

Model Portfolio Using ETFs

- We are updating our five ETF Model Portfolios to May 2019, with complete tear sheets for five different risk profiles from Income to Max Growth
- Two specialty portfolios are discussed - ESG and Yield Focus portfolios
- In this report we walk through portfolio construction, product selection on core and strategic ETFs, benchmarking as well as analytics

Overview: In this report, we update the five core model ETF portfolios. We also provide two specialty portfolios: one integrates ESG (environmental, social and governance) considerations using available Canadian ETFs, and the other is a balanced portfolio with a monthly yield focus. We present detailed summary reports showing geographic and sector exposures, simulated backtest performance and benchmarking.

Asset Allocation: Based on in-house views from our Economics and Strategy team (Quarterly Investment Strategy Report, March 2019). These are broad and diversified weighting schemes with six basic asset classes, including cash.

Core ETF Selection: For each asset class, we seek the broadest possible exposure for the lowest expense in terms of fees and transaction costs. We screen ETFs along a range of quantifiable metrics to assess 1) Liquidity 2) Performance 3) Cost and 4) Diversification to arrive at a selection of “core” funds for each exposure.

Strategic ETF Selection: Where allocation allows, each asset class is supplemented with a strategic, factor-based or active ETF that considers a more qualitative set of criteria:

- 1) Does the strategy have a compelling economic rationale?
- 2) Does the ETF deliver its intended strategy?
- 3) Is the ETF sufficiently different from a low-cost, broad-market ETF?
- 4) Is the investor comfortable with the fund’s characteristics?
- 5) Is the ETF strategy robust?

Benchmark: We compare the performance of each portfolio with a blended combination of indices, using the fixed weights in the Investment Strategy reports. The blended benchmarks are rebalanced quarterly and consist of passive index components, as illustrated in Table 14.

Rebalance: In the backtest simulation, asset classes were rebalanced to target weights recommended for each historical quarter at the end of the first trading day in January, April, July and October.

Other Methodology Notes:

Total return is calculated based on ETF market price rather than NAV.

Proxy: Where applicable, prior to an ETF’s inception, proxies act as substitutes for ETF returns. When an index is used as the ETF’s proxy, we penalized the index return by the ETF’s management expense ratio (MER) to simulate a live return.

Portfolio Fees: Backtested returns are presented net of ETF fees and incorporate an additional assumed 1% annual fee for the service and transaction costs of the portfolio.

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**Asset
Allocation**



**Core ETF
Selection and
Screening**



**Strategic ETF
Selection and
Screening**



**Blended
Benchmark**



**Backtest &
Analytics**

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Summary

As of June 2019, there were over 800 ETFs in Canada from 36 providers. With the ever-growing number and variety of ETFs in the Canadian marketplace, not to mention the United States, investors have unprecedented power and freedom to create low-cost, efficient and diverse portfolios with exposure to nearly every asset class under the sun.

This is an annual report in which we walk through our portfolio construction and ETF selection process. We demonstrate five core model portfolios and two specialty portfolios that employ our methodology for asset allocation, portfolio construction, backtesting and analytics. Much of the content has been described in our previous editions and/or other thematic reports, but new for 2019 are the following:

- Updated the quarterly asset allocation with the 2019 weights from National Bank's Investment Strategy Committee.
- Added a specialty portfolio for ESG (environment, socially responsible, governance) investing and removed the U.S. dollar portfolio.
- We try to present multiple products when they are equally compelling. Therefore different ETFs are used across the five model portfolio.
- Strategic equity ETFs are screened with considerations that are tailored for the suitability of each portfolio's objectives. This is in addition to accommodating risk tolerance through asset allocation.

1. ETF Model Portfolios Construction

1.1 Asset Allocation

We begin with our NBF asset allocation based on the views from our Economic and Strategy team's Investment Strategy Report. These are broad and diversified asset allocation schemes with six basic asset class lines, including cash (Table 1). The low number of lines makes the model extremely flexible and accommodative to portfolios of virtually any size or risk tolerance. These weights are updated quarterly with slight changes based on in-house market expectations. The model allows for static weights for each asset class, without the quarterly tactical shifts. We apply the static asset allocation scheme towards broad, well-recognized indices to calculate five blended benchmarks to measure and assess the performance of each model portfolio.

Table 1: National Bank Financial Investment Strategy Asset Allocation March 2019

	Income	Conservative	Balance	Growth	Maximum Growth
EQUITY	23.0%	39.0%	50.0%	59.0%	69.0%
Cdn	9.0%	15.5%	20.0%	23.5%	27.5%
U.S.	9.0%	15.5%	20.0%	23.0%	27.0%
Foreign	5.0%	8.0%	10.0%	12.5%	14.5%
BOND	66.0%	51.0%	35.0%	26.0%	11.0%
Cdn	33.0%	25.5%	24.0%	18.0%	7.0%
International	33.0%	25.5%	11.0%	8.0%	4.0%
ALT	5.0%	5.0%	10.0%	10.0%	15.0%
Infrastructure	2.5%	2.5%	3.3%	5.0%	7.5%
Gold	2.5%	2.5%	3.3%	0.0%	0.0%
Other	0.0%	0.0%	3.3%	5.0%	7.5%
CASH	6.0%	5.0%	5.0%	5.0%	5.0%

Source: National Bank Financial

1.2 Currency Overlay

In this report, we have stripped away currency hedging decisions within the equity portion of the product selection and display currency *non-hedged* products in the model portfolios. Our blended benchmark portfolios also adopt a similar strategy, using non-hedged total return equity indices. This allows us to conduct direct comparisons between the model ETF portfolios and the commonly accepted benchmarks through the entire period of backtesting. In the case of foreign bond ETFs, most products hedge or discretionarily hedge currency exposure, which would represent our product choice and bond index treatment when benchmarking.

We do recognize the value of the currency hedging in the certain market environments and encourage investors to make this decision as part of the portfolio construction process. Where applicable, we indicate the availability of the currency hedged version of a product.

1.3 Strategic Allocation

We take two specific directions with regard to gaining exposure to each asset class:

- **Core:** for broadest and least expensive exposure
Here we're looking for ETFs that offer the broadest possible exposure to the asset class with the lowest expense in terms of fees and transaction costs. We typically use passive index-tracking ETFs, selected by using a range of quantifiable metrics to assess the cost, performance, liquidity and diversification to arrive at a selection of "core" funds for each exposure. All core funds in this report show a similar degree of very high quality. Virtually any combination of these core products could represent a low-cost, well-diversified, efficient ETF portfolio.
- **Satellite:** for characteristic tilt and potential outperformance
Where appropriate, we supplement each passive "core" with a strategic ETF that can be anything from alternatively weighted, actively managed or factor index-based (e.g., value or growth). This allocation builds on the passive core for investors wishing to express a particular view, for example preferring only dividend-paying stocks, or those looking for a specific strategy such as low volatility. In addition, where available, investors may have the choice to implement an outright actively-managed fund if they believe the particular asset class is not well represented by an index tracking product.

We want to emphasize that the strategic segment is neither required nor risk-free for any portfolio. By adding strategic components, investors take on additional cost and tracking risk with the possibility of underperforming a plain market cap weighted exposure. Underperformance can result from the added costs associated with these exposures, or from selecting the wrong strategy (e.g., growth vs. value) or simply by having a poor-performing strategy, methodology or manager. If all aligns well, however, investors may benefit from additional returns or enhanced portfolio risk-adjusted performance.

Sliding Scale of Relative Weights: The relative weight of the passive core versus the strategic component is subjective and up to the investor to decide the appropriate allocation (if any) in each asset class. Investors are free to choose no strategic ETFs, or they can turn their portfolio towards an entirely factor-based direction if they like. The choice can vary greatly by asset class.

We elected to go with a general one-third allocation within each segment as a starting point, but this is by no means an exact science. In the sample portfolios at the back of this report, the decision of "how much" to allocate between passive and strategic components depends on the asset class, risk profile, cost, and suitability of available products. The following rules of thumb were put into play:

- **Asset Class:** The smaller or less efficient a market, the more room for allocation to strategic ETFs. If an asset class is relatively small or "inefficient" in terms of market dynamics, non-passive strategies have a greater chance of offering outperformance. By a similar token, some asset classes have notable distortions in terms of sector exposures—Canadian equity's tilt to energy and financials being a prime example. In such cases, a strategic ETF that offers a divergence from the passive benchmark's tilts may be an appropriate supplement.
- **Risk Profile:** The higher the risk profile, the more room for strategic ETFs among higher-risk asset classes. Portfolios in the "growth" or "maximum growth" risk categories naturally have higher allocations to riskier asset classes such as international equities or alternatives. This extra "room" accommodates additional supplementary positions alongside the passive benchmark core. At the same time, the

investor's higher appetite for risk can translate to a greater tolerance for benchmark deviation, enabling a product selection that branches into more volatile single-factor exposure such as value or momentum.

- **Product selection:** If a particular strategic ETF has a strong track record, good liquidity, low cost, or combination of the three, investors can feel comfortable holding more of it relative to the passive core. Sometimes an individual ETF or index might offer a compelling rationale backed up by evidence or a strong history, so the relative allocation to a strategic ETF of this nature might merit greater emphasis.

While we feel comfortable in our ability to select the top performing products in the passive core, the decision among strategic, non-cap-weighted products is subjective. Investors' market outlooks and perspectives play a key role in the decision process. We simply present the potential toolset in each asset class for investors to choose from, selecting products for the model portfolio as an illustrative guide.

1.4 Core ETF Selection

We consider four categories to judge an ETF's effectiveness:

Liquidity: Many of the most liquid securities in the world are in fact ETFs, able to accommodate billions of dollars of trading without market impact. However, there are many funds that do not have this type of liquidity but are still sufficiently liquid for the average investor. To gauge liquidity, we looked at several key metrics falling under two blanket categories:

- **Primary Market Liquidity:** This refers to the liquidity of an ETF's underlying security. The tradability of an ETF's underlying basket will be constrained by its least liquid positions. We measure this by calculating the implied liquidity of the underlying basket for equity ETFs (see Glossary for definitions).
- **Secondary Market Liquidity:** Of lesser importance is the actual share volume and market capitalization of the ETF itself. The true liquidity of an ETF can be greater than its average trading volume, given the creation and redemption ability of ETFs. However, some ETFs with a high degree of secondary market activity can accommodate further trading that adds to and complements the liquidity provided by the ETF's designated broker or market makers. This is especially valuable in the case of Fixed Income ETFs, for which transparent measures of basket implied liquidity may be unavailable.

Performance: Here we stress that the metric we are analyzing is not raw performance on an absolute return basis. A priori, it is always very difficult to pick which ETF, index or strategy will have higher returns in the future. Instead, what we call performance is a measure of how well an ETF tracks its index. We separate this into two areas:

- **Excess Return** is the difference between the NAV based total return of an ETF and that of its underlying index for a specific period. We evaluate it on a rolling period basis and a standard deviation basis.
- **Premium/discounts to NAV** is a function of trading that captures how well the market price of the ETF follows its net asset value. ETFs generally trade around fair value, so we try to understand the cause of discrepancies when an ETF does not.

Cost: We look for the least expensive product in an asset class that delivers the performance we seek. There are two key metrics that help assess overall cost:

- **Total Expense Ratio (TER):** This metric considers an ETF's Management Expense Ratio (MER), which is the amount the ETF provider gets paid directly for offering the ETF, typically quoted as an annual percentage of assets. Total Expense Ratio also considers other costs internal to the ETF and not quoted as part of MER, such as internal trading expenses (and derivative counterparty fees in the case of synthetic ETFs).
- **Bid-Ask Spread Ratio:** This is the difference in price between the offer price and the bid price expressed as a ratio relative to the mid price. The wider this spread, the greater the cost to buy and sell the ETF. We measured this as the average bid-ask spread ratio over a specific historical period (e.g., the last month). We also consider the effective spread for nominal trades of various size.

Diversification

- **Concentration:** For the purposes of our ranking, we measure the percentage weight of the top 10 holdings within the ETF. A lower percentage is preferred, because it means the ETF has a lower concentration in a greater number of issuers.

- **Number of Holdings:** The overall number of equities or bonds in an ETF also helps us assess how diversified the fund is. Generally, the higher the number the better. This metric may be an important measure of diversification, but it does show diminishing returns as the number of holdings becomes significantly large.

Liquidity	Performance	Cost	Diversification
1. Primary Market 2. Secondary Market	3. Index to NAV 4. NAV to Price	5. TER (%) 6. Bid/Ask Spread	7. Concentration 8. # of Holdings

Source: NBF

1.5 Satellite ETF Additional Considerations

Thematic, factor-based or active ETFs can supplement the low-cost, pure-market ETFs that form the core of each asset class. In the past few years, the number of such products has ballooned to record proportions, with no slowdown in the pace of launches. Many of these offer attractive investment theses. In addition to the screening criteria mentioned in the previous section, we also consider the following questions when selecting ETFs for a satellite position:

- **Does the strategy have a compelling economic rationale?**
We look for strategies that can expect to generate explainable alpha, either by taking on additional risk or by profiting from behavioral or structural biases. The strategy is expected to outperform over an extended time horizon.
- **Does the ETF deliver its intended strategy?**
Many strategies work in the backtest given a frictionless environment, but the alpha disappears when these strategies are implemented in real life, where trading cost, market dynamics and long/short position constraints all come into play. We evaluate the live product over time to make sure the ETF delivers the expected risk/return profile.
- **Is the ETF sufficiently different from a low-cost, broad-market ETF?**
We evaluate how different the strategy is compared to a low-cost broad market mandate using Active Share. This is to identify closet index funds charging high fees. To be clear, we are perfectly okay with ETFs that hug a benchmark and only slightly deviate to enhance the portfolio. However, we check that the “cost per active share” is reasonable so that investors are paying less for reduced “activeness”.
- **Is the investor comfortable with the fund’s characteristics?**
Risk is a critical element for any investment let alone ETFs, but when it comes to strategies that differ significantly from a benchmark index, investors can identify the implications of their product selections. Some strategic ETFs explicitly promise reduced levels of risk, such as low-volatility ETFs. Others promise a degree of factor exposure (e.g., value, momentum) without mentioning the level of additional risk that might necessarily be assumed by adopting such strategies. We use several metrics to evaluate the ETF’s risk profile, including volatility, upside and downside capture ratios.
- **Is the ETF strategy robust?**
Because ETFs trade on exchanges, they require a certain level of liquidity and transparency to enable an open-ended structure. An ETF’s construction methodology should allow scalable assets under management. It should also be robust to regime shifts. For example, a fixed size inclusion cutoff of \$1 billion would be less robust than relative screening criteria defined as 0.1% of a region’s total market capitalization.

2. Product Selection

2.1 Core Equity

In addition to the core ETF criteria mentioned in the previous section, we are also defaulting to certain products to highlight for the Core Equity ETF selection. The preference is given to broad market exposures encompassing large, mid and small cap stocks. We are also choosing to highlight ETFs that track a well-established benchmark. We try to present a variety of products when they are equally compelling. Therefore different ETFs are used across the five model portfolio.

Table 2: Core Canada Equity ETFs

Ticker	Fund Name	MER %
XIC	iShares Core S&P/TSX Capped Composite Index	0.06
ZCN	BMO S&P/TSX Capped Composite Index ETF	0.05

Source: NBF, Bloomberg. Data as of May 2019

Canada Core Equity: There are 11 ETFs from seven fund companies providing either broad or large cap Canadian equity exposure. While many are high quality products, the model portfolios make use of the iShares Core S&P/TSX Capped Composite Index ETF (XIC) and BMO S&P/TSX Capped Composite Index ETF (ZCN), Table 2. Both products track the bellwether equity benchmark which encompass large, mid and small cap Canadian companies.

U.S. Core Equity: Though the S&P 500 ETFs are used by many to gain U.S. equity exposure, we like to use multi-cap ETFs that include thousands of companies for complete coverage of all companies listed on major U.S. stock exchanges. Some of the most diversified ETFs for U.S. exposure are also highly competitive. The iShares Core S&P U.S. Total Market Index ETF, with more than 3,500 holdings, charges only a 7 bps expense ratio (XUU), Table 3. The Vanguard U.S. Total Market Index ETF (VUN) is also a good product, charging 16 bps in MER. Both strategies have CAD-hedged versions (XUH and VUS, respectively).

Table 3: Core U.S. Equity ETFs

Ticker	Fund Name	MER%
VUN	Vanguard U.S. Total Market Index ETF	0.16
XUU	iShares Core S&P US Total Market Index	0.07

Source: NBF, Bloomberg. Data as of May 2019

Foreign Core Equity: In this segment, the ETFs tracking MSCI international developed and emerging market indices are given a slight preference in scoring as they are recognized benchmarks among the investment community. Secondly, some preference is also given to “all cap” versions of the benchmark, which consist of thousands rather than hundreds of stocks. Another consideration is to avoid potential country overlaps between the developed and emerging markets ETFs. FTSE considers South Korea as belonging to “Developed Markets” while MSCI includes it in the Emerging Markets indices. As a result, we select paired ETFs from the same provider to keep exposures consistent.

