Yet Another Appendix Discussing ZPR

I'm beginning to get a little tired of ZPR (the "BMO Laddered Preferred Share Index ETF") and its problems, but another appendix became imperative recently due to a very peculiar exchange of eMails with my contact at Solactive, which provides the underlying index, the "Solactive Laddered Canadian Preferred Share Index". Following my receipt of Solactive's eMail dated 2023-11-7 (reported in the second text box on page 40 of the November PrefLetter), I wrote another eMail on 2023-11-14:

> Thank you for your response. I confess to some surprise that the term bucket reweighting was not explicitly announced.
>
> I have analyzed the index composition published on your site November 7 according to last bid prices as of November 6 and wish to draw your attention to three issues, listed in your published composition as:
> BCE INC CUM RED 1ST PFD SHS SERIES AM 1.64633
> BCE INC 1ST PFD SHS SERIES -AA- 0.807292
> BCE INC CUM RED 1ST PFD SHS SERIES -AK- 3.562722
>
> For convenience, I will refer to these three issues by their ticker symbols, BCE.PR.M, BCE.PR.A and BCE.PR.K.
>
> My analysis indicates that these three issues have weights in the portfolio of 1.93%, 1.04% and 4.03%, respectively. BCE.PR.A is assigned to the 2027 Term Bucket due to its reset date of 2027-9-1; while both BCE.PR.M and BCE.PR.K are assigned to the 2026 Term Bucket based on reset dates of 2026-3-31 and 2026-12-31.
>
> However, the 2026 Term Bucket has an index weight of 18.55% according to this analysis and therefore the total weight of BCE issues in this Term Bucket is 32%.
>
> This appears to be contrary to the GUIDELINE, Solactive Laddered Canadian Preferred Share Index, Version 2.1 dated December 18th, 2017, which states (Section 1.6) "On each Adjustment Day each Index Component of the Solactive Laddered Canadian Preferred Share Index is weighted according to the Market Capitalization of the respective preferred share within the term buckets. The weights are capped twofold on a Selection day, whereas a cap on an issuer basis is applied of 12.5% per issuer on a selection day as well as a Cap of 20% per Maturity Bucket."
>
> I recognize that my analysis was not performed as of a Selection Day, but the indicated weight of BCE in the 2026 bucket of 32% is so far in excess of the 20% Cap that it is inconceivable that interim market price changes could cause the discrepancy. I also note that if BCE.PR.K has in fact been assigned to the 2027 bucket for any reason, this only shifts the problem due to the presence of BCE.PR.A in the 2027 bucket. The excess is also far more than could be explained by an error in my calculation of the 2026 Bucket Weight.
>
> Can you tell me whether the "Cap of 20% [per issuer] per Maturity Bucket" is being enforced? If it is, how is the apparent violation described above explained?

I received a reply on 2023-11-17:

> I'm afraid that we are not able to reconcile the number of shares that you have quoted for the three issues that you have listed, and these do not match the composition published on our website, either shortly before, or after the November rebalance which was effective and published on 9 November.
>
> But in any case, I can confirm that a cap of 20% per issuer per Maturity Bucket is not being enforced. This was not foreseen in the development of the index and is not how the index has been implemented. The Index Guideline states "The weights are capped twofold on a Selection day, whereas a cap on an issuer basis is applied of 12.5% per issuer on a selection day as well as a Cap of 20% per Maturity Bucket." The cap of 20% is therefore applied per Maturity Bucket and not per issuer per Maturity Bucket.

Readers can well imagine that this message perplexed me to a high degree. How could my figures obtained from the Solactive website possibly be incorrect? I assure my readers that I did not spend my time making up numbers with seven significant figures that upon analysis would prove to provide an entirely reasonable but inaccurate snapshot of what the index might have looked like.

One nefarious possibility is brought to mind by contrasting the information contained in my eMail – *I have analyzed the index composition published on your site November 7* – with Solactive's response – *these do not match the composition published on our website, either shortly before, or after the November rebalance which was effective and published on 9 November*. The response seems very lawyerly, precise and ignores the fact that I provided the exact day on which I pulled the data. I don't know. I can't prove anything so I won't say much.

One possibility is that perhaps we were looking at different things: I take my figures from the 'Total Return' index, but there is also an index composition published for the 'Price Return' index. So on November 29, I printed data for both indices for comparison purposes, as outlined in Table ZPR-0.[1]

Table ZPR-0: Comparison of Total Return and Price Return indices holdings of two issues; data downloaded (and printed!) 2023-11-29

Index	BCE.PR.K	BCE.PR.M	Ratio (K/M)
Total Return	2.971266	1.375825	2.159524
Price Return	1.972952	0.915337	2.155437

The difference in the ratios is small, but arises on the fourth significant figure of the ratio when the input data has seven significant figures. Differing ratios may arise because the Index Methodology[2] indicates (Section 3.4) that dividends are not reinvested proportionally in the entire index, but each individual dividend payment is reinvested solely in the issue that paid the dividend.

Mind you, this still doesn't explain the difference in the ratio because presumably the weighting would be reset to the market capitalization on every monthly selection date , and then possibly adjusted to enforce the caps on issuer weight and Term Bucket weight – and these adjustments should be identical for these two issues. However, the difference between the ratios of these holdings will be left as a loose thread in the analysis; not only does it not affect my conclusions, but I confess to being pretty sick and tired of ZPR and its index at this point.

The remainder of this essay will be organized as follows: first, I will provide a discussion of edge effects; these were mentioned briefly in the November discussion of Table ZPR-6A (Resets Effective by Calendar Year), but deserve a longer look due to their importance in quantitative investment analysis; I will then reprise all the tables from the November edition using my revised data from the November 17 data download, analyzed as of November 16 and comparing it with the data published in November, which downloaded (yes it did! Honest!) data from November 7 and analyzed it as of November 6; finally, I will add a new section looking at the performance of the fund vs. that of the index according to BMO's data as of October 31. I can't remember ever having seen a tracking error so large in a putative index fund, so it's interesting.

Edge Effects

In the essay "Retirement Withdrawals, Long-term Equity Returns and Annuities" (published in the April, 2012 edition of PrefLetter), I discussed the disadvantages of 'sharp-edged' analytical models. The same concept can be applied to the Term Bucket weightings discussed in the present essay. The Term Buckets are supposed to be reweighted so that 20% of the portfolio (by value, I think! There's a good argument to be made that the weighting should be by number of shares, since the market value of each position has no effect on the expected income from that issue, which is always dependent upon the par value) resets in every calendar year; definitions can lead to problems:

> **From the November PrefLetter**
> A degree of caution in examining the results is warranted due to the influence of the previously mentioned 'edge effects'. There are four issues listed with a 'Next Reset Date' of 2027-12-31 (BN.PF.J, BN.PR.Z, BPO.PR.I and IFC.PR.A) which have total portfolio weights of 3.69% (Index) or 1.60% (ZPR), comprising 18% or 14% of the bucket, respectively. In addition, I list BCE.PR.K (with a portfolio weight of 4.03% [Index] or 1.59% [ZPR]) as having a next reset date of 2026-12- 31 and it is possible that this may be assigned to the 2027 bucket by the Index or ZPR or both.1 I do not believe such possible error will have a material effect on the analysis, particularly given that the 2026 bucket is also severely underweighted. But one should never get into an argument without first determining exactly what the problem is, so I will welcome revised and justified term-bucket assignments from either party.

A problem exists with BCE.PR.K, resetting 2026-12-31; at 4% weight in the index, it hits what I thought was the maximum 20% weight of any Term Bucket all by itself, but in my analysis I assigned it to the 2026 Term Bucket, which already includes an unambiguous BCE member: BCE.PR.M, with a reset date of 2026-3-31 and a index weight of 1.93%. So, you might think, I've made an error. For some no doubt convincing reason, BCE.PR.K should have been assigned to the 2027 Term Bucket and that will fix the problem. Unfortunately, however, the 2027 Term Bucket includes BCE.PR.A, resetting 2027-9-1, with a 1.04% index weight, so we haven't solved the problem, we've only moved it.

But what if BCE.PR.A did not exist and we determined that BCE.PR.K had to be assigned to the 2026 Term Bucket? In such a case, the index methodology, I thought, indicates that we have to apply a special weighting factor to the BCE issues in the 2026 Term Bucket to bring the total weight of BCE.PR.M and BCE.PR.K down to permissible levels. And at the same time, the 2027 Term Bucket, in this scenario, doesn't have any BCE weight at all.

[1] It's Table Zero so that the numbering of the tables in the rest of this essay will match previous numbering.

[2] Solactive, *GUIDELINE, Solactive Laddered Canadian Preferred Share Index, Version 2.1 dated December 18th, 2017*, available on-line at https://www.solactive.com/wp-content/uploads/2017/12/Index-Methodology_Laddered_Preferred_Index.pdf (accessed 2023-10-13)

This means that the sharp edge determined by our selection of calendar years has resulted in an adjustment that strikes me as undesirable, given the reduction of otherwise determined weights to achieve a maximum presence of BCE in one bucket despite the zero presence in an adjacent bucket, which would contain BCE.PR.K if that reset date were shifted by a single day.

I grant that this particular problem exists only due to my misunderstanding of the Solactive methodology. I can assure readers, however, that 'sharp edges' occur very frequently in investment analysis: for instance, the Term Buckets in ZPR are defined so rigidly that large consequences can arise from the difference between 2023-12-31 and 2024-1-1.

I suggest that undesirable actions such as the application of special and not particularly justifiable adjustment to the weight of BCE in the foregoing scenario could be avoided by using a weighting function to achieve smooth distributions of issues by weight. For instance, we could define the proper distribution (of portfolio weight resetting per year, or single issuer in a single bucket) by using a Gaussian curve. We use this curve to weight the actual index weights of each issue in accordance with their reset date relative to the date being checked.

