Calculating Total Portfolio Attribution for a Fund-of-Funds Onboarding Guide M RNINGSTAR Direct

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Calculating Total Portfolio Attribution for a Fund-of-Funds

Total portfolio attribution (TPA, also sometimes referred to as macro attribution) allows a user to identify the performance impact attributable to a strategic asset allocation policy and tactical manager selection. Users can measure manager-picking skill in aggregate, or by asset class or investment style.

Morningstar Direct users can use the Total Portfolio Attribution capability to analyze user-created model portfolios, as well as funds-of-funds from the Morningstar database. This guide offers the following exercises in support of this work:

- Exercise 1: Identify a fund-of-fund's benchmark indexes and weights (page 5)
- Exercise 2: Create a custom benchmark (page 9)
- Exercise 3: Create the Total Portfolio Attribution report (page 12)
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- Exercise 5: Set up the asset classes for the report (page 16)
- Exercise 6: Complete the Benchmark Setup page (page 18)
- Exercise 7: Update the Fee Assignment page (page 19)
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Overview

Total Portfolio Attribution for a fund-of-funds requires a mixed benchmark of indexes, the latter representing the fund's various asset classes. This guide analyzes the Schwab Target Date 2040 Index fund (SWYGX). Prior to analyzing a fund-of-funds, the composition of its Primary Prospectus Benchmark needs to be done, and that benchmark needs to be recreated using representative asset classes.

Exercise 1: Identify a fund-of-fund's benchmark indexes and weights

Identifying the fund-of-funds' primary prospectus benchmark involves adding the fund to a list, then customizing the data set to show just the benchmark name, which will be exported. After being exported, the data will be modified to make it easier to read for the sake of re-creating the custom benchmark in Morningstar Direct. Do the following:

- 1. Select Workspace > Investment Lists > My Lists.
- 2. Click New.

Morningstar Direct					
<u>F</u> ile <u>N</u> ew Favorites <u>T</u> o	ols <u>H</u> elp	Search for In 1	This View	• Go	
Home	My List				
Equity/Credit Research	Action	🔹 🗄 New 🟦 Export 🔹 🕨 PDF	🤹 Refresh		Lies this icon to grants a list with
Local Databases	Γ	Name		Owner	the target date fund to be analyzed
Global Databases					
Performance Reporting	□ 1	Morningstar Prospects		Mornings	
Asset Allocation	<u></u> 2	Morningstar Open Index Project		Mornings	
Portfolio Management	□ 3	Sustainable Landscape U.S. Funds	Q4 2019	Mornings	
	□ 4	Large Growth Consistent Performe	ers	Training	
Portfolio Analysis	5	Model Portfolio Holdings List		Web-Bas	
Markets	□ 6	Multiple Investments		Training :	
Asset Flows	□ 7	Sample List		Training :	
Presentation Studio	8	US Small Value 5 Star Funds & ET	Fs	Training	
Risk Model Analysis					
Workspace					
▼■ Investment Lists					

3. The option for **Single Investment** should be selected. Type **SWYGX** then click the fund **name** when it appears.

Select Investments				\times	
Select Investments					
How do you want to se Name/Ticker/ISIN/CUSIP/S	lect In ecId	vestments?			Select this fund when its name appears
Single Investment:		SWYGX			Select this futful when its hame appears.
O Multiple Investmen	ts	SWYGX Schwab Targe	et 2040 Index	< FO	
🔾 Search Criteria	Open	End Funds		\sim	
⊖ My Lists				\sim	
O Import List					
		ок	Cancel	Help	

4. Click **OK**. The fund now appears in the grid view. The next step is to look up the Primary Prospectus Benchmark so it can be exported.

5. From the toolbar, click **Edit Data**. The Select Data Points dialog box opens.

Morningstar Direct						
<u>F</u> ile <u>N</u> ew Favorites <u>T</u> o	ols <u>H</u> elp	Search for In This View	▪ Go			
Home	My Lists	Untitled Investment List				
Equity/Credit Research	Action	🖈 🛧 🖌 🛠 View Snapshot	🔹 🔚 Save 🚹 Ad	d F Edit Da	ta 🐙 Sort	I lea this icon to isolate
Local Databases		Name	Base	Ticker	ISIN	the Primary
Global Databases			Currency			Prospectus
Performance Reporting	□ 1	Schwab Target 2040 Index	US Dollar	SWYGX	US80850L8	Benchmark data point
Asset Allocation						
Portfolio Management						
Portfolio Analysis						
Markets						
Asset Flows						
Presentation Studio						
Risk Model Analysis						
Workspace						
Investment Lists						

- 6. Click Remove All to remove all data points.
- 7. From the Available Data Points section, **scroll down** to select **Primary Prospectus Benchmark** then click **Add**.

