighting	Selection	Basic Materials	0.11	1.55	-1.44	-2.97	1.37	-4.33	0.10	-0.01	Communication Services	5.17	5.23	-0.06	3.99	1.92	2.07	0.01	0.12	Consumer Cyclical	7.28	14.87	-7.59	21.07	4.97	16.11	0.26	1.15	Consumer Defensive	2.27	5.11	-2.84	26.85	-0.60	27.45	0.27	0.60	Energy	0.54	1.21	-0.67	41.04	6.36	34.68	0.01	0.18	Financial Services	6.05	4.59	1.46	8.76	8.99	-0.23	0.01	-0.01	Healthcare	27.18	14.76	12.42	13.46	14.05	-0.59	0.71	-0.14	Industrials	14.21	18.70	-4.49	5.57	7.34	-1.78	0.04	-0.24	Real Estate	0.00	3.56	-3.56	—	1.00	—	0.27	0.00	Technology	31.33	30.15	1.18	14.69	11.43	3.25	0.05	1.00	Cash	5.86	0.15	5.71	0.40	0.40	0.00	-0.46	0.00	Attribution Total	100.00	99.88	0.12	12.10	8.17	3.93	1.27	2.66	Missing Performance	0.00	0.13	-0.13	—	—	—	—	—	Total	100.00	100.00	0.00	—	—	—	—	—	Reported Total	—	—	—	12.60	8.12	4.48	—	—	Expense Ratio	—	—	—	0.18	0.06	0.11	—	—	Residual(Reported - Attribution + Expense)	—	—	—	0.67	0.01	0.66	—	—																																		
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<p>Attribution Allocation Effects</p>	<div data-bbox="587 268 1182 640"> <table border="1"> <caption>Best Allocation</caption> <thead> <tr> <th>Managerial Sector</th> <th>Weight +/-</th> <th>Mean +/-</th> <th>Effect</th> </tr> </thead> <tbody> <tr> <td>Healthcare</td> <td>12.40</td> <td>5.88</td> <td>0.71</td> </tr> <tr> <td>Consumer Defensive</td> <td>-2.86</td> <td>-8.77</td> <td>0.27</td> </tr> <tr> <td>Real Estate</td> <td>-3.57</td> <td>-7.17</td> <td>0.27</td> </tr> <tr> <td>Consumer Cyclical</td> <td>-7.61</td> <td>-3.20</td> <td>0.26</td> </tr> <tr> <td>Basic Materials</td> <td>-1.44</td> <td>-6.90</td> <td>0.10</td> </tr> <tr> <td>Technology</td> <td>1.14</td> <td>3.26</td> <td>0.06</td> </tr> <tr> <td>Industrials</td> <td>4.51</td> <td>-0.82</td> <td>0.04</td> </tr> <tr> <td>Energy</td> <td>-0.67</td> <td>-1.81</td> <td>0.01</td> </tr> <tr> <td>Financial Services</td> <td>1.45</td> <td>0.82</td> <td>0.01</td> </tr> <tr> <td>Communication Services</td> <td>-0.07</td> <td>-6.25</td> <td>0.01</td> </tr> </tbody> </table> <table border="1"> <caption>Worst Allocation</caption> <thead> <tr> <th>Managerial Sector</th> <th>Weight +/-</th> <th>Mean +/-</th> <th>Effect</th> </tr> </thead> <tbody> <tr> <td>Cash</td> <td>5.71</td> <td>-7.76</td> <td>-0.04</td> </tr> </tbody> </table> </div> <p>This page visualizes the out-performance and under-performance as well as the over-weighting and under-weighting of the selected portfolio breakdown by grouping (stock sectors, in this instance) against the benchmark.</p> <p>The best allocation is on sectors that out-performed and were over-weighted (top right corner), or that were under-weighted and under-performed (bottom left corner).</p> <p>The worst allocation is on sectors that out-performed but were under-weighted (bottom right corner), or that under-performed and were over-weighted (top left corner).</p>	Managerial Sector	Weight +/-	Mean +/-	Effect	Healthcare	12.40	5.88	0.71	Consumer Defensive	-2.86	-8.77	0.27	Real Estate	-3.57	-7.17	0.27	Consumer Cyclical	-7.61	-3.20	0.26	Basic Materials	-1.44	-6.90	0.10	Technology	1.14	3.26	0.06	Industrials	4.51	-0.82	0.04	Energy	-0.67	-1.81	0.01	Financial Services	1.45	0.82	0.01	Communication Services	-0.07	-6.25	0.01	Managerial Sector	Weight +/-	Mean +/-	Effect	Cash	5.71	-7.76	-0.04
