

Sovereign investor models: Institutions and policies for managing sovereign wealth

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Background and acknowledgements

Background

This research features the insights of experts from a number of the world's leading universities, former policymakers, and investment professionals. The report is the result of collaboration between two centers at Harvard Kennedy School: the Belfer Center for Science and International Affairs and the Center for International Development (CID).

Dr. Khalid Alswilem, the former Chief Counselor and Director General of Investment at the Saudi Arabian Monetary Agency (SAMA), joined the Belfer Center as a Fellow in 2013 to conduct research on sovereign wealth funds, with a particular focus on the management of Saudi Arabia's reserves and their links to the real economy. He is one of the longest serving and most successful sovereign investment practitioners, having held senior investment positions at SAMA for over two decades.

Malan Rietveld and Angela Cummine are sovereign wealth fund experts and have conducted doctoral research on the topic at Columbia University and the University of Oxford, respectively. Katherine Tweedie has led the Investec Investment Institute's collaboration with CID, supporting Professor Ricardo Hausmann and his team's groundbreaking research on the role of productive knowledge as a primary driver of economic growth.

The complimentary interests and expertise of this group has resulted in a broad-based approach to the study of sovereign wealth funds. In order to understand and analyze the policies and institutional arrangements of leading sovereign wealth funds, we have used official documents, economic theory, and statistical analysis, as well as interviews with leading sovereign wealth fund policymakers, advisors, and scholars. This report, together with the accompanying profiles of leading sovereign wealth funds and our quantitative model, offers a comprehensive overview of the management of sovereign wealth, and lays the foundation for deeper analysis of context-specific policies and institutional arrangements on a country-by-country basis.

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Executive summary

► Sovereign wealth funds (SWFs) are playing an increasingly important role in the management of government windfalls and income surpluses from a variety of sources. The rise of SWFs is reflected not only in the increase in the size of assets under their management – now estimated at over \$5 trillion globally – but also in the proliferation of new funds established over the past decade and the anticipated establishment of new funds in countries with recent resource discoveries. This report digs deeper into the roles, practices and governance structures of SWFs. The primary aim of the report is **to identify the leading practices among existing funds and establish an analytical framework for assessing the critical policy and institutional aspects that legislators, policymakers and practitioners need to consider in establishing a new SWF or reforming an existing one.**

Institutional and policy choices for managing sovereign wealth

Chapter one introduces a working definition of SWFs and discusses their place in the universe of sovereign investors. We discuss the major sources of sovereign wealth, the primary and ancillary functions performed by SWFs, and lay the foundation for the rest of the report by identifying the four critical elements of SWF design and implementation: **savings rules, spending rules, investment policies and governance structures.**

Accumulating, stabilising and spending sovereign wealth

The next section of the report investigates the economics of SWFs – specifically the challenge of striking an appropriate balance in the stabilisation, spending and saving of sovereign wealth and the revenue that is derived

from it. Chapter two considers the extent of accumulated savings that resource-rich countries can generate by adopting simple rules which transfer a portion of the revenues that arise from temporary periods of elevated commodity prices or sharp increases in resource production (windfall revenues). The two overarching messages of the chapter are: (i) resource-rich countries are generally better off accumulating a critical level of assets with which to capitalise their SWFs before setting up such funds, and (ii) generating these savings are much easier to do – economically as well as politically – in periods of booming revenues.

In Chapter three, we consider a similar question for countries whose sovereign wealth arises not from natural resources, but from the accumulation of an excess of foreign exchange reserves. Countries that have accumulated such excess reserves have increasingly moved a portion of those assets into more long-term investment portfolios, with a higher risk tolerance and investment horizon. This chapter identifies a striking similarity in the operational and institutional structures for managing resource and revenue-based forms of sovereign wealth: the stabilisation funds established by resource-rich countries have similar functions and investment objectives and practices as traditional central bank reserves, while the SWFs established from excess reserves are, in many respects, similar to the savings funds resource-rich countries. For a number of emerging market economies, the rapid, and now massive, accumulation of foreign exchange reserves has resulted in a deeper analysis of the related concepts of ‘reserves adequacy’ and ‘excess reserves’, both of which are critical to the decision-making process around when to establish a SWF and how much capital to transfer to it. Rule-of-thumb measures of reserves adequacy relate the minimum level of reserves a country should hold to; indicators of the cost of

imports, the repayment of short-term debt and the size of the domestic financial system. More recent and complex models of reserves adequacy and the optimal level of reserves remain a work in progress and difficult to apply across countries – however, policymakers can use the ideas behind these models in assessing whether they hold excess reserves that can be used to set up an SWF.

Beyond the initial accumulation of assets with which to capitalise a SWF, long-term policy choices around the balance between the stabilisation, spending and saving of sovereign wealth need to be made in an integrated way, rather than in isolation from each other. These policy choices and the trade-offs they imply are more complicated in resource-rich countries, which typically face the challenges of revenue volatility and long-term declines in their underlying wealth. Chapter four (along with more detailed information in the Technical Appendix) presents a model that enables a country-by-country simulation of the impact of different stabilisation, spending and savings policies. We apply the model to four contrasting country scenarios: Saudi Arabia, Nigeria, Azerbaijan and Ghana in order to demonstrate how it can be used in different contexts. The chapter concludes by drawing out a number of generalised implications from the four country scenarios.

Governing sovereign wealth

We then move to consider SWFs. Chapter five considers issues of implementation and governance, particularly the rules, institutional structures and internal structures. We examine the extent to which SWFs spending and savings policies are implemented through an adherence to rules – and, to the extent that such rules exist, how they are governed. The chapter, therefore, considers not just the rules required, but who determines them and who has the

authority to review and potentially change them. We find that a number of funds have clear spending and savings rules, and that a broad range of public institutions are involved in the governance of those rules.

Chapter six examines options and models within the broad public sector to position the management or operational authority with responsibility for the fund – for example, the central bank, the ministry of finance or an independent authority – given the wide variety of models observed in practice, it is important to understand the origins, advantages and disadvantages of each option. We take the need for clarity around roles and responsibilities as a given, and show how certain models promote clarity while others potentially reduce it. For a number of reasons outlined in the chapter, a clear separation of the management entity from the owner and policymaker may be desirable, although credible (and sometimes cost-effective) ‘second-best solutions’ do exist.

Finally, Chapter seven looks at various practical aspects of internal governance structures including: the composition of a fund’s highest governing body, the appointment process to that governing body and internal procedures around the investment process. Although a mix of approaches is again evident among SWFs in this area, generalised lessons on desirable practices that reinforce widely accepted principles of good governance include: (i) promoting diversity in the composition of the board, (ii) establishing minimum competency requirements for board members, (iii) limiting owner and operational representation on the board, (iv) promoting arms-length appointment processes, and (v) clearly defining the role of the investment committee. Chapter eight summarises the findings and recommendations of this report in greater detail than is possible here.

Experts consulted

During this research project, the authors consulted a number of senior executives from a range of sovereign investment funds, as well as academic experts, government officials and policy advisors. The authors are particularly grateful for the support and contributions of the following experts:

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List of abbreviations

ADIA	Abu Dhabi Investment Authority	KIA	Kuwait Investment Authority
ADNOC	Abu Dhabi National Oil Company	KIC	Korea Investment Corporation
BoK	Bank of Korea	LTGP	Long-term growth portfolio
CBC	Central Bank of Chile	MAS	Monetary Authority of Singapore
CIC	China Investment Corporation	MoF	Ministry of Finance
CID	Center for International Development	NBIM	Norges Bank Investment Management
CPI	Consumer Price Index	NDRC	National Development Reform Commission
EFAC	Exchange Fund Advisory Committee	NZSF	New Zealand Superannuation Agency
ESSF	Economic and Social Stabilisation Fund	PNG	Papua New Guinea
FGF	Future Generations Fund	PRF	Pension Reserve Fund
GAPP	Generally Agreed Practices and Principles	QIA	Qatar Investment Authority
GIC	Government Investment Corporation	SAFE	Chinese State Administration of Foreign Exchange
GLC	Government-Linked Company	SAMA	Saudi Arabian Monetary Agency
GPFG	Government Pension Fund Global	SAR	Special Administrative Region
GRF	General Reserve Fund	SDF	Sovereign Development Fund
HKMA	Hong Kong Monetary Authority	SNB	Swiss National Bank
IFI	International Financial Institutions	SOFAZ	State Oil Fund of Azerbaijan
IMF	International Monetary Forum	SWF	Sovereign wealth fund
IWG	International Working Group	UAE	United Arab Emirates

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A black and white night photograph of a city skyline. In the foreground, a multi-lane highway interchange curves through the city, with light trails from cars. In the middle ground, a large suspension bridge with two towers spans across a body of water. The city is filled with numerous lit-up buildings, including several tall skyscrapers. In the background, dark hills are visible with some lights on top. The overall scene is illuminated by city lights, creating a high-contrast, dramatic atmosphere.

Introduction: **Managing sovereign wealth**

Chapter 1:

Sovereign wealth fund functions, policies and governance

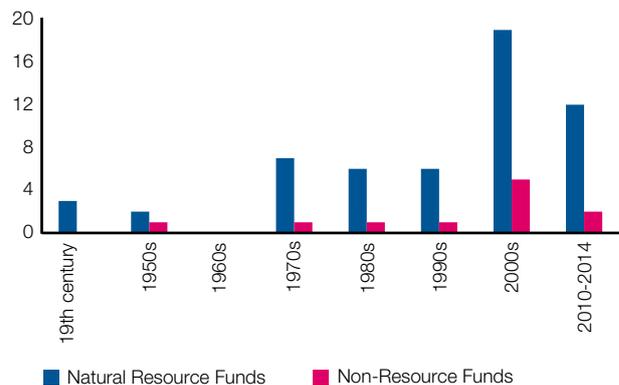
► Key messages

- Sovereign wealth funds are a subset of the broader category of sovereign investors. The former includes stabilisation and savings (or investment income) funds, although sovereign development funds are rising in importance and can increasingly be regarded as part of the SWF universe, rather than an extension to it.
- Sovereign wealth funds perform a large and varied range of functions. Stabilisation and savings can be regarded as the most prominent functions; while domestic economic development, the avoidance of Dutch disease and the establishment of an alternative revenue source are ancillary functions.
- The specification of a sovereign wealth funds' functions and objectives are determined by a range of economic and political factors, including the source and nature of its underlying assets, the country's level of economic development, the diversity of public revenue sources, and the nature of the country's long-term public liabilities.
- The four most important policy decisions in setting up an SWF are:
 - the savings rule: how are assets transferred to the fund?
 - the spending rule: how are assets transferred from the fund?
 - the investment strategy: how should assets be invested?
 - governance and implementation: roles and responsibilities – who does what?

Chapter overview

Over recent years there has been an increasing interest in the role SWFs play in the management of government windfalls and surpluses. The rise of SWFs as a global investor class is reflected, not only in the increase in the size of assets under their management – now estimated at over \$5 trillion globally, but also in the proliferation of new funds, as shown in Figure 1.1.¹ The growth in the number of new SWFs is unlikely to end soon, as a large number of governments are currently assessing the merits of such institutions to manage anticipated revenue windfalls.²

Figure 1.1: Number of new SWFs by decade



Sources: Revenue Watch Institute, SWF Institute and fund documentation

¹ The origins of the Kuwait Investment Authority (KIA) trace back to 1953, when its predecessors were established to stabilise and invest oil revenues. The permanent funds established in the American states of Texas, Arizona, New Mexico and Idaho in the late-19th century to invest the proceeds of land sales and generate revenues to finance public spending (notably on education), are examples of public investment institutions that have followed a similar model to that of many modern SWFs.

² The list of countries in this position includes Israel, Colombia, Peru, Niger, Uganda, Kenya, Tanzania, Namibia and Zambia; while a number of sub-national jurisdictions, such as Saskatchewan and the Northwest Territories in Canada, and the American states of West Virginia and Pennsylvania, have announced similar steps.

Sovereign wealth funds are a highly diverse group, reflected in the wide range of economic contexts in which they operate: from some of the world's richest (Norway, Canada and the United States) and poorest (East Timor, Nigeria, São Tomé and Príncipe and Papua New Guinea) countries. This calls for clarity around definitions, functions and policies. This chapter starts by providing a working definition of SWFs, which places them within the broader universe of sovereign investors, a community that also includes central banks, public pension and pension reserve funds, and national development banks. We then summarise the main functions performed by SWFs, as well as the factors that affect how these functions are determined, including the:

- source and volatility of the underlying wealth that feeds the fund
- expected size and profile of that funding
- country's level of development, liabilities and demographic profile
- degree of diversification in revenue sources.

Finally, the chapter lays the foundation for the rest of the report by identifying the most important policy dimensions around SWFs, namely: the savings and spending rules, the investment mandate and policy, and the governance structures.

1.1 Sovereign wealth funds and the broader sovereign investor universe

A universal definition of SWFs remains elusive in both academic literature and policy discussions. The broadest definitions describe SWFs as 'special purpose investment funds or arrangements, owned by the general government' or entities 'owned or controlled by the government [that] hold, manage, or administer assets primarily for medium- to long-term macroeconomic and financial objectives' (IWG, 2008 and IMF, 2008). These definitions are, by the admission of the authors, very broad and are best employed in general discussions around sovereign investors. More focused discussions require granular and precise definitions and a distinction between different kinds of sovereign investors. Table 1.1 categorises various types of sovereign investors and situates SWFs within the following sovereign investor landscape:

- **Sovereign wealth funds:** stabilisation and savings funds, established through the transfer of natural resource revenues, excess foreign exchange reserves or privatisation windfalls.
- **Central banks:** monetary authorities that typically hold national foreign exchange reserves in highly liquid, 'safe haven' fixed income securities; although there has been some marginal diversification into equities or other volatile asset classes (indeed, some 'investment tranches' managed by central banks have become de facto SWFs, as illustrated in Section Two).
- **Public pension reserve funds:** concerns over future public liabilities – particularly in countries with unfavourable demographics – have motivated the establishment of public pension reserve funds, with more global, diversified portfolios and longer investment horizons than that of the underlying pension funds that they help pre-fund.³
- **Development banks, funds and agencies:** there is a large and varied group of sovereign investors whose primary function is to invest in projects and sectors with high expected social and economic returns, particularly in context of private sector financing gaps.

³The Norwegian sovereign wealth fund, the Norwegian Government Pension Fund - Global, may be included in this list; however, the link to the funding of future public pension liabilities has not been formally or legally defined (despite the fund's name).

Table 1.1: A typology of sovereign investors

SOVEREIGN INVESTOR TYPE	MAIN SOURCES OF CAPITAL	MAIN FUNCTIONS	TYPICAL INVESTMENT MODELS	EXAMPLES
Sovereign wealth funds	Resource revenues Excess foreign exchange reserves	Investing national wealth (surpluses and savings), typically through by an independent entity Promoting macroeconomic and fiscal stability	Savings funds: diversified portfolios with long-term horizons Stabilisation funds: highly liquid, fixed-income denominated portfolios	Norwegian Government Pension Fund Global, Abu Dhabi Investment Authority, China Investment Corporation, Kuwait Investment Authority
Central banks	Foreign exchange reserves	Held predominantly for exchange-rate management and intervention purposes	Highly liquid, fixed-income denominated portfolios Limited diversification into liquid equities, equity indexes and alternatives	National central banks Some equity exposure: Swiss National Bank, People's Bank of China, Hong Kong Monetary Authority, Saudi Arabian Monetary Agency
Public pension reserve funds	Earmarked fiscal provisions and/or surplus contributions	Dedicated asset pools without short-term liabilities, promoting long-term solvency of national pension and social security systems (anticipation of rising entitlements)	Diversified portfolios with long-term horizons and ability to hold illiquid assets	Swedish AP Funds, Australia Future Fund, National Pension Fund Korea, Government Pension Investment Fund of Japan, Canadian Public Pension Investment Board
Sovereign development funds, banks and agencies	Government transfers, debt- and equity-financing using own balance sheet	Investing in projects and sectors with high expected social and economic returns, particularly in context of financing gaps (commercial versus developmental orientation differs)	Large variation in assets and portfolios, with assets that may include debt, public and private equity, infrastructure and public-private partnerships	National and Regional Development Banks Mubadala (UAE), Temasek (Singapore), Samruk-Kazyna (Kazakhstan), Khazanah (Malaysia), Public Investment Fund (Saudi Arabia)

Once differentiated from other types of sovereign investors, SWFs themselves can be categorised according to a number of interrelated criteria, such as:

01. **Investment styles:** for example, short-term horizons, with highly liquid portfolios versus long-term horizons, with diversified and more illiquid portfolios.
02. **Capital sources:** for example, oil revenues, general or resource-related fiscal surpluses, foreign-exchange reserves, or the proceeds from the sale of other state-owned assets.
03. **Functions:** for example, stabilisation, savings, income-generation, exchange-rate suppression and domestic economic development.

The following section presents an overview of the most important functions performed by SWFs, which is a very useful way of distinguishing between different kinds of funds. Capital sources and investment styles are not irrelevant to these distinctions – indeed, these dimensions are inter-related. However, a categorisation of SWFs based on functions (which are not mutually exclusive), offers the clearest framework for policy analysis and an appropriate mapping between the type of SWF and a country's economic and political context.

1.2 The functions of sovereign wealth funds

Sovereign wealth funds also perform a wide-ranging set of functions, which are not mutually exclusive – in fact most funds, today, perform more than one of the functions outlined in this section. It is important to differentiate between primary and ancillary functions – primary functions are typically articulated in the formal mandates and objectives of the fund, while ancillary functions are more implicit. The ancillary functions are mostly extensions of the over-arching primary functions and can be interpreted as deeper, underlying motivations of the primary functions.

1.2.1. Primary functions

The two most important functions of SWFs relate to their role in:

01. The stabilisation of key macroeconomic variables
02. The long-term investment of accumulated public savings.

While the stabilisation function is most commonly associated with resource-based SWFs, it is also part of the motivation for the establishment of reserves-based funds (as discussed in Chapter three). The savings function cuts across both resource- and reserves-based funds.

Macroeconomic and fiscal stabilisation

The stabilisation function is particularly important in resource-rich countries that are highly dependent on natural resources for economic prosperity and government revenue. Resource-dependent economies face economic uncertainties on a number of fronts: commodity prices are notoriously volatile, while production levels and the value of resource reserves are very hard to predict over the medium- to long-term. Sovereign wealth funds can form a critical part of a government's policy apparatus for combatting macroeconomic volatility (reducing the volatility of GDP growth, public investment and balance of payments fluctuation), as well as more specific purposes, such as stabilising fiscal revenue and foreign-exchange earnings.

The stabilisation function is, in most cases, performed by dedicated stabilisation funds, which hold safe and liquid assets that can be used at short notice for intervention purposes when unanticipated shocks hit resource-dependent economies. Examples of such short-term stabilisation funds include the Economic and Social Stabilisation Fund in Chile, the Oil Revenues Stabilisation Fund of Mexico, the Algerian Revenue Regulation Fund, and the Stabilisation Fund managed by the Nigerian Sovereign Investment Authority. Long-term savings funds, which have more diversified portfolios that include more illiquid and risky assets, can also contribute to the stabilisation of fiscal revenues if their annual or quarterly investment income is significant compared to other public revenue sources (for example, in Norway, Abu Dhabi, Kuwait and Botswana). Through either a Stabilisation Fund or a permanent Investment Income Fund, SWFs reduce the volatility of fiscal revenues by generating a stable revenue stream that can be countercyclical if the fund's investments and/or spending rules are uncorrelated or even negatively correlated with the underlying resource revenue.

Macroeconomic stabilisation – specifically in the form of self-insurance against debt, banking and balance-of-payments crises – also plays an important role in the accumulation of massive foreign exchange reserve holdings, particularly in a number of Asian countries in the aftermath of the Asian financial crisis of 1997-1998. As discussed in greater detail in Chapter three, foreign reserves held for these purposes have largely remained under the control of central banks, while a portion of 'excess' reserves have been transferred to dedicated SWFs with a more long-term saving function.

Long-term investment of public savings

Sovereign wealth funds, in both resource- and reserves-rich countries, invest accumulated public savings through diversified portfolios with long-term investment horizons and high expected average returns. The dynamics and motivations underlying the public savings that feed SWFs in resource- and reserves-rich countries are, however, rather different.

The factors that encourage the saving of resource revenues include prudence around the depleting nature of the country's source of wealth and income, ethical arguments in favour of the intergenerational distribution of benefits and revenues from natural resources, and practical concerns around the ability to absorb large revenue windfalls in the context of constraints on the absorptive capacity of the domestic economy. By transforming a depleting asset base (natural resources) into a permanent one (an endowment of financial assets), a country can ensure that levels of public spending observed during the period of resource extraction can be sustained (or even increased), once that resource extraction has ended. Several commodity-based SWFs, including those in Norway, Kuwait, Chile, Botswana, Alberta and Alaska, have the stated objective of preserving part of today's resource revenue windfalls for future generations. Finally, concerns over the ability to prudently and productively spend and invest potentially massive resource windfalls (even when stabilised) has been part of the motivation behind the establishment of long-term savings funds in countries such as Abu Dhabi, Kuwait, Qatar, Botswana and East Timor, as well as developed and industrialised economies, such as Norway.

The savings function of SWFs is not, however, limited to resource-rich countries. In particular, after the Asian financial crisis of 1997-1998, a number of countries have accumulated massive holdings of foreign exchange reserves, as a result of a combination of undervalued exchange rates (achieved through exchange rate intervention), sustained current-account surpluses and an excess of domestic savings over investment.⁴ These assets were initially held almost exclusively in 'safe haven' assets, until roughly a decade of rapid reserve accumulation resulted in increased awareness of the opportunity costs of holding low-yielding assets. This opportunity cost, coupled with the need to provide for anticipated future liabilities associated with demographic shifts, prompted the transfer of a share of these assets into more diversified portfolios, with longer investment horizons and great risk tolerance, in pursuit of higher returns.

⁴Academic scholars have attributed these complex dynamics to both 'mercantilist' and 'self-insurance' motivations. The former relates to the desire to maintain a favourable exchange rate in order to stimulate export growth and suppress the demand for imports; while the latter arises from the need to hold foreign assets in order to handle and prevent balance-of-payments, foreign-debt and currencies crises (Aizenman and Lee, 2005).

The management of these longer term and more risk-orientated portfolios – whether financed by resource revenues or excess foreign exchange reserves – required different governance arrangements, operational structures and investment expertise, so a number of countries created new, stand-alone institutions in the form of SWFs. This often involved transferring assets away from their traditional locations in the treasury (in the case of resource revenues) and central banks (in the case of foreign exchange reserves).

1.2.2. Ancillary functions

A number of the more ancillary (implicit) functions of SWFs underlie the primary functions – for example, the primary function of saving a share of resource revenues, could be motivated by an ancillary function, such as generating an alternative source of government revenue, transforming a depleting asset into a permanent one, or pre-funding an anticipated rise in public liabilities. Other ancillary functions are independent of the primary functions outlined above, notably the increasingly popular role SWFs are playing in the development of the domestic economy.

Domestic development: infrastructure and economic diversification

Particularly among resource-dependent developing countries, there is a growing tendency to give SWFs a mandate for investing at least part of their capital in domestic assets – to such an extent that some have referred to them as sovereign development funds (Santiso, 2009, and IMF, 2013). These investments have often been concentrated on physical infrastructure, based on the following motivations:

- A shortfall in well-functioning physical infrastructure
- Evidence of a financing gap in the supply and demand for infrastructure-related capital
- A belief that infrastructure investments can generate high financial returns in the context of capital-scarcity over a sufficiently long investment horizon
- The realisation that functional infrastructure is a prerequisite for economic growth and development, and is thus subject to high social returns.

Another area of focus for SWFs is direct investment in industries and sectors that policymakers believe will promote economic diversification.⁵ Among resource-rich countries, it is common for SWFs, with domestic investment mandates, to invest in downstream industries related to the primary resource, such as refining, liquefaction and petrochemical engineering, in order to capture a greater national share of the resources value chain. Sovereign wealth funds, in both resource- and reserves-rich countries, have also been given mandates to invest in completely unrelated (and uncorrelated) sectors, such as tourism, entertainment and particularly financial services. These investments can be predicated on the belief that these sectors and industries are either labour (creating employment opportunities) or skills intensive (generating productivity and income gains).

This mechanism for domestic investment is known as a Sovereign Development Fund (SDF). Examples of SDFs which combine domestic infrastructure development, investment in public goods and diversification functions include Bahrain's Mumtalakat Holdings, Abu Dhabi's Mubadala, Saudi Arabia's Public Investment Fund and France's Fonds Stratégique d'Investissement. Singapore's Temasek Holdings can also be seen as an SDF, although it has graduated towards a more long-term wealth management approach that increasingly favours commercial objectives over developmental ones. Sovereign development funds differ in their ranking of commercial and developmental objectives: some are expected (at least in principle) to apply strict commercial criteria to domestic investments, based on their expected risk-return characteristics; while others explicitly take non-commercial objectives into account and are willing to forgo financial returns in order to pursue these additional objectives (for a detailed discussion from the recent literature, see Gelb et al., 2014).

⁵As noted below, many SWFs, in resource-rich countries, contribute in an indirect way to diversification by preventing or combatting Dutch disease and an appreciation of the real exchange rate, which undermines the competitiveness of their tradable goods sector.

Preventing Dutch disease and maintaining export competitiveness

As noted above, an increasing number of SWFs and SDFs have been given an explicit mandate to promote diversification through direct investments in the local economy. However, SWFs in both resource- and reserves-rich countries have been more indirectly linked with efforts to maintain export competitiveness through the exchange-rate channel. The theory of Dutch disease, whereby a commodity-export boom results in an appreciation of the real exchange rate, a consequent loss of export competitiveness and a decline in the tradable manufacturing sector, remains one of the most compelling explanations for the resource curse (Van Wijnbergen, 1981 and Corden and Neary, 1982). By investing (part of) the proceeds from the extraction of natural resources in foreign assets, SWFs help avoid an appreciation of the real exchange rate during boom periods in the commodity-price or –production cycle.

The effects of Dutch disease are particularly acute in countries with limited absorptive capacity, due to inflexible and unskilled labour markets (which puts pressure on real wages, infrastructure bottlenecks and a lack of trade openness that, in turn, prevent markets from clearing). A number of countries – including Norway, Botswana, Chile and Israel – have made explicit reference to the role of their SWFs in avoiding Dutch disease. Further, as noted earlier, the rapid accumulation of foreign exchange reserves in a number of Asian countries since the late 1990s, has been linked to active exchange rate interventions that have kept exchange rates competitive, enabling export-led growth and the suppression of import demand – in that sense, Asia’s SWFs may be more a result of exchange-rate policies, rather than a policy instrument in aid of it.

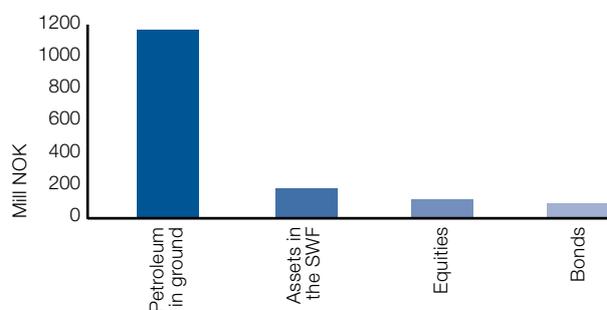
Revenue diversification and wealth transformation

Both primary functions of resource-based SWFs – stabilisation and savings – can be understood as part of a process of transforming one source of wealth and revenue (natural resources) into another (financial assets). Basic principles from portfolio theory demonstrate the value and importance of diversifying wealth and income sources. Applied at the national level, this provides one of the rationales for the establishment of an SWF, which is an institutional mechanism through which (at least part of) natural wealth is transformed into financial wealth. Knut Kjaer, the former head of the Norwegian SWF, clearly articulated this logic in a speech in 2006 (see also Figure 1.2).

“Oil price volatility has historically been far larger than the variations in the return on equities and fixed-income instruments.”

Knut Kjaer
Former Chief Executive of Norges Bank
Investment Management (Norway’s SWF)

Figure 1.2: Stabilisation – value-at-risk of Norway’s financial versus oil assets

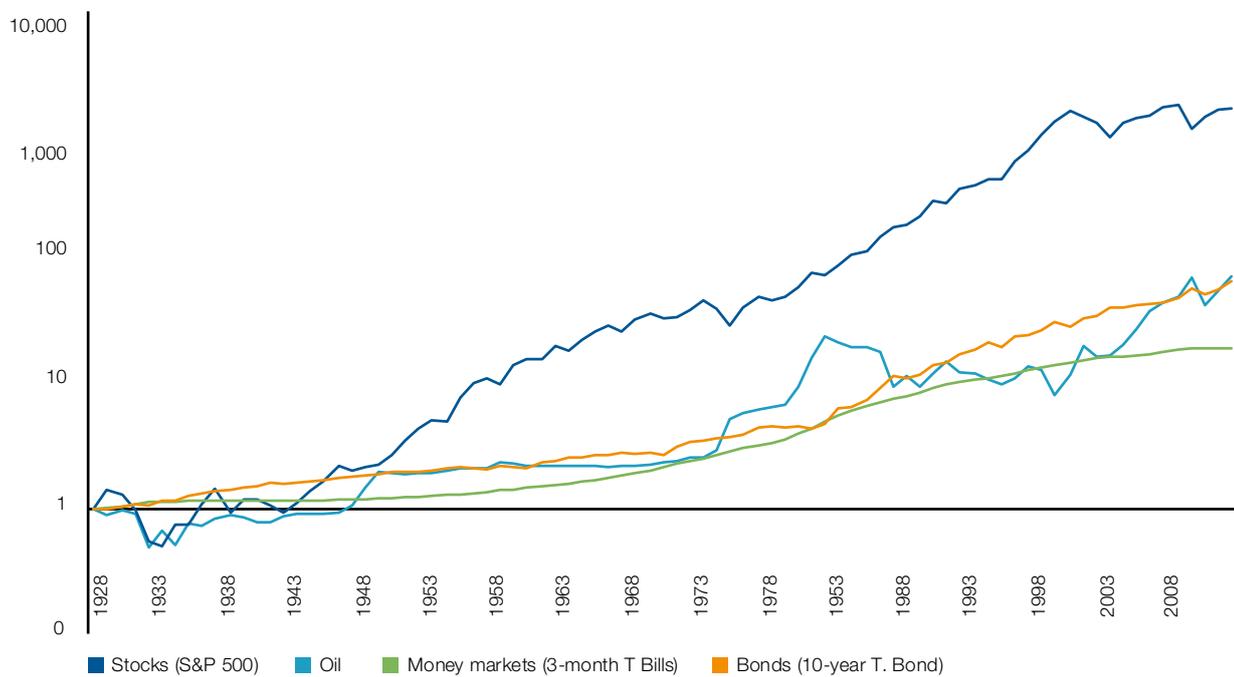


Note: the chart shows VaR calculation as of 2006.
Source: Kjaer (2006)

Resources-rich countries, in particular, use their SWFs to provide a supplementary – and, ideally, uncorrelated – source of public income to finance capital and recurrent expenditures. The desire to transform the income source from commodities to financial assets comes from the diversification principle, the

volatility of resource prices (and revenues), the finite nature of resource wealth, and a belief that financial assets may have a higher risk-adjusted return than natural assets (the historical outperformance of financial assets over oil is shown in Figure 1.3). All four of these reasons played a part in the establishment of Norway's SWF.

Figure 1.3: Wealth transformation – growth in the value of \$1 of financial assets and oil, 1928-2005



Source: Bloomberg and US Energy Information Agency (2006)

Combatting waste, corruption and poor public investments

Political economy dynamics play a prominent role in the establishment of SWFs, particularly in resource-rich economies. There is a wealth of evidence showing that the quality of public investment deteriorates during periods of (often unexpected) sharp increases in public revenue, spending and investment, particularly in resource-rich countries. By establishing a clear, rule-based framework for the management of resource revenues, SWFs can reduce the rent-seeking associated with the revenue windfalls (Robinson et al., 2006). Beyond these political dimensions, there is strong evidence that public investment is subject to significant declining marginal returns, in the short term, particularly in the context of both economic and institutional capacity constraints. Finally, long-term public investments may be left incomplete and their recurrent costs unfinanced, if the revenue and export boom is reversed due to a decline in commodity prices, global demand or domestic production (this applies to both resource- and reserves-rich countries).

While SWFs are no panacea to deep-rooted political and institutional problems, they can lengthen the horizon over which revenue windfalls are spent and invested in the domestic economy, thereby potentially improving the political incentives and reducing the declining returns on public investment in the short term. That is, SWFs are an institutional 'commitment technology' allowing revenues from a resource boom to be spent and invested more gradually, as absorptive capacity constraints are lifted over time.

1.3 What determines sovereign wealth fund functions?

The functions of SWFs are not mutually exclusive. Norway's SWF, for example, performs a number of inter-related functions: it contributes to the stability of Norway's fiscal revenues, supports inter-generational transfers of finite oil revenues and the sustainability of resource-financed public spending, helps counteract Dutch disease, and reduces the scope for the politicisation around the spending of oil revenues. The interaction of a number of factors – economic, social, historical, institutional and political – determine how SWF functions are articulated. Setting politics aside for the time being, the following economic determinants of SWF functions, and their investment and governance models, are worth highlighting:

- **Funding source:** Does the fund invest surpluses arising from volatile, uncertain and potentially declining natural resources; or from deliberate policy interventions such as exchange rate intervention, privatisation or specifically earmarked provision to pre-fund future pension liabilities?
- **Expected size and profile of funding:** In addition to the source of funding, the anticipated size and time horizon of surplus revenues are important – resource revenues tend to rise steadily for a number of decades following the commencement of production, before gradually declining – these expectations affect savings, spending and stabilisation objectives.
- **Liabilities and demographics:** Whether the SWF has explicit or implicit liabilities has a significant bearing on how its functions (and investment strategies) are defined. Countries with ageing populations may recognise the need to have provision for significant shifts in the national asset-liability calculus. A resource-rich country, confronted with the dual prospect of ageing demographics and a steady long-term decline in resource revenues, may need to raise the share of near-term resource revenues it saves and invests, in order to maintain required levels of public spending (or ensure that other revenue sources are developed in order to replace resource revenue).

-
- **Diversity of revenue sources:** the degree of economic and fiscal dependence on a particular sector has significant implications for the function of an SWF. Many SWFs in resource-dependent countries are tasked with contributing directly to diversification through their investments. However, resource dependence also increases the need for a stabilisation fund and, in the long run, for a savings fund in order to transform a depleting asset into a permanent one. In contrast, the existence of a number of alternative fiscal revenue sources, such as taxes on personal income, consumption, value-added production and corporate profits, give governments a range of policy options in addressing macroeconomic needs and can reduce the need for an SWF.

Chapters two, three and four provide an overview of how these factors affect the articulation of SWF functions and, consequently, the specification of institutional mandates and investment objectives. Section II of the report takes the discussion further by considering issues around implementation and governance arrangements, once SWF functions, mandates and objectives have been specified.

1.4 Key considerations for policy decisions and implementation

The preceding discussion underlined the fact that SWFs perform a myriad of functions, which are determined by a variety of factors, notably the economic context and needs of the country. The successful pursuit of these functions requires a sound policy and governance framework. The following elements form the critical building blocks of such a framework:

1.4.1. The savings rule: how are assets to be transferred into the fund?

All SWFs, whether resource- or reserves-based, need a mechanism through which to accumulate and receive assets. These mechanisms can be informal and discretionary, but for the sake of public accountability and predictability are often rule-based and transparent. For SWFs in resources-rich countries, a certain percentage of the resource revenue windfall is typically carved out of the general budget and transferred to the SWF. This transfer can be formulated in various ways:

- As a fixed percentage
- As a deviation from the past moving average of resource revenues
- As a windfall revenue that arises when the resource price exceeds a certain 'hurdle price' (for example, \$75 per barrel for oil)
- As ad hoc, discretionary transfers during boom times. If the country has a number of different SWFs with stabilisation, savings or development functions, further rules are required to allocate revenue between these funds.

For reserves-based SWFs, the policy question becomes how much of the 'excess' reserves should be moved out of the liquid, low-yielding central bank portfolio into a SWF with a longer investment horizon and greater tolerance for risk factors, such as volatility and illiquidity. For these countries, some form of sovereign asset-liability matching can provide a useful framework, as well as standard measures of reserve adequacy.

1.4.2. The spending rule: how are assets to be transferred from the fund?

The use of SWFs' resources pertains to capital (or principal) and investment income. Following the permanent fund approach, some SWFs, such as those in Norway and several American states, spend only the real returns generated by the fund, while its capital is preserved in real terms into perpetuity. An alternative is to reinvest rather than spend the fund's investment income in order to achieve a more aggressive build-up of assets managed by the SWF (perhaps before switching to a permanent fund approach, once the fund has reached a target level of assets under management). Both the SWFs capital and its investment income can be linked, implicitly or explicitly, to specific public spending needs on, for example, infrastructure, education and healthcare or a citizens' dividend.

1.4.3. The investment strategy: how should assets be invested?

The final major policy decision around an SWF is how to structure its investment strategy in way that reflects its functions and the capacity and expertise in relevant institutions. The functions and (implied, contingent or explicit) liabilities of the SWF will determine all the key ingredients that result in its strategic asset allocation: its exposure to different asset classes or risk factors, its investment horizon, target returns and risk limits.

The investment strategy also reflects an assessment of realities around investment capacity, operational and implementation issues that determine, for example, the balance between active and passive, and internal versus external, management – as well as the willingness to make tactical departures from the strategic asset allocation. For either public disclosure purposes, or for the clarity of the internal decision-making process, the SWFs investment policies and strategies should ideally be consolidated in a 'Statement of Investment Beliefs and Policies'. This type of document sets out the fund's investment objectives, risk-bearing capacity, and beliefs around which risk premia and factor exposures can, and should, be captured, given the SWFs particular characteristics. In general, savings and investment income funds should be able to use their long investment horizons and tolerance to various risk factors, in order to earn factor-risk premia and generate higher average returns.

1.4.4. Governance and implementation: roles and responsibilities – who does what?

The term 'governance' can mean many things depending on the context in which it is used. Simply put, the governance of SWFs refers to the procedures that determine 'who does what' in relation to the policies discussed above, as well as the oversight and accountability of the funds. The successful implementation of SWFs' policies requires coordination between various arms and institutions of government, including ministries (for finance, natural resources and economic planning), the central bank, independent investment authorities, parliament, and public auditors. Five key elements of SWF governance and implementation are:

- **Savings and spending rules and decisions:** the flow of funds in and out of SWFs can be discretionary or rule based. From a governance and implementation perspective, the key questions are: who decides these transfers under a discretionary arrangement? Under a rule-based system; who has the authority to set and potentially change the rules?
- **Position in the public sector:** who is responsible for the day-to-day operations and policy implementation of the SWF? Common arrangements are for the operational aspects of the fund to sit in the central bank, the ministry of finance or in a dedicated investment authority (generally depending on the operational complexity of the investment process).
- **Internal governance structures:** the SWFs internal governance structures – the rules and procedures that determine the roles and duties of different groups within the organisation – are also critically important to the successful implementation of policy. Successful implementation requires clarity around the powers and responsibilities of the board versus the executive, the role and composition of the investment committee, the integrated operation of the front-, middle- and back-office functions, and reporting lines with the organisation.
- **Extent of disclosure:** a key part of the governance process relates to the extent of disclosure to various stakeholders, including political masters, legislators, regulatory and supervisory authorities, citizens and general public and recipient governments. Disclosure involves not only (or even necessarily) details of the fund's investments, but also its objectives, savings and spending rules, decision-making process and investment beliefs and strategy.

– **Investment objectives, policies and strategies:**

responsibilities for the various elements of the investment process – from the articulation of investment objectives based on the funds’ function, to mapping of those objectives into policies and implementation strategies – can be allocated in a number of ways, depending on the political and institutional context of different countries, and the degree of autonomy from government that the SWF enjoys. It is common for the government or legislators to set the general objectives and goals (setting the goal posts), while the fund’s senior management is responsible for devising the strategy for achieving these (the game plan) and for the board to oversee the executive’s conduct (refereeing the game).

Conclusion

This chapter has provided a typology of the different kinds of sovereign investors and SWFs, with specific emphasis on the variety of functions they perform and how these are determined. The chapter also considered how the articulation of SWFs’ functions influences their policies, governance and implementation strategies. It is clear that there is significant scope for tailoring the key factors of SWFs, outlined in this chapter, to local requirements, based on the economic and political realities of the countries in question. There is no ‘one size fits all’ model for SWFs.

Recommendations

There is no ‘one-size-fits-all’ solution to the policies and institutional design of SWFs. Countries need to consider a range of country- and context-specific factors that determine the functions and objectives of their SWFs.