10 Select Data Points				×	
Select Data Points Choose a Universe, name. To change the	then locate data poir e general or calculati	nts by selecting an exis on settings of a selecte	sting view, or searchi ed point, use the Sett	ng by ings button.	
Available Data Lists					
Universe	Open End Funds		~]	
Find Data Point By	View	○ Name contain	ning		
	Snapshot		~]	
Augilable Data Data	_				
Total Data Points: 147	5				
Manager Tenure (Avera Primary Prospectus Ben	i <u>ge)</u> chmark		^		
Primary Prospectus Ben Primary Prospectus Ben	chmark Id chmark Inception Date				
Strategic Beta Strategic Beta Group					Add only the highlighted data point
Index Selection Index Weighting					to the Selected Data Points area.
Net Assets Date		Add	V IIA bbA		
Selected Data Points					
Total Data Points: 2					
Name Primary Prospectus Ben	chmark			*	
				^	
				~	
				*	
[Settings	Remove	Remove All		
_					
		Save	OK Cancel	Help	

8. Click **OK**. The data set is now displayed in the grid.

9. From the toolbar, click Export > Export to Microsoft Excel.

Morningstar Direct							1
<u>F</u> ile <u>N</u> ew Favorites <u>T</u> oo	ols <u>H</u> elp	Search for	In This View	• Go			
Home	My List	s Untitled Investment	t List				
Equity/Credit Research	Action	- < 🔺 🖌 😵 View Unt	itled	🔹 🔚 Save 📑 Add 📑 Edit Data	🐙 Sort 🔍 Locate	🟦 Export 🔹 🔊 PDF 🛛 🧔	
Local Databases	Г	Name		Primary Prospectus Beochmark		Export to Excel	Use this icon to
Global Databases				Denemian C		Export to CSV	export the data
Performance Reporting	□ 1	Schwab Target 2040 Index		(FTSE Emerging NR USD) 5.500%			to a spreadsneet.
Asset Allocation							
Portfolio Management							
Portfolio Analysis							

- 10. In the Microsoft[®] Excel[®] file, select the **Primary Prospectus Benchmark** cell.
- 11. Select the Data ribbon, then click Text to Columns.

AutoSave 💽 🛱 🏷 < 🤇 🗸 🗟 Morningstar Expo	ort
File Home Insert Draw Page Layout Formulas Data Review View Help Acrobat Morningstar 🖓 Search	
Get From From Table/ Recent Existing Data ~ Text/CSV Web Range Sources Connections Get & Transform Data Get & Transform Data	ash ill
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D2 -	5 11
A B C D E F	
1 Name Primary Prospectus Benchmark	
2 Schwab Target 2040 Index (FTSE Emerging NR USD) 5.500% + (DJ US TSM Large Cap TR USD) 45.500% + (DJ US TSM Small Cap TR USD) 5.300% +	- (B
3	
4 Summary Statistics	
5 Seventy-fifth Percentile	
6 Fiftieth Percentile	
7 Twenty-fifth Percentile	
8 Sum	
g Average	
10 Count 1	
11 Maximum	
12 Minimum	
13 Median	

12. In Step 1, select the option for **Delimited**, then click **Next**.

Convert Text to Columns Wizard - Step 1 of 3	?	\times	
The Text Wizard has determined that your data is Fixed Width.			
If this is correct, choose Next, or choose the data type that best describes your da	ita.		
Original data type			
Choose the file type that best describes your data:			
Delimited - Characters such as commas or tabs separate each field.			Select this option, then click Next
Fixed width - Fields are aligned in columns with spaces between each	field.		
Preview of selected data:			
2 (FTSE Emerging ND HSD) 5 5008 + (D.I HS TSM Large Can TD	USD)	41.0	
3	0527		
4			
6		~	
<	3	>	
Cancel < Back <u>N</u> ext >	<u>F</u> ini	sh	

13. In Step 2, select the option for **Other** and type + in the field, then click **Next**.

Convert Text to Col	umns Wizard - Step 2 of 3	?	×	
This screen lets you in the preview below	set the delimiters your data contains. You can see ho v.	w your text is at	fected	
Delimiters				
Se <u>m</u> icolon	Treat consecutive delimiters as one			Be sure to type the + sign in the highlighted field, then click Next.
Data <u>p</u> review				
(FTSE Emerging	f NR USD) 5.500% (DJ US TSM Large Ca	p TR USD) 45	× ×	
	Cancel < <u>B</u> ack <u>N</u> ext	t > <u>F</u> in	ish	

14. In Step 3, click **Finish**. The content of the selected cell is split into separate columns. The next step is to convert these columns to rows.

Convert Text to Columns Wizar	rd - Step 3 of 3	?	Х	
This screen lets you select each Column data format © <u>G</u> eneral <u>T</u> ext <u>D</u> ate: <u>MDY</u> <u>V</u> O Do not <u>i</u> mport column (skip	Column and set the Data Format. 'General' converts numeric values to to dates, and all remaining values t <u>A</u> dvanced	o numbers, date o text.	values	
Destination: \$B\$2 Data preview			1	
Feneral (FTSE Emerging NR USD)	Ceneral 5.500% (DJ US TSM Large Ca	p TR USD) 48	× >	Simply click Finish upon reaching this step
	Cancel < <u>B</u> ack Nex	t > <u>F</u> in	iish	

- 15. Copy cells **C2** to **I2**.
- 16. Select cell B3.