For instance, when determining whether the issues are properly distributed over time, we calculate the Gaussian curve with a mean on any given day; issues resetting that day will receive a relative weighting of 1.0; issues resetting six months away might get a relative weighting of 0.62; those resetting one year from the selected day might be assigned a relative weighting of 0.125. For every issue, we multiply the Index Weight by the relative weighting factor and demand that for any date chosen the five years of outlook, the sum of these products must be within certain bounds. Only if these bounds are exceeded will we apply any special adjustments and these adjustments can be applied to all instruments in the universe proportionally to their relative weighting according to the Gaussian curve.

This procedure will, as far as I can tell, virtually eliminate edge effects due to the reset day as well as ensuring a smoother distribution of reset dates than is implied by the concept of Term Buckets – which could, for instance, have all their issues resetting in the January of their year and still be considered functionally equivalent to a Term Bucket that had the same weight resetting each month.

This philosophy can and should be applied throughout all quantitative systems: suppose, for instance, that you build an analytical system which seeks to maximize the sum of Earnings Yield (EY – the inverse of the P/E ratio) and the Dividend Yield (DY), all the while constraining the Cash Flow from Operations Per Share / Price ratio (CF) to be greater than PE. You put all these valuation parameters into an Objective Function (OF) so that it looks something like:

$$OF = DY + EY \text{ if } CF \geq EY$$
$$= -100 \text{ if } CF < EY \qquad (1)$$

The rest of your programme will calculate OF for every member of your universe and perhaps include constraints by sector on the entire portfolio and whatever else you can think of. Naturally, there will weightings applied to the two constituents of OF, and probably a strong inclination to try out other possible contributors to OF, but we'll ignore this for now. At the moment, we've just started building our portfolio management model so it's pretty simple.

A competent analyst will look at this equation and see a problem immediately: there is a very strong edge effect in OF when CF is very close to EY. Let's say we own a stock because the Dividend Yield and Earnings Yield are so wonderful, but the CF is very close to PE; say again that due to some minor fluctuation in accounts receivable CF changes from 0.0001 greater than PE to 0.0001 less than PE. At that point, OF declines instantly to -100 and your system will indicate that the position be sold. And perhaps the next quarterly report will indicate that CF has increased to its prior status of greater than PE and your system will buy it again.

This means that you will have:

- had no exposure to this wonderful stock for the three months between quarterly reports,

and

- incurred immense transaction costs to very little purpose.

Clearly, it would be better if the absolute constraint on CF was converted into a penalty that is applied whenever the value of CF is within a certain range. So change the absolute constraint (CF ≥ EY) with a penalty so that your objective function looks like this:

$$OF = DY + EY \text{ if } CF \geq EY + b$$
$$= DY + EY - a(CF-EY - b) \text{ if } CF < EY + b \qquad (2)$$

Where a and b are optimizable parameters.

That is to say, the penalty will start to apply when CF is a little bigger than EY, rather than becoming prohibitive at the exact point CF = EY. Additionally, when CF < EY, the Objective Function is no longer -100, but has merely been adjusted downwards by a steadily increasing amount as CF declines.

Then, when you are tuning your system, you have two more parameters to optimize: a and b. Note also that equations (1) and (2) will be equivalent when b = 0 and a is arbitrarily large: when making adjustments to a quantitative system you should always ensure that the new parameters have the opportunity to tell you that your first guess of equation (1) was correct all along!

Purists will quickly seize the opportunity to point out that there is still an edge effect in equation (2), to which I will respond that firstly this effect is much smaller than the binary inclusion/exclusion choice of equation (1) and that secondly, the analyst can avoid this if desirable by changing the function from the linear relation of the example to something that is continuously differentiable.

Equation (2) sets up the penalty as a linear function, but this can be changed if your best guess at what might work is different. It could be a square function! It could be exponential! It could be anything at all, but in practice it will very rarely be the 'bright line' prohibition of equation (1).

In summary, analyses should always be checked for edge effects. In the current specification for the Solactive Laddered Canadian Preferred Share Index there is a very clear edge effect in the definition of the term buckets: an instrument resetting on December 31 may be treated very differently from an instrument resetting on January 1 (due to differing weight adjustments to the term buckets). While some may consider this a minor matter (and I will not say I violently object to such a point of view) it is still an edge effect that doesn't make much sense when viewed objectively and should therefore be examined critically in the light of actual experience, with action being taken if the potential for suboptimal results is found to be real.

For a simple and publicly known example of edge effects, I refer readers to the essay "MAPF and Some Competitors", published in November, 2012, in which it was found that there was a sharp edge in the TXPL index inclusion requirements: if volume was over a certain figure, the issue was entirely eligible for inclusion in the index; if the volume was below this threshold, the issue was prohibited. This led to a situation in which there was significant selling by index funds (and possibly by shadow-indexers!) when an issue's volume dropped below the line – so significant, in fact, that the issue became eligible for inclusion again at the next index rebalancing. The index providers addressed this problem by making issues ineligible for inclusion at the rebalancing following exclusion; I won't say this was wrong, but I will say that transaction costs could have been reduced if there had been an adjustment to the weighting of an issue based on volume, similarly to the structure discussed with respect to equations (1) and (2) above.

We can go back to ZPR now!

Table ZPR-1
ZPR & Solactive Index Analysis
Positions and Basic Data
Analysis as of 2023-11-16

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
FixedReset – Discount											
BIK.PR.A	6.71%	9.19%	NOT RATED	48,202	21.80	0.00%	0.29%	10.24	396	2024-03-31	1.89%
BIP.PR.A	6.31%	11.38%	NOT RATED	32,639	15.74	0.00%	0.18%	9.01	356	2025-06-30	0.41%
BIP.PR.B	6.85%	10.06%	NOT RATED	41,795	20.06	0.00%	0.31%	9.97	453	2025-12-31	0.97%
BIP.PR.E	8.11%	8.56%	NOT RATED	69,684	20.47	0.48%	0.63%	10.85	300	2028-03-31	3.64%
BIP.PR.F	6.66%	9.15%	NOT RATED	124,058	19.15	0.55%	0.58%	10.24	292	2023-12-31	2.18%
BMO.PR.E	5.29%	7.27%	Pfd-2	246,973	22.92	1.07%	1.39%	12.19	268	2023-11-25	2.17%
BMO.PR.F	5.33%	7.80%	Pfd-2	103,477	23.90	0.66%	1.25%	11.64	351	2024-05-25	1.59%
BMO.PR.S	5.17%	8.45%	Pfd-2	207,032	18.61	0.73%	0.84%	11.04	233	2024-05-25	1.52%
BMO.PR.T	5.17%	8.75%	Pfd-2	120,986	17.54	0.55%	0.71%	10.83	224	2024-08-25	1.38%
BMO.PR.W	5.66%	8.93%	Pfd-2	66,913	17.02	0.40%	0.48%	10.72	222	2024-11-25	1.63%
BMO.PR.Y	4.39%	8.98%	Pfd-2	40,937	17.38	0.60%	0.55%	11.04	271	2025-08-25	0.34%
BN.PF.A	8.76%	9.07%	Pfd-2(low)	178,173	19.25	0.66%	0.69%	10.31	290	2028-09-30	3.84%
BN.PF.B	6.49%	9.73%	Pfd-2(low)	107,878	17.10	0.33%	0.46%	9.81	263	2024-03-31	1.81%
BN.PF.E	6.30%	11.01%	Pfd-2(low)	38,496	14.15	0.48%	0.48%	9.23	255	2025-03-31	1.02%
BN.PF.F	6.38%	10.76%	Pfd-2(low)	101,815	15.78	0.37%	0.46%	9.14	286	2024-09-30	1.17%
BN.PF.G	5.68%	11.23%	Pfd-2(low)	75,530	14.31	0.00%	0.56%	9.17	284	2025-06-30	0.41%
BN.PF.H	6.35%	9.76%	Pfd-2(low)	111,730	19.69	0.83%	0.66%	10.26	417	2025-12-31	0.83%
BN.PF.I	7.74%	10.41%	Pfd-2(low)	117,810	17.40	1.15%	0.67%	9.83	385	2027-03-31	1.54%
BN.PF.J	8.58%	9.57%	Pfd-2(low)	177,851	18.15	1.21%	0.47%	10.10	310	2027-12-31	3.13%
BN.PR.R	6.50%	11.38%	Pfd-2(low)	70,607	12.45	1.43%	0.53%	9.34	230	2026-06-30	0.94%
BN.PR.T	7.61%	11.16%	Pfd-2(low)	69,363	12.63	0.69%	0.39%	9.49	231	2027-03-31	1.54%
BN.PR.X	8.86%	10.67%	Pfd-2(low)	59,776	13.00	0.68%	0.29%	9.39	180	2027-06-30	2.81%
BN.PR.Z	8.82%	9.86%	Pfd-2(low)	113,757	17.25	0.95%	0.43%	9.86	296	2027-12-31	3.13%
BNS.PR.I	5.33%	7.10%	Pfd-2	186,317	22.75	0.54%	0.75%	12.35	243	2024-01-27	2.42%
CM.PR.O	5.07%	8.49%	Pfd-2	135,858	18.30	0.58%	0.70%	11.10	232	2024-07-31	1.39%
CM.PR.P	5.78%	8.94%	Pfd-2	93,056	16.90	0.87%	0.96%	10.77	224	2025-01-31	1.67%
CM.PR.Q	4.49%	9.00%	Pfd-2	81,039	17.51	0.90%	0.94%	11.06	279	2025-07-31	0.35%
CM.PR.S	7.18%	7.74%	Pfd-2	198,606	20.48	1.07%	1.44%	11.85	245	2028-01-31	3.43%
CM.PR.T	5.51%	7.70%	Pfd-2	105,981	23.58	0.60%	0.98%	11.74	331	2024-04-30	1.89%
CM.PR.Y	5.27%	7.69%	Pfd-2	101,779	24.45	0.48%	1.14%	11.84	362	2024-07-31	1.53%

ZPR & Solactive Index Analysis: November 16, 2023 (con't)

