

I The Basics of October's Sell-off

ViewPoint

ROBERT VANDERHOOF, CFA
Chief Executive Officer & Chief Investment Officer



In our view, the recent sell-off reflects a late-cycle correction rather than an end of cycle bear market. For a number of quarters we have been trimming our equity overweight in balanced accounts with an understanding that higher interest rates and central bank tightening can introduce greater market volatility, particularly as consensus earnings growth expectations were strong. We believe that while there may be more downside with the market correction, investors should keep an eye on harvesting attractive pricing and rebalance back to equity targets.

Basics of Asset Pricing Formulas

Einstein's famous $E=MC^2$ formula describes how matter can be converted to energy and energy back to mass. It's an elegant insight into the complex workings of nature within a simple formula.

Prepared by:
Robert Vanderhoof, CFA
Chief Executive Officer & Chief Investment Officer
Stu Morrow, CFA
Client Portfolio Manager, Public Equities
Jafer Naqvi, CFA
Vice-President, Fixed Income & Multi-Asset

Information shown in this document is that of Greystone as of September 30, 2018. As of November 1st, the acquisition of Greystone by The Toronto-Dominion Bank closed and Greystone now operates as TD Greystone Asset Management.

Despite the complexities of the financial world, there are fundamental formulas that describe asset pricing.

For example, one common viewpoint is that all long asset holdings can be priced using a discounted cash flow model where the market value of the asset is a function of the income it produces, a required rate of return (including risk premiums) and future growth expectations.

For a perpetual holding, the formula can be simplified to:

$$MV = CF / (R-G)$$

Where:

MV = Market Value

CF = Cash flow, earnings or income

R = Required Rate of Return (including risk premiums)

G = Expected growth rate of CF

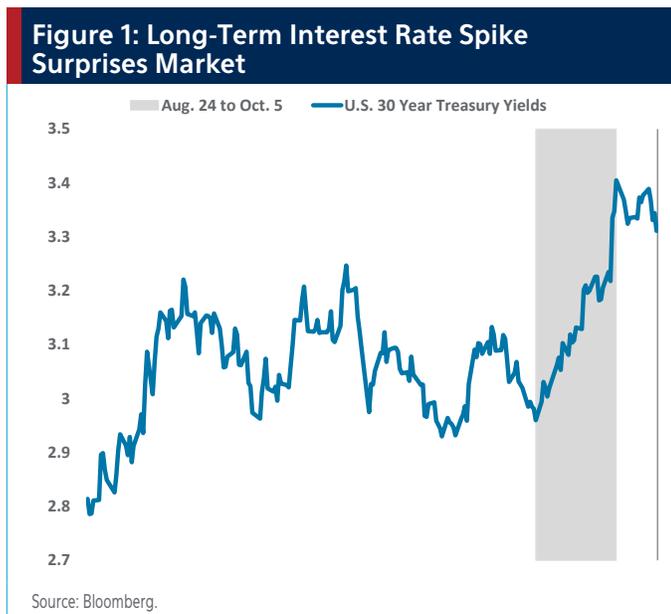
This should be familiar for anyone holding bonds as fixed income implies that CF does not change (i.e. there is no growth factor). For government bonds, we can see why an increase in interest rates (R) results in a decrease in market value. For example, if the market value of bonds held is \$100 and the coupon earned is 3%, a rise in interest rates from 3% to 3.4% for a perpetual (long-term) government bond would see its price fall from \$100 to \$88.24 as follows:

$$MV = \$3 / 3.4\%$$

$$MV = 88.24$$



The movement in yields from 3% to 3.4% highlighted in Figure 1 below aligns with the trough to peak move in 30-year U.S. Treasury yields from August 24 to October 5. This move surprised market consensus, which anticipated rising short-term yields, but expected long-term yields to remain stable.



The impact of interest rates is less evident in equities, as higher interest rates over the last 30 years have been connected to rising expectations for the economy, lower risk premiums and higher earnings growth expectations. Therefore, we have tended to see higher interest rates associated with higher expected growth rates for cash flows and a fall in the (R-G) factor. Nevertheless, equities are exposed to changes in the required rate of return. As mentioned, the move in long-term rates was largely unanticipated by the market; therefore, what we have seen through October is a shift in required returns without an associated increase in earnings growth expectations.

We can apply this to provide some insight into recent market movements for equities, which have sold off despite

continued economic expansion, stable credit spreads and otherwise accommodative financial conditions.

Let's run the recent move through our simplified discounted cash flow model:

At its peak on September 20, the S&P 500 Index traded at a level of 2930. If we take this as the market value (MV), we can calculate implied earnings of approximately 143 (CF) from the trailing price-to-earnings ratio of the index at the time (roughly 20.5). While it's difficult to calculate the exact required rate of return (R) and growth rate (G), we can calculate the combined (R-G) by modifying the discounted cash flow formula.

$$(R-G) = CF / MV$$

For the S&P 500 at its peak:

$$(R-G) = 143 / 2930$$

$$(R-G) = 4.9\%$$

Applying an unanticipated 0.4% shock to the R factor (surprise move in long-term interest rates) results in the following market value for the S&P 500 if there is no associated increase in earnings growth expectations.

