



A Rules-Based Permanent- Endowment Model for Alaska



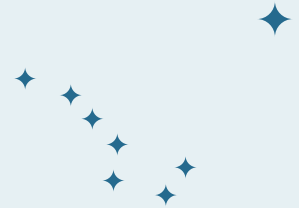
ALASKA PERMANENT
FUND CORPORATION

TRUSTEES' PAPER VOLUME 10





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LIST OF ABBREVIATIONS

APF or the Fund	Alaska Permanent Fund
APFC	Alaska Permanent Fund Corporation
AS	Alaska Statute
ERA	Earnings Reserve Account
PFD	Permanent Fund Dividend
POMV	Percent of Market Value
SNI	Statutory Net Income
UPMIFA	Uniform Prudent Management of Institutional Funds Act





Message from Board of Trustees Chair

On behalf of the Board of Trustees of the Alaska Permanent Fund Corporation (APFC), it is my privilege to present Trustees' Paper Volume 10: "A Rules-Based Permanent-Endowment Model for Alaska." This paper is authored by Dr. Malan Rietveld, a renowned expert in sovereign wealth funds. Dr. Rietveld's analysis provides crucial insights into the Alaska Permanent Fund's (the Fund) history, structure, and relationship to the diversified asset types in which it is currently invested as a modern, total-return investment portfolio.

The paper begins by noting Alaska's long adherence to a rules-based policy for the management of the Fund and its ever-increasing importance as a source of renewable revenue that underpins the fiscal future of our great state. The paper then suggests potential solutions to identifiable risks that flow from the Fund's legacy two-account structure and specific statutory accounting rules. The paper acknowledges the Fund's essential role in meeting the State's revenue needs while protecting the Alaska Permanent Fund Dividend and ensuring the health of the Fund as a whole for future generations of Alaskans.

The paper also now incorporates a February 2024 scenario modeling addendum from APFC's general economic and financial consultant, Callan, to better inform the policy discussion. The Callan addendum enriches the paper by providing a simulation that models distributions from the Earnings Reserve Account (ERA) across various market conditions to inform the likelihood of depleting the ERA under the current percent of market value (POMV) draw and two-account system. Furthermore, it offers probabilistic outcomes based on Callan's current market

forecast, assessing the likelihood of a sufficient balance in the ERA to meet the Fund's POMV obligation.

We believe that Trustees' Paper Volume 10 represents a foundational step in our collective effort to ensure the sustainability and prosperity of the Alaska Permanent Fund. Your thoughtful consideration of the insights and recommendations contained within this paper is paramount as we collectively navigate the challenges and opportunities ahead.

Thank you for your continued support and engagement in shaping the future of the Alaska Permanent Fund.

Respectfully,

Ethan Schutt



Executive Summary

Since its introduction during the 2019 fiscal year, the annual POMV draw has become a critical element of the rules-based policy framework that governs the flow of funds to and from the Alaska Permanent Fund (APF or the Fund). The POMV distribution supports the provision of essential State services through the budget, as well as the funding of the PFD. The POMV draw is likely to be a permanent feature of the framework, as Alaska substitutes its historic reliance on oil income for financial income.

At the same time, the Board of Trustees has grown increasingly concerned about the risk of a depletion of funds available for appropriation by the Legislature in the context of the rigid separation between the APF's Principal (or "Corpus") and its ERA. Under this two-account structure, the ERA is the only account that the Legislature can appropriate from the Fund for the POMV distribution. The depletion of the ERA would, therefore, immediately result in a fiscal crisis, affecting both the budget and the PFD.

While the Board has expressed concerns about the stability of the two-account structure for more than two decades, the risk of depleting the ERA has significantly increased in recent years. The adoption of the annual POMV draw in FY2019 materially increases the level of annual distributions from the ERA. Further, the departure from rules-based inflation-proofing since 2016 has resulted in large and often unpredictable appropriations from the ERA, including large "catch-up" inflation-proofing transfers in FY2020 and FY2022. These actions have left the ERA balances at a historically low level relative to both the size of annual distributions and the overall assets of the APF.

This paper discusses various reforms to mitigate the risk of depleting the ERA. The first and preferred approach is a constitutional amendment to establish a single-account permanent-endowment model, with a POMV rule that limits annual distributions to the long-term average real return of the portfolio. Short of a constitutional amendment, consideration should be given to the option of combining the two accounts and establishing the permanent-endowment model in statute, based on an interpretation of the Constitutional language pertaining to the APF that is informed by prevailing trust and institutional-investor law.

The paper concludes with a consideration of two possible reforms that assume the two-account structure is maintained. The first option includes suspending inflation proofing if the ERA balance approaches a minimum level relative to either POMV draw or total assets, and then catching up on missed inflation proofing once the ERA balance has recovered to healthier levels in the future.

The second option is a policy of forced realizations in which the APFC would have to sell traded assets (public equities and bonds) in order to move unrealized capital gains (and losses) into the ERA, rather than sharing unrealized net capital gains proportionally between the ERA and the Principal.

The proposed reforms outlined in this paper are urgently required to address the increased risk of depleting the ERA. Successful reforms will ensure that the APF continues to benefit both current and future generations of Alaskans.

1 Introduction and Overview

The State of Alaska has a long history of rules-based policy for the management of mineral royalties deposited in the APF. Since the passage of a Constitutional Amendment in 1976 that created the Fund and mandated the transfer of at least 25% of annual mineral royalties to it, statutory provisions, a tradition of legislative adherence to those provisions, rules-based inflation-proofing, and prudent investment management by the APFC have resulted in the steady accumulation of assets managed for the benefit of current and future generations of Alaskans.

The introduction of the POMV draw to govern total distributions from the APF is another rule-based element to the framework governing the Fund. Since the adoption of the POMV spending policy and the decline of oil revenues in recent years, having a fit-for-purpose rules-based policy framework has become more important than ever, as sustainable distributions from the APF are critical to the State of Alaska's economic and fiscal future.

For more than two decades, the Board and APFC staff have expressed concerns over the APF's "two-account" structure. The risks associated with this unique structure have increased since the introduction of the POMV draw and undermines the stable functioning of the rules-based framework. The two-account structure establishes a rigid separation between the Fund's Principal, which receives deposits of new capital, largely from mineral royalties and annual inflation-proofing appropriations, and cannot be appropriated by the Legislature; and its ERA, which collects net interest, rents, dividends, realized capital gains, and a proportional share of net unrealized gains on an annual basis.¹

While the Board has long argued in favor of a single-account structure along the lines of a

permanent-endowment model, two developments in recent years have increased the urgency of such reforms.² The first is the adoption of the annual POMV draw in FY2019, which significantly increases the size of annual distributions that can only be appropriated from the ERA under the two-account structure. The second is the departure from the historical custom of rules-based inflation-proofing – the statutory process for preserving real value of the Principal – since 2016. The absence of any inflation-proofing appropriations in FY2016, FY2017, FY2018, FY2021 and FY2022 was followed by large, "catch-up" inflation-proofing and special appropriations from the ERA to the Principal – in addition to the POMV draws – in FY2020 and FY2022. These actions, combined with modest Statutory Net Income (SNI) in FY2023 have left the ERA balances at a historically low level relative to both the size of annual distributions and the Principal balance.

The risks inherent to the two-account structure have been exacerbated by the introduction of the annual POMV draw and the breakdown of the rules-based framework for inflation-proofing.

¹ The allocation of net unrealized gains is not a durable or stable contribution to the ERA. First, unrealized gains are volatile and can fluctuate significantly over short periods of time; second, whenever the ERA balance declines due to appropriations, the proportional allocation of net unrealized gains declines too, requiring a reallocation back to the Principal account.

² The Board has passed four resolutions (00-13, 03-05, 04-09, and 20-01) in support of converting the two-account structure into a single endowment-type fund.

While concerns over the durability of the ERA are acute at present, the current structure will inevitably produce periodic uncertainty to the sustainable funding of the POMV distribution.

In combination with a period of diminished SNI, the probability of depleting the ERA balance within a three- to five-year period has increased significantly. While concerns over the durability of the ERA are acute at present, the current structure will inevitably produce periodic uncertainty to the sustainable funding of the POMV distribution.

This paper outlines the risks to the durability of the ERA, before discussing several reforms to mitigate this risk. It starts by placing the establishment of the two-account structure in historical context, which underlines that this structure is at odds with the APF's total-return investment approach and the adoption of the POMV draw. The paper then examines the role of inflation-proofing in exacerbating concerns about the durability of the ERA, particularly when the inflation-proofing process departs from predictable, rules-based provisions.

This is followed by a discussion of various quantitative models and scenarios of ERA dynamics, which all identify a significant risk of depletion over the coming three to five years, in the event of below-average portfolio returns. Finally, the paper discusses potential reform paths focused on two possible approaches. The first is the Board's preferred approach of a constitutional amendment to establish a single-account permanent-endowment model, with a POMV rule that limits annual distributions to the long-term average real return of the portfolio. The second approach involves various statutory reforms to the rule-based framework governing the APF.

2 The Structure of the Alaska Permanent Fund

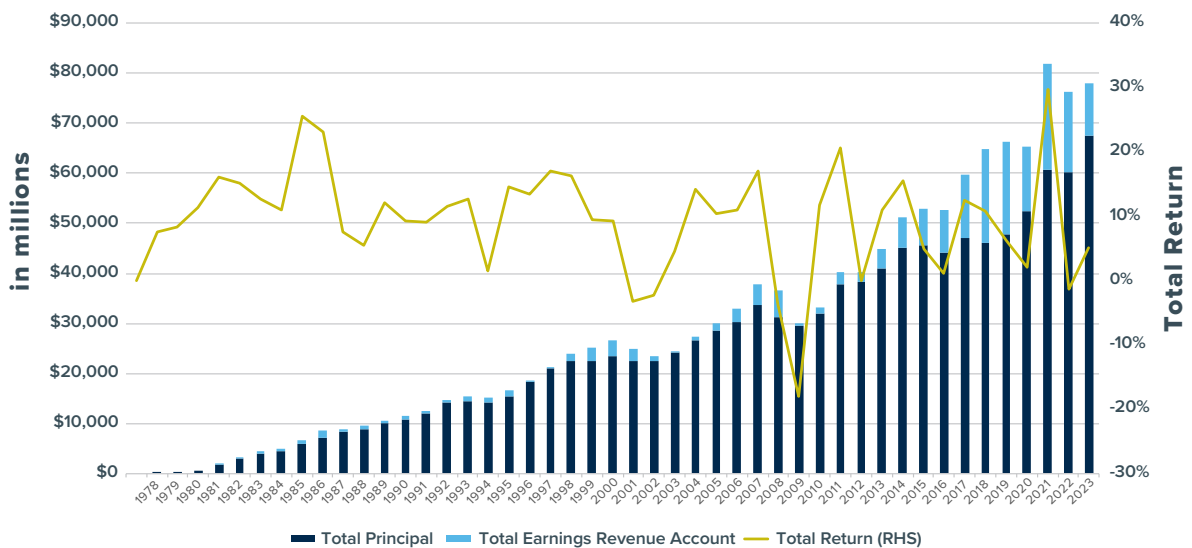
The APF was established through an amendment to the State of Alaska Constitution, approved by over two-thirds of Alaskan voters in 1976. The amendment requires that at least 25% of Alaska’s non-renewable mineral royalties be deposited into the Fund rather than being allocated to the State’s General Fund. The amendment mandates the Fund to pursue income-producing investments and provides the Legislature with the discretion to determine how to use the income generated from these investments.

The APF has two separate accounts: the Principal and the ERA. The Principal was established as part of the constitutional amendment that created the APF, while the ERA was established in statute in the early 1980s as a separate account to hold SNI from interest, dividends, rents and realized capital gains. Under current accounting practices, the Principal and the ERA are also credited with

a proportional share of the unrealized gains and losses on unsold assets held by the APF. This proportional share shifts between the accounts as underlying account balances adjust due to appropriations from the ERA and as market values increase or decrease.

The two-account structure does not affect the APF’s investment program, as all assets attributed across both accounts are invested in a single, comprehensive portfolio. Figure 1 shows the historic accumulation of assets, held across the two accounts, as well as the fluctuations in annual returns on the portfolio. This accumulation of assets is the result of the constitutionally required deposits described above, as well as the compounding of returns in excess of annual distributions from the Fund, plus a number of historic statutory transfers of excess revenues to the APF.

Figure 1 Accumulated Balances and Annual Returns of the APF



Source: APFC

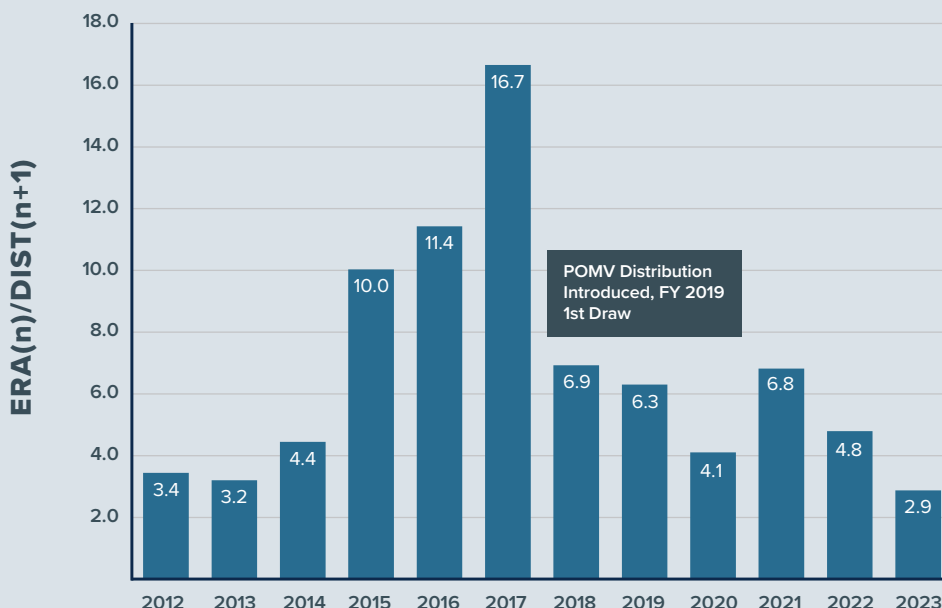
Historically, appropriations from the ERA have funded the annual PFD, introduced in 1980, and covered the operational costs of the APFC, and part of the costs of state agencies involved with collecting royalties and distributing dividends. The second major source of appropriations from the ERA are transfers to the Principal for “inflation-proofing” purposes – ensuring that the real value of the Principal keeps pace with long-term inflation, to preserve the purchasing power of the Principal’s capital for future generations (see detailed discussion in section 5).