AutoSave 💽 🖫 🏷 · 🤍 🖁 · 🔻		Book1 - Morningstar Export		Сһ	nd Lowny 🌒 🖉 🖻	- 0
File Home Insert Draw Page Layout Fo	ormulas Data Review View Hel	lp Acrobat Morningstar	,♀ Search		년 Share	Commer
	Queries & Connections Properties Get Links	ography ♥ \$	Clear Reapply Advanced	Hat-If Fo Karalysis∼ S	ecast heet Bubtotal	
Get & Transform Data	Queries & Connections Data Typ	pes Sort & Filte	Data	Tools Forecast	Outline 5	
B3 ▼ : × √ fx						
A	В	с	DE	F G H	L L	
1 Name Primary Prospectus	Benchmark					
2 Schwab Target 2040 Index. (FTSE Emerging NR US	SD) 5.500%	(DUISTS	(DILUS TSI (BBgBarc	DLUS Sel (BBgBarc (FTS	Dv i (BBgBarc US Agg Bond	TR USD) 14 5009
4 Summary Statistics						

- 17. Select the **Home** tab.
- 18. Click **Paste** > **Transpose**. The content from cells C2 to I2 become rows under column B.

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合 兌 兪 🏟	x v	f (DJ US TSM Large Cap TR USD) 45.500%	
â¢			Lloo thi
Paste Values			Use th
🔝 🗟 😰		Primary Prospectus Benchmark	to conv
Other Parte Ontions	40 Index	(FTSE Emerging NR USD) 5.500% (D) US TS (D) US TS (D) US TS (BBgBarc (FTSE Dv I (BBgBarc US Agg Bond TR USD) 14.500%)	column
Other Paste Options		(DJ US TSM Large Cap TR USD) 45.500%	ooranni
🖗 🗔 🔂 🕌	ics	(D) US TSM Small Cap TR USD) 5.300%	
Paste Special	entile	(BBgBarc US Treasury 1-3 Yr TR USD) 0.800%	
		(DJ US Select REIT TR USD)4.200%	
7 Twenty-fifth Perc	entile	(BBgBarc US Treasury Bill 1-3 Mon TR USD) 1.700%	
3 Sum		(FTSE Dv Ex US NR USD) 22.500%	
Average		(BBgBarc US Agg Bond TR USD) 14.500%	
0 Count		1	
1 Maximum			
2 Minimum			

Custom Benchmarks are comprised of a mix of indexes and are created from the Portfolio Management module. To create the custom benchmark to be used when performing Total Portfolio Attribution, do the following: Exercise 2: Create a custom benchmark

- 1. Select Portfolio Management > Custom Benchmarks.
- 2. When prompted to save the Investment List, click No.
- 3. From the toolbar, click **New**. The Benchmark Basics dialog box opens.

Morningstar Direct				
<u>F</u> ile <u>N</u> ew Favorites <u>T</u> oo	ols <u>H</u> elp	Search for In This View	▼ Go	
Home	Custom	Benchmarks		
Equity/Credit Research	Action	🛨 New 🛃 Import 🗐 View Import Job Ri	esults 🔒 Export	Use this icon to create
Local Databases	Γ	Name	▲ Owner	a custom benchmark.
Global Databases				
Performance Reporting	□ 1	Aggressive Benchmark	Training :	
Asset Allocation	2	Conservative Benchmark	Training :	
Portfolio Management	<u>∏</u> 3	Custom Allocation 2	Training :	
E Chartenien	4	Moderate Benchmark	Training :	
Model Portfolios				
Custom Benchmarks				
Accounts				
Account Groups				
Securities Invested				
Saved Reports				

- 4. In the Name field, type Schwab Target 2040 Index Benchmark.
- 5. Scroll down to set the **Rebalancing Frequency** to **Daily**. (This is done to keep the weights assigned to each index constant.)
- 6. From the **Performance Calculation Start Date** field, select **Earliest Common**. (This is used to obtain the longest common history among the indexes.)
- 7. Click Save. The Holdings Entry window opens.

mark Basics				
eneral benchmark inform	ation here.			
Name	Schwab Target 2040 Index Benchmark			
Combined series	⊖Yes ●No			
Combined series:Yes				
Base series		2		
Operator	Arithmetic Addition	~		
Second series		2		
Combined series:No				
Currency	US Dollar	~		
Benchmark 1	S&P 500 TR	2		
Benchmark 2		2		
Risk free proxy	USTREAS T-Bill Auction Ave 3 Mon	2		
Portfolio ID			Note the values for the highlig	ihte
Performance source	Calculated based on underlying positions	~		
Management fee effective period	Entire period Custom pe	eriod		
Management fee %				
Fee applied*	Annually	~		
Performance series	Daily	×		
Rebalancing frequency	Daily	~		
Rebalancing based on	Calendar Period End	~		
Performance calculation start date	Earliest Common	~		
Use Gross Return				
Notes		~		
		~		
*The fee that is defined u each day within the frequ	under Management fee % is applied evenly ency selected.	to		
	Save Cancel H	lelp		

8. In the first row, click the **magnifying glass icon** in the Symbol cell. The Add Holdings dialog box opens.



- 9. Change the Universe drop-down field to Market Indexes.
- 10. Reference the Microsoft Excel spreadsheet to **add** the indexes from there one at a time.