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
FixedReset – Discount (con't)											
CU.PR.C	7.46%	8.76%	Pfd-2	79,323	17.42	1.27%	0.84%	11.04	240	2027-06-01	2.80%
CU.PR.I	5.46%	8.77%	Pfd-2	81,187	20.60	0.88%	0.98%	11.16	369	2025-12-01	0.81%
FTS.PR.G	7.88%	7.91%	Pfd-2(low)	159,838	19.43	0.53%	0.56%	11.54	213	2028-09-01	3.99%
FTS.PR.H	3.46%	9.50%	Pfd-2(low)	24,672	13.25	0.00%	0.36%	10.63	145	2025-06-01	0.39%
FTS.PR.K	5.60%	8.64%	Pfd-2(low)	74,773	17.54	0.35%	0.39%	10.80	205	2024-03-01	1.88%
FTS.PR.M	5.70%	9.21%	Pfd-2(low)	170,131	17.15	0.82%	0.94%	10.49	248	2024-12-01	1.43%
NA.PR.C	7.03%	7.10%	Pfd-2	165,044	25.00	2.25%	1.41%	3.46	343	2027-11-15	3.60%
NA.PR.E	6.98%	7.66%	Pfd-2	59,598	20.85	0.73%	0.84%	12.04	258	2028-05-15	3.24%
NA.PR.G	7.57%	7.60%	Pfd-2	183,850	23.30	0.81%	0.90%	12.17	277	2028-11-15	3.97%
NA.PR.S	5.42%	8.60%	Pfd-2	162,614	18.57	0.51%	0.55%	10.88	240	2024-05-15	1.62%
NA.PR.W	5.79%	9.15%	Pfd-2	79,214	16.58	0.85%	0.69%	10.57	225	2025-02-15	1.59%
PWF.PR.P	4.03%	10.04%	Pfd-2(high)	61,850	12.40	1.27%	0.47%	10.47	160	2026-01-31	0.40%
PWF.PR.T	5.69%	8.68%	Pfd-2(high)	79,125	18.53	0.29%	0.39%	10.70	237	2024-01-31	1.85%
RY.PR.H	5.07%	8.56%	Pfd-2(high)	180,266	17.99	0.71%	0.73%	11.00	226	2024-08-24	1.39%
RY.PR.J	4.43%	8.82%	Pfd-2(high)	188,656	18.05	1.85%	1.59%	11.07	274	2025-05-24	0.46%
RY.PR.M	4.37%	8.88%	Pfd-2(high)	92,625	17.15	0.88%	0.77%	11.22	262	2025-11-24	0.38%
RY.PR.S	5.60%	7.46%	Pfd-2(high)	197,924	21.41	0.59%	0.82%	12.03	238	2024-02-24	2.42%
RY.PR.Z	4.97%	8.29%	Pfd-2(high)	249,483	18.62	0.73%	1.08%	11.20	221	2024-05-24	1.49%
TD.PF.A	5.23%	8.76%	Pfd-2(high)	214,266	17.49	0.69%	0.92%	10.85	224	2024-10-31	1.42%
TD.PF.B	4.97%	8.40%	Pfd-2(high)	311,545	18.50	0.73%	1.15%	11.13	227	2024-07-31	1.41%
TD.PF.C	5.70%	8.97%	Pfd-2(high)	164,125	17.00	1.46%	1.36%	10.70	225	2025-01-31	1.63%
TD.PF.D	4.48%	8.94%	Pfd-2(high)	73,610	17.85	1.07%	1.02%	11.02	279	2025-07-31	0.41%
TD.PF.E	4.53%	8.93%	Pfd-2(high)	94,513	17.88	0.61%	0.49%	11.12	287	2025-10-31	0.37%
TD.PF.I	6.79%	7.39%	Pfd-2(high)	189,770	23.20	1.83%	1.22%	12.20	301	2027-10-31	3.29%
TD.PF.J	6.79%	7.65%	Pfd-2(high)	113,652	21.15	0.86%	1.31%	12.08	270	2028-04-30	3.05%
TD.PF.L	5.42%	7.56%	Pfd-2(high)	118,411	24.00	0.66%	1.18%	11.85	327	2024-04-30	1.93%
TD.PF.M	5.26%	7.74%	Pfd-2(high)	151,270	24.25	0.86%	1.34%	11.74	356	2024-07-31	1.54%

ZPR & Solactive Index Analysis: November 16, 2023 (con't)

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
FixedReset – Insurance											
GWO.PR.N	3.56%	9.51%	Pfd-2(high)	64,083	12.29	0.53%	0.41%	10.97	130	2025-12-31	0.45%
IFC.PR.A	7.14%	8.16%	Pfd-2(high)	45,364	16.96	0.95%	0.45%	11.48	172	2027-12-31	3.12%
IFC.PR.C	5.16%	9.00%	Pfd-2(high)	104,171	16.75	1.78%	1.05%	11.20	266	2026-09-30	0.80%
IFC.PR.G	7.27%	7.85%	Pfd-2(high)	144,793	20.66	0.60%	0.76%	11.66	255	2028-06-30	3.46%
MFC.PR.F	4.36%	9.02%	Pfd-2(high)	51,065	13.47	0.00%	0.33%	11.25	141	2026-06-19	0.94%
MFC.PR.I	7.23%	8.16%	Pfd-2(high)	116,433	20.68	1.16%	0.59%	11.39	286	2027-09-19	3.12%
MFC.PR.J	7.33%	7.86%	Pfd-2(high)	138,645	21.00	0.49%	0.65%	11.59	261	2028-03-19	3.55%
MFC.PR.K	7.61%	7.66%	Pfd-2(high)	95,588	20.85	0.61%	0.90%	11.62	222	2028-09-19	4.13%
MFC.PR.L	5.20%	8.49%	Pfd-2(high)	72,506	18.19	0.29%	0.32%	10.93	216	2024-06-19	1.63%
MFC.PR.M	5.25%	8.65%	Pfd-2(high)	90,836	18.09	0.50%	0.60%	10.92	236	2024-12-19	1.44%
MFC.PR.N	5.12%	8.55%	Pfd-2(high)	49,751	17.95	0.77%	0.71%	11.09	230	2025-03-19	1.38%
MFC.PR.Q	7.18%	7.83%	Pfd-2(high)	104,559	20.70	0.48%	0.66%	11.69	255	2028-06-19	3.39%
SLF.PR.G	3.37%	9.25%	Pfd-2(high)	32,638	13.55	0.00%	0.27%	10.83	141	2025-06-30	0.41%
SLF.PR.H	4.50%	8.42%	Pfd-2(high)	28,768	16.50	0.00%	1.08%	11.82	217	2026-09-30	0.80%
Scraps – FixedFloater											
BCE.PR.A	7.88%	10.61%	Pfd-3	187,839	15.68	1.01%	0.48%	10.35	No Sol.	2027-09-01	N/A
BCE.PR.C	7.87%	10.29%	Pfd-3	83,812	16.13	0.47%	0.50%	10.59	No Sol.	2028-03-01	N/A
BCE.PR.F	6.04%	11.03%	Pfd-3	76,549	16.00	0.65%	0.28%	9.62	No Sol.	2025-02-01	N/A
BCE.PR.G	5.72%	11.04%	Pfd-3	69,983	14.72	1.40%	0.74%	10.30	No Sol.	2026-05-03	N/A
BCE.PR.I	5.80%	11.13%	Pfd-3	81,937	14.60	1.48%	0.51%	10.23	No Sol.	2026-08-01	N/A
BCE.PR.R	5.08%	11.14%	Pfd-3	40,644	14.85	0.92%	0.45%	10.08	No Sol.	2025-12-01	N/A
BCE.PR.T	7.52%	10.03%	Pfd-3	84,962	16.6	0.00%	0.65%	10.54	No Sol.	2026-11-01	N/A
Scraps – FixedReset – Discount											
ALA.PR.A	5.27%	10.64%	NOT RATED	42,951	14.51	0.00%	0.17%	9.69	266	2025-09-30	0.40%
ALA.PR.E	5.37%	7.18%	NOT RATED	179,721	25.10	0.59%	0.75%	12.22	317	2023-12-31	2.22%
ALA.PR.G	5.27%	8.70%	NOT RATED	105,352	20.11	0.27%	0.41%	10.83	306	2024-09-30	1.18%
AQN.PR.A	6.77%	9.23%	Pfd-3	127,369	19.05	0.00%	0.28%	10.17	294	2023-12-31	2.22%
AQN.PR.D	6.53%	9.39%	Pfd-3	52,762	19.48	0.00%	0.11%	10.09	328	2024-03-31	1.81%
AX.PR.E	11.32%	11.73%	Pfd-3(low)	22,328	15.89	0.00%	0.08%	8.28	330	2028-09-30	3.90%
AX.PR.I	11.09%	12.18%	Pfd-3(low)	65,684	15.77	0.22%	0.36%	8.31	393	2028-04-30	3.06%

ZPR & Solactive Index Analysis: November 16, 2023 (con't)