Since 2019, the Alaska Legislature has adopted the POMV spending rule for annual appropriations from the ERA to support the State budget and finance the PFD. Inflation-proofing transfers sit alongside the POMV draw as a source of outflows from the ERA. Inflation-proofing is intended to be a rule-based process, bound by AS 37.13.145(c). While the Legislature historically followed the rule-based inflation-proofing framework, there have been significant deviations from the rules since 2016 that have resulted in several years in which no inflation-proofing appropriations were made, combined with large, *ad hoc* “catch-up” appropriations in other years (see section 5).

A simple way to illustrate current concerns over the durability of the ERA, is to scale the accounts balance to known (committed) distributions scheduled for the following year. Figure 2 shows the ratio of ERA balances to total committed distributions for the following fiscal year. Since the adoption of the POMV draw in FY2019, this “coverage ratio” is equal to the ERA:POMV ratio – as total distributions are determined by the POMV. Note that recently, the ERA:POMV coverage ratio has dropped to 2.9, having ranged between 6.9 and 4.1 over the last five years.

As shown in Figure 2, prior to the adoption of the POMV distribution policy in FY2019, the ratio of the ERA balance to committed distribution (prior to FY2019, distributions were equal to the total PFD payments committed for following year) was as high as 16.7 due to a combination of a smaller distribution, foregone inflation-proofing, and several years of above-average realized gains associated with strong global equity markets. Large “catch-up” inflation-proofing and special appropriations in FY2020 and FY2022, combined with the introduction of the POMV distribution since 2019 and lower SNI over the past three years, have reduced this ratio to below 3.

Figure 2 The ERA:POMV Coverage Ratio



3 The Two-Account Structure in Historical Context

It is instructive to consider the historical context in which the two-account structure was created – and how that context has changed. This includes the original intent behind the establishment of the Fund, critical changes in the distribution profile of the APF (notably the introduction of the POMV draw), and broader trends in capital markets and the portfolio-management models and practices of long-term institutional investors. A consideration of this evolving context leads to the conclusion that the two-account structure constitutes a piece of “legacy infrastructure” that no longer fits the investment model and distributions associated with the APF.

The original intent behind the establishment of the APF, as expressed by the Legislature in 1980, involved two major objectives. First, the APF was to hold and accumulate a portion of the State’s revenues from non-renewable resources for the benefit of current and future generations of Alaskans. The need to ensure that capital is preserved for future generations was the motivation behind the establishment of the Principal from which the Legislature cannot appropriate funds. The original framing of the APF also allowed for returns and income generated on the Fund’s capital to be used for spending, with the constitutional amendment directing investments in “income-producing assets”. For this reason, the ERA was established in AS 37.13.145(a) by the Legislature to collect and hold SNI, which can be used for spending through appropriation.

For several decades, the annual PFD, enacted by Statute in 1980, was the most significant expression of the spending objective. However, as noted above, earnings and returns accumulated in the ERA have also been used for inflation-proofing, covering the APF’s operational expenses – and, since FY2019, to support the State budget.

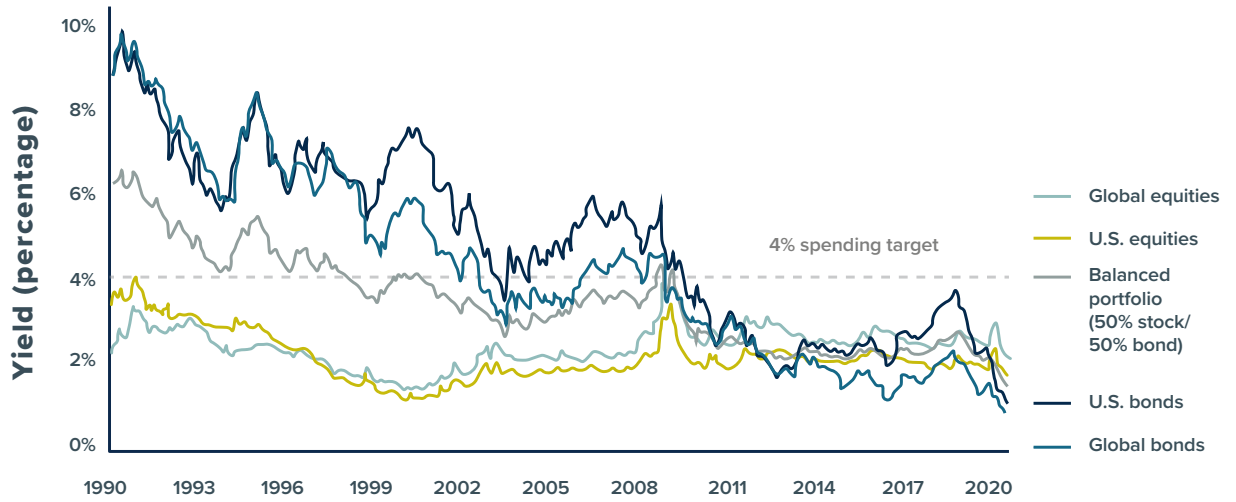
Starting in FY2019, the POMV spending rule established in Statute has governed the size of the appropriation from ERA to support the State budget and fund the PFD.

The establishment of the two-account structure in the early 1980s was in keeping with prevailing legal, accounting, and investments practices of investors tasked with the twin goals of accumulating and preserving capital for future generations, while also supporting spending. In the early 1980s, the pervasive approach to portfolio construction for these involved maximizing income – also called “portfolio yield”. Accordingly, the portfolio was dominated by investments in predominantly bonds, but also other interest-bearing investments and high dividend-yielding stocks – assets for which regular income-based cash flows are the sole or dominant component of return, rather than capital appreciation.

Given the high real and nominal interest rates in latter half of the 1970s and early 1980s, investments in these assets generated attractive levels of income. Income-oriented investors typically did not need to specify a target return or sustainable withdrawal rate to determine the appropriate size of distributions for spending. Rather, they simply collected annual interest, rental and dividend income, and distributed these to support spending.

As interest rates steadily declined since the early 1980s, income generated on bonds and other interest-bearing investments, as well as the dividend yields on stocks, was reduced too, generally falling well short of even a highly conservative 4% POMV spending target (see Figure 3).

Figure 3 Declining Interest Rates and Yields



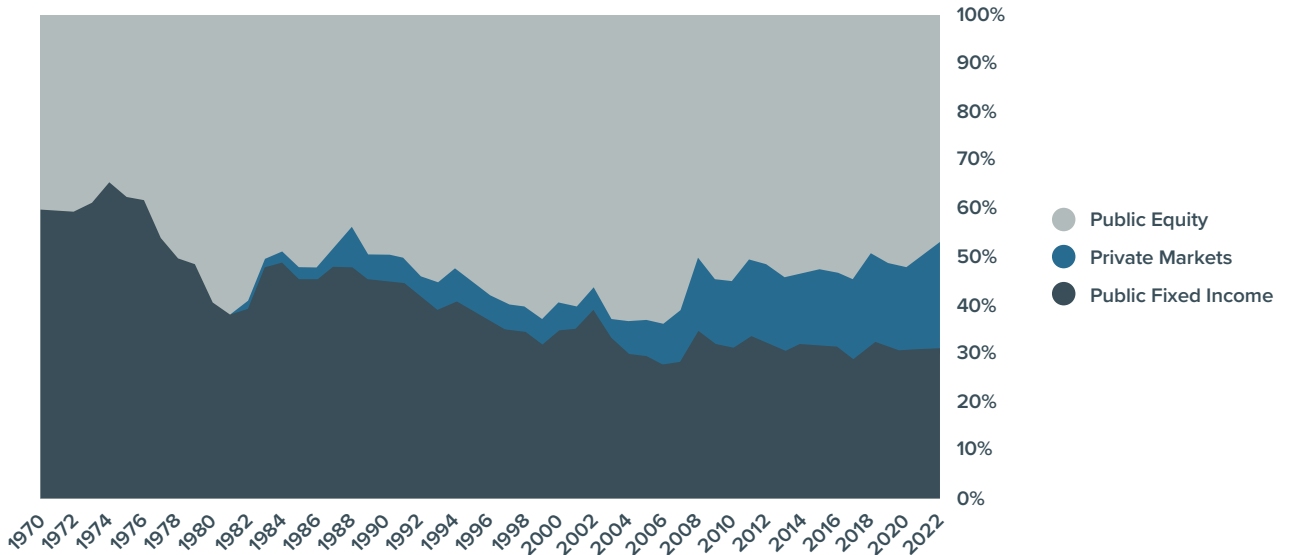
Source: Vanguard, using data from Thomson Reuters Datastream

By the turn of the century, an investment and spending approach based solely on interest and yield delivered less than the typical 4-6% annual spending target or policy of income-producing institutional investors.

In response, institutional investors increasingly gravitated towards diversified portfolios, steadily increasing their exposure to “growth assets”

from around 30% to 60% of portfolio weights on average (see Figure 4). In so doing, the pervasive investment model shifted towards the “total-return portfolio” approach, in which investors do not target income, but rather the highest possible risk-adjusted total return, through any combination of income, yield and capital appreciation.

Figure 4 The Decline in Fixed-Income Investments by Institutional Investors



Source: Callan



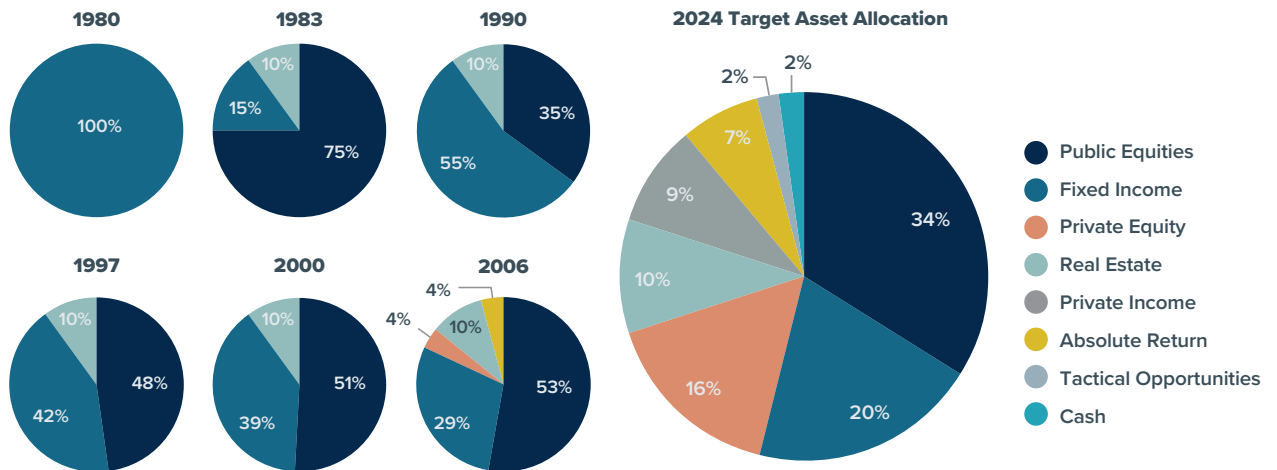
The total-return portfolio has many advantages for long-term investors over an income-orientated approach and has always enjoyed strong theoretical and empirical support. From a portfolio-construction perspective, the ascendancy of Modern Portfolio Theory, developed by Harry Markowitz (1952) and for which he was awarded the Nobel Prize in 1990, underlined the importance of diversification and total returns.

Similarly, Litvack, Malkiel and Quandt (1974) and James Tobin (1974), another Nobel Prize winner, showed that optimal spending and capital preservation from a permanent portfolio resulted from a combination of total-return investing and

a POMV spending rule, rather than the traditional focus on income. As discussed below, a total-return portfolio combined with a sustainable POMV spending policy constitutes what may be called the “permanent-endowment model”.

As shown in Figure 5, the evolution of the APF’s own asset allocation has matched this trend. From a 100% allocation to fixed-income assets in 1980, the APF has steadily increased its exposure to growth assets, which include public equities (listed stocks), but also more recent and smaller-scale allocations to private-market investments such as real estate, private equity and alternative assets.

Figure 5 The APF’s Path to a Total Return Portfolio



Source: APFC

Over the long-term, the total return on growth assets has been much higher than those on fixed-income investments. Higher average long-run returns grow the size of the APF's capital (complementing constitutionally mandated transfers of mineral royalties). This permanently raises the amount of income and return that can be sustainably "harvested" for annual distributions for spending.

Once a portfolio is invested following the total-return approach, it no longer makes sense to base spending and distribution policies on realized gains and the income from bonds, real estate, and share dividends. Rather, it has been repeatedly shown that a spending rule based on a POMV linked to a portfolio's long-term average real return – that is returns after accounting for inflation – results in a more stable and predictable spending profile than the traditional, income-only approach:

"The major objection to the traditional spending rule is that it gives rise to an insoluble dilemma: If the endowment is invested for maximum total return, only by accident will the amount of dividends and interest earned in a given year be consistent with the amount that ought to be spent on the basis of general policy considerations" (Litvack, Malkiel and Quandt, 1974).

Combining a total-return portfolio with a POMV spending rule based on the portfolio's long-term average real return results in an investment approach that can be referred to as the "permanent-endowment model". The permanent-endowment model requires greater flexibility in the treatment of "income" and "capital" than an income-oriented approach that preceded it. It is not productive to have a rigid distinction between "income" and "capital" that imposes constraints on the ability to fund annual distributions.

In the context of a diversified, total-return portfolio with significant allocations to growth assets there are several sources and factors driving portfolio returns.