Three pairs of ETFs scored highly in our selection process, they are: iShares XEF and XEC, Vanguard VIU and VEE, and BMO ZEA and ZEM. All six ETFs charge low management fees ranging from 20 bps to 26 bps while providing sound exposure to foreign markets, Table 4.

Table 4: Core Foreign Equity ETFs

Ticker	Fund Name	MER%
International Developed		
ZEA	BMO MSCI EAFE Index ETF	0.21
XEF	iShares Core MSCI EAFE IMI Index ETF	0.22
VIU	Vanguard FTSE Developed All Cap ex North America	0.23
Emerging Markets		
ZEM	BMO MSCI Emerging Markets Index ETF	0.26
XEC	iShares Core MSCI Emerging Markets IMI Index	0.26
VEE	Vanguard FTSE Emerging Markets All Cap	0.24

Source: NBF, Bloomberg. Data as of May 2019

2.2 Strategic Equity

The equity asset class offers, by far, the greatest number of choices for strategic products including individual factors such as value, momentum, low volatility, dividend and multifactor strategies. In addition, actively managed ETFs have also gained market share. As a result, investors have the option to express a number of different views. The selection process for this segment incorporates screening used for the passive core, strategic equity as well as the portfolio-specific considerations described below. We show the Canada-focused strategic equity ETF selections in Table 5 and the full list of selected strategic ETFs in Appendix 2.

Income and Conservative portfolios: We incorporated screening on risk metrics such as volatility, downside capture and maximum drawdown. ETFs that stand out mostly fall under Dividend and/or Low Volatility buckets. Appendix 2 shows our resulting list.

- **Dividend ETFs** deserve strong consideration in Canada because of the eligible dividend tax credit available to Canadian investors. Dividends are also a “factor” of sorts, with strong academic and historical evidence of outperformance over multiple market cycles.
- **Low Volatility** strategies provide equity exposure with lower than benchmark volatility. These strategies have performed well in the past few years for a combination of reasons. Though some overweighted sectors such as utilities and REITs may show rate sensitivity. We consider this when constructing the fixed income portion of the portfolio.

Balanced Portfolio: We placed a focus on ETFs having a risk profile similar to the benchmark while adding potential upside through factor tilting. Multifactor and Dividend ETFs screened well, along with strategies like value and equal weight.

- **Multifactor** ETFs incorporate several of the commonly accepted factors in security selection. The mixed approach helps to diversify risks and reduce extreme deviations from the benchmark. See our Multi-Factor ETF report ([Link](#)) for more details.

Growth and Maximum Growth Portfolio: We seek products that are willing to deviate more from the benchmark and hence can take more risk in order to gain potential outperformance. We screened for high active share, high upside capture against their benchmarks and “low cost per unit of active share” to control costs. Products standing out include value ETFs and momentum ETFs. Some multifactor ETFs, dividend ETFs and even low volatility ETFs screened well as a result of their added value during recent market volatility.

- **Value** ETFs: Value has long been identified as a factor that can generate a risk premium. The strategy has had a challenging time in the past few years as we enter the later stage of the economic cycle. However, we continue to root for it as a return driver, recognizing the long-term conviction that is required to benefit from this factor.
- **Momentum** in particular is a powerful factor offering a high degree of return potential. It might inject an element of risk inconsistent with a more conservative investing style, but suitable for investors with a more aggressive mandate.

Table 5: Canada Focused Strategic Equity ETFs

Ticker	Fund Name	Main Focus
XCG	iShares Canadian Growth Index ETF	Fundamental
FXM	CI First Asset Morningstar Canada Value Index ETF	Fundamental
XEI	iShares S&P/TSX Composite High Dividend Index ETF	Income
ZDV	BMO Canadian Dividend ETF	Income
VDY	Vanguard FTSE Canadian High Dividend Yield Index ETF	Income
XDIV	iShares Core MSCI Canadian Quality Dividend Index ETF	Income
WXM	CI First Asset Morningstar Canada Momentum Index ETF	Momentum
QCD	AGFIQ Enhanced Core Canadian Equity ETF	Multi-Factor
MCLC	Manulife Multifactor Canadian Large Cap Index ETF	Multi-Factor
DGRC	Wisdomtree Canada Quality Dividend Growth Index Etf	Multi-Factor
RCE	RBC Quant Canadian Equity Leaders ETF	Multi-Factor
ZLB	BMO Low Volatility Canadian Equity ETF	Risk
TLV	Invesco S&P/TSX Composite Low Volatility Index ETF	Risk
XMV	iShares Edge MSCI Min Vol Canada Index ETF	Risk

Source: NBF

2.3 Core Fixed Income

In this era of market volatility and slowing global economic growth, it is important to remember the role that bonds play in a full portfolio context. Rather than chasing yields and absolute returns, long-term investors should select bond ETFs fulfilling the wider investment goal of diversification and risk mitigation, working in concert with all the other asset classes.

Canadian Aggregate Bond ETFs: Our benchmark for fixed income is the S&P Canada Aggregate Bond Index, which consists of all Canadian sovereign bonds and investment grade corporate bonds that pass certain issue size and liquidity thresholds. Similar to other Canadian aggregate universe bond indices, this index has a fairly long weighted average duration of almost seven years.

With yields where they are, the question of fee sensitivity has additional relevance when it comes to bond ETFs. There are many excellent aggregate bond ETFs in Canada; by and large, they are all similar with only small differences in overall credit, maturity and tax efficiency.

Table 6: Canadian Aggregate Bond ETFs

Ticker	Fund Name	MER%
ZAG	BMO Aggregate Bond Index ETF	0.09
XBB	iShares Core Canadian Universe Bond Index	0.10
VAB	Vanguard Canadian Aggregate Bond Index ETF	0.09

Source: NBF, Bloomberg. Data as of May 2019

Table 7: International Bond ETFs

Ticker	Fund Name	MER%
VBG	Vanguard Global ex-U.S. Aggregate Bond (CAD-H)	0.38
XGGB	iShares Global Government Bond Index ETF (CAD-H)	0.40

Source: NBF, Bloomberg. Data as of May 2019

Our choice of ETFs are iShares **XBB**, BMO **ZAG** and Vanguard **VAB** because they charge low fees with tight bid-ask spreads and with ample secondary market liquidity. Note that **ZAG** was structured as an “ETF of ETFs” but is now transitioning to directly hold the underlying bonds.

International Bond ETFs: To further diversify the portfolio outside of Canada, we added a component of global bonds. While the rate outlook for these regions isn’t necessarily attractive on its own merits, exposure to bonds outside of Canada should provide uncorrelated diversification benefits to the fixed income portfolio as a whole.

The core of our international bond holding is **VBG** (Vanguard Global ex-U.S. Aggregate), a CAD-hedged wrap of the U.S.-listed ETF **BNDX** which holds almost 4,000 fixed income securities from around the world, including countries like Japan, France and Germany. **VBG** has a mixed of Government and corporate holdings, with the latter being 25% of the portfolio. The ETF charges a 38 bps MER.

Alternatively, the iShares Global Government Bond Index ETF CAD-Hedged (**XGGB**) can also be used. The ETF invests in government bonds only from the U.S. (40%) and other countries (60%). **XGGB** charges a 40 bps MER.

2.4 Strategic Fixed Income

We supplement the core fixed income position with selected actively managed funds in an attempt to reduce excess rate sensitivity, enhance yield and broaden diversification. A selected list of strategic fixed income ETFs and related metrics is shown in Appendix 2.

Horizons Active Floating Rate Bond ETF (HFR)

Income and Conservative portfolio profiles have large allocations to aggregate fixed income and strategic equity products focusing on dividend and low volatility, all of which can tilt a portfolio towards higher rate sensitivity. To mitigate this risk, **HFR** is added to these two portfolios. The fund holds an actively managed Canadian corporate bond portfolio, then employs a series of fixed-for-floating interest rate swaps to convert the payments to floating rate. The BMO Ultra Short-Term Bond ETF (**ZST**) and Exemplar Investment Grade Fund ETF (**CORP**) are also good choices for the same purpose of rate risk reduction, Table 8

Table 8: Ultra Short Term Canadian Corporate Bond ETFs

Ticker	Fund Name	MER (%)
HFR	Horizons Active Floating Rate Bond ETF	0.46
ZST	BMO Ultra Short-Term Bond ETF	0.17
CORP	Exemplar Investment Grade Fund ETF	1.07

Source: NBF, Bloomberg. Data as of May 2019

iShares Short Term Strategic Bond ETF (XSI)

For the global bond allocation, we chose **XSI** to mitigate the high duration of the Income and Conservative portfolios. **XSI** uses BlackRock’s quantitative model to select from other iShares fixed income ETFs around the world while keeping duration under five years. The current composition tilts towards higher yielding and lower credit bonds. Other comparable products would be the iShares Conservative Short Term Strategic Fixed Income ETF (**XSC**) and First Asset Enhanced Short Duration Bond ETF (**FSB**), Table 9.

Table 9: Short Term Global Bond ETFs

Ticker	Fund Name	MER %
XSI	iShares Short Term Strategic Fixed Income ETF	0.56
XSC	iShares Conservative Short Term Strategic FI	0.45
FSB	CI First Asset Enhanced Short Duration Bond ETF	0.77

Source: NBF, Bloomberg. Data as of May 2019

Horizons Active Corporate Bond ETF (HAB)

We do not see rate risk as overly pronounced in the Balanced and Growth portfolios due to the lower fixed income allocation. Therefore, we have focused on enhancing yield by using an actively managed corporate bond mandate, **HAB**, as a core Canadian bond supplement. The ETF has slightly reduced duration but offers higher yield than the broad market benchmark. Another good product is the Franklin Liberty Canadian Investment Grade Corporate ETF (**FLCI**), Table 10.

Table 10: Canadian Corporate Bond ETFs

Ticker	Fund Name	MER %
HAB	Horizons Active Corporate Bond ETF	0.59
FLCI	Franklin Liberty Canadian Investment Grade Corp	0.42

Source: NBF, Bloomberg. Data as of May 2019

PIMCO Monthly Income Fund ETF series (PMIF)

Another strategic tilt we made is by adding an unconstrained bond ETF, which helps enhance yield in the foreign bond allocation. We continue to like PMIF for its high “Active Level”, even after adjusting for fees. See our report *Actively Managed Fixed Income ETFs* ([Link](#)) for more details on Active Level.

PMIF aims to provide relatively high and consistent income from fixed income issues selected globally. Currently, it has a short duration of 2.38 years, which is at the discretion of its managers and can change over time. Other similar products we would recommend include Horizons **HAF**, Mackenzie **MUB**, RBC **RBDI**, BMO **ZGSB** and BMO **ZMSB**. See Table 11 and Appendix 2 for details.

Table 11: Global Unconstrained Bond ETFs

Ticker	Fund Name	MER %
HAF	Horizons Active Global Fixed Income ETF	0.82
MUB	Mackenzie Unconstrained Bond ETF	0.57
PMIF	PIMCO Monthly Income Fund	0.85
RBDI	RBC Bluebay Global Diversified Income CAD-H	0.73
ZGSB	BMO Global Strategic Bond Fund ETF	0.82
ZMSB	BMO Global Multi-Sector Bond Fund ETF	0.67

Source: NBF, Bloomberg. Data as of May 2019

Franklin Liberty Global Aggregate Bond ETF CAD-Hedged (FLGA)

For the Growth and Maximum Growth portfolios, we incorporate fewer fixed income lines as the weight allocation to bonds is small. The core Canadian bond exposure still gets a dedicated line with liquid products like **XBB**, **VAB** and **ZAG**. To supplement the core, we screened for products that provide comprehensive diversification outside of Canadian core while having a moderate “Active Level”. **FLGA** fits the profile, as well as Mackenzie **MGB** and PIMCO **IGCF**, Table 12.

Table 12: Global Strategic Bond ETFs

Ticker	Fund Name	MER %
MGB	Mackenzie Core Plus Global Fixed Income ETF	0.67
IGCF	PIMCO Investment Grade Credit Fund	0.85
FLGA	Franklin Liberty Global Aggregate Bond CAD-H	0.39

Source: NBF, Bloomberg. Data as of May 2019

2.5 Alternative Investments

“True alternatives” are assets that are neither stocks nor bonds but can diversify portfolio returns. However, such assets are not easy to find, especially in the public markets. Most alternative strategy indices demonstrate somewhat market-correlated performance. We include Gold bullion, Infrastructure and Liquid Alternative ETFs for this allocation, Table 13.

Gold Bullion: Physical commodity ETFs holding gold bullion are an option for those investors wanting to allocate a fraction of their portfolio to alternatives. Gold bullion can also act as an inflation hedge in the long term. We like **KILO/B** (KILO for currency hedged) for its low fee, which charges only 23 bps per year.

iShares **CGL/C** and the Royal Canadian Exchange-traded Receipt **MNT** are good alternatives with secondary liquidity and low trading costs.

Infrastructure: The theory behind this subsector as an alternative or a diversifier partly hinges on the fact that infrastructure investments have historically shown a steady pattern of cash flows through a variety of market conditions. Typically, large scale institutional managers will add tangible infrastructure assets to a portfolio by buying actual physical entities such as toll roads, hospitals or utility grids. These hard assets cannot go inside an ETF of course, but a profile of their returns can be approximated by the subsectors of the construction industry that focus on these projects. The infrastructure ETFs **ZGI** and **RIG** hold the stocks of public companies from around the world that operate in the transportation, utility or construction sectors.

Liquid Alternative are actively managed funds that have the leeway to employ strategies that are off-limits to traditional mutual funds, such as short positions, in addition to long. These ETFs employ quantitative strategies that use liquid securities, such as futures, to gain exposures like currencies, commodities and equity and bond indices. Since the Canadian regulators introduced the Alternative Mutual Fund framework last October, many liquid alt ETFs have been launched or filed using the new framework. While we will closely monitor the new products, here are two ETFs that we have long employed in our model ETF portfolios.

- **HAC** (Horizons Seasonal Rotational ETF) is not outwardly branded as a hedge fund ETF, but its active trading strategy is quite “hedge fund like” and its performance profile bears this out. **HAC** seeks to deliver long-term capital appreciation by tactically allocating among equities, bonds, commodities, currencies and derivatives, using both long and short positions.
- **PMM** (Purpose Multi-Strategy Market Neutral Fund) uses a variety of diversified alternative strategies such as long/short equities, momentum trades and carry themes within currency and commodity futures.

2.6 Cash

Our benchmark index for cash is Canadian 90-Day T-Bills, which forms the basis for many short-term rates. Because the cash weight in the NBF Economics & Strategy team’s asset allocation is relatively low at this point, even for the lower-risk income and conservative portfolios, we elected to use just one ETF for cash: **PSA** (Purpose High Interest Savings ETF). **PSA** holds high-interest deposit accounts with Canadian banks and term deposits with credit unions. Although not strictly the same as cash, we consider it “cash-like” in that it poses many of the advantages associated with cash, such as liquidity, yield, low duration risk, low credit risk and low counterparty risk.

Table 13: Alternative Investments

Ticker	Fund Name	MER%
Gold		
KILO/B	Purpose Gold Bullion Fund	0.23
CGL/C	iShares Gold Bullion ETF	0.56
MNT	Royal Canadian Mint - Canadian Gold Reserves	0.35
Infrastructure		
ZGI	BMO Global Infrastructure Index ETF	0.60
RIG	RBC Quant Global Infrastructure Leaders ETF	0.62
Hedge Fund		
HAC	Horizons Seasonal Rotation ETF	1.27
PMM	Purpose Multi-Strategy Market Neutral Fund-ETF	1.05

MNT is an Exchange-Traded Receipt, not an ETF
Source: NBF, Bloomberg

3. Specialty Portfolios

We added two specialty portfolios this year to address investor demand beyond the five standard model ETF portfolios. The backtest of the specialty portfolios adopts a static asset allocation for each quarterly rebalance and starts on December 2010.

3.1 Yield Focus ETF Portfolio

In today's low-rate environment, investors have naturally hunted for yield in all corners of the market, and as a result, income-themed ETFs have gained enormous traction in recent years. For our Yield-focused specialty portfolio, we include only ETFs designed around investor demands for cash distribution, through offering high distribution yield and monthly payments. The overall portfolio aims to maintain a balanced risk profile.

Studying the relationship between ETF's distribution and total performance, we often see the pattern of extreme high distribution being correlated with lower total return (gross dividend). This is likely a result of reduced upside market participation and high market friction when the fund is laser-focused on providing current distribution. Therefore we avoid ETFs which we believe may be adding risk or giving up long-term performance for ultra-high current yield.

3.2 ESG ETF Portfolio

ETFs that incorporate environmental, social and/or governance (ESG) factors in the investment process have seen tremendous growth. The product choices in Canada have expanded to include both niche focuses and broad coverages. In addition, the investment costs (i.e., fees) for such products have come down significantly, allowing investors to incorporate ESG without being penalized by excessive fee drag. Investors can now build an ESG-conscious portfolio while still meeting the risk, return, diversification and cost profiles of a traditional portfolio. We demonstrate a Balanced model portfolio using Canadian-listed ESG ETFs.