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
Scraps – FixedReset – Discount (con't)											
BCE.PR.K	5.84%	9.32%	Pfd-3	202,618	14.15	3.38%	1.62%	10.94	188	2026-12-31	1.43%
BCE.PR.M	5.16%	9.64%	Pfd-3	61,538	14.25	1.58%	0.89%	10.65	209	2026-03-31	0.85%
BCE.PR.Q	7.67%	7.89%	Pfd-3	179,793	21.30	0.57%	0.66%	11.47	264	2028-09-30	3.90%
BEP.PR.G	7.20%	10.48%	Pfd-3 (high)	118,686	19.10	1.42%	0.39%	9.67	447	2026-01-31	1.03%
BEP.PR.M	8.49%	9.48%	Pfd-3 (high)	113,501	17.81	0.52%	0.56%	10.27	300	2028-05-01	3.05%
BEP.PR.O	6.85%	9.50%	Pfd-3 (high)	123,812	21.00	0.29%	0.38%	10.01	394	2024-04-30	1.81%
BPO.PR.A	13.09%	19.31%	Pfd-3(low)	126,096	8.99	0.21%	0.32%	5.49	315	2024-12-31	1.56%
BPO.PR.C	13.66%	18.81%	Pfd-3(low)	106,865	11.20	0.95%	0.42%	5.84	518	2026-06-30	0.94%
BPO.PR.E	13.95%	18.09%	Pfd-3(low)	127,808	9.85	0.61%	0.27%	6.12	396	2027-03-31	1.54%
BPO.PR.G	15.86%	18.18%	Pfd-3(low)	94,007	10.32	0.64%	0.25%	5.75	374	2027-06-30	2.81%
BPO.PR.I	15.42%	17.13%	Pfd-3(low)	80,850	10.31	0.58%	0.26%	6.03	323	2027-12-31	3.13%
BPO.PR.N	13.10%	20.18%	Pfd-3(low)	99,270	7.65	0.89%	0.41%	5.67	307	2026-06-30	0.94%
BPO.PR.P	14.14%	19.01%	Pfd-3(low)	113,496	8.02	0.54%	0.37%	5.95	300	2027-03-31	1.54%
BPO.PR.R	13.11%	19.75%	Pfd-3(low)	99,516	8.20	0.87%	0.25%	5.82	348	2026-09-30	0.82%
BPO.PR.T	10.99%	14.97%	Pfd-3(low)	129,836	12.25	0.36%	0.55%	6.64	316	2023-12-31	2.22%
BRF.PR.A	5.41%	10.79%	Pfd-3 (high)	38,058	14.50	0.43%	0.37%	9.46	262	2025-04-30	0.52%
BRF.PR.C	6.65%	10.54%	Pfd-3 (high)	90,915	16.36	0.32%	0.46%	9.28	294	2024-07-31	1.41%
CPX.PR.C	5.95%	7.95%	Pfd-3(low)	57,411	22.91	0.00%	0.48%	11.36	323	2023-12-31	2.22%
CPX.PR.E	8.09%	8.67%	Pfd-3(low)	67,810	20.50	0.48%	0.44%	10.8	315	2028-06-30	3.48%
CPX.PR.K	6.07%	8.62%	Pfd-3(low)	50,698	23.70	0.00%	0.26%	10.75	415	2024-06-30	1.60%
CVE.PR.A	5.27%	10.42%	Pfd-3 (high)	50,466	12.23	0.00%	0.85%	10.13	173	2026-03-31	0.85%
CVE.PR.C	5.82%	8.68%	Pfd-3 (high)	104,107	20.13	0.40%	0.52%	10.92	313	2024-12-31	1.56%
CVE.PR.E	5.64%	8.99%	Pfd-3 (high)	97,930	20.35	0.00%	0.67%	10.75	357	2025-03-31	1.02%
CVE.PR.G	4.92%	8.97%	Pfd-3 (high)	57,230	20.00	0.51%	0.52%	10.86	352	2025-06-30	0.42%
CWB.PR.B	5.77%	9.08%	Pfd-3	34,713	18.65	0.00%	0.17%	10.39	276	2024-04-30	1.54%
CWB.PR.D	6.19%	8.30%	Pfd-3	50,294	24.25	0.00%	0.27%	11.06	404	2024-04-30	1.96%
ECN.PR.C	15.14%	17.15%	Pfd-4 (high)	39,665	13.11	0.00%	0.02%	6.04	519	2027-06-30	2.75%
EFN.PR.A	6.88%	8.45%	Pfd-3 (high)	39,555	25.18	0.34%	0.30%	0.12	471	2023-12-31	2.22%
EFN.PR.C	6.27%	8.94%	Pfd-3 (high)	68,339	24.75	0.25%	0.36%	10.46	481	2024-06-30	1.40%
EFN.PR.E	5.97%	8.33%	Pfd-3 (high)	41,323	24.70	0.26%	0.36%	0.83	472	2024-09-30	1.18%
EMA.PR.C	8.35%	8.59%	NOT RATED	118,932	19.26	0.56%	0.63%	10.89	265	2028-08-15	3.78%
EMA.PR.F	6.46%	9.90%	NOT RATED	55,435	16.25	0.00%	0.47%	9.94	263	2025-02-15	1.57%
EMA.PR.H	7.97%	8.20%	NOT RATED	108,334	19.84	0.69%	0.67%	11.29	254	2028-08-15	3.78%
EMA.PR.J	6.32%	9.96%	NOT RATED	115,698	16.80	1.42%	0.93%	10.26	328	2026-05-15	0.97%

ZPR & Solactive Index Analysis: November 16, 2023 (con't)

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
Scraps – FixedReset – Discount (con't)											
ENB.PF.A	6.58%	10.42%	Pfd-3 (high)	59,619	15.57	0.00%	0.38%	9.51	266	2024-12-01	1.44%
ENB.PF.C	6.52%	10.57%	Pfd-3 (high)	110,110	15.11	1.31%	1.20%	9.48	264	2025-03-01	1.30%
ENB.PF.E	5.47%	11.17%	Pfd-3 (high)	146,002	13.90	0.84%	0.79%	9.28	266	2025-06-01	0.38%
ENB.PF.G	5.19%	10.70%	Pfd-3 (high)	52,833	14.36	0.68%	0.60%	9.71	268	2025-09-01	0.30%
ENB.PF.K	8.24%	9.14%	Pfd-3 (high)	211,758	18.85	1.12%	1.25%	10.62	317	2028-03-01	3.04%
ENB.PR.B	8.73%	10.20%	Pfd-3 (high)	196,412	14.90	1.71%	1.01%	9.81	240	2027-06-01	2.80%
ENB.PR.D	8.88%	9.96%	Pfd-3 (high)	207,061	15.24	0.82%	0.96%	9.96	237	2028-03-01	3.04%
ENB.PR.F	8.79%	9.83%	Pfd-3 (high)	205,294	15.75	0.94%	1.04%	10.08	251	2028-06-01	3.03%
ENB.PR.H	8.94%	8.98%	Pfd-3 (high)	122,843	17.10	0.71%	0.64%	10.47	212	2028-09-01	3.99%
ENB.PR.J	6.60%	9.78%	Pfd-3 (high)	146,069	16.85	0.34%	0.45%	9.78	257	2024-03-01	1.88%
ENB.PR.N	6.83%	8.95%	Pfd-3 (high)	310,831	18.62	0.99%	1.18%	10.50	265	2023-12-01	2.44%
ENB.PR.P	6.52%	9.71%	Pfd-3 (high)	137,973	16.78	0.54%	0.63%	9.84	250	2024-03-01	1.88%
ENB.PR.T	6.40%	10.15%	Pfd-3 (high)	137,690	15.90	0.51%	0.58%	9.56	250	2024-06-01	1.57%
ENB.PR.Y	6.24%	10.46%	Pfd-3 (high)	162,809	14.97	0.72%	0.80%	9.41	238	2024-09-01	1.36%
FFH.PR.C	6.26%	9.32%	Pfd-3 (high)	70,855	18.80	0.28%	0.27%	10.35	315	2024-12-31	1.56%
FFH.PR.E	5.58%	10.25%	Pfd-3 (high)	22,250	14.26	0.00%	0.03%	9.81	216	2025-03-31	1.02%
FFH.PR.G	5.08%	10.43%	Pfd-3 (high)	46,982	14.57	0.00%	0.36%	9.85	256	2025-09-30	0.40%
FFH.PR.I	5.51%	10.32%	Pfd-3 (high)	83,172	15.10	0.67%	0.61%	10.04	285	2025-12-31	0.48%
FFH.PR.K	6.91%	9.48%	Pfd-3 (high)	63,354	18.26	0.98%	0.39%	10.59	351	2027-03-31	1.53%
FFH.PR.M	6.03%	9.31%	Pfd-3 (high)	67,969	20.75	0.82%	0.64%	10.44	398	2025-03-31	1.02%
LB.PR.H	6.96%	11.15%	Pfd-3	56,797	14.80	0.00%	0.11%	8.74	255	2024-06-15	1.57%
NPI.PR.A	5.57%	10.98%	NOT RATED	28,587	14.36	0.00%	0.02%	9.44	280	2025-09-30	0.40%
PPL.PF.A	8.28%	9.17%	Pfd-3 (high)	241,949	19.02	0.89%	0.91%	10.59	326	2028-03-01	3.04%
PPL.PF.E	8.19%	9.14%	Pfd-3 (high)	137,296	19.79	0.58%	0.60%	10.59	351	2028-02-15	2.97%
PPL.PR.A	6.67%	8.81%	Pfd-3 (high)	151,258	18.39	0.54%	0.67%	10.63	247	2023-12-01	2.44%
PPL.PR.C	6.49%	9.59%	Pfd-3 (high)	44,772	17.25	0.00%	0.24%	9.94	260	2024-03-01	1.88%
PPL.PR.E	6.55%	9.97%	Pfd-3 (high)	64,873	17.45	0.00%	0.46%	9.69	300	2024-06-01	1.57%
PPL.PR.G	6.46%	10.00%	Pfd-3 (high)	81,167	16.94	0.33%	0.34%	9.82	294	2024-12-01	1.44%
PPL.PR.I	5.81%	9.92%	Pfd-3 (high)	64,542	18.50	0.71%	0.46%	10.24	391	2025-12-01	0.39%
PPL.PR.O	8.53%	9.45%	Pfd-3 (high)	82,203	18.06	0.81%	0.41%	10.15	292	2027-09-30	3.24%
PPL.PR.Q	6.51%	9.52%	Pfd-3 (high)	43,787	18.50	0.00%	0.18%	9.98	301	2024-03-31	1.81%
PPL.PR.S	5.68%	9.63%	Pfd-3 (high)	59,957	20.60	0.00%	0.59%	10.24	427	2025-06-30	0.41%

ZPR & Solactive Index Analysis: November 16, 2023 (con't)

