

The Role of Sovereign Wealth Funds in Managing Commodity Revenues

Sovereign wealth funds (SWFs) have been used by a number of countries with large commodity related export revenues to manage the effects of commodity price cycles and to transfer the benefits of natural endowments to future generations. This note discusses the objectives and design features of several commodity funded SWFs. The effectiveness of SWFs in managing commodity revenues has been mixed. In general, funds with the objective of accumulating wealth have been more successful than those designed to insulate the government budget and domestic economy from volatility in commodity revenues.

What is a Sovereign Wealth Fund?

A SWF is a pool of assets owned by a government for specific national objectives. The accepted definition of a SWF excludes foreign exchange reserves which are typically invested in low risk and highly liquid assets and are controlled by the monetary authority for the purpose of managing balance of payment imbalances or the exchange rate.

The SWF Institute (2009) estimates the assets of SWFs amounted to US\$3.8 trillion as at December 2009, with funds originating from oil and gas revenues accounting for around 60 per cent of the total. This compares with an estimated size of global financial markets of US\$160 trillion at the end of 2008 (Arsov and Deans 2009). The IMF (2008) projects that the assets of sovereign wealth funds could increase to US\$6-10 trillion by 2013. In this note we examine SWFs funded by the development of non-renewable natural resources.

Motivation and Objectives for Commodity Funded SWFs

For a country with significant commodity resources, commodity revenues from developing these resources present challenges. In particular, volatility in commodity prices can be transmitted to the domestic economy through volatility in export income, government revenue and investment activity. Another important issue stems from the fact that resource commodities are not renewable. This raises the issue of intergenerational equity and the challenge of transforming these resources into a sustainable source of future income.

Commodity SWFs in a range of countries have been established to meet budget stabilisation and/or long-term savings challenges. Stabilisation funds are designed to receive excess revenues during periods of high commodity prices and inject them into the government budget during troughs. Savings funds seek to convert commodity revenues to financial assets, often for the purpose of funding future government pension expenditure.

Countries with commodity SWFs are characterised by having a dominant exportable natural resource, usually oil, that may produce windfall gains in the event of a price increase or new discovery.¹ In most cases commodity exports account for at least half of total exports and at least one quarter of government revenues are attributable to commodities (Table 1). Australia and Canada are examples of countries with significant commodity exports but no commodity derived SWF.² Relative to countries with SWFs, Australian and Canadian exports are more diversified - no single commodity dominates exports or government revenue. The

¹ Stabilisation type SWFs have also been used to manage revenues from soft commodities, such as coffee, sugar and wheat.

² Australia's SWF, the Future Fund, established in 2006 receives commodity revenues indirectly, with contributions to the Fund coming from budget surpluses.

contribution to government revenue and GDP from trade in commodities is also lower than for the countries that operate a commodity SWF.

In some cases SWFs are created by subnational states or provinces which have large commodity receipts. Examples include Canada's Alberta Heritage Fund, the Abu Dhabi Investment Corporation of the United Arab Emirates' and the Alaska Permanent Fund and Wyoming Permanent Mineral Trust Fund in the US.

Table 1: Importance of Commodities for Selected Countries- 2008¹

	Commodity exports % total	Government commodity revenue % total	Contribution of commodities to GDP (%) ²	SWF as a % of annual GDP
Countries with commodity derived SWFs				
Canada, Alberta - oil and gas	66	33	31	5
Chile - mining (mostly copper)	49	23	7	13
Kuwait - oil	95	95	-50	150
Norway - crude oil and gas	50	33	27	105
Russia - oil and gas	66	36	10	13
UAE, Abu Dhabi - oil	98	60-90 ³	59	316 ⁴
US, Alaska - mining (mostly oil and gas)	37	66	32	84
US, Wyoming - mining (mostly gas and coal)	82	~67	31	11
Countries with no country wide commodity derived SWF				
Australia - mining, oil and gas	48	6	7	0.5
Canada - mining, oil and gas	32	2	4.5	-
US - mining, oil and gas	2	-	2	-

Sources: Official sources, Thomson Datastream and Mining Association of Canada

¹ Or latest available

² Industry gross value added

³ Of UAE government revenue

⁴ Of UAE GDP

Fund Design and Effectiveness

Existing SWFs differ in their objectives, usage rules, governance and operation, and investment strategies. The choice of governance and management structure appears to depend on country specific factors. In contrast, the investment mandates and rules about accumulation and withdrawal depend on whether the objective is cyclical stabilisation or long-term wealth accumulation. Table 2 summarises the objectives and design features of selected commodity funded SWFs. We discuss these features in more detail below and then consider how effective the various SWF's have been at achieving their objectives.