- **Core Equity:** We use newly launched iShares ESG ETFs (**XESG**, **XSUS**, **XSAB**, **XSTB**), which aim to maintain a similar risk-adjusted profile as the broad benchmark while providing improved ESG scores. The funds follow the MSCI Extended ESG Focus indices and charge low annual fees ranging from 20 bps to 35 bps.
- **Strategic Equity:** We use Desjardins RI CO2 Multifactor ETF (**DRFU**), Mackenzie Maximum Diversification ETF (**MKC**), AGFIQ Enhanced Global ESG Factors ETF (**QEF**) and Horizons Global Sustainability Leaders (**ETHI**) to give the portfolio some factor tilt.
- **Fixed Income:** iShares ESG Canadian Aggregate Bond Index (**XSAB**) ETF is the core position and two ETFs are used for the strategic positions: Desjardins RI Active Canadian Bond - Low CO2 ETF (**DRCU**) and iShares ESG Canadian Short Term Bond Index ETF (**XSTB**).
- **Other:** For alternative and cash components, we used similar ETFs as other Model Portfolios (**KILO/B**, **PMM**, and **PSA**). Infrastructure ETFs are excluded as they tend to have lower ESG scores.

4. Portfolio Benchmarking and Analytics

4.1 Blended Benchmarking

Table 1 shows National Bank's recommended weights as of the last quarterly Investment Strategy Report in March 2019. National Bank's team of asset allocation professionals tactically shift among the asset classes to capitalize on macroeconomic trends, while remaining consistent within each of the five risk profiles. In addition to the tactical weights, the model also includes default static weights, which remain constant and serve to illustrate the portfolio positioning in the absence of any tactical shifts. To create five different blended benchmarks, we apply these static weights to the benchmark indices for each of the asset classes.

Table 14 shows the breakdown of the static weights by asset class, with the name of each index that serves as the component benchmark.

Table 14: Static Blended Benchmark Weights

Asset Class	Benchmark Name	Income	Conserv	Bal	Growth	Max Growth
Equity		20.0%	35.0%	45.0%	55.0%	65.0%
Canadian	S&P/TSX Composite Total Return Index	8.0%	14.0%	18.0%	22.0%	26.0%
U.S.	S&P 500 Total Return Index	8.0%	14.0%	18.0%	22.0%	26.0%
Foreign	MSCI EAFE Net Total Return Index	4.0%	7.0%	9.0%	11.0%	13.0%
Fixed Income	S&P Canadian Aggregate Bond Index	70.0%	55.0%	40.0%	30.0%	15.0%
Alternatives		5.0%	5.0%	10.0%	10.0%	15.0%
Infrastructure	S&P Global Infrastructure Index	1.7%	1.7%	3.3%	3.3%	5.0%
Gold	LBMA Gold Price (Gold Bullion)	1.7%	1.7%	3.3%	3.3%	5.0%
Other	Morningstar Nexus Hedge Fund Replication Index	1.7%	1.7%	3.3%	3.3%	5.0%
Cash	90 Day Canada T-Bill	5.0%	5.0%	5.0%	5.0%	5.0%

Source: NBF

- **Canadian Equity:** The S&P/TSX Composite Total Return Index is a cap-weighted index consisting of 240+ Canadian companies, covering large-cap, mid-cap and some small-cap stocks.
- **U.S. Equity:** The S&P 500 Total Return Index is a long-running cap-weighted index of the 500 largest companies in the U.S.
- **Foreign Equity:** The MSCI EAFE Index is a cap-weighted index of developed nations in Europe, Asia and Far East.
- **Fixed Income:** The S&P Canadian Aggregate Bond Index tracks the performance of CAD-denominated investment grade public bonds issued in Canada, including government, agency and corporate bonds.
- **Alternatives:** The alternative benchmark is an equal-weighted blended benchmark with the following three sub-components:
 - **S&P Global Infrastructure Index** tracks 75 infrastructure companies around the world, from both developed and emerging markets. There are industry caps (energy, transportation and utilities) to avoid concentration.
 - **LBMA Gold Price Index** is a recognized measure of gold bullion performance. The index is owned by London Bullion Market Association (LBMA) and the auction platform and index methodology are provided by ICE Benchmark Administration (IBA).
 - **Morningstar Nexus Hedge Fund Replication Index:** The index intends to reproduce the performance of hedge fund strategies using a quantitative replication strategy. The index is composed of liquid financial instruments such as index futures, volatility derivatives, debt futures, currency contracts and commodity futures.
- **Cash:** Canadian 90-Day T-Bills. There is no specific third-party index tracking the performance of cash, so we use the 90-Day Canada Treasury Bill Rate as reported daily by the Bank of Canada, which forms the basis for many short-term rates.

4.2 Backtest Methodology

We've constructed a simulated performance backtest of our ETF model portfolios going back to the start of the calendar 2011. A backtest provides an additional perspective for investors to gain insights into return and risk metrics. Although backtested with historical data, the results are simulated and only approximate how these portfolios may have performed.

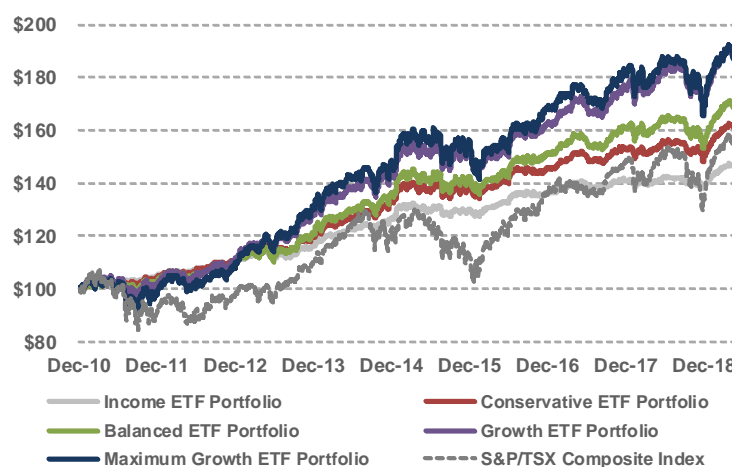
Some ETFs were not available for the full time period, so we defaulted to using index returns penalized appropriately for management fees and additional costs. Key methodology characteristics are as follows:

- Asset allocation adjusted quarterly to recommended weights from NBF's Investment Strategy. Quarterly rebalance at the end of the first day of each calendar quarter.
- Assumed 100 bps annual management fee, deducted daily.
- Index substituted in before ETF inception date (Index return reduced by ETF expense ratio and 100 bps management fee). If no index is available, we used a suitably correlated similar ETF product as a proxy.
- Distributions reinvested on ex-date into their parent assets for apple-to-apple comparison of total return performance.
- If applicable, the returns of USD-denominated ETFs are in CAD dollar terms. No external currency hedging was applied.
- All returns simulated as pre-tax, so gross of income and capital gains. If applicable, U.S.-listed returns are gross of international withholding tax, although Canadian ETFs that hold international equity assets distribute net of withholding tax in most cases.
- The end date of the simulation was May 31, 2019.

4.3 Backtest Results

Returns: In the backtest period between the model inception date of Dec. 31, 2010 and the most recent month-end of May 31, 2019, the S&P/TSX Composite Index has delivered an annual total return of 4.2%. This is in line with the core portfolios, which had positive returns of 4.7% for Income to 7.6% for Maximum Growth (Table 15 and Chart 1). The global exposure of the portfolios, combined with traditional bond and equity allocations, enhanced overall return, especially from a risk-adjusted perspective.

Chart 1: ETF Model Portfolio Performance



Source: National Bank Financial, Bloomberg

Risk:

- **Max Drawdown (Daily Observations):** This measures the largest percentage drop from peak to trough over the analysis period. Higher-risk portfolios experienced greater drawdown, with the Maximum Growth Portfolio drawing down by 12.3% during the market turmoil of late 2018. The Income Portfolio experienced a max drawdown of only 3.8%.
- **Sharpe Ratio** is a measure of reward per unit of risk (See Glossary in Appendix 1 for complete definition). The differences in the Sharpe Ratios for the five model portfolios depend on the asset allocation and the makeup of the satellite strategic ETFs selected for each asset class, but one conclusion is immediately apparent: all of the Sharpe ratios are more than double that of Canada's main benchmark equity index, the S&P/TSX Composite, highlighting the enhancement to risk-adjusted return that comes from mixing multiple asset classes together into a holistic diversified portfolio.

- Volatility for all the portfolios was a fraction of the S&P/TSX Composite, or even lower, ranging from 2.9% on a monthly basis for the Income Portfolio to 7.2% for Maximum Growth, whereas the S&P/TSX Composite had monthly volatility of 9.4%.

Table 15: ETF Model Portfolio Performance

As of: 31-May-19	Income	Conservative	Balanced	Growth	Maximum Growth	S&P/TSX Composite
Period	Simulated Returns					
Since Dec-10	46.7%	61.3%	67.8%	87.3%	84.6%	41.3%
Annualized	4.7%	5.8%	6.3%	7.7%	7.6%	4.2%
3 Month	1.9%	2.3%	1.6%	1.7%	-0.4%	-6.6%
YTD	6.1%	8.3%	8.2%	11.5%	6.4%	1.7%
1 Year	4.1%	5.1%	3.4%	4.3%	0.9%	3.0%
3 Year	10.4%	14.2%	16.2%	21.9%	17.6%	15.2%
	Risk Metrics (since Dec-10)					
Max Drawdown	3.8%	5.2%	7.6%	10.0%	12.3%	21.5%
Sharpe Ratio	1.28	1.31	1.15	1.12	0.92	0.48
Volatility	2.9%	3.7%	4.7%	6.0%	7.2%	9.4%

Returns are total returns net of simulated 1% fee
Source: National Bank Financial, Bloomberg

Blended Benchmark Comparison

It's important to identify the purpose of the blended benchmark calculations before comparing metrics with the model ETF portfolios. The benchmarks exist to "anchor in reality" the outcomes that are possible within each risk profile. This way, investors can compare real-world returns to the benchmarks, not with the intention of outperforming them, but rather to check if the chosen risk profile delivers an overall risk and return that is commensurate with expectations. While some divergence from these metrics should be expected, and tolerated, the degree of this divergence should be small and the drivers and attribution should be well understood. When a portfolio diverges from its benchmark, the possible sources are as follows:

- Fees and costs:** First and foremost, the blended benchmarks metrics come from combining the results of six theoretical indices. Index returns come gross of all fees and transaction costs. Our ETF portfolio simulation assumes a 1% fee on top of all realized ETF expense ratios, which are already "baked into" their real-world returns. The weighted average MERs of the five ETF portfolios range around 30 bps, so an "underperformance" relative to the index of 1.3% annualized should be the starting point of the comparison.
- Product selection:** The indices chosen for each asset class represent the broadest possible exposures. We did not drill down to narrower geographic sub-regions or sub-asset classes. This type of bias is possible within the ETF portfolios—Investors can choose to overweight or underweight certain countries or sectors within equity allocations as easily as they choose factor-based or non-cap-weighted strategies. These types of choices will always cause some deviation from the overarching index for that specific asset class.
- Tactical asset allocation:** The blended benchmarks employ static allocations for each asset class. The ETF model portfolios employ National Bank Investment Strategy's recommended weights for each quarter, which can alter the weights on the margins, for example favouring U.S. equity with accompanying underweight in Canadian equity if NBF economists and strategists subscribe to this particular outlook for a given quarter.

Table 16: Blended Benchmark Performance Metrics

As of: 31-May-19	Income	Conservative	Balanced	Growth	Maximum Growth	S&P/TSX Composite
Period	Simulated Returns					
Since Dec-10	59.0%	74.5%	86.6%	96.9%	109.0%	41.3%
Annualized	5.7%	6.8%	7.7%	8.4%	9.1%	4.2%
3 Month	2.9%	2.6%	2.3%	2.1%	1.9%	-6.6%
YTD	11.2%	13.0%	14.0%	15.0%	15.8%	1.7%
1 Year	5.9%	5.7%	5.6%	5.5%	5.3%	3.0%
3 Year	15.5%	20.0%	22.8%	25.4%	27.8%	15.2%
	Risk Metrics (since Dec-10)					
Max Drawdown	4.1%	6.9%	8.4%	9.8%	11.0%	21.5%
Sharpe Ratio	1.29	1.28	1.24	1.21	1.17	0.48
Volatility	3.7%	4.5%	5.3%	6.0%	6.9%	9.4%

Source: National Bank Financial, Bloomberg

Table 16 above shows the five portfolio benchmark returns in the same format as the actual ETF model portfolios reported in Table 15. Immediately a few patterns are apparent:

- **Risk/reward (as represented by Sharpe Ratio) trends down** as the asset allocation becomes more aggressive. But over long timescales, the riskier blended benchmarks show higher absolute returns. This is consistent with the intuitive concept that lies at the foundation of investing: the greater the risk, the greater the reward. However, there is a diminishing return per unit of risk that is available.
- The ETF portfolios on average underperform the blended benchmark by 1.2% annually and the maximum growth portfolio underperforms the benchmark the most, primarily due to the inclusion of value factor ETFs. The value factor has been underperforming the broad market and growth factor since the financial crisis as mentioned above in the “Strategic Equity” section. However, we included value factor ETFs in the maximum portfolio because academic studies do show that the value factor can deliver strong long-term risk premia and it performs best during early economic expansions. Since the model portfolios are positioned as long-term buy-hold, we believe the economic rational, risk and return characteristics of value factor fits well into a maximum growth portfolio, at the cost of lower recent performances.

4.4 Model Portfolio Execution and Related Costs

ETFs are in effect mutual funds that trade like stocks, so investors are responsible for the trading costs incurred: these include commissions paid to the broker, as well as the bid-ask spreads they must cross when entering or exiting a position. ETF bid-ask spreads are typically quite low, and in our simulated performance backtest, we consider them “absorbed” by the deducted 1% annual blanket fee on each portfolio. However, to illustrate an investor’s experience in executing these model portfolios, simulated turnover figures appear below in Table 17. **Turnover** is a measure of how frequently the securities in a portfolio are traded. Determining turnover is the first step in analyzing execution costs.

Turnover in an ETF portfolio can come from multiple sources. The first two sources—rebalancing and tactically trading—are modeled in this section’s estimate of execution costs.

Sources of Turnover:

1. **Rebalancing:** At each quarterly rebalance date, the market-driven price drift of each ETF will trigger buying and selling in order to arrive at new recommended weights. Some ETFs distribute cash that needs to be redeployed on an ongoing basis, further contributing to small amounts of turnover that can be considered part of “rebalancing.”

2. **Tactically trading:** The tactical shifting of the target weights can also cause additional buying and selling.

The next two sources of turnover—security replacement and cash injection or withdrawal—are not modeled in our turnover estimate.

3. **Security replacement:** In reality, an investor can choose to completely replace one ETF in a portfolio with another. This would cause an amount of turnover equal to that ETF’s weight at the time of the transaction. Our model portfolios are simulated backward in time to illustrate the risk-reward profile of

their composition at the current snapshot without any security replacement, so this element of turnover does not contribute to the calculation.

4. **Cash injection and withdrawals:** If an investor chooses to add to a portfolio by deploying a new amount of cash, or conversely, wishes to withdraw funds from the portfolio by selling down positions, this can also cause a one-way turnover.

Our turnover calculation considers the first two factors by summing each ETF's absolute weight changes on all four rebalance days in the calendar year. We then divide the figure by two to determine a one-way indication of implementation.

A quick way to interpret these figures is to multiply a portfolio's turnover by its average **bid-ask spread** to estimate the annual cost related to executing rebalances. Bid-ask Spread is an extremely important aspect of ETF investing and the principal way they differ from mutual funds, which transact once daily at a common NAV price for all buyers and sellers. For more information and a detailed review of this topic, please see our Industry Note *ETF Bid-Ask Spreads: Regulatory Requirements and Review*, published December 15, 2016.

To recap, by way of example, a portfolio that has each position exited and then replaced twice over the course of one year would have a turnover of 200%. If the bid-ask spread ratio of the portfolio aggregates to 25 bps, then in this example the implementation cost would be 200% x 25 bps, or 50 bps in that year. While some extremely active funds might have turnover figures as high as 200%, Table 17 above shows that the model ETF portfolios have low turnover figures, despite volatile asset classes and tactical weight shifts. Most of the underlying ETFs in the model portfolios have very tight bid-ask spread ratios. The Income Portfolio has a weighted average surface level spread of 13 bps and for Maximum Growth Portfolio it is 23 bps. (These surface spread numbers are historical figures and do not represent spreads going forward). Our highest period of turnover was 17%, which occurred within the Balanced portfolio in 2018—at a conservatively estimated bid-ask spread ratio of 20 bps, this still represents an implementation cost of under 4 bps, well within the 100 bps “cost cushion” assumed for each portfolio.