Having established and articulated clear functions and objectives, the four major areas of decision-making are:

- **Establishing savings rules/procedures:** how money flows into the SWF
- **Establishing spending rules/procedures:** how money flows out of the SWF
- **Creating investment objectives and policies** that ensure the SWF performs its function
- **Setting up governance and implementation strategies** that create sound oversight and distribution of roles and responsibilities between different public institutions.

Section I: **Accumulating, stabilising and spending sovereign wealth**



Chapter 2:

Banking the boom: accumulating wealth through resource revenue windfalls

► Key messages

- Resources-rich countries can take advantage of periods of massive revenue windfalls – that arise either through sharp increases in resource prices or production volumes following the discovery of new resources – to accumulate significant financial assets and savings for future use.
- It is useful to consider a set of simple accumulation rules that help countries set aside a share of resource revenues with which to capitalise their SWFs and establish a policy framework that balances future stabilisation, spending and savings needs.
- There is a wide variety of savings or accumulation rules that countries can look to emulate, ranging from those based on price or revenue movements around a target or moving average, to ones based on fixed percentage transfers.
- Countries should avoid static and mechanistic rules in favour of dynamic and cyclically adjusted rules – and, eventually, look to integrate the savings process with spending and stabilisation policies for the management of natural resource revenues.

Chapter overview

One of the most important determinants of the long-term growth of SWFs is its **savings rule** or **accumulation process**. This chapter focuses on this accumulation process in which a government seeks to build up a principal for a sovereign investment vehicle in anticipation of using its assets and income for a variety of economic purposes. This chapter and the next also consider the mechanisms through which a portion of resource revenues or foreign exchange reserves are accumulated and transferred to a separate fund, portfolio or institution, rather than used for current government spending or held in low-yielding, liquid assets for other short-term policy objectives. This chapter considers a number of simple rule-based mechanisms for such transfers in **resource-rich countries**, while Chapter three will consider the same question from the perspective of **reserves-rich countries**.

We begin by outlining the logic and implementation of very simple rules for transforming resource revenue into financial wealth through a saving or accumulation rule. We consider rules based on fixed percentage transfers of resource revenues to an SWF, as well as when the transfer of a percentage of revenues is determined more indirectly, via deviations in oil price from a specified reference price. Then, we apply two of the four rules (listed on page 18) to three contrasting oil-rich countries – Saudi Arabia, Nigeria and Azerbaijan – retrospectively, using data on oil revenues for 2000 to 2013. This gives a sense of the extent of financial assets that these countries could have accumulated during this period of generally rising resource prices and revenues, and the trade-off in terms of foregone spending associated with outcomes based on such rules.

Using contrasting country applications

In this chapter and in chapter 4, we illustrate a number of our arguments through applications to specific countries using the best available data. In order to demonstrate how the rules and policies we outline would operate in a number of different contexts, we use a number of contrasting country examples. This chapter applies a number of basic savings rules to Saudi Arabia, Azerbaijan and Nigeria; while we add Ghana to the analysis in chapter 4, as an example of country in anticipation of new resource revenues.

- **Saudi Arabia:** significant previous savings with a stable resource production outlook, but with a rapid and sustained increase in government spending.
- **Azerbaijan:** some previous savings, but a gradually declining revenue production profile, and anticipated increases in government spending.
- **Nigeria:** limited previous savings, with a delayed decline in resource revenue and no immediate demographically driven spending pressure (providing some room to correct the current unsustainable path).
- **Ghana:** a new oil producer with a sharp, but relatively short, rise in resource production, whose current lack of dependence on oil gives it room to implement prudent savings and stabilisation policies.

These four countries have wide-ranging economic fundamentals, historic and expected future resource production profiles, and are at different stages of their economic development. They are therefore chosen not for their similarities and direct comparability, but rather because they illustrate how policies and rules operate in contrasting contexts.

The analysis confirms that if these countries followed relatively modest saving policies between 2000 and 2013, the accumulation of assets would have been significant. The findings of this chapter are revealing in their own right, but also have important implications for the analysis in Chapter four, where we introduce an integrated model that simultaneously takes stabilisation, spending and savings objectives into account.⁶ Given that the rules discussed in this chapter are focused exclusively on the savings process, they are best understood as being relevant to a temporary period in which a country seeks to accumulate a critical level of capital, before implementing the more integrated model discussed in Chapter four.

2.1 Accumulation rules for resource-rich countries: a conceptual overview

Accumulation rules for resource-rich countries can be anchored to a number of macroeconomic variables: the consolidated or non-resource fiscal balance, an underlying commodity price, or as a rule-based or discretionary percentage of resource revenues. Basing the accumulation rule directly on revenues has the advantage that it incorporates a range of critical factors related to the resource economy, as total resource revenue is a function of the resource price, production levels, and the taxes, duties and levies imposed on resource extraction (and the efficiency with which they are collected).⁷ On the other hand, an accumulation rule that is anchored to commodity prices, bases the savings process on factors that are exogenous to government policies, as governments typically have no influence on market-determined resource prices. The decision to anchor the accumulation rule or mechanism to either revenues or prices is at the discretion of policymakers, and reflects their preference for exposing the savings process to factors that are endogenous, such as production levels and tax rates, and exogenous such as price movements, to government actions.

As noted above, the rules discussed in this chapter work best as a means to accumulate financial assets in an SWF.

With the exception of the rule based on the financing of the non-resource deficit, none of these rules, in any sense, integrate the savings decision with the spending decision or distinguish between the stabilisation and savings functions of SWFs. Therefore, **these rules require strong political will and consensus**. Once countries have accumulated such a critical level of funds (or if they have already done so previously), a more fully-fledged and integrated framework that links savings, stabilisation and spending policies (see Chapter four) can be adopted. If the emphasis is, however temporarily, only on the accumulation of financial assets, then the following are examples of simple accumulation rules through which this may be achieved (see Table 1 for a summary of key features):

2.1.1. Fixed-percentage transfers

Simple, highly mechanistic rules transfer a fixed percentage – for example, 10% or 20% – of annual resource revenues to an SWF. Unless there is some additional mechanism or ‘escape clause’ for suspending the rule during ‘hard times’, such transfers are not contingent on the state of the commodity prices, revenue cycles, production levels or the economy. While this makes these rules potentially pro-cyclical, as they oblige the government to transfer revenues even in years of unanticipated revenue shortfalls, they have the advantage of being very easy to communicate and difficult to manipulate.

⁶ As we show in those chapters, having a critical level of initial funds greatly reduces the trade-offs involved with implementing savings and stabilisation policies.

⁷ In some countries, notably Nigeria, total oil revenues are also a function of the extent of oil theft and sabotage. In Nigeria, these are not trivial factors – the Extractive Industry Transparency Initiative estimated that Nigeria lost \$10.9 billion in revenue in 2009 to 2011 due to oil theft, a figure that equates to 10% of reported government revenue from oil over the same period.

2.1.2. Deviations from moving averages

More dynamic accumulation rules are based on deviations in resource revenues (or resource prices) from their moving average of preceding periods. For example, if a country generates \$60 billion in oil revenues in a given year, compared to an average of \$50 billion per year over the preceding four years, a rule may specify that \$10 billion should be transferred to an SWF. While this rule has the advantage of hardwiring counter-cyclical properties – transferring more revenues to the SWF when prices and revenues exceed the average level of recent years; and potentially vice versa – transfers can also be volatile in periods of sharp fluctuations in commodity prices and resource production. This volatility may complicate the operations and investment process of the SWF and limit its ability to invest assets in anything but the most liquid, low-yielding assets. The rule also imposes some technical challenges and introduces scope for manipulation. First, policymakers need to decide the period and weightings to use in applying the moving average. Second, the rule can be applied symmetrically, allowing for both in- and outflows from the SWF, depending on whether revenues are above or below the moving average; or asymmetrical, with positive transfers to the SWF when revenues exceed their moving average, but no outflows from the SWF when revenues drop below the average.

2.1.3. Financing of sustainable non-resource fiscal deficits

A number of countries have adopted rules that transfer all resource revenues to the SWF, which then, in turn, transfers back to the budget an annual amount equal to the size of the non-resource fiscal deficit. The advantage of this rule is that, if prudently and sustainably applied, it will ensure that government spending does not become dependent on resource revenues. In order to be sustainable, such rules need to ensure that the financing of the non-resource deficit

through the resource revenues and/or the SWF is not too large. For this reason, the government of Norway links the average size of its non-oil deficit to the income it expects to receive from the SWF, based on its expected average long-run real return of its SWFs (4%) – which ensures that oil revenues are sustainably consumed. A limitation of this rule is that it cannot be fully introduced in countries that are already dependent on resources for fiscal revenues, as the non-resource fiscal deficit will be very large and impossible to finance through the SWFs investment income.

2.1.4. Reference-price based rules

Another set of dynamic and, therefore, potentially counter-cyclical accumulation rules are based on deviations in the underlying commodity price from a specified reference price, established by the government and policymakers, most typically as part of the annual budget process. The government then commits to transferring excess revenues, which arise when the observed commodity price rises above the reference price. For example, if the government sets a reference price of \$75 per barrel for oil in the 2014 budget and the average oil price for the year ends up being \$90 per barrel, 20% of revenues are transferred to the SWF at the end of the year.

Such a rule gives the government and policymakers plenty of leeway to regularly adjust the accumulation rule by adjusting the reference price and to pick a conservative, high-accumulation rule (low reference price) or low-accumulation rule (high reference price). Reference-price based rules can also be symmetrical, permitting in- and outflows based on positive and negative deviations from the reference price respectively; or asymmetrical, only allowing inflows to the fund. One important implication is that the strength of the government's commitment to saving is dependent on whether it sets a high or low reference price. This underlines the critical importance of the process and institutions through which the reference price is determined.

Table 2.1: Key features of simple accumulation rules

TYPE OF RULE	OPERATION	ADVANTAGES	DISADVANTAGES	REAL-WORLD EXAMPLES
Fixed percentage	A fixed percentage of annual resource revenue is transferred to the SWF – for example 10% or 20% of oil revenues	Easy to communicate and monitor (if data for total resource revenues is available, accurate and public)	Rule is mechanistic and does not respond to cyclical state of the economy or commodity prices/revenue – government still has to transfer a portion of revenues in a low-revenue year ⁸	Kuwait Investment Authority Alaskan and Wyoming Permanent Funds
Deviation from moving average	Revenues are transferred to (and potentially from) the SWF when revenues are above (or below) their multi-period moving averages. Policymakers need to decide if rule is symmetrical or asymmetrical ⁹	A more dynamic, counter-cyclical rule than the fixed-percentage transfer rule. Does not require transfers to the SWF in periods of low revenues	Difficult to communicate and monitor, and therefore open to abuse. Can generate volatile transfers to (and from) the SWF, complicating the fund's investment process	Ghana Heritage Fund Mongolia Fiscal Stabilisation Fund
Non-resource deficit financing	The government commits to running a non-resource fiscal deficit that can be sustainably funded by income from the SWF	If prudently applied, combats fiscal dependence on resources and ensures sustainable consumption of resource revenues (incentivises the generation of non-resource revenues)	Requires strong commitment from government to run sufficiently small non-resource fiscal deficit. Cannot be implemented in countries that are already fiscally dependent on resources (but can help prevent a new producer from becoming dependent)	Norwegian Pension Fund Global East Timor Petroleum Fund
Reference-price	Revenue transfers are based on deviations from a pre-determined reference price for the underlying commodity	Can provide strong counter-cyclical force. Also allows government to better plan multi-year public spending programmes, as unanticipated surpluses are saved rather than spent	Rule is constantly open for manipulation in the absence of a binding commitment or institutional arrangement to set prudent (low) reference price. Transfers to the SWF can be very lumpy	Nigerian Sovereign Investment Authority/Excess Crude Account (non-binding) State Oil Fund of Azerbaijan

⁸ Unless a separate 'escape clause' is put in place to suspend transfers to the SWF in low revenue/price periods.

⁹ Rules are symmetrical if outflows from the SWF are permitted when revenues are below average; and asymmetrical when only inflows are permitted.

2.2 Counterfactuals based on simple accumulation rules

In this section, we consider the profile of transfers to a hypothetical SWF that would have materialised if two of the simple accumulation rules were followed. To illustrate the point, we analyse the revenue data of two established oil producers, Nigeria and Saudi Arabia, who experienced an upward trend in revenues between 2000 and 2013 (particularly due to a number of windfall years towards the end of the period); as well as Azerbaijan, whose revenues rose sharply, not only due to the upward trend in oil prices (which also boosted the revenues of the established oil producers), but also due to a rapid increase in oil production over the period.¹⁰

These contrasting country cases show how the basic accumulation rules operate in different contexts with respect to the size and growth of revenues. The countries are chosen, therefore, for their differences, rather than their similarities.

The analysis conducted in this chapter requires data on a number of key inputs and variables, particularly resource revenues and financial market returns. Table 2.2 shows the **annual oil revenues** generated by Saudi Arabia, Nigeria and Azerbaijan over the sample period, as well as the average oil price for each year (the average annual dollar per barrel spot price for West Texas Intermediate, provided by the US Energy Information Administration).

Table 2.2: Oil revenues and average oil price (nominal US\$ billion)

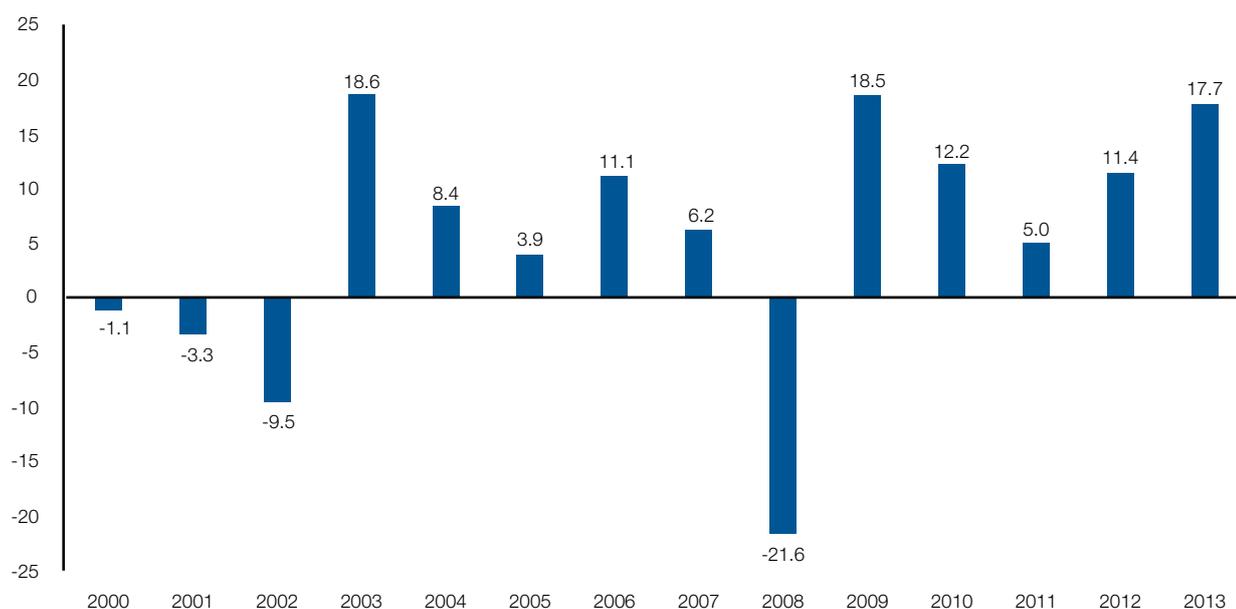
	AZERBAIJAN	NIGERIA	SAUDI ARABIA	OIL PRICE
2000	0.3	16.2	57.2	30.4
2001	0.2	15.6	49.0	26.0
2002	0.7	12.2	44.3	26.2
2003	0.8	16.3	61.6	31.1
2004	0.9	25.2	88.0	41.5
2005	1.3	34.4	134.5	56.6
2006	3.0	40.0	161.2	66.1
2007	5.0	33.9	149.9	72.3
2008	18.8	53.7	262.2	99.7
2009	12.1	18.0	115.8	62.0
2010	18.2	32.1	178.7	79.5
2011	22.1	56.7	275.8	94.9
2012	20.8	48.3	305.3	94.1
2013	20.6	37.0	276.0	98.0

Source: IMF Article IV consultations and national sources

¹⁰ The choice of these countries illustrates the effect of different rules in three distinct contexts and experiences over the sample period: a large oil producer that enjoyed stable production and price-driven increases in revenues (Saudi Arabia); a country that experienced not only price-driven volatility but also production-driven volatility (Nigeria); and a country that enjoys consistent production and consequently revenue increases (Azerbaijan).

In order to proxy the retained investment income that could have been earned on these accumulated assets, we consider two alternatives. First, we use annual returns on a balanced portfolio, as shown in Figure 2.1, which is a plausible benchmark for a risk-tolerant SWF. The balanced portfolio consists of a 60/40 equity-bond split, in which the performance of stocks is assumed to reflect the S&P 500 Index and that of bonds by the Barclays US Aggregate Bond Index. The portfolio is rebalanced quarterly. In order to isolate the impact of investment returns, we also compare this performance to a stylised scenario where the SWF makes a fixed 5% annual nominal return.

Figure 2.1: Annual returns on 60/40 balanced portfolio, 2000-2011



Source: Bloomberg (see Appendix to this chapter for details)

Using this data, we can construct counterfactual scenarios in which government implemented an accumulation rule from the set of simple rules we have illustrated. Given the pro-cyclical nature of the fixed-transfer rule and the more data-intensive nature of rules, based on the non-oil deficit, we consider the following two rules:

- **A moving-average rule** where transfers to the SWF are based on positive deviations in revenue from its four-year moving average.
- **A reference-price rule** where transfers to the SWF are based on positive deviations in the price of oil from a predetermined reference price. A percentage of revenues proportional to the difference between the actual price and pre-specified one, then get transferred to the SWF.

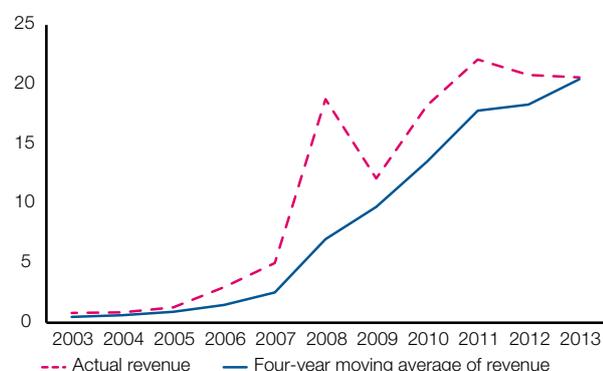
Note that the application of both accumulation rules is asymmetrical – the government transfers money to the SWF when revenues exceed the moving average or the oil price is above the reference price, but it does not transfer money from the SWF back to the government when revenues or prices fall. While this may seem implausible, the government still has alternative policy tools for insuring against downside risk to revenues, such as hedging against a drop in oil prices in the options market.¹¹

2.2.1. Applying the moving-average rule

If the governments of Saudi Arabia, Nigeria and Azerbaijan committed to accumulating foreign assets from windfall oil revenues, starting in the year 2000, then the windfall revenue needs to be calculated. In order to determine what constitutes a windfall, the government calculates the four-year moving average of past revenues, and saves all revenues arising in the current year in excess of that moving average, starting in the year 2003. Figure 2.2 shows the difference between actual revenues and the four-year moving average of revenues for the three countries.

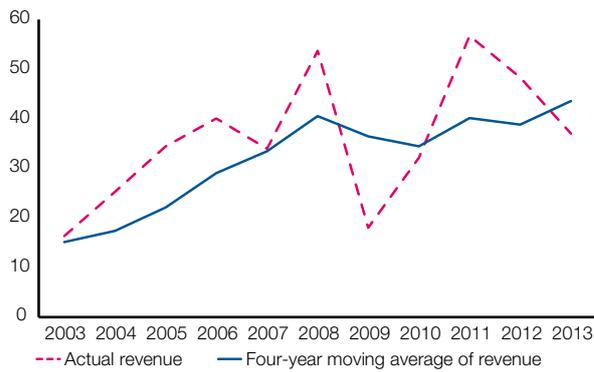
Figure 2.2: Actual versus four-year moving average of annual oil revenues (US\$ billion)

2.2.a. Azerbaijan

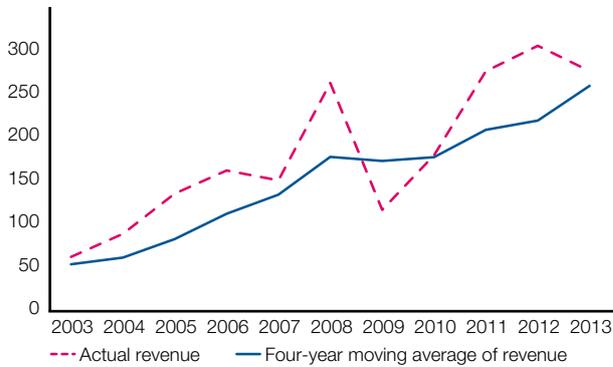


¹¹ For example, the government can lock-in a floor price by buying options to sell oil at \$60 per barrel. Mexico has adopted this approach to managing downside risks to revenue.

2.2.b. Nigeria



2.2.c. Saudi Arabia



We then assume that the government invests the money transferred to the SWF – as (at least during this initial build-up phase) the objective is to accumulate a critical level of financial assets as capital in the SWF. The size of assets would, therefore, grow not only due to transfers, but also through the compounding of investment returns on those assets. The SWF has no short-term liabilities in this initial accumulation phase, and can, therefore, invest in a risk-tolerant manner. In order to proxy the investment performance of this type of portfolio, we use data on 60/40 equity-bond balanced portfolio with quarterly rebalancing (see description above and in the Technical Appendix). We also consider the growth of assets assuming a fixed 5% annual nominal return. Table 2.3 shows a number of key statistics around the counterfactual application of this rule in the three countries, while Figure 2.3 shows the growth in assets from 2003 to 2013 under the two return scenarios.

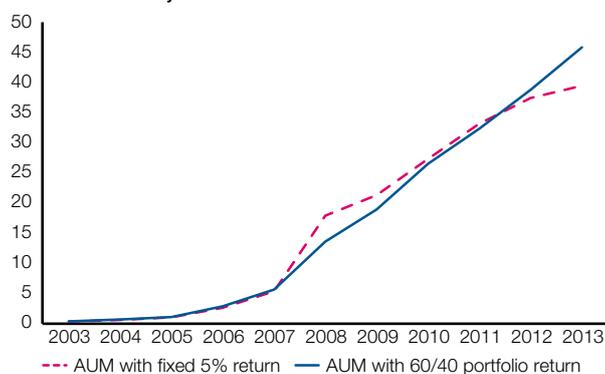
Table 2.3: Key indicators of the moving-average rule, 2003-2013

	AZERBAIJAN	NIGERIA	SAUDI ARABIA
Years yielding positive transfers	11 out of 11	8 out of 11	10 out of 11
Total oil revenues (\$ billion)	123.6	395.6	2009.2
Total transfers to sovereign wealth fund (\$ billion)	30.7	72.3	413.0
Fund assets in 2013 with fixed 5% return (\$ billion)	39.6	98.5	716.5
Fund assets in 2013 with 60/40 portfolio return (\$ billion)	46.0	113.2	829.7

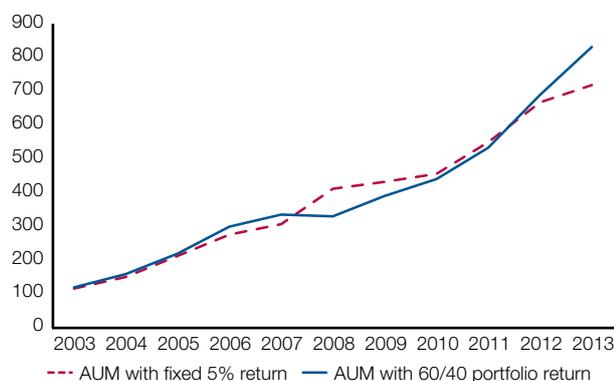
Note: for Saudi Arabia, we start the fund with initial capital of \$100 billion in 2003 as the country had already amassed substantial savings by that point from previous periods of high revenues.

Figure 2.3: Accumulated assets under moving-average rule with investment returns (US\$ billion)

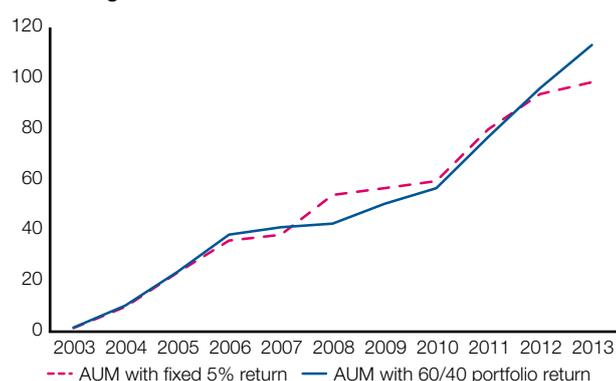
2.3.a. Azerbaijan



2.3.c. Saudi Arabia



2.3.b. Nigeria



2.2.2. Applying the reference-price rule

As noted in the preceding section, accumulation rules can also be based on the underlying commodity price, rather than revenues. It is, therefore, useful to investigate the implications of a **reference-price based rule**. The key element in determining how conservative any such rule is – and, therefore, the size of transfers to the SWF – is the choice of a high or low reference price. The choice of a low reference price implies a conservative accumulation rule, and vice versa. In order to analyse the impact of different reference prices on the implementation of the rule, assume a counterfactual starting from three plausible reference prices for oil at the end of 2013: \$80, \$70 and \$60 per barrel, respectively. Working backwards from that price, we subtract 2% per annum to compensate for inflation, so that the \$80 reference price in 2013 equals \$61.5 in 2000, the \$70 reference price in 2013 equals \$53.8 in 2000, and the \$60 reference price in 2013 equals \$46.1 in 2000. Applying this to all the years in the sample provides three inflation-adjusted ‘reference-price paths’:

01. A high-savings path derived from a \$60 reference price in 2013
02. A medium-savings path derived from a \$70 reference price in 2013
03. A low-savings path derived from an \$80 reference price in 2013.

Comparing the actual average oil price in each year from 2000 to 2013, to the price signalled for that year by each of the three price paths, we can calculate the percentage difference between the actual price and the reference price. An accumulation rule can be specified mandating the transfer of that percentage of revenues to the SWF: if actual oil prices are 10% above the reference price in any given year (for example, \$77 relative to reference price for the year of \$70), 10% of total oil revenues would be transferred to the SWF.¹² The difference between actual revenues (based on actual oil prices) and the revenues consistent with the three price paths is shown in Figure A.2.¹³

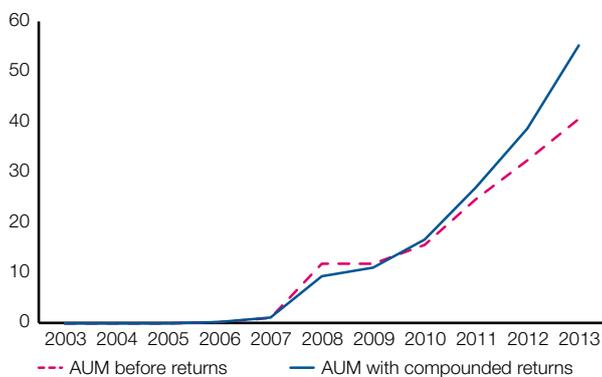
It is striking that the medium-savings price path does not generate any savings from 2000 to 2006, given the relatively subdued oil prices during that period. Excess revenues, arising when prices are above the respective price paths, are concentrated in only four years – 2008 and 2011, 2012 and 2013 – across all three versions of the rule. As was the case for the moving-average rule analysed above, the government would invest the assets that had been transferred to the SWF. Assume that the government adopts the medium-savings price path and saves all resource revenues that arise when the actual oil price exceeds the price signalled by the price path in any given year. Figure 2.4 shows the result from the application of this rule with the investment return (approximated by the 60/40 equity-bond portfolio) added.

¹² Note again that we only consider an asymmetrical version of the rule, allowing only for transfers to the SWF, but not from it. Recall that the government can use other tools, notably hedging through the options market, to hedge against downside risk.

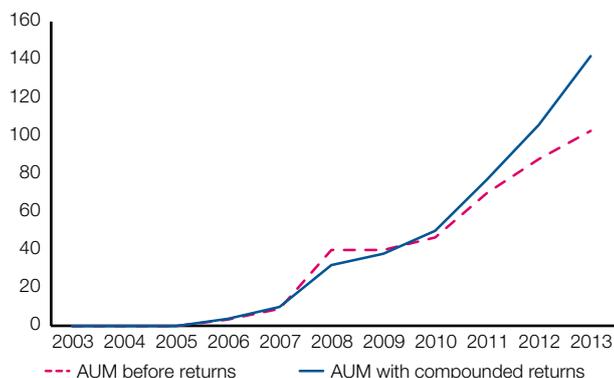
¹³ The graphs show both positive and negative deviations in revenues, but the asymmetric version of the rule would transfer assets to a SWF only when the values are positive.

Figure 2.4: Accumulated assets under reference-price rule (US\$ billion)

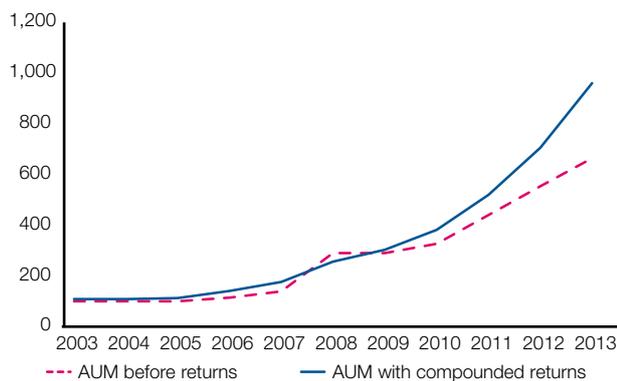
2.4.a. Azerbaijan



2.4.b. Nigeria



2.4.c. Saudi Arabia



2.3 Policy implications for resource-rich countries

This chapter applied simple saving rules to construct a number of counterfactual scenarios for the accumulation of excess oil revenues in three contrasting countries, Saudi Arabia, Nigeria and Azerbaijan, between 2000 and 2013. The application of two of these rules showed that all three countries should have amassed significant assets over this period, given a number of very high-revenue years, had these rules been followed. This accumulation of assets would have been even more significant if the revenues were invested (proxied here by a balanced 60/40 global equity-bond portfolio) and the proceeds reinvested and allowed to compound.

In the case of Saudi Arabia, a simple moving-average rule with reinvested investment income would have resulted in the accumulation of \$716.5 billion to \$829.7 billion by the end of 2013 (assuming that the country already had \$100 billion saved at the start of the sample in 2000). This is very close to the actual accumulation of assets Saudi Arabia did in fact experience over this period, suggesting that this modelled rule and investment approximates the policies pursued over this period. However, the actual accumulation by 2013 was towards the lower end of

the range of the modelled accumulation of assets under the moving-average. Moreover, a reference-price rule based on a real price of \$70 per barrel (as of 2013), with reinvested investment income, would have generated accumulated assets of around \$1 trillion by 2013. The interpretation is that, while Saudi Arabia did save a reasonable share of windfall revenues between 2000 and 2013 – and SAMA invested those assets well – there was scope for an even greater accumulation of assets through higher savings. In chapter four we will show how such savings would have facilitated a higher permanent level of spending in the long run under a fiscal-rule framework.

Our analysis also showed that Nigeria and Azerbaijan accumulated less assets between 2000 and 2013 than what our simple savings rules suggest. Nigeria, in particular, has little to show by way of saved assets from this boom period in revenues. Whereas actual savings amounted to around \$7 billion assets by 2013 (using the level of assets held in the Excess Crude Account), the rule of thumb measures with reinvested income, suggest total savings of between \$98.5 billion and \$113.2 billion. Chapter four shows the significant long-term costs of this lower level of savings (although, of course, some share of the spent oil revenues was, in theory, allocated to growth-enhancing investments in education, health and infrastructure). While Azerbaijan's sovereign wealth fund held around \$38 billion in assets of as mid-2014, our analysis shows that the level of savings under the basic savings rules would have slightly higher. The basic rule of thumb measures suggest a level of savings by the end of 2013 in Azerbaijan of around \$40 billion to \$55 billion dollars (depending on the exact rule and assumed return on assets).

A number of generalised policy implications can be extracted from the analysis that are relevant to all resource-rich countries during an initial accumulation phase in which they build up 'starting capital' for their SWFs.

2.3.1. The power of savings in boom years

The analysis underlines how important and powerful it is to save a portion of revenues during boom periods (or even in single boom years), in which exceptionally high resource prices result in an unanticipated resource revenue windfall. For established resource producers who are dependent on resource revenues to finance the budget, implementing accumulation rules that are centred on such boom years should be relatively painless: the government can maintain spending in low- or even average-revenue years, while only saving when resource revenues rise unexpectedly due to exogenous price movements.

Of course, a resource revenue boom could arise also from a production boom, rather than through (or perhaps in conjunction with) a price boom. For new resource producers, like Azerbaijan, modest savings from rapidly rising revenues allows the government to not only moderate the scale-up in public spending and investment, but also creates a buffer fund with which to stabilise volatile public income and endows future generations with a share of the production boom. By saving only a quarter of revenues during the first decade of oil production and investing them prudently, Azerbaijan would have created a buffer equal to roughly twice annual resource revenues.¹⁴

¹⁴ The implied savings rate of 20-25% refers to the amount of revenue put aside in the fund. Note, however, that the government is able to invest those funds. In the absence of short-term spending of those assets, these assets earn compound returns, which in the analysis above equates to roughly 50% of the saved amount. Therefore, the effective savings rate (the transferred amount, minus the compound returns earned on those savings) drops to around 10% to 15%.

2.3.2. Reference-price rules are very sensitive

Many countries, including Nigeria and Azerbaijan (and previously, Chile and Russia) have adopted some form of reference-price rule, either formally or informally, to guide the saving of resource revenue windfalls. The previous analysis underlines a simple fact about these rules: the commitment to save revenues during a windfall period can only be realised if policymakers establish a prudent reference price. A \$10 difference in the reference price may sound trivial, but has a massive impact on the total amount of funds transferred to the sovereign wealth fund over a number of years. Consider Nigeria, which received an estimated \$440 billion in oil revenues between 2000 and 2013. The use of three different reference-price paths, based on a real oil price of \$60, \$70 and \$80 (with 2013 as the base year), resulted in total positive transfers of \$36 billion, \$70 billion and \$124 billion; or a savings rates of 8%, 16% and 28%, respectively. This raises important questions around the process or mechanisms through which the reference price is set: is it at the discretion of the ministry of finance, by an independent panel of experts, in consultation with the IMF, or according to a formula or model?¹⁵ These are all critically important issues to consider with respect to the governance and institutional arrangements of the SWF.

2.3.3. Transfers can be lumpy

The rules analysed above, particularly the reference-price rule, can generate highly concentrated or lumpy transfers to the SWF – for example, years in which oil prices are below the reference price (generating no new transfers to the fund) can be followed by a single year in which prices far exceed the reference price (generating a big transfer to the fund). In the hypothetical scenarios above, the overwhelming share of the total net transfers occurred in only two boom periods: 2008 and 2011-2013. This potentially complicates the long-term investment planning and strategy of the SWF. If this is the case, an additional mechanism may be required to stagger or smooth out transfers to the fund, enabling it to better implement its investment strategy.

2.3.4. Symmetrical versus asymmetrical rules

Given the volatility of resource revenues over the sample period, there is a significant difference in total transfers under the versions of the accumulation rule that permits both in- and outflows (symmetrical) and ones that only allow for inflows (asymmetrical). Using the example of Nigeria again: under the medium-saving price path, a symmetrical rule would have yielded \$63.7 billion in net transfers, while a rule with inflows only would have yielded \$102.6 billion in transfers. It is absolutely critical for policymakers to decide whether the fund's transfer rule applies in a symmetrical or asymmetrical manner. Firstly, the distinction has serious implications for the total net assets transferred to the SWF; and secondly, funds governed by symmetrical rules need provision for potentially large and unpredictable outflows, which will significantly impact the fund's investment strategy towards holding more liquid, lower-yielding assets.

¹⁵ The moving-average rule considered above, while conditioned on revenue rather than price, is an example of a formula-based mechanism for implementing the rule. The moving-average approach could easily be adapted to apply to price movements too.

Conclusion

This chapter has discussed a number of simple rule-based mechanisms for transferring public assets arising from natural resource revenues into separate funds, portfolios or institutions that are able to invest these assets with a long-term investment horizon, with higher exposure to risk and illiquidity in order to generate higher returns. After discussing a number of different types of accumulation rules, the chapter demonstrated the extent to which these rules would have resulted in the accumulation of significant assets in three country cases: Saudi Arabia, Nigeria and Azerbaijan, between 2000 and 2013. The policy implications outlined in the final section of the chapter are universal to all resource-rich countries looking to embark on a transitory period of accumulating assets in order to capitalise their SWFs.

The rules discussed in this chapter isolate the accumulation decisions from the spending decisions and the possible functions of the SWF. The starting assumption behind these rules is that the government is committed to saving a portion of the resources revenue windfall in a way that is economically (and politically) viable, in order to accumulate assets and establish principal capital for an SWF. Once the government has completed this initial accumulation period, attention can turn to a more integrated framework that matches the assets of the SWF to its function, particularly stabilisation and the generation of investment income. Chapter four, in particular, will continue the analysis in this direction. Chapter three considers the accumulation or capitalisation process from the perspective of reserves-rich countries.

Recommendations

- It can be very useful for new resource producers (or established producers moving towards the establishment of an SWF) to implement simple accumulation rules that determine how much and when a portion of revenues are set aside to capitalise an SWF.
- While static and mechanistic rules that set aside a fixed percentage of annual revenues are easiest to implement and explain, more dynamic and cyclically adjusted rules are more desirable from an economic perspective.
- It is important that countries take advantage of periods of resource revenue windfalls (driven by either price or volume increases) to accumulate assets, as it is much easier to generate such savings during boom periods, than when revenues are stable or declining.

Appendix to Chapter 2

► Notes on the collection of data on past resource revenues

Data on country-level resource revenues are not readily available, but can be calculated based on IMF estimates of the ratio of resource revenues to GDP, which is available at the annual frequency from the Fund's Article IV consultations. In order to get cross-country data on the annual dollar amount of resource revenues, this ratio is

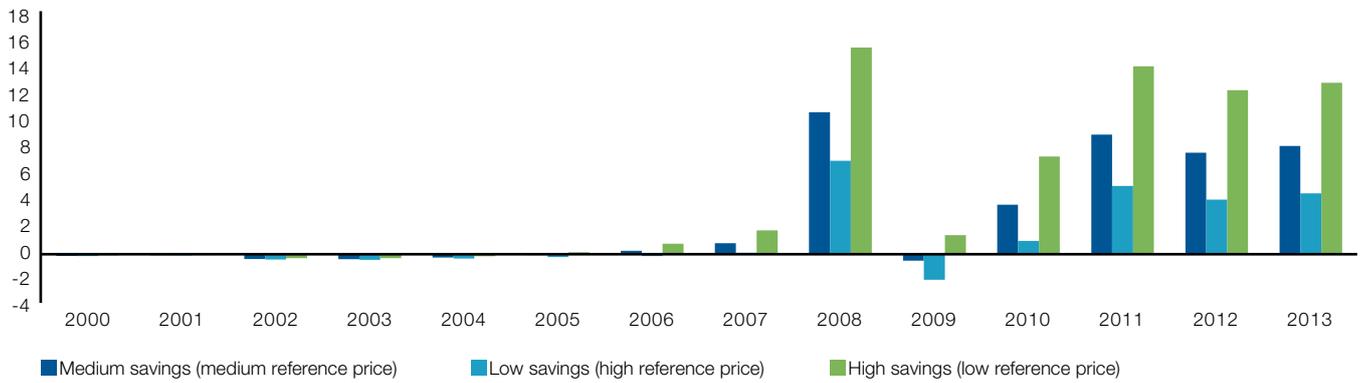
applied to estimates of each country's nominal GDP in US dollar from the World Development Indicators. This yields a series of annual data on the total resource revenues, expressed in billions of US dollar for a number of countries for the 2000 to 2013 sample period. In order to ensure accuracy, the data is crosschecked with national sources, where these are available. Table A.2.1 shows the data for a set of countries between 2000 and 2011.