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
Scraps – FixedReset – Discount (con't)											
TA.PR.D	6.06%	11.32%	Pfd-3(low)	52,729	11.86	0.00%	1.21%	9.45	203	2026-03-31	0.85%
TA.PR.F	8.70%	10.20%	Pfd-3(low)	56,687	16.83	0.00%	0.44%	9.67	310	2027-06-30	2.75%
TA.PR.H	8.60%	9.45%	Pfd-3(low)	68,359	20.05	1.01%	0.47%	10.13	365	2027-09-30	3.24%
TA.PR.J	6.51%	10.13%	Pfd-3(low)	71,040	19.15	0.25%	0.28%	9.58	380	2024-09-30	1.19%
TRP.PR.A	6.89%	11.35%	Pfd-3 (high)	116,166	12.62	0.36%	0.34%	8.89	192	2024-12-31	1.56%
TRP.PR.B	4.01%	11.42%	Pfd-3 (high)	37,205	10.55	0.00%	0.41%	9.25	128	2025-06-30	0.41%
TRP.PR.C	4.62%	11.52%	Pfd-3 (high)	70,118	10.55	1.35%	0.64%	9.46	154	2026-01-30	0.41%
TRP.PR.D	6.07%	9.94%	Pfd-3 (high)	318,425	16.08	0.76%	0.80%	9.67	238	2024-04-30	1.52%
TRP.PR.E	6.22%	10.31%	Pfd-3 (high)	196,569	15.11	0.54%	0.65%	9.54	235	2024-10-30	1.41%
TRP.PR.G	5.53%	10.38%	Pfd-3 (high)	62,313	15.16	0.66%	0.53%	10.06	296	2025-11-30	0.39%
Scraps – FixedFloater											
TRP.PR.F	11.97%	12.34%	Pfd-3 (high)	35,915	14.70	0.00%	0.02%	7.87	192	2014-12-31	N/A
ZPR Total or Average	**6.49%**	**9.38%**		**125,117**		**99.96%**		**10.39**			**1.76%**
Index Total or Average	**6.81%**	**9.76%**		**127,738**			**100.00%**	**10.15**			**1.78%**

Yields to perpetuity are calculated assuming a constant 5-Year Canada yield of 3.97%, a constant 3-Month Bill yield of 5.12%, or a constant Prime Rate of 7.20% as applicable.

To calculate yields using other assumptions, use the FixedReset Yield Calculator described and linked at http://prefblog.com/?p=27023.

Implied GOC5 Last Reset is weighted by the notional number of shares held in a $1-million portfolio. All other averages are weighted by the applicable Holdings Weight.

12.31% of ZPR is held in issues not held by the Index

Table ZPR-1 Notes

Table ZPR-1A: Overweight & Underweight Issues Analysis of 2023-11-16

Ticker	Next Reset	Index Weight	ZPR Weight	Difference
BCE.PR.K	2026-12-31	3.38%	1.62%	-1.76%
BEP.PR.G	2026-1-31	1.42%	0.39%	-1.03%
BCE.PR.I	2026-8-1	1.48%	0.51%	-0.97%
BN.PR.R	2026-6-30	1.43%	0.53%	-0.90%
NA.PR.C	2027-11-15	2.25%	1.41%	-0.84%
….	….	….	….	….
CM.PR.Y	2024-7-31	0.48%	1.14%	+0.66%
CVE.PR.E	2025-3-31	0.00%	0.67%	+0.67%
CVE.PR.A	2026-3-31	0.00%	0.85%	+0.85%
SLF.PR.H	2026-9-30	0.00%	1.08%	+1.08%
TA.PR.D	2026-3-31	0.00%	1.21%	+1.21%

Table ZPR-1A is very similar to its equivalent published in the November issue, with the change that not all of the highlighted issues are in the 2026 term bucket. I can think of nothing better to say than repeating my observations from the November issue, most importantly:

> There may be a reason for this: a good reason would be that BMO is experiencing difficulties in filling up the bucket and so is scrambling buy whatever it can that can be counted towards meeting its 20% commitment for this term.
>
> A bad reason would be that we also notice the severely underweighted issues all have relatively high index weights; BMO highlights the top ten holdings in ZPR1, which range in weight … and they may have determined that showing higher weights (particularly the large index allocation to BCE.PR.K!) would worry their customers; in other words, deviating from the index methodology for purely cosmetic purposes. Having five members of their 'Top 10' all being in the same bucket could, possibly, be deprecated similarly.

BMO's highlighted 'top ten holdings' in ZPR[3] has changed a bit from that reported in the November issue and the weights of these issues now[4] ranges from 1.62% (RY.PRJ) to 1.22% (TD.PF.I).

I will point out that all the differences highlighted by Table ZPR-1A are much larger than what one might expect from a so-called index fund holding 162 issues.

Table ZPR-1B: BN Group Components – Concentration Concern Analysis of 2023-11-16

Issuer	Index Weight	ZPR Weight
BEP	2.23%	1.33%
BIK	0%	0.29%
BIP	1.03%	1.70%
BN	8.78%	6.09%
BPO	5.65%	3.10%
BRF	0.75%	0.83%
Total	**18.44%**	**13.34%**

Table ZPR-1B shows the concentration of credit exposure to the various preferred share issuing components of the Brookfield empire. I suggest that prudence would dictate considering all these elements as coming from a single issuer and therefore that a cap of 10% of portfolio weight is desirable for an investment grade issuer and 1% for junk. The desirability of a limit on issuer weight is recognized by the Solactive index methodology,[5] section 1.6'; but I go further in advocating that related issuers be considered as one for issuer concentration calculation purposes.

[3] See https://www.bmogam.com/ca-en/products/exchange-traded-fund/bmo-laddered-preferred-share-index-etf-zpr/

[4] As of December 1; note that this is not the same date as the that of the analysis shown in Table ZPR-1.

[5] Solactive, *GUIDELINE*, supra

Table ZPR-1C: Issuer Concentration Concerns Analysis of 2023-11-16			
Issuer	Index Total Weight	ZPR Total Weight	Reason for Concern
ALA	0.86%	1.33%	Junk
BCE	11.46%	6.78%	Junk
BEP	2.23%	1.33%	Junk
BPO	5.65%	3.10%	Junk
CPX	0.48%	1.18%	Junk
CVE	0.91%	2.56%	Junk
EFN	0.85%	1.02%	Junk
EMA	2.67%	2.70%	Junk
ENB	11.23%	11.51%	Junk
FFH	2.75%	2.30%	Junk (but note was upgraded 2023-12-1)
PPL	3.86%	4.86%	Junk
TA	1.26%	2.40%	Junk
TD	8.72%	9.99%	See note
** TD doesn't really concern me any more, but in the September edition I reported a ZPR weight of 11.29% as of 2023-7-31, too much for my comfort, even for an investment-grade issuer.*			

It should be noted that the concerns highlighted in Table ZPR-1C are from an investment standpoint only and reflect my own philosophy of how much exposure to a given issuer is too much. Different people will have different risk appetites and it can be very difficult to prove any given philosophy incorrect! This table reflects only my views regarding ZPR as an investment and does not deal with the main theme of these interminable appendices – that BMO is lying to its customers regarding the investment characteristics of ZPR. However, those of a curious bent may look at the difference in exposures to BCE, BPO, CVE, PPL, TA and TD in the index compared to ZPR and draw their own conclusions! Data highlighting differences in issuer exposure are shown in Table ZPR-1D:

Table ZPR-1D: Differences between Index and ZPR Issuer Exposure Analysis of 2023-11-16			
Issuer	Index Total Weight	ZPR Total Weight	Difference
BN Group (from table ZPR-1B)	18.44%	13.34%	-5.10%
BCE	11.46%	6.78%	-4.68%
BN *	8.78%	6.09%	-2.69%
BPO *	5.65%	3.10%	-2.55%
IFC	3.33%	2.26%	-1.07%
…	…	…	…
BMO	4.01%	5.22%	+1.21%
TD	8.77%	9.99%	+1.22%
SLF	0.00%	1.35%	+1.35%
CVE	0.91%	2.56%	+1.65%
CM	4.50%	6.16%	+1.66%
BN and BPO are constituents of the BN group, as shown in Table ZPR-1B.			

These tables make nonsense of BMO's advertising claim highlighted at https://www.bmogam.com/ca-en/products/exchange-traded-fund/bmo-laddered-preferred-shareindex-etf-zpr/: the Constituent Issues are most definitely not held in the ZPR portfolio "in the same proportion as they are reflected in the Index."

Portfolio Strategy
BMO Laddered Preferred Share Index ETF has been designed to replicate, to the extent possible, the performance of the Solactive Laddered Canadian Preferred Share Index, net of expenses. The Fund invests in and holds the Constituent Securities of the Index in the same proportion as they are reflected in the Index.

Table ZPR-2: HIMIPref Subindex Analysis Analysis of 2023-11-16		
Subindex Group	Total Weight	Total Weight ZPR Index
Ratchet	0.00%	0.00%
FixFloater	0.00%	0.00%
Floater	0.00%	0.00%
OpRet	0.00%	0.00%
SplitShare	0.00%	0.00%
Interest Bearing	0.00%	0.00%
PerpetualPremium	0.00%	0.00%
Scraps	0.00%	0.00%
PerpetualDiscount	0.00%	0.00%
FixedReset – Discount	42.99%	43.99%
Insurance Straight	0.00%	0.00%
FloatingReset	0.00%	0.00%
FixedReset – Premium	0.00%	0.00%
FixedReset – Bank non-NVCC	0.00%	0.00%
FixedReset – Insurance non-NVCC	8.16%	8.78%
Scraps – Ratchet	0.00%	0.00%
Scraps – FixFloater	5.93%	3.60%
Scraps – Floater	0.00%	0.00%
Scraps – OpRet	0.00%	0.00%
Scraps – SplitShare	0.00%	0.00%
Scraps – PerpPrem	0.00%	0.00%
Scraps – PerpDisc	0.00%	0.00%
Scraps – FixedReset Discount	42.93%	43.61%
Scraps – Insurance Straight	0.00%	0.00%
Scraps – FloatingReset	0.00%	0.02%
Scraps – FixedReset Premium	0.00%	0.00%
Scraps – Bank non-NVCC	0.00%	0.00%
Scraps – Insurance non-NVCC	0.00%	0.00%
XXA00001	0.00%	0.00%

Table ZPR-3: Liquidity Analysis Analysis of 2023-11-16		
Liquidity Group	Index Weight	ZPR Weight
< 50M	4.74%	7.87%
50M – 100M	34.48%	33.04%
100M – 200M	47.93%	45.95%
200M – 300M	10.37%	10.01%
> 300M	2.48%	3.13%
Undefined	0.00%	0.00%

Table ZPR-4 Notes

It is again disappointing to see such poor credit quality in ZPR, with over 40% of the portfolio being rated in the 'junk' range by DBRS.