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<p>Cumulative Attribution Effects</p>	<div data-bbox="587 1354 1172 1654"> <p>This page visualizes the Allocation and Selection effects, as well as the Active Return.</p> </div>																																																				

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<p>Portfolio Statistics</p>	<div data-bbox="592 275 1403 800"> <p>Portfolio Statistics as of 12/31/2019</p>  <table border="1" data-bbox="592 546 1403 800"> <thead> <tr> <th>Percentiles</th> <th>Portfolio</th> <th>Benchmark</th> <th>+/-</th> <th>Portfolio</th> <th>Benchmark</th> <th>+/-</th> <th>Portfolio</th> <th>Benchmark</th> <th>+/-</th> <th>Portfolio</th> <th>Benchmark</th> <th>+/-</th> </tr> </thead> <tbody> <tr> <td>Max</td> <td>26.51</td> <td>25.51</td> <td>0.00</td> <td>98.00</td> <td>98.83</td> <td>-0.83</td> <td>58.73</td> <td>59.10</td> <td>-0.37</td> <td>1,415.73</td> <td>2,708.43</td> <td>-1,292.71</td> </tr> <tr> <td>5th</td> <td>0.83</td> <td>1.37</td> <td>-0.54</td> <td>3.86</td> <td>4.98</td> <td>-1.12</td> <td>8.11</td> <td>9.25</td> <td>-1.14</td> <td>4.05</td> <td>4.92</td> <td>-0.87</td> </tr> <tr> <td>25th</td> <td>2.03</td> <td>3.40</td> <td>-1.37</td> <td>6.81</td> <td>11.21</td> <td>-4.40</td> <td>12.50</td> <td>17.65</td> <td>-5.14</td> <td>7.45</td> <td>10.10</td> <td>-2.65</td> </tr> <tr> <td>Median</td> <td>3.48</td> <td>5.49</td> <td>-2.00</td> <td>13.66</td> <td>17.28</td> <td>-3.62</td> <td>20.59</td> <td>25.47</td> <td>-4.88</td> <td>15.28</td> <td>15.67</td> <td>-0.38</td> </tr> <tr> <td>75th</td> <td>7.79</td> <td>8.35</td> <td>-0.56</td> <td>22.13</td> <td>22.84</td> <td>-0.71</td> <td>31.82</td> <td>34.91</td> <td>-3.29</td> <td>29.61</td> <td>23.93</td> <td>5.68</td> </tr> <tr> <td>95th</td> <td>18.47</td> <td>19.25</td> <td>-0.79</td> <td>94.92</td> <td>94.91</td> <td>0.01</td> <td>51.21</td> <td>53.66</td> <td>-2.45</td> <td>139.09</td> <td>71.64</td> <td>67.45</td> </tr> <tr> <td>Min</td> <td>0.35</td> <td>0.54</td> <td>-0.19</td> <td>2.15</td> <td>2.44</td> <td>-0.28</td> <td>4.17</td> <td>1.51</td> <td>2.66</td> <td>1.16</td> <td>1.26</td> <td>-0.10</td> </tr> <tr> <td>Asset Coverage</td> <td>92.96</td> <td>84.44</td> <td>8.52</td> <td>62.66</td> <td>78.78</td> <td>-16.12</td> <td>53.06</td> <td>74.02</td> <td>-20.95</td> <td>72.92</td> <td>89.72</td> <td>-16.79</td> </tr> <tr> <td>Average</td> <td>5.61</td> <td>6.87</td> <td>-1.26</td> <td>15.80</td> <td>17.85</td> <td>-2.06</td> <td>23.81</td> <td>27.45</td> <td>-3.64</td> <td>43.69</td> <td>34.50</td> <td>9.19</td> </tr> <tr> <td>Geometric Average</td> <td>3.79</td> <td>5.25</td> <td>-1.46</td> <td>12.37</td> <td>15.51</td> <td>-3.14</td> <td>19.86</td> <td>24.06</td> <td>-4.21</td> <td>16.47</td> <td>16.35</td> <td>0.12</td> </tr> <tr> <td>Harmonic Average</td> <td>2.52</td> <td>3.88</td> <td>-1.35</td> <td>9.42</td> <td>12.85</td> <td>-3.43</td> <td>16.42</td> <td>20.08</td> <td>-3.66</td> <td>9.76</td> <td>11.93</td> <td>-2.17</td> </tr> <tr> <td>Standard