While this number is indicative, it should be noted that it is still merely an estimate, because bid-ask spread calculations are impacted by size and trading practices, among other factors. Furthermore, actual trading costs may come from certain pockets of the portfolio, rather than each ETF evenly.

However, via this estimate, investors can still find a general idea of what the trading costs might be when executing the model portfolios in the real world.

Table 17: Model Portfolio Turnover

Year	Income	Conserv	Bal	Growth	Max Growth
2013	13%	14%	16%	11%	13%
2014	6%	10%	11%	8%	5%
2015	5%	5%	6%	6%	7%
2016	8%	8%	10%	10%	11%
2017	6%	7%	8%	7%	8%
2018	8%	8%	11%	14%	17%
2019 YTD	4%	5%	6%	6%	5%

Source: NBF, Bloomberg. Data as of May 2019

Appendix 1 - Glossary of Terms

12M Yield (12-Month Dividend Yield): Sum of all dividends that have gone ex-dividend over the prior 12 months, divided by the current stock price. Value is “—” if the fund has less than one year of record; value is “0” if the fund has not paid a dividend in the past 12 months.

Active Share: A percentage measure of how a specific portfolio differs from the holdings and weights of its category benchmark index. Active share is calculated by summing the absolute value of all the differences in an ETF's holdings versus those weights in the benchmark index, then dividing by two.

Aggr # Holdings (Aggregated Number of Holdings): Total number of unique underlying securities in an ETF. This metric looks through any underlying ETF holdings and aggregates its underlying securities.

AUM (Assets under Management): ETF's assets under management, equal to total shares outstanding times the net asset value. Market price per unit is used when the net asset value is not available.

Avg Daily Turnover (20-Day Average Daily Traded Value): 20-day average daily traded value, expressed in millions of dollars.

Duration: A measure of a bond's sensitivity to changes in interest rates. A bond's duration reflects the amount of time it takes for its price to be repaid by its cash flows, including coupons and par value at maturity. When we report a bond ETF's duration, we are referring to the weighted average duration in years.

Excess Return: The period return of ETF minus benchmark index total return.

Implied Liquidity: A representation of how much an ETF can be traded in a single day as determined by the available volume in all of its underlying securities. Given a specific volume impact threshold, for example 10%, we calculate the notional trade that would impact no more than 10% of the underlying share volume in any security belonging to a significant majority or optimized subsample (e.g., 90%) of the creation/redemption basket.

Max Drawdown: A measure of risk that is found by calculating the largest historical percentage drop in an asset's value from peak to trough.

MER (Management Expense Ratio): Manager's 2018 annual fee for managing and administering the fund, expressed as a percentage of total fund value. In most cases this includes fees from investing in other ETFs. Where audited MER is unavailable or if the fee has been significantly reduced recently, the MER is estimated using the Stated Management Fee and sales tax.

Period Return: Total return of an ETF or index with dividends reinvested over a period such as a week, quarter or year.

Prem/Disc. to NAV (Premium/Discount to NAV): Average end-of-day price premium divided by Net Asset Value.

Sharpe Ratio: A risk-adjusted return-ranking measure used to determine the reward per unit of risk. It is the average excess return of a risky asset over the risk-free rate (91-day treasury bills), divided by the standard deviation of the fund's excess returns.

TER (Total Expense Ratio): This captures all the fees and expenses embedded in an ETF's NAV-based returns. It includes MER (defined above) in addition to other fund costs such as internal trading expenses and derivative counterparty fees in the case of synthetic ETFs.

Top Level Bid Ask Spread: Bloomberg five-day average level 1 bid ask spread in percentage terms.

Turnover Ratio: A measure of the trading activity within a portfolio, expressed as an annual percentage. Turnover may come from rebalancing, security replacement, tactical asset allocation and cash injection or withdrawal. It is expressed as a percentage—a turnover of 100% means that a dollar amount equal to the full portfolio value was sold and bought during a specified year.

Up/Down Capture (Upside/Downside Capture Ratios): Upside capture represents a portfolio's performance relative to its benchmark during only those periods (e.g., calendar weeks) when the benchmark returns were positive. Conversely, Downside Capture is the portfolio's relative performance during only those periods when the benchmark was negative.

YTM (Yield to Maturity): A bond's YTM is an estimate of its future pre-tax total annual return. It is equal to the discount rate that makes the present value of its future cash flows equal to its market price. A bond ETF's YTM refers to its underlying weighted average yield to maturity before fees.

Appendix 2 - Selected Equity and Fixed Income Strategic ETFs

Table 18: Canada Strategic Equity ETFs

14	Ticker	Fund Name	Incept. Year	Main Focus	ETF Metrics		Return (%)		Risk (%)*		Liquidity (\$M)		Diversification	
					MER (%)	AUM (\$M)	12M Yield	Annu. 3Yr Tot Return	Vol	Up / Down Capture (%)	Top Level Bid Ask Spread %	Implied Basket Liq	Active Share (%)	Aggr # Holdings
		Benchmark: S&P/TSX Composite Index	-	Broad	-	-	2.8	7.62	9.1	100 100	-	613	0	271
1	XCG	iShares Canadian Growth Index ETF	2006	Fundamental	0.55	35	1.5	9.64	10.0	96 91	0.09	135	65	45
2	FXM	CI First Asset Morningstar Canada Value Index ETF	2012	Fundamental	0.67	78	2.3	3.18	11.7	89 108	0.17	14	90	31
3	XEI	iShares S&P/TSX Composite High Dividend Index ETF	2011	Income	0.22	581	4.9	7.18	8.1	88 85	0.08	140	65	74
4	ZDV	BMO Canadian Dividend ETF	2011	Income	0.38	447	4.8	6.94	8.5	89 86	0.08	155	54	51
5	VDY	Vanguard FTSE Canadian High Dividend Yield Index ETF	2012	Income	0.22	514	4.0	8.25	8.9	91 84	0.05	285	56	59
6	XDIV	iShares Core MSCI Canadian Quality Dividend Index ETF	2017	Income	0.11	129	4.5	-	-	- -	0.09	104	72	20
7	WXM	CI First Asset Morningstar Canada Momentum Index ETI	2012	Momentum	0.67	671	0.8	9.04	11.5	106 105	0.16	27	84	31
8	QCD	AGFIQ Enhanced Core Canadian Equity ETF	2017	Multi-Factor	0.45	96	1.7	-	-	- -	0.09	150	40	57
9	MCLC	Manulife Multifactor Canadian Large Cap Index ETF	2017	Multi-Factor	0.45	38	1.9	-	-	- -	0.09	395	23	81
10	DGRC	Wisdomtree Canada Quality Dividend Growth Index Etf	2017	Multi-Factor	0.24	176	1.5	-	-	- -	0.12	74	71	50
11	RCE	RBC Quant Canadian Equity Leaders Etf	2015	Multi-Factor	0.43	14	2.3	7.36	9.2	97 97	0.10	279	30	118
12	ZLB	BMO Low Volatility Canadian Equity ETF	2011	Risk	0.39	1,444	2.4	9.13	6.9	61 43	0.08	58	68	46
13	TLV	Invesco S&P/TSX Composite Low Volatility Index ETF	2012	Risk	0.34	359	3.9	7.07	6.4	58 47	0.10	27	70	50
14	XMV	iShares Edge MSCI Min Vol Canada Index ETF	2012	Risk	0.33	95	2.8	6.90	7.4	75 71	0.08	160	44	67

*Based on three-year weekly Net Asset Value; Data as of 2019-05-31; Source: NBF, Canadian ETF Providers, S&P, MSCI, Bloomberg;

Table 19: U.S. Strategic Equity ETFs (currency non-hedged or discretionary)

17	Ticker	Fund Name	Incept. Year	Main Focus	ETF Metrics		Return (%)		Risk (%)*		Liquidity (\$M)		Diversification	
					MER (%)	AUM (\$M)	12M Yield	Annu. 3Yr Tot Return	Vol	Up / Down Capture (%)	Top Level Bid Ask Spread %	Implied Basket Liq	Active Share (%)	Aggr # Holdings
		Benchmark: S&P 500 Index in CAD\$ Term	-	Broad	-	-	2.0	12.95	13.7	100 100	-	10,664	0	500
1	XXM/B	CI First Asset Morningstar US Value Index ETF	2013	Fundamental	0.67	28	1.4	-2.14	15.8	94 138	0.84	39	98	51
2	ZUQ	BMO MSCI USA High Quality Index ETF	2014	Fundamental	0.32	252	1.0	14.64	13.5	107 106	0.43	2,560	64	126
3	ZVU	BMO MSCI USA Value Index ETF	2017	Fundamental	0.33	9	2.0	-	-	- -	0.60	1,659	84	148
4	ZEUS	BMO Shiller Select US Index ETF	2017	Fundamental	0.73	18	1.4	-	-	- -	0.49	737	83	80
5	EQL	Invesco S&P 500 Equal Weighted Index ETF	2018	Equal-Weight	0.26	107	1.6	-	14.6	- -	0.95	4,929	47	506
6	ZDY	BMO US Dividend ETF	2013	Income	0.32	1,357	2.9	9.89	11.4	84 83	0.27	1,617	76	101
7	XHU	iShares US High Dividend Equity Index ETF	2015	Income	0.33	39	2.6	7.77	11.9	75 78	0.55	1,429	81	74
8	YXM/B	CI First Asset Morningstar US Momentum Index ETF	2013	Momentum	0.69	20	-	7.57	15.8	102 123	0.93	70	98	51
9	RUE	RBC Quant US Equity Leaders Etf	2015	Multi-Factor	0.44	30	1.5	11.00	14.1	99 104	0.52	1,814	46	161
10	DGR/B	WisdomTree US Quality Dividend Growth Index ETF	2016	Multi-Factor	0.37	71	1.7	-	-	- -	0.31	2,450	59	297
11	QUS	AGFIQ Enhanced Core US Equity ETF	2017	Multi-Factor	0.45	146	1.1	-	-	- -	0.50	1,960	59	95
12	DFU	Desjardins USA Multifactor-Controlled Volatility ETF	2017	Multi-Factor	0.59	25	1.3	-	-	- -	0.66	2,304	62	306
13	MULC/B	Manulife Multifactor US Large Cap Index ETF	2017	Multi-Factor	0.39	131	1.2	-	-	- -	0.58	9,270	25	762
14	FLUS	Franklin Libertyqt US Equity Index Etf	2017	Multi-Factor	0.28	221	1.7	-	-	- -	0.63	2,773	61	249
15	XMU	iShares Edge MSCI Min Vol USA Index ETF	2012	Risk	0.33	417	1.4	12.86	11.6	80 75	0.84	1,508	58	211
16	ZLU	BMO Low Volatility US Equity ETF	2013	Risk	0.33	936	1.7	9.22	10.6	63 62	0.25	854	81	107
17	ULV/C	Invesco S&P 500 Low Volatility Index ETF	2017	Risk	0.34	20	1.8	-	-	- -	0.31	732	80	100

*Based on three-year weekly Net Asset Value; Data as of 2019-05-31; Source: NBF, Canadian ETF Providers, S&P, MSCI, Bloomberg;

Table 20: International Strategic Equity ETFs (currency non-hedged or discretionary)

8	Ticker	Fund Name	Incept. Year	Main Focus	ETF Metrics		Return (%)		Risk (%)*		Liquidity (\$M)		Diversification	
					MER (%)	AUM (\$M)	12M Yield	Annu. 3Yr Tot Return	Vol	Up / Down Capture (%)	Top Level Bid Ask Spread %	Implied Basket Liq	Active Share (%)	Aggr # Holdings
		Benchmark: MSCI EAFE Index in CAD\$ Term	-	Broad	-	-	3.1	6.99	11.2	100 100	-	2,711	0	793
1	VXM/B	CI First Asset Morningstar International Value Index ETF	2014	Fundamental	0.68	184	1.6	6.29	11.3	98 93	0.46	14	92	214
2	RID	RBC Quant EAFE Dividend Leaders ETF	2014	Income	0.54	301	4.8	4.55	9.5	83 87	0.60	255	79	154
3	PID	Purpose International Dividend Fund	2015	Income	0.68	143	4.4	7.44	10.0	79 73	0.57	131	79	87
4	ZXM/B	CI First Asset Morningstar International Momentum Index	2014	Momentum	0.69	22	1.4	6.04	11.2	98 99	0.50	47	90	212
5	RIE	RBC Quant Eafe Equity Leaders Etf	2015	Multi-Factor	0.55	20	3.4	6.45	10.5	97 97	0.68	489	62	253
6	XFI	iShares Edge MSCI Multifactor EAFE Index ETF	2015	Multi-Factor	0.51	89	3.3	5.85	10.8	98 99	0.43	317	89	196
7	ILV	Invesco S&P International Developed Low Volatility Index	2014	Risk	0.42	34	3.2	6.85	10.2	66 60	0.38	184	75	200
8	ZLI	BMO Low Volatility International Equity ETF	2015	Risk	0.42	375	2.4	7.38	9.2	72 66	0.20	131	91	109

*Based on three-year weekly Net Asset Value; Data as of 2019-05-31; Source: NBF, Canadian ETF Providers, S&P, MSCI, Bloomberg;

Table 21: Global Strategic Equity ETFs (currency non-hedged or discretionary)

					ETF Metrics		Return (%)		Risk (%)*		Liquidity (\$M)		Diversification		
14	Ticker	Fund Name	Incept. Year	Main Focus	MER (%)	AUM (\$M)	12M Yield	Annu. 3Yr Tot Return	Up / Down Vol	Capture (%)	Top Level Bid Ask Spread %	Implied Basket Liq	Active Share (%)	Aggr # Holding	
Benchmark: MSCI ACWI Index in CAD\$ Term			-	Broad	-	-	2.1	10.27	12.0	100	100	-	9,373	0	1,402
1	ZGQ	BMO MSCI All Country World High Quality Index ETF	2014	Fundamental	0.50	64	1.4	11.86	12.4	109	106	0.30	3,049	70	353
2	PXG	Invesco FTSE RAFI Global+ Index ETF	2015	Fundamental	0.59	11	3.3	8.88	12.7	90	91	0.55	6,402	38	2,412
3	PZW	Invesco FTSE RAFI Global Small	2015	Fundamental	0.55	9	1.8	7.61	13.0	98	105	0.51	742	97	3,000
4	VVL	Vanguard Global Value Factor ETF	2016	Fundamental	0.40	79	2.1	-	-	-	-	0.43	832	78	1,168
5	RLD	RBC Strategic Global Dividend Leaders Etf	2016	Income	0.61	11	3.2	7.41	8.0	74	74	0.39	264	72	687
6	HAZ	Horizons Active Global Dividend ETF	2017	Income	0.73	182	2.1	-	11.2	68	63	0.31	592	83	45
7	GHD	Invesco S&P Global ex. Can High Dividend Low Volatility	2017	Income	0.63	5	3.8	-	-	-	-	0.75	282	91	100
8	XDG	iShares Core MSCI Global Quality Dividend Index ETF	2017	Income	0.22	83	3.3	-	-	-	-	0.45	1,965	79	289
9	FLGD	Franklin LibertyQT Global Dividend Index ETF	2018	Income	0.49	10	3.8	-	-	-	-	0.35	434	91	120
10	DWG	Invesco DWA Global Momentum Index ETF	2016	Momentum	0.75	14	1.2	7.37	14.4	106	123	0.69	148	90	511
11	VMO	Vanguard Global Momentum Factor ETF	2016	Momentum	0.40	33	0.7	-	-	-	-	0.30	777	77	906
12	VLQ	Vanguard Global Liquidity Factor ETF	2016	Other	0.40	20	1.6	-	-	-	-	0.51	375	89	1,291
13	XMW	iShares Edge MSCI Min Vol Global Index ETF	2012	Risk	0.48	149	1.8	9.59	10.2	70	64	0.22	768	74	424
14	RWW/B	CI First Asset MSCI World Low Risk Weighted ETF	2014	Risk	0.69	434	1.9	10.13	8.2	67	57	0.33	306	83	198

*Based on three-year weekly Net Asset Value; Data as of 2019-05-31; Source: NBF, Canadian ETF Providers, S&P, MSCI, Bloomberg;