🕌 Add Holdings				×	
Within	Universes	◯ My Lists	O My Searches		
	Market Indexes)	~		
Find By	Name	 ✓ ● Begins with ✓ Include Only \$ 	O Contains Surviving Investments	1	
	BBgBarc US Ag	g Bond TR USD		Go	The values from the spreadsheet
Available Records					can be copied, pasted, and
Total records: 1					edited here one at a time.
Jump to record name:	BBgBarc US Ag	g Bond TR USD			
BBoBarc US Add Bond	TR USD (USD.Per	rf.RepPerf)			
		Add	Add All		
Selected Records					
Total records: 8					Be sure the correct number
BBgBarc US Treasury 1	-3 Yr TR USD (US	SD,Perf,RepPerf)	^	*	of indexes appears here.
DJ US Select REIT TR U	JSD (USD,Port+Pe	ert,RepPert)		^	
ETSE DV EX US NR USE) (USD Port+Perf	RepPerf)		~	
BBgBarc US Agg Bond	TR USD (USD,Per	rf,RepPerf)		*	
			*		
		Remov	e Remove All		
			C Kentove An		

11. Click **OK**.

Exercise 3: Create the

Total Portfolio

Attribution report

- 12. In the Holdings Entry window, reference the Microsoft Excel spreadsheet to enter the correct value in the **Percent (%)** column for each index.
- 13. Click **Finish >>**. The custom benchmark opens in a new window.

se the tabs to en	nter holdings for a bench	" mark's portfolio. The defa by Shares or by Arnount I	ult entry method is percentage rom the Enter By Action menu.	Assign weights to th	e members of your b	enchmark by typing valu	ues into the	
osition as of	9/22/2003 🔲 -	🗹 Use Earliest Co	mmon Date					
Stoc	k/Fund I	Fixed Income	Cash					
Action •	Enter By • + Add	I 🤹 Refresh Price	Edit Definition Master	USD Equiv. Tot	al Amount: 10,0	100.00 Total Weight:	100.00	
	Symbol	Name		Inception Date	Percent (%)	Number of Shares	USD Eq. Amount	Be sure the values fro
□ 1	e	FTSE Emerging NR US	D	12/29/2000	5.50	8.74	55 🔺	the spreadsheet are
□ 2	2	DJ US TSM Large Cap	TR USD	1/30/1987	45.50	0.20	4,5	accurately entered by
□ 3	Q	DJ US TSM Small Cap	FR USD	1/30/1987	5.30	0.02	53	accurately entered in
4	٩	BBgBarc US Treasury 1	-3 Yr TR USD	12/31/1991	0.80	0.41	8	
5	Q	DJ US Select REIT TR	USD	12/31/1986	4.20	0.16	42	
6	Q	BBgBarc US Treasury B	ill 1-3 Mon TR USD	11/29/1991	1.70	1.04	17	
7	٩	FTSE DV Ex US NR US	Ð	9/22/2003	22.50	2.25	2,2	
8	Q	BBgBarc US Agg Bond	TR USD	1/3/1980	14.50	1.27	1,4	
🗌 э	٩							
10	٩							
11	٩							
- ·-	<						>	
Feedback	Equal Weight			Finisk		Cancel	Help	7

14. Close the custom benchmark window.

The Total Portfolio Attribution report can now be created. Do the following:

1. Select Portfolio Analysis > Total Portfolio Attribution > Single Portfolio.

- 2. When the tutorial window opens, click **Close**. (To see it again the next time this module is selected, click **Yes**.)
- 3. Click **New**. The New Report dialog box opens.

Morningstar Direct					
<u>F</u> ile <u>N</u> ew Favorites <u>T</u> oo	ols <u>H</u> elp	Search for		In Securities	• Go
Home	Single P	ortfolio			
Equity/Credit Research	Action •	New 1	Templates	🖌 Learn More	
Local Databases	: []	Name		_	👝 Last Calc
Global Databases					
Performance Reporting					
Asset Allocation					
Portfolio Management					
Portfolio Analysis					
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Equity Attribution					
🕨 🚞 Single Portfolio					
Multiple Portfolios					
Archived Reports					
🕶 🚞 Total Portfolio Attribution					
🗉 Single Portfolio					
Presentation Studio					

4. In the **Portfolio** field, type **SWYGX**, then click the fund's **name** when it appears.

Portfolio	SWYGX	2	New Edit	Select the fund when
Benchmark	SWYGX Schwab Target 2040 Index FO XNAS USA			its name appears.
benefinarie	Select from Portfolio Management	_		
	(Manually Enter Allocations)	Q	New Edit	
	Asset Mix	1		
Currency		1		
carrency]		
Report Name				

- 5. From the Benchmark field, choose the option for Select from Portfolio Management.
- 6. In the field below, type **Schwab Target 2040 Index Benchmark** and select it when it appears.

New Report		×		
Portfolio	Schwab Target 2040 Index	New Edit		
Benchmark	O Manually Enter Allocations			
	Select from Portfolio Management			
	Schwab Target 2040	New Edit		Be sure to
	SWERX	Schwab Target 2040 Schwab Target 2040 Index	FO XNAS USA	select this item
	91655b63-22de-42fa-af0e-22ecf308b4bf	Schwab Target 2040 Index Benchmark	BM	
Currency	US Dollar	~		
Report Name	Schwab Target 2040 Index			
Report Settings				
New				

- 7. In the Report Name field, enter Schwab Target 2040 Index Fund.
- 8. Under Report Settings, ensure the option for **New** is selected.