Table A.2.1: Annual oil revenues (\$bn), 2000-2011

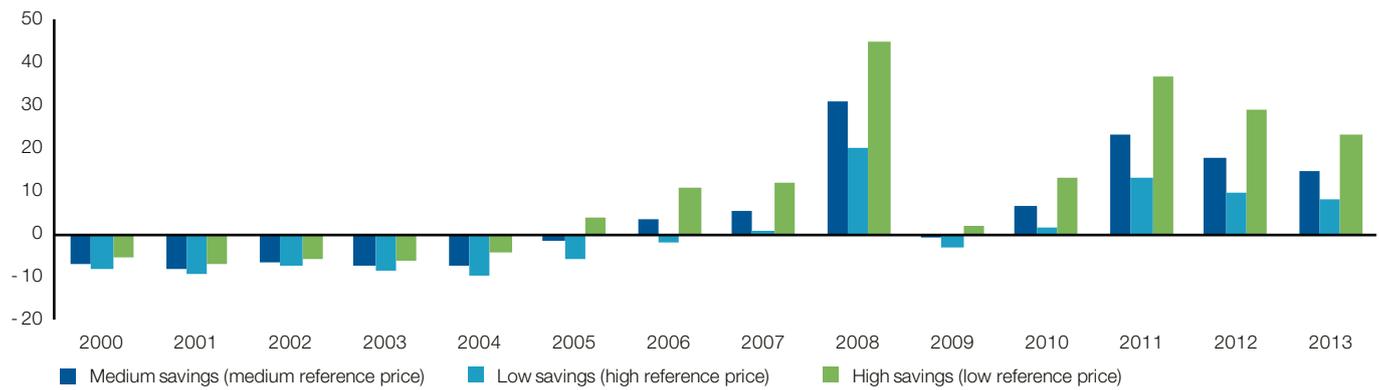
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Algeria	16.2	13.0	12.7	17.5	21.8	32.2	38.4	40.6	63.6	33.0	38.9	55.0
Angola	4.1	3.2	3.4	4.0	5.7	10.0	16.9	22.6	34.8	18.3	27.3	41.3
Azerbaijan	0.3	0.2	0.7	0.8	0.9	1.3	3.0	5.0	18.8	12.1	18.2	N/A
Bahrain	2.0	1.8	1.8	2.2	2.5	3.4	3.8	4.3	6.1	3.8	5.7	7.0
Brunei	2.5	2.0	2.1	2.5	3.3	4.4	5.6	3.9	9.3	3.9	5.4	9.7
Equatorial Guinea	0.2	0.4	0.5	0.7	1.4	2.6	2.9	3.5	5.4	3.8	3.2	4.3
Iran	16.6	13.7	18.5	22.7	28.7	41.3	46.8	58.3	59.3	49.8	63.5	87.6
Kazakhstan	N/A	N/A	1.1	1.8	3.0	5.8	7.3	9.7	14.4	10.2	16.6	20.9
Kuwait	N/A	17.0	18.6	20.4	29.7	46.3	54.2	66.6	78.9	64.4	68.2	92.8
Libya	9.6	7.3	7.2	10.3	15.3	27.4	35.2	45.6	56.3	34.7	N/A	N/A
Malaysia	3.5	5.1	4.6	4.7	6.5	8.7	13.0	15.5	20.0	19.5	18.3	21.9
Mexico	42.0	42.7	45.2	51.0	57.6	68.4	80.2	81.2	95.1	65.6	78.0	90.4
Nigeria	16.2	15.6	12.2	16.3	25.2	34.4	40.0	33.9	53.7	18.0	32.1	56.7
Norway	24.6	24.0	27.1	30.5	32.1	33.5	33.7	36.9	38.3	34.7	36.1	39.5
Oman	8.4	7.8	7.5	7.9	9.4	12.8	15.5	15.6	24.6	14.6	20.0	26.1
Qatar	5.5	4.2	5.0	5.0	9.0	11.3	14.1	17.5	22.8	21.1	24.0	31.1
Russia	16.4	16.7	17.4	22.9	46.1	97.2	127.2	138.3	209.6	108.8	149.5	222.7
Saudi Arabia	57.2	49.0	44.3	61.6	91.0	140.1	170.6	162.1	286.2	132.0	208.9	324.9
Trinidad and Tobago	0.5	0.8	0.5	1.1	1.3	2.6	4.0	3.8	6.1	2.7	3.6	4.5
United Arab Emirates	22.1	18.9	15.6	21.2	27.7	42.3	60.3	65.1	100.4	48.5	63.6	99.0
Venezuela	22.4	16.7	13.5	15.4	19.4	26.7	32.8	37.5	49.0	15.1	41.4	40.0
Yemen	2.7	2.3	2.2	2.6	3.1	4.4	5.5	4.9	7.5	3.6	5.2	5.1

Source: IMF and World Bank

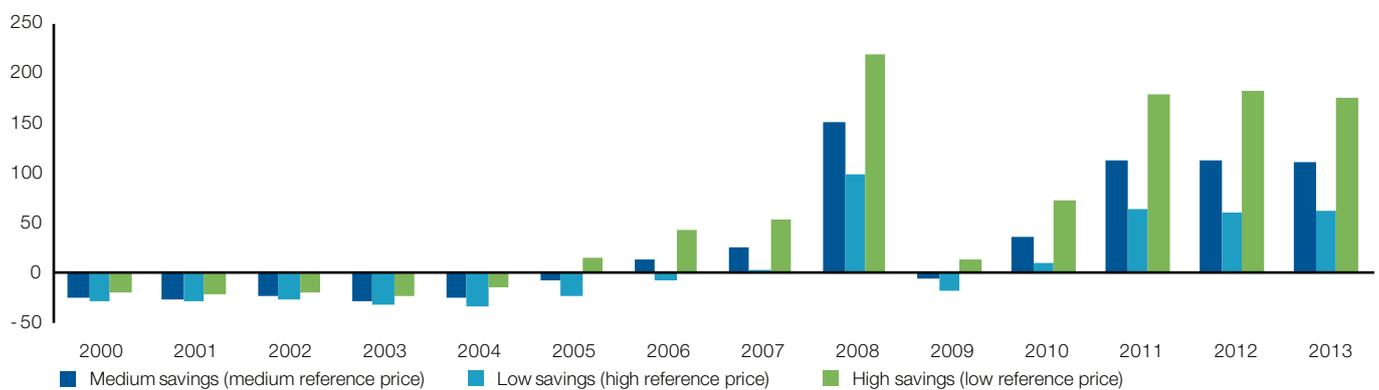
Figure A.2.1: Annual deviations in revenue based on reference-price rules (US\$ billion)



A.2.1.b. Nigeria



A.2.1.c. Saudi Arabia





Chapter 3:

Enough is enough: accumulating wealth through excess foreign reserves

► Key messages

- Countries that have accumulated very significant holdings of foreign exchange reserves have increasingly moved a portion of those assets into more long-term investment portfolios, with a higher risk tolerance and investment horizon.
- The accumulation of foreign exchange reserves has resulted in deeper analysis of the related concepts of ‘reserves adequacy’ and ‘excess reserves’.
- Rule-of-thumb measures of reserves adequacy relate the minimum level of reserves a country should hold to indicators of the cost of imports, the repayment of short-term debt and the size of the domestic financial system.
- More recent and complex models of reserves adequacy and the optimal level of reserves remain a work in progress and difficult to apply across countries. However, policymakers can use the ideas behind these models to overlay country-specific assessments of their reserve holdings.

Chapter overview

Countries with large holdings of foreign exchange reserves have increasingly moved a portion of assets, previously held in low-yielding liquid investments, into more diversified portfolios in search of higher returns – similar to their resource-rich peers with their commodity-based revenues. This chapter considers accumulation rules for the establishment of long-term investment funds financed through excess foreign exchange reserves. The accumulation of such reserves in countries with persistent current-account surpluses already implies previous savings – the question then becomes: what should be done with these savings? More precisely, policymakers need to determine whether the country has sufficient levels of reserves to prevent excessively painful adjustments to a range of possible shocks. If so, the country may wish to transfer a portion of these excess reserves to an SWF. Such funds can take the form of a separate fund, institution or even just a segregated portfolio or tranche within the central bank (as discussed later in Chapter Six).

In this chapter we discuss and apply a number of commonly used rule-of-thumb measures of reserve adequacy: the ratio of foreign exchange reserves to short-term debt (the so-called ‘Greenspan-Guidotti rule’, named, in part, after the former chairman of the US Federal Reserve who cited it as a broad-based measure of prudence.), the number of months of import cover, and proxies for the size of the domestic banking sector. Given that these simple rules provide only a general indication of reserve adequacy, fail to capture all the idiosyncratic risks individual countries may face, and ignore the fact that large holdings of low-yielding reserves have both direct and opportunity costs, we discuss preliminary progress in the literature towards deeper and more complex models of optimal reserve holdings. Before delving into these measures, it is useful to get a clear sense of the differences and similarities that have emerged in practice around the management of resource- and reserves-based forms of sovereign wealth.

3.1 Comparing reserves – and resource-based sovereign wealth

The analysis of sovereign wealth, from accumulated foreign exchange reserves, requires a different approach to wealth from natural resources, given a number of fundamental differences between the dynamics of reserves-rich and resource-rich countries:

- Reserves-rich countries do not face the same stabilisation (managing the volatility of government revenues) or savings (of a depleting asset and revenue source) problems that resource-rich countries do. Reserves are not typically a major source of funding for the government, and certainly not a volatile or declining one.
- The accumulation of foreign exchange reserves already implies a degree of savings, which means that the question for reserves-rich countries is not “how much to save”, but rather “how should savings be used and invested”. Excess foreign exchange reserves are typically accumulated in countries that run persistent current-account surpluses, which is only possible if there is excess saving in the domestic economy.¹⁶ The decision to establish a reserves-based sovereign wealth fund, therefore, does not imply a saving decisions, but rather a shift in the way a portion of existing savings are used.

¹⁶Under the assumption of open capital- and current accounts, a surplus (deficit) on the current account, which implies domestic savings, would be reflected in the balance of payments by an offsetting deficit (surplus) on the capital account, and an accumulation of (reduction in) net foreign assets. However, in a number of countries, notably in Asia, current-account surpluses are, or have historically been, accompanied by restrictions on the free movement of capital, so that instead of running a capital-account deficit, current-account surplus is reflected in the accumulation of foreign exchange reserves by the national central bank.

– The problem of the policymaker in a resource-rich country can be framed as essentially one of stabilising domestic fiscal revenue and spending, and ensuring that both can be maintained once the resource is depleted; while the problem of the policymaker in a reserves-rich country is to self-insure against external shocks, and then earn a higher return on excess foreign assets.

Despite these fundamental differences, there are also striking similarities in the observed operational and institutional arrangements for the management of these two forms of sovereign wealth. These similarities pertain to the objectives and motivations behind the establishment of different pools and portfolios of sovereign wealth, the investment strategies adopted in pursuit of those objectives, and the separate institutional arrangements required for the effective management of these distinct pools of sovereign wealth.

A symmetry has emerged in the way the two major sources of sovereign wealth are managed in practice: the stabilisation funds of resource-rich countries are comparable to the conventional foreign exchange reserve portfolios managed by central banks, while the savings (future generation or investment income) funds of resource-rich countries are the counterparts of the long-term investment funds established with excess reserves in a number of countries. The former are essentially buffer funds – against external shocks and revenue volatility, respectively – and therefore hold highly liquid, low-yielding assets. The latter are established to generate higher long-run average real returns – to meet anticipated future liabilities, replace a depleting natural asset or provide an alternative source of government revenue – and consequently hold more diversified portfolios with significant risk exposure in order to generate higher returns. Table 3.1 summarises the similarities in the economics, operations and institutional arrangements of managing resource- and reserves-based sovereign wealth.

Table 3.1: Comparing resource- and reserves-based sovereign wealth management

	RESERVES-BASED SOVEREIGN WEALTH	RESOURCE-BASED SOVEREIGN WEALTH
Source of assets	Excess savings and current-account surpluses	Fiscal revenue from natural resource
Liquid Portfolio		
Primary motivation behind liquid portfolio	Precautionary savings against shocks (debt, trade, financial crises)	Stabilisation of volatile revenues and commodity-price shocks
Typical manager of liquidity portfolio	Central bank (Conventional reserves portfolio)	Ministry of Finance (Stabilisation Fund)
Typical portfolio structure	Highly liquid, short-dated sovereign bonds and cash	Highly liquid, short-dated sovereign bonds and cash
Investment horizon	Short (0-12 months)	Short (0-12 months)
Long-term Portfolio		
Primary motivation behind long-term investment portfolio	Higher return on excess reserve assets	Depletion of resource revenue and desire to establish an alternative source of fiscal revenue
Typical manager of long-term investment portfolio	Dedicated investment authority (or separated entity in central bank if investment model is not too complex)	Dedicated investment authority (or separate entity in central bank if investment model is not too complex)
Typical portfolio structure	Diversified portfolio, with significant exposure to risk assets	Diversified portfolio, with significant exposure to risk assets
Investment horizon	Medium to long-term (1-10 years)	Medium to long-term (1-10 years)

3.2 The accumulation of foreign reserves: from adequacy to excess

All countries hold foreign exchange reserves with which to make both anticipated and unanticipated external payments, notably paying for imports and repaying external debt. These reserves have historically been held in the short-dated dollar and other hard-currency bills and bonds, managed by the central bank. In recent years, however, a number of countries, notably in emerging-market economies, have accumulated reserves far in excess of what could plausibly be used to meet short-term external payments, even in the face of significant shocks.

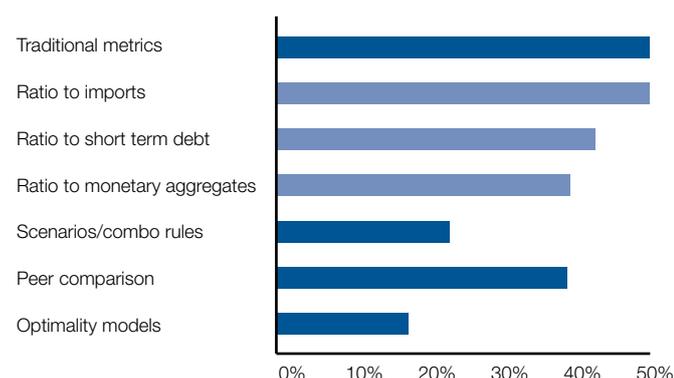
This trend, coupled with a growing recognition that there are both direct and opportunity costs to accumulating these assets, has resulted in a greater appreciation of the need to move a portion of these low-yielding assets into SWFs, investment portfolios and separate institutions with longer-term investment horizons, greater risk exposure and higher expected returns. This raises the questions of what level of reserves countries need to hold, and what the appropriate balance is between holding traditional reserve assets and more risky, higher yielding assets. This section presents and applies some of the most commonly used measures for determining how much reserves a country needs to hold to meet external payments in the event of shocks (the concept of 'reserve adequacy'). Following that, we discuss the derived idea of 'excess reserves', a portion of which can be transferred to an SWF, investment tranche or long-term portfolio within the central bank.

The decision to transfer foreign exchange reserves to a more long-term, risk tolerant fund, portfolio or institution requires an assessment of whether the country holds sufficient reserves to meet near-term payments in the event of conceivable shocks or disruptions. The government, therefore, needs to first formulate a view on which shocks and risks it is trying to prevent or manage; and, second, how much foreign assets it needs to hold in order to do so. Having answered these two questions, an assessment can be made around whether it holds surplus foreign assets; and, if so, which can then be placed into a separate portfolio or institution with a long-term investment horizon, with a greater tolerance for risk and illiquidity.

Two major approaches to analysing the question of reserve adequacy have emerged: first, very simple measures of the size of reserves, relative to a number of proxies for short-term liabilities; and second, more dynamic and integrated models that incorporate measures of risk aversion, the output losses associated with responding to unanticipated shocks in the absence of reserves holdings, and measures of the costs of holding reserves. While the latter promises a more comprehensive way of assessing the minimum level of reserves a country needs to hold (and, if the cost of reserves are incorporated, what the optimal level of reserves are), little headway has been made on developing robust models that are fit-for-purpose in actual policy decisions. Moreover, recent surveys¹⁷ of reserves managers have confirmed that simple rule-of-thumb measures continue to be much more widely used, in practice, than the emerging suite of structural models (see Figure 3.1). While the development of the latter is certainly a promising and vibrant area of ongoing research, we focus more on a number of simple rule-of-thumb measures of reserve adequacy, and what they suggest about current levels of reserves in a number of countries, before discussing the more generic insights that emerge from the efforts to develop structural optimality models.

¹⁷IMF (2011) and Carver (2014).

Figure 3.1: The popularity of various reserve adequacy measures



Source: IMF (2011)

The idea behind the simple rule-of-thumb measures of reserve adequacy is that a country – particularly an emerging market with increasing trade and finance links to the global economy – needs to hold reserves in order to insure against and manage various shocks, such as a sudden stop in capital inflows or a sudden deterioration in the terms of trade, leading to sharp fall in exports. The need to hold liquid foreign-currency assets results from the fact that these shocks often adversely affect countries' ability to make short-term external payments, such as debt repayments or the financing of imports. Therefore, the two most popular rule-of-thumb measures assess the level of reserves, relative to short-term external debt, and a certain number of months' of import payments. More recently, the use of foreign exchange reserves to provide liquidity to the domestic banking sector (particularly when the domestic financial system has incurred large foreign-currency liabilities) has resulted in the assessment of reserves relative to broad money or M2, a widely used proxy for the banking or financial system.

3.2.1. Reserve adequacy measures based on months of import cover

Measures of reserves, relative to months of imports, indicate how long a country should be able to maintain imports without a potentially painful adjustment in the balance of payments, should all inflows (export revenue and foreign investment) stop. The measure is a reasonable proxy for the risks faced by countries dependent on imports, financed by potentially volatile exports (such as minerals, agricultural commodities and hydrocarbons) and/or short-term portfolio capital inflows. The measure is usually based on a certain number of months of expected future imports, with three months' coverage commonly used as a benchmark measure of adequacy. More conservative measures can define reserve adequacy as sufficient to cover around four to six months of imports. If imports are relatively stable, in real terms, the most recent three months (or three times the monthly average of the preceding year) can be used; or, if imports are rising fast, a growth rate (5% to 10%) can be applied to the value of previous months of imports.

3.2.2. Reserve adequacy measures based on short-term debt

Shocks to countries' ability to maintain external payments can also arise through the capital-account side of the balance of payments. As noted by the IMF (2011), short-term debt has "a well-established record as an indicator of crisis risk for market-access countries, and as such has a key role in any assessment of reserve adequacy." The Greenspan-Guidotti rule states that countries should aim to hold reserves equal to (at least) 100% of short-term debt (due in 12 months). The implication is that a country could continue to make external payments for one year, even in the event of losing access to the international capital markets. While there are some question marks around whether 12 months is an appropriate time horizon for short-term debt and the ability of countries to regain market access, the measure could still be regarded as rather conservative, as countries' ability to roll-over existing debt does not reduce to zero in practice, even in the most severe crisis episodes (IMF, 2011).

3.2.3. Broad money: a proxy for the financial system

A less well-established measure is based on the ratio of reserves to broad money, where the latter is assumed to be a reasonable proxy for the size of the domestic financial sector and/or the risk of capital flight by domestic residents. The measure is more applicable in cases where domestic banks have large external exposures, in which case central bank support in, or after, a crisis could require access to highly liquid external resources. There is little consensus around what is an appropriate ratio of reserves-to-M2, given the large cross-country differences in the relative size of the financial sector and its external liabilities. A ratio of reserves-to-M2 of 20% is regarded as conservative in most circumstances – a 20% rule sets a higher benchmark for reserve adequacy than the previous two rules over the emerging-market grouping as a whole, as well as in the majority of country-specific cases.

3.2.4. Using rule-of-thumb in combination

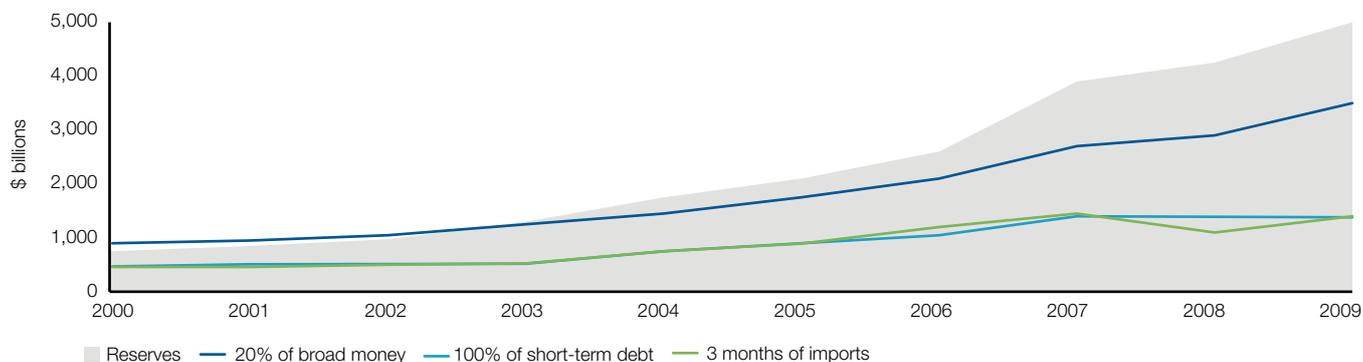
The three most commonly used basic rules we have described essentially pertain to three different types of shocks: those to the capital account, those to current account and banking or those to the financial system. It is quite possible that policymakers are concerned about all three types of disruptions, in which case they are likely to monitor all three metrics at the same time. The policy response would be to continue accumulating reserves if reserve adequacy appears marginal on any one of the three metrics. Of course, it is also possible that policymakers are concerned with the risk of more than one type of crisis occurring simultaneously (for example, a sharp decline in exports occurring at the same time as a sudden stop in

capital flows), in which case it is prudent to consider whether reserves are adequate, not only with the ratio of reserves to individual indicators, but some combination of them. A conservative rule would suggest that reserves should cover debt due in 12 months, plus three to six months of imports and 10% to 20% of M2. In a similar vein, a new measure for emerging markets, developed by the IMF (2011), focuses on episodes of ‘exchange market pressure’ during which countries are more likely to suffer foreign-exchange losses from multiple sources of pressure on the balance of payments, requiring a risk-weighted assessment of different drivers of pressure (short-term debt, losses in export earnings, portfolio liabilities and banking-sector liabilities).

3.2.5. Current reserve levels against rule-of-thumb measures of adequacy

Applying the above-mentioned rule-of-thumb measures to a number of leading emerging markets and lower-income countries, using the latest cross-country data from the World Development Indicators, reveals a great deal of variation in the levels of reserve adequacy across countries. As shown in Figure 3.2, there has been significant growth in total reserves held by emerging-market economies, relative to the levels implied by the rule-of-thumb measures of adequacy, since the turn of the century. This is particularly true when measured against the two most commonly used measures based on short-term debt and three months of import cover, which implies an almost five-fold excess in emerging-market reserves over adequacy levels: almost \$5 trillion in total reserve assets against the measures’ indicated level of \$1 trillion. Using the proxy for the size of the financial sector (M2) considerably reduces the size of total excess reserves.

Figure 3.2: Total EM reserve holdings relative to popular rules-of-thumb



Source: World Development Indicators, World Bank

It is well known that the accumulation of reserves has been dominated by a small number of emerging market economies. With an estimated \$3.4 billion in reserves, China alone contributes the overwhelming share to total growth in emerging market reserves, while a number of other Asian countries (Korea, India, Thailand and Malaysia) and oil exporters (notably Saudi Arabia and Russia) also contribute significantly to overall emerging market reserve accumulation.

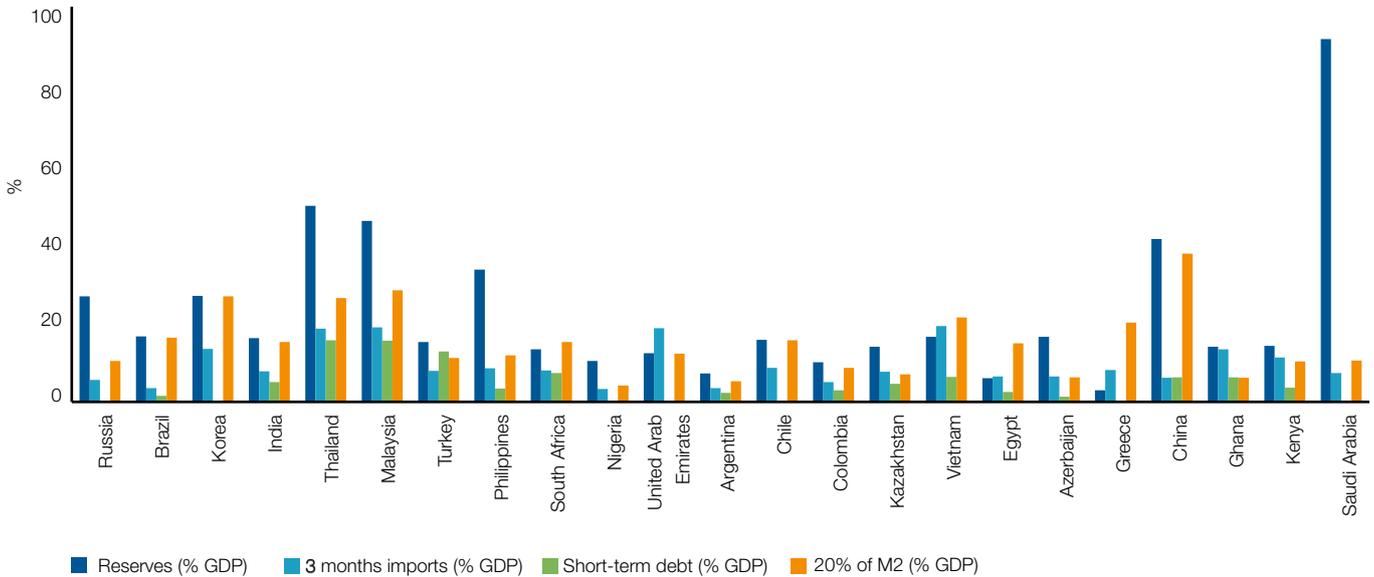
However, these trends need to be viewed in context: Figure 3.3 shows the latest reserves data for selected emerging markets, weighted by the size of their respective GDPs and against rule-of-thumb based on short-term debt, import cover and domestic financial liabilities (also weighted by their share of GDP). It is striking that Saudi Arabia stands out for its exceptionally high ratio of reserves to GDP.

It should be noted that this exceptionally high ratio of reserves to GDP in Saudi Arabia is due, in part, to the fact that the country's export earnings from oil have remained

under the management of the central bank (SAMA). These assets are, therefore, counted as official foreign exchange reserves. While country practices differ, most resource-rich countries do not regard their SWF assets - particularly long-term savings funds - as part of their reserves. In that sense, Saudi Arabia's exceptionally high reserves to GDP ratio reflects the fact that it has kept its sovereign wealth as part of its foreign exchange reserves managed by the central bank, rather than in a separated SWF.

Further, the relative size of reserves held by Saudi Arabia, Malaysia and Thailand is, in fact, larger than that held by China (whose massive holding needs to be understood relative to the size of its financial system). It is also striking that, for a number of countries, current reserve levels are broadly in line with the reserve adequacy measure, based on a proxy for the size of the financial system (20% of M2), while, generally, being above the levels suggested by the debt- and trade-based measures.

Figure 3.3: Reserve holdings relative to rule-of-thumb in individual countries (GDP-weighted)



Source: IMF World Economic Outlook (September 2014).

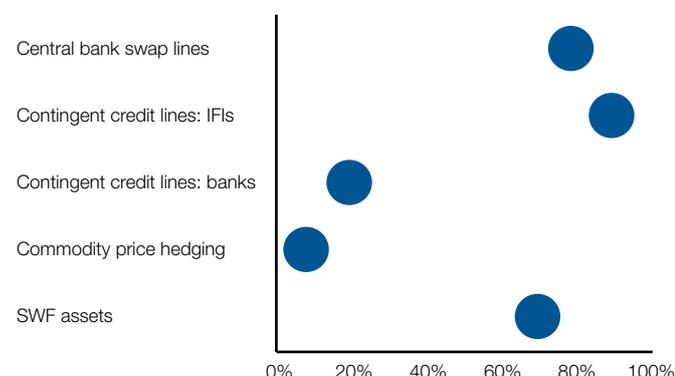
3.2.6. Insights from more complex models

The rule-of-thumb measures discussed above remain, by far, the most widely used tools for assessing reserve adequacy (along with simple peer comparisons), as shown earlier in Figure 3.1. They are, however, limited for a number of reasons. Firstly, they do not take into account structural and behavioural features that can have a significant bearing on the level of reserves a country needs to hold. Secondly, while they provide some insight into the minimum level of reserves, they do not take the direct and opportunity costs associated with reserves, into account – factors that put an upper limit on the amount of reserves a country should hold. Thirdly, these measures do not quantify the welfare or output losses associated with holding inadequate reserves (or, alternatively, the gains from holding adequate or optimal reserves).

One of the reasons for the continued popularity of the simple rule-of-thumb measure is that efforts to model these more complex and multi-dimensional features remain very much a work in process. As of yet, they do not generally offer greater insights as to the appropriate level of reserves to hold. One problem is that these models need to incorporate a massive number of variables (see below), with great uncertainty around the different weights placed on individual variables over time and across countries. The IMF (2011) concluded in its overview of existing approaches to assessing reserve adequacy “that explicit optimisation models postulate functional forms for costs and benefits to provide a complete solution, but are highly dependent on the structure and calibration of the model assumed” (IMF, 2011). This model-dependence is most acute for emerging markets, where shocks are typically exogenous.

Perhaps an even more fundamental stumbling block to creating models of optimal reserves levels, is the fact that there are various substitutes for reserves, which reduce the need for holding reserves or the portion of reserves held in highly liquid, low-yielding assets. These alternative crisis management and prevention tools include: swap lines with other central banks (notably the US Federal Reserve), contingent credit lines with the international financial institutions (notably the IMF) and international banks, the presence of commodity-price hedges (for resource-dependent countries), resource-revenue Stabilisation Funds and other SWFs, and domestic financial-crisis management tools and institutions (macroprudential measures, liquidity facilities and deposit insurance). Figure 3.4 shows the results from an IMF (2011) survey of reserve managers that asked central banks to list viable substitutes for reserves. In many emerging market economies, the exceptionally high levels of reserve accumulation in recent years, in large part, reflects the absence of substitutes for reserves.

Figure 3.4: Survey responses regarding substitutes of reserves



Source: IMF (2011)

A useful corollary of efforts to build more complex models of reserve adequacy and optimisation, is that they help explain why country-specific holding of reserves are often different from those suggested by the rule-of-thumb measures. Additional country-specific factors to those used in the rule-of-thumb measures can also help explain why reserves levels do not always change in the expected direction and magnitude, in response to the shocks they are assumed to help manage. A categorisation of the additional factors, not captured by the rule-of-thumb measures, is as follows:

- **Reserve substitutes:** the existence of swap lines, contingent credit lines with IFIs and banks, commodity-price hedges (for resource-dependent countries), SWFs, macroprudential measures, liquidity facilities and deposit insurance.
- **Policy space:** the ability to respond to shocks through changes in monetary and fiscal policy, and the flexibility of the exchange rate regime.
- **Cost of reserves:** either the opportunity cost of holding an unnecessarily high level of reserves in low-yielding assets; or the direct cost related to the spread or ‘negative carry’ between the interest earned on reserve assets and the domestic liabilities issued to acquire them or sterilise their domestic inflationary impact.
- **Behavioural and political economy factors:** policymakers’ relative risk aversion and their willingness to accept conditions and costs associated with contingent credit from IFIs and private banks.

In practice, each country needs to assess the relative importance of these factors, in addition to the more familiar risks and shocks captured by the rule-of-thumb measures, on a case-by-case basis. The simple rule-of-thumb measure provides a useful starting point or benchmark for assessing reserve adequacy, from which countries may decide to hold more (or possibly less) reserves, depending on the above-mentioned structural features.

Conclusion

This chapter considered when and how to transfer sovereign wealth from liquid, low-yielding foreign exchange reserves into separate investment portfolios, funds or institutions, with a longer investment horizon, greater risk tolerance and higher expected returns. An important difference underlying the accumulation decision for reserves- and resource-rich countries is the need, in the latter, for integrating the accumulation and savings process with revenue stabilisation and spending. Resource-based wealth arises from volatile and finite domestic fiscal revenues, rather than from structural external surpluses, as in the case with reserves-rich countries. Foreign reserves are the manifestation of high savings and an excess of exports over imports – the decision to carve out a portion of such savings into a more long-term, return-orientated investment portfolio is essentially an isolated one, based on policymakers' preferences and a range of factors outlined in this chapter. The accumulation of sovereign wealth in resource-rich countries requires a more delicate and technical balancing act between savings, stabilisation and spending of resource revenues.

We analysed why countries hold and accumulate reserves in the first place, and introduced the concepts of reserve adequacy and excess reserves. The chapter then discussed the logic behind the most commonly used rule-of-thumb measures of reserve adequacy, and assessed what these measures suggest about the level of reserves held by emerging-market economies and lower-income countries today. The limitations, particularly in terms of universal applicability, of basic rule-of-thumb for reserves adequacy should be noted: they provide only very preliminary indications of the possible separation of adequate and excess reserves. In practice, the insights from rule-of-thumb measures need to be overlaid with a number of country- and context-specific indicators and factors, which may call for holding more or less reserves in a highly liquid form. While progress on developing more complex structural models, to guide reserve accumulation decisions, remains at an early stage, these efforts assist in establishing a conceptual framework for considering and categorising all of these additional factors.

Recommendations

- As a first step in assessing whether a country holds sufficient foreign exchange reserves, policymakers should employ the three most commonly used rule-of-thumb measures of reserves adequacy, which compare reserves to months of import payments, short-term debt liabilities and the size of the domestic financial sector.
- As a supplement to these rule of thumb measures, policymakers should consider whether additional insights could be gained from more complex, structural models – in full knowledge that these models have some well-documented shortcomings themselves. At the very least, the ideas behind these models can point policymakers to additional considerations.
- Policymakers should also consider whether access to 'reserves alternatives' – such as swap lines with the US Federal Reserve and contingent credit from the IFIs – could reduce the need for reserves.
- Once policymakers are satisfied that the country holds a sufficient level of reserves, opportunities to generate higher returns on excess reserves should not be ignored – these can be pursued within a central bank or through the establishment of an SWF.



Chapter 4:

Integrating stabilisation, spending and savings decisions in resource-rich countries

► Key messages

- In the long term, resource-rich countries need to evaluate policies pertaining to the stabilisation, spending and saving of resource revenues in an integrated way, rather than in isolation.
- An integrated approach reflects the fact that countries with different structural features have different spending needs and priorities, and the ability to save a portion of resource revenues depends on a range of country-specific factors.
- This chapter applies a simple integrated model of stabilisation, spending and saving to a number of resource-rich countries with highly differentiated structural features.
- The output of these models allows us to assess the impact of different stabilisation, spending and savings policies over a multi-decade horizon.

Chapter overview

Resource-rich countries are a highly diverse group – as are resource-rich countries who hold SWFs. Consequently, there are no ‘one-size-fits-all’ policy solutions that can be transplanted from noted success stories, such as Norway, Chile and Botswana. While these countries and their SWFs have some universal features, the macroeconomic policies around SWFs – particularly the balance between stabilisation, spending and saving of revenues – should be specified in a way that takes countries’ needs, risk and contextual development factors into account.

These policy challenges are particularly acute for resource-rich countries, and are more complex than for reserves-rich countries. Countries with excess foreign exchange reserves are not dependent on those assets for fiscal revenue, nor do they face the prospect that those assets and the revenues derived from them are subject to long-term declines or episodes of extreme volatility. Resource-rich countries,

typically, face all these challenges. Therefore, they need to secure macroeconomic policies for their SWFs in a framework that takes all these factors into account. This chapter presents a model that integrates the stabilisation, spending and savings decisions around resource revenues in a single, consistent framework. In this framework, the different starting positions (or ‘initial conditions’) and economic needs of different countries are direct and critical inputs. Where Chapter Two focused only on the issue of how assets may be accumulated from resource-revenue windfalls, this chapter takes the analysis a step further to examine how much revenue countries should save – given their spending needs and preferences; and how assets held for stabilisation versus investment income purposes should be separated.

In order to analyse how the model operates in different contexts, we have applied it to four prototype resource-rich countries: Saudi Arabia, Azerbaijan, Nigeria and Ghana. These four countries have wide-ranging economic fundamentals, historic and expected future resource production profiles, and are at different stages of their economic development.

We briefly summarise each country’s economic contexts, opportunities and needs – from which different policy objectives follow. We then provide an intuitive overview of the model (the technical details are discussed in detail in our Technical Appendix to the report). An attractive feature of the model is that it allows policymakers to tailor policies – and assess the trade-offs involved in stabilisation, spending and savings decisions – to local needs, preferences and constraints. We then present a set of country-specific simulations of the model, calibrated to the different country contexts, which puts the policy decisions and trade-offs in closer focus. Finally, we summarise the more general insights and lessons generated from the application of the model to countries at different stages of development and resource dependence.

4.1 Structural features: strengths and weaknesses

The starting point for the analysis is that resource-rich economies are highly diverse. Any model proposing to offer sensible solutions to stabilisation, spending and saving decisions around resource revenues, needs to take this diversity into account. The four countries we have used to illustrate this point have sharply contrasting structural features. These include: their level of development, degree of resource dependence, expected long-term public liabilities and spending profiles (linked in this chapter to demographic trends), and the size of accumulated assets from previous resource revenue booms. These contrasting features result in big differences in the desired and achievable balance between stabilisation, savings and spending of resource revenues. These features can be regarded as structural strengths and weaknesses, and are summarised below and in Table 4.1.

As we did in Chapter two, we use the contrasting country cases of Saudi Arabia, Nigeria, Azerbaijan (and add Ghana, as a country in anticipation of new oil revenues) to show how the model used we introduce in this chapter can be applied in different contexts. Again, the countries are chosen because of their differences, rather than their similarities.

Saudi Arabia

Saudi Arabia has been the world's largest oil-producer for several decades and oil revenues account for in excess of 85% of fiscal revenues and export earnings.¹⁸ While the country is extremely dependent on oil revenues, it has a relatively stable outlook for oil production over the coming decades, so that the risk of volatility in revenues arises from price volatility. As a recipient of numerous revenue windfalls during past episodes of high oil prices, Saudi Arabia has been able to accumulate roughly \$800 billion in assets, currently held by the national central bank. However, given

the country's deteriorating dependency ratio, public spending is expected to rise sharply from the levels experienced in recent decades. The key policy challenges for Saudi Arabia, therefore, are: to establish a formal framework for stabilising revenues in the face of price volatility, while at the same time generating investment income and higher returns on existing and future savings of oil revenue in order to help meet rising spending needs.

Azerbaijan

Azerbaijan experienced rapid growth in oil exports and revenues during the first decade of the 21st century. Oil revenues rose from a mere \$300 million in 2000 to \$18.2 billion by 2010 (before peaking at \$22.1 billion the following year) – and 5.4% of total government revenue in 2000 to 34.5% in 2010. The longevity of this oil boom is, however, limited: estimates used by the IMF suggest that oil production peaked in recent years, and will be subject to a gradual decline in the years to come (although some of this decline may be cushioned by the growth of the natural gas sector). In addition to managing the volatility of future oil revenues, the Azerbaijani authorities need a financial endowment from current and past oil revenues (or a rise in non-oil revenues) in order to maintain current levels of spending. A structural advantage Azerbaijan enjoys is that it has already accumulated significant foreign assets during the oil boom of the past decade, particularly through the State Oil Fund of Azerbaijan (SOFAZ), established in 1999. As of June 2014, SOFAZ managed \$37.6 billion in assets. However, Azerbaijan remains an underdeveloped economy, with significant infrastructure and social spending needs; as well as experiencing a long-term decline in the ratio of working age to retired people (World Bank, 2011). Therefore, the challenges confronting policymakers in Azerbaijan are: to stabilise the volatility of oil revenues, while continuing to transform a depleting natural asset into a permanent one in order to maintain current levels of spending.

¹⁸ Recent oil production data suggests that oil production in the US has started to match – and possibly surpass – that of Saudi Arabia in light of the US shale gas and tight oil revolution.

Nigeria

Nigeria has been exporting oil since the early 1970s, and has experienced a series of successive oil price increases (as well as sharp declines). Over time, oil has crowded out other sources of government income, leaving Nigeria highly dependent on oil for fiscal revenue and foreign exchange earnings: taxes and profits on oil account for 75% to 90% of revenue and exports. Given current oil reserves and geological evidence of significant unproven reserves, Nigeria could still enjoy substantial revenues for a number of decades. Moreover, a successful reduction in production disruptions and oil theft alone could raise government revenues from oil by between 20% and 25% at current levels of production. However, foreign investment in the oil sector and in new discovery has been very limited in recent decades. It is, therefore, possible (if not likely) that Nigeria could experience a sustained secular decline in production and revenues over the next decade. More positively, the country's demographics are favourable for the coming decades, with a large youth population entering the labour force (although these trends could very well reverse over roughly the same period as the expected decline in oil revenue – in a generation's time). Distinct structural weaknesses include: fractious domestic politics and lack of fiscal discipline around the allocation and spending of oil revenues and very significant domestic infrastructure investment needs. Nigeria's policy challenges include: the need to stabilise oil revenues on which the government will remain dependent over the short- to medium term, and possibly introducing a rule-based framework for balancing the spending and saving of the declining oil revenues.