Table 2: Objectives and Design Features of Selected Sovereign Wealth Funds

Country	Name	Established	Closed	Accumulation Rules	Withdrawal Rules	Governance/Operation	Investment	Assets - % of annual GDP ^{1,2}
Stabilisation Objective								
Chile	Copper Compensation Fund	1986	2007	Based on a reference price determined by the government	Based on a reference price determined by the government	Ministry of Finance/ Central Bank of Chile	Offshore. Sovereign bonds and money market instruments	10.5
	Economic and Social Stabilisation Fund	2007	ongoing	Budget surplus in excess of 1% of GDP	Transfers to budget to fund deficits. Medium-term structural budget surplus target of 1% of GDP	Ministry of Finance/ Central Bank of Chile	Offshore. Sovereign bonds and money market instruments	
Russia	Stabilisation Fund	2004	2008	Based on a reference price determined by the government	Transfers to the budget to fund deficits if assets of the Fund exceed 500 billion rubles	Government/ Central Bank of Russia	Offshore. Sovereign bonds and bank deposits	5.5
	Reserve Fund	2008	ongoing	Total oil and gas revenues until the size of the Fund reaches 10% of GDP	Transfer made to the budget each year. Determined in advance by the government as a percentage of forecasted GDP	Government/ Central Bank of Russia	Offshore. Sovereign bonds and bank deposits	
Savings Objective								
Canada - Alberta	Heritage Fund	1976	ongoing	1976-1987: 30% of government resource revenues. From 2005: ad hoc contributions from budget surpluses	1976-1997: withdrawals allowed for capital projects in the province. Earnings are spent. From 2006, only real earning are spent	Ministry of Finance and Enterprise/ Independent authority	Local and offshore. All asset classes	5
Chile	Pension Reserve Fund	2007	ongoing	0.2%-0.5% of GDP based on the size of budget surplus	Earnings may be spent. Further withdrawals allowed from 2016 onwards based on pension liabilities	Ministry of Finance/ Central Bank of Chile	Offshore. Invested in bonds and money market instruments. Riskier assets classes to be introduced	2
Kuwait	Future Generations Fund	1976	ongoing	10% of all state revenues. Earnings reinvested	Discretionary withdrawals allowed if sanctioned by law	Independent authority/ Independent authority	Offshore. All asset classes	150 ³
Russia	National Wealth Fund	2008	ongoing	Remaining oil and gas revenues once Reserve Fund has reached its cap	Determined by the government. Can only be spent to co-finance voluntary pension savings and to balance budget of Pension Fund of Russia	Government/ Central Bank of Russia	Offshore - sovereign bonds and bank deposits. Local - Russian Development Bank.	7
United Arab Emirates - Abu Dhabi	Abu Dhabi Investment Authority (ADIA)	1976	ongoing	70% of budget surplus	Unknown	Independent authority/ Independent authority	Primarily offshore. Equities, real estate, bonds and money market instruments	316 ⁴
US - Alaska	Alaska Permanent Fund	1976	ongoing	At least 25% of oil and gas royalties	Only earnings are spent. Earnings first used to 'inflation proof' principal. Secondly, an annual dividend is paid to Alaskan residents. Any remaining earnings may be spent or reinvested	Independent authority/ Independent authority	Local and offshore. All asset classes	84
US - Wyoming	Permanent Mineral Trust Fund	1974	ongoing	1.5% severance tax on all minerals plus ad hoc contributions	Earnings in excess of 5% may be spent	State government/ State Treasury	Local and offshore. All asset classes	11
Stabilisation and Savings Objectives								
Kuwait	General Reserve Fund	1953	ongoing	Residual budget surpluses	Discretionary	Independent authority/ Independent authority	Local and offshore	150 ³
Norway	Government Petroleum Fund, renamed Government Pension Fund - Global in 2006	1990	ongoing	Net government oil revenues	Discretionary transfers to budget to finance the non-oil deficit. Non-oil budget deficit designed to equal real return on the Fund over time	Ministry of Finance/ Norges Bank (Central bank)	Offshore. Equities, real estate and bonds	105