📶 New Report			×
Portfolio	Schwab Target 2040 Index	New Edit	Note the name to enter here
Benchmark	Manually Enter Allocations Select from Portfolio Management Schwab Target 2040 Index Benchmark Asset Mix	New Edit	
Currency Report Name	US Dollar Schwab Target 2040 Index Fund	~	
Report Settings	TPA Classification		
Based on Report		× ×	
Help		OK Cancel	

9. Click **OK**. The Settings dialog box opens.

The first setting to address is the Time Period. The default time period is the previous quarter and is already added to the Selected Time Periods field. Additional time periods can be included, if required. Do the following:

Exercise 4: Select the time period for the report

1. Select the current **time period**, then click **Settings**. The Time Period Settings dialog box opens.

Vi Settings				7
Report Settings	Time Period			
Portfolio and Benchmark				
Time Period	Start Date	3 months ago	✓ 10/01/2019	
Asset Class Setup	End Date	Last Quarter End	✓ 12/31/2019	
Benchmark Setup	Time Periods	Single period	O Rolling window	
Fee Assignment		O Trailing periods	Regular periods from start	
View Cottings		Forward extending periods	Regular periods from end	
view Settings	Window size			
	Number of columns	1 Add Columns		
	Selected Time Perio	ods		
	2019-10-01 - 2019-1	2-31(Last Quarter End)		
				Select the time period, then click this button.
	* • •	¥ Sett	ings Remove Remove All	

2. Select the option for **Average Weights**, then click **OK** to return to the Settings dialog box.

M Time Period S	×			
Time Period Di	splay			
Time Period	2019-10-01 - 2019-12-31			
Display Name	2019-10-01 - 2019-12-31			
	Display time periods in column headings			
Allocation Disp	lay			
0	Ending Period Weights		0.1	
0	O Beginning Period Weights			
۲	Average Weights			
Result				
For	time period greater than one year, show results as nulative or annualized.			
۲	Cumulative			
0	Annualized			
	OK Canc	el		

The next step is to define the asset classes to be used. By default, the portfolio constituents and the policy benchmarks are classified to a Morningstar Broad Category Group. This asset allocation will be overwritten for most items, and this needs to be done for both the constituents of the fund-of-funds and the indexes belonging to the custom benchmark.

- Note: The fund-of-funds also contains some cash (Interest and Dividends Receivable, and Uninvested Cash). This is not part of the fund's strategy, so these will be excluded from the analysis by leaving them as Unclassified.
- Click in the Broad Category Group cell for the first constituent, then enter the new asset class label per the following table. Repeat this operation for all portfolio constituents and the custom benchmark indexes (scroll down to see the indexes). Once entered, each new custom asset allocation label is available from the drop-down field.
 - Note: Any changes made in the Asset Class column are reflected in the Asset Class Display section at the bottom of this page.

M Settings								
Report Settings	Asset	Class Setup						
Portfolio and Benchmark	+	+ Add X Delete Save As Custom Database						
Asset Class Setup		Name	Holding	Broad Category Group				
Benchmark Setup	□ 1	Schwab Emerging Markets Equity ETF™	Portfolio	International Equity				
Fee Assignment	2	Schwab International Equity ETF™	Portfolio	Equity				
	□ 3	Schwab Short-Term US Treasury ETF™	Portfolio	Equity				
View Settings	□ 4	Schwab US Aggregate Bond ETF™	Portfolio	International Equity				
	5	Schwab US Large-Cap ETF™	Portfolio	Money Market	Onco an assot class			
	☐ 6 Schwab US REIT ETF™		Portfolio		name is manually			
	□ 7	Schwab US Small-Cap ETF™	Portfolio	Equity	entered it			
	8 🗌	8 Schwab Variable Share Price Money Ultr		Money Market	becomes available			
	9	Time Deposits	Portfolio	Unclassified	in other rows.			
	L 10	Time Deposits	Portfolio	Unclassified				
	T 11	Time Deposits	Portfolio	Unclassified				
	□ 12	Time Deposits	Portfolio	Unclassified				
	Asset							
		Schwab US Aggregate Bond ETF™						
	Ē	- International Equity 			When a change			
	Money Market Schwab Variable Share Price Money Ultra				table above, it is			
		BBaBara US Ann Bond TP USD			reflected here.			

Name	Asset Class
Schwab Emerging Markets Equity ETF^{TM}	International Equity
Schwab International Equity ETF^TM	International Equity
Schwab Short-Term US US Treasury ETF^TM	Fixed Income
Schwab US Aggregate Bond ETF^TM	Fixed Income
Schwab US Large-Cap ETF™	US Equity
Schwab US REIT ETF [™]	Specialty Equity
Schwab US Small-Cap ETF [™]	US Equity
Schwab Variable Share Price Money Ultra	Money Market

Exercise 5: Set up the asset classes for the report

Name	Asset Class				
FTSE Emerging NR USD	International Equity				
DJ US TSM Large Cap TR USD	US Equity				
DJ US TSM Small Cap TR USD	US Equity				
BBgBarc US Treasury 1-3 Yr TR USD	Fixed Income				
DJ US Select REIT TR USD	Specialty Equity				
BBgBarc US Treasury Bill 1-3 Mon TR USD	Money Market				
FTSE Dv Ex US NR USD	International Equity				
BBgBarc US Agg Bond TR USD	Fixed Income				

The next step is to decide whether to compare each investment against its Asset Class Policy Benchmark, or another index. If the intent is to examine the outcome of deliberate deviations from policy weights (which the manager may have done to take advantage of market conditions) then a different index should be selected. Exercise 6: Complete the Benchmark Setup page

Do the following:

- 1. At the top of the Settings dialog box, the most recent policy date should be selected.
- 2. Ensure each asset class has the proper benchmark, per the following table:

Asset Class	Index Name
Fixed Income	BBgBarc US Agg Bond TR USD
International Equity	FTSE Emerging NR USD
Money Market	BBgBarc US Treasury Bill 1-3 Mon TR USD
Specialty Equity	DJ US Select REIT TR USD
US Equity	DJ US TSM Large Cap TR USD

3. Ensure each **holding** has the proper benchmark.

Settings				
Report Settings	Policy	Dates 12/31/2019 ~ A	Add Delete	
Portfolio and Benchmark				
Time Period				
Asset Class Setup				
Benchmark Setup	10 E	xpand to Level 0 1 2		
Fee Assignment		Display Groups/Investments	Benchmark	Policy Weights
View Settings	□ 1	▼ Total		100.00
nen settings	2	▼ Fixed Income	BBgBarc US Agg Bond TR 💌 🍳	15.30
	3	Schwab Short-Term US Treasury ETF™	BBgBarc US Treasury 1-3 💌 🧟	Ū.
	4	Schwab US Aggregate Bond ETF™	BBgBarc US Agg Bond TR 🚽 🧟	6
	5	 International Equity 	FTSE DV EX US NR USD	28.00
	6	Schwab Emerging Markets Equity ETF™	FTSE Emerging NR USD 🚽 🧟	6
	7	Schwab International Equity ETF™	FTSE DV EX US NR USD	6
	8	▼ Money Market	BBgBarc US Treasury Bill 💌 🍳	1.70
	9	Schwab Variable Share Price Money Ultra	a S&P 500 TR 🗾 🧟	6
	l 10	▼Specialty Equity	DJ US Select REIT TR USE 🕶 🥝	4.20
	🗌 11	Schwab US REIT ETF™	DJ US Select REIT TR USE 🚽 🧟	6
	12	▼Unclassified	Blended Benchmark 💌 🥝	0.00
	🗌 13	Time Deposits	S&P 500 TR 🗨 🦉	6
	14	Time Deposits	S&P 500 TR 🗾 🥑	6
	l 15	Time Deposits	S&P 500 TR 🗨 🦉	6
	l 16	Time Deposits	S&P 500 TR 🗨 🦉	6
	17	Time Deposits	S&P 500 TR 🗨 🦉	6
	l 18	Time Deposits	S&P 500 TR 🗨 🧟	6
	l 19	Usd	S&P 500 TR 🗨 🦉	6
	20	Usd	S&P 500 TR 🔍 🥑	6
	21	▼ US Equity	DJ US TSM Large Cap TR 🚽 🍳	50.80
	22	Schwab US Large-Cap ETF™	DJ US TSM Large Cap TR 🚽 🭳	6
	23	Schwab US Small-Cap ETF™	DJ US TSM Small Cap TR 👻 🍳	

Be sure to select the correct benchmark for each asset class.

The Fee Assignment page allows users to either change which expense data point to use, or they can input a custom fee. Isolating fees preserves the purity of skill-based decisions. The default fee is the Annual Report Net Expense Ratio.

Exercise 7: Update the Fee Assignment page

1. For each investment, change the **Source of Fees** drop-down field to **Prospectus Net Expense Ratio**.

eport Settings	Manage	er Level Fees				
ortfolio and Benchmark	Γ	Name	Manager	Source of Fee		
ime Period			Fee			
sset Class Setup	🗆 1	Schwab Emerging Markets Equity ETF™	0.11	Prospectus Net Expense Ratio	-	
enchmark Setup	2	Schwab International Equity ETF™	0.06	Prospectus Net Expense Ratio	•	
ee Assignment	П 3	Schwab Short-Term US Treasury ETF™	0.05	Prospectus Net Expense Ratio	-	
	□ 4	Schwab US Aggregate Bond ETF™	0.04	Prospectus Net Expense Ratio	-	
ow Fottings	5	Schwab US Large-Cap ETF™	0.03	Prospectus Net Expense Ratio	-	
ew settings	6	Schwab US REIT ETF™	0.07	Prospectus Net Expense Ratio	-	
	7	Schwab US Small-Cap ETF™	0.04	Prospectus Net Expense Ratio	-	
	□ 8	Schwab Variable Share Price Money Ultra	0.19	Annual Report Net Expense Ratio	-	
	Г 9	Time Deposits	0.00	Annual Report Net Expense Ratio		
	☐ 10	Time Deposits	0.00	Custom Prospectus Net Expense Ratio		
	□ 11	Time Deposits	0.00	Annual Report Gross Expense Ratio		Select this option for each f
	12	Time Deposits	0.00	Custom Custom		Select this option for each h
	□ 13	Time Deposits	0.00	Custom	-	
	14	Time Deposits	0.00	Custom	-	
	15	Usd	0.00	Custom	-	
	16	Usd	0.00	Custom	-	
	-		L			

2. Click Next.

The View page allows users to customize how the results should be viewed. Do the following:

Exercise 8: View the settings for the report

- 1. In the Calculation Option section, **deselect** the **Combine Manager Fee into Manager Selection Effect**; this helps better measure a fund's value relative to the fees it charges.
- 2. Because the fund-of-funds is comprised of ETFs and not open-end funds, contribution is based on Net Returns. Therefore, **deselect** the option for **Gross Return**.