Deviation</td> <td>5.19</td> <td>5.17</td> <td>0.02</td> <td>10.36</td> <td>8.82</td> <td>1.74</td> <td>14.24</td> <td>13.21</td> <td>1.03</td> <td>142.84</td> <td>160.82</td> <td>-17.99</td> </tr> <tr> <td>Weighted Average</td> <td>6.69</td> <td>8.64</td> <td>-1.95</td> <td>15.82</td> <td>20.45</td> <td>-4.63</td> <td>21.82</td> <td>31.72</td> <td>-9.89</td> <td>32.93</td> <td>44.62</td> <td>-11.69</td> </tr> <tr> <td>Weighted Geometric Average</td> <td>4.51</td> <td>6.90</td> <td>-2.40</td> <td>11.64</td> <td>18.82</td> <td>-7.19</td> <td>17.94</td> <td>28.94</td> <td>-10.99</td> <td>16.62</td> <td>20.86</td> <td>-4.24</td> </tr> <tr> <td>Weighted Harmonic Average</td> <td>3.06</td> <td>5.30</td> <td>-2.22</td> <td>8.41</td> <td>16.67</td> <td>-8.26</td> <td>15.07</td> <td>25.66</td> <td>-10.61</td> <td>10.31</td> <td>16.32</td> <td>-6.01</td> </tr> <tr> <td>Weighted Median</td> <td>3.48</td> <td>5.49</td> <td>-2.00</td> <td>13.66</td> <td>17.28</td> <td>-3.62</td> <td>20.59</td> <td>25.47</td> <td>-4.88</td> <td>15.28</td> <td>15.67</td> <td>-0.38</td> </tr> <tr> <td>Weighted Standard Deviation</td> <td>5.94</td> <td>5.84</td> <td>0.09</td> <td>11.45</td> <td>7.48</td> <td>3.97</td> <td>14.32</td> <td>12.83</td> <td>1.50</td> <td>77.02</td> <td>201.44</td> <td>-124.42</td> </tr> </tbody> </table> <p>The chart and table on this page and the next depict data for the equity holdings of the portfolio. For the chart, consider the spread of each metric for the fund compared to the benchmark, as well as the relative weighting between the quartiles. What opportunity or potential risk does this represent for the fund?</p> </div>	Percentiles	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-	Max	26.51	25.51	0.00	98.00	98.83	-0.83	58.73	59.10	-0.37	1,415.73	2,708.43	-1,292.71	5th	0.83	1.37	-0.54	3.86	4.98	-1.12	8.11	9.25	-1.14	4.05	4.92	-0.87	25th	2.03	3.40	-1.37	6.81	11.21	-4.40	12.50	17.65	-5.14	7.45	10.10	-2.65	Median	3.48	5.49	-2.00	13.66	17.28	-3.62	20.59	25.47	-4.88	15.28	15.67	-0.38	75th	7.79	8.35	-0.56	22.13	22.84	-0.71	31.82	34.91	-3.29	29.61	23.93	5.68	95th	18.47	19.25	-0.79	94.92	94.91	0.01	51.21	53.66	-2.45	139.09	71.64	67.45	Min	0.35	0.54	-0.19	2.15	2.44	-0.28	4.17	1.51	2.66	1.16	1.26	-0.10	Asset Coverage	92.96	84.44	8.52	62.66	78.78	-16.12	53.06	74.02	-20.95	72.92	89.72	-16.79	Average	5.61	6.87	-1.26	15.80	17.85	-2.06	23.81	27.45	-3.64	43.69	34.50	9.19	Geometric Average	3.79	5.25	-1.46	12.37	15.51	-3.14	19.86	24.06	-4.21	16.47	16.35	0.12	Harmonic Average	2.52	3.88	-1.35	9.42	12.85	-3.43	16.42	20.08	-3.66	9.76	11.93	-2.17	Standard Deviation	5.19	5.17	0.02	10.36	8.82	1.74	14.24	13.21	1.03	142.84	160.82	-17.99	Weighted Average	6.69	8.64	-1.95	15.82	20.45	-4.63	21.82	31.72	-9.89	32.93	44.62	-11.69	Weighted Geometric Average	4.51	6.90	-2.40	11.64	18.82	-7.19	17.94	28.94	-10.99	16.62	20.86	-4.24	Weighted Harmonic Average	3.06	5.30	-2.22	8.41	16.67	-8.26	15.07	25.66	-10.61	10.31	16.32	-6.01	Weighted Median	3.48	5.49	-2.00	13.66	17.28	-3.62	20.59	25.47	-4.88	15.28	15.67	-0.38	Weighted Standard Deviation	5.94	5.84	0.09	11.45	7.48	3.97	14.32	12.83	1.50	77.02	201.44	-124.42
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