Table 22: Strategic Fixed Income ETFs

					ETF Metrics		Return (%)		Risk (%)		Liquidity		Fixed Income Metrics	
17	Ticker	Fund Name	Incept. Year	Main Focus	MER (%)	AUM (\$M)	12M Yield	1Yr Tot Return	1yr Vol	1 yr Maximum Drawdown	Daily Traded Value (\$M)	Top level bid/ask spread %	YTM (%)	Dur
Benchmark: Canadian Universe Bond Index ETF*							2.8	6.6	3.3	-2.4			2.85	6.45
1	HFR	Horizons Active Floating Rate Bond ETF	2010	CAN Ultra-short Corp	0.46	717	2.6	2.9	0.9	-0.5	3.1	0.14	2.57	0.65
2	ZST	BMO Ultra Short-Term Bond ETF	2013	CAN Ultra-short Corp	0.17	603	3.0	2.5	0.9	-0.1	2.6	0.05	2.21	0.52
3	CORP	Exemplar Investment Grade Fund ETF	2017	CAN Ultra-short Corp	1.07	9	3.0	2.4	1.7	-3.5	0.0	0.37	NA	0.15
4	XSI	iShares Short Term Strategic Fixed Income ETF	2015	ST Global Strategic	0.56	122	3.4	3.3	2.3	-2.2	0.3	0.36	3.65	2.66
5	XSC	iShares Conservative Short Term Strategic Fixed Income	2015	ST Global Strategic	0.45	138	2.7	3.6	1.5	-0.9	0.5	0.30	2.82	2.83
6	FSB	CI First Asset Enhanced Short Duration Bond Etf	2017	ST Global Strategic	0.77	227	2.4	2.6	1.0	-1.0	1.3	0.26	3.11	0.87
7	HAB	Horizons Active Corporate Bond ETF	2010	Canada Corporate	0.59	564	3.1	5.7	2.8	-2.4	1.0	0.28	3.87	6.20
8	FLCI	Franklin Liberty Canadian Investment Grade Corporate	2017	Canada Corporate	0.42	69	4.0	5.9	3.1	-2.4	0.4	0.31	3.63	6.62
9	HAF	Horizons Active Global Fixed Income ETF	2009	Global Unconstrained	0.82	46	3.1	1.2	1.7	-3.5	0.1	1.30	3.50	2.03
10	MUB	Mackenzie Unconstrained Bond ETF	2016	Global Unconstrained	0.57	446	4.3	3.6	1.5	-1.4	2.8	0.51	5.11	2.18
11	PMIF	PIMCO Monthly Income Fund	2017	Global Unconstrained	0.85	1,152	3.4	5.4	2.0	-0.8	5.7	0.07	4.54	2.38
12	RBDI	RBC Bluebay Global Diversified Income CAD-H	2017	Global Unconstrained	0.73	15	4.5	5.2	2.9	-3.9	0.0	0.57	5.20	5.00
13	ZGSB	BMO Global Strategic Bond Fund ETF	2018	Global Unconstrained	0.82	20	3.4	5.9	2.8	-1.6	0.2	0.15	5.84	5.03
14	ZMSB	BMO Global Multi-Sector Bond Fund ETF	2018	Global Unconstrained	0.67	6	3.1	5.1	2.3	-2.6	0.2	0.14	3.97	3.90
15	MGB	Mackenzie Core Plus Global Fixed Income ETF	2016	Global Strategic	0.67	166	4.0	3.1	2.1	-1.9	0.8	0.69	3.23	3.40
16	IGCF	PIMCO Investment Grade Credit Fund	2017	Global Strategic	0.85	41	4.1	5.6	3.0	-2.8	0.4	0.24	4.81	6.37
17	FLGA	Franklin Liberty Global Aggregate Bond ETF CAD-H	2018	Global Strategic	0.39	424	2.2	5.8	1.7	-2.0	0.7	0.36	3.16	6.59

*Benchmark used: iShares XCB. Source: NBF, Bloomberg. Data as of 2019-05-31

Appendix 3 - Model Portfolios

Income ETF Portfolio Summary

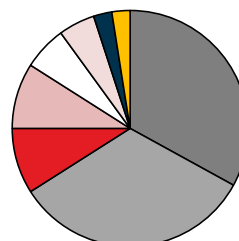
Portfolio Description: A diversified and efficient ETF portfolio with Income asset allocation. Weighted average ETF MER is 29 bps.

Investor Objective: The investor gives priority to income and investment safety. The investor does not find the stock market very attractive because of its volatility, but he or she is not against the idea of investing a small part of a portfolio in stocks, mainly to counteract the effects of inflation.

Risk Profile: Tolerance for risk is very low.

Income	Conservative	Balanced	Growth	Maximum Growth
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Asset Allocation: Portfolio split at 23% equity to 66% fixed income, with 6% in cash and 5% in alternatives.



- 33.0% Canadian Bonds
- 33.0% International Bonds
- 9.0% Canadian Equity
- 9.0% U.S. Equity
- 6.0% Cash
- 5.0% Foreign Equity
- 2.5% Infrastructure
- 2.5% Gold

Simulated Historical Performance

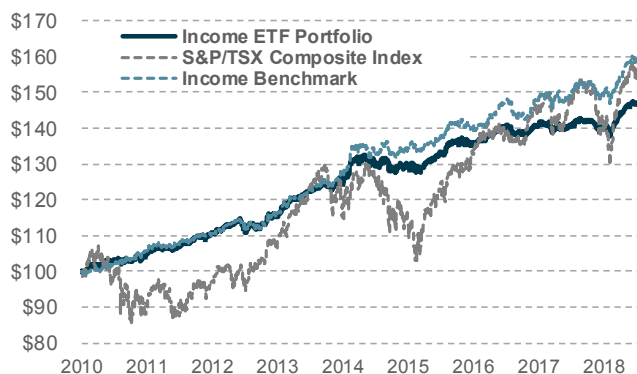
Since backtest start date of 30-Dec-10, the Income Portfolio has had a total return of 46.7%, or 4.1% in the past year with volatility of 2.9%. Max drawdown in the period was 3.8%, compared with the TSX composite's drawdown of 21.5%.

Period Performance

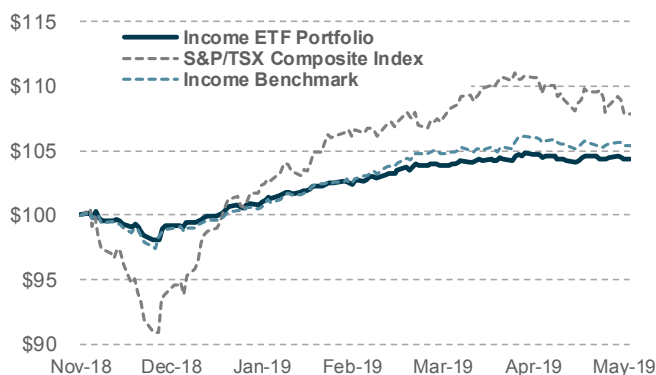
As of: 31-May-19	Income Portfolio*	Income Benchmark	S&P/TSX Composite Index
Simulated Period Returns			
Since Dec-10	46.7%	59.0%	53.7%
Annualized	4.7%	5.7%	5.2%
YTD	6.1%	11.2%	12.1%
3 month	1.9%	2.9%	1.6%
1 year	4.1%	6.0%	3.6%
3 year	10.4%	15.5%	25.3%
Risk Metrics (since Dec-10)			
Max Drawdown	3.8%	4.1%	21.5%
Sharpe Ratio	1.28	1.29	0.49
Volatility	2.9%	3.7%	9.4%

*Total returns net of simulated 1% fee

Cumulative Performance

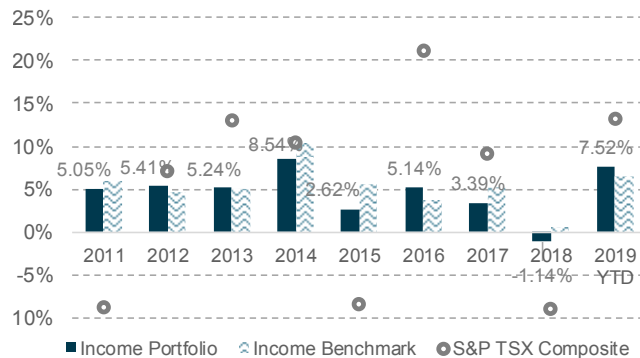


Recent Cumulative Performance



Source: NBF, Bloomberg

Calendar Year Performance



Income ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				23.00%					
Canadian Equity									
Broad Income	ZCN	CN	BMO S&P/TSX Capped Composite Index ETF	6.00%	\$21.75	\$60,000	2,758	0.05%	2.85%
	VDY	CN	Vanguard FTSE Canadian High Dividend Yield Index ETF	3.00%	\$33.39	\$30,000	898	0.22%	4.11%
U.S. Equity									
Broad Income	XUU	CN	iShares Core S&P US Total Market Index ETF	6.00%	\$28.42	\$60,000	2,111	0.07%	1.66%
	UHD	CN	Invesco S&P 500 High Dividend Low Volatility Index ETF	3.00%	\$20.81	\$30,000	1,442	0.39%	3.61%
Foreign Equity									
Developed Income	XEF	CN	iShares Core MSCI EAFE IMI Index ETF	2.50%	\$29.68	\$25,000	842	0.22%	2.60%
	RID	CN	RBC Quant EAFE Dividend Leaders ETF	2.50%	\$22.38	\$25,000	1,117	0.54%	4.86%
FIXED INCOME				66.00%					
Canadian Bonds									
Aggregate Corporate	XBB	CN	iShares Core CanadianUniverse Bond Index ETF	19.80%	\$31.78	\$198,000	6,230	0.10%	2.79%
	HFR	CN	Horizons Active Floating Rate Bond ETF	13.20%	\$10.05	\$132,000	13,134	0.46%	2.56%
International Bonds									
Global	VBG	CN	Vanguard Global ex-U.S. Aggregate Bond Index ETF CAD-H	13.20%	\$27.28	\$132,000	4,839	0.38%	2.25%
Strategic	PMIF	CN	PIMCO Monthly Income Fund	9.90%	\$20.00	\$99,000	4,950	0.85%	3.39%
Strategic	XSI	CN	iShares Short Term Strategic Fixed Income ETF	9.90%	\$18.81	\$99,000	5,263	0.56%	3.43%
ALTERNATIVE INVESTMENTS				5.00%					
Gold Infrastructure	KILO/B	CN	Purpose Gold Bullion Fund	2.50%	\$21.21	\$25,000	1,179	0.23%	NA
	ZGI	CN	BMO Global Infrastructure Index ETF	2.50%	\$39.17	\$25,000	638	0.60%	2.63%
Cash				6.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	6.00%	\$50.01	\$60,000	1,200	0.15%	2.00%
Total				100.00%		\$1,000,000		0.29%	2.74%

US exchanges are NYSE Arca or NASDAQ; CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

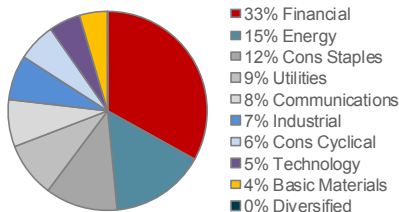
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

Ticker	Company Name	Weight (%)
RY CN	Royal Bank of Canada	3.35%
ENB CN	Enbridge Inc	3.26%
TD CN	Toronto-Dominion Bank/The	3.14%
TRP CN	TC Energy Corp	2.00%
BNS CN	Bank of Nova Scotia/The	1.95%
BMO CN	Bank of Montreal	1.45%
Top 10 Holdings Total Weight		19.66%

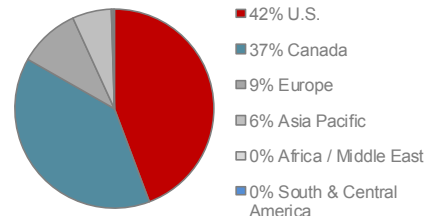
Source: NBF, Bloomberg; Data as of 30-May-2019

Equity Sub-Portfolio Sector Allocation



Source: NBF, Bloomberg

Equity Sub-Portfolio Geographic Allocation

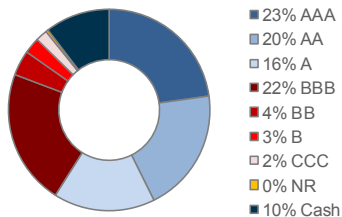


Fixed Income Sub-Portfolio Metrics

Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
XBB	27.50%	7.78	2.25%	2.15%
PMIF	13.75%	2.38	4.54%	3.69%
HFR	18.33%	0.65	2.57%	2.11%
XSI	13.75%	2.64	3.64%	3.08%
PSA	8.33%	-	1.92%	1.77%
VBG	18.33%	7.80	0.90%	0.52%
Weighted Average		4.38	2.54%	2.15%

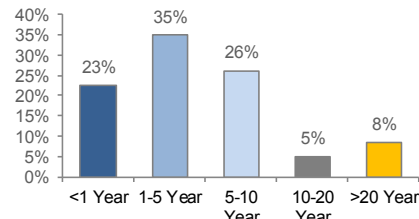
Source: NBF, ETF Providers; Data as of 30-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Source: NBF, ETF Providers, Bloomberg

Fixed Income Sub-Portfolio Maturity Allocation



Summary

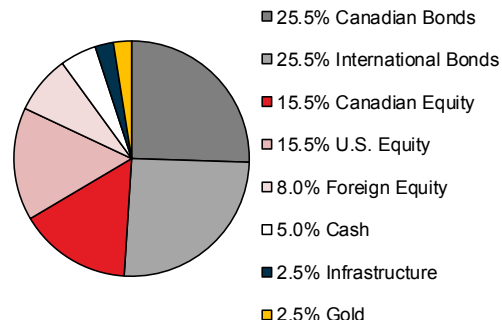
Portfolio Description: A diversified and efficient ETF portfolio with Conservative asset allocation. Weighted average ETF MER is 27 bps.

Investor Objective: Although the investor can tolerate limited volatility to ensure that assets will grow, the investor prefers having a portfolio consisting mainly of fixed-income investments for reasons of stability.

Risk Profile: Tolerance for risk is low.

Income	Conservative	Balanced	Growth	Maximum Growth
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Asset Allocation: Portfolio split at 39% equity to 51% fixed income, with 5% in cash and 5% in alternatives.



Simulated Historical Performance

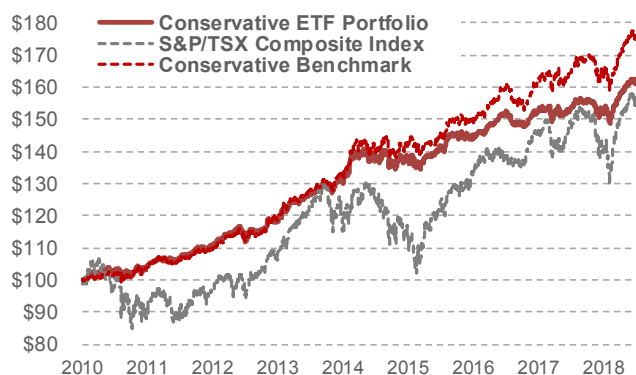
Since backtest start date of 30-Dec-10, the Conservative Portfolio has had a total return of 61.3%, or 5.1% in the past year with volatility of 3.7%. Max drawdown in the period was 5.2%, compared with the TSX composite's drawdown of 21.5%.

Period Performance

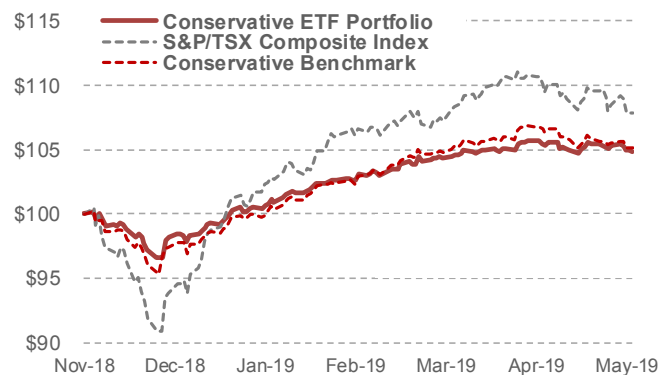
As of: 31-May-19	Conservative Portfolio*	Conservative Benchmark	S&P/TSX Composite Index
Simulated Period Returns			
Since Dec-10	61.3%	74.9%	53.7%
Annualized	5.8%	6.9%	5.2%
YTD	8.3%	13.3%	12.1%
3 month	2.3%	2.8%	1.6%
1 year	5.1%	6.0%	3.6%
3 Year	14.2%	20.2%	25.3%
Risk Metrics (since Dec-10)			
Max Drawdown	5.2%	6.9%	21.5%
Sharpe Ratio	1.31	1.28	0.49
Volatility	3.7%	4.5%	9.4%

