



To	Wyoming State Treasurer's Office
From	RVK, Inc.
Subject	Asset Allocation, Spending, and the Nature of Fixed Income
Date	February 2, 2016

Background

The purpose of this memorandum is to provide an overview of:

- 1) The asset allocation structure of the Wyoming Permanent Mineral Trust Fund ("PMTF"),
- 2) How the asset allocation supports the long-term nature and objectives of the PMTF and interacts with the spending policy,
- 3) How and why the asset allocation structure has evolved over time, and
- 4) Challenges we see related to these items as we look ahead to the future

Although each of the various Permanent Funds has its own unique objectives and constraints, we will throughout this memo deal specifically with the PMTF as representative of the group of funds we collectively refer to as the "Permanent Funds." While modest adjustment should be made to account for the specific factors related to each of the various funds, we believe that the overarching objectives, constraints, and challenges are to a large degree more similar than not among the funds. The primary exception we would note among the Permanent Funds is the Workers' Compensation Fund, which has its own and unique set of circumstances that should guide any discussion of its asset allocation structure.

In simple terms, the PMTF is designed to transfer a portion of current earnings from mineral extraction (a finite source of income) into a long-term (perpetual) endowment for the benefit of current and future generations of Wyoming citizens.

Perpetual endowments, such as the PMTF, at their core are charged with two primary objectives:

- 1) Provide a stable and reliable source of current income
- 2) Provide for income in future years that is at least equal to

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current income in inflation adjusted terms

These two objectives are arguably to some degree at odds with each other, as the best way to achieve objective # 1 is to invest in safe, liquid assets with a predictable income stream, while the best way to achieve objective #2 is to invest in assets that will over longer periods of time generate sufficiently high inflation-adjusted returns (generally riskier assets). These primary attributes (safety and high real returns) are typically not found in the same types of investments. As a very basic starting premise, a diversified approach to investing starts to make sense if we think in terms of these primary (and competing) goals.

At the nexus of these two objectives is the idea of “intergenerational equity,” the idea that future generations of Wyoming citizens should benefit from the State’s abundant natural resources to the same degree than the current generation, even after those resources may have been depleted.

The long-term asset allocation structure and spending policy are the two most important factors in determining whether or not intergenerational equity can be achieved. It is important that both are working in a coordinated fashion to ensure a sustainable long-term program.

Interaction with Spending Policy and Evolution of Asset Allocation Changes

As recent as 20 years ago, the PMTF was invested almost exclusively in an internally managed fixed income portfolio. Although fixed income yields were significantly higher, annual spending dollar amounts were also much higher as a percentage of the corpus. With recent market volatility and a generally bleak (low return) outlook for many asset classes, some may wonder “why don’t we just invest in fixed income and clip our coupons?”

The answer is that this approach would not sustainably support the “dual mandate” of current and future inflation adjusted income. Consider the following simplified example for “Endowment A”, a hypothetical endowment with \$1 Million in assets. Endowment A only spends its income up to a 5% maximum (not breached here due to low yields). Long-term inflation is assumed to be 2%. 100% of the portfolio is invested in a safe, buy and hold fixed income portfolio, with a current yield of 2%.

Figure 1: Endowment A - Buy and Hold Fixed Income Portfolio

	Beginning Market Value	Income	Spending	Ending Market Value	Inflation Adjusted Spending	Inflation Adjusted Market Value
Year 1	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$20,000.00	\$980,000.00
Year 2	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$19,600.00	\$960,400.00
Year 3	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$19,208.00	\$941,192.00
Year 4	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$18,823.84	\$922,368.16
Year 5	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$18,447.36	\$903,920.80

Year 6	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$18,078.42	\$885,842.38
<i>(Table continues on the following page)</i>						
Year 7	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$17,716.85	\$868,125.53
Year 8	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$17,362.51	\$850,763.02
Year 9	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$17,015.26	\$833,747.76
Year 10	\$1,000,000.00	\$20,000.00	(\$20,000.00)	\$1,000,000.00	\$16,674.96	\$817,072.81

As you can see in this example, current income is very stable, but the inflation adjusted value erodes over time. While the decision-makers responsible for this portfolio may sleep well at night and have very little concern for potential market losses, there is a silent thief at work here – inflation. 10 years into the future, the value of the portfolio will have deteriorated by almost 20% in real (today’s dollar) terms and future purchasing power of the corpus will be less. Annual spending is steady, but will purchase significantly fewer goods and services in the future. The portfolio must earn a total rate of return that is equal to the annual spending amount **plus** the rate of inflation in order to meet both of its objectives. In this simple example, a 7% return would be required for long-term sustainability. An updated example of how this plays out in inflation adjusted terms is provided below (assumes annual total returns are 7%, with a 5% spending policy).