Unrealized capital gains/losses, for example, often dominate annual portfolio returns of investors who allocate heavily to growth assets.³

The uncertain timing of the combination of realized and unrealized capital gains across assets classes, as well as income from interest, yield and dividend, should not impinge on the ability to manage a total-return portfolio for the highest long-term risk-adjusted return. Rather, investment decisions should be made independently from considerations of the need to generate short-term income. As Litvack et. al. (1974) neatly stated, "It is the size of the total return, not its composition that matters if the [endowment] is to achieve the largest stream of resources over time."

The permanent-endowment model, therefore, requires the ability to spend or harvest a sustainable portion of these unrealized gains – even if those would traditionally be attributed to portfolio's principal or capital. The ability to do so required a softening of rigid capital and income distinctions, particularly the ironclad restrictions on spending from principal-capital accounts that characterized the laws that governed trusts and endowed institutions prior to the adoption of total-return investing.

³ Unrealized gains/losses can also be significant on long-duration bond portfolios, as sensitivity of interest-rate movements can dominate fixed coupon payments on long-duration bonds.

4 Legal Reforms to Enable the Permanent-Endowment Model

The need to permit greater flexibility in the treatment of capital and income is reflected in several changes in the laws governing intergenerational income-providing investors that today pursue a permanent-endowment model. In the United States, the process of legal reform has been guided by changes to several uniform acts since the mid-1970s.

Uniform acts promote consistency and uniformity in laws across state jurisdictions within the United States through the drafting of “model laws” on issues of shared interest and concern. Model uniform acts are drafted by the Uniform Law Commission, an organization composed of legal experts from all states, before subsequently being adopted by state legislatures. Uniform acts cover a wide range of topics – including corporate liability, health care, wills and probate, family support and corporate liability, amongst others – where consistency across state jurisdictions promote efficiency and legal uniformity. The adoption of these acts by individual states is voluntary, and states may choose to modify them based on specific needs and circumstances.

Uniform acts have played an important role in promoting the consistent and widespread adoption of total-return portfolios and the permanent-endowment model amongst a range of permanent, inter-generational investors, including public and private trusts, endowments, and foundations. Two uniform acts promulgated in the 1990s started the process of softening the

historical rigid distinction between capital and income, as applied primarily to trusts.

First, the Uniform Prudent Investor Act, drafted in 1994, moved away from the traditional focus on preserving capital and generating income to a more comprehensive approach that considers the total return of the portfolio. The Act introduced the concept of the “prudent investor rule,” which encourages fiduciaries to consider the overall return of the portfolio and allowed for the spending of capital gains if it is consistent with the prudent investor standard. This aligns with the concept of a total-return approach, where the focus is on optimizing the overall return of the portfolio rather than exclusively on income.

The Uniform Principal and Income Act of 1997 (revised in 2004) took this approach a step further by explicitly affording trustees the “power to adjust between principal and income to the extent the trustee considers necessary”, provided trustees meet the standard of a prudent investor in making such adjustments. This provision was a significant departure from earlier model acts, since for the first time a fiduciary was allowed to allocate trust principal to the income beneficiary (or to reallocate a portion of the trust income to principal). Even for trusts that were set up with rigid distinctions between principal capital and income, the uniform acts allowed for the portfolio to be invested under a total-return model and for distributions to be based on POMV draw that met prudent-investor standards.

Finally, the promotion of the total-return over income-based approach extended to institutional investors when the Uniform Prudent Management of Institutional Funds Act (UPMIFA) replaced the Uniform Management of Institutional Funds Act in 2006. Today, UPMIFA guides best-practice for income-providing institutional investors and by advocating for a permanent-endowment model that rests on three pillars:

- a) Investing the portfolio for maximum total return, subject to an acceptable level of risk.
- b) Basing distributions on a POMV-based spending rule, anchored to the long-term average real return of the portfolio.
- c) The legally supported ability to harvest total returns in a manner that is not constrained by historical distinctions between principal and income.

The 26th Alaska Legislature enacted UPMIFA in 2010 and HB 416 was signed into law on June 10, 2010, making Alaska the 47th state to enact this model legislation.⁴ While this legislation does not apply to the investment and management of the APF, the concepts encapsulated in this model act and the recognition of the need to modernize the long-term management of endowment funds provides additional support for moving away from the current two-account fund structure to a single fund with the annual draw limited to the long-term real return of the fund.

The APF has achieved the first two of these three steps towards to the adoption of the permanent-endowment model. Over the past 25 years, the APF's diversified, total-return portfolio has generated much higher average returns, considerable portfolio growth and more income for the State of Alaska than the alternative of an income-orientated portfolio would have. Second, the adoption of a POMV spending rule – capped at a maximum of 5% – aligns with permanent-endowment best practice for rule-based sustainable and stable spending policies.

The third pillar, however, still requires reform and threatens to derail Alaska's successful adoption of the permanent-endowment model. The two-account structure's strict distinction between income and principal remains as a piece of legacy infrastructure from an earlier era of income-orientated investment. As the Board of Trustees has repeatedly warned, the two-account structure is problematic given the risk of depleting the ERA, particularly since the State now relies on the POMV distribution to support the state budget.

As argued in the previous section, the need for consistent inflation-proofing – and particularly the breakdown of a predictable, rules-based process for inflation-proofing, which resulted in large, *ad hoc* appropriations in FY2020 and FY2022 – is a significant source of volatility and risk to the durability of the ERA. The following section discusses the need for inflation-proofing under the two-account structure, before demonstrating in a quantitative sense how the current low level of ERA balances relative to distributions risks a depletion of this account.

⁴ Chapter No. 66, SLA 2010.

5 The Thief in the Night: The Need for Inflation-Proofing in the Two-Account Structure

Departures from the rules-based system for inflation-proofing introduce significant volatility and unpredictability to the ERA balances, and significantly exacerbate the risk of depleting this account. It is important, however, to understand why inflation-proofing is required under the two-account structure.

A core tenet of intergenerational investing – whether by sovereign wealth funds, trusts, foundations, or endowments – is that distributions from the Fund should not deplete the capital at the expense of future generations. This is often called “intergenerational equity.” The establishment of a principal account from which funds cannot be appropriated without changes to the Constitution achieves the most basic form of intergenerational equity: current generations cannot raid the Fund at the expense of future generations.

However, the Constitution does not make provisions for inflation adjustments, even though true intergenerational equity requires that assets and income across generations keep pace with inflation and the rising cost of living. Compounded over several years, inflation can have a material impact on the real value of assets and income.

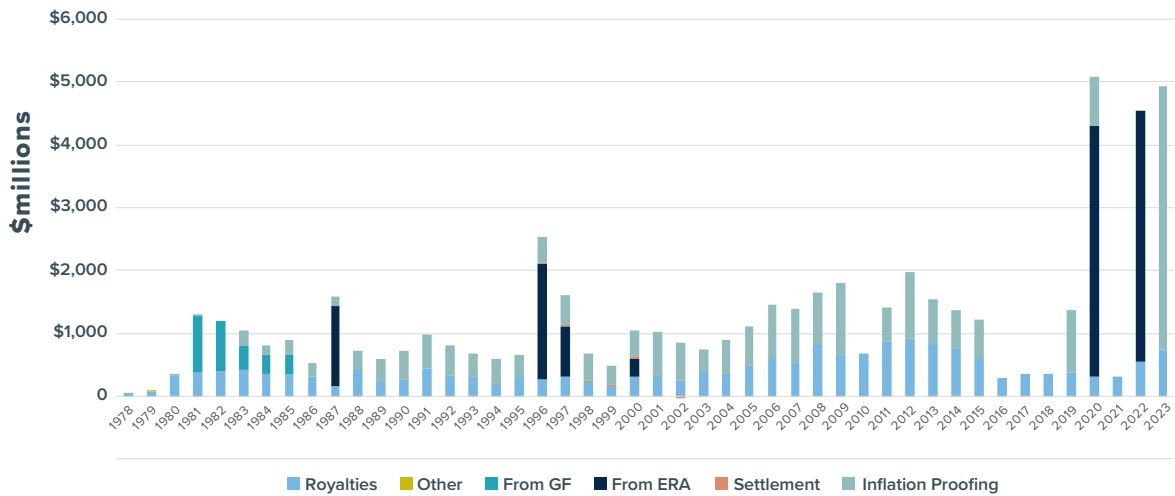
Elmer Rasmuson, the first chairman of the Board of Trustees of the Alaska Permanent Fund, memorably described inflation as “a thief in the night” that raids the real purchasing power of money. Unless spending or withdrawals are linked to the average long-term real return of a portfolio, the real value of a fund’s capital value is not preserved over time.

Using the national inflation rate for the United States, for example, \$10 billion invested in 1977 has an equivalent real value of around \$50 billion in 2023, given the cumulative impact of over four decades of inflation on the cost of living and hence the “purchasing power” of the capital. That means that the preservation of the real value of a dollar held in 1977 – ensuring it could purchase the same amount of goods and services – requires a five-fold increase to five dollars by 2023.

Under the two-account structure, the Principal would not be suitably protected for future generations if the growth in the account’s value did not match long-term inflation. To counter the workings of this thief in the night on the value of the Principal, the Alaskan Legislature has adopted, through enactment of AS 37.13.145(c), a rule-based approach to ensuring that its real value is preserved – or inflation proofed – in the long run.

A rule-based system for inflation-proofing was established in Alaska statute in the early 1980s and has been strongly supported by the Board and generally adhered to by successive Legislatures. As shown in Figure 6, inflation-proofing transfers have been a major source of contributions to the growth of the Principal.

Figure 6 Historical Contributions to the Principal, By Source



Source: APFC

Indeed, cumulative inflation-proofing transfers from the ERA (\$22.2 billion) are the largest historical source of capital in the Principal, exceeding contributions from mineral royalties (\$19.2 billion) and special appropriations from the General Fund (\$2.7 billion) and from the ERA (\$12.2 billion).⁵

It is important to note that from a purely investment perspective, there is no need for inflation-proofing appropriations from the ERA to the Principal. Recall that all APF assets, irrespective of which account they are attributed to, are invested as part of a single, total-return portfolio. Therefore, if distributions from the APF's total asset pool do not erode the real value of the capital in the long run, intergenerational equity would still be achieved – as per the permanent-endowment model described above.

The need for inflation-proofing, then, is purely due to the two-account structure and the variation in the accessibility of funds held in the ERA and the Principal.

The relative ease with which assets held in the ERA can be spent – appropriations require a simple Legislative majority and Governor's support – creates the risk that accumulated balances in this account can be appropriated in an *ad hoc* manner, breaking the permanent-endowment principle of limiting spending out of the portfolio to its long-term average real return.

⁵ The Legislature has not always stated the reasons behind special appropriations to the Principal from the General Fund and the ERA. However, the need for inflation-proofing, particularly through “catch-up” appropriations after periods of forgone statutory inflation-proofing (such as FY2016 through FY2018), was at least part of the motivation. Figure 6 also includes relatively small contributions from other royalties (\$15.8m) and settlements (\$152.9m).



Seen in isolation, the Legislature’s historical track record of inflation-proofing and ensuring the real value of the Fund is preserved has been exemplary.

There are, however, several challenges to the ability to sustain rule-based inflation-proofing under the two-account structure. The first is that, while inflation-proofing should be conducted on a predictable, rule-based basis, it is also important to maintain a sufficient “buffer” in the ERA balance to withstand a sustained adverse market environment lasting several years. Given the central importance of the POMV draw to supporting the State Budget and funding the PFD, depleting the ERA would have highly detrimental consequences for Alaska’s economic and fiscal stability.

The periodic tension between maintaining a sufficient buffer in the ERA and conducting inflation-proofing transfers is exacerbated by the breakdown of the rules-based statutory process for inflation-proofing in recent years. The collapse in oil revenues in 2014, resulted in a subsequent period of fiscal pressure and adjustment, during which the statutory rules for inflation-proofing were not followed. Specifically, no inflation-proofing appropriations were made in FY2021

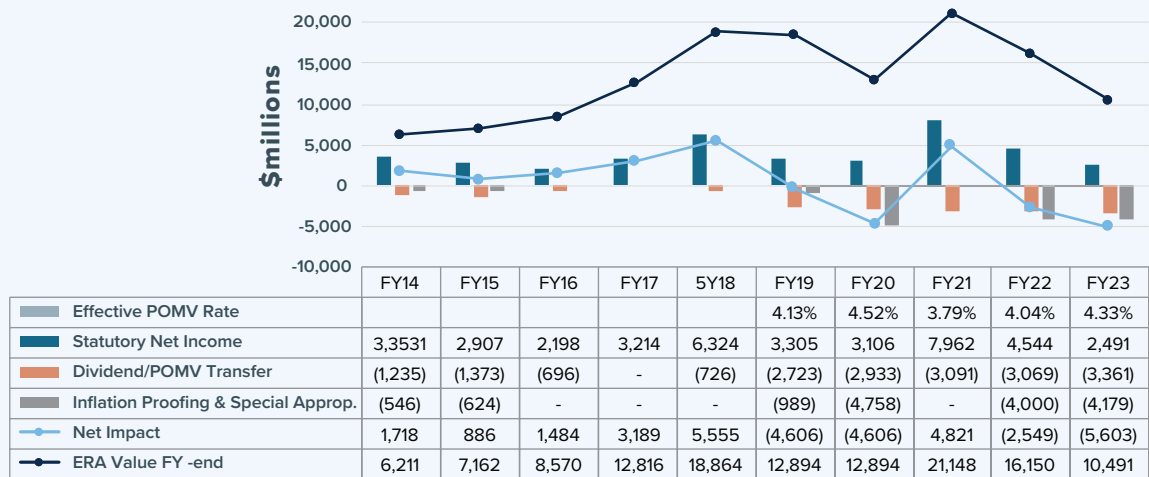
and FY2022. The resulting cumulative shortfall in inflation-proofing across FY2016, FY2017, FY2018, FY2021 and FY2022 was just over \$4.4 billion.

As shown in Figure 7, the legislation has further departed from the statutory, rules-based approach to inflation-proofing over this period by making use of large “special appropriations” (of \$4 billion each) from the ERA to the Principal in FY2020 and FY2022.