*Total returns net of simulated 1% fee

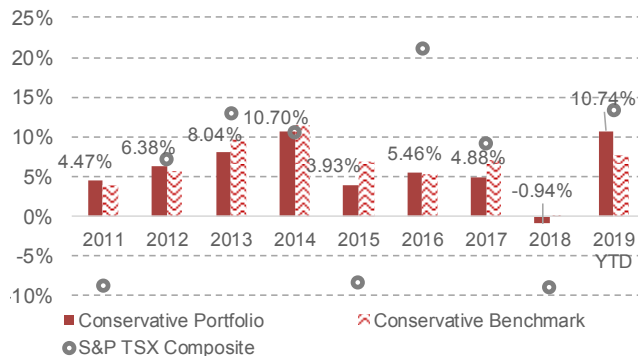
Cumulative Performance



Recent Cumulative Performance



Calendar Year Performance



Source: NBF, Bloomberg

Conservative ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				39.00%					
Canadian Equity									
Broad	ZCN	CN	BMO S&P/TSX Capped Composite Index ETF	10.33%	\$21.75	\$103,333	4,750	0.05%	2.85%
Low Vol	ZLB	CN	BMO Low Volatility Canadian Equity ETF	5.17%	\$33.22	\$51,667	1,555	0.39%	2.44%
U.S. Equity									
Broad	XUU	CN	iShares Core S&P US Total Market Index ETF	10.33%	\$28.42	\$103,333	3,636	0.07%	1.66%
Low Vol	XMU	CN	iShares Edge MSCI Min Vol USA Index ETF	5.17%	\$54.13	\$51,667	954	0.33%	1.42%
Foreign Equity									
Developed	XEF	CN	iShares Core MSCI EAFE IMI Index ETF	4.00%	\$29.68	\$40,000	1,348	0.22%	2.60%
Low Vol	ILV	CN	Invesco S&P International Developed Low Volatility Index ETF	4.00%	\$24.03	\$40,000	1,665	0.42%	3.17%
FIXED INCOME				51.00%					
Canadian Bonds									
Aggregate	XBB	CN	iShares Core Canadian Universe Bond Index ETF	15.30%	\$31.78	\$153,000	4,814	0.10%	2.79%
Corporate	HFR	CN	Horizons Active Floating Rate Bond ETF	10.20%	\$10.05	\$102,000	10,149	0.46%	2.56%
International Bonds									
Global	VBG	CN	Vanguard Global ex-U.S. Aggregate Bond Index ETF CAD-H	10.20%	\$27.28	\$102,000	3,739	0.38%	2.25%
Strategic	PMIF	CN	PIMCO Monthly Income Fund	7.65%	\$20.00	\$76,500	3,825	0.85%	3.39%
Strategic	XSI	CN	iShares Short Term Strategic Fixed Income ETF	7.65%	\$18.81	\$76,500	4,067	0.56%	3.43%
ALTERNATIVE INVESTMENTS				5.00%					
Gold	KILO/B	CN	Purpose Gold Bullion Fund	2.50%	\$21.21	\$25,000	1,179	0.23%	NA
Infrastructure	ZGI	CN	BMO Global Infrastructure Index ETF	2.50%	\$39.17	\$25,000	638	0.60%	2.63%
Cash				5.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	5.00%	\$50.01	\$50,000	1,000	0.15%	2.00%
Total				100.00%		\$1,000,000		0.27%	2.50%

US exchanges are NYSE Arca or NASDAQ: CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

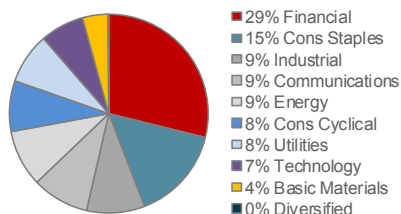
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

Ticker	Company	Weight (%)
RY CN	Royal Bank of Canada	1.81%
TD CN	Toronto-Dominion Bank/The	1.72%
ENB CN	Enbridge Inc	1.72%
TRP CN	TC Energy Corp	1.25%
MSFT US	Microsoft Corp	1.09%
CNR CN	Canadian National Railway Co	0.96%
Top 10 Holdings Total Weight		12.09%

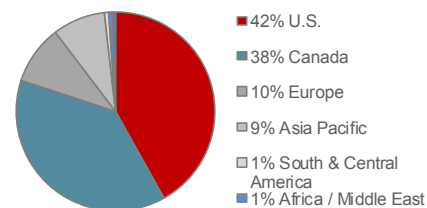
Source: NBF, Bloomberg; Data as of 30-May-2019

Equity Sub-Portfolio Sector Allocation



Source: NBF, Bloomberg

Equity Sub-Portfolio Geographic Allocation

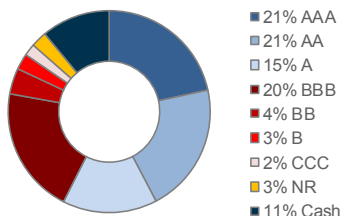


Fixed Income Sub-Portfolio Metrics

Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
XBB	27.32%	7.78	2.25%	2.15%
PMIF	13.66%	2.38	4.54%	3.69%
HFR	18.21%	0.65	2.57%	2.11%
XSI	13.66%	2.64	3.64%	3.08%
PSA	8.93%	-	1.92%	1.77%
VBG	18.21%	7.80	0.90%	0.52%
Weighted Average		4.35	2.54%	2.15%

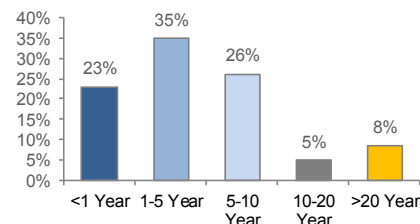
Source: NBF, ETF Providers; Data as of 30-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Source: NBF, ETF Providers, Bloomberg

Fixed Income Sub-Portfolio Maturity Allocation



Summary

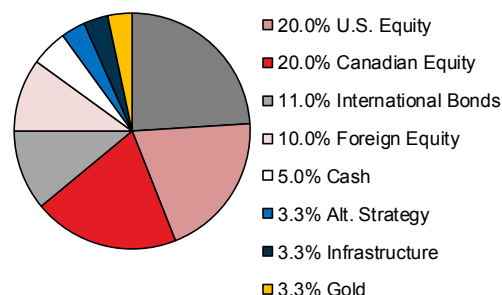
Portfolio Description: A diversified and efficient ETF portfolio with Balanced asset allocation. Weighted average ETF MER is 28 bps.

Investor Objective: The investor gives equal weight to income and capital growth. The investor can tolerate moderate volatility to ensure the growth of capital, but he or she prefers having a portfolio with a significant exposure to fixed-income securities for reasons of stability.

Risk Profile: Tolerance for risk is average.

Income	Conservative	Balanced	Growth	Maximum Growth
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Asset Allocation: Portfolio split at 50% equity to 35% fixed income, with 5% in cash and 10% in alternatives.



Simulated Historical Performance

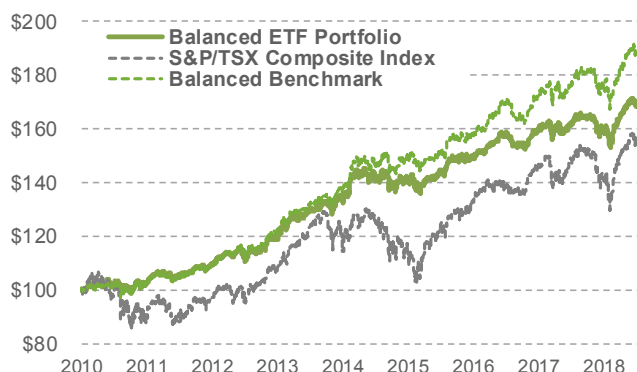
Since backtest start date of 30-Dec-10, the Balanced Portfolio has had a total return of 67.8%, or 3.4% in the past year with volatility of 4.7%. Max drawdown in the period was 7.6%, compared with the TSX composite's drawdown of 21.5%.

Period Performance

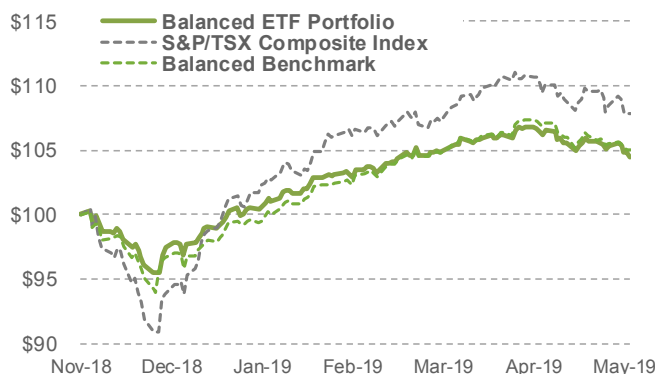
As of: 31-May-19	Balanced Portfolio*	Balanced Benchmark	S&P/TSX Composite Index
Simulated Period Returns			
Since Dec-10	67.8%	87.3%	53.7%
Annualized	6.3%	7.7%	5.2%
YTD	8.2%	14.5%	10.6%
3 month	1.6%	2.7%	1.6%
1 year	3.4%	6.0%	3.6%
3 Year	16.2%	23.3%	25.3%
Risk Metrics (since Dec-10)			
Max Drawdown	7.6%	8.4%	21.5%
Sharpe Ratio	1.15	1.25	0.49
Volatility	4.7%	5.3%	9.4%

*Total returns net of simulated 1% fee

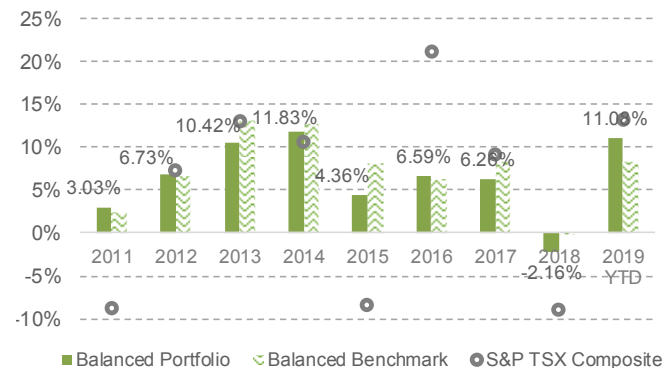
Cumulative Performance



Recent Cumulative Performance



Calendar Year Performance



Source: NBF, Bloomberg

Balanced ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				50.00%					
Canadian Equity									
Broad	XIC	CN	iShares Core S&P/TSX Capped Composite Index ETF	13.33%	\$25.62	\$133,333	5,204	0.06%	2.88%
Factor	DGRC	CN	Wisdomtree Canada Quality Dividend Growth Index Etf	6.67%	\$27.60	\$66,667	2,415	0.24%	1.54%
U.S. Equity									
Broad	XUU	CN	iShares Core S&P US Total Market Index ETF	13.33%	\$28.42	\$133,333	4,691	0.07%	1.66%
Factor	QUS	CN	AGFIQ Enhanced Core US Equity ETF	6.67%	\$30.20	\$66,667	2,208	0.45%	1.15%
Foreign Equity									
Emg. Mkt.	XEC	CN	iShares Core MSCI Emerging Markets IMI Index ETF	2.50%	\$25.67	\$25,000	974	0.26%	2.57%
Developed	XEF	CN	iShares Core MSCI EAFE IMI Index ETF	2.50%	\$29.68	\$25,000	842	0.22%	2.60%
Factor	XFI	CN	iShares Edge MSCI Multifactor EAFE Index ETF	5.00%	\$22.68	\$50,000	2,205	0.51%	3.30%
FIXED INCOME				35.00%					
Canadian Bonds									
Aggregate	ZAG	CN	BMO Aggregate Bond Index ETF	14.40%	\$15.92	\$144,000	9,045	0.09%	2.88%
Corporate	HAB	CN	Horizons Active Corporate Bond ETF	9.60%	\$10.90	\$96,000	8,807	0.59%	3.08%
International Bonds									
Global	VBG	CN	Vanguard Global ex-U.S. Aggregate Bond Index ETF CAD-H	6.60%	\$27.28	\$66,000	2,419	0.38%	2.25%
Strategic	PMIF	CN	PIMCO Monthly Income Fund	4.40%	\$20.00	\$44,000	2,200	0.85%	3.39%
ALTERNATIVE INVESTMENTS				10.00%					
Gold	KILO/B	CN	Purpose Gold Bullion Fund	3.33%	\$21.21	\$33,333	1,572	0.23%	NA
Alt. Strategy	PMM	CN	Purpose Multi-Strategy Market Neutral Fund-ETF	3.33%	\$22.08	\$33,333	1,510	1.05%	0.00%
Infrastructure	ZGI	CN	BMO Global Infrastructure Index ETF	3.33%	\$39.17	\$33,333	851	0.60%	2.63%
Cash				5.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	5.00%	\$50.01	\$50,000	1,000	0.15%	2.00%
Total				100.00%		\$1,000,000		0.28%	2.28%

US exchanges are NYSE Arca or NASDAQ; CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

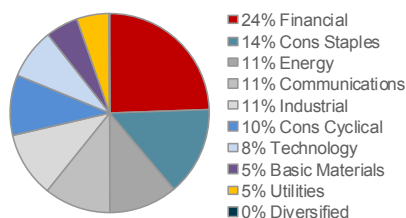
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

Ticker	Company	Weight (%)
ENB CN	Enbridge Inc	2.40%
RY CN	Royal Bank of Canada	1.63%
CNR CN	Canadian National Railway Co	1.61%
TD CN	Toronto-Dominion Bank/The	1.52%
MSFT US	Microsoft Corp	1.24%
TRP CN	TC Energy Corp	1.07%
Top 10 Holdings Total Weight		13.34%

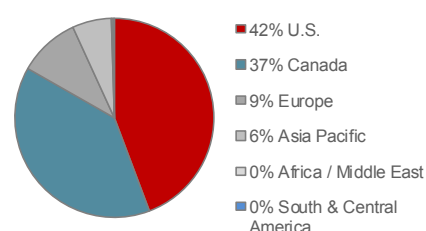
Source: NBF, Bloomberg; Data as of 30-May-2019

Equity Sub-Portfolio Sector Allocation



Source: NBF, Bloomberg

Equity Sub-Portfolio Geographic Allocation

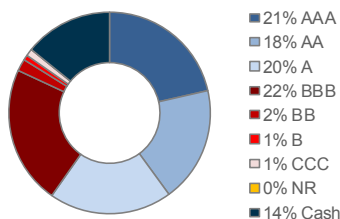


Fixed Income Sub-Portfolio Metrics

Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
ZAG	36.00%	7.64	2.32%	2.23%
PSA	12.50%	-	1.92%	1.77%
HAB	24.00%	6.32	3.06%	2.47%
PMIF	11.00%	2.38	4.54%	3.69%
VBG	16.50%	7.80	0.90%	0.52%
Weighted Average		5.82	2.46%	2.11%

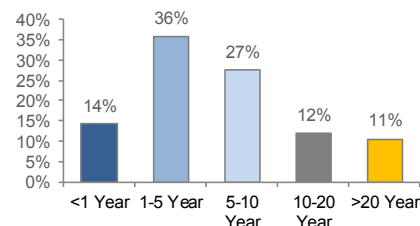
Source: NBF, ETF Providers; Data as of 30-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Source: NBF, ETF Providers, Bloomberg

Fixed Income Sub-Portfolio Maturity Allocation



Summary

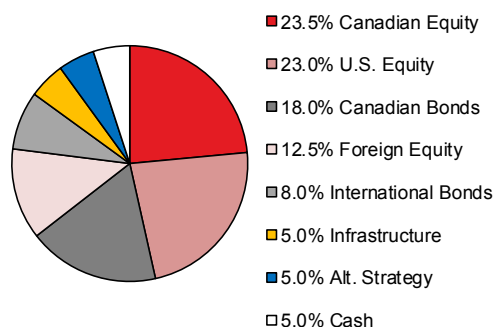
Portfolio Description: A diversified and efficient ETF portfolio with Growth asset allocation. Weighted average ETF MER is 30 bps.

Investor Objective: The investor's main goal is capital growth. Although the investor can tolerate greater volatility in order to increase the value of assets, the investor is not prepared to invest his or her entire portfolio in stocks.

Risk Profile: Tolerance for risk is high.

Income	Conservative	Balanced	Growth	Maximum Growth
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Asset Allocation: Portfolio split at 59% equity to 26% fixed income, with 5% in cash and 10% in alternatives.



Simulated Historical Performance

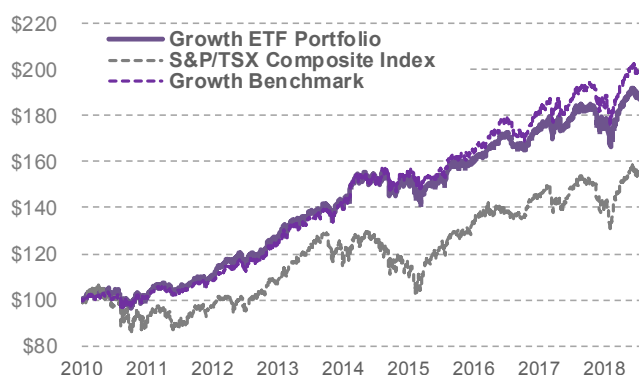
Since backtest start date of 30-Dec-10, the Growth Portfolio has had a total return of 87.3%, or 4.3% in the past year with volatility of 6.0%. Max drawdown in the period was 10.0%, compared with the TSX composite's drawdown of 21.5%.

