Strategic Asset Allocation for Sovereign Wealth Funds

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How should long-term investors like sovereign wealth funds (SWFs) accumulate and decumulate reserves and invest their endowments to achieve their long-run and short-run objectives? Despite the proliferation of SWFs across countries, normative analysis of SWF management is relatively scant. This partly reflects the idea that the model should behave in similar ways to a life-cycle model in which background risk in the form of undiversifiable labor income risk is replaced by the natural resource endowment of a particular country. The natural resource acts like an implicit riskless asset, just like labor income from a household's point of view, and the SWF can take more aggressive positions early in its creation, and move into safer assets as the resource is depleted.

We revisit this intuition based on the idea that the problem of a self-interested household should not be identical to the problem of any government caring about current and future generations. The primary difference arises from the specification of the SWF's objective function and the constraints a sovereign government faces. Norway's experience validates this motivation. The stated objectives of the Norwegian SWF emphasize its long-term horizon, taking into account the welfare of current and future generations but also the SWF's usefulness as a stabilization tool for the Norwegian economy, both in periods of overheating and in periods when the economy needs fiscal stimulus.

In building a normative strategic asset allocation model for the SWF, we start by explicitly specifying the objective function. We explicitly include a sustainability constraint where the SWF withdraws the expected SWF returns. The sustainability constraint generates a tight link between the endogenous asset allocation decision and the withdrawal rate because the asset allocation decision determines expected returns. Moreover, we also take into account certain minimum expenditures that the SWF needs to cover. These commitments could be infrastructure projects or public sector wages. We model background risks for the SWF as arising from persistent commodity prices and deviations from a deterministic trend in GDP.

There are a number of implications from this model. First, strategic asset allocation predicts a de-risking approach as the SWF matures. Moreover, a higher (lower) expected growth rate in the economy implies a higher (lower) desired withdrawal rate through a permanent income hypothesis logic, and the sustainability constraint implies that this is achieved through a higher (lower) asset allocation in stocks.

Second, over shorter time periods, the asset allocation — and in this setup the resulting withdrawal rate — depends on the correlation between the GDP innovation and the commodity price innovation. If the economy is well diversified and the correlation is low, as would be the case in a country like Norway, then short-run stabilization could best be achieved by reacting to the GDP innovation — the business cycle— rather than the commodity price. In recessions (expansions), a higher (lower) withdrawal is needed, and this is achieved with a higher (lower) average asset allocation in stocks. On the other hand, when the economy is not well diversified, as would be the case in a country like Saudi Arabia, where oil revenues materially impact GDP, then the response to the commodity price innovation is much larger than the response to the business cycle.

Third, a key parameter involves the extent to which the SWF is explicitly affected by the state of the business cycle. We model the ability to rely on some tax revenues for government expenditures by introducing explicitly a small component of the exogenously evolving GDP in the objective function. In good (bad) times, the presence of some component of the good (bad) state GDP in the objective function will reduce (increase) the need to take funds out of the SWF. Equivalently, in good times,

government expenditures can be paid more easily with existing taxes and therefore there is less of a need to withdraw from the SWF. Asset allocation becomes a lot more conservative when this parameter is set to zero because the government cannot rely on any tax revenues arising outside the SWF.

Fourth, the sustainable spending constraint generates a clear “reaching for yield” preference where a lower risk-free rate makes it harder to hit the spending constraint and therefore a higher exposure in the stock market is taken. Despite this higher exposure, the withdrawals tend to be slightly lower than in the higher real interest rate environment, leaving the average size of the fund unchanged.

Fifth, in the presence of fixed consumption commitments, the SWF acts in a more risk-averse way. Consumption commitments act like a habit and generate more risk-averse behavior. The lower asset allocation in stocks with commitments implies lower withdrawals; interestingly the average wealth accumulation is the same in both cases.

We plan to extend the model in different directions involving the role of foreign exchange risk, as well as the effects of long-term climate change on the value of natural resources and SWF strategic asset allocation.