While one of these special appropriations was not officially designated as being for inflation-proofing, the shortfall between FY2016 and FY2018 suggests that at least part of the motivation for these subsequent special appropriations included the need for “catch-up” inflation-proofing (indeed, the need for inflation-proofing was stipulated in the intent language of the FY2020 special appropriation).

In addition to the two \$4 billion special appropriations, FY2023 saw by far the largest inflation-proofing appropriation in Alaskan history of \$4.18 billion. The result of all these appropriations was an outflow of almost \$13 billion for special appropriations and inflation-proofing between FY2020 and FY2023.

Figure 7 Inflows and Outflows to/from the ERA



The breakdown of the rules-based process for inflation-proofing has added significant volatility and unpredictability to the ERA – at exactly the time when this account’s stability and durability are critical, given the adoption of the POMV rule to govern increasingly significant distributions from the APF.

More importantly, the breakdown of the rules-based process for inflation-proofing has added significant volatility and unpredictability to the ERA – at exactly the time when this account’s stability and durability are critical, given the adoption of the POMV rule to govern increasingly significant distributions from the APF.

The unpredictability of inflation-proofing and *ad hoc* special appropriations from the ERA since FY2016 has exacerbated the inherent volatility in the account’s balances, which is also subject to outflows to fund the annual POMV draw, as well as fluctuations in both SNI and unrealized gains and losses. With respect to the latter, it is important to note that large outflows from the ERA can have a multiplier effect on the ERA balances in subsequent years. Recall that under current accounting practices, the ERA and Principal accounts are attributed proportional share of unrealized capital gains and losses. Therefore, if large appropriations from the ERA reduce its size relative to that of the Principal, so too does it reduce the share of unrealized capital gains.

This volatility comes at a moment when the durability of the ERA is of utmost importance to the State of Alaska’s fiscal stability. Support for the State budget through the POMV draw is likely to be a permanent trend, as Alaska increasingly substitutes its historic reliance on oil wealth and income for financial wealth and income. Under the two-account structure, the ERA is the only way to fund the POMV distribution. The depletion of the ERA would immediately result in a fiscal crisis in which there are no accessible funds to fund the POMV distribution. Before outlining several reform proposals, the following section demonstrates the clear and present risk of ERA depletion through different quantitative analyses.

6 Quantifying the Risk of ERA Depletion

While the POMV draw enacted in FY2019 is likely to become a permanent feature of Alaskan fiscal policy, representing an annual liability to the ERA, the account is also subject to inflation-proofing appropriations, *ad hoc* special appropriations and unpredictable fluctuations in income and unrealized gains and losses. A total of almost \$13 billion in inflation-proofing and special appropriations from the ERA since FY2020, alongside the POMV draw, has contributed to state where the ratio of the ERA balance to known forthcoming POMV distribution is concerningly low.

This section demonstrates how significant the risk to the durability of the ERA is by summarizing the outputs from quantitative “stress tests”, drawing on three distinct approaches. The intention is not to argue that one approach is superior, but rather to ensure that risks are assessed in a variety of ways. It is striking that the three modeling approaches used produce consistent results and identify a material risk that the ERA could be depleted within three years in the event of plausible negative market events.

6.1 Deterministic modeling

The simplest approach to modeling future ERA dynamics is to fix the values of key variables affecting the balance of the account, without accounting for a range of possible outcomes. This approach is helpful in forming initial insights around the risk of ERA depletion. The biggest shortcoming in this methodology is the unrealistic assumption that key variables are fixed for several years – an assumption that is relaxed in the approaches that follow from this deterministic starting point.

A deterministic picture of ERA dynamics can be gained using the following assumptions:

- Initial account balances for the Principal and the ERA for FY2024 are assumed to be equal to the actual balances at the end of FY2023.
- Realized returns for FY2024 are taken from actual returns observed over the preceding fiscal year, while two return levels (medium and low, discussed below) are taken from the projections used by Callan, the APF’s long-standing investment consultant, for future years.
- Inflation-proofing is set to the level of the appropriation for FY2024 of \$1.4 billion and adjusted upwards for an assumed fixed annual inflation rate of 2.5% for future years.
- Mineral-revenue deposits are taken from the 2023 Spring Revenue Forecast.
- No *ad hoc* special appropriations from the ERA are assumed.

Table 1 shows the changes in key APF balances under the “medium return” path, in which the portfolio generates a total return of 7.45% each year and a realized return of 5.35% (with all other variables as per the list of assumptions above). These return assumptions are in line with the average long-term returns of the APF. The starting balances for FY2024 are \$67.52 billion for the Principal account and \$10.49 billion for the ERA.

As shown in Table 1, deterministically fixing the return at a level comparable with long-run historical observations results in a steady depletion of the ERA from the initial \$10.49 billion to \$3.02 billion by FY2027. This reduction of over

60% in the ERA over the course four fiscal years, results in a balance that is less than the size of the annual POMV scheduled for the following year, even without factoring in inflation-proofing requirements for that year.

Table 1 Account Balances Under a Deterministic Medium-Return Scenario

(millions)		FY24 MID	FY25 MID	FY26 MID	FY27 MID
FUND BALANCES					
Principal					
Contributions and appropriations	\$	58,278	60,174	62,112	64,114
Unrealized appreciation on invested assets		14,237	16,601	17,993	20,068
Total Principal		72,515	76,235	80,105	84,182
Committed Earnings Reserve					
CY+1 POMV Transfer to General Fund		3,657	3,798	3,973	4,003
Total Committed Earnings Reserve		3,657	3,798	3,973	4,003
Uncommitted Earnings Reserve					
Realized Earnings		2,661	1,349	(196)	(1,704)
Unrealized Appreciation on Invested Assets		1,544	1,374	1,094	720
Total Uncommitted Earnings Reserve		4,205	2,723	898	(984)
TOTAL EARNINGS RESERVE		7,862	6,521	4,871	3,019
TOTAL FUND BALANCES	\$	80,377	82,756	84,976	87,201

Table 2 Account Balances Under a Deterministic Low-Return Scenario

(millions)		FY24 LO	FY25 LO	FY26 LO	FY27 LO
FUND BALANCES					
Principal					
Contributions and appropriations	\$	58,278	60,174	62,112	62,639
Unrealized appreciation on invested assets		9,137	6,765	4,190	1,497
Total Principal		67,415	66,939	66,302	64,136
Committed Earnings Reserve					
CY+1 POMV Transfer to General Fund		3,657	3,741	3,801	0
Total Committed Earnings Reserve		3,657	3,741	3,801	0
Uncommitted Earnings Reserve					
Realized Earnings		2,661	158	(2,461)	0
Unrealized Appreciation on Invested Assets		991	438	90	0
Total Uncommitted Earnings Reserve		3,652	596	(2,371)	0
TOTAL EARNINGS RESERVE		7,309	4,337	1,430	0
TOTAL FUND BALANCES	\$	74,724	71,276	67,732	64,136



We can now consider the implications of a period of lower returns. The results in Table 2 arise from unchanged input assumptions to those reported in Table 1, other than the annual total return which decreases to a fixed 0.05% (and the realized return to 4.05%). Under this scenario of essentially flat returns from FY2025 through FY2027, the ERA is depleted by FY2027, leaving no funds available for distribution to the support the State budget under the POMV or for inflation-proofing the Principal (indeed, there is an unmet \$1.5 billion shortfall in inflation-adjusting the value of the Principal in FY2027).

These two deterministic exercises provide a high-level insight into the dynamics of the ERA and the significant risk of depletion given the current low initial balance of the ERA relative to distribution requirements. Even in the medium-level return scenario, the ERA balance declines, while a period of flat returns (that is, not even accounting for the possibility of significant negative returns), the ERA would be depleted within four fiscal years. Both deterministic scenarios also assume a benign environment of 2.5% inflation – while higher actual inflation rates would in fact require larger appropriations to preserve the real value of the Principal under statutory inflation-proofing rules.

6.2 History-as-a-guide modeling

In generating a more realistic and broader range of scenarios for portfolio returns than the fixed, deterministic paths used above, two additional approaches are employed. The first is to use history as a guide, looking at the stability of the two-account structure assuming current initial account balances, coupled with a repeat of several historical return environments. The second approach, discussed in sub-section 6.3., simulates a range of return and inflation scenarios in a forward-looking manner, to produce a probabilistic distribution of outcomes.

In modeling return scenarios based a repetition of historic patterns, observed data on capital-market returns from the past 120 years are used. Eleven discrete 20-year rolling-returns scenarios using data from 1900 through 2020 are constructed –

the eleven return scenarios therefore mirror actual 20-year rolling returns for “1900 – 1920”, “1910 – 1930”, and so forth until “2000 – 2020”. These eleven historical return scenarios take the total returns on a 70/30 domestic stock-bond portfolio (with annual rebalancing), which serves as a good proxy for the risk-return characteristics of the APF’s portfolio.

The goal of this exercise is to examine how often – based on a repeat of past capital market outcomes, but with current ERA and Principal balances – a depletion of the ERA materializes. The additional input assumptions for this exercise are as follows:

- Inflation is equal to the observed rate over the eleven historical periods.
- Inflation-proofing is assumed when realized earnings are available, after paying POMV.
- Initial ERA and Principal balances are the actual values as of June 30, 2023.
- Mineral revenue deposits are taken from the 2023 Spring Revenue Forecast.
- No *ad hoc* special appropriations from ERA are assumed.

Table 3 presents results based on this historically driven scenario analysis. The striking initial observation is that the ERA balance is insufficient in seven out of the eleven historical 20-year return environments to make the full POMV distribution. In five of the eleven scenarios, a shortfall in the ERA would materialize before the end of the current decade.

There are two scenarios in which the entire POMV liability is not met (that is, the ERA is completely depleted), and two additional scenarios in which less than 10% of the POMV amount can be distributed. It is notable, that a repeat of the past two decades’ (2000 – 2020) returns over the coming two decades would result in the first shortfall in the ERA by 2027, a shortfall in eight of the next 20 years, and a cumulative shortfall of \$11.4 billion.

Table 3 POMV Shortfalls Based on a Repeat of Historical Return Pattern

(\$ in millions)	Base Case				
	Shortfall Year	Initial Shortfall	Cum. Shortfall	Worst % Shortfall	#Shortfall Years
1 = "1900-1919 - 70/30"	FY 2038	(\$1,231)	(\$7,162)	57%	3.00
2 = "1910-1929 - 70/30"	FY 2028	\$0	(\$7,073)	62%	5.00
3 = "1920-1939 - 70/30"	N/A	\$0	\$0	0%	0.00
4 = "1930-1949 - 70/30"	FY 2026	(\$1,484)	(\$13,256)	92%	6.00
5 = "1940-1959 - 70/30"	FY 2026	(\$2,610)	(\$3,547)	71%	2.00
6 = "1950-1969 - 70/30"	N/A	\$0	\$0	0%	0.00
7 = "1960-1979 - 70/30"	FY 2038	(\$488)	(\$6,979)	100%	3.00
8 = "1970-1989 - 70/30"	FY 2029	(\$4,106)	(\$4,293)	98%	2.00
9 = "1980-1999 - 70/30"	N/A	\$0	\$0	0%	0.00
10 = "1990-2009 - 70/30"	N/A	\$0	\$0	0%	0.00
11 = "2000-2019 - 70/30"	FY 2027	(\$3,711)	(\$11,442)	100%	8.00

The combination of having a low initial ERA:POMV coverage ratio as a starting point, coupled with the existence of the POMV distribution policy and the need for inflation-proofing, means that in only four of the past eleven discrete 20-year return environments would returns have been sufficient to ensure that all POMV and inflation-proofing distributions could be made over the 20-year period.

The key insight underlined by this exercise is the fundamental risk posed by the current low level of ERA balances relative to the size of the POMV and inflation-proofing. Under the two-account structure, funding the POMV (and having additional money available for inflation-proofing) requires higher ERA balances relative to required distributions.

Using historical returns as guide to possible future return scenarios, underlines the fact it would be imprudent to assume there is an investment-driven solution to the structural problem of a too-small initial balance in the ERA relative to distributions. Only in a minority of cases – four out of eleven discrete 20-year historically informed scenarios; or just over a third of cases – are capital-market returns sufficient to avoid a shortfall in the ERA, given the low initial ERA balance.

6.3 Probabilistic simulation modeling

Our final approach is to use Monte Carlo simulation to simulate the behavior of the APF across thousands of future possible return and inflation scenarios. The parameters for these simulations – return, volatility, and correlations between markets – are based on observed historical capital-markets behavior, with minor adjustments for widely understood changes in the markets over time.

Using this approach, it is possible to develop probabilistic distributions of outcomes for important APF financial variables, including the market value of the two accounts, annual spending/distributions, and inflation-proofing. Importantly, each simulation captures both return and volatility, allowing for an understanding what happens in both good and bad years and another way to assess the statistical probability of depleting the ERA in any given year of the simulation.

The advantage of this approach is that it explores a much broader range of potential outcomes than the previous deterministic and historical models.

It would be imprudent to assume there is an investment-driven solution to the structural problem of a too-small initial balance in the ERA relative to distributions. Only in a minority of cases are capital-market returns sufficient to avoid a shortfall in the ERA, given the low initial ERA balance.

This allows for an understanding of the dynamics of the APF across a wider range of scenarios and quantify, subject to the underlying assumptions, the probability of various outcomes. The limitations are that the methodology may be less intuitive to those unfamiliar with the modeling technique, and the presentation and interpretation of probabilistic results. Further, the results are dependent on a set of assumptions about future capital-markets behavior that may not capture the entire range of potential outcomes.