Ghana

Unlike Saudi Arabia, Azerbaijan and Nigeria, Ghana is a new oil producer. The country only starting producing economically significant quantities of oil in recent years and is expected to see sharp increases in oil production and revenue over the coming decade, before revenues start declining gradually (unless additional discoveries are made and new oil fields are opened). As a new oil producer, Ghana has the structural advantage of not currently being dependent on revenues and earnings from oil – it has an existing non-oil revenue and export base (including agriculture and small, but growing, industrial, consumer and services sectors). While the country enjoys favourable short- to medium-term demographics and growth in the non-oil economy, it also faces huge pressure to address infrastructure shortages and other development priorities. Ghana's policy challenge – which is shared by many other low-income countries with recent resource discoveries, such as Uganda, Kenya, East Timor, Papua New Guinea and Mongolia – is to stabilise the volatility of its new and rising oil revenues. Second, the government must balance the need to spend income oil revenues on domestic development with the desire to preserve some portion of the temporary windfall for the long term. Third, as oil revenues are expected to rise sharply, the country also faces the challenge of absorbing new capital in an economy characterised by various capacity constraints. Institutionally, these challenges are particularly acute given the absence of prudent and rule-based government spending policy.

Table 4.1: Structural determinants of SWF functions and policies

	SAUDI ARABIA	NIGERIA	AZERBAIJAN	GHANA
Funding source	Taxes and profits on established non-renewable resource extraction	Taxes and profits on established non-renewable resource extraction	Taxes and profits on established non-renewable resource extraction	Taxes and profits on future oil production
Expected size and profile of funding	Significant revenues for several decades to come, given massive proven reserves. Volatility of revenue arises mainly through the price channel	Significant revenues for several decades to come, with some scope for an increase (contingent on new investment and discoveries), before gradual decline	Current production levels are at or near peak levels, but subject to an anticipated gradual decline starting around 2019	Significant, steady increase in resource-based revenues for two decades, followed by gradual decline from then onwards
Liabilities and demographics	Deterioration in dependency ratio, leading to pressure on pensions	Favourable in near term: large youth population entering labour force, followed by mid-century deterioration in dependency ratio	In early stage of the ageing of its population and a decline in the ratio of working age to elderly people	Favourable in near term: large youth population entering labour force, followed by mid-century deterioration in dependency ratio
Economic structure and revenue sources	Highly dependent on non-renewable resources for fiscal revenue and foreign-exchange earnings (financing of imports)	Highly dependent on non-renewable resources for fiscal revenue and foreign-exchange earnings (financing of imports)	Highly dependent on non-renewable resources for fiscal revenue and foreign-exchange earnings (financing of imports)	Some degree of diversification and range of fiscal revenue established prior to discovery of non-renewable resource
Structural strengths	<p>Unlike most oil-producing countries, does not face a secular decline in production levels, given massive oil reserves</p> <p>Has already accumulated around \$800bn (as of end-2014) in foreign assets through ad hoc savings during previous boom periods</p>	<p>Growth in non-oil economy creates scope for raising non-oil revenue</p> <p>Potential for a future surge in oil revenues, if able to attract investment and exploration, and reduce production losses and oil theft</p> <p>Favourable demographics</p>	<p>Non-oil economy is growing, creating scope for raising non-oil revenues</p> <p>Has already saved a significant portion of the previous oil revenue boom (c. \$38bn through SOFAZ)</p>	<p>Not (yet) resource dependent, given that oil discovery occurred recently – hence has alternative sources of revenue and export earnings</p> <p>Non-oil economy is growing, creating scope for continued growth of non-oil revenues</p>
Structural weaknesses	<p>Current lack of a rule-based framework for savings, stabilisation and spending of oil revenues</p> <p>Demographic pressures/demand is already driving up public spending</p> <p>Highly dependent on oil for fiscal revenue</p>	<p>Current lack of a rule-based framework for savings, stabilisation and spending of oil revenues</p> <p>No significant saving from past revenue booms – i.e. still needs to accumulate buffer funds</p> <p>Highly dependent on oil for fiscal revenue</p>	<p>Current absence of rules for savings, stabilisation and spending of oil revenues</p> <p>Resource revenues are currently at peak levels (based on current information)</p> <p>Relatively high dependence on oil for fiscal revenue</p>	<p>No current political commitment to implement newly established accumulation rules</p>

4.2 A simple model for integrated policy choices

In order to assess the stabilisation, spending and savings choices around resource revenues, we apply a simple analytical model, which captures the most important relationships between these policy choices, the behaviour of resource revenues, investment returns, and the stabilisation and savings objectives of the SWF. The model is sufficiently flexible to operate in different economic conditions, to fit the contrasting country-scenarios, structural factors, policy preferences and requirements, as the calibrations show. A full discussion of the model is provided in the Technical Appendix.

4.2.1. An intuitive overview of the model

The assumption of the rules discussed in Chapter Two was that some portion of resource revenues transfer to the SWF. The first departure in the fully integrated model used in this chapter, is that we start from a position where all revenues are transferred first to the SWF, and that the SWF then makes transfers to the government according to a clear and fixed spending rule. Given that the government is assumed to favour a stable spending path, this rule stabilises transfers from the SWF – and, hence, government spending. This rule is a variant of the so-called ‘Yale-Stanford mixed rule’, widely used by other endowments and foundations, in which spending is based on a combination of the previous year’s spending and the value of the SWF.¹⁹

The SWF itself consists of two components: a Stabilisation Fund and an Investment Income Fund. The Stabilisation Fund holds a highly liquid, low-yielding portfolio, as it receives and makes large annual transfers in order to stabilise government spending, according to the spending rule. In the unlikely scenario that resource revenues are in permanent supply (not subject to a long-term decline), the Stabilisation Fund and the spending rule alone are sufficient to stabilise transfers (and, hence, government spending), even when underlying resource revenues are highly volatile.²⁰ There is thus no need to transform natural wealth into financial wealth. An Investment Income Fund is not needed, as the only challenge is that of stabilising the volatility of the resource.²¹

However, in a more likely scenario, in which resource revenues are expected to decline over time, the government needs to build-up an Investment Income Fund, if the policymakers want to maintain a stable level of resource-based spending once resources deplete (or, at least, reduce the pace of the decline). Over time, the income generated on this fund supplements – and ultimately replaces – the depleting resource revenue as a source of permanent income to the government. Once resource revenues have completely ceased to exist, the Stabilisation Fund will be run down to zero, as no new revenue inflows ‘feed’ the fund. The Investment Income Fund will then stabilise around a permanent level in real terms, if withdrawals are linked to the fund’s sustainable long-run real return.

¹⁹For an excellent and accessible overview of different spending rules, see Kaufman and Woglom (2005). The authors’ empirical analysis provides strong support for the superiority of Yale-Stanford mixed rules.

²⁰In a statistical sense, the assumption of ‘permanent’ means that revenues (in real terms) move within a steady range, which can, however, be quite wide, given the volatility of revenues, around a constant mean.

²¹Note, however, that even under the permanent resource scenario, the government may still wish to create a separate fund (or a tranche within the existing fund) that is invested in more risky assets in order to generate a higher return and raise the average size of transfers.

Under the two-fund version of the model, a full spending rule from the SWF (that is, the total transfers from both the Stabilisation Fund and Investment Income Fund components) is given by the following formula:

$$T_t = \alpha TS_{t-1} + \beta S_{t-1} + \delta E_{t-1}$$

Where: T is total transfers from both funds, TS is the transfer from the Stabilisation Fund, S is the size of the Stabilisation Fund and E is the size of the Investment Income Fund. The first two terms are akin to a Yale-Stanford mixed rule spending, based on a combination of the previous year's spending and the value of the fund. The parameters α and β are determined by policymakers' preference for stable spending, subject to some constraints around what is sustainable and prudent.²² The Investment Income Fund, which receives a share of annual resource revenues (for example, 10%, 20% or 50%), makes an annual transfer to the budget, based on its expected average long-run real investment return (for example, 4% or 5%, based on the fund's investment style and asset allocation), signified by a parameter, δ .

Assume that the share of resource revenues going to the Investment Income Fund is signified by the parameter, φ , which takes a value between 0 and 1. The value of φ reflects the preferences of policymakers, and the ability to forego current spending, in order to build up financial assets that can provide an alternative source of government income to the (depleting) natural asset. A higher φ suggest a great willingness and/or ability to pursue such savings from current resource revenues. If the government wishes to stabilise spending indefinitely (beyond the lifecycle of the resource), the choice of φ is no longer a discretionary choice, but becomes a technical optimisation problem, in which the savings from resource revenues need to be sufficiently large in order to create a financial endowment that replaces the resource asset. Likewise, if the government hopes to increase real spending along a certain path, plausible values of φ can be estimated that achieve this.

4.2.2. Data, assumptions and modelling process

The application of the model outlined above and in the Technical Appendix requires data on a number of key inputs and variables, particularly resource revenues and financial market returns. A brief description of the data follows:

4.2.2.a. Simulating future paths of random variables

The application of the model is forward looking, requiring some assumptions around the future path of resource revenues, and the returns generated on the Stabilisation Fund and the Investment Income Fund. In order to incorporate the volatility of these variables into the model, we randomised the outcomes in the following ways:

01. **Resource revenues:** the long-term (multi-decade) tendency of revenues follows the current best-guess forecasts used by the IMF, the World Bank and/or national governments. The, random fluctuations around that central tendency of 20% per annum are included – for example, if the country is forecast to generate \$100 billion in resource revenues in 2020, the randomisation process means it could take a value as low as \$80 billion and as high as \$120 billion.
02. **Investment Income Fund returns:** this fund is assumed to manage a diversified portfolio, with significant allocation to risk assets in order to generate higher returns. Based on historical financial markets performance, we assume a real return of 5% per annum, but the randomisation process means returns can be as low as -5% and as high as 15% in any given year.
03. **Stabilisation Fund returns:** the Stabilisation Fund is assumed to hold a portfolio of liquid, fixed-income assets, whose real return ranges from 1% to 3%.

Given the volatility permitted in the variables, there is a potential concern that any particular outcome from the model is driven by a combination of extreme results from the

²² See section 4.2.2.b and the Technical Appendix for a discussion of how the technical question of the calibration of α and β can be approached analytically.

randomisation process. In order to assess the range of possible outcomes – and to ensure that the model does not collapse or explode under a combination of extreme output – we employ ‘Monte Carlo simulations’ that run 100 combinations of randomised values for the variables discussed above.

4.2.2.b. Calibrating key parameters of the model

The values for α and β , which determine the size of and transfers out from the Stabilisation Fund; and the value for φ , which determines the size of transfers to (and long-term growth of) the Investment Income Fund, are the key parameters of the model. If the Investment Income Fund is to remain a source of permanent income, the value of δ should equal the fund’s expected long-run average real return, which can be based on the historical performance of long-run investors (pensions, endowments, foundations and other SWFs). Based on historical data, we model this to be 5% ($\delta = 0.05$).²³ The prudent policymaker has little leeway in adjusting the value of this parameter, as long-run returns reflect market-based returns to risk factors.

There are a number of feasible combinations of α and β that provide a satisfactory degree of stability in transfers (and, therefore, spending) from the Stabilisation Fund – as a general rule, a higher α requires a lower β , and vice versa. In order to stabilise spending, policymakers would wish to have as high a value for α as possible (as $\alpha = 1$ would completely stabilise spending). However, α cannot be implausibly large, as this risks generating explosive dynamics in the evolution of the Stabilisation Fund (depleting the fund if revenues are consistently low; and generating excessive growth in the fund if revenues are consistently high). Given the similarities in the model set-up and assumed volatilities of key variable between our model and that of Hausmann et al. (2014), we follow the latter’s

approach to the calibration of α and β . Hausmann et al. (2014) use Monte Carlo simulations to run 1000 iterations based on different outcomes of the randomisation process, and find that values of α up to a maximum of 0.7 stabilise spending, with zero probability of generating explosive or unsustainable dynamics in any of the 1000 random outcomes. For a fixed $\alpha = 0.7$, a range of β between 0.07 and 0.15 provides an optimal degree of stability, depending on the random outcome. A value for $\beta = 0.11$ (the mid-point of the range) can be regarded as providing a high degree of stability in spending, while also being robust to all plausible outcomes in the randomisation process. We, therefore, fix α and β at 0.7 and 0.11, respectively, in all four country cases, as this provides a satisfactory and robust solution to the stabilisation problem.²⁴

The spending rule is, therefore, calibrated with parameter values of $\alpha = 0.7$, $\beta = 0.11$ and $\delta = 0.05$ in all four cases, and is given by the following formula:

$$T_t = 0.7 (TS_{t-1}) + 0.11 (S_{t-1}) + 0.05 E_{t-1}$$

In countries with declining resource revenues, as the size of the Stabilisation Fund decreases, the size of the Investment Income Fund needs to grow by a similar magnitude, if spending levels are to be maintained as resources are depleted. Note that whereas the choice of values for α and β are largely a technical exercise, involving the calibration of the stabilisation policy that provides a satisfactory and robust reduction in the volatility of spending (compared to that of the underlying resource revenue), the choice of value for φ is more discretionary, involving a trade-off between current and future/permanent spending. A higher φ implies less spending in the near term in favour of higher spending levels in the future (including a higher sustainable permanent level spending that extends in perpetuity, even for countries whose resources have been depleted).

²³ Of course, we incorporate significant volatility around this, with real returns modelled to take values between -5% and 15% annually. See the Technical Appendix for further details.

²⁴ Note that as long as the values for both parameters remain within a feasible range of combinations, the results do not vary greatly. A significant reduction in the volatility of spending (relative to that of revenue) is still achieved and is robust to all plausible random outcomes that we simulate. See the Technical Appendix for a discussion of how a range of plausible combinations of parameters can be calculated.

4.3 Applications and insights from contrasting country cases

We applied the process described above to our four case studies: Saudi Arabia, Azerbaijan, Nigeria and Ghana. We provide a narrative description and motivation for the choice of parameter values and initial conditions in each case below, but a summary of these key assumptions per country is provided in Table 4.A.1 at the end of this chapter.

4.3.1. Saudi Arabia

We have assumed that Saudi Arabia had \$900 billion in previously accumulated foreign assets in 2014, which is split between the Stabilisation Fund (\$500 billion) and the Investment Income Fund (\$400 billion). In line with budgeted figures, total spending in 2014 is assumed to be \$230 billion. The rationale for adopting the two-fund version of the model is different from the standard case, in which an Investment Income Fund replaces declining resource revenues as a source of permanent income. In the case of Saudi Arabia, resource revenues are, in fact, assumed to be permanent (up to 2050), given the country's massive oil reserves. However, the need to establish an Investment Income Fund is driven by the need to not only maintain current levels of spending, but to raise it, as demographic pressures result in greater public spending on social welfare, food and fuel

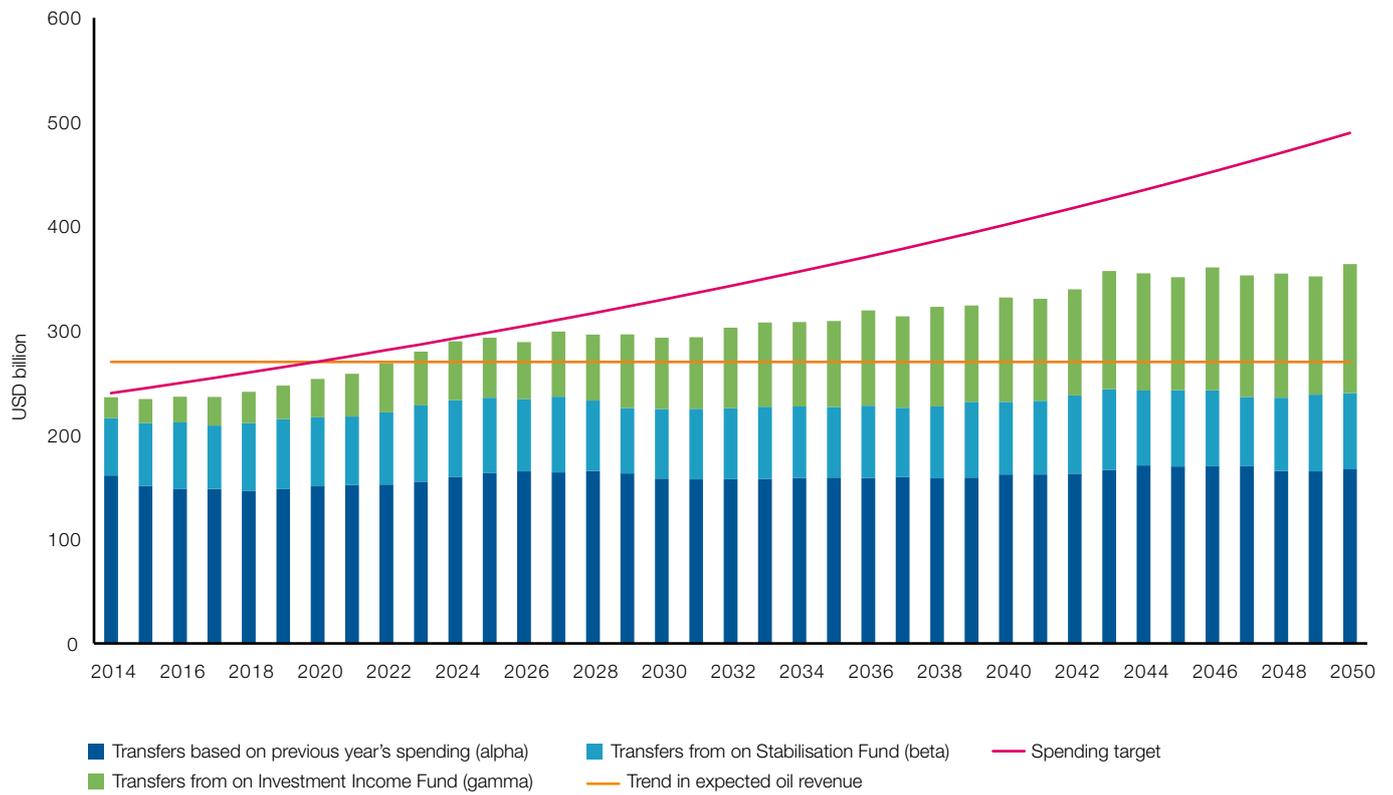
subsidies, and pension benefits. Beyond the stabilisation objective, which can be solved to a satisfactory degree with a Stabilisation Fund ($\alpha = 0.7$ and $\beta = 0.11$), the real challenge for Saudi Arabia is to allocate a portion of its revenues into a long-term savings fund that can generate a higher return and keep the level of spending in line with the expected spending path.

Figure 4.1 shows the output from the baseline calibration of the model for Saudi Arabia.²⁵ The blue line indicates the government's spending target (in real US\$), which is rising due to demographic pressures. Starting in 2014, the growth in real spending is 1% per annum, rising gradually to 2.5% by 2024 before declining gradually again from 2027 onwards. This spending target path can be used in calibrating plausible values for φ . Figure 4.1 shows the output of a calibration in which $\varphi = 0.2$ (i.e. 20% of revenues are allocated to the Investment Income Fund). In the graphs below, the bars show total spending, which comes from a combination of the three components on the spending rule:

- A percentage (70%) the previous year's spending, depicted by the light grey line;
- A transfer based on a percentage (11%) of assets in the Stabilisation Fund, depicted by the dark grey line; and
- A transfer based the long-run real return (5%) of the Investment Income Fund, depicted by the green line.

²⁵ Note that the line depicting resource revenues in this graph, and the ones that follow, shows the average or trend path (in the case of Saudi Arabia, we assume this to be flat in real terms). In reality, there will be significant variations in annual revenue around this path. Our modelling exercise, therefore, includes 100 randomly distributed revenue outcomes with up to 40% annual deviations around the trend path (not shown here for the sake of simplicity).

Figure 4.1: Baseline calibration for Saudi Arabia



The baseline calibration shown in Figure 4.1 ($\alpha = 0.7$, $\beta = 0.11$, $\varphi = 0.2$ and $\delta = 0.05$) achieves a number of desirable outcomes:

- It significantly reduces the volatility of spending relative to revenues. In repeated Monte Carlo simulations, the average standard deviation of spending is roughly half that of resource revenues.²⁶ This shows that the calibrated model would help achieve the stabilisation objective.
- By transferring 20% of revenues to the Investment Income Fund, the government is also able to maintain spending in line with the target path of rising real spending – at least for the first decade. The spending level enabled by the introduction of the SWF, however, starts to undershoot the target path from 2026 onwards. This suggests that the SWF would have to be bigger – in order to meet future spending through oil revenue and SWF income only, $\varphi > 0.2$. In the absence of a more aggressive build-up of the SWF, the government would have to either cut spending (i.e. a flatter spending target path) or raise non-oil fiscal revenue. It should, however, be noted that the model as calibrated is a considerable improvement on the scenario that would occur without a fund: beyond 2026, the SWF helps meet roughly half of the shortfall between oil revenues and the target spending path. This shows that the savings objective, which in this case is linked to the increased future spending needs of the country, is also being met.
- Finally, the two preceding objectives are achieved in a politically and economically feasible way – in particular, the initial reduction in spending (i.e. the dip at the very start of the sample period) is very small, given the significant increase in the level of spending that follows. This limited degree of austerity is the direct result of previous periods of savings, which enabled the Saudi calibration to start with initial values for the Stabilisation Fund of \$500 billion and the Investment Income Fund of \$400 billion.

The benchmark calibration also shows just how large the Investment Income Fund has to become in order to meet the target spending path implied by demographic pressures on government spending – if indeed the government is unable to cut per capita spending and/or fails to generate non-oil fiscal revenue sources. Even with the post-2026 shortfall shown in Figure 4.1, the real value of Investment Income Fund would grow to around \$1.15 trillion by 2025, \$1.83 trillion by 2035 and \$3 trillion by the end of the simulation horizon in 2050 (while the Stabilisation Fund remains anchored around \$600 billion).²⁷

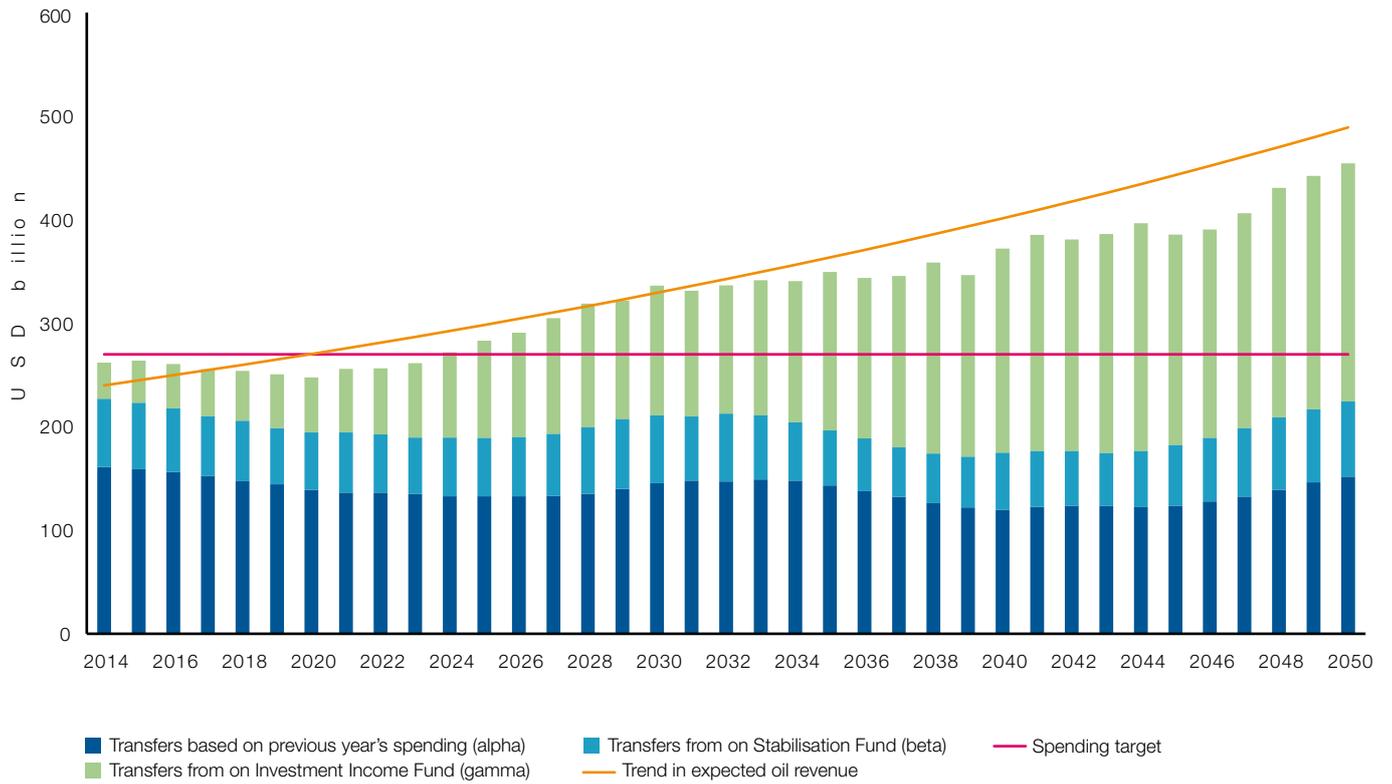
The Saudi Arabian case illustrates another very useful insight from the model: the impact of higher levels of previous savings. Assume that Saudi Arabia had already accumulated \$1,300 billion as of 2014, rather than \$900 billion – which would have been a plausible assumption, had the government consistently saved a relatively small portion of revenues since the mid-1970s during boom periods.²⁸ In that case, the Stabilisation Fund could start with an initial allocation of \$600 billion and the Investment Income Fund with \$700 billion. The calibration of the model shows that raising the transfer of revenue to the latter fund from 20% to 30% achieves a desirable degree of stability in government spending, as shown in Figure 4.2.

²⁶ The stabilisation coefficient, which is the ratio of the standard deviation of transfers to the standard deviation of revenues, ranges from 0.3 to 0.7, depending on the combination of random variables in any given iteration.

²⁷ Note that these numbers are expressed in real terms. The nominal value of the Investment Income Fund would exceed \$2 trillion much earlier (by around 2018), as discussed in Alsweilem and Rietveld (2015).

²⁸ Alsweilem and Rietveld (2015) estimate that if Saudi adopted a 20% savings rate, and choose to retain all investment income generated on those assets, the nominal value of total accumulated assets would have been even higher. They estimate total total accumulated assets of \$1.85 trillion by end 2014.

Figure 4.2: Alternative Saudi Arabia calibration with higher initial funds



The outcome shown in Figure 4.2 is striking for a number of reasons. First, it shows that spending now rises in line with the target path for a whole decade longer than in Figure 4.1. Second, once the shortfall emerges (around 2035) the cumulative gap between the target spending path and the level of spending permitted by the spending rule is considerably smaller – which means it would be much easier to finance through alternative revenue sources (or spending cuts). This very clearly underlines the value of previous savings – or alternatively, the danger and consequences of delaying savings if spending needs to rise and/or resource revenues are subject to a long-term declining trend.

Given that Saudi Arabia's current levels of previously accumulated assets are, in fact, closer to those used in Figure 4.1 than in Figure 4.2, it is clear that the government needs to pursue a combination of the following policies:

- Establish rules and structures that allow it to generate a higher return from the financial assets that it accumulates from oil revenue – in this model, this is approximated by the establishment of the Investment Income Fund.
- A spending rule anchored to the transfers from the Stabilisation Fund would reduce the volatility of annual government spending by around 50% compared to the volatility of oil revenues.
- Continue to accumulate and save a portion of future oil revenues – approximated in the model by a savings rule that transfers between 20% and 30% of oil revenues to the Investment Income Fund. The longer the delay in implementing such rules and policies, the larger the future shortfall between fiscal revenue (from oil and investment income) and the target spending path.

- Even with the establishment of a long-term Investment Income Fund, clear spending and savings rules around the transfer of oil revenues to the fund and the use of the fund's investment income, Saudi Arabia needs to establish non-oil sources of revenue or reduce its current level of per capita spending, significantly. The sooner the establishment of savings rules and a long-term Investment Income Fund, the less pressing the need for non-oil tax revenue and/or spending cuts.
- Finally, even if Saudi Arabia's apparently massive current holding of foreign assets is used to establish the rule-based framework shown in Figure 4.1, there is a need for a small reduction in total spending in the near term to place Saudi Arabia on a sustainable long-term fiscal path. The degree of upfront austerity is feasibly small, but would not have been required had Saudi Arabia saved more assets from previous booms – which underlines the negative consequences of delaying high savings policies further.

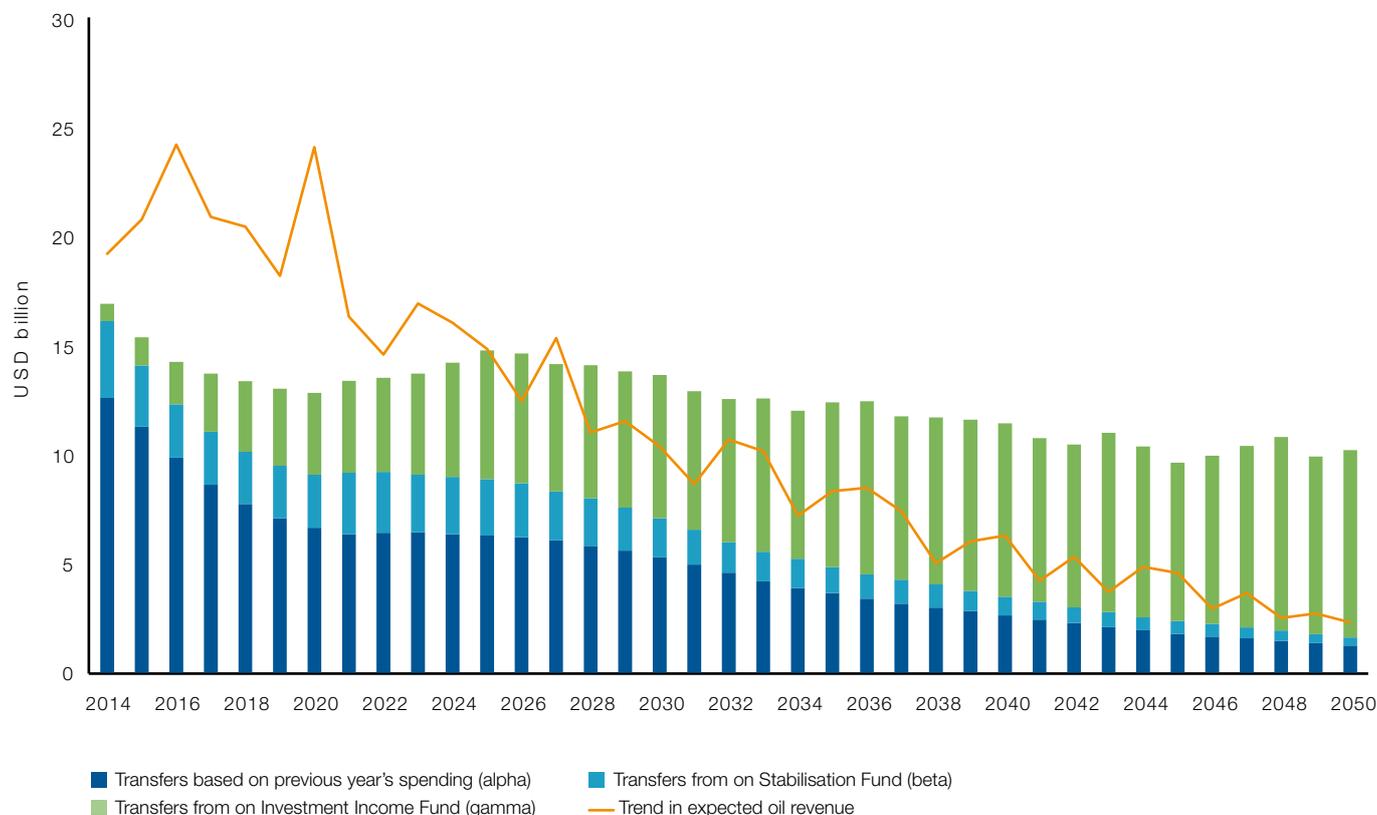
A continuation of the current status quo – in which emerging pressures on spending reduces the percentage of average annual oil revenue that is saved, and in which there is no formal move to establish and fund a long-term Investment Income Fund – will result in spending exceeding oil revenues and the income from previously saved revenues, within the next decade, possibly as soon as 2021. Even with the assumption of non-declining revenues, the 'business as usual' approach will result in a shortfall between revenue and spending that tends to get larger from that point onwards.

4.3.2. Azerbaijan

Our analysis of Azerbaijan assumes that annual oil revenue is currently at its peak – \$21.2 billion per annum. While production will continue around this peak level until 2019; from 2020 onwards, annual oil revenues decline at a rate of 7% per annum.²⁹ The level of spending, based on oil in 2015, is \$18 billion. In anticipation of this gradual decline in oil revenues, the two-fund model is necessary, in order to transform depleting oil assets into a permanent asset, to maintain and stabilise current levels of spending, especially since the government is currently heavily dependent on oil revenues (roughly one-third of all revenue comes from oil). SOFAZ holds \$38 billion in assets as of June 2014. Under the baseline scenario, this is the total size of initial capital to be allocated between the Stabilisation Fund and the Investment Income Fund.

The values of α , β and δ are again set as 0.7, 0.11 and 0.05, respectively. Given that SOFAZ currently holds the majority of its assets in low-yielding debt and money-market instruments (these account for a minimum of 80% of the fund’s asset allocation), it is effectively a stabilisation fund. We, therefore, assume in the calibration that of the \$38 billion held by SOFAZ, all of \$36 billion is allocated to the Stabilisation Fund component and only \$2 billion is initially held in the Investment Income Fund. We consider two possible scenarios for Azerbaijan: firstly, one in which φ is set so that spending is stabilised and maintained, despite steadily declining oil revenues (through the aggressive build-up of the Investment Income Fund at the expense of near-term spending); and secondly, one in which relatively high current levels of spending are maintained in the near term, but gradually reduce as oil revenues deplete (the focus here is on stabilising volatility and only somewhat moderating the decline in resource-based spending).

Figure 4.3: Azerbaijan calibration that stabilises spending in long run



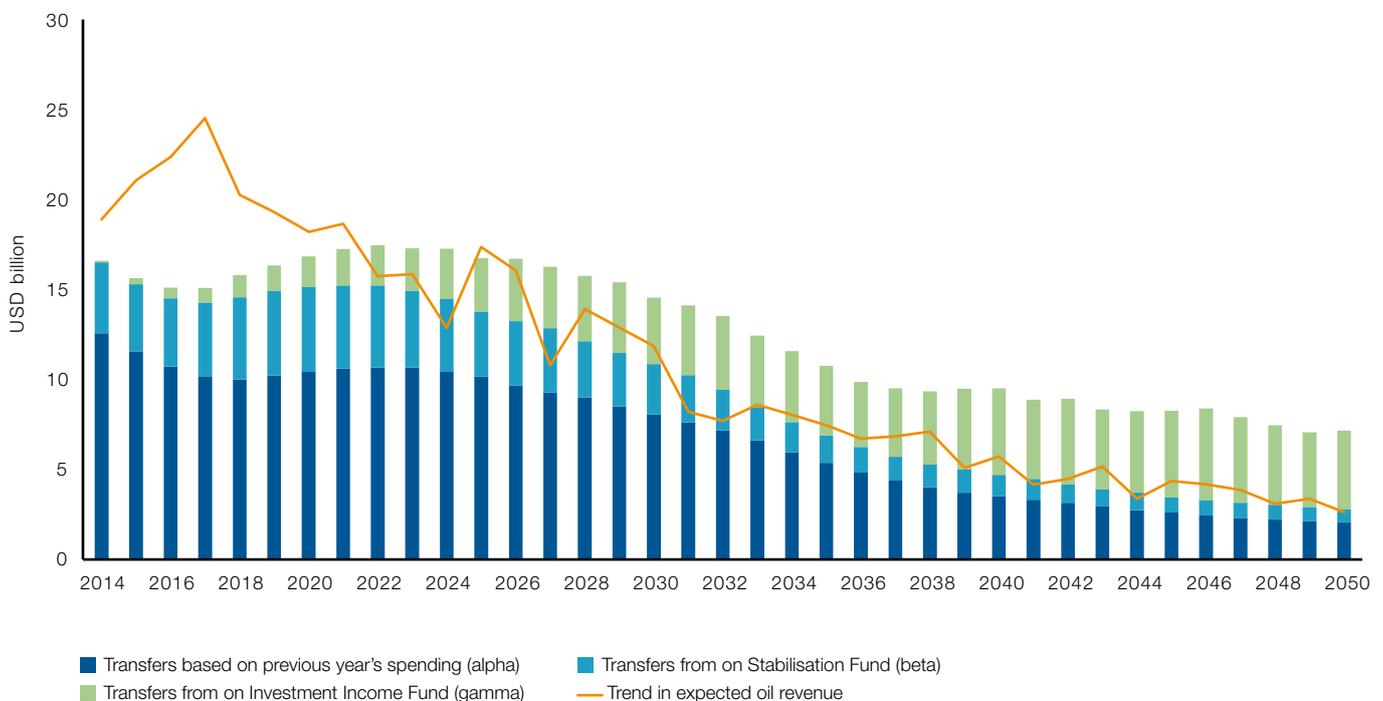
²⁹IMF. (2014). Republic of Azerbaijan: 2014 Article IV Consultation-Staff Report, 11 June 2014.

Figure 4.3 shows the outcome of the calibration that fits the scenario in which policymakers want to maintain the current level of spending in real terms, in the long run. As resource revenues decline, the income from the Investment Income Fund rises steadily, as indicated by the growing contribution of the green part of Figure 4.5. This is achieved by the rapid build-up of the Investment Income Fund, which grows to \$100 billion by 2024 and \$200 billion around 2044. This requires the transfer of 40% of future oil revenues ($\varphi = 0.4$). Note that spending levels still have to decline slightly in near term and continue to trend marginally downward until stabilising around \$13 billion permanently (when income from the Investment Income Fund dominates).

In the second scenario, shown in Figure 4.4, policymakers are more willing to trade-off lower future levels of resource-based spending, in favour of higher spending in the near

term. This approach could be justified by an ability to raise non-oil revenues in future, particularly if current oil revenues are successfully directed towards the diversification of the economy. This policy involves a less rapid build-up of the Investment Income Fund and a reduced transfer of 25% of oil revenues ($\varphi = 0.25$) – which is, in fact, closely aligned to what the Azerbaijani authorities currently do. This allows a high level of spending to be maintained for the 15 years of the forecast horizon, before spending starts declining along with oil revenues. By the end of the forecast horizon, when oil revenues have almost entirely disappeared, spending has dropped to below \$10 billion per annum. If, as suggested by this simulation, the Investment Income Fund reaches a level of \$140 billion by the time oil revenues stop, a 5% spending rate (based on the fund's long-run real return) would enable a permanent level of oil-based spending of \$7 billion per annum.

Figure 4.4: Azerbaijan calibration with gradual decline in spending



The policy implications from the calibration of the model for Azerbaijan can be summarised as follows:

- Given that the oil revenues are assumed to currently be at their peak and are subject to a secular decline within the next five years, the government needs to maintain a very high savings rate of at least 40% of future oil revenues, if it wants to maintain current levels of spending from oil revenues.
- The government could decide not to maintain the current level of oil-based spending indefinitely, trading off higher spending in the short term against future spending. This would then require raising alternative sources of fiscal revenue to finance increases in future public spending (recall that around one-third of government revenue currently comes from oil) – which are to be anticipated, given the country’s demographic profile and domestic development needs.