Sources: Official sources, SWF Institute

¹ Latest available

² For non-country SWF's assets are measured as a % of GDP for the state, province or emirate unless specified

³ Total of Future Generations Fund and General Reserve Fund

⁴ Of United Arab Emirates GDP

Stabilisation Funds

A stabilisation fund is designed to reduce the impact of volatile commodity revenue on government spending and the economy. Stabilisation funds do not directly affect spending but rather aim to transfer revenue volatility to the fund. When the relevant commodity price(s), and therefore government revenue, is high the fund will accumulate assets. When the price and government revenue is low, the government may draw down on the fund. This procedure essentially fixes commodity revenue in the government budget.

Accumulation and Withdrawal Rules

In practice, all accumulation and withdrawal rules require assumptions about the long-run sustainable commodity price and associated revenues. The most basic mechanism for determining fund injections and withdrawals involves the setting of a reference value for the relevant commodity price based on past observations and/or forecasts of future prices. Revenues received when commodity prices are in excess of the reference price are accumulated in the fund. If actual prices fall below the reference price, a transfer is made to the government budget to substitute for the revenue that would have been received if the actual price was equal to the reference price. This type of rule was used by Chile's Copper Compensation Fund and Russia's Stabilisation Fund until these funds were restructured and is currently used by Venezuela in their Macroeconomic Stabilisation Fund (established 1998, not in table).

An extension of this approach treats fluctuations in both commodity and other sources of government revenue on a consistent basis. This requires the estimation of the long-term level of government revenue, that is, the revenue that would be received when commodity prices were at their long-run sustainable level and the economy was growing in line with trend. Annual fiscal expenditure is set equal to or just below this long-term revenue estimate. In the event that in any period actual government revenue exceeds the long-term estimate, due to higher than average commodity prices or above average economic growth, these surplus revenues are accumulated in the stabilisation fund. When actual government revenue is less than the long-term estimate a withdrawal is made from the stabilisation to fund government spending. This approach is used by Chile's Economic and Social Stabilisation Fund (ESSF).

Norway's SWF was designed with both stabilisation and savings objectives in mind, and uses a variation of the above approach to determine fund accumulations and withdrawals. In this case, over time government spending is intended to equal projected long-run non-oil government revenues only (rather than projected long-run total government revenue), which includes the real earnings of the SWF. This implies that over the longer term all net oil revenues are accumulated in the fund, thereby preserving the capital value of oil resources.

Investment

In order for the funds to be available for use during periods of low commodity prices, or low economic growth, stabilisation funds are invested in highly liquid, capital-preserving assets such as money market instruments and government bonds. Funds are invested offshore consistent with neutralising the impact of revenue fluctuations on the domestic economy.

Savings Funds

A savings fund is a government owned investment fund created to manage national savings. A common objective of these funds is to facilitate government savings necessary to fund public pension liabilities (Chile and Russia).³ For commodity exporters, a savings fund may have a secondary aim of reducing the economy's reliance on commodity revenue.

Accumulation and Withdrawal Rules

Existing funds have two types of accumulation rules. In *revenue share* funds the accumulation rule states that some portion of resources revenue be deposited into the fund (Alaska, Kuwait and Russia). Other funds accumulate a set portion of government budget surpluses (Abu Dhabi and Chile). These rules are simpler to implement than those used for stabilisation funds as they do not require long-term projections of commodity prices.

Withdrawal rules for savings funds depend on their purposes. For example, Chile's and Russia's savings funds are for the funding of pension liabilities and over time these funds will be drawn down. In contrast, more long-term savings funds aim to preserve the real value of assets and the rate of withdrawal is set less than or equal to the real rate of return on the portfolio (examples include Alaska, Norway and Kuwait).

Investment

The longer term investment horizon of savings funds means investment usually includes more riskier growth assets than stabilisation funds, including equities, corporate bonds, real estate and absolute return strategies.