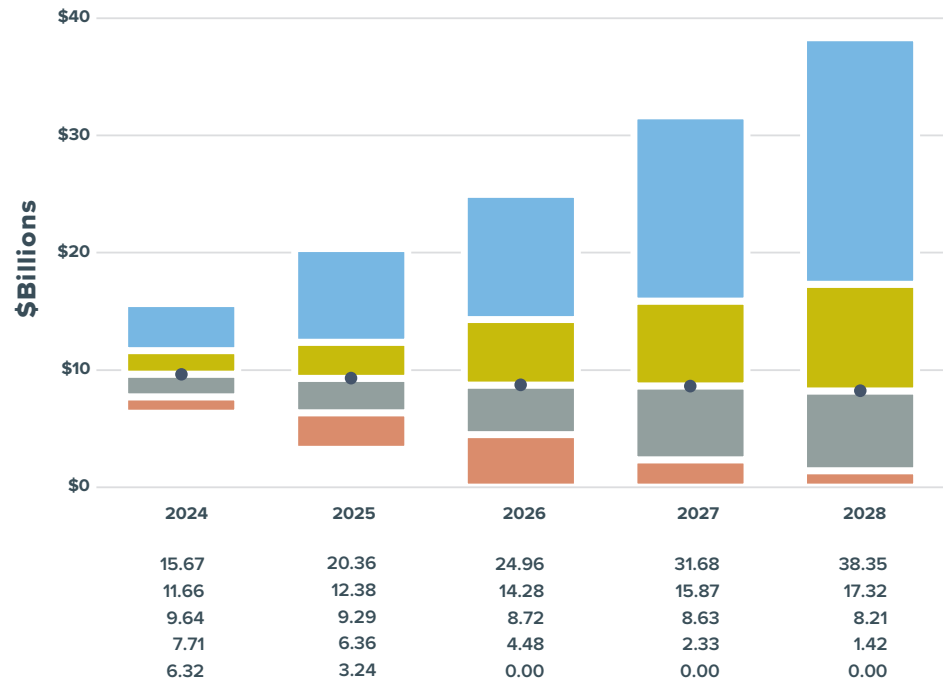
The input assumptions of the modeling approach are as follows:

- The starting date was July 1, 2023.
- The model generated 2,000 20-year simulations.
- The initial values for the ERA and Principal were as reported in the 2023 Annual Report.
- The FY2024 target asset allocation is maintained over the entire simulation period.
- The model simulated a range of inflation scenarios with a median rate of 2.5%.

- Returns are based on Callan’s long-term capital market assumptions, resulting in a median annualized geometric return of 7.2% for the APF portfolio.
- Mineral deposits are assumed to be the same across all simulations and based on the most recent projections from the Department of Revenue.
- Spending appropriations are assumed to take precedence over inflation-proofing in years where the ERA balance was too small to cover both.
- There are no “catch-up” or *ad hoc* appropriations in years following a shortfall in either inflation-proofing or POMV appropriations.

Figure 8 shows the distribution of outcomes for the ERA balance from the simulation modeling. Note that at the 95th percentile of outcomes, the ERA is completely depleted by FY2026. Another way to express this risk is that the simulations show a 5.4% probability that the ERA will be depleted by FY2026.

Figure 8 The Simulated ERA Balance at Various Percentiles



Source: Callan

Further, when the horizon is increased, the analysis projects that there is a 20% chance of depleting the ERA at least once over the next 10 years.

It is instructive to note that the probability of depleting the ERA and failing to fund the POMV draw in these models have increased significantly from when the same exercise was conducted in 2021. While the modeling predicts a 20% chance of depleting the ERA over the next 10 years based on the current ERA balance, the same analysis done in December 2021 predicted less than 5% chance of exhaustion over 10 years (this despite slightly lower baseline return assumptions used in 2021).

Again, the reason for the considerably higher risk of ERA depletion identified in the more recent modeling exercise is clear: in the December 2021 analysis, the ERA balance was \$21.2 billion, while the initial ERA balance for the recent exercise was \$10.5 billion. As argued above, there is no investment-driven solution to this problem. Reducing risk exposure also reduces expected return and, consequently, the probability of generating an average long-term real return that matches the POMV draw over the long run. Conversely, increasing risk (and therefore expected return) increases the magnitude of losses in worse-case outcomes, and consequently, so too the size and frequency of ERA shortfalls.

7 The Ultimate Solution: Constitutionally Removing the Two-Account Structure

The preceding discussion underlined the extent to which the ERA and Principal separation under two-account structure potentially jeopardizes the ability to sustainably fund the POMV while ensuring that the real value of the Principal is not eroded over time by inflation. While Alaska's rules-based framework has increasingly moved in the direction of a permanent-endowment model for the APF, given its total-return investment model and statutory POMV-based spending policy, the legacy two-account infrastructure continues to pose a risk to the proper functioning of this model.

In light of this risk, the Board has consistently supported the consolidation of the APF's two accounts into a single fund, while strictly limiting the annual draw to the fund's long-term real return. As noted earlier, the Board has expressed support for this approach over several decades, but the urgency with which reforms should be pursued has increased significantly since the adoption of the POMV distribution policy in FY2019.

The combination of single-account structure and a Constitutional limit on POMV draws linked to the APF's long-term real return (which the Board believes can prudently be assumed as equalling 5% per year), will complete the APF's transition to a permanent-endowment model, with the following attractive features and characteristics:

- **Total-return investing:** for decades, the APF's assets have been invested for maximum long-term total returns. The permanent-endowment model will ensure that this remains the case and avoid ever needing to manage part of the portfolio to meet short-term liquidity needs and generate cash flows. Total-return investing is the

best way to grow the APF and ensure that the highest possible distributions for current and future generations.

- **POMV spending and automatic inflation-proofing:** the POMV spending policy is the best way to equitably and sustainably harvest the APF's total returns for the benefit of current and future generations. Having a rule-based POMV based on or capped at the fund's long-term real return generates larger sustainable distributions than a rule based on income or portfolio yields. This spending rule also negates the need for inflation-proofing as long as the POMV rate matches the long-term average real return, resulting in automatic inflation-proofing (see Box 1).
- **Alignment with prudent-investor law and best practice:** establishing a single account, invested for maximum total return and with distributions limited to long-term real returns would align the APF with standard practice amongst income-producing intergenerational trusts, permanent- and sovereign-wealth funds, endowments, and foundations – and the provisions of several Uniform Acts governing their practices.
- **Fit for purpose:** the permanent-endowment model is the best way ensure a stable, sustainable revenue stream that meets the current and long-term fiscal needs of the State of Alaska as oil revenues decline. A single-account structure removes the self-imposed constraint of concerns about the ERA balance, creating an institutional infrastructure that is fit for purpose given the APF's investment model and the fiscal needs of the State of Alaska.

Overall, consolidating the two-account structure into a single fund creates much better alignment with how the APF currently invests and should continue to invest in the interest of the State of Alaska’s fiscal needs under the POMV distribution policy.

The most binding way to consolidate the two-account structure into a single, permanent-

endowment is through a Constitutional Amendment. The merits of Constitutional Amendment for this purpose have been considered on several occasions, resulting in extensive debate during 22nd and 23rd sessions of the Alaska Legislature – and notably in the 31st and 32nd sessions.

BOX 1 Automatic Inflation-Proofing in the Permanent-Endowment Model

The POMV draw that has governed withdrawals from the APF since FY2019 keeps the annual draw percentage in line with a reasonable estimate of the long-term average real return of the total Fund. As long as the average POMV draw does not exceed the average long-term real (above inflation) return on the APF’s total portfolio, there will be no erosion in the purchasing power or real value of the APF’s capital.

Under the permanent-endowment model, the spending rate is the other side of the expected real return coin. As long as the spending rate does not systematically exceed the average long-term real return of the portfolio, inflation-proofing is effectively built into the model, consistent with the intent behind the establishment of the APF.

However, if spending rates exceed the average real return for a number of years, an erosion in the purchasing power of the Fund will occur.

A critical element, therefore, to the proper functioning of the rule-based permanent-endowment model is the periodic reassessment of observed and expected future returns in order to determine if the spending rate remains appropriate or should be adjusted.

A more conservative spending rate (and implied real-return expectation) reduces the risk of overspending. For this reason, informed by the historic returns of the APF and peer institutions, the Board has consistently argued that under POMV spending policy, the rule should “limit the annual draw from the combined Fund to no more than 5% of the average fiscal year-end market value of the Fund over the immediately preceding five years.” In the Board’s view, a long-term POMV spending policy above 5% would require an imprudent level of risk to the APF’s portfolio in pursuit of higher returns.

To date, none of the Legislative resolutions that emerged during these debates have received sufficient support to advance to a general election for consideration by Alaska voters. However, the analysis contained in this paper underline the Board’s continued support – most recently articulated in Resolution 20-01 – for such a Constitutional Amendment, as it represents the ultimate rules-based system.

Short of a Constitutional Amendment – and possibly as part of transition period towards a Constitutionally enforced permanent-endowment model – there a number of statutory reforms that can be considered to achieve similar outcomes. These options are discussed in the following section.

8 Statutory Reforms to Mitigate ERA Durability Risks

The Board strongly supports a Constitutional Amendment as a means to establish the most comprehensive and enduring rules-based permanent-endowment model for the APF. However, given the high political and procedural hurdles that need to be cleared to pass an amendment, it is important to consider a number of statutory reforms that could mitigate the risks posed by the current operation of the two-account structure, combined with the POMV draw.

8.1. A Statutory Permanent-Endowment Model

Consideration should also be given to statutory means of consolidating the ERA into the Principal as a single account.⁶ A statutory consolidation of the two-account structure into a single account would follow the established tradition of rules-based policy in Alaska, including the existing statutory commitment to limit the POMV spending rule to the long-term average real return and the Constitutional requirement to transfer 25% of mineral royalties to the APF.

The Board believes that the intent behind the Constitutional language that established the APF is consistent with the adoption of a rules-based permanent-endowment model. The word “permanent” not only appears in the title of the constitutional provision, it also appears three different times in the two sentences creating the Fund. This constitutional language also requires the principal to be used for income-producing investments and provides the Legislature with discretion in determining how the income generated on these investments should be used. The Legislature has already exercised its discretion in defining what is “income” in AS 37.13.140. In the Board’s view, the intent of the Constitutional Amendment is consistent with the

Legislature enacting a statute creating a Fund of permanent duration and limiting the annual draw from this Fund to its long-term real return. Such an interpretation of this constitutional language is also consistent with the provisions of UPMIFA, which the Legislature enacted in 2010.

The Board first raised this possible statutory solution in 2020 in Board Resolution 20-01. The evolution of best practices, and the interpretation and implementation of Uniform Laws pertaining to trusts, foundations and endowments described in Section 3 of this paper serves as a useful guide in this regard. In keeping with an interpretation of the Constitutional language, informed by the Uniform Acts described in Section 3 of this paper, the guiding principle in establishing a spending rule that meets the Constitutional requirement of preserving the Principal would be “prudent” in preserving the original purchasing power of the Fund, not just the original dollars contributed to the fund. The Board believes limiting POMV draws to the long-term real return meets this requirement.

Moreover, as explained in Box 1, as long as draws from a single permanent-endowment fund do not, on average and in the long run, exceed the average real return of the portfolio, annual inflation-proofing appropriations would no longer be necessary.

⁶ As the ERA and Principal are statutory and constitutional constructs, respectively, the single-account transformation will amount to removing the ERA once the permanent-endowment model has established as a statutory rule, and maintaining the Principal account as the single account.

So, while the Board still believes that constitutional amendment is the most effective and most enduring solution to the two-account problem, should such a solution remain out of reach, the Board looks forward to working with the Legislature and Administration to evaluate the viability of this statutory solution.

8.2. Revise Rule-Based Inflation-Proofing

The current rules-based system for inflation-proofing is governed by AS 37.13.145(c). As described in Section 5, there have been significant departures from this rules-based system since 2016. The Board strongly encourages a return to a rules-based framework for inflation-proofing, if the two-account structure is maintained. That said, the Board emphasizes that the statutory inflation-proofing rule would need to be revised in a manner that addresses the increased risks to ERA durability that accompanied the adoption of the POMV draw.

A direct way to account for ERA-durability risk in the rule is by making inflation-proofing appropriations contingent on the preservation of a critical “buffer” in the relative size of the ERA balance. A contingent rule would dictate a targeted “floor” or minimum value for the ERA balance that should be preserved at all times.

Technical details of such a rule would require determining the appropriate floor or buffer level – which should be specified relative to the size of the POMV or the relative size of the market value of the ERA to that of the total assets of the APF. Second, a contingent rule could also establish remedial actions to ensure a clear and consistent process for the subsequent correction of any temporary suspension of inflation-proofing, or adjustments to ensure that the buffer-level of the ERA is reestablished (for example, through a reduction in the POMV, as discussed above; or direct appropriations of mineral revenues to the ERA).

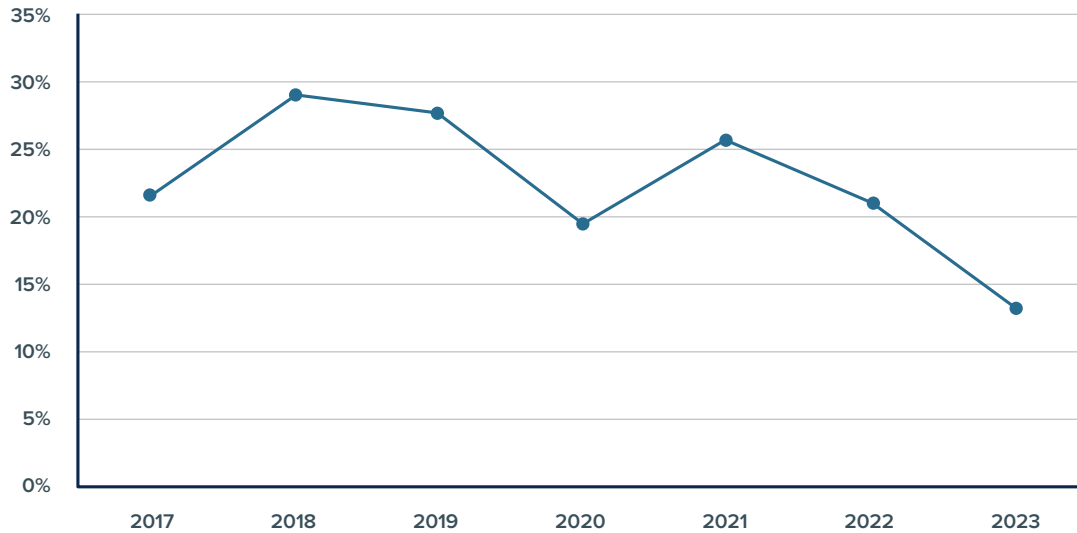
These technical details should be informed by careful modeling and stress testing, but APF’s initial analysis suggests that a buffer rule that preserves an ERA balance equal to four times the size of the most recent ERA draw would significantly reduce the risk of ERA depletion. Alternatively, a buffer rule could require that a minimum of 20% of the market value of total APF assets should always remain in the ERA. Assuming a maximum POMV of 5%, this 20% relative balance in the ERA is similar to the four-times rule ($4 \times 5\% = 20\%$), but would likely result in a more stable relationship, as the factors that drive fluctuations in the market value of the ERA and Principal are the same (given that the assets in both accounts are invested in the same way in one single portfolio).