Table ZPR-4: Credit Analysis Analysis of 2023-11-16

Credit Group (DBRS Ratings)	Index Weight	ZPR Weight
Pfd-1(high)	0.00%	0.00%
Pfd-1	0.00%	0.00%
Pfd-1(low)	0.00%	0.00%
Pfd-2(high)	23.26%	24.61%
Pfd-2	16.37%	18.33%
Pfd-2(low)	10.48%	8.33%
Pfd-3(high)	26.25%	27.82%
Pfd-3	11.45%	7.74%
Pfd-3(low)	7.61%	7.11%
Pfd-4(high)	0.00%	No Sol!
Pfd-4	0.00%	No Sol!
Pfd-4(low)	0.00%	No Sol!
Pfd-5(high)	0.00%	No Sol!
Pfd-5	0.00%	No Sol!
Pfd-5(low)	0.00%	No Sol!
Undefined	4.57%	6.04%

It will be noted that BMO provides a credit quality classification analysis of its own on the ZPR main page at https://www.bmogam.com/ca-en/products/exchange-traded-fund/bmo-laddered-preferred-share-indexetf-zpr/; this indicated that only 27.5% of the portfolio is in the P-3 group on December 6, 2023. Most of the discrepancy will be due to Enbridge, which is rated P-2(low) by S&P and Pfd-3(high) by DBRS; this company has a weight of 11.5% in ZPR as indicated in Table ZPR-1C. Another chunk is accounted for by BCE, which comprises about 6.8% of ZPR and 11.5% of the index. The S&P outlook for Enbridge's rating was revised to negative on 2023-9-6, so perhaps the 'split rating' of this issuer will be resolved in the near future! However, in December a new 'split rating' has been created,[6] with Fairfax Financial Holdings now rated at Pfd-2(low) by DBRS and Pfd-3(high) by S&P; some might take comfort in this, as it mitigates the lack of balance between the overall DBRS and S&P assessments of credit quality.

Table ZPR-5: FixedReset Spread Analysis Analysis of 2023-11-16

Spread Group	Index Weight	ZPR Weight
< 100bp	0.00%	0.00%
100 – 149bp	0.53%	1.78%
150 – 199bp	7.99%	4.68%
200 – 249bp	25.95%	28.48%
250 – 299bp	28.46%	30.53%
300 – 349bp	16.45%	15.85%
350 – 399bp	10.65%	11.14%
400 – 449bp	2.25%	2.18%
450 – 499bp	0.85%	1.34%
500 – 549bp	0.95%	0.44%
550 – 599bp	0.00%	0.00%
> = 600bp	0.00%	0.00%
Undefined	5.93%	3.60%

[6] See https://prefblog.com/?p=46084

Table ZPR-6 Notes

And at last we get to the fascinating part of this analysis, a comparison of term-bucket weights! First, the data presented with term buckets as defined by HIMIPref™:

Table ZPR-6: Floating Rate Start Date Analysis Analysis of 2023-11-16

Floating Rate Start Date Term Buckets determined relative to Calculation Date	Index Weight	ZPR Weight
Currently Floating	0.00%	0.02%
0 – 1 year	20.76%	30.57%
1 – 2 years	18.01%	21.46%
2 – 3 years	21.92%	16.54%
3 – 4 years	19.72%	11.14%
4 – 5 years	19.59%	20.27%
5 – 6 years	0.00%	0.00%
More than 6 years	0.00%	0.00%
Not Floating Rate	0.00%	0.00%

Both the fund and the index indicate that their buckets are based on calendar years, so the data has been sorted with the following results:

Table ZPR-6A: Resets Effective by Calendar Year Analysis of 2023-11-16

Calendar Year	% with Reset Effective in Calendar Year		
	Index Weight	ZPR Weight	ZPR Weight per BMO
2024	19.60%	28.60%	27.69%
2025	20.78%	22.46%	22.35%
2026	19.22%	12.97%	13.40%
2027	20.03%	11.13%	11.38%
2023/2028	20.33%	24.62%	25.19%
BMO data is taken from their report at https://bmogamhub.com/system/files/bmo_etfs_preferred_share_data.pdf/?file=1&type=node&id=81954 downloaded 2023-12-7 and dated as of 2023-10-31			

As discussed in the November edition, edge effects and minor differences in the deemed Reset Date (does the issue reset on December 31, or on January 1 of the following year?) might be responsible for some of the differences between the BMO figures and my analysis, but the agreement is pretty good – and might well reflect differential performance between the reset buckets due to the term to reset.[7] However the conclusions are clear: ZPR is grossly underweighted in the 2026 and 2027 reset buckets, contrary to their prospectus and advertising: https://www.bmogam.com/ca-en/advisors/investment-solutions/etf/bmo-laddered-preferred-share-index-etf-zpr/:

Portfolio Strategy
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Benchmark Info
The Solactive Laddered Canadian Preferred Share Index includes Canadian preferred shares that meet size, liquidity, listing and quality criteria. The Index uses a five year laddered structure where annual buckets are equal weighted while constituent securities within each bucket are market capitalization weighted.

A Closer Look at the 2027 Reset-Term Bucket

The issues comprising the 2027 Reset Term Bucket have been isolated from Table ZPR-1 and are shown in Table ZPR-7.

I will note, again, that there may be edge effects in this analysis as there are four issues with a listed (but possibly inaccurate) reset date of 2027-12-31; there is one issue (BCE.PR.K) that has been assigned to the 2026 bucket due to a listed reset date of 2026-12-31. I have not investigated these potential inaccuracies, as it is evident that my figures are so close to BMO's that if we've made any mistakes in the bucket assignments, we've made them together!

[7] See the discussion "Interest Rate Shocks and Term to Reset" In the August, 2022, edtion of PrefLetter.

Table ZPR-7
2027 Reset-Term Bucket
Analysis of 2023-11-16

Ticker	Current Yield Bid	Yield-to-Worst (at Bid)	DBRS Rating	Average Trading Value	Holdings bid price	Index Holdings Weight	ZPR Holdings Weight	Modified Duration YTW	FixedReset Spread	Floating Rate Start Date	Implied GOC5 Last Reset
BN.PF.I	7.74%	10.41%	Pfd-2(low)	117,810	17.40	1.15%	0.67%	9.83	385	2027-03-31	1.54%
BN.PR.T	7.61%	11.16%	Pfd-2(low)	69,363	12.63	0.69%	0.39%	9.49	231	2027-03-31	1.54%
BPO.PR.E	13.95%	18.09%	Pfd-3(low)	127,808	9.85	0.61%	0.27%	6.12	396	2027-03-31	1.54%
BPO.PR.P	14.14%	19.01%	Pfd-3(low)	113,496	8.02	0.54%	0.37%	5.95	300	2027-03-31	1.54%
FFH.PR.K	6.91%	9.48%	Pfd-3 (high)	63,354	18.26	0.98%	0.39%	10.59	351	2027-03-31	1.53%
CU.PR.C	7.46%	8.76%	Pfd-2	79,323	17.42	1.27%	0.84%	11.04	240	2027-06-01	2.80%
ENB.PR.B	8.73%	10.20%	Pfd-3 (high)	196,412	14.90	1.71%	1.01%	9.81	240	2027-06-01	2.80%
BN.PR.X	8.86%	10.67%	Pfd-2(low)	59,776	13.00	0.68%	0.29%	9.39	180	2027-06-30	2.81%
BPO.PR.G	15.86%	18.18%	Pfd-3(low)	94,007	10.32	0.64%	0.25%	5.75	374	2027-06-30	2.81%
ECN.PR.C	15.14%	17.15%	Pfd-4 (high)	39,665	13.11	0.00%	0.02%	6.04	519	2027-06-30	2.75%
TA.PR.F	8.70%	10.20%	Pfd-3(low)	56,687	16.83	0.00%	0.44%	9.67	310	2027-06-30	2.75%
BCE.PR.A	7.88%	10.61%	Pfd-3	187,839	15.68	1.01%	0.48%	10.35	No Sol.	2027-09-01	N/A
MFC.PR.I	7.23%	8.16%	Pfd-2(high)	116,433	20.68	1.16%	0.59%	11.39	286	2027-09-19	3.12%
PPL.PR.O	8.53%	9.45%	Pfd-3 (high)	82,203	18.06	0.81%	0.41%	10.15	292	2027-09-30	3.24%
TA.PR.H	8.60%	9.45%	Pfd-3(low)	68,359	20.05	1.01%	0.47%	10.13	365	2027-09-30	3.24%
TD.PF.I	6.79%	7.39%	Pfd-2(high)	189,770	23.20	1.83%	1.22%	12.20	301	2027-10-31	3.29%
NA.PR.C	7.03%	7.10%	Pfd-2	165,044	25.00	2.25%	1.41%	3.46	343	2027-11-15	3.60%
BN.PF.J	8.58%	9.57%	Pfd-2(low)	177,851	18.15	1.21%	0.47%	10.10	310	2027-12-31	3.13%
BN.PR.Z	8.82%	9.86%	Pfd-2(low)	113,757	17.25	0.95%	0.43%	9.86	296	2027-12-31	3.13%
BPO.PR.I	15.42%	17.13%	Pfd-3(low)	80,850	10.31	0.58%	0.26%	6.03	323	2027-12-31	3.13%
IFC.PR.A	7.14%	8.16%	Pfd-2(high)	45,364	16.96	0.95%	0.45%	11.48	172	2027-12-31	3.12%
ZPR Total or Average	**8.48%**	**9.99%**		**125,933**			**11.13%**	**9.17**			**2.68%**
Index Total or Average	**8.60%**	**10.15%**		**125,531**		**20.03%**		**9.20**			**2.68%**

Yields to perpetuity are calculated assuming a constant 5-Year Canada yield of 3.97%, a constant 3-Month Bill yield of 5.12%, or a constant Prime Rate of 7.20% as applicable.