M Settings					
Report Settings					
Portfolio and Benchmark	Calculation Option	Combine Manager	r Fee into Manager Selecti	on Effect	
Time Period		Combine Premium	n/Discount into Manager S	election Effect	
Asset Class Setup		Combine Misfit Eff	ects into Manager Selectio	on and Allocation Effects	
Benchmark Setup					Deselect the
Fee Assignment					highlighted items.
	Column Display	Weights	Gross Return	🗹 Net Return	
View Settings		Relative +/-	Contribution using	Market Return $$	
	Equity Display	Security Name		Ticker	
		ISIN	Morningstar ID		
	Decimal Display	2 ~			

Before calculating the report, save the settings as a template. To do so, do the following:

1.	In the bottom-left corner	of the Settings	dialog box,	click Save as Template.

Exercise 9: Save the template

🥻 Settings					
Report Settings]				
Portfolio and Benchmark Time Period	Column Display	Actual	Policy	⊠Relative +/-	
Asset Class Setup	Equity Display	Security Name	CUSIP	Ticker	
Benchmark Setup		ISIN	Morningstar ID		
Fee Assignment					
View Settings	Decimal Display	2 ~			
					Click this icon to be able to use these same settings again
Save As Template			< Previous	ОК Са	

- 2. When the Settings prompt appears asking whether to save the Custom Security Classification Groups, click **Yes**.
- 3. In the Name field, type TPA Classification, then click OK.
- 4. Click **OK** again to open the report.

Once the report finishes calculating, the data can be analyzed. By default, information as the asset class level (Level 1) is shown on the report. Consider the following questions for this data:

Exercise 10: Analyze the report

- ► Which asset classes are over- or under-weighted compared to the benchmark?
- ► Which asset classes are over- or under-performing compared to the benchmark?

Schwab Target 2040 Index	Fund - Performance Attribution Wind	low													
Eile New Favorites	Help Search for	In Securities	• Go							🔤 Se	and us feedback				
iews	Attribution														
Attribution	Settings 🕶 🧮 Calculate	Settings - 🧱 Calculate 📕 Save Export - 🖪 Summary PDF 🚲 Custom Report													
i Weight	🔍 Portfolio : Schwab Targe	🔍 Portfolio : Schwab Target 2040 Index 🔍 Rolicy : Schwab Target 2040 Index Benchmark 🔍 Currency : US Dollar													
			10-1-2019 -	12-31-2019											
	Name	Benchmark	Weights % Net Return(%) Market Return(%)												
	Level 1 2		Actual	Policy	+/-	Portfolio	Benchmark	+/-	Portfolio	Benchmark	+/-				
	Fixed Income	BBgBarc US Agg	16.65	15.30	1.35	0.18	0.18	0.00	0.13	0.18	(0.05				
	International Equity	FTSE Dv Ex US	27.65	28.00	(0.35)	8.87	8.23	0.63	8.66	8.23	0.43				
	➤ Money Market	BBgBarc US Tre	1.21	1.70	(0.49)	0.46	0.44	0.02	0.46	0.44	0.02				
	Specialty Equity	DJ US Select RE	1 4.09	4.20	(0.11)	(1.25)	(1.23)	(0.01)	(1.35)	(1.23)	(0.12				
	➤ Unclassified	S&P 500 TR USE	0.00	0.00	0.00										
	US Equity	DJ US TSM Larg	50.40	50.80	(0.40)	9.01	9.02	(0.01)	8.97	9.02	(0.05				
	Total		100.00	100.00	0.00	6.95	6.84	0.11	6.85	6.84	0.01				

ies ins :es

- ▶ What is the Active Return for the fund? What do the Allocation and Manager Selection Effects contribute to this?
- ► Which asset class has the highest Active Return? Which has the lowest?
 - Pote: Ignore the Unclassified section, which contains the cash in the portfolio.

lame	Benchmark) Demokransk		Market Return	(%) Davaharah		Contribution%	Danakanak		Attribution Effect(%)				A shire Determ	
Level 1 2		benchmark	+/-	Portiolio	Denchmark	+/-	Portiono	Denchmark	+/-	Category Group Allocation	Selection	Manager Benchmark Misfit	Manager ree	Active Return	Scroll all the way to
Fixed Income	BBgBarc US Agg	0.18	0.00	0.13	0.18	(0.05)	0.02	0.03	(0.01)	(0.09)	(0.01)	0.00	(0.00)	(0.10	the right to see the
International Equity	FTSE DV Ex US	8.23	0.63	8.66	8.23	0.43	2.38	2.29	0.09	(0.00)	(0.06)	0.18	(0.01)	0.11	the right to see the
Money Market	BBgBarc US Tre	0.44	0.02	0.46	0.44	0.02	0.01	0.01	(0.00)	0.03	(0.10)	0.11	(0.00)	0.03	Active Return column
Specialty Equity	DJ US Select RE	(1.23)	(0.01)	(1.35)	(1.23)	(0.12)	(0.06)	(0.05)	(0.01)	0.01	(0.01)	0.00	(0.00)	0.00	
Unclassified	S&P 500 TR USD							0.00		0.00		0.00		0.00	
US Equity	DJ US TSM Larg	9.02	(0.01)	8.97	9.02	(0.05)	4.50	4.56	(0.06)	(0.01	(0.03)	0.00	(0.00)	(0.04	
Total		6.84	0.11	6.85	6.84	0.01	6.85	6.84	0.01	(0.06)	(0.21)	0.30	(0.01)	0.01	

Click the Level 2 button to see the holdings and answer the following questions:

- ► Which fund in the International Equity asset class is responsible for the Manager Benchmark Misfit value?
- ► Which funds, if any, have a positive Net Return?