Figure 9 shows the decline in the ERA relative to the APF’s total assets in recent years – which is self evidently problematic, given that the POMV draw is based on the size of the total assets of the APF. Given that the current ERA:POMV ratio has fallen to below 3 and that ERA currently holds around 13% of the APF’s total assets, a period of short- to medium-term adjustment would be required under the adoption of a buffer rule in order to rebuild the ERA to an prudent level, relative to either the POMV draw or as a share of total APF assets.

The advantage of adding a contingent provision to the existing statutory framework for inflation-proofing is that it preserves Alaska’s long-standing track record of rules-based policymaking. The addition of the contingent rule would be justified by the need to update the rules-based framework to meet the new requirements and risks introduced by the establishment of the POMV draw. An updated, contingent rules-based framework would restore predictability and consistency to the inflation-proofing process over the recent trend towards unpredictable, *ad hoc* decisions.



Figure 9 The Declining ERA Balance Relative to Total APF Assets



8.3. Forced Realizations of Capital Gains

While concerns over the durability of the ERA have assumed greater significance and urgency since the adoption of the POMV draw, the issue is not new. In the past, several observers have suggested that one solution would be for the APFC to sell a portion of its assets – most likely publicly traded bonds and equities. This policy would amount to the forced realization of unrealized gains.

Recall that net unrealized gains (on all assets) are attributed on a pro rata or proportional basis between the ERA and Principal, while realized gains flow entirely to the ERA. Therefore, the forced realization of gains has the potential to temporarily boost the ERA balance by forcing the proportional share of what would otherwise have been accounted for as net unrealized gains in the Principal into SNI (100% of which is attributed to the ERA). While forced realizations could provide a short-term fix to a shortfall in the ERA, this would only be the case under circumstances that cannot be anticipated. More fundamentally, a policy would contravene key principles of good governance in

independent investment management and have negative long-term implications for the growth of the APF.

The results of a hypothetical policy of forcing the realization of all the APF's public equity and bond holdings annually are discussed below. It is helpful to summarize the conceptual concerns forced sales and gains realization, and why long-term investors generally eschew it. The concerns identified in the literature include:

- **Market Timing:** selling investments to realize capital gains introduces an element of market timing that most long-term investors tend to avoid. The exact timing and composition of returns on both individual assets and a total portfolio are often unpredictable. Forced realizations may require investors to sell assets during periods of market volatility when the magnitude of realized gains becomes unpredictable. Moreover, market dynamics could result in unrealized capital losses on significant parts of the portfolio, limiting the gains that can be realized net of losses.

- **Fire Sales and Distress Discounts:** as a specific example of market-timing risk, resorting to asset sales and forced realizations during bear markets can result in lower realized capital gains than anticipated. For unlisted and less liquid traded assets, fire sales and distress asset sales can result in a significant discount from book value when an asset is sold.
- **Reduced Long-Term Growth Potential:** forced assets sales can result in investors missing out on future capital gains and/or income streams. In such circumstances, selling investments for distribution reduces the future growth of the portfolio. If the investments sold have strong growth potential, foregoing future appreciation can limit the overall portfolio's ability to generate returns over the long term.
- **Disruption of Asset Allocation and Portfolio Rebalancing:** selling specific assets to fund distributions can disrupt the intended asset allocation of the portfolio. This may lead to unintended concentrations in certain asset classes or sectors. This is particularly true when listed assets (public equities and bonds) account for a disproportionate share of forced gains realization. Forced realizations concentrated in public asset classes can also disrupt the parallel process of periodic portfolio rebalancing back to target asset allocations.
- **Limitations Due to Significant Private-Asset Allocations:** forced realization is complicated when investors have significant allocations to private markets, such as private debt, private equity, and most real-estate and infrastructure investments. This is true for the APF, where

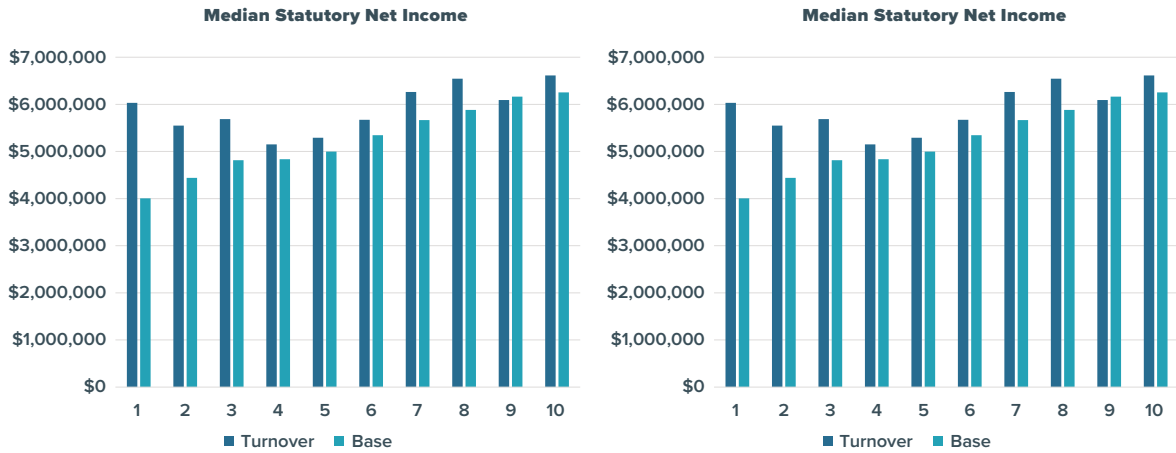
private assets have in recent years accounted for more than three quarters of unrealized gains. Selling large real-estate and private-equity holdings would increase uncertainty in terms of timing and realized value.

- **Transaction costs:** buying and selling securities incurs transaction costs, such as brokerage fees and bid-offer spreads (particularly for less liquid assets). Frequent trading to fund distributions erodes returns in the presence of high transaction costs. In this sense, forced realizations impose a “realization tax” on the portfolio's long-term return, particularly for the more illiquid parts of the portfolio (small-cap equities, emerging-markets equities, and high-yield bonds). A reasonable estimate would be that it would reduce the return on the APF's public markets portfolio alone by around 25 basis points per year.

These conceptual concerns around forced realizations can be further illustrated in the case of the APF through another modeling exercise. The results below show the outcomes for SNI and the ERA balance, under the assumption of selling the entire public equity and fixed income portfolios every year (25% turnover per quarter). The results shown are for the median-return scenario and the 90th percentile (1-in-10) worse-case outcomes for each variable. The median-return scenario in this analysis uses Callan 2023 capital market assumptions and assumes APF's FY2024 Strategic Policy Target for asset allocation. The assumption is that assets can be traded at market prices and assume that there are no transaction costs associated with doing so.



Figure 10 Statutory Net Income under a Forced Realization Policy



Source: Callan

Figure 10 shows the impact of this forced-realization policy on SNI. Recall that, under the APF’s current accounting framework, the mechanism through which forced realizations boost the ERA is by converting net unrealized gains (proportionally shared between the Principal and ERA accounts) into SNI (attributed in full to the ERA). Unsurprisingly, then, forcing an annual realization of the entire APF public equity and bond portfolio boosts SNI in the median-return scenario. It is striking, however, that even in this median-return scenario, the effect is largely transitory: the biggest boost to SNI occurs during the first year and by the fourth year, the increase in SNI is negligible (and then remains so in the following years).

Even more striking is what happens to SNI under a forced-realization policy in a negative market environment (represented by the 90th-percentile results in Figure 10). While a negative environment only slightly reduces SNI in the first year, it dramatically reduces it in subsequent years. This is due to starting each year after the first with no unrealized gains “reserves” in public equities and public fixed income. Negative return outcomes result in losses which are realized and not offset by embedded gains.

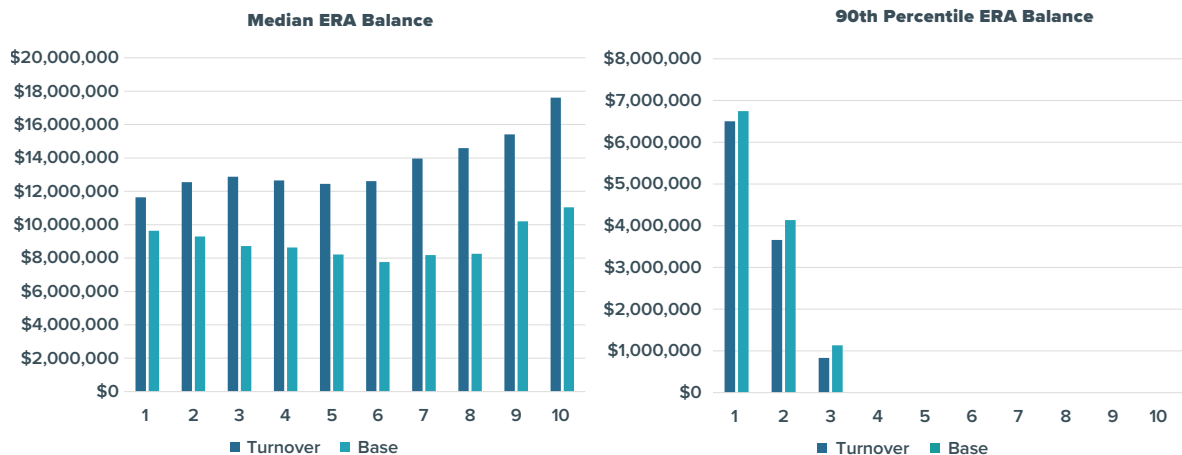
Figure 11 shows the impact of forced realizations on the ERA balance. Forced realizations increase size of the ERA in median-return scenario due to higher SNI (which are kept and compounded over time in the ERA, as distributions and inflation-proofing are the same in median case outcomes). Therefore, an extreme version of a policy of forced realizations – in which 100% of traded assets in the APF are sold each year – raises the balance of the ERA at the expense of growth in the Principal in a median-return scenario.⁸ The trade-off between growth the ERA and Principal is intuitive, as the all of the capital gains that arise in a median-return environment are “forced” out of the Principal and into the ERA each year.

However, the policy of forced realizations fails to address – and in fact slightly exacerbates – the problem of ERA durability in a bad market environment. Again, this is because every year

after the first one starts with no unrealized gains reserves in public equity and fixed income: negative returns are 100% absorbed by ERA balance. Under both the current approach and a forced-realization policy there is at least a 10% chance of depleting the ERA after three years. This underlines a key caveat to a policy of forced realizations: in a favorable market environment, it simply shifts assets from the Principal to the ERA; while the policy exacerbates risks around the durability of the ERA in a low-return environment.

⁸ In the median case, the size of the Principal under the forced-realization policy is consistently lower than it would be in the base case (current policy). In the median case, forced realization results in a roughly 10% reduction in the size of the ERA after 10 years, relative to the base case.

Figure 11 The ERA Balance Under a Forced Realization Policy



Source: Callan

A forced realization today in support of the near term POMV draws comes at the expense of the future earnings that would have otherwise been generated by the assets being realized to bridge this financial gap. Put simply, this potential remedy seeks to hold current generations harmless from the ERA balance shortfall, but does so at the expense of future generations that would be negatively impacted by such forced realizations.

In summary, forced realizations are a last-resort response to the depletion of the ERA due to failure to implement the policy and institutional reforms discussed above. While selling assets to force realized capital gains into the ERA could temporarily boost the ERA, the critical caveat is the effectiveness and cost of this approach are highly sensitive to the market environment in which it is conducted. Recall that the analysis also abstracted from the practical problem and cost of transaction costs, which effectively tax the return on the portfolio in the long run. As such, relying on forced realizations is a high-risk approach – a roll of the dice that gambles on a favorable market in subsequent years – that should be avoided through the kind of reforms described earlier.

It is also important to acknowledge that a forced realization today in support of the near term POMV draws comes at the expense of the future earnings that would have otherwise been generated by the assets being realized to bridge this financial

gap. Put simply, this potential remedy seeks to hold current generations harmless from the ERA balance shortfall, but does so at the expense of future generations that would be negatively impacted by such forced realizations. Arguably, this action to benefit current generations at the expense of future generations runs contrary to the intergenerational equity objective of the APF identified by the Legislature in AS 37.13.020(a). An amendment to this statute to authorize the forced realization of gains to support a POMV distribution shortfall in the ERA would need to be authorized by the Legislature and approved by the Governor. Thus, although a statute allowing forced realization of SNI to fund POMV or other draw shortfalls could be last resort in an emergency scenario, it is the staff and Board of the APF's least preferred way to address ERA durability problems.

This paper has shown that the APF's two-account structure creates significant risks around the ability to fund POMV distributions, threatening the stability and proper functioning of Alaska's well established rules-based fiscal framework. The analysis underlined that the current low ERA balance exacerbates the inherent structural risk of an ERA depletion under adverse – but plausible – market conditions. The two-account structure, with its rigid distinction between earnings and principal, no longer aligns with: (i) the practices and governing laws of income-producing institutional investors, (ii) the APF's total-return investment model, and (iii) the size and importance of the annual POMV draw.

Our discussions included various reform options. The paper reinforces the Board's long-standing support for a Constitutional Amendment to establish a single-account permanent-endowment model. The adoption of a permanent-endowment model with a limit on POMV draws tied to APF's long-term real return would also ensure the

real value of the Fund's capital is not eroded by inflation in the long term – without requiring annual inflation-proofing appropriations. A constitutional solution is the most durable way to establish a rules-based permanent-endowment model for the APF.