$$MV = 143 / (4.9\% + 0.4\%)$$

$$MV = 2698$$

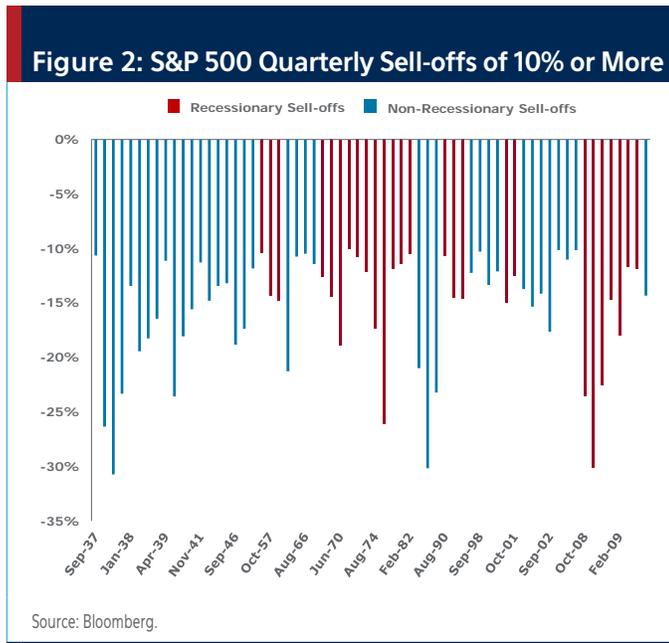
This would equate to a return of -9.2% for the S&P 500 from the peak, simply due to the change in long-term interest rate expectations, which were not associated with an increase in earnings growth expectations. This is not far from the value of the S&P 500 at time of writing on October 26 (2667).

This is a simplification of the real world dynamics as higher volatility can introduce additional shifts in the required rate of return due to evolving risk premiums. In actuality, the growth rate is also not static and expectations for growth rates may also be shifting. A simple stress test for the downside may involve your expectations for shifting risk premium / falling growth expectations. For example, stress testing equity markets with an additional 0.5% shift

to the (R-G) factor would place the S&P 500 Index at 2423, an 18% fall from the peak.

Conclusion

A market correction in the 10-20% range would not be outside of the range for equity movements during periods of economic expansion. We can see in Figure 2 that quarters with a loss of 10% or more can occur frequently, even in periods of expansion (blue bars). The challenge for many investors is that we haven't seen such a quarterly move since 2011.



On a positive note, we have observed that the fourth quarter has historically experienced the strongest average returns. The S&P 500 has finished positively 73% of the time in fourth quarters, with an average price return of 2.7%, going back to 1928.

While we acknowledge that momentum can drive additional losses from here, we also separate the impact of mid-to-late cycle corrections from the impact of a potential recession. The former, which is our current view, calls for setting targets to re-enter the market, whereas the latter would advocate for a reduction to equity targets.



Looking for a Multi-asset Class Solution Investment Partner?

Jafer Naqvi, CFA

Vice-President, Fixed Income & Multi-Asset
416.309.2586 | jafer.naqvi@greystone.ca

Sean Collins, CFA

Senior Vice-President, Institutional Relationships
416.309.2183 | sean.collins@greystone.ca

Proud of our Prairie Roots

REGINA (HEAD OFFICE)

300 Park Centre
1230 Blackfoot Drive
Regina, Saskatchewan S4S 7G4
Canada

TORONTO

77 King Street West
Suite 4510, TD North Tower
Toronto, Ontario M5K 1J3
Canada

WINNIPEG

201 Portage Avenue
Suite 1907
Winnipeg, Manitoba R3B 3K6
Canada

HONG KONG

Suite 1, 12/F
International Commerce Centre
1 Austin Road West, Kowloon
Hong Kong

Greystone Managed Investments Inc.

Greystone Managed Investments Inc. is an institutional money manager with multi-asset solutions proudly serving its clients since 1988. Headquartered in Regina, with additional offices in Toronto, Winnipeg and Hong Kong, Greystone manages over C\$35 billion¹ on behalf of institutional clients.

Greystone has in-house expertise in the following areas:

MULTI-ASSET

- Balanced
- Balanced Plus
- Target Date Plus
- Alternative Plus²

ALTERNATIVES

- Real Estate
- Infrastructure

PRIVATE DEBT

- Mortgages

FIXED INCOME

- LDI
- Term
- Plus
- Sector

PUBLIC EQUITIES

- Canadian & U.S.
- International
- Global
- China

¹ As at Sep 30, 2018.

² The Greystone Alternative Plus Solution is an integrated open-ended alternatives mandate where a client invests in the Greystone Infrastructure Fund (Canada) LP, the Greystone Mortgage Fund and the Greystone Real Estate Fund Inc. or the Greystone Real Estate LP Fund. Greystone holistically manages the underlying cash flows and liquidity of the allocation as well as the asset mix between the underlying strategies.

This document is for informational purposes only. It is not meant as investment advice and is not an offer, solicitation or recommendation to purchase or sell any security. There is no assurance that any predictions or projections will actually occur. Past performance is not necessarily indicative of future results. Commentary reflects the opinions of Greystone Managed Investments Inc. as of the date of the document. This document was developed from sources believed to be reliable, but is not guaranteed to be accurate or complete.

Greystone claims compliance with the Global Investment Performance Standards (GIPS®). A GIPS® compliant presentation is available upon request. Greystone has been independently verified for the period January 1, 2000 to December 31, 2017. The verification report(s) is/are available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS® standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS® standards. Verification does not ensure the accuracy of any specific composite.

In Canada, Greystone is a registered portfolio manager, exempt market dealer and investment fund manager. Greystone is registered as an investment adviser with the Securities and Exchange Commission in the United States.

© Greystone Managed Investments Inc. All rights reserved.