4.3.3. Nigeria

When it comes to the management of oil revenues, Nigeria has a troubled past. From the perspective of the calibration of the model, this is apparent from the fact that, unlike Saudi Arabia and Azerbaijan (and a large number of commodity-producing countries not considered here), Nigeria does not possess significant foreign assets accumulated during

previous revenue booms. The lack of initial funds means that the country faces a tough choice: either go through a period of significant austerity, in the near term, in order to build up such funds, or forego any efforts to maintain current levels of oil-based spending once resource revenues start declining.³⁰ These choices are all the more difficult given the country’s current dependence on oil revenues to finance public spending. In order to illustrate the effects of Nigeria’s difficult initial conditions and the policy choices its government has, we consider three different scenarios:

- **Scenario One:** we consider how the model could have been calibrated, if Nigeria had followed modest savings rules such as those discussed in Chapter Two, since 2003.
- **Scenario Two:** we show the extent of austerity and savings required if the government wishes to maintain a more or less steady level of real spending from oil-based revenue, given its low levels of assets as of 2014.
- **Scenario Three:** we consider a scenario in which the government gives up on any efforts to maintain current levels of oil-based spending in the long run, and only creates a Stabilisation Fund with which to stabilise the volatility of spending based on oil revenues – thereby leaving no financial legacy for future generations and raising the urgency of introducing non-oil revenue sources.

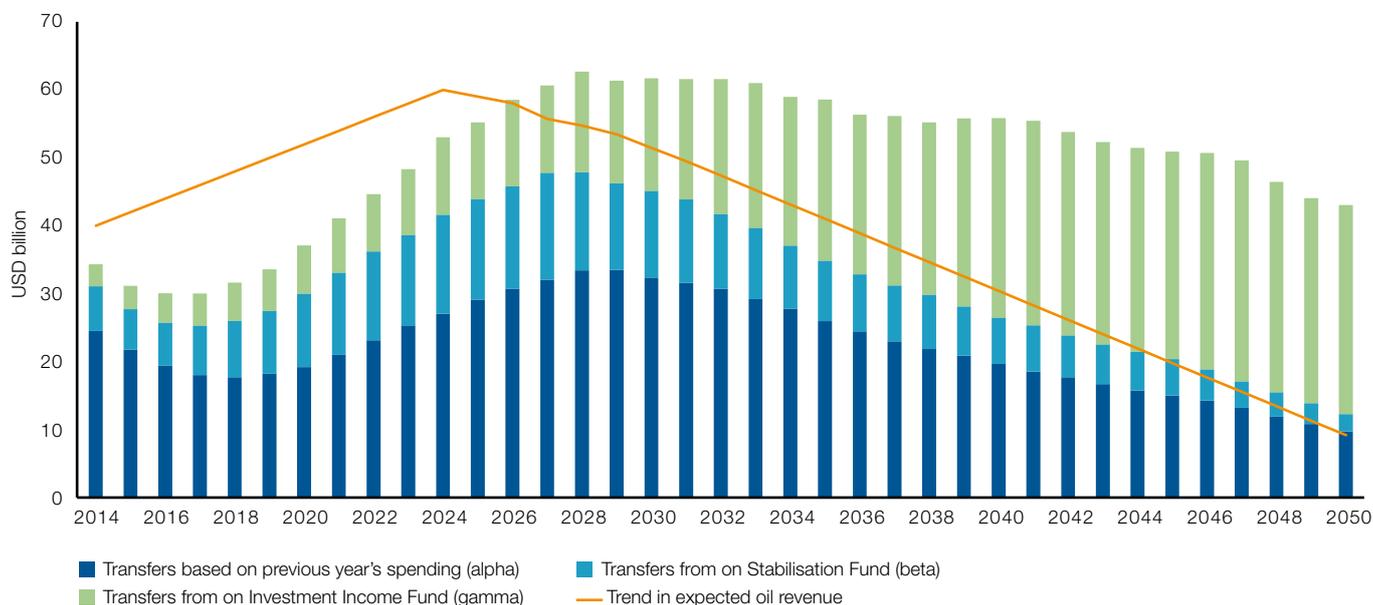
³⁰ Under some forecasts, this scenario is imminent given the lack of investment in Nigeria’s oil sector. In our scenarios, however, the decline in revenues is assumed to be gradual and only start after a decade of still-rising oil revenues.

Scenario One: What could have been?

If Nigeria had followed a simple savings rule, as described in Chapter Two, between 2000 and 2013 total accumulated assets of \$125 billion by 2014 would not have been an unrealistic starting point. From this, Nigeria could have established a Stabilisation Fund of \$65 billion and an Investment Income Fund of \$60 billion in 2014. Nigeria's oil revenues currently average around \$40 billion annually. Assume that this rises steadily before peaking at \$60 billion in real terms in 2023, and then gradually declining to \$9 billion in 2050. The same revenue trend assumptions will be used for all three scenarios. The level of oil-based spending in 2015 is \$35 billion.

With the standard values for the parameters α , β and δ (0.7, 0.11 and 0.05, respectively), a φ of 0.3 (30% of oil revenues transferred to the Investment Income Fund) provides a high degree of stability in spending, which rises steadily and can be maintained at a higher level, even when oil runs out. Figure 4.5 shows the outcome of this calibration. Spending decreases very slightly in the first five years, but starts increasing again, until real spending stabilises permanently around \$40 billion to \$50 billion, in the long term. The Stabilisation Fund is depleted as oil revenues run out, but the Investment Income Fund continues to increase and reaches \$500 billion by 2050.

Figure 4.5: Nigerian 'what could have been' scenario



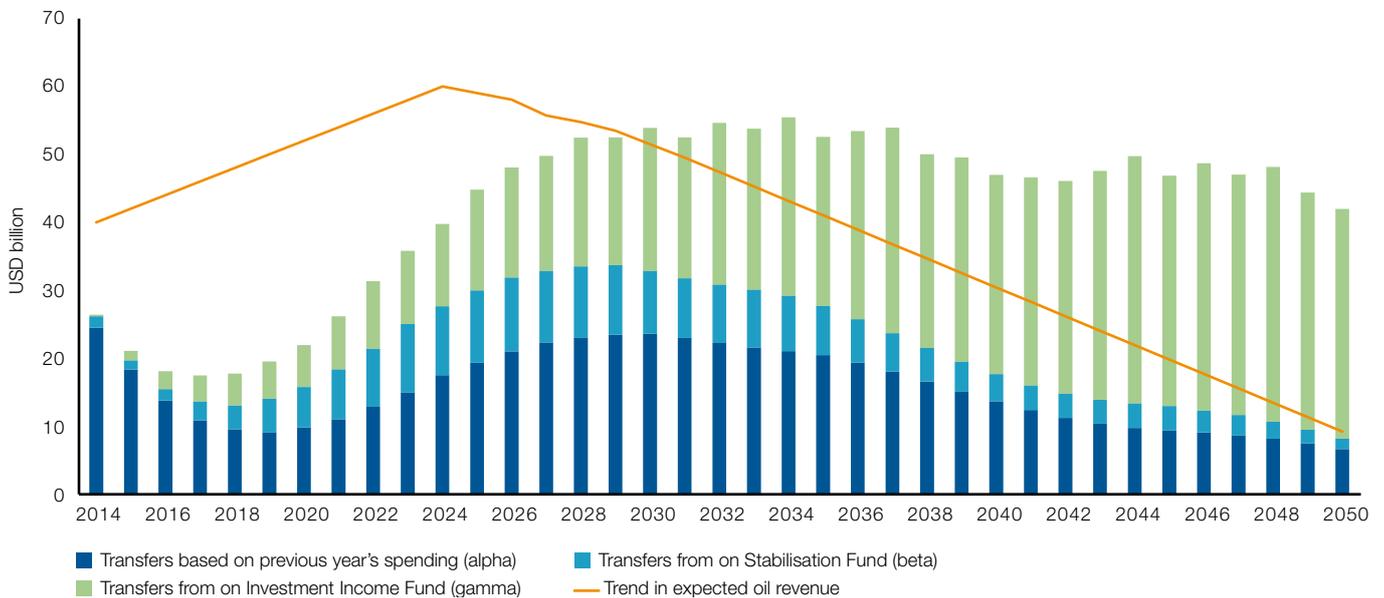
Scenario Two: Nigeria with low initial funds

Scenario One painted a fairly encouraging scenario for Nigeria: not only was a significant reduction in the volatility of spending achieved (relative to the volatility of oil revenues), but the real level of spending could rise and then be maintained to a high level long after oil production and revenue had stopped. A more realistic scenario would be to start with the assumption that Nigeria currently has \$20 billion in current savings, of which \$15 billion can be placed in the Stabilisation Fund and the remaining \$5 billion in the Investment Income Fund.

Again, we are using the standard values for α , β and δ of 0.7, 0.11 and 0.05, respectively. The calibration of the model shows that in order to provide stable spending in perpetuity, even when oil revenues are mostly depleted, an φ of 0.5

(50% savings) is required. Both the level of long-term spending (around \$50 billion) and the level of the Investment Income Fund in 2050 of around \$800 billion is similar to that of Scenario One, although both now appear to be trending downward, rather than stabilising. However, the key difference is that the degree of austerity in the early years is significantly heightened in Scenario Two. In this scenario, spending dips to a low of around \$16 billion in 2017 – less than half of the initial transfer of \$35 billion in 2013 – compared to the low of \$30 billion in Scenario One with \$125 billion in current saved assets. In other words, the cost to Nigeria of not having saved a share of resource revenues in the past decade, is that it needs to more than halve its spending of oil revenues in the next few years, in order to build up funds large enough to stabilise spending and have a permanent income stream in the long term.

Figure 4.6: Revenue and spending in tough austerity scenario with two funds



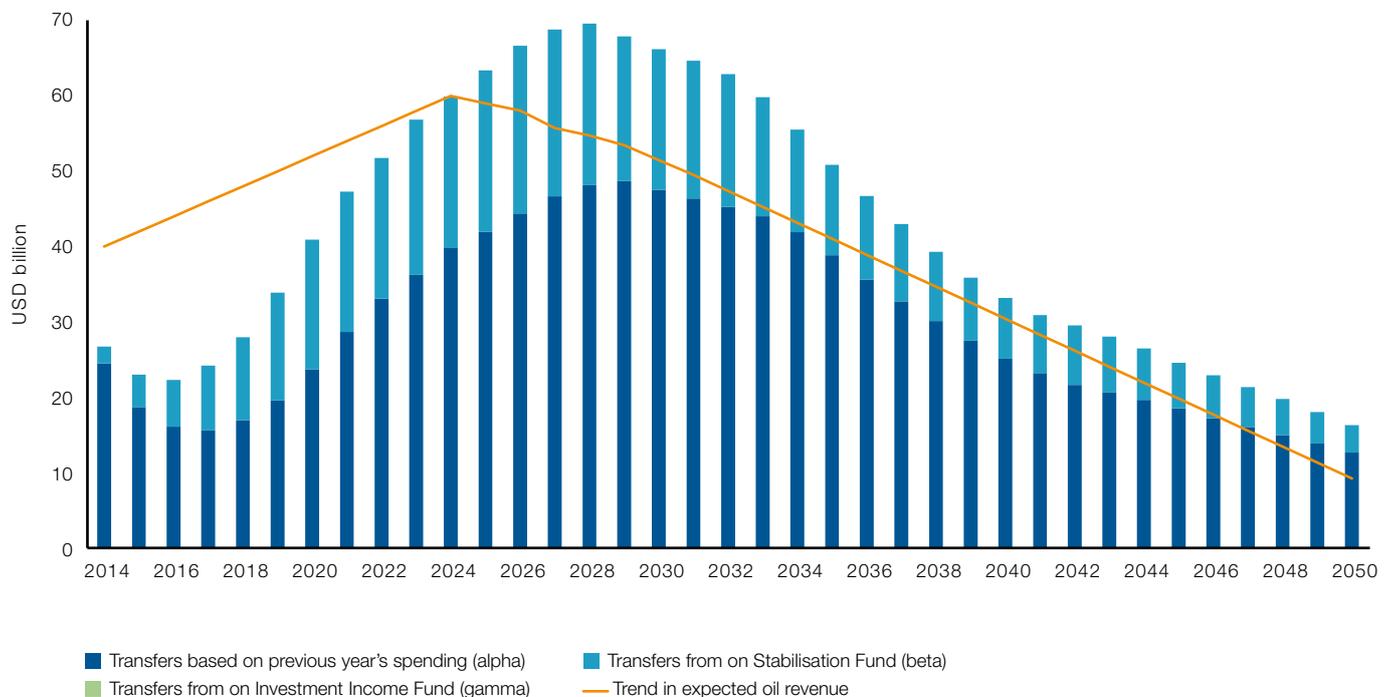
Scenario Three: Stabilisation only, no savings

In the final scenario, we again start from the more realistic assumption that Nigeria has no more than \$20 billion in saved assets from previous oil revenue booms. However, we now assume that the austerity demanded in Scenario Two is too much and is not politically or economically feasible. The government could argue that it does not need to establish a permanent income stream from oil, as over time the economy will develop and diversify, generating alternative revenue sources (arguably even more so if it uses oil revenues today to invest in much needed infrastructure and human capital). Therefore, the government could choose to abandon all efforts to build up a long-term Investment Income Fund and generating a source of permanent income from oil; and, instead, focus on stabilising oil revenues over the lifecycle of oil production. In terms of the calibration of the model, these choices would amount to Nigeria putting all of the \$20 billion in previously accumulated savings and

future oil revenues into the Stabilisation Fund ($\varphi = 0$) and not transferring any future oil revenues to an Investment Income Fund.

As shown in Figure 4.7, spending largely tracks the expected revenue profile (with a slight lag), with only a small cut in spending up front (which suggests that current spending is slightly higher than it should be and that Nigeria still needs to accumulate more assets in its Stabilisation Fund). While the oil revenue peaks in 2024 around \$60 billion, the consumption of oil revenues peak around five years later, at a slightly higher level of \$63 billion. The Stabilisation Fund peaks at around \$200 billion, which is significantly higher than in Scenario One and Two, as all the oil revenue is transferred to the Stabilisation Fund in the absence of an Investment Income Fund. The Stabilisation Fund tracks the oil revenue trend, and is gradually depleted as oil revenues decline over the horizon of the simulation.

Figure 4.7: Revenue and spending in the stabilisation-only scenario



The policy implications from the calibration of the model, under various assumptions and initial conditions, for Nigeria can be summarised as follows:

– The model underlines how difficult it is to achieve both stabilisation and savings objectives if: (i) the country has not taken advantage of previous oil revenue booms to build-up sufficient ‘initial funds’, and (ii) the country faces a long-term expected decline in oil revenues (even after initial increase).

– The choice set for policymakers inheriting this reality is as follows:

01. Do not attempt to implement the proposed framework until the country is able to accumulate a sufficient level of saving or initial fund levels. An increased awareness of this requirement could help ensure that the government saves a sufficient portion of any future revenue windfalls when it is easier to save (perhaps targeting a level of \$100 billion in saved assets, before adopting the proposed framework);

02. Undergo a potentially painful period of austerity – at least in terms of the consumption of oil revenues – the impact of which could be reduced by the introduction of new non-oil taxes on consumption, income and/or corporate income (which should rise rapidly if the non-oil economy is growing fast);

03. Forget about generating a permanent source of income financed by oil, and rather aim to stabilise oil revenue while it is available. This approach makes sense if the government is able to generate and grow non-oil fiscal revenues, such as consumption, income and/or corporate taxes.

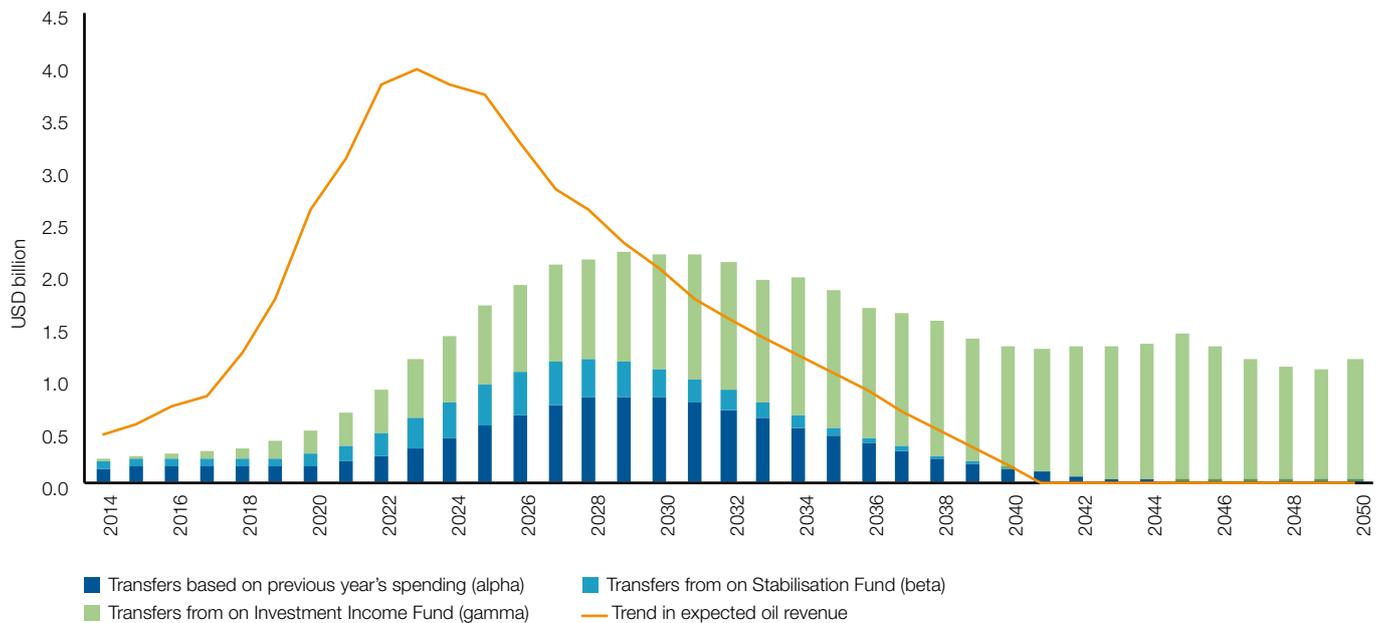
4.3.4. Ghana

Ghana is different from the three other countries discussed, having only recently started producing significant quantities of oil. Its level of oil revenue in 2014 is assumed to be \$470 million. Current expectations are for oil revenues to steadily rise in the coming years, peaking in 2022 at \$3.95 billion, then declining until production stops in 2040.³¹ Since annual oil revenues are expected to increase rapidly within the next decade – more than eight-fold – and then decrease sharply, uncertainty around the outlook for revenue is driven not only by the volatility of oil prices, but also considerable doubt over the size and timing of production levels (new discoveries are plausible and even likely, given the extent of recent investment and exploration in Ghana’s oil and gas sector).

In the baseline calibration of the model (Figure 4.8), this uncertainty and rapid rise in revenues suggest that the government should adopt a high savings rate ($\varphi = 0.7$) in order to provide stability in spending. Note that this high savings rate still permits a rapid rise in oil-related spending, and steadily raises the overall level of non-debt financed government spending from pre-oil levels.

³¹ As there is no consensus on long-term projections of future oil discoveries and production in Ghana, the revenue projection assumption we make is a fairly conservative one.

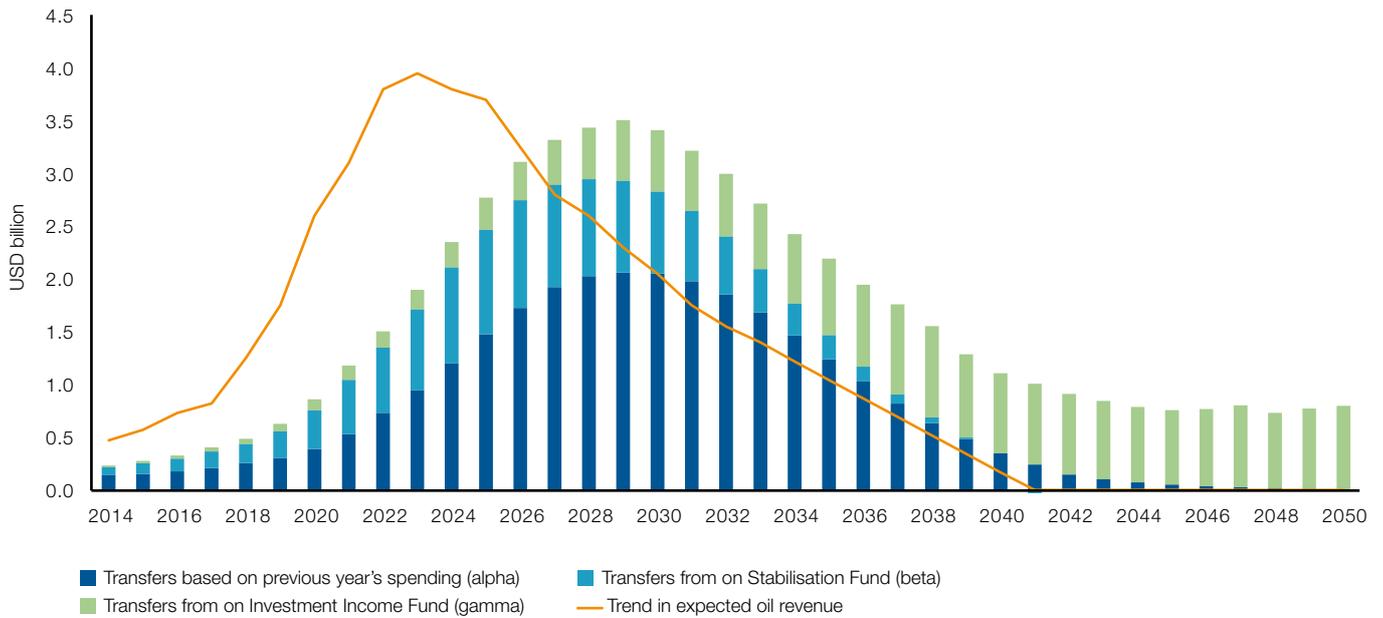
Figure 4.8: Revenue and spending in the baseline calibration – high savings rate



The baseline scenario assumes an initial fund size of \$1 billion, of which \$700 million is in the Stabilisation Fund and \$300 million is in the Investment Income Fund. Again, in line with the previous country scenarios, α , β and δ are set as 0.7, 0.11 and 0.05, respectively; while $\varphi = 0.7$ implies the highest savings rate of the four countries. The high φ can be attributed to the rapid increase and decrease in the oil revenues (i.e. production-driven volatility), as well as the fact that oil production will completely cease by 2040 – both facts necessitating the need for the rapid build-up of the Investment Income Fund, if spending is to be stabilised and maintained in the long run. The Investment Income Fund would increase to \$30 billion by 2032, which in turn stabilises the long-term transfer at a permanent level of between \$1 billion and \$1.5 billion per annum by 2040, the year oil production is assumed to cease. Note that spending still rises rapidly, albeit less dramatically than the underlying oil revenue.

Additionally, the stabilisation coefficient is 0.32, implying that the volatility of the transfers from the two funds is roughly one-third that of the volatility of the underlying oil revenue – the stabilisation objective has also been successfully met, even with a relatively high φ value which clearly achieves the savings objective. Of course, the government may wish to spend more of the oil revenue upfront – which implies a smaller φ of, say, 0.25. This calibration is shown in Figure 4.9. This shows a much more rapid ramp-up in spending – almost mapping, with a slight lag, the profile of expected oil revenues – with a considerably smaller contribution from the Investment Income Fund, and a level of spending that stabilises below \$1 billion in the long term (when oil production has ended).

Figure 4.9: Revenue and spending in the baseline calibration – lower savings rate



The following conclusions emerge from the calibration of the model for Ghana:

- Being a new resource producer, with low levels of resource dependence, provides scope for implementing sound savings and stabilisation policies, as it reduces the trade-offs (notably, sharp cuts in government spending) involved with this process.
- Given the sharp rise in oil production, Ghana would still see a significant rise in government spending – even under a highly conservative savings policy. This rise would, however, be stable, predictable and place Ghana on a path to maintain a high level of oil-based spending in perpetuity, long after oil production has stopped.
- Both calibrations of the model (Figure 4.8 and Figure 4.9) would be robust to any shocks to the level of oil production – for example, if new discoveries result in a secular rise in revenues above the expected path. Such a development would simply lead to a marginally faster ramp-up in government spending and a higher level of permanent spending in the future.

4.4 Generalised lessons from country-specific cases

The lessons from the calibration exercises for the four countries used in this chapter extend beyond the countries themselves. The underlying dynamics of these countries, particularly with respect to the extent of their previous savings, and the expected future profile of real government spending and oil revenues, can be seen as prototypical of the position other resource-rich countries currently find themselves in (and could find themselves in a few years' time). In short, the prototypical characteristics the four countries share with other resource-rich countries are:

- **Saudi Arabia:** significant previous savings with a stable resource production outlook, but with a rapid and sustained increase in government spending.
- **Azerbaijan:** some previous savings, but a gradually declining revenue production profile, and anticipated increases in government spending.
- **Nigeria:** limited previous savings, with a delayed decline in resource revenue and no immediate demographically driven spending pressure (providing some room to correct the current unsustainable path).

- **Ghana:** a new oil producer with a sharp, but relatively short, rise in resource production, whose current lack of dependence on oil gives it room to implement prudent savings and stabilisation policies.

The model and its calibration also suggests a number of more general lessons and implications for policymakers in resource-rich countries:

Firstly, high-savings policies may be appropriate – or indeed required – both in countries with declining and increasing revenues. The logic in these two scenarios is, however, different. In countries with declining revenues, unless very significant savings have already been amassed,³² the country will need to save a high portion of revenues in order to maintain and stabilise future spending beyond the lifecycle of the resource (if, indeed, that is a policy objective). In countries with rising revenues, high savings is both possible (given that the rise in revenues is supplementary to the existing revenues) and desirable (graduating the rapid ramp-up in spending, which can be hard to absorb; and creating an endowment through which to enable spending to be maintained by future generations). Moreover, due to the earning power of capital, getting savings policies correct at the initial stages of the resource lifecycle, makes maintaining and stabilising future spending considerably easier.

Secondly, the model presents a framework for both stabilising and maintaining resource-based spending. However, there is nothing that automatically compels countries to pursue the latter objective, which involves a clear trade-off in terms of a reduction in short-term spending. Governments may choose not to maintain current levels of oil-based spending in perpetuity – arguing that they need to spend and invest resource revenue now in order to raise productivity and develop infrastructure that will be needed to grow the non-resource economy. However, if this approach is pursued from a position of resource dependence, coupled with an expected decline in resource revenues, the country will face declines in government spending if non-resource revenues fail to grow in replacement of resource revenues. Raising non-resource revenues, notably through taxes on individuals and companies, could be difficult to achieve in future.

Thirdly, the stabilisation question is a largely technical one, involving relatively small trade-offs, whereas the savings

question is more a matter of preferences and judgment. There are no compelling arguments against the implementation of, and need for, stabilisation policies. The saving process has a larger political economy dimension: higher levels of near-term spending are foregone in order to have higher and permanent spending in future.

Conclusion

This chapter concludes Section I, which considered the economic aspects and policy challenges around SWFs. One of the repeated patterns – both in countries with resource- and reserves-based forms of sovereign wealth – is the need to separate assets held for stabilisation, risk management and crisis-prevention purposes, from those held for saving and income-generation purposes. This – together with the need to establish strong, rule-based processes and mechanisms for transferring assets in and out of the SWF – underlie the critical importance of governance and implementation strategies that coordinate SWF policies and actions across government sectors, while delineating a clear separation of roles, responsibilities and reporting lines. Using examples from actual SWFs, these topics are the subject of Section II of the report.

Recommendations

- Decisions around saving – or indeed stabilising and spending – resource revenues should not be taken in isolation. Rather, countries should establish a framework for assessing needs simultaneously, in a manner that takes country-specific structural features, needs, preferences and opportunities into account.
- Countries that are dependent on volatile resource revenues should establish a liquid Stabilisation Fund, with clear spending and savings rules, in order to maintain a steady level of public spending in real terms.
- In addition, if resource revenues are subject to long-term declines and policymakers wish to maintain public spending (or if the level of public spending needs to rise), the Stabilisation Fund should be complemented by an Investment Income Fund, which effectively transforms resource assets and revenues into financial wealth and revenue.

³² An example here is Kazakhstan. Hausmann et al. (2014) show that the country already has the required levels of savings to stabilise and sustain oil-based spending, having accumulated some \$64 billion in assets relative to a target level of oil-based spending of c.\$19 billion per annum.

Appendix

Table 4.A.1: Input assumptions per country

	SAUDI ARABIA	AZERBAIJAN	NIGERIA	NIGERIA (STABILISATION ONLY)	GHANA
Revenue trend	Average annual oil revenue in real terms remains stable (at \$270bn), with annual fluctuations (max 40%)	Remaining at peak until 2019, followed by gradual decline. Annual oil revenue is currently at its peak (\$21.2bn/year), which will continue until 2019. From 2020, annual oil revenues will decline at a rate of 7%	Annual oil revenue (currently at \$40bn) rises steadily, peaking at \$60bn in 2023, then declines to \$9.2bn in 2050	Annual oil revenue (currently at \$40bn) rises steadily, peaking at \$60bn in 2023, then declines to \$9.2bn in 2050	Annual oil revenue (currently at \$470mn) steadily rises until peaking in 2022 at \$3.95bn. Afterwards, oil revenues will decline until production stops in 2040
Initial spending	\$230bn	\$18bn	\$35bn	\$35bn	\$0.3bn
Initial revenue	\$270bn	\$21.2bn	\$40bn	\$40bn	\$0.46bn
Initial Stabilisation Fund AUM	\$500bn	\$20bn	\$60bn	\$40bn	\$0.7bn
Initial Investment Income Fund AUM	\$400bn	\$18bn	\$65bn	0.0	\$0.3bn
Alpha	0.7	0.7	0.7	0.7	0.7
Beta	0.11	0.11	0.11	0.11	0.11
Gamma	0.2	0.5	0.5	0.0	0.7
Additional assumptions	Growth in real government spending (peaking at 2.5% p.a. in 2024-2026, due to demographic dynamics)	X	X	Policymakers only care about stabilisation – no Investment Income Fund (Gamma = 0)	X





Section II: **Governing
sovereign wealth**

Chapter 5:

Rule-based policies and governance in resource-revenue funds

► Key messages

- In addition to establishing a sound policy framework for stabilising, spending and saving revenues, any resource-based SWFs ultimate success depends critically on issues of implementation, notably the rule-based nature of these policies and the governance arrangements around the fund.
- While it is not always easy to determine whether resource-based SWFs pursue rule-based saving and spending policies (that is, rules may exist that are not disclosed by opaque funds), there are excellent examples of clear policy rules for the more transparent funds.
- Good governance of SWFs refers not only to the institutional arrangements and intra-governmental reporting lines around these funds' operations, but also to the processes that determine how policy rules are made, assessed and potentially changed.

Chapter overview

The preceding section underlined the desirability of rule-based policies for transferring assets, revenues and investment income to and from an SWF. We identified the conditions under which it may be desirable to separate assets used for conventional policy purposes (fiscal spending in the case of resource revenues, and exchange-rate management and crisis prevention in the case of foreign exchange reserves) from those used to stabilise volatility of resource revenues, and save a portion of assets to create an alternative source of revenue and transfer wealth to future generations.

This chapter focuses on a number of resource-rich countries with SWFs and considers how they implement and govern the saving and spending policies of the funds – that is, the flow of money into and out of their funds. This, of course, brings the discussion closer to issues of country-specific political cultures and institutional histories. It is difficult to criticise SWF practices that may look deeply flawed, when judged in isolation and from an external viewpoint, but which may, in fact, be functional and pragmatically devised 'second-best' solutions and institutions. (Rodrik 2008). We, therefore, attempt to not only highlight good practice in general, but also understand why particular implementation strategies and governance frameworks have emerged.

5.1 Sources of funding: savings rules

Section I discussed a number of basic rule-of-thumb savings measures for resource revenues, as well as a more integrated model in which the savings rule or process is integrated with the spending objective: stabilising spending in light of the volatility and expected depletion of resource revenues. In practice, countries use a variety of approaches to determine the level and dynamics of transfers of resource revenues to their SWFs. While some countries have no rules (at least not binding or publicly disclosed rules), others have adopted simple, mechanistic rules akin to the rule-of-thumb measures, while a small number of countries have integrated savings and spending decisions in a manner comparable to that presented in the model used in Section I.

Norway

The primary source of funds for Norway's Government Pension Fund Global (GPF) is taxes and royalties generated from the extraction of oil and gas. The fund also manages net revenues from the government's sale of shares in Statoil, the national oil company, and other government equity in the sector. Finally, the fund retains returns on its investments (in excess of the 4% of assets transferred to the budget annually).

The process for allocating resource revenues starts with the transfer of all resource revenues to the fund – the government formulates an annual budget as if it had no resource revenues at all (the 'structural non-oil budget'). This non-oil budget is permitted to run an average long-term deficit equal to 4% of the SWF, which is covered by an equivalent transfer from the fund. The specification of this limit is based on what policymakers believe to be the sustainable amount of spending of resource revenues – and is equal to the expected long-term average real return generated on the fund's capital. In other words, the SWFs investment income finances the non-oil deficit: the bigger the fund becomes, the larger the transfer, and the larger the sustainable non-oil deficit.

One of the most striking aspects of the Norwegian model is the exceptionally large portion of its resource revenues that is transferred to its SWF. Norway's level of economic development, abundance of capital, quality of existing public infrastructure and ample alternative sources of fiscal revenue, make this highly conservative savings policy, viable – features that less developed and more resource-dependent countries do not share. Given its fairly limited degree of fiscal resource-dependence (non-oil revenues account for around 75% to 80% of revenue) and the very stable spending rule for its SWF, Norway is further in the unique position that it requires no Stabilisation Fund or mechanism. The savings and spending rules are sufficiently stabilising for the GPFG to be a pure Investment Income Fund.

Kuwait

In Kuwait, the General Reserve Fund (GRF) receives all government revenues, including all oil revenues (which accounts for 75% to 85% of total government revenue) and the GRF's investment income. From this initial allocation, funds are then transferred to domestic investments, the general budget and the Future Generations Fund (FGF) – Kuwait's long-term investment income fund managed by the Kuwait Investment Authority (KIA). While there is a publicly disclosed rule for the percentage of revenue transferred to the FGF, the allocation of revenues between the general budget and domestic investments under the GRF is less transparent.

The FGF originally received a fixed 10% of state revenues, including investment income, from the GRF each year. However, beginning in the fiscal year 2012-2013, the Council of Ministers raised the transfer rule to a fixed 25%. The savings rule for the FGF is, therefore, an example of the most simple rule-of-thumb measure: a fixed-percentage savings rule. As noted in Chapter 2, this type of rule has the advantage of being very simple – it is easy to understand and hard to manipulate. The disadvantage of this rule, as with all fixed-percentage rules, is that (if consistently applied) it yields transfers to the SWF that are in no way cyclically adjusted. The rule, therefore, requires the Kuwaiti government to maintain a steady transfer percentage, irrespective of whether resource revenues (in this case, oil revenues) are far above or below their long-term trend, potential or average.

Kazakhstan

The savings rule for the National Fund of Kazakhstan (National Fund) underwent a significant change in 2005, when the authorities clarified the type of funds that are to be transferred to the fund. It is useful, therefore, to contrast the savings rule that governed the fund from 2000 to 2004 with that which has applied since 2005. The 2000 to 2004 rule was ambiguous: the budget surplus, determined annually by the President, was deposited from the national budget into the National Fund. This imposed few constraints or discipline on the leadership and finance ministry of Kazakhstan, as they are under no obligation to run a fiscal surplus, even during times of booming oil and gas prices and rapid rises in production levels. In 2005, however, the President issued a decree that specified the following revenue sources as earmarked for transfer to the National Fund:

- Direct taxes on approved petroleum corporations
- Other income from petroleum operations, such as fines
- The proceeds from the privatisation of state mining and manufacturing assets
- Proceeds from sales of agricultural land
- Investment income generated by the Fund
- Other income deposited by the government that is not prohibited by law.

While the post-2005 clarification of the source of funds is an improvement on the preceding framework, it still leaves significant scope for manipulation by the political leadership of Kazakhstan. For example, the minister of finance and the minister of oil and gas jointly approve the list of petroleum corporations that pay the aforementioned taxes, and the list changes from year to year. The Kazakhstan savings process can be described as one in which certain types of revenue (or revenue categories) are earmarked for saving.

Chile

Chile is a great example of a resource-rich country that has adopted the kind of two-fund structure described previously in Chapter Four – one that combines its short-term stabilisation fund, the Economic and Social Stabilisation Fund (ESSF) and a long-term savings/income fund the Pension Reserve Fund (PRF). The ESSF was established in 2007 through an initial transfer of \$2.58 billion out of the old Copper Stabilisation Fund, which the ESSF had replaced.

The rules and procedures for transferring revenue to and from the Chilean sovereign wealth funds particularly the ESSF, are inextricably linked to the structural balance rule, Chile's more general fiscal rule. The structural budget balance is the surplus or deficit excluding automatic stabilisers – that is, the difference between the expenditures that would be made and the revenues that would be collected if the economy were operating at potential GDP and copper prices were in equilibrium. The process of understanding how far the economy is from potential GDP (and hence how big the structural budget surplus or deficit is) involves two advisory committees of the Ministry of Finance, who calculate potential GDP growth and the outlook for copper prices, respectively. These estimates are then used to formulate and calculate cyclically-adjusted fiscal revenue and spending.

The most interesting characteristic of the structural balance rule is that it is not static, but rather dynamic – it is contingent on cyclical fluctuations in GDP and copper prices

and revenues. The fiscal rule incorporates information on the business cycle, as reflected by deviations from potential GDP and cyclical deviations of the price of copper, from trend. In essence, the structural balance rule commits government to formulate fiscal policy as if GDP growth and copper revenues were at their long-term level – and the Chilean savings rule is therefore akin to the reference-price type savings rules described in Chapter Two.

Given the two-fund structure, it is important to understand the rule-based process that governs the allocation of savings not only to the Chilean SWFs, but also between them. A minimum of 0.2% of the previous year's GDP must be deposited into the PRF annually. If the effective fiscal surplus exceeds this amount, the deposit amount can rise to a maximum of 0.5% of the previous year's GDP. Additional deposits can be financed with funds from the ESSF at the discretion of the minister of finance. The PRF is currently capped at 900 million Unidades de Fomento (approximately \$37 billion, as of March 2014), while its assets under management as of January 2014 were \$7.4 billion. The ESSF receives all remaining fiscal surpluses, after deposits to the PRF have been made (minus any funds used for public debt repayments or advance payments into the ESSF made in the previous year). The ESSF has grown considerably since its inception, to a total market value of \$15.6 billion as of January 2014. If by 2021, withdrawals from the PRF are not greater than 5% of pension spending that year, the PRF will cease to exist and its remaining funds will be transferred to the ESSF.

Abu Dhabi

Under the Constitution of the United Arab Emirates (UAE), the natural resources and wealth are the public property of the Emirate in which they are located. Consequently, the Abu Dhabi Investment Authority (ADIA) 'receives funds of the Government of the Emirate of Abu Dhabi that are allocated for investment'. The process for allocating and transferring revenues to ADIA is not rule based (or any possible rule-based allocation is not disclosed). However, ADIA's assets are based on three sources:

- Budget surpluses, which arise from an excess of petroleum revenues. A precise definition for what constitutes 'petroleum revenues' is not provided, but in practice includes taxes on oil companies and profits from the Abu Dhabi National Oil Company (ADNOC).
- An undisclosed percentage of ADNOC's income is paid directly to ADIA and the Abu Dhabi Investment Council. The fourteen subsidiaries of ADNOC account for approximately 80% of Abu Dhabi's national income (ADIA reportedly receives around 70% of any surplus income and revenue from ADNOC, while the Abu Dhabi Investment Council receives the rest of the surplus).
- Income from investments generated by ADIA is reinvested.

Neither the Abu Dhabi government, nor ADIA, have disclosed the extent and profile of transfers of revenues to the ADIA or indeed Abu Dhabi's other sovereign investment vehicles. The savings processes around Abu Dhabi's SWFs can, therefore, be described as discretionary or non-rule-based – or at least based on informal and/or undisclosed rules. The lack of transparency around ADIA, including the rules and processes around how it receives assets, makes it very difficult to compare it to other countries or for external observers to evaluate the effectiveness of these policies. While such practices appeared to have worked reasonably well in Abu Dhabi – given its particular historical, institutional and political context – it is not generally an advisable approach for other countries to follow.

5.2 The use of sovereign wealth fund assets and income: spending rules

The spending rules and processes around SWFs determine how and when their assets and/or their investment income and proceeds are used. This section reviews the spending rules of the resource-based SWFs which we have considered.

Norway

The Norwegian SWFs assets are not explicitly linked to any liabilities. Despite the inclusion of 'pension' in its title, there are no formal links between the GPF and future pension liabilities or formal asset-and-liability matching. However, the implicit link to future pension liabilities is established through the fund's name and the frequent mention of long-term fiscal pressures on the Norwegian social safety net and welfare state due to challenging demographics. In addition to these implicit long-term liabilities, the fund's annual transfers to the general budget – currently capped at 4% of total fund capital, which is deemed to be an appropriate long-term real return on the fund's assets – serves as an implied short-term liability. However, this short-term liability is small, relative to the fund's total assets and the annual transfers of new funds in any given year, which means the fund's portfolio is not constrained by the need to maintain significant balances of liquid assets.