The paper also outlined several statutory reform paths that could be pursued to address the current and structural risks to the durability of the ERA. The first of these is to combine the two accounts and establish the permanent-endowment model in statute, based on an interpretation of the Constitutional language pertaining to the APF that is informed by trust and institutional-investor law under the provisions of several Uniform Acts.

The paper also considered two other possible reforms that assume the two-account structure is maintained. The first of these is to give consideration to the option of reforming the rule-based process for inflation-proofing under the two-account system.

The paper reinforces the Board's long-standing support for a Constitutional Amendment to establish a single-account permanent-endowment model.

Introducing a minimum-level rule for the ERA balance reduces the risk of depleting the account to an acceptable level. A “floor” for the ERA balance could be expressed relative to either the balance of the total APF assets (such that the ERA account for at least 20% of total assets) or the size of the POMV (such that the ERA holds a minimum of at least four times the most recent POMV draw).

Finally, the paper also considered the implications of a policy of forced realizations in which selling all the APF’s traded assets (public equities and bonds) moves all capital gains (and losses) into the ERA, rather than sharing unrealized net capital gains proportionally between the ERA and the Principal. The analysis shows that relying on forced realizations is a last-resort response to the depletion of the ERA.

While selling assets to force realized capital gains into the ERA could temporarily boost the ERA, the critical caveat is the effectiveness and cost of this approach is highly sensitive to the market environment in which it is conducted. Relying on forced realizations is a high-risk approach that should be avoided through the kind of reforms described above. We also note that a policy of forced realizations would likely require the approval of the Legislature and the Governor.

This paper has identified the material risk of depleting the ERA within three to four years. The reduction in the size of the ERA balance relative to both the APF’s total assets and the annual POMV in recent years has significantly increased this risk. The menu of reforms outlined in this paper require urgent attention, as the failure to act would undermine the functioning of Alaska’s rule-based framework for sustainably harvesting APF’s returns to support the State budget and fund the PFD. Successful reforms to address the risk of depleting the ERA will ensure that the APF continues to benefit both current and future generations of Alaskans.

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- Markowitz, H. (1952). “Portfolio selection,” *Journal of Finance*, Vol. 7(1): 77–91.
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Addendum: Callan, APF ERA Analysis

Objective of the Analysis

- This paper proposes a permanent-endowment model for Alaska in which the APF's current two-account structure is replaced by a single account.
- The permanent-endowment model only differs from a traditional endowment in that the spending rule is written into the State Constitution, creating a high bar for future changes and helping to ensure the long-term sustainability of the APF.
- The permanent-endowment structure removes the limitation on spending imposed by the ERA balance, allowing the APF to make the full transfer (based on the 5% POMV spending rule) every year. The vast majority of major endowments, foundations, and sovereign wealth funds employ a traditional endowment structure versus the current APF two-account structure.
- The analysis in this Addendum uses a Monte Carlo simulation model to examine the impact on the APF of changing from the current two-account structure (Principal and ERA) to the one-account, permanent-endowment structure proposed in the paper.
- The simulation model allows us to examine a full range of potential future capital market outcomes from best case to worse case, and to understand their impact on the APF (such as, transfer amounts and market values of all accounts) under each of the two structures.
- The model allows us to assign probabilities to outcomes of interest (such as, the ERA being depleted).

Analysis Outline

- The “Base Case” assumes:
 - Callan 2023 capital market assumptions (see following page)
 - APF FY2024 Strategic Policy Target
 - Current ERA limits on appropriations¹
- The “Permanent Endowment Case” assumes:
 - Callan 2023 capital market assumptions
 - APF FY2024 Strategic Policy Target
 - No ERA limits on appropriations
- Both cases assume starting values (ERA balance, market value and unrealized gains) as of July 1, 2023, as well as the current 5% POMV spending rule.
- The exercise examines the impact on a year-by-year basis on key financial variables, including:
 - Distributions, annual and cumulative over 10 years
 - Market Value
 - Statutory Net Income
- The analysis focuses on range of outcomes for each financial variable from 5th to 95th percentile.

¹ The Base Case model uses a generous interpretation of the ERA limitation. It assumes that the Fund can transfer up to the sum of the ERA balance at the beginning of the fiscal year plus the first three quarters of Statutory Net Income during the fiscal year. If a more conservative model were used where only the beginning ERA balance could be transferred, the ERA limitation would kick in earlier and more severely. This would reduce transfers in worse-case outcomes for the Base Case relative to what is shown in this analysis.

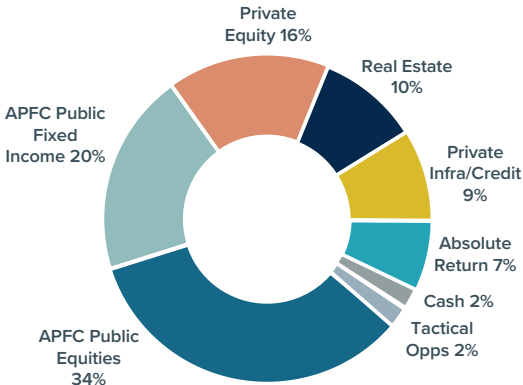
Callan's 2023 Capital Market Projections – Used in Analysis

Asset Class	Performance Index	PROJECTED RETURN		PROJECTED RISK	
		1-Year Arithmetic	10-Year Geometric Return	Annualized Standard Deviation	Projected Yield
APFC Public Equities		9.05%	7.60%	18.50%	2.85%
Global Equity	MSCI ACWI - IMI	9.05%	7.60%	18.50%	2.85%
APFC Public Fixed Income		4.35%	4.35%	4.20%	4.55%
Cash Equivalents	90-Day T-Bill	2.75%	2.75%	0.90%	2.75%
TIPS	Bloomberg TIPS	4.10%	4.00%	5.30%	3.95%
US Fixed Income	Bloomberg Aggregate	4.25%	4.25%	4.10%	4.30%
US Investment Grade Credit	Bloomberg Credit Bloomberg Global	4.30%	4.25%	4.60%	4.55%
Non-US Fixed Income	Treasury ex-US Hedged	2.70%	2.25%	9.80%	2.40%
Emerging Market Debt	50/50 JPM EMBI/JPM GBI	6.25%	5.85%	10.65%	7.40%
High Yield	Bloomberg US High Yield 2% Issuer Cap	6.75%	6.25%	11.75%	8.00%
US Securitized	Bloomberg US Securitized	3.90%	3.90%	4.00%	3.65%
Private Equity/Growth Opps		11.95%	8.50%	27.60%	0.00%
Private Equity	Cambridge Private Equity (lag)	11.95%	8.50%	27.60%	0.00%
Private Real Estate		6.60%	5.75%	14.20%	4.40%
Real Estate	NCREIF Total Index (lag)	6.60%	5.75%	14.20%	4.40%
Private Infra/Credit/Income Opps		7.50%	6.90%	12.45%	5.55%
Private Infrastructure	Cambridge Global Private Infra (lag)	7.15%	6.15%	15.45%	4.60%
Private Credit	Bloomberg US High Yield (lag)	8.00%	7.00%	15.50%	7.00%
Absolute Return		5.80%	5.55%	8.45%	0.00%
Hedge Funds	HFRI Total HFOF Universe	5.80%	5.55%	8.45%	0.00%
Tactical Opportunities		8.60%	7.25%	17.75%	2.00%
Tactical Opportunities	S&P 500	8.60%	7.25%	17.75%	2.00%
Cash Equivalents		2.75%	2.75%	0.90%	2.75%
Hedge Funds	90-Day T-Bill	2.75%	2.75%	0.90%	2.75%
Total Fund	APFC Total Fund Target	7.80%	7.20%	13.10%	2.90%
Inflation	CPI-U		2.50%	1.50%	

APF FY2024 Total Fund Policy Target Projected Risk and Return

- Assumed asset allocation used in analysis is the APF 2024 Policy Mix.
- Return and risk projections for APF 2024 Policy Mix are generated using Callan’s 2023 Capital Market Projections.
- Projected median 10-year annualized return of **7.20%** for APF 2024 Policy Mix.
- Inflation expectation is **2.50%**.
- Projected median 10-year annualized real return of **4.70%**.
- Projected standard deviation of **13.10%**.
- Percent probability of exceeding 5% annualized **real** return over 10-year horizon is estimated to be **47%**.
- Percent probability of exceeding return of 7.1% (median effective payout plus inflation) is estimated to be roughly **51%**.

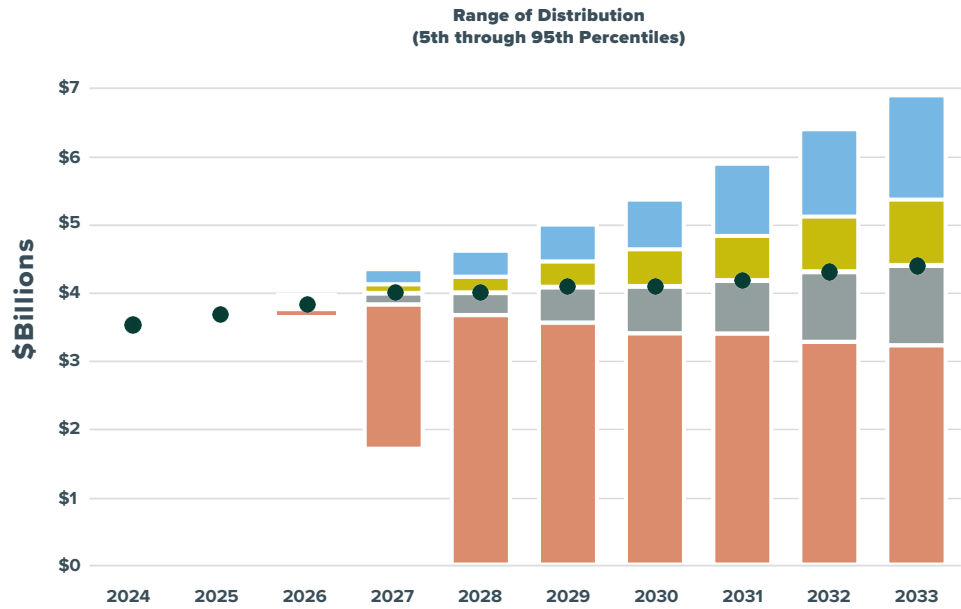
FY2024 Total Fund Target



Expected 10-year Geometric Return:	7.20%
Expected Standard Deviation:	13.10%
Expected Inflation:	2.50%
Expected Real Return:	4.70%

Range of Distributions – Base Case

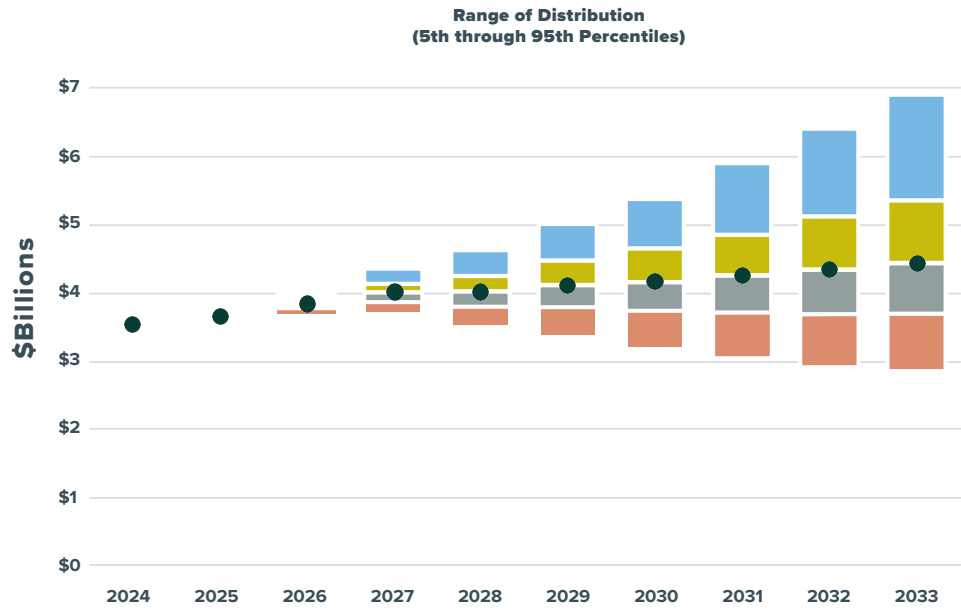
- At least a 5% probability that the ERA will limit the distribution to less than half of the formula beginning in 2027.
- At least a 5% probability of a zero-distribution due to ERA exhaustion by 2028.
- At least a 10% probability of a zero distribution due to ERA exhaustion by 2033.



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
5th Percentile	3.53	3.66	3.96	4.34	4.61	5.00	5.36	5.89	6.40	6.90
25th Percentile	3.53	3.66	3.88	4.12	4.23	4.45	4.63	4.83	5.11	5.36
50th Percentile	3.53	3.66	3.82	3.99	4.00	4.08	4.09	4.18	4.30	4.40
75th Percentile	3.53	3.66	3.76	3.83	3.68	3.57	3.41	3.40	3.28	3.23
95th Percentile	3.53	3.66	3.68	1.71	0.00	0.00	0.00	0.00	0.00	0.00

Range of Distributions – Permanent-Endowment Case

- Removing the ERA limitation on distributions results in a full distribution being paid in all years across all outcomes.
- 5th through 50th percentile outcomes are essentially the same as the Base Case.
- Outcomes below the 75th percentile are substantially better than the Base Case beginning in 2027.