The majority of savings funds invest in foreign financial assets. Offshore investment brings diversification benefits and helps reduce the upward pressure on the real exchange rate and resulting negative effects on the tradeable and import competing sectors. Chile's Pension Reserve Fund, Kuwait's Future Generations Fund and Norway's Government Pension Fund – Global are all invested entirely offshore. Non-country SWF's (Abu Dhabi, Alberta, Alaska and Wyoming) tend to invest in their home market as well as offshore. Domestic investments may include direct holdings in real estate or infrastructure (Abu Dhabi, Alaska and Kuwait).

Governance

The legal framework for a SWF generally follows one of three approaches, all of which can be used to achieve the SWF's objectives. The first approach is the establishment of a separate legal entity governed by a constitutive law (Abu Dhabi, Alaska, Kuwait). The entity has full capacity to act and decision making is normally carried out by a board of trustees. The second approach involves setting up a state-owned corporation governed by general company law (China Investment Corporation). The third approach is the formation of a pool of assets with no separate legal entity owned by the state or central bank (Alberta, Chile, Norway, Russia). Under the third approach the ministry of finance is the usual trustee of the SWF and the operational management of the fund is delegated to the ministry of finance (Russia), central

³ Although Norway's Government Pension Fund – Global will play a role in accumulating savings needed to meet future public pension obligations, the government has noted that the fund is not formally earmarked for these expenditures.

bank (Chile and Norway) or an independent authority set up to manage the portfolio (Alberta).

Policies about the public disclosure of information regarding SWF's differ widely. Many SWF's have their own website detailing information about the fund such as its objectives, rules, investment policy and performance. The Middle Eastern funds, such as Abu Dhabi and Kuwait, tend to be less transparent, with only information of a general nature available to the public.

The International Working Group of Sovereign Wealth Funds (IWG) devised a voluntary set of principles and practices in 2008, aiming to promote appropriate governance arrangements and sound investment practices for SWFs.⁴ These Generally Accepted Principles and Practices (IWG 2008) are aspirational in nature and all countries in the IWG have implemented or are working towards implementing these.

How Effective are SWFs?

The effectiveness of a SWF must be evaluated according to its objectives. At a glance, the savings funds appear to have been more effective at achieving their objective of accumulating assets than the stabilisation funds have been at reducing the impact of volatile commodity revenue on government spending, perhaps due to the difficulty in forming appropriate accumulation and withdrawal rules for the latter. We discuss the effectiveness of SWF's in more detail below.

Stabilisation Funds

Countries with the most successful stabilisation funds tend to be those in which accumulation and withdrawal rules are integrated with fiscal policy and where the government maintains expenditure at a sustainable level. For example, in Chile, the introduction in 2000 of a long-term target for fiscal policy to work alongside its stabilisation fund has helped smooth government revenue available to the budget and ensure that spending remains in line with long-term revenue.⁵ This has resulted in a marked reduction in the volatility of government spending relative to income (Rodríguez et al. 2007). Similarly, Norway's SWF and longer term fiscal guideline have allowed real underlying government expenditure growth to remain positive for the past 15 years despite wide fluctuations in the oil price and government revenue.

The objectives of the stabilisation fund are compromised when the government maintains expenditure at an unsustainable level. One way this may occur is when accumulation and withdrawal rules are not followed. For example, the IMF (2009) had noted that Russia's fiscal policy had become increasingly procyclical in the lead up to the global financial crisis (GFC) due to political pressure to spend more of Russia's oil wealth. Another way this may occur is

⁴The IWG was established following calls from the International Monetary and Financial Committee for the development of a set of best practices for SWFs. The IMF was the facilitator and coordinator of the group while the discussions around the principles and practices were held. The IWG member countries are: Australia, Azerbaijan, Bahrain, Botswana, Canada, Chile, China, Equatorial Guinea, Iran, Ireland, South Korea, Kuwait, Libya, Mexico, New Zealand, Norway, Qatar, Russia, Singapore, Timor-Leste, Trinidad & Tobago, the United Arab Emirates, and the United States.

⁵ Prior to 2000 Chile's fiscal policy and the stabilisation fund operated independently, with fund accumulations and withdrawals based on a reference price for copper.

through excessive government borrowing. In the case of Papua New Guinea, the government issued large amounts of debt to fund expenditures, thereby bypassing the rules of its Mineral Resources Stabilisation Fund. As the fund was deemed ineffective it was wound up in 2001 (Davis et al. 2001).