The 4% of the fund's capital, transferred back to the budget annually, is explicitly earmarked to finance the non-oil structural deficit. This transfer is not insignificant given the massive size of the fund: at its current value of \$840 billion, a 4% transfer amounts to around \$33.5 billion in redistributed fiscal revenue back to the budget. This should allow Norway to finance a structural non-oil deficit of as much as 6% of GDP in 2014 – although the Ministry of Finance has kept that deficit between 4.4% - 5.3% of GDP (or 3.3% - 3.9% of the fund) since 2010.

The Norwegian spending rule is an exceptionally well-designed one, given the country's needs. Firstly, it ensures that the spending of oil revenues are sustainable, as the fund's capital is inflation-protected, and not drawn down to finance current government spending (only real returns are spent). Secondly, it provides a very stable source of income, as the fund does not transfer actual, realised return (which can be volatile), but rather the sustainable long-term average return. Thirdly, the rule ensures that oil revenues do not crowd out other sources of revenue, as the size of the non-oil deficit may not exceed the investment income from the fund, creating incentives to keep raising non-oil revenues. Finally, the rule is also very ethical: future generations will have an equivalent claim to the income generated on the fund's capital – at least until that capital is drawn down (perhaps to fund some sort of pension reform process as the population continues to age).

Praise for the Norwegian model does not mean that it can simply be replicated in other countries. Above all else, poorer and more capital constrained countries may need to spend more of their resource revenues upfront, rather than only spend the investment proceeds generated by a fund created with those resource revenues. From a legal and governance perspective, it is also striking that the entire Norwegian saving and spending framework is not formalised in law, but rather rests on political consensus between the various branches of government and political parties. This may have worked (at least thus far) in Norway, but is not generally advisable in other contexts. Finally, one point of potential criticism of the Norwegian spending rule is that the government could reveal more about what it intends to do with the steadily accumulated capital of the SWF – while the fund's name (and it was renamed to include 'pension' in its title in 2006) suggests a link to future pension liabilities, this has not been made explicit at this stage.

“Norway's 4% spending rule is not intended as a cap, but as an average target – we can go below or above that figure in given years and we have, smoothing out consumption. This approach ensures the 4% rule retains its power as a disciplinary tool, but its flexible interpretation allows a degree of responsiveness to macroeconomic conditions.”

Martin Skancke, Former Head,
Asset Management Department,
Norwegian Ministry of Finance

Kuwait

There are no formal withdrawal rules around Kuwait's GRF, which essentially acts as part of the budget, and is subject to the policies of the Ministry of Finance and approval by the National Assembly. The only formal spending or transfer rule from the GRF is the 25% of funds transferred annually to the FGF, as outlined previously (part of the GRF's spending rule is the mirror image of the FGF's savings rule). The FGF's assets are locked into the fund by law and investment returns are reinvested. The assets are held and managed, to help meet future spending needs, but these liabilities have not been made explicit or been formally defined. Doing so will require the National Assembly to pass a specific authorisation law.

The general lack of transparency around the use of its oil assets and income is not a feature other countries should look to emulate.³³ However, the involvement of the National Assembly in authorising the future use of the FGF's assets and income is good practice, as it balances the power and oversight of the executive and legislative branches of government.

Kazakhstan

Since inception, the National Fund of Kazakhstan has undergone a number of important changes to its 'spending rule', first in 2005 and then again in 2010. From 2000 to 2004 there was essentially no spending or withdrawal rules. In 2005, the President issued a decree according to which withdrawals from the National Fund were supposed to be earmarked for exclusive use in financing long-term development programmes, rather than current budget expenditures. The amount was determined using the following formula:

$$S = C + rNF_{t-1} * FX$$

Where:

S = the transfer amount.

C = a three-year estimate of the average cost of budgeted development programmes.

r = a three-year estimate of the National Fund's real investment income.

NF_{t-1} = the value of National Fund assets at the start of the fiscal year.

FX = the exchange rate between the Kazakh Tenge and the US dollar.

There are a number of striking similarities between this spending rule and the one proposed in Chapter four – notably, the spending component tied to the real returns of the SWF and the component that tries to stabilise spending (in the rule in Chapter four, this is done based on the previous year's spending; while in the Kazakh case, this is done through three-year averages of budgeted development programmes). While this formula-based spending rule required legislative approval, there were a number of avenues through which it could be manipulated in order to generate larger transfers. For example, the classification of expenditure as development programmes rather than current expenditure, estimates of the costs of such programmes and the anticipated investment income generated by the fund were all levers through which to withdraw a larger amount from the National Fund than that consistent with long-term savings and sustainability. Moreover, one-off withdrawals, called 'targeted transfers', were also permitted – and indeed authorised in 2008 – 2009 in order to finance Samruk-Kazyna, a state development fund, and KazMunaiGas, the national oil company. Targeted transfers totalled approximately \$7 billion.

Since 2010, transfers are anchored around a nominal amount of \$8 billion per year, which can be adjusted by 15% by parliament, depending on the state of the economy and can be used to fund current budget expenditures and development programmes. In addition, the balance of the National Fund cannot fall below 20% of GDP in a given fiscal year – if it does, the shortfall has to be covered by cutting the fixed annual transfer by the amount needed to cover the difference. Finally, withdrawals to cover the National Fund's operational expenses and annual external audits are permitted. In summary, the Kazakh spending rule has gone from being highly discretionary, to being based on a dynamic formula, to a simple fixed transfer amount – while the first change was clearly a significant improvement, it is not clear that the latest change (judged in isolation) is similarly a step in the right direction (although the 15% band does allow for some flexibility and cyclical adjustment).

³³ Given the troubled history Kuwait has enjoyed with its neighbours, particularly its invasion by Iraq in 1990, it has been suggested that revealing the size of the country's SWF assets would put it at risk of future conflict.

Chile

Transfers from Chile's PRF and ESSF are governed by different spending rules. The use of assets and/or investment proceeds from the PRF can be used exclusively to pay for pension and social welfare liabilities. Current provisions differentiate between a spending rule until 2016 and a new process after that date:

- Until 2016, only the previous year's real return on the PRF may be withdrawn and spent.
- From 2016 onward, annual withdrawals from the PRF cannot be greater than one-third of the difference between that year's pension-related expenditures and 2008's pension-related expenditures (adjusted for inflation).

Withdrawals from ESSF can be made, at the discretion of the finance minister, to fund the PRF, cover a shortfall in government revenue overspending, and to pay down debt. However, all withdrawals are subject to the structural balance rule, which puts the emphasis of Chilean fiscal policy on the need for counter-cyclicality and long-term sustainability (particularly, the avoidance of unsustainable spending from temporary copper-driven revenue booms). For 2014, for example, the Ministry of Finance has calculated the target structural balance to be a 1% deficit, indicating the need for withdrawals from the ESSF, rather than deposits (which are required when there is a structural surplus).

Abu Dhabi

As with the source of funds (savings rule), the liabilities (spending rule) of ADIA are not clearly articulated or underpinned by a publicly disclosed rule or formula. By law, ADIA is required to make funds available for withdrawal by the government whenever needed; however, such withdrawals occur infrequently and are limited to prolonged periods of historically low petroleum prices and consequent fiscal revenue shortfalls. There is a clear separation between ADIA, which invests in financial assets outside the region for long-term financial returns; and the general public investment and spending of the Abu Dhabi government through the fiscal process and its domestically- and regionally-focused sovereign investment vehicles.

5.3 Governance of savings and spending rules

It is generally desirable to delegate certain operational powers of the management of an SWF – particularly a long-term savings or investment income fund – to an independent authority. Against this, governments (as owners of the assets), in all cases, retain a high degree of control and representation in formal oversight structures and functions, including the enforcement of saving and spending rules. In practice, there is a significant degree of variation around which institutions, or combination of institutions, are responsible for determining the key strategic direction and parameters of the SWFs, although it is very common for the Ministry of Finance to establish at least the strategy, objectives and risk tolerance of the fund, with varying degrees of consultation and delegation around how this broad guidance is operationalised and expressed.

This section outlines the most salient features of the inter-institutional governance structures of various resource-based SWFs, including the governance of the savings and spending rules described previously.

Norway: consensus-based regime

The fiscal-rule framework, introduced in 2001, determines the flow of oil revenues and investment income in and out of Norway's SWF. Both the savings rule and the spending rule are not legally binding, but rather came about through a broad consensus around the prudence of the fiscal rule. The current rule-based approach enjoys the support of the ministry of finance, the parliament and Norges Bank Investment Management (NBIM), all of which play key roles in managing the GPF. However, it is consensual and can, at least in theory, be changed if the relevant parties agree. The spending rule is, arguably, the most likely element of such change, as it is based on the expected sustainable long-term real return of the fund.

The ministry of finance, NBIM and external experts have agreed in recent years that a 4% annual real return is feasible, and is an appropriate amount to transfer (as permanent income) back to government to finance the non-oil structural deficit. However, this expectation is potentially dynamic and largely out of policymakers control

(that is, the fund's expected return is partially exogenously determined). In late 2013, for example, the governor of Norges Bank suggested that it may need to be lowered to 3% due to lower returns in global financial markets. The process of changing the spending rule in light of lower expected returns on the portfolio would involve external consultation and research, but is likely to be driven by the ministry of finance and Norges Bank Investment Management, in consultation with parliament. It appears that there is a strong institutional bias towards preserving the 4% spending rule: the Norwegian finance minister has dismissed calls to lower the rate to 3%, arguing that it would set a precedent to subsequently raise it to 5% or 6%.

Norway's consensus-based approach to spending and saving sovereign wealth is supported by its inter-institutional approach to managing and overseeing its sovereign fund. The Norwegian model involves a number of public sector entities, each with clearly defined roles and responsibilities, and exceptionally high reporting and disclosure requirements and practices. The distribution of core responsibilities and reporting lines around the GPFG are as follows:

- The **Norwegian parliament** passes legislation governing the fund, approves the annual budget, appoints the Supervisory Council and reviews reports on the fund's guidelines, strategies and performance prepared by the Ministry of Finance, the fund's operational investment manager and auditors.
- The **minister of finance** acts as fund owner (on behalf of citizens) and determines the fund's broadest strategic orientation (as reflected in its Strategic Asset Allocation). The ministry delegates all operational management, the small degree of discretionary powers around the strategy and the selection and monitoring of external managers to a dedicated team within the central bank, through a clearly articulated mandate that includes investment guidelines, ethical standards, risk management and internal control.
- The **Central Bank Executive Board** is the fund's operational manager. It further develops the investment mandate of the fund in line with the strategy developed by the Ministry of Finance, and establishes principles of risk

management and internal management for NBIM, the dedicated investment management unit within the central bank. The Executive Board is subject to an internal audit; and is part of a separate governing structure for the management of the SWF, rather than for other aspects of the central bank (such as monetary policy and financial supervision).

- **Norges Bank Investment Management** is a dedicated asset management department within the central bank and is the day-to-day, operational fund manager (it also manages other public funds and the central bank's foreign exchange reserves). It implements investment strategy and exercises the relatively small degree of active management that is permitted by the fund's owner.
- The **Supervisory Council** supervises the central bank's activities (in general, not only of NBIM). It has the right of access to information and investigative powers. It reports to the parliament, who also appoints the 15 members of the council. Appointments are for four-year terms with the possibility of re-appointment twice (twelve years maximum). Every other year, up to half of the membership is reappointed or replaced. The chairman and deputy chairman are appointed for two-year terms.
- The **Auditor General** performs an audit of the fund and the operations of NBIM, and reports to the parliament and the government. In addition, an **external auditor** is appointed and reports to the Supervisory Council.

As has been widely noted in literature on SWFs, Norway has exemplary governance structures. While other funds may find it difficult to implement similar structures given political constraints and local public-sector practices, the Norwegian governance arrangements rest on three characteristic features: (i) a profound commitment to transparency and public disclosure that incorporates strategy, operations and intra-governmental oversight; (ii) the separation of powers and responsibilities across various stakeholders and public institutions; and (iii) generating a stable consensus between these institutions through a highly consultative and representative process. One of the most striking features of the Norwegian model is the number of critical policy choices around the SWF that are not contained in law, but rather rest on a broad political and public consensus.

Kuwait: a partially law-governed regime

The annual 25% transfer of funds from the GRF to the FGF is mandated by law. There is currently no spending rule for the FGF, as the portfolio simply grows over time and investment income is reinvested – however, any future decision to deploy the FGF's assets and/or income will require will require the National Assembly to pass a specific authorisation law.

Kuwait's more formal, legal approach is necessary, in part, due to the state's creation of 'an independent public authority' in the form of the KIA to manage its sovereign wealth. According to the KIA, its 'long-established autonomy...helps assure that its investment decisions are based strictly on commercial, rather than geopolitical, considerations.' This autonomy is, however, balanced by a high degree of broad government representation in the senior structure around the SWF: the KIA's board of directors contains key ministers (including the minister of finance, who chairs the board), the governor of the central bank and appointed independent officials – and the board enjoys extensive powers in overseeing the operational management and strategies of the KIA, and in appointing its most senior officials. The management and operational staff of the KIA consist of civil servants who do not hold political office.

The KIA reports, through its board of directors, to the council of ministers, the National Assembly and the State Audit Bureau. Senior representatives of KIA report periodically to the National Assembly's various committees (including the finance and economic committee, budget committee, and closing accounts committee) to discuss any issues raised by the State Audit Bureau, who have onsite representatives working in the KIA. The accounts of the KIA are jointly audited by two of the world's leading external audit firms. The board of directors, appointed by the council of ministers, has ultimate responsibility over the organisation and its funds.

The KIA's size and track record (it is one of the world's long-standing SWFs) has made it a credible organisation with a high degree of expertise and professionalism. Moreover, the KIA is accountable to a number of public institutions in Kuwait, who provide oversight of the organisation and its funds, but public disclosure and transparency around specifics of the KIA's saving and spending rules and its funds' portfolios remains somewhat limited.

Kazakhstan: centralised, non-arms-length regime

The National Fund of Kazakhstan is characterised by an exceptionally high degree of centralised authority and oversight, with the President serving as the highest reporting authority of the fund and as a member of the powerful management council. The transfer of funds in and out of the National Fund is governed by presidential decree, the most recent (and current) of which empowers parliament to authorise annual deposits and withdrawals from the National Fund. These transfers are guided by clear, publicly disclosed principles, although the governing framework allows for significant drawdowns in times of economic pressure.

The most recent framework for savings and spending around the National Fund is an improvement on the fund's initial institutional arrangements, which rested almost entirely on the exercise of presidential discretion. As discussed earlier, steps have been taken to introduce a more rules-based framework for deposits and withdrawals from the fund, although the frequent changes to these rules, the remaining scope for the manipulation of the key variables in the rules, the possibility of large withdrawals, and the lack of independence of the management council mean that the political leadership, particularly the President and senior ministers, still have a high degree of control and discretionary power over the fund. A striking feature of the institutional structure of the Kazakhstan fund is the formal recognition of the President as the highest reporting authority for the fund (something that is typically either avoided, or only implicit, in other SWFs). Much of the authority for establishing the National Fund's policies and investment strategy rests with the management council, which includes the President alongside senior government officials. The inter-institutional governance structure for the National Fund is as follows:

- **The President:** officially recognised as the highest reporting authority of the National Fund. The President created the National Fund and the management council, on which he sits, through presidential decrees.
- **The management council:** consists of the President, key economic policy ministers and other high-ranking officials (including representatives of the legislature). The management council sets all key governance, operational and investment policies for the National Fund.

- The **minister of finance** and the **minister of oil and gas** jointly approve the list of petroleum sector companies whose taxes are deposited into the National Fund, while parliament passes laws determining small variations in the amounts transferred from the fund annually.
- The day-to-day investment management of the National Fund is the responsibility of the **National Bank of Kazakhstan**. The central bank selects and oversees the fund's external managers of its equity portfolios.
- The central bank is subject to **external audits**, which include its activities in relation to the investment of the National Fund's assets. These details of these audits are not made public.

Although the National Fund is established in Kazakh law as an independent institution and operational management is delegated to the central bank establishing some autonomy, the power vested in the management council – and, moreover, the President's prominent position on the council, underlines the high degree of centralised power and executive control over the fund, making it one of the least independent SWFs in practice (at least under the current institutional arrangements).

Chile: a fully law-governed, rule-based regime

The rules governing the flows in and out of Chile's two sovereign funds, and indeed the funds themselves, are established by law in the form of the Fiscal Responsibility Law, passed in 2006. The legal foundation of the strong rule-based saving and spending procedures means that there is little discretion vested in the hands of the President, ministry of finance or the parliament to change them. On the savings-rule side, there is potentially some room for discretion and manipulation through the estimation of the two key variables in the rule: anticipated deviation from trend GDP and expected copper prices and revenues. However, in both cases, the estimation of these two variables is placed in the hands of dedicated independent expert committees. The advisory committee for GDP growth estimations consists of 16 members, while the committee on copper revenues consists of 12 members – all are appointed by the ministry of finance. On the spending-rule side, the provisions described in the previous section are established in law, which limits the scope for discretion or abuse of the sovereign funds.

The allocation of roles and responsibilities around the management of the Chilean SWFs is also largely law-governed. The roles, responsibilities and reporting lines for the ministry of finance are established in law, and by ministerial decree for the central bank (issued in 2006) and the financial committee (issued in 2007). They can be summarised as follows:

- The **Chilean Congress** passed the legislation authorising the funds and receives monthly, quarterly and annual reports from the ministry of finance.
- The **comptroller general** performs an audit of the ministry of finance's activities (including the fiscal rule and sovereign funds), and reports to the Congress. Independent **external auditors'** reports are included in the report of the general treasury.
- The **ministry of finance** determines investment and internal management policies for the sovereign funds, while the general treasury, Chile's revenue service, is responsible for accounting and preparing audited reports on the funds. The fiscal rules framework determines transfers of revenues to the sovereign funds, with significant input from expert panels appointed by the ministry.
- The **financial committee** is a panel of experts, appointed by the ministry of finance, which provides advice on the funds' management and investment policies. It releases its own annual reports and minutes from meetings, separate from those of the ministry.
- The **Central Bank of Chile** manages the funds' investment portfolios, with a portion (currently around 35% of all assets of the PRF) delegated to external fund managers. The central bank also appoints and monitors the performance of external fund managers and custodians.

The prominence of the ministry of finance in the institutional arrangements of the Chilean funds is, in some respect, an exception to the tendency towards autonomy for SWFs, particularly long-term savings funds such as Chile's PRF. However, this high degree of ministerial control is counter-balanced by exceptional transparency and disclosure, a very simple and non-discretionary investment strategy, and SWF governance that is embedded in a rule-based fiscal framework. In the case of Chile, it could be argued that discretionary powers are not delegated to an independent authority, exactly because the rule-based framework and investment strategy does not permit much discretion in the first place.

Abu Dhabi: partially law-governed regime

The governance arrangements and rules around the allocation and transfer of oil revenues and the use of the Emirate's SWF assets and income are not publicly disclosed in Abu Dhabi. The government has not disclosed rules or procedures for such distributions, or the decisions around the allocation of assets between Abu Dhabi's various sovereign investment vehicles. However, Abu Dhabi has increasingly disclosed information regarding its institutional arrangements for managing its sovereign wealth. The ADIA was established, in law, as an independent government investment institution in 1976, with minor changes to the law governing it, being made in 1981. ADIA is wholly owned by and subject to supervision by the Abu Dhabi government. ADIA carries out its investment programme independently and without reference to the Abu Dhabi government or the other institutions that also invest funds on behalf of the government.³⁴ The law establishes a separation of roles and responsibilities among the owner, the governing entity and the management as follows:

- The **government of Abu Dhabi**, under the former Emir of Abu Dhabi, passed the legislation creating ADIA; and is the legal owner of ADIA and its assets.

- The **board of directors** provides oversight over ADIA's management. The board's members are appointed by the Emir of Abu Dhabi, with over half of its members coming from Abu Dhabi's ruling family. The Emir also serves as the chairman of the board.
- The **managing director** of ADIA is responsible for investment and operational decisions and reports to the board of directors, of which the managing director is also a member.
- The **investment committee** advises the managing director on investment policy and external manager selection and performance (around 75% of ADIA's assets are reportedly managed externally).
- An **internal audit** department reports to the managing director and the board of director's audit committee; while the **audit committee** oversees and appoints two external auditors.

The institutional arrangements around ADIA, can best be described as promoting operational independence through the managing director and investment committee, while retaining a high level of political control and representation in the oversight functions and structures.

³⁴ The Abu Dhabi Investment Authority has made great strides in recent years around the disclosure of its mandate, objectives and strategies – however, it remains one of the least transparent sovereign funds in the world, including around the true degree of autonomy versus government oversight and management of the fund.

Conclusion

This chapter has considered the myriad of practical approaches governments have taken to the governance of savings and spending rules, and institutional delegation and the separation of powers around the management of SWFs. The countries and funds profiled in the chapter – Norway, Kuwait, Kazakhstan, Chile and Abu Dhabi – use a number of different savings and spending rules, and have a wide-ranging set of institutional arrangements that govern the operation of those rules, ranging from political and public consensus, to ministry-level policy frameworks, to laws and decrees.

The chapter also considered the ways in which countries have resolved a familiar tension in public policy: balancing the need or desire for operational independence (for the manager or investor of sovereign wealth), with that of preserving a degree of government control and oversight of such delegated authority. All cases share three governance features:

A degree of delegated authority to an independent institution, which is at a minimum responsible for operational aspects, but can also exercise discretionary powers.

Mechanisms and processes to ensure government oversight, typically through a range of state institutions (ministries, the central bank, parliament and public auditors).

Government control over the broad strategic direction and institutional mandate and function of sovereign wealth fund (in practical terms, this means that the government sets (or is deeply involved with setting) the investment goals of the fund.

While these three elements are present in all funds analysed in this chapter, there is a significant degree of country variation in emphasis between delegated and centralised control over national SWFs and the rules and processes that govern the flow of money in and out of the funds.

Recommendations

Rules are essential to ensuring that the policies around resource-based SWFs are consistently pursued and applied. The leading SWFs in the world have established clear rules to govern the policymaking process around their funds.

Sound rules can be undermined if the governance arrangements around them – which determines when, how and by whom rules are made, reviewed and changed – leave too much discretion in the hands of particular political agents.

Policymakers should strive to make policy rules, and the governance arrangements around them, as transparent and inclusive of political stakeholders as possible, without sacrificing clear lines of authority and responsibility for setting rules.



Chapter 7:

Internal governance: board composition, appointment process and investment policy

► Key messages

- Internal governance of a sovereign investment vehicle concerns the rules and procedures that determine the powers and responsibilities of different groups within an organisation.
- State sponsors are responsible for key aspects of internal governance, even under delegated-authority models, including the appointment and composition of a fund's governing body and the processes for determining investment policy.
- Fund governing bodies should be diverse in terms of public- and private-sector representation, include minimum competency requirements for board members and have limited owner and operational representation.
- The appointment process to the governing body must balance accountability to the government owner with ensuring de-politicisation of fund management.
- Sovereign wealth funds and other sovereign investors should have a dedicated investment committee with a formally defined role in the setting and implementation of investment policy.

Chapter overview

A crucial element of the institutional framework for sovereign investors' concerns their internal governance. Internal governance refers to the rules and procedures that determine the powers and responsibilities of different groups within these agencies or institutions. Whereas the preceding two chapters considered institutional arrangements and governance issues between government institutions, this chapter investigates similar issues from within the agency or institution tasked with managing sovereign wealth.

The most fundamental demand made in relation to the internal governance of SWFs is clarity. The findings of Section I of this report reinforce the overall need for clarity in fund design. The conclusion that an Investment Income Fund should be separately instituted and managed from a Stabilisation Fund is the strongest articulation of the need for a clear division of roles and responsibilities in sovereign

investment vehicles. Moreover, given the observation that the macroeconomic motivations for accumulating sovereign wealth may vary across countries and over time, and that the decision to set up a savings or Stabilisation Fund is a function of local policy preferences and judgments, it is imperative that government/owners are unequivocal about their fund's intended purpose and wider place within the economic policy apparatus of the state. These findings reinforce the appropriateness of existing best practice for internal fund governance. This chapter builds on those discussions by looking more closely at what clarity in internal fund design requires, with a particular focus on board composition, the governing body appointment process and investment policy management.

7.1 Clarity in internal governance

Numerous studies on SWF arrangements have emphasised the importance of clarity in the powers and responsibilities of in-house decision-making bodies (IMF 2008; IFSWF 2011, IMF 2013). The theme of clarity also permeates the Santiago Principles, the leading framework of Generally Agreed Practices and Principles (GAPP) for SWFs. A number of the principles that specifically address internal aspects of governance³⁶ stress the need for clarity, including:

- **GAPP 6** on the effective division of roles and responsibilities within a fund.
- **GAPP 7** on the appointment of members to governing bodies and the exercise of oversight of the SWF by the government owner.
- **GAPP 8** on the mandating of governing bodies.
- **GAPP 9** on procedures for the independent operational management of the SWF.

In other words, there should be clarity around the internal division of labour between the board or governing body and the executive, the appointment of decision-makers and managers to the fund; the authority over investment policy and reporting lines within the sovereign fund. This requires precision and transparency about who does what and why.

³⁶ There are multiple other Santiago Principles that also demand clarity in other aspects of sovereign fund design that concern 'external governance'. These issues that have been addressed in the previous two chapters. Those principles concern the SWF's ultimate policy purpose, its place within the policy apparatus of the state and its coordination with macroeconomic policy. See in particular GAPP Principles 2, 3 and 4.

However, the demand for clarity on its own does not provide guidance on ways to achieve clear and effective decision-making processes and governance arrangements. Accordingly, we start by unpicking the concept of clarity in the institutional design of sovereign investors, identifying key principles for clear internal governance. Labelled the 'Triple A' framework, these include:

- the alignment of a fund's macroeconomic purpose and investment mandate
- establishing arms-length operational management of the fund from the government owner
- the affiliation of the fund's governance and risk budgets.

Building on this foundation, this chapter addresses more practical, granular aspects of fund governance including: the composition of the highest governing body of the fund; the appointment process to this and other decision-making bodies within the fund and the determination of and authority over a fund's investment policy. This is necessary since neither the earlier findings of this report, nor the consensus demand for clarity in fund governance provide advice on these more practical issues. In response, this chapter reviews different approaches to these issues within sovereign funds, evaluating their appropriateness in light of the principles established in this report.

“There is no cookbook on governance. There is a set of questions the owner has to ask about the purpose of the fund. The most important step towards encouraging good governance is ensuring clarity of fund objectives.”

Ted Truman
Senior Fellow, Peterson Institute
for International Economics

7.2 Foundations for good governance

Good governance is the subject of much debate. Across the extensive academic and regulatory literature, at least three themes recur to form what can be considered the principles of good fund design. They are described here as the ‘Triple A’ framework of good governance involving the ‘alignment’, ‘arms-length’ and ‘affiliation’ principles.

7.2.1. Alignment of investment mandate with institutional purpose

A basic requirement for all sovereign investors is that their investment mandate and objectives are aligned with their policy functions. In order to achieve this alignment, the function of the sovereign investment fund must be clearly defined, for instance, to stabilise volatile resource inflows or to offset public-sector pension liabilities. A precise statement of a fund’s purpose helps determine the investment objectives. As Chapter 1 showed, the underlying policy purpose of all SWFs is to stabilise volatile economic outcomes (spending, revenue or capital flows) or invest public savings. Beyond this, there are a number of ancillary functions an SWF may perform. Some of these included promoting economic development, diversifying revenue, transforming wealth, preventing Dutch disease and combatting waste and corruption. While it is crucial that a sovereign fund is plainly identified as a stabilisation or investment fund, a sufficiently clear articulation of a fund’s policy purpose often requires a more detailed elaboration of the purpose behind the stabilisation (for instance, is the fund to perform fiscal or macroeconomic stabilisation over a

short- or long-term period) or investment of savings (to augment savings to meet a defined liability, to provide contingency assets or to stimulate economic development and revenue diversification). Some funds perform multiple functions, simultaneously.

These factors have a bearing on the return objectives, risk tolerance and investment horizon as articulated within a fund’s investment mandate. A well-governed fund would reveal an intuitive alignment of its investment mandate with its underlying policy purpose. For instance, the ultimate objective of Australia’s Future Fund, set up in 2006, is to strengthen the national government’s long-term financial position to help offset federal public sector superannuation liabilities from 2020. This policy purpose is clearly stipulated in the fund’s enabling legislation, The Future Fund Act 2006. As there is a quantifiable liability, which the Future Fund is working towards offsetting, there is a clearly defined target asset level for the fund, determined by the Australian Government Actuary. The Future Fund is quarantined from withdrawals until it reaches its target asset level for a given year (or July 2020, whichever comes first). The quantifiable nature of the fund’s liabilities and explicit time horizon by which it must deliver has influenced the fund’s investment mandate. Somewhat uniquely, it has an absolute annualised return target of 4.5% to 5.5% above inflation (defined by the Consumer Price Index) over the long-term, defined as rolling ten-year periods. While this appears to be an unusual mandate, relative to peer funds, it is apparent that the investment mandate is well aligned with the institution’s ultimate function and purpose, explicit liabilities and defined long-term horizon.

7.2.2. Arms-length operational management from government/owner

A second theme in good governance by sovereign investors is that their operational management should be arms-length from the government sponsor to avoid potential political interference that may impair achievement of the fund's objectives (IMF, 2013). The GAPP addresses this demand in Principles 9 and 16, requiring that SWFs' strategies should be implemented in an independent manner, and in the way in which the governance framework realises that independence should be publicly disclosed. The requirement for a degree of arms-length operation from the owner applies to most sovereign investment vehicles, and is particularly strong in the case of long-term investment income funds. As discussed in the preceding chapter, this is achieved by either delegating operational management to an independent public entity, such as the central bank (as in Chile, Norway and East Timor); or establishing a separate statutory agency (as in Australia, Abu Dhabi, China, Kuwait, Korea, New Zealand and Qatar).

7.2.3. Affiliate governance budget with risk budget

All sovereign investors, irrespective of risk appetite, must ensure that their governance capabilities match their risk management competencies. Research shows that this is largely reliant on matching the 'governance budget' and 'risk budget' of an organisation (Clark and Urwin 2010). The governance budget refers to the resources available to ensure the fund can perform the tasks required to operate effectively in global financial markets, subject to risk and uncertainty. It contains three ingredients: time, expertise and collective commitment (Clark and Urwin 2008):

- **Time:** amount of time that a fund can apply to a given investment problem (assessing fund performance against benchmarks, market trends, peer performance; time spent procuring independent expert advice).

- **Expertise:** level of expertise recruited (expenditure on high quality advice, extent to which specialised knowledge is used in deliberations).

- **Collective commitment:** organisational effectiveness of the governing body (responsive capabilities of the board, decision-making in real-time or calendar time) (Monk and Dixon, 2013).

In developing a corresponding risk budget, an organisation should determine and formally articulate the fund's risk tolerance and then develop risk management frameworks for adhering to those tolerance parameters. Measuring risk is complex and approaches will vary from fund to fund. But the important point with a risk budget is that a fund dedicates some resources to ascertaining the risk tolerance of the asset owner (sovereigns and their citizens) and the bodies designated as stewards of these assets (IMF, 2013).

In trying to align and synchronise these two budgets, sovereign investors must ensure that the resources they invest in their governance capabilities and decision-making processes broadly equal those dedicated to determining and managing the fund's risk-bearing capacity. It is not a matter of more resources equals better management; but rather, matched resources (in terms of time, expertise and common commitment) will likely improve investment performance over the long term.

Having articulated the principles of good sovereign investor governance, the next step is to establish effective governing bodies and procedures that respect these principles. The following aspects are vital in realising aligned, arms-length and affiliated investment fund operation.

7.3 Board composition

While most SWFs centralise their internal governance powers in a board of directors, steering committee, commission or government department, some use a more dispersed model (IMF 2008). These bodies vary in terms of institutional form (independent board, government committee or commission), size (number of members) and eligibility criteria for membership (political, non-political, financial/industry expertise).

Tables 7.1 and 7.2 provide a summary of governing body arrangements of a selection of sovereign investors within our study universe. Table 7.1 focuses on the excess reserve-based funds of East Asia, while Table 7.2 looks at a sample of resource windfall funds.

7.3.1. Diversity in board composition

Diversity in board composition is desirable and it can be realised in two forms. First, there may be broad public-sector representation on a fully bureaucratic board. Compare the boards of the CIC and ADIA, both entirely comprised of government and political officials or bureaucrats. Of the two, CIC's board is more representative, with CIC's Articles of Association requiring five important government agencies – ministry of finance, ministry of commerce, SAFE, the central bank and the National Development Reform Commission (NDRC) – to nominate one non-executive director to CIC's board. This was mainly done to avoid bureaucratic disputes between China's central bank, which resisted the establishment of a new, independent SWF to manage a portion of excess reserves currently under its control, and the Ministry of Finance, who wanted greater influence over China's growing stock of foreign reserves (Koch-Weser and Haacke, 2013). The ministry of finance and state council appoint the remaining board members.

While the motivation for entrenching broad public sector representation on CIC's board was largely about appeasing internal bureaucratic rivalry, as opposed to ensuring coordinated decision-making across China's civil service, it is arguable that the public-sector diversity of CIC's board helps integrate the SWF's policy-making with that of China's wider economic policy apparatus.

In contrast, ADIA's board appointment process is set out by the ruling Emir of Abu Dhabi, with no mandated input from other parts of the emirate's civil service or stakeholder agencies. Typically, the board has been comprised of members of the ruling family, with over half of the current board coming from the ruling elite.

The second way in which a board may achieve diversity is by using a mixed model of public- and private-sector representation. This is, arguably, more important when the fund is a stand-alone entity, with a need to ensure arms-length management from the government owner. Most of the funds reviewed in Tables 7.1 and 7.2 display a mixed approach, with some mandated public-sector representation from key economic and financial policymaking agencies, combined with a number of independent, private-sector experts, appointed as non-executive directors. The sectors from which these experts are drawn, include finance, business, accounting, law, academia and asset management. While the balance between government and private sector directors varies across the funds, most of the board arrangements summarised in the table involve a majority of independent expert directors. Appointing a majority of non-government directors to a board, balanced with a degree of public sector representation, is more likely to achieve the objective of arms-length, yet accountable, governance.

Table 7.1: Board arrangements of select Asian ‘excess reserve’ funds

FUND	SAFE IP	CIC	KIC	GIC	HKMA
Sponsor	China	China	Korea	Singapore	Hong Kong
Owner	People’s Bank of China (PBOC)	State Council	Government of Korea	MoF	Hong Kong Monetary Authority (central bank)
Legal format	Pool of assets governed by central bank law	Separate legal entity with specific constitutive law	Separate legal entity with specific constitutive law	State-owned corporation governed subject to general company law	Pool of assets governed by central bank law
Public sector placement	Run as a branch of the reserve management department of the SAFE within the PBOC	Independent entity with some day-to-day affairs overseen by the MoF. CIC reports directly to the state council	Independent entity with some oversight by entrusting institutions (MoF and BoK) through steering committee representation	Independent entity with some oversight by the MoF	Run as a branch of HKMA as part of the Exchange Fund and advised by the Exchange Fund Advisory Committee (EFAC). Overseen by the financial secretary of Hong Kong
Governing body	Board of directors	Board of directors	Steering Committee	Board of directors	Advisory committee
Size, composition and appointment process	<ul style="list-style-type: none"> – 5 directors – Top officials from SAFE – Appointment process unclear 	<ul style="list-style-type: none"> – 9 directors (previously 11) – By law, must include government officials from numerous financial sector agencies, including MoF, China Banking Regulatory Commission and the central bank – State council makes appointments 	<ul style="list-style-type: none"> – 9 members – By law, must include KIC’s CEO, finance minister, BoK governor and 6 South Korean private sector professionals from finance, academia, major corporates – Supported by board of directors with 4 members from senior management – The President of Korea appoints the CEO and 6 private sector members on advice from nomination committee 	<ul style="list-style-type: none"> – 14 members – Chaired by Singapore’s Prime Minister Lee Hsien Loong. – Mix of government ministers and private sector individuals – Board members appointed by the MoF with assistance from the GIC in sourcing qualified candidates 	<ul style="list-style-type: none"> – 15 members – EFAC members selected for expertise and experience in monetary, financial and economic affairs, business, investment, accounting or law – Appointed in personal capacity for expertise by financial secretary of Hong Kong who chairs EFAC

One notable fund in this respect is KIA. As Table 7.2 shows, its nine directors consist of a minority of government representatives, mandated by law, including the minister of finance, the minister of oil, the governor of the central bank and the under-secretary of the ministry of finance, ensuring broad public sector representation for key agencies. This effort to ensure accountability to the owner and coordination across the public sector is balanced by majority appointment of Kuwaiti nationals from the private sector, at least three of which must not simultaneously hold public office. This innovative model establishes a degree of insulation from political interference, while at the same time, ensuring a well-defined relationship between the sovereign investor and other parts of the public service by giving stakeholder agencies a voice in KIA.

At the other end of the spectrum is the use of an entirely independent governing body, as in Chile. Its financial committee was set up to advise Chile's ministry of finance on the management of its ESSF and PRF funds and is comprised wholly of local financial experts and macroeconomists, drawn from outside government, but within Chile. This approach places a premium on technical knowledge and is compatible with Chile's highly rule-governed approach to sovereign wealth management (see Chapter five). While the five members of the financial committee are only able to issue non-binding recommendations to the ministry of finance on the funds' investment policies, they provide a valuable standing mechanism for feeding in expert views to the fund's decision-making. Moreover, the substantial transparency

around the financial committee (numerous meetings, of with published minutes), ensures that the finance minister's actions can be evaluated against the views of the 'experts'. This more technocratic model is likely to increase the fund's governance capacities and, therefore, budget. Recall that the level of expertise recruited by a fund, including expenditure on high quality advice and the extent to which specialised knowledge is incorporated into policy-making deliberations counts towards the overall governance capacity of a sovereign investor.

Chile is one of a few funds to establish a permanent and regular mechanism for feeding in technical recommendations to its management. These recommendations are non-binding, but they still enjoy a permanent place in the decision-making cycle of the Chilean funds. This may also be appropriate given the two distinct funds that make up Chile's sovereign wealth management framework, one of which is a Stabilisation Fund, governed by technical rules whose application demands a solid understanding of Chile's macroeconomic environment. On the other hand, the EFAC committee of the HKMA (see Table 7.1) is entirely comprised of independent directors. There are strict rules governing the transfer of funds between the liquidity and investment portfolios of the HMKA Exchange Fund and, perhaps for this reason, it is more important to have a governing body that allows broader views of the business community and the macroeconomic environment to feed into the monitoring of that very technical, rigid funding regime.

Table 7.2: Board arrangements of select resource revenue funds

FUND	GPFG	ESSF AND PRF	PULA FUND	ADIA	KIA
Sponsor	Norway	Chile	Botswana	UAE	Kuwait
Owner	Ministry of Finance	Ministry of Finance	Ministry of Finance/ central bank	Government of Abu Dhabi	Government of Kuwait
Legal form	Pool of assets without separate legal identity	Pool of assets without separate legal identity	Pool of assets without separate legal identity	Separate legal entity governed by specific constitutive law	Separate legal entity governed by specific constitutive law
Public sector placement	Run by a special unit (NBIM) within the central bank	Run by the central bank of Chile overseen by the Ministry of Finance	Run by the central bank within the financial markets department as a separate fund	Run by a managing director, who is chief executive	An independent public authority staffed by independent civil servants
Governing body	Executive Board	Financial Committee	Board of Directors	Board of Directors	Board of Directors
Size, composition and appointment process	<ul style="list-style-type: none"> – 7 members – Chairman: central bank governor – Vice-chairman: deputy governor of central bank – Members: chair and vice-chairmen plus 5 externals (academics, labour representatives and business leaders) – Appointed by the King 	<ul style="list-style-type: none"> – 5 members – Local financial experts and macroeconomists – Serve overlapping tenures of 2 years. – Meets every 6 weeks at the MoF – Issues non-binding recommendations about funds' investment policies to the MoF – Appointed by the Ministry of Finance 	<ul style="list-style-type: none"> – 9 members – Members include: governor (ex officio), permanent secretary of the ministry of finance and development planning (ex officio) and 7 other members appointed in their individual capacity – Appointed board members drawn from across government (up to a maximum of two), academia and the private sector based on their good standing and experience – 4 year renewable tenures – Appointments by the Minister of Finance 	<ul style="list-style-type: none"> – 9 members – Chairman: Emir – Other members: managing director, and other board members, all of whom are senior government officials appointed by the Emir. Over half of the board's members come from Abu Dhabi's ruling family – Renewable 3 year period – Appointments by Abu Dhabi Emir 	<ul style="list-style-type: none"> – 9 members – Chairman: minister of finance, by law – Law also requires minister of oil, the governor of the Central Bank of Kuwait and the under-secretary of the Ministry of Finance, and five other Kuwaiti nationals from the private sector – At least three of these appointees may not hold any other public office – Appointments by the Council of Ministers

7.3.2. Minimum competency requirement for board members

For funds that have either fully independent boards or a mixed approach, where some members are drawn from outside government ranks, a requirement for a minimum standard of competency for governing body members is recommended. The recruitment of adequately equipped and experienced decision-makers on governing bodies improves the likelihood of aligning a fund's purpose and investment mandate. Even the best-drafted constitutive laws and policy documents are no guarantee as to their prudent interpretation and implementation.