Period Performance

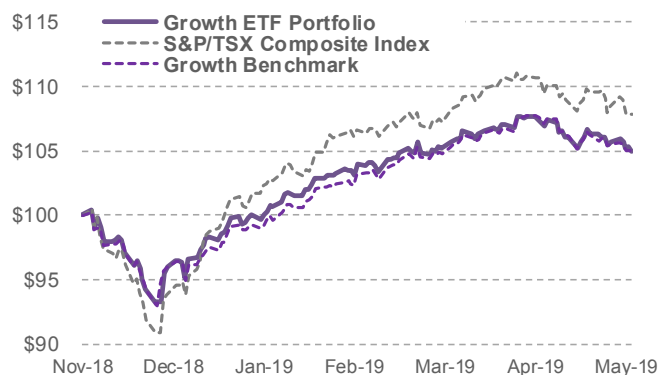
As of: 31-May-19	Growth Portfolio*	Growth Benchmark	S&P/TSX Composite Index
Simulated Period Returns			
Since Dec-10	87.3%	97.9%	53.7%
Annualized	7.7%	8.4%	5.2%
YTD	11.5%	15.6%	10.6%
3 month	1.7%	2.6%	1.6%
1 year	4.3%	6.0%	3.6%
3 Year	21.9%	26.0%	25.3%
Risk Metrics (since Dec-10)			
Max Drawdown	10.0%	9.8%	21.5%
Sharpe Ratio	1.12	1.23	0.49
Volatility	6.0%	6.0%	9.4%

*Total returns net of simulated 1% fee

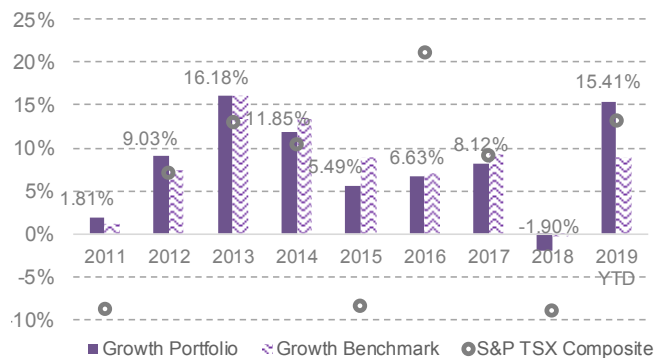
Cumulative Performance



Recent Cumulative Performance



Calendar Year Performance



Source: NBF, Bloomberg

Growth ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				59.00%					
Canadian Equity									
Broad	XIC	CN	iShares Core S&P/TSX Capped Composite Index ETF	15.67%	\$25.62	\$156,667	6,115	0.06%	2.88%
Factor	WXM	CN	CI First Asset Morningstar Canada Momentum Index ETF	7.83%	\$17.81	\$78,333	4,398	0.67%	0.83%
U.S. Equity									
Broad	XUU	CN	iShares Core S&P US Total Market Index ETF	15.33%	\$28.42	\$153,333	5,395	0.07%	1.66%
Factor	ZUQ	CN	BMO MSCI USA High Quality Index ETF	7.67%	\$36.24	\$76,667	2,116	0.32%	1.02%
Foreign Equity									
Emg. Mkt.	VEE	CN	Vanguard FTSE Emerging Markets All Cap Index ETF	3.13%	\$33.01	\$31,250	947	0.24%	2.17%
Developed	VIU	CN	Vanguard FTSE Developed All Cap ex-North America Index	3.13%	\$27.17	\$31,250	1,150	0.23%	2.70%
Global	ZGQ	CN	BMO MSCI All Country World High Quality Index ETF	6.25%	\$32.13	\$62,500	1,945	0.50%	1.42%
FIXED INCOME				26.00%					
Canadian Bonds									
Aggregate	VAB	CN	Vanguard Canadian Aggregate Bond Index ETF	10.80%	\$25.93	\$108,000	4,165	0.09%	2.67%
Corporate	HAB	CN	Horizons Active Corporate Bond ETF	7.20%	\$10.90	\$72,000	6,606	0.59%	3.08%
International Bonds									
Global	FLGA	CN	Franklin Liberty Global Aggregate Bond ETF Cad-Hedged	8.00%	\$20.69	\$80,000	3,867	0.39%	2.17%
ALTERNATIVE INVESTMENTS				10.00%					
Infrastructure	RIG	CN	RBC Quant Global Infrastructure Leaders ETF	5.00%	\$20.76	\$50,000	2,408	0.62%	3.92%
Alt. Strategy	HAC	CN	Horizons Seasonal Rotation ETF	5.00%	\$21.46	\$50,000	2,330	1.27%	0.00%
Cash				5.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	5.00%	\$50.01	\$50,000	1,000	0.15%	2.00%
Total				100.00%		\$1,000,000		0.30%	2.07%

US exchanges are NYSE Arca or NASDAQ: CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

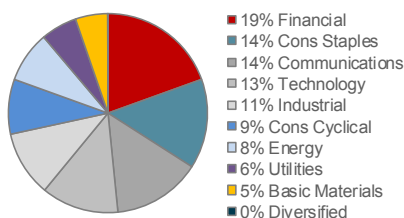
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

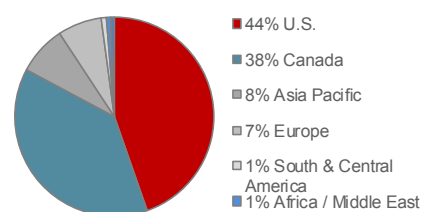
Ticker	Company	Weight (%)
MSFT US	Microsoft Corp	1.94%
RY CN	Royal Bank of Canada	1.59%
TD CN	Toronto-Dominion Bank/The	1.49%
CNR CN	Canadian National Railway Co	1.41%
BCE CN	BCE Inc	1.23%
ENB CN	Enbridge Inc	1.10%
Top 10 Holdings Total Weight		12.61%

Source: NBF, Bloomberg; Data as of 30-May-2019

Equity Sub-Portfolio Sector Allocation



Equity Sub-Portfolio Geographic Allocation



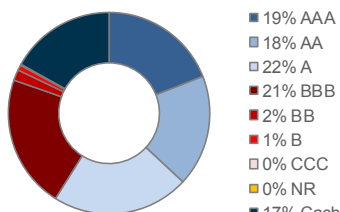
Source: NBF, Bloomberg

Fixed Income Sub-Portfolio Metrics

Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
VAB	34.84%	7.70	2.30%	2.21%
HAB	23.23%	6.32	3.06%	2.47%
FLGA	25.81%	6.63	3.58%	3.19%
PSA	16.13%	-	1.92%	1.77%
Weighted Average		5.86	2.75%	2.45%

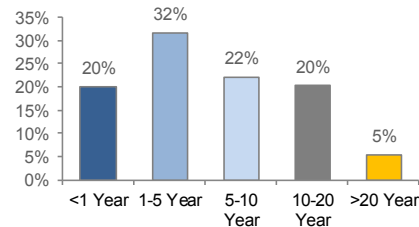
Source: NBF, ETF Providers; Data as of 30-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Source: NBF, ETF Providers, Bloomberg

Fixed Income Sub-Portfolio Maturity Allocation



Summary

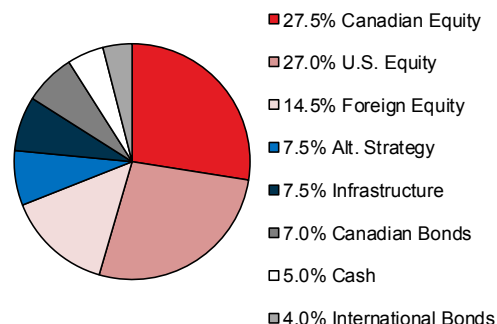
Portfolio Description: A diversified and efficient ETF portfolio with Maximum Growth asset allocation. Weighted average ETF MER is 35 bps.

Investor Objective: The investor wants to maximize eventual return on capital by investing all or most of his or her portfolio in the stock market. In doing so, the investor accepts higher volatility of investment returns in the hope that these returns will be ultimately higher.

Risk Profile: Tolerance for risk is very high.

Income	Conservative	Balanced	Growth	Maximum Growth
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Asset Allocation: Portfolio split at 69% equity to 11% fixed income, with 5% in cash and 15% in alternatives.

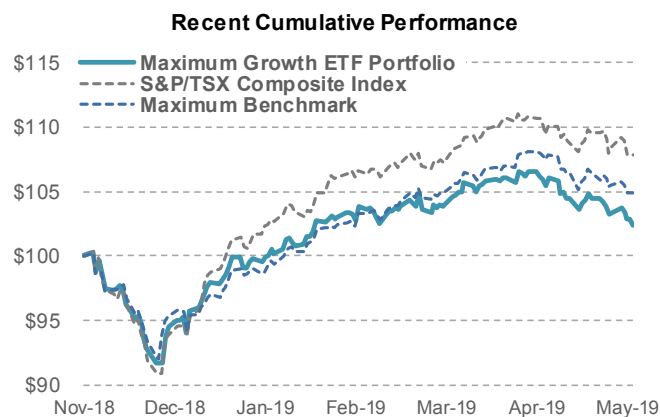
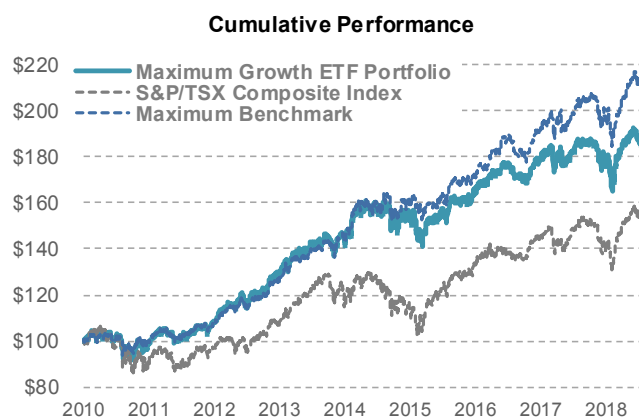


Simulated Historical Performance

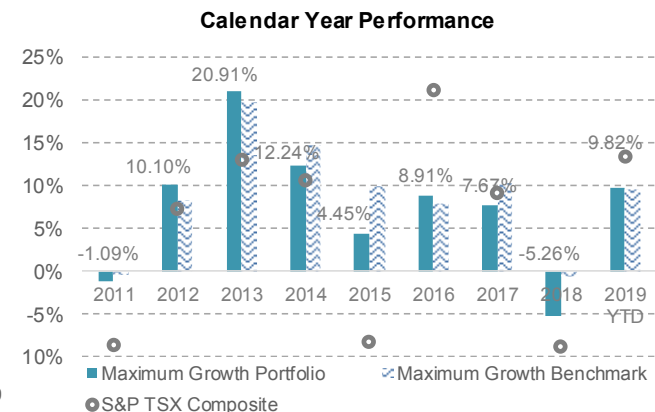
Since backtest start date of 30-Dec-10, the Maximum Growth Portfolio has had a total return of 84.6%, or 0.9% in the past year with volatility of 7.2%. Max drawdown in the period was 12.3%, compared with the TSX composite's drawdown of 21.5%.

As of:	Maximum Growth Portfolio*	Maximum Growth Benchmark	S&P/TSX Composite
31-May-19			
Simulated Period Returns			
Since Dec-10	84.6%	110.4%	41.3%
Annualized	7.6%	9.2%	4.2%
YTD	6.4%	16.5%	1.7%
3 month	-0.4%	2.5%	-6.6%
1 year	0.9%	6.0%	3.6%
3 Year	17.6%	28.6%	15.2%
Risk Metrics (since Dec-10)			
Max Drawdown	12.3%	11.0%	21.5%
Sharpe Ratio	0.92	1.19	0.49
Volatility	7.2%	6.8%	9.4%

*Total returns net of simulated 1% fee



Source: NBF, Bloomberg



Maximum Growth ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				69.00%					
Canadian Equity									
Broad	XIC	CN	iShares Core S&P/TSX Capped Composite Index ETF	18.33%	\$25.62	\$183,333	7,156	0.06%	2.85%
Factor	FXM	CN	CI First Asset Morningstar Canada Value Index ETF	9.17%	\$13.85	\$91,667	6,619	0.67%	2.31%
U.S. Equity									
Broad	XUU	CN	iShares Core S&P US Total Market Index ETF	18.00%	\$28.42	\$180,000	6,333	0.07%	1.63%
Factor	XXM/B	CN	CI First Asset Morningstar US Value Index ETF	9.00%	\$14.12	\$90,000	6,374	0.67%	1.45%
Foreign Equity									
Emg. Mkt.	VEE	CN	Vanguard FTSE Emerging Markets All Cap Index ETF	3.63%	\$33.01	\$36,250	1,098	0.24%	2.18%
Developed	VIU	CN	Vanguard FTSE Developed All Cap ex-North America Index	3.63%	\$27.17	\$36,250	1,334	0.23%	2.67%
Global	ZGQ	CN	BMO MSCI All Country World High Quality Index ETF	7.25%	\$32.13	\$72,500	2,256	0.50%	1.40%
FIXED INCOME				11.00%					
Canadian Bonds									
Aggregate	VAB	CN	Vanguard Canadian Aggregate Bond Index ETF	7.00%	\$25.93	\$70,000	2,700	0.09%	2.66%
International Bonds									
Global	FLGA	CN	Franklin Liberty Global Aggregate Bond ETF Cad-Hedged	4.00%	\$20.69	\$40,000	1,933	0.39%	2.15%
ALTERNATIVE INVESTMENTS				15.00%					
Infrastructure	RIG	CN	RBC Quant Global Infrastructure Leaders ETF	7.50%	\$20.76	\$75,000	3,613	0.62%	3.85%
Alt. Strategy	HAC	CN	Horizons Seasonal Rotation ETF	7.50%	\$21.46	\$75,000	3,495	1.27%	0.00%
Cash				5.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	5.00%	\$50.01	\$50,000	1,000	0.15%	2.00%
Total				100.00%		\$1,000,000		0.35%	2.10%

US exchanges are NYSE Arca or NASDAQ: CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

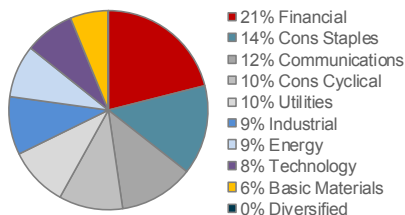
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

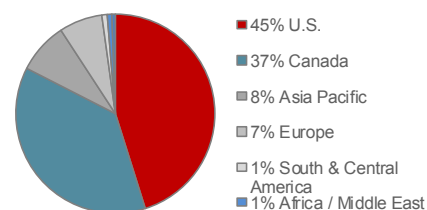
Ticker	Company	Weight (%)
RY CN	Royal Bank of Canada	1.56%
TD CN	Toronto-Dominion Bank/The	1.46%
MSFT US	Microsoft Corp	1.31%
ENB CN	Enbridge Inc	1.07%
CNR CN	Canadian National Railway Co	0.97%
BNS CN	Bank of Nova Scotia/The	0.91%
Top 10 Holdings Total Weight		10.48%

Source: NBF, Bloomberg; Data as of 30-May-2019

Equity Sub-Portfolio Sector Allocation



Equity Sub-Portfolio Geographic Allocation



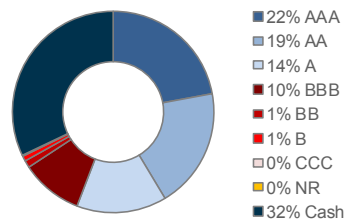
Source: NBF, Bloomberg

Fixed Income Sub-Portfolio Metrics

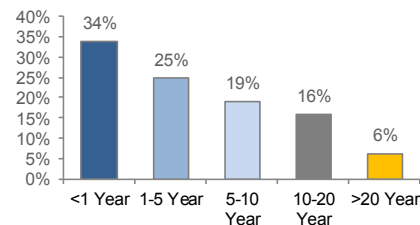
Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
PSA	31.25%	-	1.92%	1.77%
VAB	43.75%	7.70	2.30%	2.21%
FLGA	25.00%	6.63	3.58%	3.19%
Weighted Average		5.03	2.50%	2.32%

Source: NBF, ETF Providers; Data as of 30-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Fixed Income Sub-Portfolio Maturity Allocation



Source: NBF, ETF Providers, Bloomberg

Yield Focus ETF Portfolio Summary

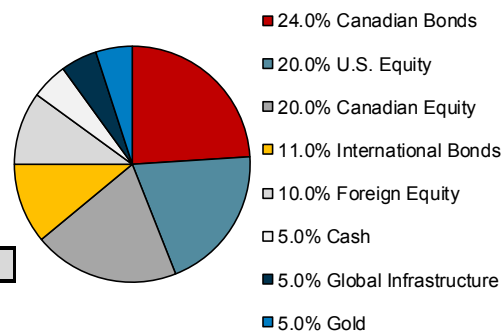
Portfolio Description: A diversified and efficient ETF portfolio with Balanced asset allocation and monthly distribution. Weighted average portfolio MER is 37 bps, 12 month dividend yield is 3.31%.

Investor Objective: The investor prioritizes higher distribution yield over growth. The investor places high ongoing yield as the primary investment objective. At the same time, the investor tries to preserve capital by maintaining an overall balanced risk profile.

Risk Profile: Tolerance for risk is average.



Asset Allocation: Portfolio split at 50% equity to 35% fixed income, with 5% in cash and 10% in alternatives.