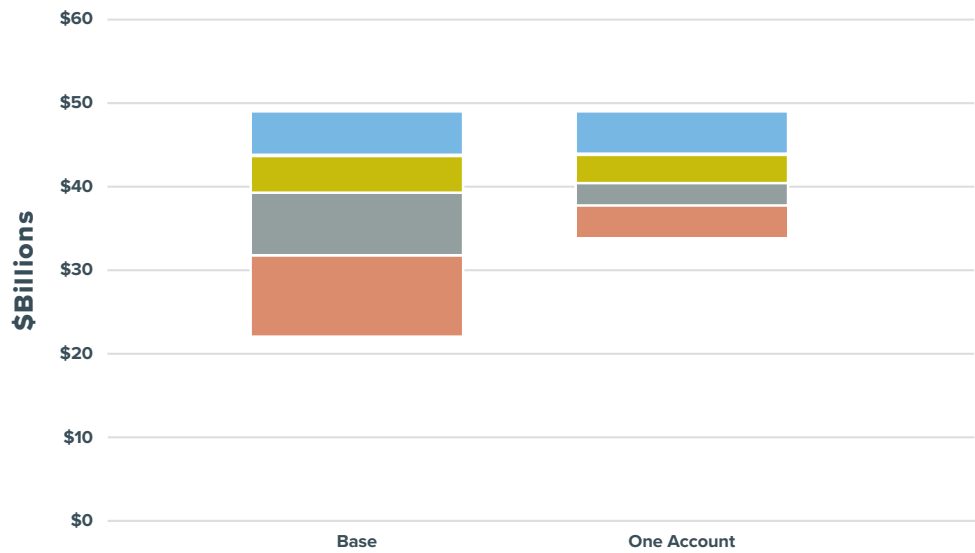


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
5th Percentile	3.53	3.66	3.96	4.34	4.61	5.00	5.36	5.89	6.40	6.90
25th Percentile	3.53	3.66	3.88	4.12	4.23	4.46	4.64	4.84	5.11	5.34
50th Percentile	3.53	3.66	3.82	3.99	4.01	4.10	4.15	4.24	4.33	4.43
75th Percentile	3.53	3.66	3.76	3.85	3.79	3.78	3.72	3.70	3.67	3.68
95th Percentile	3.53	3.66	3.69	3.70	3.52	3.38	3.20	3.02	2.89	2.83

Range of Cumulative Distributions

- Sum of total distributions over 10-year projection period.
- Eliminating the ERA limit and employing the Permanent Endowment model increases contributions in worse-case outcomes.
- \$12 billion cumulative difference in transfer to state over ten years between 5th percentile worse-case outcomes.

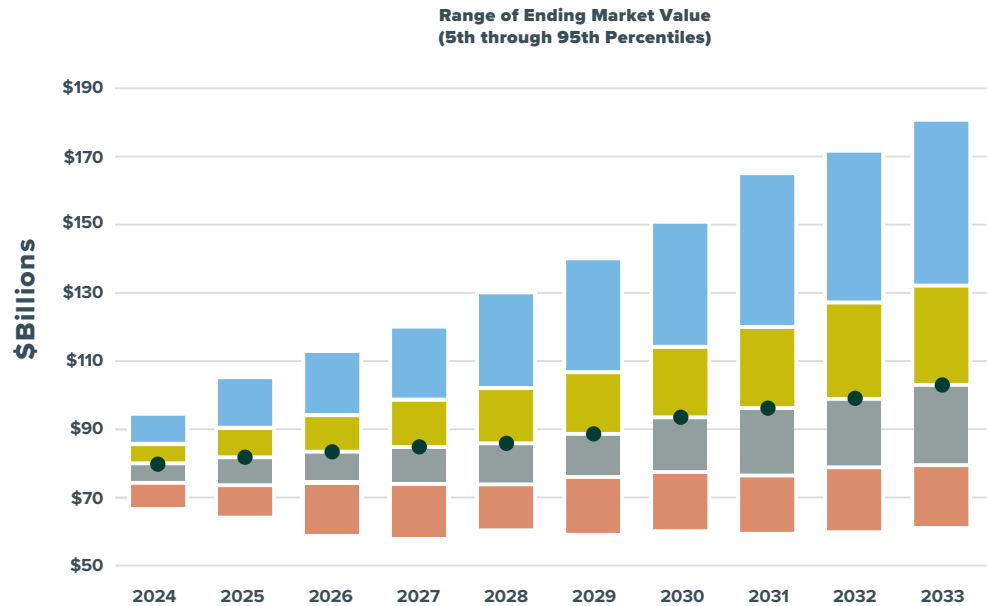
**Range of Cumulative 10-Year Distribution
(5th through 95th Percentiles)**



	Base	One Account
5th Percentile	48.93	48.93
25th Percentile	43.64	43.76
50th Percentile	39.20	40.35
75th Percentile	31.42	37.45
95th Percentile	21.62	33.77

Range of Market Value – Base Case

- Market value is a product of asset allocation, capital market returns, and net flows into and out of the Fund.
- High market value outcomes associated with strong markets.
- Low market value outcomes associated with weak or negative markets.

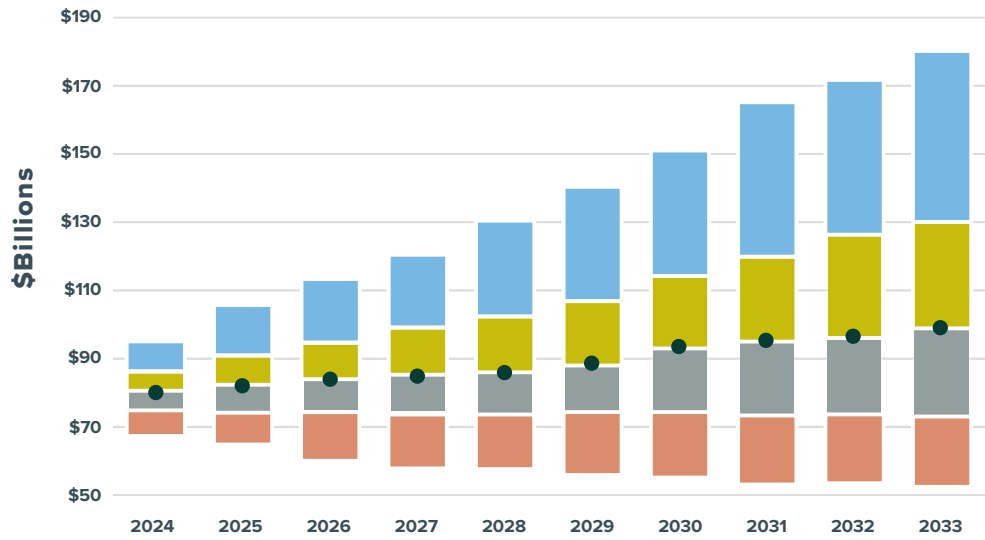


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
5th Percentile	94.5	105.1	112.8	119.9	129.9	139.8	150.5	164.7	171.3	180.3
25th Percentile	85.7	90.4	94.2	98.7	102.0	106.7	114.1	119.8	127.0	131.9
50th Percentile	80.1	81.9	83.5	84.9	86.0	88.7	93.6	96.2	98.9	103.0
75th Percentile	74.4	73.8	73.9	73.5	74.0	76.1	77.5	76.5	78.9	79.6
95th Percentile	66.8	64.4	59.7	58.9	60.6	59.4	60.4	59.7	60.1	61.4

Range of Market Value – Permanent-Endowment Case

- Market value is lower in Permanent-Endowment Case in worse-case outcomes.
- This is because the Fund can make full transfers in years where otherwise the ERA structure would limit them (sometimes to zero).
- 5th percentile worse-case outcome is a market value of \$51.8 billion in 2033, versus \$61.4 billion in the Base Case.

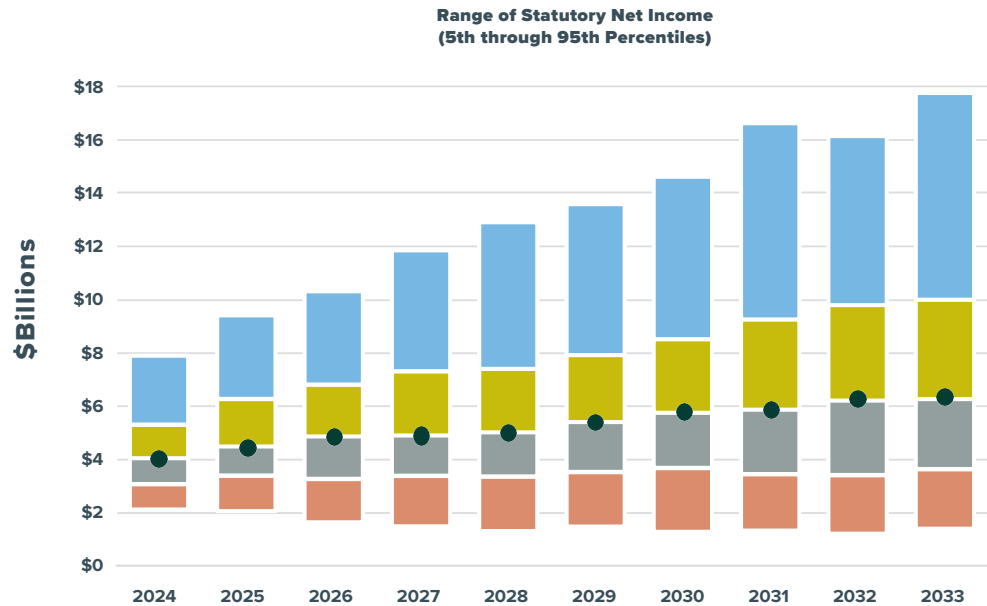
**Range of Ending Market Value
(5th through 95th Percentiles)**



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
5th Percentile	94.5	105.1	112.8	119.9	129.9	139.8	150.5	164.7	171.3	179.8
25th Percentile	85.7	90.4	94.2	98.6	101.9	106.3	113.6	119.4	125.8	129.5
50th Percentile	80.1	81.9	83.5	84.8	85.5	87.5	92.5	94.5	96.1	98.4
75th Percentile	74.4	73.8	73.9	73.2	73.2	73.9	73.9	72.9	73.2	72.6
95th Percentile	66.8	64.4	59.7	57.4	57.3	55.3	54.6	52.6	52.9	51.8

Range of Statutory Net Income – Base Case

- Annual Statutory Net Income (realized income and capital gains) is impacted by asset allocation and capital market behavior.
- High outcomes are associated with strong markets and/or high interest rate regimes.
- Low outcomes are associated with weak or negative markets and/or low interest rate regimes.

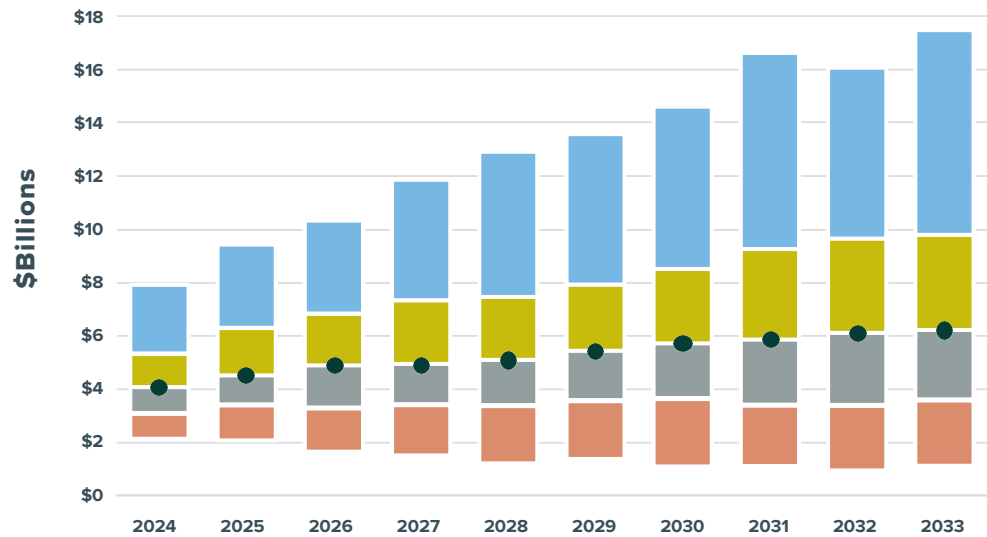


	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
5th Percentile	7.83	9.33	10.23	11.78	12.82	13.50	14.53	16.54	16.06	17.67
25th Percentile	5.24	6.21	6.75	7.25	7.33	7.86	8.44	9.19	9.72	9.93
50th Percentile	4.00	4.44	4.81	4.85	4.97	5.35	5.70	5.82	6.16	6.21
75th Percentile	3.02	3.34	3.21	3.33	3.30	3.47	3.62	3.39	3.35	3.58
95th Percentile	2.07	2.00	1.58	1.43	1.26	1.43	1.23	1.27	1.16	1.34

Range of Statutory Net Income – Permanent-Endowment Case

- Statutory Net Income relatively unaffected by elimination of ERA limit.
- Slight reduction in worse-case Statutory Net Income.
- Higher payouts in worse-case outcomes result in lower market value.
- Lower market value results in lower Statutory Net Income.
- Impact is small, \$1.04 billion in 2033 vs \$1.34 billion in the Base Case.

Range of Statutory Net Income
(5th through 95th Percentiles)



	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
5th Percentile	7.83	9.33	10.23	11.78	12.82	13.49	14.53	16.54	15.99	17.39
25th Percentile	5.24	6.21	6.75	7.25	7.37	7.84	8.42	9.17	9.55	9.70
50th Percentile	4.00	4.44	4.81	4.87	5.02	5.36	5.64	5.78	6.03	6.14
75th Percentile	3.02	3.34	3.22	3.35	3.31	3.50	3.57	3.33	3.32	3.53
95th Percentile	2.07	2.00	1.58	1.43	1.13	1.30	1.02	1.03	0.86	1.04

Conclusions

- Projected transfers are relatively similar between the two structures in median and above outcomes.
- In below median outcomes the ERA limitation under the current structure kicks in and reduces the size of the transfers beginning as early as FY2026.
- Limitations under the current structure become more severe (in worse-case outcomes) over time, resulting in an increasing probability of a zero transfer.
 - Probability of zero transfer – greater than 5% (1 in 20) by FY2028.
 - Probability of zero transfer – greater than 10% (1 in 10) by FY2033.
- The permanent-endowment model eliminates the ERA limitation allowing the Fund to make the full transfer in each year.
- Transfers are lower in worse-case outcomes under the permanent-endowment model due to reduced market values, but they are not reduced to zero by the “cliff” effect of the ERA balance being exhausted.
- Worse-case outcomes under the permanent-endowment model result in lower market values than under the current structure due to higher payouts that would be limited by the ERA balance.

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