To calculate yields using other assumptions, use the FixedReset Yield Calculator described and linked at http://prefblog.com/?p=27023.

Implied GOC5 Last Reset is weighted by the notional number of shares held in a $1-million portfolio. All other averages are weighted by the applicable Holdings Weight

Performance

As has been shown in the preceding sections, there are a lot of discrepancies between the Solactive portfolio characteristics and those of the ZPR portfolio. These discrepancies may possibly have no effect on performance (if, for instance, every preferred share issue exhibits the same performance over any given period) or the effect could be quite significant.

So in order to investigate this further, I downloaded the performance of the ZPR portfolio as reported by BMO against their reporting of the index performance. These figures are reported in Table ZPR-8.

Table ZPR-8: Performance of ZPR and of Index to October 31, 2023 As reported by BMO

Annualized Performance	1Y	2Y	3Y	5Y	10Y	Since Inception
NAV	-6.06%	-10.99%	2.69%	-0.67%	-0.17%	-0.42%
Index	-9.93%	-12.87%	1.31%	-1.24%	-0.15%	-0.30%

Data recovered 2023-11-22, dated as of 2023-10-31 from https://www.bmogam.com/ca-en/advisors/investment-solutions/etf/bmo-laddered-preferred-share-index-etf-zpr/

I cannot stress highly enough just how ridiculous these numbers are. This is supposed to be an index fund, and I will remind readers, yet again, of BMO's promise in advertising:

> **Portfolio Strategy**
> BMO Laddered Preferred Share Index ETF has been designed to replicate, to the extent possible, the performance of the Solactive Laddered Canadian Preferred Share Index, net of expenses. The Fund invests in and holds the Constituent Securities of the Index in the same proportion as they are reflected in the Index.

There is also these assertions in the prospectus:[8]

> BMO Laddered Preferred Share Index ETF seeks to replicate, to the extent possible, the performance of a Canadian preferred shares index, net of expenses.
>
> …
>
> The investment strategy of BMO Laddered Preferred Share Index ETF is currently to invest in and hold the constituent securities of the Solactive Laddered Canadian Preferred Share Index in the same proportion as they are reflected in the Index. The Manager may also use a sampling methodology in selecting investments for BMO Laddered Preferred Share Index ETF to obtain exposure to the performance of the Index.
>
> As an alternative to or in conjunction with investing in and holding all or some of the constituent securities of the Solactive Laddered Canadian Preferred Share Index, BMO Laddered Preferred Share Index ETF may invest in or use Other Securities to obtain exposure to the performance of the Index.

And in the factsheet:[9]

> **Portfolio Strategy**
> BMO Laddered Preferred Share Index ETF has been designed to replicate, to the extent possible, the performance of the Solactive Laddered Canadian Preferred Share Index, net of expenses. The Fund invests in and holds the Constituent Securities of the Index in the same proportion as they are reflected in the Index.

[8] See https://www.bmogam.com/uploads/2023/10/b72a3cbed64409c74ceb88ea8ac16ddd/bmo-etf-prospectus_en.pdf. Note that this link has changed from that provided with previous editions of this newsletter (accessed 2023-12-8).

[9] Downloadable from https://www.bmogam.com/ca-en/products/exchange-traded-fund/bmo-laddered-preferredshare-index-etf-zpr/ (accessed 2023-12-8)

And in the ETF Facts:[10]

What does the ETF invest in?
The ETF seeks to replicate, to the extent possible, the performance of a Canadian preferred share index, net of expenses. Currently, the ETF seeks to replicate the performance of the Solactive Laddered Canadian Preferred Share Index (the "Index"). The Index includes rate reset preferred shares that generally have an adjustable dividend rate and are laddered with equal weights in annual reset term buckets. Securities are market capitalization weighted within the annual term buckets.

With all these assurances, it is difficult to comprehend the tracking error of 387bp over one year between the index and the fund … but we have seen from the prior work in this essay and in its predecessors that there is a great gulf between promises and reality.

Readers will recall from Tables ZPR-1B and ZPR-1C that the proportion of BPO held in the two portfolios was 5.65% for the Index and 3.10% for ZPR in this analysis – a discrepancy that is horrifying considering that BPO has a junk-level rating and is therefore generally considered to have a higher issuer-specific risk than investment-grade issues. As we know that BPO issues have performed horribly in the past year:[11]

Table ZPR-9: Weights and Performance of BPO Issues

Issue	Weight in Index	Weight in ZPR	Total Return, one year ending 2023-10-31	Total Return, two years ending 2023-10-31
BPO.PR.A	0.21%	0.32%	-45.56%	-55.33%
BPO.PR.C	0.95%	0.42%	-51.55%	-55.23%
BPO.PR.E	0.61%	0.27%	-47.89%	-57.74%
BPO.PR.G	0.64%	0.25%	-52.37%	-53.72%
BPO.PR.I	0.58%	0.26%	-50.58%	-52.93%
BPO.PR.N	0.89%	0.41%	-52.97%	-62.40%
BPO.PR.P	0.54%	0.37%	-51.10%	-61.49%
BPO.PR.R	0.87%	0.25%	-51.39%	-61.08%
BPO.PR.T	0.36%	0.55%	-36.98%	-46.81%
Total or Average, Index	**5.65%**		**-50.15%**	**-57.19%**
Total or Average, ZPR		**3.10%**	**-48.13%**	**-55.82%**

Averages have been calculated using the 2023-11-16 weights for each of the two periods ending 2023-10-31. This is not correct: the weights used should have been those applicable at the beginning of each period, not the weight after the end! I do not consider the error thus introduced to be significant; the calculation of the correct figures and the sending of a scornful and triumphant eMail to the author is left as an exercise for the reader.

Now comes my favourite part of doing these appendices: algebra! We want to determine how much of the tracking error can be attributed solely to ZPR's underweighting in the poorly performing BPO issues, given an assumption that the fund did no trading over the year.This assumption will be incorrect, of course, but BMO is welcome to send me figures that reflect the details of the fund's operation.

Let: W^1_{BPO} be the weight of BPO at the end of the period

W^1_{OTHER} be the weight of other issuers at the end of the period

W^1_{BPO} be the weight of BPO at the beginning of the period

W^0_{OTHER} be the weight of other issuers at the beginning of the period

R_{BPO} be the return of BPO over the period

R_{OTHER} be the return of other issuers over the period

R be the total return of of the portfolio over the period

MER be the expenses of the portfolio

so $R = W^1_{BPO} \bullet R_{BPO} + W^0_{OTHER} \bullet R_{OTHER} - MER$ (1)

[10] Downloadable from https://www.bmogam.com/ca-en/products/exchange-traded-fund/bmo-laddered-preferredshare-index-etf-zpr/ (accessed 2023-12-8)

[11] See, for instance, https://prefblog.com/?p=45091 and the comments thereto, which are very good.

and since $W^{1}_{BPO} + W^{0}_{OTHER} = 1$ (1.5)

then $R = W^{0}_{BPO} \bullet R_{BPO} + \left(1 - W^{0}_{BPO}\right) \bullet R_{OTHER} - MER$ (2)

The weights of the constituents will change over the period:

$$W^{1}_{BPO} = \frac{W^{0}_{BPO} \bullet R_{BPO}}{R + MER} \quad (3)$$

$$W^{0}_{OTHER} = \frac{W^{0}_{OTHER} \bullet R_{OTHER}}{R + MER} \quad (4)$$

and by rearranging:

$$W^{0}_{BPO} = \frac{W^{1}_{BPO} \bullet \left(R + MER\right)}{R_{BPO}} \quad (5)$$

and clearly $W^{0}_{OTHER} = 1 - W^{1}_{BPO}$ (6)

We can show the calculation as Table ZPR-10

Table ZPR-10: Solution of Equations; Analysis of 2023-11-16

Parameter	Solactive	ZPR	Source
BN Group (from table ZPR-1B)	18.44%	13.34%	-5.10%
W^{1}_{BPO}	0.0565	0.0310	Table ZPR-1D
R + MER	0.9007	0.9444	Table ZPR-8 (net return) and BMO's "ETF Facts" (MER)
R_{BPO}	0.4985	0.5187	Table ZPR-9
W^{0}_{BPO}	0.1021	0.0564	Equation (5)
W^{0}_{OTHER}	0.8979	0.9436	Equation (1.5)
R_{OTHER}	0.9464	0.9721	Equation (1)

Table ZPR-10 can be summarized with conventions more usual for portfolio reporting:

Table ZPR-11: Alternative Summary of Table ZPR-10 Analysis of 2023-11-16

Parameter	Index Value	ZPR value
Initial Weight BPO	10.21%	5.64%
Initial Weight Other	89.79%	94.36%
Return BPO	-50.15%	-48.13%
Return Other	-5.36%	-3.02%
Total Return + MER	-9.93%	-5.56%

The conclusion to be drawn from Table ZPR-11 is that the tracking error of the total portfolio, 4.37%, was comprised of tracking errors of 1.96% due to the "Other Issuers" (largely due to the return differential) and 2.41% essentially due to the underweighting of BPO in ZPR relative to the index.

An immediate objection to Table ZPR-11 and the conclusions thereof is that 10.21% sounds like a very big portfolio weight for BPO. The company is a big issuer, but surely it's not that big! We can rationalize this mystery by examining Table ZPR-1 a little more closely, focussing on the BPO issues; we do this in Table ZPR-12.