These requirements are often set in legislation, as has been done in Australia and New Zealand. The founding law of the New Zealand Superannuation Fund (NZSF) stipulates that its Board of Guardians must consist of between five and seven guardians, chosen for their experience, training, and expertise in financial investment management. Similarly, the Future Fund Act 2006 which created Australia's reserve public pension fund stipulates at Section 38(3), that the fund's board members must have:

01. substantial experience or expertise
02. professional credibility and significant standing in either
03. investing financial assets
04. managing their investment
05. corporate governance.

The premium placed on expertise and experience distinguishes Australia's Future Fund from the typical approach of many liability-based pension funds, which are subject to arbitrary representation quotas. The legislation also requires that board members be drawn from outside government. The ban on political appointments is a direct attempt to foster genuinely independent decision-making.

Australia's approach to corporate governance demonstrates a strong commitment to arms-length management. It is an approach that has been emulated in one of the world's newly emerging funds. Draft legislation for Papua New Guinea's (PNG) Liquefied Natural Gas fund states that the

fund's board will consist of seven members, a chair (a PNG citizen from the private sector), another five private sector citizens and the secretary of the treasury, ex-officio. Bearing the fingerprints of the Australian Future Fund legislation, board members must be drawn from outside government and may not have held political office, an even stronger commitment to non-political appointments than that achieved by the Australian legislation. In addition, board members must be persons of integrity, independence of mind and good reputation and have substantial experience or expertise and professional credibility and significant standing in at least one of the following: investing in financial assets; the management of investments in financial assets; or corporate governance.

Funds, whose governing bodies consist of a mix of government appointees and independent private sector experts, have also adopted minimum competency requirements for their external directors. The KIC, whose steering committee comprises the chief executive officer, the governor of the central bank, minister of finance and six civil professionals, sets out its minimum competency requirement for the civil professionals in the Korea Investment Corporation Act 2005.

01. A person who is employed at a university or research institute and whose research experience in finance or investment is more than ten years.
02. A person with more than ten years' experience in investment at international financial organisations or domestic/overseas financial institutions of more than a certain size set forth by presidential decree.
03. An attorney-at-law or a certified public accountant with more than ten years' experience in finance, investment or company audit.

The KIC's requirements are some of the most stringent, in terms of length of accumulated experience required for governing body members. They also entrench a statutory proclivity for diversity in board member credentials, referring to academic, financial, accounting and legal experience as relevant skills.

7.3.3. Limited owner and operational representation

It is desirable that the owner of SWFs should have limited representation on internal governing and management bodies and that accountability is instead achieved through reporting and oversight procedures. Some governing bodies do reserve membership for the owner's representative, most commonly the minister of finance or governor of the central bank. In the case of KIC, both entrusting institutions - the BoK and the ministry of finance – are represented on the board. However, the fullest expression of a commitment to arms-length governance is to avoid any direct owner representation on the governing body. Similarly, it is preferable if members of the operational management of the funds are not on the board and instead sit on advisory, specialist committees advising upwards to the top governing body. While there are examples of operational management sitting on governing bodies, such as in the case of the CIC, ADIA and Qatar Investment Authority (QIA) boards, keeping a strict separation between the governing body and operational management is more likely to ensure the effective division of roles and responsibilities within an organisation.

7.4 Appointment processes

The process of appointing governing body members to SWFs is another crucial area in which the principles of aligned, arms-length and affiliated fund governance can be realised. Appointments are nearly always undertaken by the owner (the government), ensuring an accountability link to the fund, although in a number of cases an independent advisory committee has contributed to this process to help prevent purely political appointments. Korea, PNG and New Zealand all take diverse approaches to nominating their SWF committees.

Papua New Guinea is setting up an appointments committee for its new sovereign fund, responsible for the appointment and removal of board members. The appointments committee will be comprised of the Prime Minister, opposition leader, Bank of PNG governor, the auditor-general, and a representative from the Chamber of Commerce and Industry. Each board member will have an office term of up to five years. Korea uses an advisory committee approach where the President is responsible for appointing the six civil-sector members of the KIC's nine-person steering committee as well as the chief executive

officer of the fund, but is given recommendations for these appointments by the President's Civil Member Candidate Nomination Committee. While the input of the nomination committee is meant to buffer the appointment process somewhat from politicisation, the high turnover of senior management at the KIC (five chief executive officers in the first seven years of the fund's existence) suggests that these procedures could be better insulated from political influence.

One possible model for emulation is the New Zealand approach. The NZSF is based upon a unique 'double-arm's length' autonomy structure in which the fund is overseen by a separate Crown entity known as the Guardians of New Zealand Superannuation, and the guardians themselves are nominated by an independent (non-government) committee. The legislative framework for the fund requires that the nominating committee makes recommendations to the minister of finance, who then consults with representatives of other parliamentary political parties, before recommending the governor general appoint a person to the board. Board members are chosen for their experience, training, and expertise in financial investment management and are appointed for up to five years and eligible for reappointment.

The New Zealand model is an outlier. In most cases, governments (and most commonly the minister of finance or another elected official) make the appointments with independence in fund management achieved in other ways including long-tenure for board members (often five or more years) that decouples the fund appointment process from election cycles or by imposing limits on the number of seats allocated to government officials (IMF, 2008). It also helps if the appointment and removal process is set out in law, with clearly stipulated procedural rules. Where the sovereign investment vehicle is not a separate legal entity, the governing body may compromise only government officials, such as in the case of SAFE. Norway and Botswana are somewhat different, however. Despite having sovereign investment vehicles within their central banks, they use mixed board models, with the majority of governing body members drawn from outside of government. Five of the seven members on the governing board of Norway's GPF are external members (academics, labour representatives and business leaders) appointed by the King of Norway. Similarly, in Botswana, four of the seven-member board of the Pula Fund must be drawn from outside government, based on their good standing and experience.

7.5 Investment objectives, policy and strategy

The third crucial element of internal governance is the processes for developing the fund's investment policy and risk management framework. Ensuring clarity typically requires that the owner sets out precise investment objectives for the fund, or explicitly delegates that task to the governing body, following a well-defined articulation of the fund's ultimate function and purpose. In some cases, the owner consults the highest governing body or an investment committee within the fund, when determining the investment objectives and mandate.

Existing funds display a variety of investment objectives, including maximising returns relative to a benchmark, identifying an absolute return objective or fulfilling a very general objective (for example, seeking long-term financial returns) with the setting of a clearer returns target left to the fund's governing body. There is no more or less suitable type of return objective here. Instead, the priority is alignment between the purpose and the investment

objectives of the fund and ensuring that appropriate decision-making machinery is put in place with regards to investment policy decisions.

Recent research by the IMF has set out a desirable division of labour between the owner and fund manager in formulating and implementing investment policy. The ideal reflected there is similar to the approach described in the introduction to this report in which the government, or legislators, set the general objectives and goals ('setting the goal posts'), while the fund's senior management is responsible for devising the strategy for achieving these ('devising the game plan' and 'scoring the goals') and the governing body for overseeing the executive's conduct ('refereeing the game'). While instructive, this figure does not capture how funds should fulfil their responsibilities, in terms of developing and implementing aspects of their investment policy. In other words, which procedures should they use to carry out their investment policy once high-level objectives and investment mandates have been formulated by the owner?

A review of various funds' investment policy governance reveals that multiple sovereign funds have investment committees to assist the board or governing body in taking investment decisions. These committees are usually smaller than the board, with between four to seven members, and relevant fund executives ensuring coordination between those responsible for risk and investment monitoring. Following the 2008 global financial crisis, the KIC was radically reformed to improve its management of market risk and the coordination of its investment strategy with its risk appetite. A major step was the creation of a dedicated chief risk officer, as well as the formation of two sub-committees to assist the steering committee in determining high-level investment and risk management policy:

01. The investment steering sub-committee

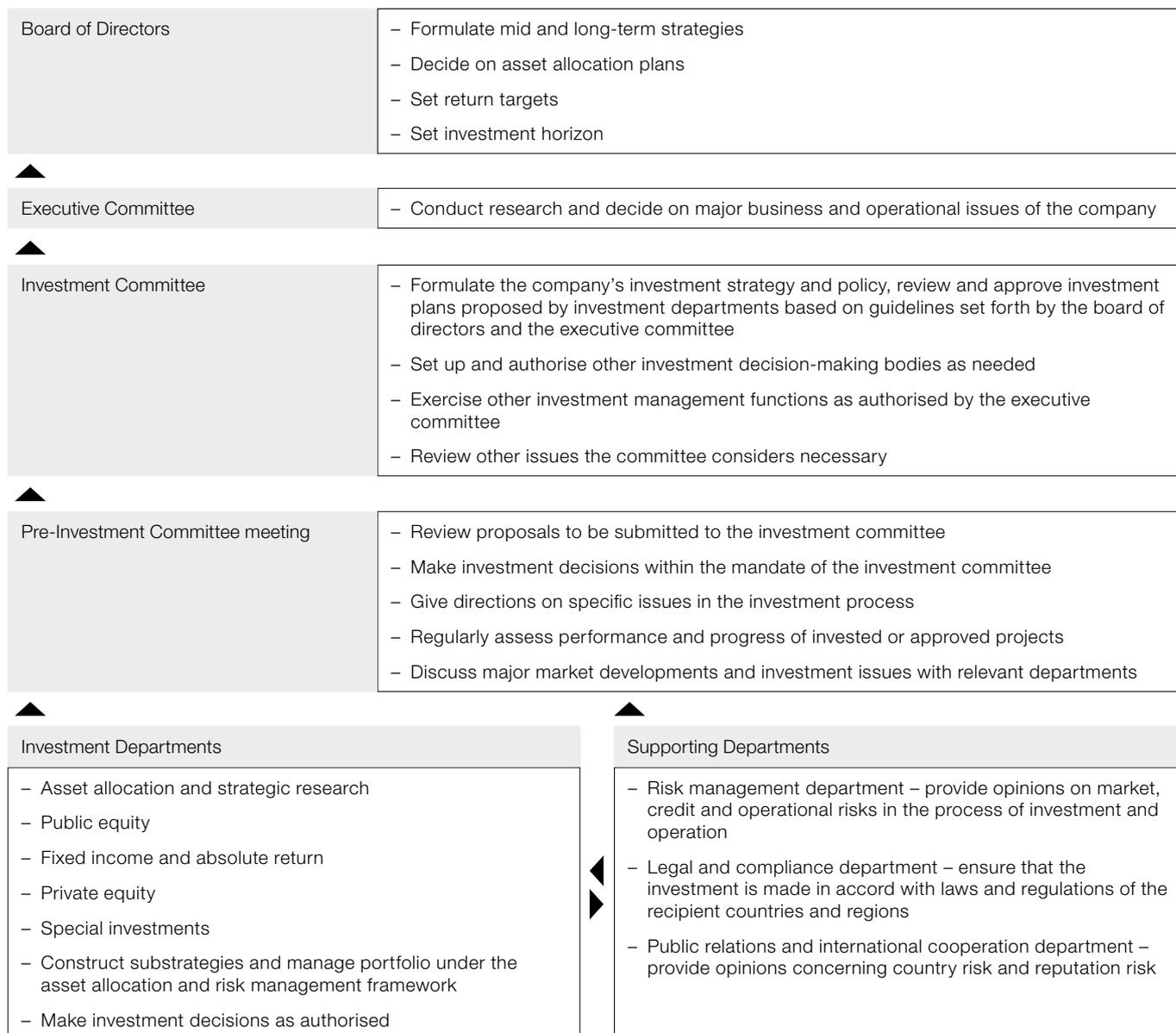
02. The risk management steering sub-committee.

The investment steering sub-committee establishes and revises investment policies and drafts the annual investment plan, while the risk management sub-committee establishes

and revises risk management policies and a status report of annual investment performance. Each sub-committee has four members. KIC's chief executive officer sits on the investment sub-committee and risk management sub-committee along with three independent steering committee members, one of whom is on both sub-committees. Neither the minister of finance nor the BoK governor sits on these sub-committees. This reflects an attempt to embed independent, expert advice throughout the KIC's decision-making, while insulating its investment policy machinery from political interference.

The CIC employs a particularly extensive distribution of decision-making power over investment policy. In its 2013 Annual Report, the fund revealed a well-defined division of labour for internal implementation of investment policy, as summarised in Figure 7.1. China's approach certainly offers sovereign funds a guide to the sort of extensive machinery that can be used to determine and implement investment policy.

Figure 7.1: The CIC's investment policy governance machinery



Source: CIC Annual Report 2013.

Conclusion

This chapter reviewed some of the most important elements of a sovereign fund's internal governance. It highlighted that the most important attribute in a fund's internal governance is clarity. The government/owner is primarily responsible for creating a legislative or policy framework that ensures clarity at the highest level, through an explicit articulation of a fund's policy purpose and investment objectives and the creation of arms-length governance procedures that ensure these objectives are not compromised by on-going political interference. The chapter then went on to look at the ways in which this arms-length governance could be realised in specific aspects of internal governance, including board composition, appointment processes and investment policy decision-making. Once again, the universe of sovereign investors displays enormous variance on these issues, but there are some models which either intuitively, or in practice, better support our foundation principles for good internal governance of aligned fund and investment objectives, arms-length operation and affiliated governance and risk budgets. These are summarised as key recommendations below.

Recommendations

- **Diversity in board composition:** government/owners should seek to ensure broad public sector representation on their investment fund governing bodies and ideally a mix of both public and private sector representatives, with more independent representatives than government officials.
- **Minimum competency requirements for board members:** a certain standard of professional competency and requisite experience should be statutorily mandated for independent (non-government) board members.
- **Owner and operational representation on boards should be limited:** governing bodies are best able to respect the need for a clear division of duties and roles if the representation of the owner and operational managers on governing bodies is limited or non-existent.
- **Arms-length appointment processes:** while government-run appointment processes to fund governing bodies offer a degree of accountability to the owner, these must be balanced with devices that insulate the process from politicisation including long tenure for board members, input from independent advisory committees or a ban on former or current political officials.
- **Clearly defined role for an investment committee:** funds should establish an investment committee to support the decision-making of the board/governing body whose members consist of senior operational managers within the fund and whose ability to advise the governing body is formally incorporated into the fund's decision-making processes.

Chapter 6:

Public sector placement of sovereign funds: mandating central banks or independent authorities?

► Key messages

- The institutional location of a sovereign investment entity is critical as it influences investment capabilities, reporting lines and who has authority over the fund on behalf of the state sponsor.
- The three most common locations for sovereign investment vehicles are: (i) an independent entity outside the traditional institutions of state, (ii) a delegated, constrained operational authority within a central bank, with ministries retaining control over policies; or (iii) a segregated investment portfolio within a central bank under the monetary authority's control.
- Institution locational is mainly a function of investment strategy: passive, liquidity-heavy stabilisation funds are better suited to placement in a central bank/finance ministry, where investment is index/benchmark-driven; while diversified, sophisticated investment/savings funds demand specialist investment capabilities best cultivated in an independent authority.
- Independent authorities are the most prolific model for managing sovereign wealth and the most desirable in terms of promoting arms-length governance – which is particularly important for long-term investment income or savings funds.
- There are however, limited circumstances in which macroeconomic policy needs or local bureaucratic factors may support the placement of a sovereign investment vehicle or portfolio within a central bank. In such circumstances, a delegated operational authority within the central bank is preferable to a segregated portfolio or tranche, as the former better supports the governance principles of mission clarity and operational independence.

Chapter overview

The previous chapter helped identify when countries with commodity windfalls or excess reserves should consider establishing a Stabilisation Fund or Investment Income Fund. It also considered the rules for governing the saving and spending of their sovereign wealth. This chapter moves to the next stage: to look at the crucial implementation issue of where such funds should be placed within a state's institutional apparatus. Fund location is critical, since the institutional placement of a sovereign investment vehicle influences who has authority over the fund on behalf of the state sponsor, the appropriate reporting lines and the investment capabilities available for realising the mandate. Yet, existing guidance tends to simply note these options, observing that any of these models are acceptable as long as the legal basis and institutional framework for a fund is clear and transparent (IMF 2013).

This chapter reviews the options available to governments regarding the placement of investment funds within the public sector. It reviews current practices in this area, identifying three options: separate, independent authorities outside traditional state organs; delegated operational authorities within ministries/central banks; or segregated investment tranches within central banks. The chapter examines a working example of each model, reviewing the reasons why that particular country chose its set-up and offers guidance on the suitability of different institutional locations for managing sovereign wealth.

6.1 Existing approaches to institutional placement

There are a variety of approaches to institutional placement of entities that manage natural resource wealth or excess reserves (see Table 6.1). The ‘separate institution’ model, in which stand-alone entities are established outside the traditional state organs for the exclusive purpose of managing sovereign wealth, is the most popular approach. The proliferation of this model is explained by a number of factors, including:

- the desire to insulate a portion of public wealth from short-term political pressures.
- the need to recruit professional fund managers with more sophisticated investment skills than those required by established bureaucratic agencies, a task often made difficult by the public sector’s restrictive hiring practices and limited ability to compensate competitively (Klitzing, Lin, Lun and Nordin 2010).
- a commitment to the intergenerational transfer of this wealth, best served by its quarantining in a stand-alone agency mandated to protect and preserve these assets.

As the list of examples in Table 6.1 shows, this model is practiced by states wishing to save excess foreign exchange reserves (Korea, China, Singapore), natural resource revenues (Kuwait, Qatar, Abu Dhabi) and less common sources of sovereign wealth such as privatisation proceeds (Australia, Singapore) and fiscal surpluses (New Zealand).

A less common model is the ‘delegated operational authority’, where a separate fund is created but placed within an existing state institution, most commonly the central bank. High profile examples include the SWFs of Norway, Botswana and Chile. All these funds are situated within their state sponsor’s monetary authority, although the central bank is not typically the legal owner of these funds. The Norwegian and Chilean funds are owned by their respective ministries of Finance, which mandate the central bank to undertake the management of these assets on behalf of the government owner. In all three cases (and in others such as Kazakhstan), the main determinant of their institutional placement is that the central bank can handle the operation and implementation of the funds’ respective investment policies, which are essentially non-discretionary, benchmark-driven equity/bond investing strategies.

“As liquidity and safety are the primary focus of central banks, they do not always have the right culture and mindset to manage returns.”

Scott Kalb,
Former Chief Investment Officer, KIC

Table 6.1: Choices for the public sector placement of sovereign investment vehicles

FUND TYPE	INSTITUTIONAL LOCATION	LEGAL STATUS	EXAMPLES
Separate institution	Independent entity	Separate legal entities created with dedicated, enabling legislation	Australia (Future Fund), China (CIC); Kuwait (KIA), Korea (KIC); Singapore (GIC) Qatar (QIA); New Zealand (NZSF); UAE (ADIA)
Delegated operational authority	Central Bank/Ministry of Finance	A pool of assets owned by the state or the central bank, without a separate legal identity	Chile (ESSF and PRF); Norway (GPF); Pula Fund (Botswana)
Segregated investment portfolio or tranche of assets	Central Bank	A pool of assets owned by the state or the central bank, without a separate legal identity or sometimes even no separate de facto existence from liquidity reserves	China (SAFE Investment Portfolio); Hong Kong (HKMA Investment Portfolio) and Saudi Arabia (SAMA investment portfolio)

Source: Authors adapted from IMF (2013)

The final and least common model is the ‘segregated investment portfolio’ within a central bank – or what some prefer to label as a ‘diversified monetary authority’ (Rožanov, 2011). It is difficult to know precisely which central banks do, and do not, possess such tranches, especially in an era where more central banks are diversifying into equities and moving outside of the G4 bond markets. Many central banks do not explicitly identify these moves as occurring within a separate portfolio. Nevertheless, central banks with well-publicised moves into equities and other higher return assets include Swiss National Bank (SNB), Saudi Arabian Monetary Agency (SAMA), the Taiwanese central bank and Bank of Korea (BoK). Swiss National Bank had 15% of its foreign exchange assets – or \$72 billion – in equities at the end of 2013, while BoK has been accumulating emerging-market assets, gold and equities as part of a new risk management strategy (Marsh, 2014).

As part of this diversification trend, a small cluster of central banks now (officially or unofficially) possess a separate investment portfolio, dedicated to pursuing more complex investment strategies (see Box 6.1 for an overview of separate tranche models). The Investment and Long-Term Growth Portfolios of the Hong Kong Monetary Authority (HKMA) Exchange Fund constitute segregated investment tranches. Unofficially, the Chinese State Administration of Foreign Exchange (SAFE) has a series of foreign offices pursuing higher return investments, while SAMA is understood to pursue diversified, longer-term investment strategies on a larger portion of its reserves, relative to many central banks (Boozabandi 2013, 59; Truman 2010, 16).

Box 6.1: Varieties of segregated investment tranches

Segregated investment tranches of central banks take a number of forms. The reserves can be managed by the central bank as a:

01. formally separate account (example: the Investment Portfolio and Long-Term Growth Portfolio of the HKMA’s Exchange Fund)
02. de facto separate account insofar as these assets are managed by distinct offices/branches within the central bank (example: China’s SAFE)
03. portion of reserves assets allocated to higher return seeking strategies, but not physically and officially separated from the rest of the central bank’s reserve assets (example: SAMA).

The latter is the most difficult to identify and label as a separate investment tranche. Despite their different forms, these models share the feature of managing excess official reserves within a central bank with the mandate of seeking higher returns than those permitted by conventional reserve management.

6.2 Choosing where to place your sovereign investment vehicle

Why have governments chosen different locations for their sovereign investment models? What is the appeal of establishing a separate SWF versus pursuing a return-seeking mandate inside an existing public sector entity, whether the central bank or a ministry? This section examines a working example of each model, mapping the design structures in each case and identifying why the case-study country opted for its chosen institutional placement.

Box 6.2: Temasek and GIC establishment and funding

Temasek was established in 1974, a decade into Singapore's post-independence nation-building programme. Its mission was to relieve the Ministries of Finance and Trade and Industry from the commercial management of the many Government-Linked Companies (GLCs) in which the state had a controlling stake. Since that time, Temasek has developed from a sleepy holding company shepherding an initial portfolio of 35 inherited GLCs to a dynamic, global investor that is fully self-financing, generating substantial dividends for its government shareholder.

The GIC was established in 1981 as a private company mandated to preserve the international purchasing power of reserve assets. Another legacy of the government's successful economic development following independence, was the build-up of vast foreign exchange reserves from capital-account surpluses. Then Deputy Prime Minister and Chairman of the Monetary Authority of Singapore (MAS), Dr Goh Keng Swee, identified the need for an entity dedicated to investing excess reserves for higher long-term returns. The GIC was seeded with an

6.2.1. Independent entities: Singapore

As noted, many countries have opted to create independent entities to manage their sovereign wealth. They share in common the feature of being stand-alone organisations with a separate legal identity. Beyond this, they differ substantially in design and extent of independence from their respective state sponsors. Singapore offers an instructive case. As one of few states to boast two independent SWFs— Temasek and the Government Investment Corporation (GIC) – Singapore demonstrates the flexibility inherent in the 'separate institution' model. While GIC and Temasek share the traditional rationale for stand-alone entities – the desire to pursue more sophisticated investment with these assets than possible in existing public agencies - their contrasting governance and financing arrangements (See Box 6.2) reflect the differing degrees of independence from government possible in separate authorities.

initial \$5 billion in reserves and tasked with protecting the value of these assets from inflationary pressure. Today, Singapore has the 11th highest reserves in the world at \$273 billion at end-2013 and the GIC's investment mandate is to achieve a reasonable risk-adjusted rate of return above global inflation over a 20-year investment horizon.

As well as differing in terms of their seed capital, Temasek and GIC have distinct financing arrangements. Temasek started off as a privatisation-proceeds fund with irregular capital injections, but today is self-financing. After selling its initial portfolio of GLCs, Temasek received only one subsequent transfer of assets from the government in the 1990s, with proceeds from the liberalisation of telecommunications, power and port services. Temasek's capital grows through five sources: (i) portfolio company dividends, (ii) divestment proceeds, (iii) distributions of fund investment earnings and, since 2005, (iv) bond issuance and (v) European commercial paper and other short-term debt issuance. In contrast, the GIC can receive an annual discretionary capital injection from the government, financed through excess foreign exchange reserves, resulting from current-account surpluses.

The GIC has a closer relationship with its state sponsor than Temasek in several respects:

Firstly, as set out in Box 6.2, Temasek is self-financing, while the GIC still receives annual transfers from the government and the MAS.

Secondly, the GIC does not own this injected capital, but instead manages these assets on behalf of its client, the government of Singapore, while Temasek is a private holding company that owns its assets under management.

Thirdly, GIC does not disclose its total assets under management on the basis that this would reveal the full size of Singapore's financial reserves (together with that of the MAS and Temasek), which the government considers would be against its national interest. The concern is that speculative attacks may be mounted on the Singapore dollar during periods of volatility. Temasek, on the other hand, is able to publish its AUM and disclose its investment performance without reference to government sensitivities. Accordingly, GIC's actions are more circumscribed by national needs than Temasek's.

The above-mentioned differences require unique governance arrangements for each of Singapore's two SWFs. The IMF has described GIC as a 'manager model' and Temasek as an 'investment company model' (IMF, 2013). In the former set-up, the legal owner of the pool of assets constituting the SWF (usually the Ministry of Finance) gives an investment mandate to an asset manager and pays it a fee (or, alternatively, provides an operational budget); while in the latter scenario, the government as owner, sets up an investment company that, in turn, owns the assets of the fund. The latter may be a more useful structure for the implementation of an investment strategy that requires more concentrated investments and active ownership in individual companies – activities from which a state sponsor may wish to substantially distance itself. Again, the investment strategy influences the mode of fund chosen by the state sponsor.

While boards govern both funds, the close relationship between the government and the GIC is evident in the more overtly political composition of its board. The GIC's primary governance mechanism is its 14-member board, chaired by Singapore's Prime Minister Lee Hsien Loong and containing multiple government officials as directors including the:

- deputy prime minister and minister of finance
- deputy prime minister and minister for national security and home affairs
- minister for trade and industry
- minister for education.

The founding Prime Minister of Singapore, Lee Kuan Yew, is also a senior advisor to the GIC board.

The GIC's investment strategies and risk sub-committees also contain government members. The investment strategy sub-committee which oversees GIC's performance and risk profile is chaired by the deputy prime minister and minister of finance and three of its four members are government ministers. Similarly, the risk sub-committee is chaired by a government minister – the minister for trade and industry. While there are independent directors on both of these committees as well as the investment and audit sub-committees, some commentators have raised questions regarding the extent to which some of these independent directors are sufficiently arms-length from the government given the close relationship between the companies they run and the Singapore government (Clark, Dixon and Monk 2013).

In contrast, Temasek's board is smaller than that of the GIC and chaired by an independent director (see Table 6.2). While the board mostly consists of non-executive independent business leaders, four of the ten current directors have high-level government backgrounds, including the CEO Ho Ching, wife of the current Prime Minister. The government as shareholder has a right to appoint, reappoint or remove board members, including the chief executive officer. While both fund's boards reflect the close relationship between state and economy in Singapore, the GIC's governing bodies are far more closely entwined with government.

Table 6.2: Temasek versus the GIC governance arrangements

FUND	INTERNAL GOVERNANCE	INVESTMENT AND RISK MANAGEMENT	OVERSIGHT
Temasek	<p>10-member board</p> <p>Chair: independent business leader</p> <p>Directors: government members and business leaders</p>	<p>Executive Committee:</p> <ul style="list-style-type: none"> – Members: Four board members and the board’s chairman – Advised by: strategy, portfolio and risk committee, senior divestment and investment committee and senior management committee 	President of Singapore
GIC	<p>14 member board</p> <p>Chair: Prime Minister</p> <p>Directors: government members and business leaders</p>	<p>Group Executive Committee:</p> <ul style="list-style-type: none"> – Members: group’s functional and investment heads – Advised by: investment board, risk committee and investment strategies committee 	Ministry of Finance/President of Singapore

Its closer relationship to government has meant the GIC’s reserves are more readily viewed as available for government purposes than those of Temasek, despite both entities enjoying constitutional protection from drawdowns. Both funds fall under the Reserve Management Framework forming part of Singapore’s so-called ‘two-key system’, which holds that when a new government comes to power, the government’s total reserves in designated entities (including the MAS, Temasek and the GIC) are locked up for the next term of government. Past reserves are only available if both the government and the President agree that the current conditions warrant unlocking the reserves.

Despite both funds enjoying the protection of the two-key system, the GIC’s reserves were unlocked and tapped during the 2008 global financial crisis, following the first request ever from the government to the President to draw down on reserves to meet budget expenditure (Clark, Dixon

and Monk 2013). These events revealed not only ambiguity regarding the legitimate basis for withdrawals from the GIC; but also that GIC (not Temasek) was viewed as the first source for addressing government financial needs in times of financial pressure, reinforcing its closer relationship to the government.

These subtle distinctions between the GIC and Temasek underscore the differing extent of arms-length governance achievable within the category of stand-alone SWFs. Singapore with its distinct versions of the ‘separate institution’ model, brings this into sharp relief. While the GIC is more integrated into the present-day policy needs of Singapore’s fiscal and monetary system, Temasek appears freer to pursue its mandate of generating long-term returns without government interference. This ability to vary the extent of arms-length operation by stand-alone sovereign funds helps explain the model’s proliferation globally.

6.2.2. Mandating a central bank

A less common placement for sovereign investment entities is within a central bank or ministry of finance/treasury. Countries that choose this model do so for several reasons including when:

- the existing experience of central bankers or fund managers within the treasury or ministry of finance is a good fit with the mission of and investment capabilities required by the new entity (typically the case with stabilisation/liquidity providing funds).
- the investment strategy of the new entity involves outsourcing and/or tracking benchmarks (or even directly investing in indexes), making it more efficient and cost-effective to mandate an established ministry or central bank (given their existing portfolio managers, IT systems and relationships with external managers).
- a government wishes to limit the discretion of its fund managers by ensuring operational responsibilities can more easily be transferred to an established bureaucracy.
- there are tax advantages to central bank-based investment funds that do not pertain to independent sovereign entities, since investments through central banks normally enjoy sovereign immunity and other tax privileges in recipient countries (IMF, 2013).

A more political rationale for placing funds within existing state institutions, exists where the proposal to create a new entity for managing sovereign wealth threatens the incumbent state institution (central banks/ministries of finance), that wield control over the accumulated assets. These organisations may resist giving up their monopoly authority over the assets, by campaigning against the establishment of a new sovereign fund authority, or by investing their existing assets more aggressively to prove they are capable of generating higher returns. (Jen, 2010). Placing a sovereign investment vehicle with those incumbent state organisations is, sometimes, an attempt to pacify.

The resistance of incumbent institutions to the creation of new sovereign funds has been observed in numerous countries, most notably China, Korea and, recently, Taiwan – with varying degrees of success. Following the fierce resistance by the PBOC to the creation of the China Investment Corporation (CIC), the Chinese government attempted to placate its central bank by ensuring it retained

control over the majority of the country's foreign exchange reserves, seeding the CIC with capital raised through a separate bond-issue. In contrast, the Korean government required the Bank of Korea (BoK) to provide Korea's new reserve investment corporation, the KIC, with capital despite BoK's intense campaign against its creation. It tried to mollify BoK with seats on KIC's board. More recently, Taiwan's central bank issued a 50-page report arguing against the use of its excess reserves to fund a new sovereign investment entity (Su, 2014).

It is not obvious from the underlying assets or investment objectives of existing central bank/ministry investment entities, which states will opt for a delegated operational authority or segregated portfolio model. In response, the next two sections review the motivation behind the placement of existing delegated authorities and segregated portfolios in central banks/ministries. While existing consensus on good sovereign investor governance supports the establishment of an independent entity, as this section shows, there are circumstances in which placing a separate investment fund or portfolio in a central bank/ministry may be appropriate.

6.2.2.a. Delegated operational authority within a central bank: Chile

The first type of sovereign investment vehicle placed within central banks/finance ministries is what we term a 'delegated operational authority'. The countries that employ this model display a great variation in their political and economic attributes, as well as fundamental differences in fund design (see Table 6.3). Both (GPFG and Botswana's Pula Fund have multiple institutional objectives. The GPFG is tasked with fiscal stabilisation, savings and income-generation objectives and sits within the Ministry of Finance, while the Pula Fund's multi-mandate is to stabilise, save and diversify reserves from within the central bank. The Pula Fund is especially novel as it manages both government (fiscal) revenues and central bank (foreign exchange reserve) assets, resulting in a hybrid legal ownership structure between the Bank of Botswana and the Botswana government. Chile, on the other hand, has established two distinct funds, managed by the Central Bank of Chile (CBC), each tasked with separate institutional missions and distinct sources of income.

Table 6.3: Control and institutional placement of delegated authorities in central banks

	CHILE	NORWAY	BOTSWANA
Ultimate control	Minister of Finance	Storting (parliament)	Central Bank Board of Governors
Manager	Ministry of Finance	Minister of Finance	Central Bank Board of Governors
Operational manager	Central Bank of Chile	Norges Bank Investment Management	Bank of Botswana

Source: Bauer (2014)

No immediate pattern presents to suggest why a government might opt for this model or how they might design an investment fund embedded in a monetary authority/ministry. Accordingly, we look more closely at one of these ‘delegated operational authority’ models to gain more understanding of their workings. We focus on Chile for two reasons. First, the Norwegian fund is currently undergoing substantial reorganisation, grappling with its vast size. Changes include the appointment of three chief investment officers dedicated to managing different investment strategies within the fund, as well as the creation of an entirely separate leadership team for its growing property portfolio (Milne, 2014). Second, the Botswana Pula Fund with its unique co-ownership arrangement between the government and Bank of Botswana is exceptional and does not offer a pure example of the delegated operational authority approach.

Chile: a delegated operational authority

As discussed in Chapter six, Chile established two sovereign funds in 2006 through the Fiscal Responsibility Act 2006. The PRF helps to finance pension and social welfare spending, while the ESSF helps overcome fiscal deficits when copper revenues decline unexpectedly. Both funds are under the responsibility of the ministry of finance (MoF), with the CBC providing operational management of a largely passive, index-driven investment policy. The key points to recall about Chile’s rule-based regime are that:

- The flow of funding to and from each fund from the government and between the funds is rule-governed, forming part of the overall fiscal policy framework.
- A minimum of 0.2% of the previous year’s GDP must be deposited into the PRF annually. If the effective fiscal surplus exceeds this amount, the deposit amount can rise to a maximum of 0.5% of the previous year’s GDP.

- The ESSF receives all remaining fiscal surplus, after deposits to the PRF (minus any funds used for public debt repayments or advance payments into the ESSF made in the previous year).

As noted in Chapter five, an important feature of this fiscal rule is that it is not static, but rather dynamic or contingent on cyclical fluctuations in GDP and copper prices/revenues.

There are several rationales for why Chile opted to delegate operational management of these two new funds to the central bank as opposed to a new authority:

01. **Leveraging existing experience of CBC:** policymakers have indicated that the finance ministry’s decision to appoint the CBC as agent for the management of both funds was partly driven by the central bank’s vast experience in managing commodity assets for liquidity needs. Given the ESSF’s stabilisation mandate involving potential drawdowns by government to cover public debt and the PRF’S pension liabilities requiring constant pay-outs for old-age and disability pensions, the investment policy of both funds involved liquid asset classes similar to those used by the CBC for its international reserves (Parrado, 2010).
02. **Need for dynamic fluidity between funds and budget:** Chile’s funds were established as part of a more general rule-governed fiscal framework that demands a high degree of fluidity between the funds and government in two respects: (a) in the event of drawdowns by government on either fund to cover government liabilities (public debt, pensions); and (b) to allow for transfers between the funds, with additional deposits into the PRF from the ESSF at the discretion of the Minister of Finance. This fluidity between the funds, as well as in relation to the government budget, suggests that flexibility in sovereign wealth management is a priority, at least equal to that of insulating savings in an

independent entity, quarantined from political influence. By adopting a strong and transparent rule-governed framework, Chile achieved a satisfactory degree of insulation and discipline, while still ensuring the government's ready access to this capital to meet the macroeconomic objectives that motivated the funds' establishment.

03. Centralisation of assets in one institution: The Fiscal Responsibility Law that established Chile's two funds, also authorised the government to recapitalise the CBC over five years, starting in 2006, by an annual amount of up to the difference between the government's contributions to the PRF and the effective fiscal surplus with an upper limit of 0.5% of GDP. A major impetus for reforming Chile's copper fund and replacing them with the new SWFs was the need to improve transparency around the management of these commodity windfalls. Centralising all mineral revenues within the CBC arguably supported that goal.

Chile's approach to managing its sovereign wealth through the ESSF and PRF is widely respected. It has been hailed as effective in meeting its policy objectives and benefiting citizens (Bauer 2014). The ESSF has helped smooth government spending and ensure budget stability, despite large and unexpected rises and falls in government revenues, caused by copper price volatility. The placement of these funds within the central bank, rather than a stand-alone authority, has not (thus far) resulted in concerns around their lack of independence from government. Instead, effective management of Chile's sovereign wealth has been facilitated by a rule-governed fiscal framework incorporating a clear objective for both funds, high transparency in their management and dynamism and responsiveness in meeting Chile's present day economic needs. Moreover, the relatively simple benchmark-oriented investment strategy of both funds has meant a degree of comfort, with the CBC and ministry of finance maintaining control. This balance between leveraging existing investment capabilities to execute the two funds' simple investment strategies, and ensuring some flexibility and responsiveness to meeting government needs, was possible through the placement of the Chilean funds within the central bank. It also ensured close cooperation with the rest of the state's economic planning bureaucracy in managing the country's copper revenues.

6.2.2.b. Segregated portfolio within a central bank: HKMA Exchange Fund

Segregated investment tranches in a central bank typically share the same fundamental mission: to diversify a portion of foreign exchange reserves into higher return, long-term investment strategies to augment savings or preserve purchasing power. The investment portfolios of the HKMA Exchange Fund and China's SAFE are seeded with excess reserves, generated from trade surpluses; while in Saudi Arabia, SAMA's surplus reserves are commodity based.

We focus on Hong Kong's use of this model because of obstacles in examining other funds. First, very little public information exists about the governance structure, investment objectives or behaviour of SAFE and SAMA. Second, SAMA has also confirmed that the assets it allocates to higher return investments are not managed as a formally separate tranche from the rest of the monetary authority's assets, making it rather atypical of the 'separate tranche' model. In contrast, HKMA's Exchange Fund contains a rule-governed and transparently managed segregated central bank investment portfolio, offering an exemplary version of this type of sovereign investment entity.

HKMA: a separate investment portfolio

Hong Kong's total reserves as at December 2013 totalled \$311 billion, the ninth largest reserves globally (IMF IFS, 2014). The Exchange Fund is divided into three sections: the Backing Portfolio, Investment Portfolio (since 1998) and Long-Term Growth Portfolio (since 2007). The Investment Portfolio holds excess reserves and is tasked with seeking higher returns than the Backing Portfolio, which may only hold US-dollar denominated securities and pursue traditional reserve management strategies in the context of Hong Kong's currency board. The Long-Term Growth Portfolio is a small tranche of assets held in private equity and real estate. Together, both the Investment Portfolio and the Long-Term Growth Portfolio (LTGP) may be considered part of HKMA's segregated investment tranche.

The HKMA has a rule-based, stable, funding mechanism for its investment portfolio that forms part of the overall framework for managing the Exchange Fund (see Box 6.3 for a description of the rules and practices that govern HKMA's internal funding flows). The objective of each portfolio within the Exchange Fund is clear and this has allowed alignment of each portfolio's investment strategy with their institutional mission.³⁵

³⁵ In contrast, there is no official confirmation or clarity around what portion of SAMA or SAFE's reserves are allocated to their respective investment tranches.