Name	Benchmark		Net Return(%)		Market Return	Market Return(%) C				Attribution Effect(%)			
Level 1 2		+/-	Portiono	Benchmark	*/-	Portiono	Benchmark	+/-	Portiono	Benchmark	+/-	Category Group Allocation	Selection	Manager Benchmark Misfit
Fixed Income	BBgBarc US Agg	1.35	0.18	0.18	0.00	0.13	0.18	(0.05)	0.02	0.03	(0.01)	(0.09)	(0.01)	0.00
Schwab Short-Term US Tre	BBgBarc US Tre		0.49	0.51	(0.02)	0.49	0.51	(0.02)	0.00	0.00	0.00		(0.00)	0.00
Schwab US Aggregate Bon	BBgBarc US Agg		0.17	0.18	(0.01)	0.11	0.18	(0.07)	0.02	0.00	0.02		(0.01)	0.00
International Equity	FTSE DV Ex US	(0.35)	8.87	8.23	0.63	8.66	8.23	0.43	2.38	2.29	0.09	(0.00)	(0.06)	0.18
Schwab Emerging Markets	FTSE Emerging		11.71	11.76	(0.05)	11.92	11.76	0.16	0.62	0.00	0.62		0.01	0.18
Schwab International Equit	FTSE DV EX US		8.20	8.23	(0.04)	7.90	8.23	(0.33)	1.76	0.00	1.76		(0.08)	0.00
Money Market	BBgBarc US Tre	(0.49)	0.46	0.44	0.02	0.46	0.44	0.02	0.01	0.01	(0.00)	0.03	(0.10)	0.11
Schwab Variable Share Pric	S&P 500 TR USD		0.46	9.07	(8.61)	0.46	9.07	(8.61)	0.01	0.00	0.01		(0.10)	0.11
Specialty Equity	DJ US Select REI	(0.11)	(1.25)	(1.23)	(0.01)	(1.35)	(1.23)	(0.12)	(0.06)	(0.05)	(0.01)	0.01	(0.01)	0.00
Schwab US REIT ETF**	DJ US Select REI		(1.25)	(1.23)	(0.01)	(1.35)	(1.23)	(0.12)	(0.06)	0.00	(0.06)		(0.01)	0.00
Unclassified	S&P 500 TR USD	0.00								0.00		0.00		0.00
Time Deposits	S&P 500 TR USD									0.00				0.00
Time Deposits	S&P 500 TR USD									0.00				0.00
Time Deposits	S&P 500 TR USD									0.00				0.00
Time Deposits	S&P 500 TR USD									0.00				0.00
Time Deposits	S&P 500 TR USD									0.00				0.00
Time Deposits	S&P 500 TR USD									0.00				0.00
Usd	S&P 500 TR USD									0.00				0.00
Usd	S&P 500 TR USD									0.00				0.00
US Equity	DJ US TSM Larg	(0.40)	9.01	9.02	(0.01)	8.97	9.02	(0.05)	4.50	4.56	(0.06)	(0.01)	(0.03)	0.00
Schwab US Large-Cap ETF**	DJ US TSM Larg		9.00	9.02	(0.02)	8.96	9.02	(0.06)	4.03	0.00	4.03		(0.03)	0.00
Schwab US Small-Cap ETF**	DJ US TSM Smal		9.10	9.08	0.01	9.02	9.08	(0.06)	0.46	0.00	0.46		(0.00)	0.00
Total		0.00	6.95	6.84	0.11	6.85	6.84	0.01	6.85	6.84	0.01	(0.06)	(0.21)	0.30

Exercise 11: Generate

a PDF report

To generate a summary PDF report of the TPA analysis, do the following:

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

[Schwab Target 2040 Index Fund - Performance Attribution Window <u>File N</u>ew Favorites <u>H</u>elp Search for In Securities - Go Attribution Views Attribution Settings - 📰 Calculate 🛛 🖶 Save 🛛 Export -Summary PDF Use this icon to create a 🗉 Weight PDF of the TPA analysis. 🔍 Portfolio : Schwab Target 2040 Index 🛛 🍳 Policy : Schwab Target Name Benchmark +/-Level 1 2 Fixed Income BBgBarc US Agg 1.35 Schwab Short-Term US Tre... BBgBarc US Tre Schwab US Aggregate Bon... BBgBarc US Agg (0.35) International Equity FTSE DV Ex US Schwab Emerging Markets ... FTSE Emerging Schwab International Equit... FTSE Dv Ex US Money Market BBgBarc US Tre (0.49)

- 2. Check the box for Include Cover Page.
- 3. In the Report Title field, enter Schwab Target 2040 Index Fund TPA Analysis.

M Summary PDF	X	
☑ Include Cover Pag	ge	
Report Title	Schwab Target 2040 Index Fund TPA Analysis	Note the name to
Subtitle		enter for the report.
Include Logo		
Logo	Q	
	Save as Default	
Summary		
✓ Highlights	Relative Weight +/-, C 🗸	
Tactical Asset Allo	cation Effects	
Attribution Detail		
Cumulative Attrib	ution Effects	
Portfolio and Bend	hmark Allocation	
	OK Cancel	

4. Leave all pages selected for the report. Click **OK**. The PDF opens in a new window.