Simulated Historical Performance

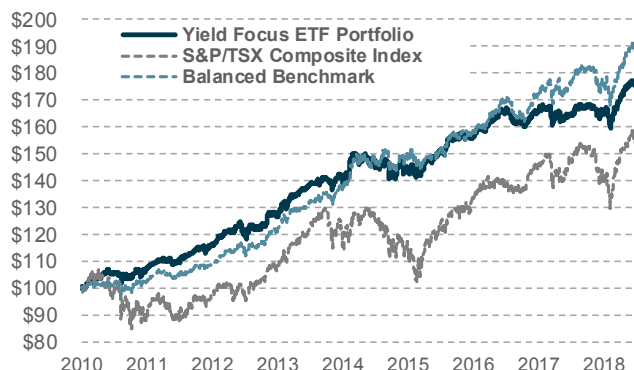
Since backtest start date of 30-Dec-10, the Yield Focus Portfolio has had a total return of 74.0%, or 5.6% in the past year with volatility of 4.4%. Max drawdown in the period was 6.4%, compared with the TSX composite's drawdown of 21.5%.

Period Performance

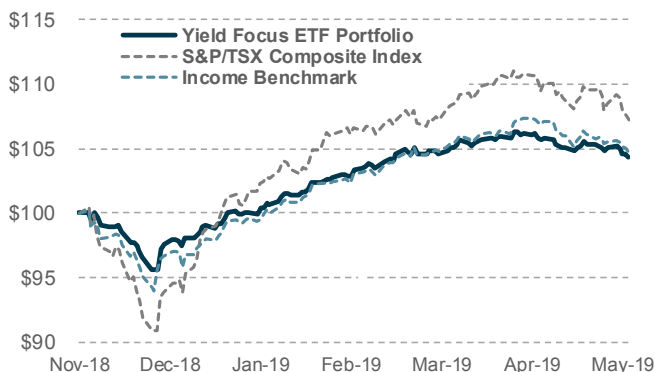
As of: 31-May-19	Yield Focus Portfolio*	Balanced BM	S&P/TSX Composite Index
Simulated Period Returns			
Since Dec-10	74.0%	86.6%	52.9%
Annualized	6.8%	7.7%	5.2%
Yield	3.3%	2.6%	3.1%
YTD	7.5%	14.0%	11.5%
3 month	1.5%	2.3%	1.1%
1 year	5.6%	5.6%	3.0%
3 year	15.1%	22.8%	24.6%
Risk Metrics (since Dec-10)			
Max Drawdown	6.4%	8.4%	21.5%
Sharpe Ratio	1.32	1.26	0.48
Volatility	4.4%	5.3%	9.4%

*Total returns net of simulated 1% fee

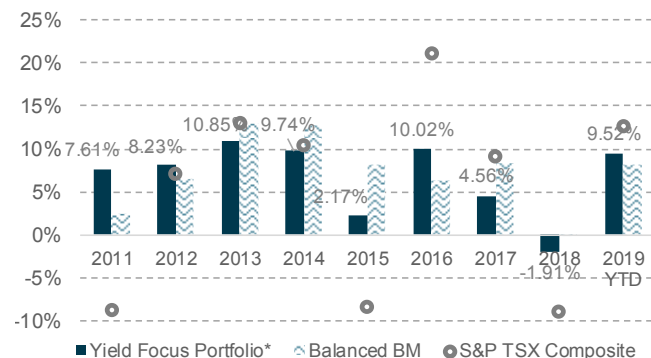
Cumulative Performance



Cumulative Performance



Calendar Year Performance



Source: NBF, Bloomberg

Yield Focus ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				50.00%					
Canadian Equity									
Core	XEI	CN	iShares S&P/TSX Composite High Dividend Index ETF	13.33%	\$20.92	\$133,333	6,373	0.22%	4.93%
Factor	VDY	CN	Vanguard FTSE Canadian High Dividend Yield Index	6.67%	\$33.39	\$66,667	1,997	0.22%	4.07%
U.S. Equity									
Core	XHU	CN	iShares US High Dividend Equity Index ETF	13.33%	\$24.87	\$133,333	5,361	0.32%	2.61%
Strategic	ZDY	CN	BMO US Dividend ETF	6.67%	\$30.92	\$66,667	2,156	0.34%	2.94%
Foreign Equity									
Developed	ZDI	CN	BMO International Dividend ETF	10.00%	\$20.35	\$100,000	4,914	0.44%	5.23%
FIXED INCOME				35.00%					
Canadian Bonds									
Aggregate	ZAG	CN	BMO Aggregate Bond Index ETF	14.40%	\$15.92	\$144,000	9,045	0.09%	2.87%
Corporate	HAB	CN	Horizons Active Corporate Bond ETF	9.60%	\$10.91	\$96,000	8,798	0.60%	3.07%
International Bonds									
Strategic	PMIF	CN	PIMCO Monthly Income Fund	11.00%	\$19.97	\$110,000	5,508	0.87%	3.39%
ALTERNATIVE INVESTMENTS				10.00%					
Gold	KILO/B	CN	Purpose Gold Bullion Fund	5.00%	\$21.65	\$50,000	2,309	0.23%	NA
Infrastructure	ZGI	CN	BMO Global Infrastructure Index ETF	5.00%	\$39.17	\$50,000	1,276	0.61%	2.60%
Cash				5.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	5.00%	\$50.01	\$50,000	1,000	0.12%	2.00%
Total				100.00%		\$1,000,000		0.37%	3.31%

US exchanges are NYSE Arca or NASDAQ; CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

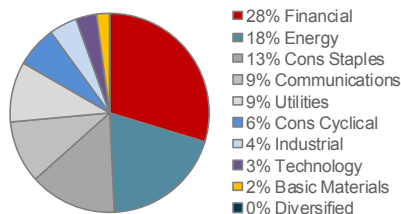
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

Ticker	Company Name	Weight (%)
ENB CN	Enbridge Inc	3.08%
TRP CN	TC Energy Corp	2.57%
BNS CN	Bank of Nova Scotia/The	2.34%
XOM US	Exxon Mobil Corp	2.33%
BMO CN	Bank of Montreal	2.04%
RY CN	Royal Bank of Canada	1.95%
Top 10 Holdings Total Weight		21.77%

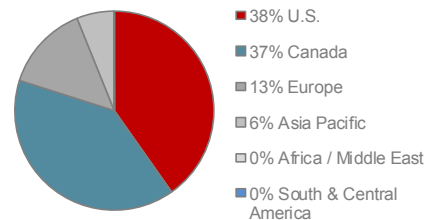
Source: NBF, Bloomberg; Data as of 31-May-2019

Equity Sub-Portfolio Sector Allocation



Source: NBF, Bloomberg

Equity Sub-Portfolio Geographic Allocation

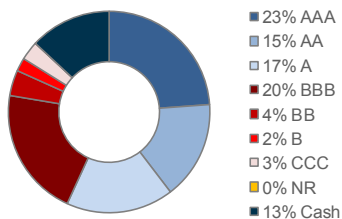


Fixed Income Sub-Portfolio Metrics

Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
ZAG	36.00%	7.64	2.32%	2.23%
HAB	24.00%	6.32	3.06%	2.47%
PMIF	27.50%	2.38	4.54%	3.69%
PSA	12.50%	-	1.92%	1.92%
Weighted Average		4.92	3.06%	2.65%

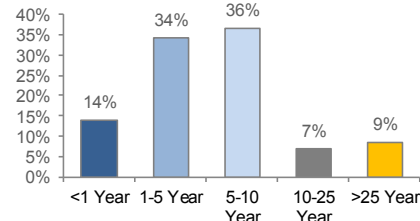
Source: NBF, ETF Providers; Data as of 31-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Source: NBF, ETF Providers, Bloomberg

Fixed Income Sub-Portfolio Maturity Allocation



ESG ETF Portfolio Summary

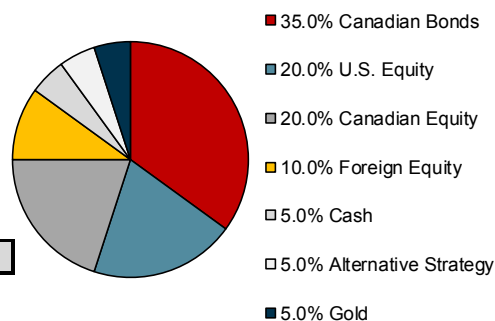
Portfolio Description: A diversified and efficient ETF portfolio with Balanced asset allocation. Weighted average ETF MER is 36 bps.

Investor Objective: The portfolio integrates environmental, social and governance (ESG) principles when selecting ETFs in the Equity and Fixed Income asset classes. The investor gives equal weight to income and capital growth, and can tolerate moderate volatility to ensure the growth of capital.

Risk Profile: Tolerance for risk is average.



Asset Allocation: Portfolio split at 50% equity to 35% fixed income, with 5% in cash and 10% in alternatives.



Simulated Historical Performance

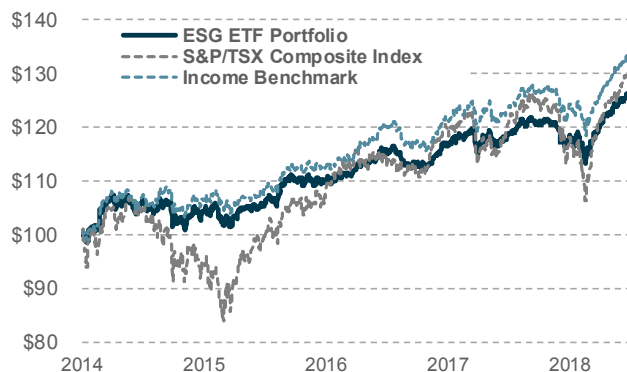
Since backtest start date of 28-Nov-14, the ESG Portfolio has had a total return of 22.4%, or 3.5% in the past year with volatility of 7.1%. Max drawdown in the period was 7.2%, compared with the TSX composite's drawdown of 21.5%.

Period Performance

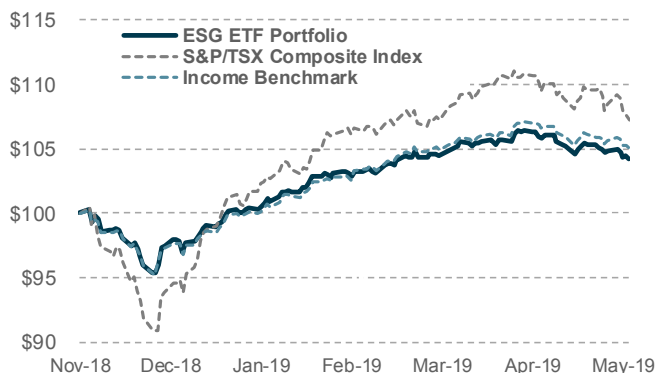
As of: 31-May-19	ESG Portfolio*	Balanced BM	S&P/TSX Composite Index
Simulated Period Returns			
Since Nov-14	22.4%	29.3%	25.1%
Annualized	4.6%	5.9%	5.1%
YTD	8.8%	11.5%	10.0%
3 month	1.3%	2.3%	1.1%
1 year	3.5%	5.2%	3.0%
3 year	15.8%	19.9%	24.6%
Risk Metrics (since Nov-14)			
Max Drawdown	7.2%	7.2%	21.5%
Sharpe Ratio	0.31	0.36	0.23
Volatility	7.1%	8.4%	11.0%

*Total returns net of simulated 1% fee

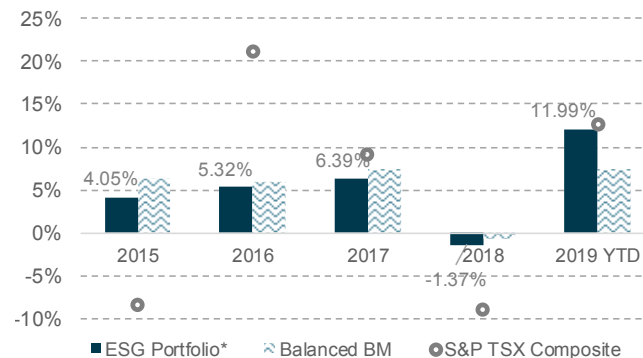
Cumulative Performance



Cumulative Performance



Calendar Year Performance



Source: NBF, Bloomberg

ESG ETF Investment Portfolio									
Asset Class	Ticker	Exch.	Name	Weight (%)	Price (CAD\$)	Market Val. (\$)	Shares	MER (%)	Yield (%)
EQUITIES				50.00%					
Canadian Equity									
Strategic Factor	XESG	CN	iShares ESG MSCI Canada Index ETF	13.33%	\$19.62	\$133,333	6,796	0.23%	NA
	MKC	CN	Mackenzie Maximum Diversification Canada Index ETF	6.67%	\$23.38	\$66,667	2,851	0.51%	1.71%
U.S. Equity									
Core Strategic	XSUS	CN	iShares ESG MSCI USA Index ETF	13.33%	\$19.79	\$133,333	6,737	0.28%	NA
	DRFU	CN	Desjardins RI USA Multifactor - Low CO2 ETF	6.67%	\$19.81	\$66,667	3,365	0.57%	1.50%
Foreign Equity									
Strategic Strategic	QEF	CN	AGFIQ Enhanced Global ESG Factors ETF	5.00%	\$26.00	\$50,000	1,923	0.51%	0.98%
	ETHI	CN	Horizons Global Sustainability Leaders Index ETF	5.00%	\$26.27	\$50,000	1,903	0.73%	0.81%
FIXED INCOME				35.00%					
Canadian Bonds									
Aggregate Strategic Strategic	XSAB	CN	iShares ESG Canadian Aggregate Bond Index ETF	14.00%	\$20.38	\$140,000	6,869	0.20%	2.69%
	DRCU	CN	Desjardins RI Active Canadian Bond - Low CO2 ETF	10.50%	\$21.08	\$105,000	4,980	0.40%	2.66%
	XSTB	CN	Ishares ESG Canadian Short Term Bond Index ETF	10.50%	\$20.12	\$105,000	5,220	0.20%	2.44%
ALTERNATIVE INVESTMENTS				10.00%					
Gold Alt. Strategy	KILO/B	CN	Purpose Gold Bullion Fund	5.00%	\$21.65	\$50,000	2,309	0.23%	NA
	PMM	CN	Purpose Multi-Strategy Market Neutral Fund-ETF	5.00%	\$22.05	\$50,000	2,268	1.06%	0.91%
Cash				5.00%					
Hi Int. Savings	PSA	CN	Purpose High Interest Savings ETF	5.00%	\$50.01	\$50,000	1,000	0.12%	2.00%
Total				100.00%		\$1,000,000		0.36% 1.36%	

US exchanges are NYSE Arca or NASDAQ: CN is the Toronto Stock Exchange. Prices as of 31-May-19. Source: NBF, Bloomberg

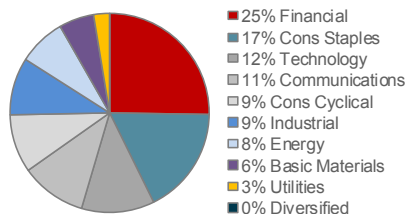
Equity & Fixed Income Sub-Portfolio Exposure

Equity Sub-Portfolio Top Holdings

Ticker	Company Name	Weight (%)
TD CN	Toronto-Dominion Bank/The	2.32%
RY CN	Royal Bank of Canada	1.78%
AAPL US	Apple Inc	1.54%
MSFT US	Microsoft Corp	1.47%
ENB CN	Enbridge Inc	1.28%
BNS CN	Bank of Nova Scotia/The	1.24%
Top 10 Holdings Total Weight		14.30%

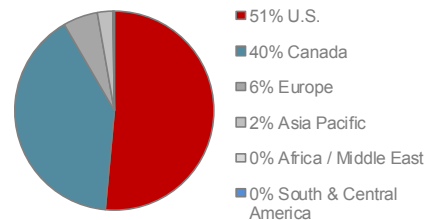
Source: NBF, Bloomberg; Data as of 31-May-2019

Equity Sub-Portfolio Sector Allocation



Source: NBF, Bloomberg

Equity Sub-Portfolio Geographic Allocation

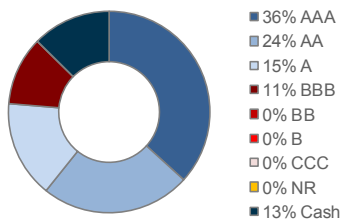


Fixed Income Sub-Portfolio Metrics

Ticker	Weight (%)	Duration (Years)	YTM Gross MER (%)	YTM Net MER (%)
XSAB	35.00%	7.96	2.17%	2.04%
DRCU	26.25%	7.87	2.36%	2.25%
XSTB	26.25%	2.58	1.84%	1.38%
PSA	12.50%	-	1.92%	1.81%
Weighted Average		5.53	2.10%	1.89%

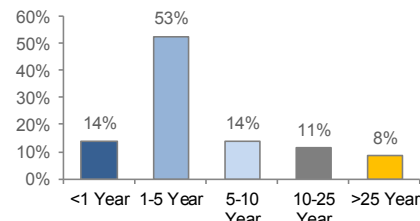
Source: NBF, ETF Providers; Data as of 31-May-2019

Fixed Income Sub-Portfolio Credit Allocation



Source: NBF, ETF Providers, Bloomberg

Fixed Income Sub-Portfolio Maturity Allocation



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