Figure 2: Endowment B - Total Return Portfolio

	Beginning Market Value	Income + Capital Gains	Spending	Ending Market Value	Inflation Adjusted Spending	Inflation Adjusted Market Value
Year 1	\$1,000,000.00	\$70,000.00	(\$50,000.00)	\$1,020,000.00	\$70,000.00	\$999,600.00
Year 2	\$1,020,000.00	\$71,400.00	(\$51,000.00)	\$1,040,400.00	\$69,972.00	\$999,200.16
Year 3	\$1,040,400.00	\$72,828.00	(\$52,020.00)	\$1,061,208.00	\$69,944.01	\$998,800.48
Year 4	\$1,061,208.00	\$74,284.56	(\$53,060.40)	\$1,082,432.16	\$69,916.03	\$998,400.96
Year 5	\$1,082,432.16	\$75,770.25	(\$54,121.61)	\$1,104,080.80	\$69,888.07	\$998,001.60
Year 6	\$1,104,080.80	\$77,285.66	(\$55,204.04)	\$1,126,162.42	\$69,860.11	\$997,602.40
Year 7	\$1,126,162.42	\$78,831.37	(\$56,308.12)	\$1,148,685.67	\$69,832.17	\$997,203.36
Year 8	\$1,148,685.67	\$80,408.00	(\$57,434.28)	\$1,171,659.38	\$69,804.24	\$996,804.48
Year 9	\$1,171,659.38	\$82,016.16	(\$58,582.97)	\$1,195,092.57	\$69,776.31	\$996,405.75
Year 10	\$1,195,092.57	\$83,656.48	(\$59,754.63)	\$1,218,994.42	\$69,748.40	\$996,007.19

It was with these dual objectives in mind that the asset allocation structure of the PMTF has evolved away from a pure “buy and hold” fixed income portfolio to a total return oriented, well diversified portfolio. The chart on the following page provides a graphical representation of the evolution of the PMTF asset allocation structure over the past 15 years:

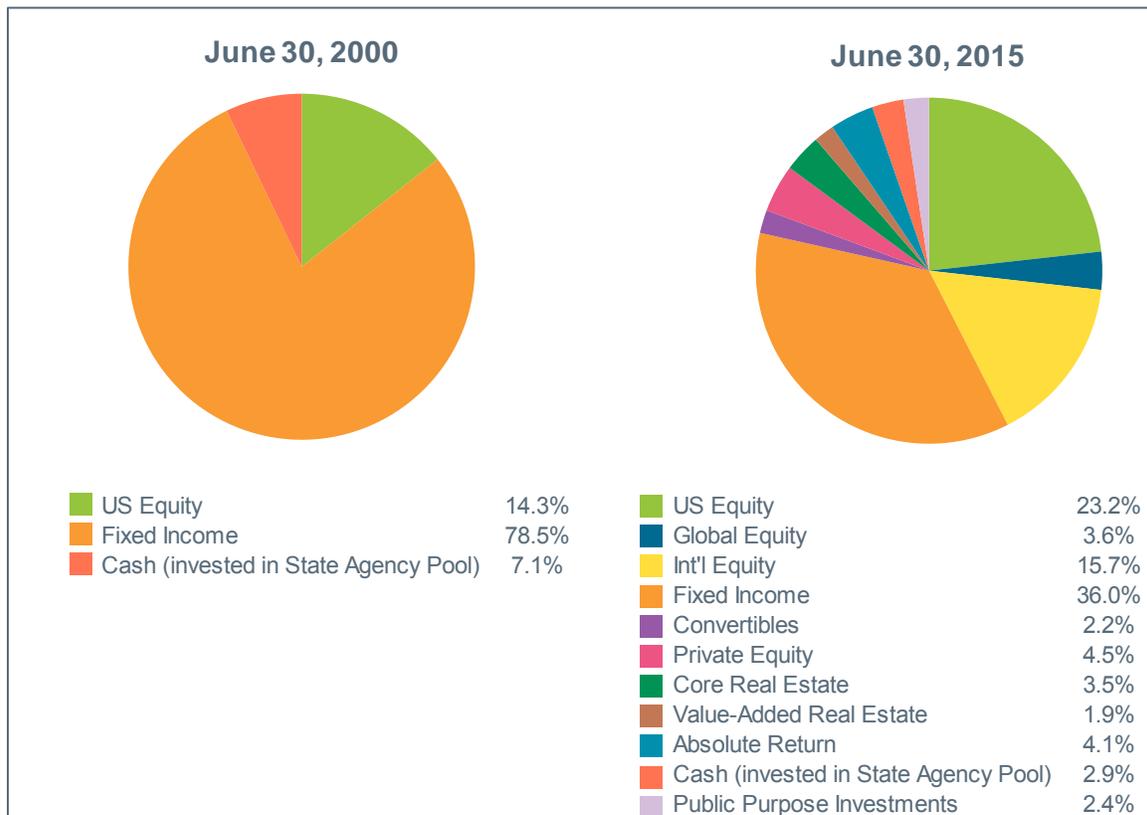


Figure 3: PMTF Asset Allocation

The PMTF asset allocation structure has been designed with the following objectives and constraints in mind:

- 1) Earn a long-term real rate of return sufficient to support current spending plus the rate of long-term inflation
 - a. Spending policy is a maximum of 5% of the trailing 5 year average market value. All income is spent up to the spending policy amount. Reserve account / spillover feature is designed to handle income amounts above the spending policy
- 2) Invest in a diversified fashion, taking advantage of a lack of perfect correlation among asset classes to reduce total fund volatility to the extent possible
- 3) Avoid a high degree of interrelationship (correlation) between PMTF investment performance and the State's other primary sources of income (mineral income)

4) Remain within Statutes that govern the investment of the portfolios

- a. Most notable is a 55% cap on public equity and interpretation of such

The asset allocation structure has evolved over time to establish a more realistic and attainable probability of achieving the long-term objectives of intergenerational equity.

In addition, there has been a routine practice of evaluating the sub-asset class structures and managers employed within each asset class with a goal of continuous improvement of risk-adjusted returns. The table below provides a general time-line of asset classes added and sub-asset class reviews completed.

Figure 4: Historical Asset Class Initiatives

Year	Asset Class	Initiative
2002	US Equity	Added Small/Mid Cap US Equity
2003	Private Equity	Added Asset Class
2004	International Equity	Added Asset Class
2005	Overlay Strategies	Added Asset Class
2005-2006	Real Estate	Added Asset Class
2006	Fixed Income	Diversified to New External Mandates
2006-2007	Absolute Return	Added Asset Class
2009	Absolute Return	Additional Commitments
2010	Real Estate	Diversified to Additional Value-Added Mandates (Debt & Equity)
2010	International Equity	Increased Emerging Markets Exposure
2012	Fixed Income	Diversified to New External Mandates
2013	Private Equity	Additional Commitments
2013	Real Estate	Diversified to Additional Value-Added Mandates (Debt & Opportunistic)
2014	Opportunistic Credit	Funded Investment
2014	US Equity	Diversified to New External Mandates

For example, the most recent major review of the fixed income portfolio was completed in 2012, following a prior review and major overhaul completed in 2006. The 2012 review was driven by a desire to improve the expected performance of the fixed income portfolio in a rising interest rate environment, while still maintaining the primary qualities expected of a fixed income portfolio (safety, liquidity, income generation, and deflation protection).

Future Challenges

In an analysis prepared for the 2015 Treasurer's Investment Conference we concluded that there is at least a reasonable probability that the PMTF can achieve intergenerational equity. We also note, however, that there are significant challenges present, and that small changes in key variables such as investment returns, spending policy, and mineral income levels, can lead to drastically different outcomes. Key challenges that we see include the following:

- 1) Low expected returns from many asset classes due to historically high valuation levels (most notably US Fixed Income and US Equity)
- 2) Conservative interpretation of Statutory maximum equity allocation may lead to investment portfolio that is too conservative to meet long-term return objectives
- 3) Spending policy maximum of 5%, when combined with low return expectations and a relatively conservative portfolio structure may be too high to support long-term sustainability
- 4) A period of low prices for the State's primary sources of mineral income could significantly reduce income levels to the PMTF at a point in time when the program is maturing and spending is growing (net deficit spending exposes the portfolio to a greater sensitivity to market risk).

This is a daunting list of challenges. Further evaluation of the asset allocation structure, spending policy, and general investment (sub-asset class) structures will be critical as we move forward. Potential areas of focus that we have recently discussed with the Treasurer's Office include the following:

- 1) Asset Allocation Study Update
- 2) Evaluation of potential new asset classes and increasing some existing asset classes that can contribute to long-term returns and overall risk/return characteristics
- 3) Consideration of more flexible approach within rebalancing ranges to underweight historically expensive asset categories and overweight historically inexpensive asset classes
- 4) Evaluation of fees paid to active managers, efficiency of fees in regards to alpha generation, and consideration of alternative structures with lower fees where appropriate
- 5) Continued evaluation of each asset class and manager structure within each
- 6) Evaluation of distressed opportunities that can contribute meaningfully to long-term return generation