Another difficulty faced by stabilisation funds is the persistence in commodity prices.⁶ Fund accumulation and withdrawal rules are based on assumptions about the relevant long-run commodity price. Large and/or persistent deviations from the long run price may lead to the accumulation of funds indefinitely or the prospect of the fund being exhausted. Both Chile and Russia have benefited from strong commodity prices in recent years, and have restructured their respective stabilisation funds to work alongside a savings fund. Other funds have had several rule changes over their life times (examples include Oman, Papua New Guinea and Venezuela (Davis et al. 2001)), which in itself can cause instability in government revenue.

Stabilisation Funds and the GFC

For some countries the assets of their stabilisation SWF's have allowed them to implement expansionary fiscal policies in the wake of the GFC without the need to issue debt. In 2009, both Chile and Russia withdrew around half of the assets of their respective funds to finance government deficits (see Table 3). In 2010, budget deficits will be funded by a combination of withdrawals from the stabilisation funds and government borrowing.

Norway also implemented significant fiscal stimulus in 2009, with the non-oil budget deficit increasing to over 6 per cent of GDP from around 2 per cent in the previous year. This deficit was funded entirely by current oil and gas revenues and Norway's SWF continued to accumulate revenues during 2009, but at a slower pace than in 2008.

Table 3: Fiscal Operations of Selected Countries with Stabilisation Funds

	Chile			Norway			Russia		
	2008	2009	2010 proj.	2008	2009	2010 proj.	2008	2009	2010 proj.
Non-commodity balance (% GDP)	-0.8	-6.7	-4.8	-1.8	-6.3	-6.7	-8.3	-13.8	-14.7
Overall balance (% GDP)	5.3	-4.1	-2.1	18.7	7.3	6.2	4.3	-5.4	-5.0
Contribution to fund (US\$bn)	5	-9.3	-	72.2	21.1	-	7.6	-37	-
Market value of fund - year end (US\$bn)	20.2	11.3	-	403.3	367.0	-	64	26	-

Sources: IMF, official sources

Savings Funds

Savings funds of the countries and states studied have generally succeeded in accumulating wealth. Table 2 shows that the assets of the SWF's of Abu Dhabi, Kuwait and Norway all exceed their annual GDP, while the assets of Alaska's Permanent Fund are around 84 per cent of annual GDP. Rising commodity prices have allowed sizeable contributions to these funds in recent years. For example, the Norwegian government contributed US\$72 billion (a 20 per cent expansion) to its SWF in 2008. Returns have also contributed to fund growth. The annualised real return on Norway's SWF was 2.7 per cent between 1998 and 2009, while Alaska's SWF has earned an annual real return of 6.9 per cent over the 24 years to 2008.

⁶ Empirical studies show that commodity prices movements are highly persistent and the mean reversion of prices typically takes a very long time (Cashin et al. (1999), Deaton and Laroque (1992) and Deaton (1999) among others).

An exception is the Alberta Heritage Fund, with assets of just 5 per cent of GDP despite the fund having been in operation for over three decades. The relatively poor growth of the fund can be partly attributable to the fund's investment policy. Up until 1997 a substantial part of the fund's capital was invested in social improvements and other infrastructure normally paid for by the state government. These investments yielded little direct financial return and as a result the size of the fund was unchanged between 1987 and 1997 (Cowper 2007). Wyoming's Mineral Trust Fund has also shown slow growth, with accumulated assets amounting to just 11 per cent of GDP after 35 years in operation. This can be attributable to relatively low contributions as well as a restrictive investment policy up until 2000.⁷

Summary

SWFs are one tool used by countries or states to manage the effects of large commodity revenues on the domestic economy. Stabilisation funds are used to insulate the domestic economy from the volatility in commodity revenues by accumulating revenues when commodity prices are high and injecting them into the budget when prices are low. Savings funds are used to accumulate revenues for use by future generations and/or for the purpose of funding future pension liabilities. Reflecting these objectives stabilisation funds are invested offshore in highly liquid, capital-preserving investments, such as government bonds, while savings funds aim to earn a real return and are typically invested in riskier asset classes.

The effectiveness of SWFs for managing commodity revenues has been mixed. The most successful stabilisation funds tend to be those whose accumulation and withdrawal rules are integrated with overall fiscal policy. This smooths government revenue available to the budget and helps ensure government spending remains at a sustainable level. The savings funds we consider have mostly been successful in accumulating commodity revenues, with several funds holding assets in excess of annual GDP.