Box 6.3: Rule-based governance of flows to HKMA's investment portfolios**Investment portfolio**

The HKMA has developed specific rules for the various components of the Exchange Fund, depending on the source of underlying assets:

Excess reserves: Since 2000, HKMA's Investment Portfolio has received funding according to a transfer rule approved by the Financial Secretary:

- When the Backing Ratio reaches 112.5% (the upper trigger point), assets will be transferred out of the Backing Portfolio to the Investment Portfolio of the Exchange Fund assets to reduce the ratio to 110%.
- Conversely, should the ratio drop to 105% (the lower trigger point), assets will be injected from the Investment Portfolio to restore it to 107.5%.

Fiscal surpluses: since 1976, the government has placed the bulk of its fiscal surpluses with the Exchange Fund in return for some interest income. The arrangement was introduced to avoid fiscal reserves having to bear exchange risks as part of the Linked Exchange Rate, to allow surpluses to be invested prudently.

Investment income: some is returned to the fund to form part of the accumulated surplus and some is transferred back to the government.

Long-term growth portfolio

The LTGP does not have explicit funding rules, but rather a maximum allocation. Its assets are capped at one-third of the accumulated surplus of the Exchange Fund, the part of the fund that is effectively liability free since it constitutes the fund's own capital. As its name implies, the LTGP can hold less liquid, higher risk assets that promise better yields over the medium to long term, such as private equity and real estate.

The HKMA Exchange Fund is also highly transparent and explicit regarding its liabilities. In a recent statement, HKMA's chief executive officer Norman Chan (2014) identified the Exchange Fund's main obligations as follows:

01. Monetary base must be covered by the Backing

Portfolio: this portfolio must be constantly liquid to meet any shortfalls in the financial system.

02. Government deficit met by the Investment Portfolio:

this portfolio is subject to periodic withdrawals, according to the transfer rule from the Backing Portfolio, as well as withdrawals by the government in times of deficit, since a large part of its assets are fiscal reserves and other public sector capital placed with the HKMA for investment management. Some depositing agencies drew down on their funds during budget deficits years between 2000 and 2004. In addition, the Exchange Fund provides guaranteed returns for the fiscal reserves, which means that under no circumstances would the fiscal reserves receive negative interest income or return.

03. Exchange rate: all of the Exchange Fund's assets are ultimately available to support the Hong Kong dollar exchange rate.

There are several possible reasons why the Investment Portfolio and LTGP were set up inside the HKMA, as opposed to a new independent authority:

01. Leveraging existing institutional capability: seeding for the Investment Portfolio initially came from assets of a Land Trust handed over from the British to the Special Administrative Region (SAR) of Hong Kong on 1 July 1997. At the financial secretary's instruction, these were placed with HKMA's Exchange Fund but managed as a separate portfolio. One explanation for choosing this approach rather than setting up a new independent entity was the desire of the newly semi-independent Hong Kong to leverage existing institutional capabilities for vital tasks at a time of transition.

02. Need for flexibility with fund transfers: similar to Chile, flexibility in reserve management in Hong Kong was determined by local economic needs. Hong Kong is a highly open, export-dependent economy, with a large financial sector that renders it vulnerable to external shocks and volatility. Constant vigilance and a large stock of reserves is therefore required to preserve financial stability. The placement of an Investment Portfolio within HKMA allowed Hong Kong to improve returns on a portion of its surplus reserves without compromising the ability of its monetary authority to fulfil its core task of preserving the stability of Hong Kong's currency, something that might have been jeopardised if a portion of these assets had been locked up in a separate SWF.

03. Preserving control over reserves: the reserve levels of Hong Kong are among the highest in the world and far in excess of 'reserve adequacy' requires. For this reason, there have been growing calls for Hong Kong to use these excess reserves to establish a separate sovereign fund. In a July 2014 statement, Norman Chan defended the substantial reserve levels of the Exchange Fund as vital to ensuring the monetary agency can effectively discharge its fundamental purpose – ensuring Hong Kong's financial stability (Chan, 2014).

While the HKMA's governance arrangements are far from perfect, having suffered from accusations of politicisation, the rule-based regime for transfers to and from the investment portfolio is more accountable and transparent than the arrangements governing the investment tranches of SAMA or SAFE. While it is debatable as to whether the HKMA needs to control the entirety of Hong Kong's reserves to fulfil its mandate, to the extent it requires liquidity while still wishing to earn higher returns on some of its reserves, it has designed an effective version of the segregated portfolio model.

Conclusion

This chapter considered issues surrounding the placement of sovereign investment entities within the public sector. It observed that the most popular and desirable institutional location for a sovereign fund is outside the traditional apparatus of state in a separate authority, although the degree to which such stand-alone entities are independent from government, depends on several aspects of organisational design. It also highlighted some circumstances in which states may instead prefer to place a delegated operational authority or create a segregated investment tranche within their established agencies. The review of existing approaches produces several general messages:

First, institutional placement is, in large part, a function of a fund's purpose and concomitant investment strategy. Separate entities are generally preferable since, in many cases, the purpose of SWFs is to quarantine public wealth for long-term policy purposes. Government should set clear goals for these funds, which should then capitalise on their arms-length status by fully developing and implementing their investment strategy. This model proves highly flexible regarding the degree of arms-length governance it permits.

Second, using a central bank/ministry to invest sovereign wealth may be a desirable in selected circumstances. This is especially so where the investment strategy requires similar skills to that of a central bank. This tends to mean stabilisation/liquidity funds are more likely to be placed in a central bank or finance ministry since they invest in basic asset classes. A savings/investment fund could also be placed here if it pursued simpler investment strategies (passive/benchmark-driven/indexed), such as in Chile and Norway. Once a fund embraces more complex strategies (active management, private markets, direct investments, alternative assets classes, alpha strategies), a separate, financially sophisticated institution is needed. There may also be macroeconomic or monetary rationale for the placement of a sovereign investment vehicle or portfolio within a central bank. This is mainly where domestic, economic and political conditions demand a high degree of flexibility and dynamism around the flow of funds between a sovereign investment entity and the government.

Third, a separate fund is preferable to a segregated portfolio within a central bank. Of the two options for placement within a central bank, there is some evidence to suggest that the use of a delegated authority like Norway's GPFG, Chile's ESSF or PRF or Botswana's Pula Fund is more compatible with effective governance, especially mission clarity. Central banks that manage their excess reserves more aggressively or use investment portfolios have faced increasing confusion regarding their status. This means central banks must devote time and resources to clarifying their precise role and can lead to confusion, at least in the public's mind, as to the function and objectives of the central bank. A fundamental principle of good governance, is clarity of objectives and should be encouraged through a clear separation of investment assets and conventional reserves.

Recommendations

- 01. Separate entities are preferable:** the creation of an independent authority to manage sovereign wealth is desirable in terms of achieving arms-length governance from state sponsors.
- 02. Sovereign wealth investing within a central bank/finance ministry is appropriate in limited circumstances** where a fund's investment strategy is compatible with the experience and capabilities of a central bank/ministry or the macroeconomic needs of the state demand more regular, flexible access to this wealth.
- 03. A delegated operational authority is preferable to a segregated portfolio within a central bank** as the former tends to support the articulation of a more clearly defined mission, independent governance arrangements and greater separation from traditional liquidity management.

Section III: **Conclusions and recommendations**



Chapter 8:

Findings and recommendations

► Governments are faced with a number of choices in the accumulation, use and governance of sovereign wealth. This report mapped the main sources of, and approaches to managing, sovereign wealth in the 21st century. The report provides an extensive review of leading sovereign investors' existing policy, institutional and governance arrangements, which are often obscured or misunderstood in debates around SWFs and other increasingly prominent sovereign investors. In doing so, the report provides insight and guidance to policymakers on a number of critical policy and governance issues around sovereign investment vehicles, notably:

- when and how to accumulate sovereign wealth (whether derived from resource revenue windfalls, excess reserves or other sources)
- how to assess and integrate the use of that wealth in the context of various kinds of risks, uncertainties and competing demands on public assets and revenues
- which governance and institutional arrangements to use in the management of sovereign wealth and the funds that invest this wealth on behalf of sovereigns – specifically the practical challenge of resolving the potential tension between establishing operational independence for the manager or investor of that wealth, while preserving a degree of government control and oversight of such delegated authority.

The opening chapter of the report provided an overview of the major sources of sovereign wealth in the 21st century and the various institutions in which such wealth is held (savings funds, stabilisation funds, pension reserve funds, central banks and development banks). It situated SWFs within the wider institutional universe of public investors, revealing significant variation within the broad sovereign investor landscape as well as within the narrow grouping of SWFs. The introduction distilled the formation and management of SWFs into a five-prong governance framework that includes:

01. savings and spending rules
(transferring money between the state sponsor and fund)
02. position in the public sector
(central bank/ministry versus independent entity)
03. internal governance structures
(who decides what within the fund?)
04. disclosure
(extent of transparency)
05. investment strategies, policies and objectives
(who determines investment policy?).

“The government owner is primarily responsible for creating a legislative or policy framework that ensures clarity at the highest level, through an explicit articulation of a fund's policy purpose and investment objectives and the creation of arms-length governance procedures that ensure these objectives are not compromised by on-going political interference.”

Section I findings: accumulating, stabilising and spending sovereign wealth

This section tackled the initial policy question surrounding sovereign wealth: – its accumulation. A fundamental challenge facing all governments is if, when and how they should amass public financial assets in a sovereign investment vehicle and for what purpose. The report examined this issue in both resource-rich (Chapter two) and reserves-rich (Chapter three) economies, seeking to provide guidance on why states in varying macroeconomic circumstances should quarantine some sovereign wealth in the ‘initial accumulation’ phase, as well as whether they should continue accumulating beyond this stage. This required consideration of the macroeconomic policy choices influencing the creation of SWFs, particularly the formulation and consequences of various saving and spending rules – that is, the rules that govern and determine the flows of public assets and revenues in and out of SWFs.

Finally, Section I presented and applied a fully integrated model for the stabilisation, saving and spending of resource revenues (the largest – and fastest growing – source of sovereign wealth). The formal theoretical elaboration of this model is set out in the Technical Appendix. The leading conclusions from Section I are as follows:

– **The sovereign investor universe is diverse and its governance multi-dimensional:** Sovereign wealth funds sit within a broad, diverse category of sovereign investors. There is substantial variety in terms of the sources and nature of sovereign wealth, the different functions of the funds that manage this wealth, and the factors that determine the articulation of functions, policy objectives and institutional arrangements around the funds. Key policy levers around sovereign investment vehicles (savings rules, spending rules and investment models) are identified, along with aspects of and options for fund governance models.

– **Governments should develop distinct policies for the initial- and ongoing-accumulation phases:** Countries may wish to differentiate between two distinct phases in the management and use of their sovereign wealth: and initial ‘accumulation phase’ in which assets are built up, without drawdowns or outflows; and a subsequent (and potentially permanent) phase in which the investment proceeds and potentially the capital of the SWF is put to use to help meet public spending needs. Rule-of-thumb savings measures that treat the savings process in isolation are generally easier to understand and communicate than more sophisticated rules and models that integrate savings decision with stabilisation and spending needs and objectives (discussed in Chapter four and the Technical Appendix). The simple rule-of-thumb measure may be applicable to, and even desirable in, the initial accumulation phase, while a more integrated approach (either formally or implicitly) is needed in the subsequent phase.

– **Model is adaptable:** The model presented in this report can be adapted and tailored to the specific level of spending, extent and profile of sovereign wealth, and political, policy and institutional realities and preferences in different countries. The balance and dynamics of the savings, spending and stabilisation of sovereign wealth will be determined by all of these, and potentially other, factors. The model helps to capture these factors and calibrate an appropriate policy response based on country-specific conditions. In order to show how the model may be used in practice to inform policy choices, the report applies the model to four countries with sharply contrasting ‘initial conditions’ and current and expected future natural resource revenues and wealth.

Section II findings: governing sovereign wealth

With a firm understanding of when states should accumulate sovereign wealth and what uses they should put these assets towards, the second part of the report turned to questions of implementation, addressing institutional design and governance. It asked what sort of fund should a state establish in order to manage its sovereign wealth and what should it look like? In particular, the focus was on three key aspects of governing sovereign wealth. Chapter five addressed the first aspect of our five dimensional governance framework relating to savings and spending rules, or what can be termed ‘external governance’ as it concerns the rules governing the transfer of capital to and from the state sponsor (whether the central bank, treasury or ministry of finance) to an SWF. That is, it addressed the overarching regulatory scaffolding within which an SWF should exist.

The report then turned to the remaining four dimensions of our governance framework in the final two chapters, both of which concern aspects of ‘internal governance’ insofar as they impact upon the design and functioning of decision-making mechanisms within the sovereign investment vehicle. Chapter six examined the placement of a fund in the public sector, identifying three options for the institutional location of sovereign funds:

01. independent entities outside the traditional state institutions
02. delegated operational authorities within a central bank/ministry
03. segregated investment portfolios within a central bank.

While options ii and iii are the least institutionally popular, some of the world’s largest managers of sovereign wealth such as Norway, China and Saudi Arabia have opted for central bank-based models. However, there is no obvious link between the nature of the underlying sovereign wealth or function of the fund and its institutional location. Our brief country review posited three suggestions on the issue of where to place a sovereign fund within the public sector:

- **Separate entities are preferable:** the creation of an independent authority is not only the most prolific of the institutional models in existence today, but this option is the most desirable in terms of achieving arms-length governance from state sponsors.
- **Sovereign wealth investing within a central bank/ ministry is appropriate in some circumstances:** there are limited circumstances in which a state’s macroeconomic and monetary needs might support the placement of a sovereign investment vehicle or portfolio within a central bank, as opposed to quarantining excess reserves in an outside entity. This is mainly when the investment objectives of a fund and the capabilities required by fund managers to meet those objectives are well met by the experience, culture and expertise of central bankers or treasury bureaucrats. Other circumstances in which this is an appropriate course of action include when the domestic economic and political conditions or institutional capabilities demand that the sovereign wealth in question is invested in a manner compatible with the expertise of central bankers; the central bank needs to retain full control over reserves to properly discharge its responsibilities; or a high degree of flexibility and dynamism is necessary around the flow of funds between a sovereign investment vehicle and the government.

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- **A separately ear-marked, delegated authority is preferable to a segregated portfolio within a central bank:** Increasingly, central banks with excess reserves, that either manage their reserves more aggressively or use investment portfolios, have faced confusion regarding their status as reserves or SWFs. Recently, this has affected the US Federal Reserve, Central Bank of Taiwan and HKMA, all of whom have faced questions as to whether they are better characterised as SWFs. Since clarity is a fundamental principle of good governance, avoidance of this type of confusion is necessary through clear separation between investment assets and conventional reserves within central banks. This is only achievable through precise, disclosed and prescriptive governance arrangements.

Chapter seven took a more detailed look at practical aspects of internal governance. It considered the composition of a fund's highest governing body, the appointment process to that governing body employed by the state owner and internal procedures around the investment process. As part of this discussion, issues of disclosure were briefly explored. Although a mix of approaches is evident among sovereign funds in this area, generalised lessons on desirable practices that reinforce widely accepted principles of good governance include:

- **Diversity in board composition:** government-owners should seek to ensure broad public sector representation on their investment fund governing bodies and ideally a mix of both public and private sector representatives, with more independent representatives than government officials.
- **Minimum competency requirements for board members:** a certain standard of professional competency and requisite experience should be statutorily mandated for independent (non-government) board members.

- **Owner and operational representation on boards should be limited:** governing bodies are best able to respect the need for a clear division of duties and roles if the representation of the owner and operational managers on governing bodies is limited or non-existent.
- **Arms-length appointment processes:** while government-run appointment processes to fund governing bodies offer a degree of accountability to the owner, these must be balanced with devices that insulate the process from politicisation, including long tenure for board members, input from independent advisory committees or a ban on former or current elected politicians.
- **Clearly defined role for an investment committee:** funds should establish an investment committee to support the decision-making of the board/governing body whose members consist of senior operational managers within the fund and whose ability to advise the governing body is formally incorporated into the fund's decision-making processes.

This report aimed to provide governments and policymakers with a practical set of tools for navigating the options in accumulating, spending and governing sovereign wealth. Combining the intellectual resources of Investec Asset Management, the Center for International Development at Harvard University's Kennedy School of Government and expert input from leaders on sovereign wealth design and governance from Columbia University, the University of Oxford and others, a blueprint is now in place for both new and emerging funds. This report also offers guidance for countries that are on the brink of wealth windfalls and keen to convert those exceptional booms into an opportunity to create revenue for years to come.



Technical appendix:

An integrated model of savings, stabilisation and spending

► Beyond an initial phase of accumulating financial assets, policymakers are not concerned with the growth of an SWF for its own sake, but rather with the context-specific functions such funds can perform, in addressing challenges affecting all exporters of oil and other volatile and finite natural resources. Our Technical Appendix presents a formal theoretical model that captures the most important relationships between resource revenues and:

- savings and spending decisions
- investment policies and returns
- the stabilisation and savings objectives of SWFs.

The model is sufficiently flexible to operate in different economic conditions, including different long-term profiles for resource revenues, the assumed volatility of those revenues, the extent of fiscal dependence on resources, and long-term public spending needs that affect the policy choices around the establishment and design of an SWF.

Sovereign wealth funds serve a number of direct and ancillary functions, with the two most common direct functions being:

01. Stabilisation: oil and/or other resource revenues are subject to large and unpredictable fluctuations, which are particularly problematic when resource revenues form a large part of overall government revenues and, consequently, spending. The need for stabilisation results from the well-documented and understood undesirability of pro-cyclical government spending, the role of such dynamics in Dutch disease, and the spill over from pro-cyclical public finances on macroeconomic volatility, more generally.³⁷

02. Savings: the finite nature of most natural resources gives rise to the role SWFs play in preserving a share of the benefits and revenues from a depleting resource for future generations. The savings function is not merely about forgoing current spending in favour of the future, but also the transformation of wealth and revenue sources. This transformation can be understood in terms of the general benefits of wealth diversification, particularly when the SWFs' asset are uncorrelated (or even negatively correlated) to resource revenues; and also, as an effort to replace a depleting asset and revenue source with a permanent one – ensuring that any increased economic and social prosperity linked to resource extraction can be sustained once those resources run out.

The model builds on collaborative work by Investec Asset Management and the Center for International Development at Harvard University. It allows for tailoring SWF spending and saving rules to country-specific requirements, through the specification of key parameters to fit the needs and preferences of policymakers in different contexts.

³⁷ See Frankel (2012) and Van der Ploeg and Poelhekke (2012) for detailed discussions of the problems associated by resource-driven volatility and pro-cyclicality.

An intuitive overview of the model

The first major conceptual departure from the simple savings rules of Chapter two is that, rather than have some portion of resource revenues transferred to the sovereign wealth fund after spending or allocation in the budget, the integrated model assumes that all revenues are transferred first to the SWF and that the fund then generates transfers to the government (or the budget) according to a rule-based framework. The rule stabilises transfers from the SWFs to the government – and, hence, government spending – so that ‘transfers’ and ‘government spending’ are synonymous in the model (this ‘transfer rule’ can, therefore, also be called the SWF’s ‘spending rule’).

The SWF consists of two components: a Stabilisation Fund and an Investment Income Fund.³⁸ The Stabilisation Fund is used to stabilise government spending according to a transfer rule, based on a formula that anchors transfers, in part, to the previous year’s transfers and, in part, to the value of assets in the fund. Under the unlikely assumption that resource revenues are permanent and not subject to a long-term decline, the Stabilisation Fund and the spending rule alone are sufficient to stabilise transfers (and, hence, government spending), even when underlying resource revenues are highly volatile.³⁹ Given that resource revenues are assumed to be permanent, there is no need to transform (declining) natural wealth into (permanent) financial wealth, which means the Investment Income Fund is not needed – the only challenge is that of stabilising the (potentially very significant) volatility of that permanent wealth.⁴⁰

However, in the more likely and realistic situation where resource revenues are expected to decline over time, the government may wish to build up an Investment Income Fund. Over time, the investment income generated on this fund supplements – and ultimately replaces – the depleting resource revenue as a source of permanent income to the government. The Investment Income Fund receives a share of annual resource revenues (for example, 20% or 50% based on the preferences of the policymaker) and makes an annual transfer to the budget based on its expected average long-term real investment return (for example, 4% or 5%, based on the fund’s investment style and asset allocation). Once resource revenues have completely ceased to exist, the Stabilisation Fund will be run down to zero and the Investment Income Fund will stabilise at a permanent steady-state level in real terms, as no new revenue inflows are feeding the fund, while it is transferring only its real return to the budget.

The separation of the SWF in to two units serves a very important institutional function: it enables policymakers to differentiate between the management and investment mandates and strategic asset allocation of the two funds. The Stabilisation Fund needs to hold more liquid assets, as its transfers (or implicit liabilities) are much more volatile and unpredictable than that of the Investment Income Fund (which only transfers its expected average long-term real investment return). The latter can have a much more illiquid and risk-orientated asset allocation, which should raise its expected return, generate more revenue for government spending and investment. The Investment Income Fund should also operate at arm’s length from the government and the standard budget and fiscal process, as its mandate is to focus on long-term investment in order to meet (and possibly exceed) its target expected long-term average return.

³⁸ Following the emerging conventions in the literature on SWFs, this component of the fund would be called a ‘savings fund’. However, an Investment Income Fund is a more accurate description, as in addition to preserving assets over time (savings), this component of the fund also provides a steady (or ‘permanent’) source of funds for current spending. The Investment Income Fund could, therefore, also be called a Permanent Fund (as is the convention in the public finances of US States with similar funds) or an Endowment Fund (as is the convention amongst universities and foundations with similar funds).

³⁹ In a statistical sense, the assumption of permanent means that revenues (in real terms) move within a steady range, which can be wide given the volatility of revenues, around a constant mean.

⁴⁰ Note, however, that even under the permanent resource scenario, the government may still wish to create a separate fund (or a tranche within the existing fund) that is invested in more risky assets in order to generate a higher return and raise the average size of transfers.

Formalising Fund Objectives and Rules

If the government of a resource-dependent economy is seriously committed to stabilising public spending, it can completely decouple spending from the underlying resource revenue, which is subject to massive annual swings. To achieve a satisfactory degree of stability, this commitment should be symmetrical: it requires government to show spending restraint in boom periods (which could last several years) as much as it allows them to maintain a steady level of spending in bust periods. Consider, for example, a spending rule in which spending is based, in part, on the previous year's spending and, in part, on the amount of funds held in Stabilisation Fund (which receives all resource revenues – not just unspent surpluses or excesses). Such a rule can be specified as:

$$T_t = \alpha T_{t-1} + \beta S_{t-1} \quad (1)$$

Where T is an annual transfer from the fund to the government (which is the only amount of resource-related revenue that the government can spend), S is the size of the Stabilisation Fund, and α and β are fixed parameters <1 that indicate the respective weight given to each of the components respectively in stabilising spending.

Through this equation, annual changes in government spending can be stabilised through plausible combinations in the values for α and β . It is possible to identify values for α and β that provide optimal solutions to the stabilisation objective in a calibration of the model by imposing unrealistically restrictive assumptions on the distribution of data. However, given the known uncertainty and volatility in the underlying data and dynamics, it is more useful and practical to identify a plausible range of combinations for α and β that provides a satisfactory degree of stability in

spending, while at the same time ensuring that the Stabilisation Fund is not depleted before resource revenues end, or becomes unsatisfactorily large, given a plausible distribution of key variables. Over time, the level of the Stabilisation Fund will evolve according to the following accounting identity:

$$S_t = (1+r_t) S_{t-1} + X_t - T_t \quad (2)$$

Where r is the rate of return on the Stabilisation Fund and X is the amount of resource revenue transferred to the fund. As is clear from Equation (2) the fund's value is determined by the return generated on the fund and the net transfers (total transfers to the fund minus funds transferred to the budget to stabilise spending).

This simple savings and spending rule, and the way in which it largely decouples spending from volatile resource revenues, has important advantages over a number of alternative rules. It is not anchored to – and in fact does not even require – any assumptions about future resource prices, production volumes or total revenues in order to stabilise spending. If resource revenues go up during any particular year, the size of the Stabilisation Fund will increase and the government will receive a fraction, β , of that increase in the following year. Should revenues stay the same the year after that, the government receives another fraction, $\beta(1+r)$; plus a fraction, α , of the increased transfers of the previous year. On the other hand, if revenues were to fall, the annual transfer to the Stabilisation Fund would also fall only by a fraction, β , in the following year, with further adjustments the subsequent years. Therefore, the rule assures that transfers to the government adjust gradually to resource revenue changes, even in the face of often-dramatic annual changes in resource prices, production and (consequently) revenue.

While this rule has attractive stabilising properties in the short run, it is instructive to consider its dynamics over the longer run. Assume an unrealistic scenario in which resource revenues and the rate of return on Stabilisation Fund are stable. Under this highly stylised scenario, the value of the Stabilisation Fund, relative to resource revenue, reaches a steady-state level, expressed by the following equation (note, steady-state variables are expressed in small caps):⁴¹

$$\frac{f}{x} = \frac{(1 - \alpha)}{\beta - (1 - \alpha)r} \quad (3)$$

Hence, from Equation (3) under the assumption of permanent resource revenues, the fund as a share of resource revenues accruing to the Stabilisation Fund will be determined by the parameters of the spending rule, α and β , and the interest rate, r . The stabilising transfer to the budget is expressed as follows:⁴²

$$t = x \left(\frac{\beta}{\beta - (1 - \alpha)r} \right) \quad (4)$$

The important implication of the steady-state analysis is that transfers from the Stabilisation Fund are larger than transfers to it. As follows from Equation (4), $t > x$ given that, in addition to annual resource revenues, the government receives the returns generated on the fund, in perpetuity. Therefore, under the unrealistic assumption that resources revenues are permanent (i.e., not subject to terminal declines over the long term), the rule, as described thus far, is sufficient to achieve not only the stabilisation objective, but also a saving objective (although it can be assumed that the return

generated on the Stabilisation Fund is not as high as it would be on a dedicated long-term investment fund/ portfolio, which is why certain countries create different portfolios, tranches and funds to pursue different type of investment strategies).

The following sections analyse the implications of the most important extension to the model: the one in which resource revenues are no longer assumed to be permanent. Rather, resource revenues are assumed to be subject to declines over the long term, and are no longer a source of permanent income to the government. This is a more realistic approximation of the challenge faced by policymakers in resource-rich countries.

In this more realistic scenario, the Stabilisation Fund can no longer serve both the stabilisation and savings functions, because the long-run secular decline in resource revenues leads to a depletion of the fund's assets. Achieving a stable level of spending requires increasingly heavy withdrawals from the fund. If resource revenues are faced with a long-term downward trend, there is no possible combination of parameters α and β that can achieve the stabilisation objective indefinitely. Consequently, the government needs to also establish an Investment Income Fund, well before resources are depleted. The income from this Investment Income Fund eventually replaces resource revenues as the source of permanent income. When resource revenues have completely ceased, the Stabilisation Fund is completely depleted and the Investment Income Fund now performs the stabilisation and savings functions. At this point, the government has completed the transformation of natural resource wealth and income into financial assets as a source of government revenue and wealth.

⁴¹ See below for the derivation of the steady-state dynamics.

⁴² See below for derivations.

Deriving the steady-state conditions of the Stabilisation Fund

The spending rule is captured by the following equation:

$$T_t = \alpha T_{t-1} + \beta S_{t-1} \quad (1)$$

The level of the Stabilisation Fund will evolve according to the following accounting identity:

$$S_t = (1 + r_s) S_{t-1} + X_t - T_t \quad (2)$$

To better understand the long-term dynamics of the Stabilisation Fund, revenues and transfers it is useful to derive steady-state conditions, in which we assume no changes in annual revenues and the interest rate – that is, rather than allowing for fluctuations around the stable mean, in the steady state these variables are always equal to their mean. In the steady state, the two equations above can be rewritten as, where steady state variables are denoted in lower case without subscripts to indicate time period:

$$t = \alpha t + \beta f \quad (1)$$

$$s = (1 + r) s + x - t \quad (2)$$

Equation (1) can be rewritten as:

$$f = \frac{(1 - \alpha)}{\beta} t \quad (3)$$

And Equation (2) can be rewritten as:

$$x = t - r(f) \quad (4)$$

To derive the size of the Stabilisation Fund as a share of resource revenues in the steady state, we can substitute and rearrange using Equations (3) and (4):

$$\begin{aligned} \frac{f}{x} &= \frac{\frac{(1 - \alpha)}{\beta} t}{t - r(f)} = \frac{\frac{(1 - \alpha)}{\beta} t}{t - r \frac{(1 - \alpha)}{\beta} t} = \frac{\frac{(1 - \alpha)}{\beta} t}{\left(1 - r \frac{(1 - \alpha)}{\beta}\right) t} \\ &= \frac{\frac{(1 - \alpha)}{\beta}}{1 - r \frac{(1 - \alpha)}{\beta}} = \frac{(1 - \alpha)}{\beta - r(1 - \alpha)} = \frac{1}{\frac{\beta}{(1 - \alpha)} - r} = \frac{(1 - \alpha)}{\beta - (1 - \alpha)r} \end{aligned}$$

Hence, in the steady state, the size of the Stabilisation Fund relative to revenue is determined only by the parameters, α and β , and the interest rate, r :

$$\frac{f}{x} = \frac{(1 - \alpha)}{\beta - (1 - \alpha)r}$$

To determine the dynamics of the transfers to be received by the government in the steady state, we can again use Equations (3) and (4):

$$x = t - r \frac{(1 - \alpha)}{\beta} t = \left(1 - r \frac{(1 - \alpha)}{\beta}\right) t$$

Hence:

$$t = \frac{x}{1 - r \frac{(1 - \alpha)}{\beta}}$$

$$t = x \left(\frac{\beta}{\beta - (1 - \alpha)r} \right)$$

Saving from a declining resource: adding an Investment Income Fund

As noted, if resource revenues are permanent, a Stabilisation Fund is sufficient to achieve both the stabilisation and saving functions, as government would receive in perpetuity not just the current resource revenues, but also the investment returns on the fund. The continual (albeit volatile) inflow of annual resource revenues means the level of the Stabilisation Fund oscillates within stable bounds, rather than being drawn down to fund spending. In reality, however, oil and most other commodities associated with SWFs are, by definition, non-renewable resources. Once production (and hence revenues) starts to decline, the Stabilisation Fund is gradually consumed until it eventually disappears. While the spending of resource revenues will be stabilised over the horizon of a country's resource production lifecycle, no part of the resource wealth is left for future generations.

If the government wishes to endow future generations with a permanent source of income, financed (at least in part) by the revenues generated by its depleting natural assets, it is necessary to build an endowment during the years of extraction of the resource.⁴³ Assume that a fraction, φ , of total oil tax revenues, X , is saved every year into the Investment Income Fund (the rest going to the Stabilisation Fund), so that:

$$XE_t = \varphi X_t \quad (5)$$

where XE is the share of total revenue that is transferred to the Investment Income Fund. Over time, the size of the Investment Income Fund will evolve according to the following identity:

$$E_t = (1 + i_t) E_{t-1} + XE_t - TE_t \quad (6)$$

where i is the return generated on the Investment Income Fund and TE is the transfer obtained from the fund based on the size of the fund in the preceding year, multiplied by the fund's expected average long-term real return, δ :

$$TE_t = \delta E_t \quad (7)$$

Basing the size of the transfer from the Investment Income Fund on the expected average long-term real return, δ , is a prudent strategy (assuming that expected rate is realistic): using the average (rather than the actual) return ensures a stable income stream of income to the government; spending only real returns ensures that the fund's capital is not eroded by inflation (i.e. the fund is 'inflation proofed'); and finally, focusing on the long-term return enables the fund to capture a number of premia (for example, the volatility and illiquidity premia) that raise the expected long-term return of the fund. In general, it is important that the fund's actual average return over time is not lower than the assumed or expected average return, otherwise the fund would be, at least partially, depleted leaving a smaller endowment for future generations.⁴⁴

The two funds have rather different underlying dynamics. The Stabilisation Fund tends to have steady-state equilibrium that is proportional to the oil tax revenues feeding it, before eventually disappearing once those revenues end. The Investment Income Fund grows continuously during the production years to reach its permanent level once oil tax revenues end. An important implication is that combining a Stabilisation Fund and an Investment Income Fund is a way to stabilise domestic expenditure beyond the oil production years, potentially into perpetuity if the government only spends the real income generated on the Investment Income Fund. With the introduction of the Investment Income Fund, alongside the Stabilisation Fund, the rules of operation of the model can be set so that it simultaneously meets the stabilisation and saving objectives. The key relationships in the framework combining the Stabilisation Fund and the Investment Income Fund are captured by the following equations:

Revenue allocation rules (savings rules)

$$X_t = XE_t + XS_t$$

$$XE_t = \varphi X_t$$

$$XS_t = (1 - \varphi) X_t$$

⁴³ Of course, creating an endowment involves a trade-off between saving assets for future generations and higher current spending. It is possible that a government could make the argument that it does not need to leave an endowment from finite resources to future generations, under the assumption that future generations would be wealthier and/or that the resource endowment is better spent financing current infrastructure and other forms of public investment (for example, education) that will raise output and income in the future (see Collier et al. 2010, for an exposition of this argument). In that case, the government may be willing to simply implement the stabilisation-only part of the framework, as described thus far, and therefore run down the Stabilisation Fund as resource revenues decline. In practice, however, the often disappointing track record of infrastructure and other forms of public investment financed by resource revenues, as documented by Gelb (1988) and Robinson and Torvik (2005) have led an increasing number of countries to use sovereign wealth funds as a means to intergenerational wealth and income transfer.

⁴⁴ In the calibration of the model, spending from the Investment Income Fund is based on an expected average long-run real return of 5%, while allowing actual real returns to fluctuate widely around an average of 5% (we permit random fluctuations between -5% and 15%).

*Transfers from the fund to the budget/government
(spending rules)*

$$\begin{aligned} T_t &= TS_t + TE_t \\ TS_t &= \alpha TS_{t-1} + \beta S_{t-1} \\ TE_t &= \delta E_{t-1} \end{aligned}$$

Level of the funds (size of assets under management)

$$\begin{aligned} F_t &= S_t + E_t \\ S_t &= (1 + r_t) S_{t-1} + X S_t - T S_t \\ E_t &= (1 + i_t) E_{t-1} + X E_t - T E_t \end{aligned}$$

As before, α and β can be chosen so as to achieve a satisfactory degree of stability in transfers to the government (either from the Stabilisation Fund; or, under the two-fund set-up, total transfers from both funds) to achieve the stabilisation objective; while δ should correspond to the expected long-term return of the Investment Income Fund, and φ can be chosen to assure the accumulation of an endowment, achieving the saving objective, without jeopardizing the stabilisation objective. The higher φ , the more willing policymakers are to accept a lower current or short-term level of spending from resource revenues in favour of transfers to future generations (and a higher level of permanent spending); while a lower φ implies a greater willingness to spend the resource revenue as it arises, leaving less of an endowment for future generations.

Conclusion

The Technical Appendix has outlined a theoretical framework for analysing the stabilisation, savings and wealth – and revenue-transformation policies of a SWF or set of funds. The framework is based on a rule that anchors spending (or transfers from the SWF to the government) to the function of the previous year's spending and the balance of assets in the SWF. In a context where resource revenues are a permanent source of income – with annual revenues fluctuating within a stable band around a stable mean – the SWF needs only to consist of an adequately capitalised Stabilisation Fund. However, in the more realistic situation where resource revenues are expected to decline after a period of peak production, the government needs to build-up an Investment Income Fund, which is a financial endowment that replaces revenue resources as a source of permanent income to the government. This simple set of rules does not depend on any assumption about the expected trajectory of oil prices or its distribution function, as is often required in other stabilisation rules. Nor does it require choosing any specific oil production scenario to define the parameters.

This framework requires a clear trade-off between a rapid ramp-up in public spending, financed by resource revenues, and the accumulation of a significant pool of financial assets in the Stabilisation Fund; and, if the government wants to leave a financial endowment from the depleting natural asset as source of permanent income, in the Investment Income Fund. The trade-off between current spending and the creation of a Stabilisation Fund is not that acute (beyond the initial accumulation with which to establish the fund); but the establishment of an Investment Income Fund involves a more substantial reduction in the level of current spending, in order to establish the endowment and maintain permanent spending.

Of course, a number of resource-rich countries have already accumulated such assets during previous commodity booms – these countries essentially already have the financial building blocks in place to successfully implement the framework, given the establishment of appropriate institutional arrangements to ensure adherence to the rules. For countries that are yet to build-up the requisite initial capital buffers with which to establish the sovereign wealth fund, the challenge is more substantial, particularly if the government wishes to continue spending a high percentage of its annual resource revenues. Ideally, these historically low savings countries should use future periods of unanticipated revenue booms to set aside a portion of revenue, with which to implement the framework, low-saving countries require a Stabilisation Fund equally to roughly twice (or sometimes three times) annual spending if they are to successfully stabilise spending based on volatile revenues.

It is useful to consider the institutional and political economy implications of the proposed framework. The most significant of these implications can be summarised as follows:

– **Understanding and explaining the trade-offs:** the analysis in the Technical Appendix helps to frame and quantify the trade-offs between current spending, building buffers for stabilisation purposes and creating an endowment for permanent income from a depleting resource source. Saving a portion of current revenue, which is needed to establish/maintain a buffer in the form of the Stabilisation Fund and/or a permanent endowment in the form of the Investment Income Fund, can be controversial and difficult to achieve politically. However, policymakers can build political consensus and public support for such short-term sacrifices by explaining the cost of unsustainable public spending and ensuring the sustainability of resource-based spending and investment and the benefits of inter-generational transfers.⁴⁵ The framework established in this chapter allows policymakers to frame and quantify the constructive role SWFs can play in meeting these challenges.

- **The importance of the design of (and adherence to) rules:** the idea is that public spending is decoupled from the volatility of annual resource revenues and part of a depleting resource is made permanent, through a set of rules. The design of the rules is embodied in the choice of – and, of course, the adherence to – key parameters. For the framework to work as intended, it is essential not only that the parameters reflect sound dynamics, but also that the government is able to abide by the rules during difficult times. Institutional, political and legal safeguards are needed to make the system resilient to changes in the political, economic and financial environment. From an institutional perspective, the ‘governance’ of SWFs pertains not only directly to the fund itself or even the institutions managing it, but also, critically, to the rules that govern the flows of funds in and out of the SWF).
- **Establishing separate investment models:** the two-fund framework that has been proposed here raises important institutional issues around how to ensure that the two different funds are mandated and incentivised to pursue investment models, and consequently strategic asset allocation and operational frameworks that are relevant to their respective functions. The Stabilisation Fund needs to maintain levels of liquidity, as it needs to partially fund government spending annually. In years of sharp declines in resource revenues, the Stabilisation Fund may need to contribute a significant amount of funding to government and the budget. In contrast, the Investment Income Fund only contributes an annual amount equal to its expected average long-term real return (for example, 4% or 5%). It is more important that the Investment Income Fund employs its long-term investment horizon and other structural advantages in order to capture various risk premia that raise both its expected and actual returns. Care should be taken in the institutional design of the SWF strategy to ensure that the Stabilisation Fund is sufficiently liquid to meet anticipated shortfalls; while the Investment Income Fund should tolerate short-term losses and be evaluated and assessed in terms of its long-term strategy and performance.

⁴⁵ Used wisely, the stable and permanent income generated by the SWFs framework could create a sense of entitlement by the population, which could serve the positive function of helping to increase public scrutiny over the funds and resource revenues, and protect them from political grab and manipulation. Although we do not consider such options explicitly, a direct way of doing this is by tying the assets and income from the SWFs to public liabilities such as pension benefits or educational grants.

– **Separating sovereign wealth fund management and oversight:** just as the Stabilisation Fund and the Investment Income Fund need different investment models, they also require different management and oversight structures. The Stabilisation Fund should hold largely safe and liquid assets, and could, therefore, be managed by the central bank (which typically has the capacity and experience to manage such assets in light of its management of the country’s foreign exchange reserves) or even directly by the national treasury.⁴⁶ In contrast, the Investment Income Fund is likely to have a more complex and diversified portfolio, which requires dedicated skills, capacity and expertise that most likely extend beyond that of the central bank or the treasury. Many governments have, in practice, handed the responsibility for managing such complex portfolios to accountable, arms-length authorities that report to the government, parliaments and/or the treasury. Any such delegated authority for such an important and complicated task requires more extensive oversight and reporting structures than the simpler Stabilisation Fund.

This Technical Appendix presents a theoretical framework for the management of SWFs in a variety of contexts. It outlines the technical aspects of the model for saving, spending and stabilising resource revenues advocated in the report. It helps demonstrate how policymakers can tailor rule-based framework – through the specification of key parameters – to the specific needs, constraints and preferences of the country and its government.

⁴⁶ Many countries, including Kuwait, Botswana, Chile and Nigeria, with a SWF structure that involves more than one type of fund, have preferred to assign responsibility for the management and investment of all funds to a single authority.



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