Table ZPR-12: Floating Rate Start Dates for BPO Issues
Analysis of 2023-11-16

Ticker	Index Holdings Weight	ZPR Holdings Weight	Floating Rate Start Date
BPO.PR.A	0.21%	0.32%	2024-12-31
BPO.PR.C	0.95%	0.42%	2026-06-30
BPO.PR.E	0.61%	0.27%	2027-03-31
BPO.PR.G	0.64%	0.25%	2027-06-30
BPO.PR.I	0.58%	0.26%	2027-12-31
BPO.PR.N	0.89%	0.41%	2026-06-30
BPO.PR.P	0.54%	0.37%	2027-03-31
BPO.PR.R	0.87%	0.25%	2026-09-30
BPO.PR.T	0.36%	0.55%	2023-12-31
Total	**5.65%**	**3.10%**	

We notice immediately that the bulk of these issues reset in 2026 and 2027 … and just by chance, these are two Term Buckets most underweighted by BMO (see Table ZPR-6A) and, as noted, in the November edition:

> It is clear that the calendar years that are underweighted are 2026 and 2027. Readers will remember that there were substantial numbers of redemptions in 2021 and 2022 (23 FixedReset in each of the two years, by my quick and unverified count); it is possible that proceeds of these redemptions were distributed among all 'reset buckets' rather than being reinvested in the originating reset bucket. Such an action would lead to underweighting in the bucket experiencing the redemption. This appears to conflict with the assertions made on the fund's web-page at https://www.bmogam.com/ca-en/advisors/investment-solutions/etf/bmo-laddered-preferred-shareindex-etf-zpr/:

So this is interesting; we shall now examine the Term Bucket weights and compare these values with the corresponding weights of BPO issues in Table ZPR-13:

Table ZPR-13: Term Bucket Holdings of BPO Issues
Analysis of 2023-11-16

Term Bucket	Index Weight Total	ZPR Weight Total	Index BPO Weight	ZPR BPO Weight
2024	19.60%	28.62%	0.21%	0.32%
2025	20.78%	22.46%	0	0
2026	19.22%	12.97%	2.71%	1.08%
2027	20.03%	11.13%	2.37%	1.15%
2023/2028	20.33%	24.82%	0.36%	0.55%
Total	**99.96%**	**100.00%**	**5.65%**	**3.10%**

Given that BPO issues comprise over 10% of the weight of both the 2026 and 2027 Term Buckets and do so having lost half their value in the past year (Table ZPR-9) it does not seem unreasonable to me that their total weight in the portfolio was over 10% a year ago: there has been a very strong effect of the Term Bucket weighting adjustments, which are described (badly) in the Index Methodology[12] and reviewed in the November edition.

In other words, as issues were redeemed in 2021-22, the adjustment to the bucket weight was increased in order to maintain these weights at 20% per bucket. BPO issues are highly concentrated in these two buckets and were therefore disproportionately affected by these changes.

[12] Solactive, *GUIDELINE, Solactive Laddered Canadian Preferred Share Index, Version 2.1 dated December 18th, 2017,* available on-line at https://www.solactive.com/wp-content/uploads/2017/12/Index-Methodology_Laddered_Preferred_Index.pdf (accessed 2023-10-13)

A Word about BMO's Customer Response

I must say I am not at all impressed with the responses by BMO front-line staff to my queries.

Early in the morning of September 7 I sent an eMail to BMO, providing some analysis and quotations from their material to provide background for my query:

> Can you comment on the relative distribution of the reset effective dates, in light of the assertions that "annual buckets are equal weighted" and "The Fund invests in and holds the Constituent Securities of the Index in the same proportion as they are reflected in the Index."?

I have been following up on this query more or less weekly ever since. I've received two apologetic responses from front line staff, but to all appearances the only thing they can do is "escalate" the query to the same recipient every single time: the "product management team."

This is ridiculous. This is not escalation. Escalation, as I understand it, means that if you don't get your answer within, say, a week, you escalate to the supervisory level and the question is dealt with supervisor to supervisor. If there's still no response, it's escalated again to the managerial level, to be dealt with manager to manager, all the way up the line until somebody with authority to do so states "we are not going to answer this question," and that a questioner with equal authority accepts that decision … or escalates it yet again.

At BMO, escalation seems to mean simply that if the 'phone staff can't answer the question, they 'escalate' it to the portfolio management staff – and it seems to me that the portfolio management staff knows they have a big problem but are hoping to keep it quiet.

My question should have been in the hands of compliance within a couple of weeks. But either there is no escalation pathway at BMO to compliance, or it hasn't been used. A disgrace in either case.

Conclusion

It seems clear that BMO is guilty of some very shady practice in their management and advertising of ZPR.

As discussed in the October and November edition, they make repeated false claims about the relative weighting of the Term Buckets in the fund, in their prospectus,[13] website advertising,[14] ETF Facts[15] and the ZPR Factsheet[16]. This fact that this falsehood is reiterated so frequently indicates to me that BMO's marketing staff has determined that laddering is very important to prospective purchasers, yet these promises are given short-shrift when it comes to portfolio composition.

Another claim, repeated in some form or another, is illustrated by this example from the factsheet:

> **Portfolio Strategy**
> BMO Laddered Preferred Share Index ETF has been designed to replicate, to the extent possible, the performance of the Solactive Laddered Canadian Preferred Share Index, net of expenses. The Fund invests in and holds the Constituent Securities of the Index in the same proportion as they are reflected in the Index.

Oh, really? There have been many examples given in this essay that show the fund does not, in fact invest in the Constituent Securities of the Index in the same proportion as they are reflected in the Index.

It is my guess that, if challenged by someone in a position to demand an answer, BMO will fall back on its ability (granted by the prospectus) to pursue a sampling methodology[17], as discussed earlier:

> BMO Laddered Preferred Share Index ETF seeks to replicate, to the extent possible, the performance of a Canadian preferred shares index, net of expenses.
> …
> The investment strategy of BMO Laddered Preferred Share Index ETF is currently to invest in and hold the constituent securities of the Solactive Laddered Canadian Preferred Share Index in the same proportion as they are reflected in the Index. The Manager may also use a sampling methodology in selecting investments for BMO Laddered Preferred Share Index ETF to obtain exposure to the performance of the Index.
>
> As an alternative to or in conjunction with investing in and holding all or some of the constituent securities of the Solactive Laddered Canadian Preferred Share Index, BMO Laddered Preferred Share Index ETF may invest in or use Other Securities to obtain exposure to the performance of the Index.

I don't think such bluster will hold up under informed scrutiny. What kind of carefully considered and properly executed sampling methodology would lead to such egregious violations of the term bucket weights? Importantly, how will such a sampling methodology result in a tracking error of over 300bp in a single year?

The bank's apologists can certainly try to argue they used a "sampling methodology in selecting investments for BMO Laddered Preferred Share Index ETF to obtain exposure to the performance of the Index," but it will take a bit of work to convince me that such a sampling methodology was designed and executed with both prudence and an eye to their explicit statements regarding portfolio composition.

They may say, for instance, that BPO is underweighted because their highly skilled investment personnel determined that BPO was a poor investment in the current environment and was ripe for a fall, with other discrepancies between the fund and its index being justified similarly. Sorry, but that's active management. The fund's clients have made an explicit decision to purchase an Index Fund – albeit a fund with an index created for the purpose of creating that index fund – and active management is completely contrary to the ethos of index funds.

I don't think such bluster will hold up under informed scrutiny. What kind of carefully considered and properly executed sampling methodology would lead to such egregious violations of the term bucket weights? Importantly, how will such a sampling methodology result in a tracking error of over 300bp in a single year?

[13] See prospectus dated 2023-1-17 at https://www.bmo.com/assets/pdfs/gam/bmo-eR-prospectus_en.pdf (accessed 2023-11-11)

[14] See https://www.bmogam.com/ca-en/products/exchange-traded-fund/bmo-laddered-preferred-share-index-eR-zpr/

[15] This document, dated 2023-1-17 can be downloaded from the fund's main web page; https://www.bmogam.com/caen/products/exchange-traded-fund/bmo-laddered-preferred-share-index-eR-zpr/

[16] This document, dated 2023-8-31, can be downloaded from the fund's main web page; https://www.bmogam.com/caen/products/exchange-traded-fund/bmo-laddered-preferred-share-index-eR-zpr/

[17] See https://www.bmogam.com/uploads/2023/10/b72a3cbed64409c74ceb88ea8ac16ddd/bmo-etf-prospectus_en.pdf. Note that this link has changed from that provided with previous editions of this newsletter (accessed 2023-12-8)

Another possible argument is that the preferred share market is so illiquid that it is completely impossible to reflect the index composition on a steady basis; I have a bit more sympathy for this argument, but again it doesn't withstand informed scrutiny. The first thing I want to know is: what steps is the bank taking to reduce differences in holdings? It would be very easy in these technological days to create a buy-basket and a sell-basket at the beginning of every trading day, seeking to buy and sell shares at favourable prices to address the discrepancies. Sure, it would be slow and perhaps only a few of the orders would get filled, but little things add up. BCE was able to buy $100-million of its own preferred shares back in its last year,[18] and all the while was able to comply (I assume!) with the very strict rules governing Normal Course Issuer Bids.

The second thing I want to know should the company try the 'illiquidity' argument is: what about BPO? Can anyone really claim there was a shortage of BPO shares available to rebalance their position during the course of a 50% loss of value over one year?

The final argument BMO can make that I can think of is … the tracking error was positive, so who cares? All I can tell you is that this makes as much sense as embezzling gambling money from a company, making reimbursement when the gamble pays off and claiming that this makes everything all right. The bets could just as easily have gone the other way; to claim that these bets are made with an informed view of the market is to admit to active management in an explicitly passive fund.

And what alternatives were there? Say that staff was very concerned about the credit quality of the portfolio and the high exposure to unpopular companies like BPO. These are legitimate concerns, but the bank has not executed the only way of addressing such concerns in an ethical manner: changing the index methodology, either by negotiating changes with Solactive or by changing the fund's benchmark to one supplied by another company. I would be pleased to see a change in the methodology to apply caps to issuer weight that reflect the Issuer Specific Risk of each issuer – say, 10% for investment-grade issuers and 1% for junk issuers, as I apply (with no sharp edges or forced sales on downgrade) to accounts I manage. And, of course, the clear alternative to lying about the relative weight of the Term Buckets is … not lying.

[18] See https://prefblog.com/?p=45962