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⁷ Up until 1996 the fund was entirely invested in capital preserving assets. Between 1996 and 2000 the allocation to equities was capped at 25 per cent. Investment in equities and other riskier asset classes now exceeds 50 per cent.

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The Effects of Large Increases in Capital Inflow for Australia

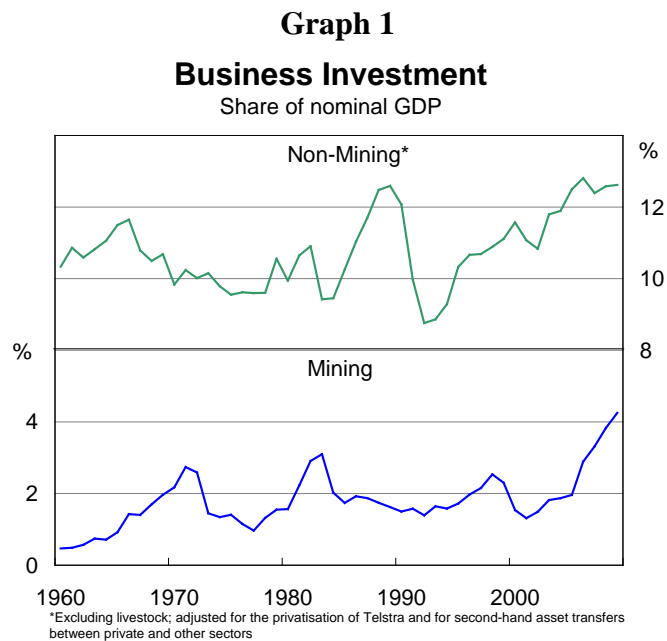
A large increase in foreign direct investment and export volumes resulting from the development of Australia's natural resources and portfolio diversification by overseas investors could lead to a significant increase in capital inflows to Australia over the next few decades. This note looks at the size of the capital inflows that might be involved and their economic effects, and discusses policy options. Under a flexible exchange rate regime and an inflation target, most of the adjustment to these shocks will occur through an appreciation of the real exchange rate. The need for a policy response, beyond standard responses of fiscal and monetary policy to an increase in demand and the resulting inflationary pressures, will depend on the size of the flows, the extent to which they are automatically offset and their expected duration.

The Potential Size of Capital Inflows

Resource Boom

The resource boom will generate two distinct balance of payments effects: an investment boom, which is likely to be funded in large part by significant large foreign direct investment (FDI) inflows to build extraction infrastructure, followed (or possibly overlapped) by an export boom.

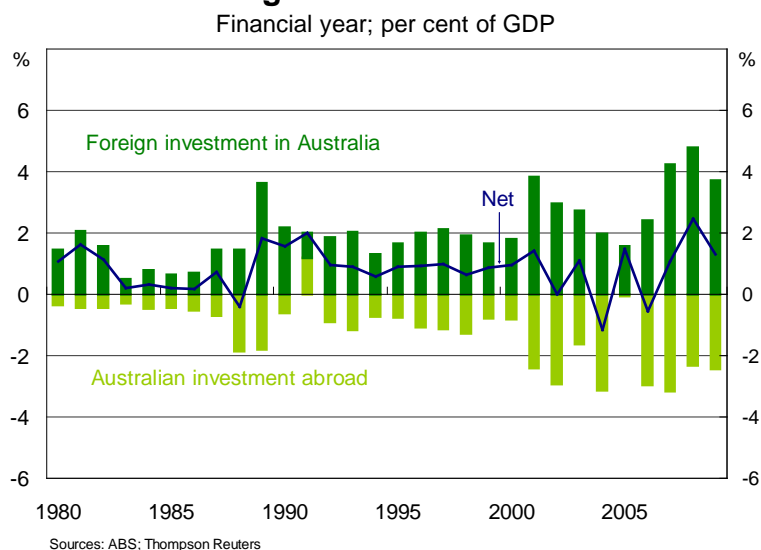
Investment in Australia's resources sector has risen sharply since the early 2000's, and as a share of GDP has been significantly higher over recent years than during mining booms of the late 1960's/early 1970's and early 1980's (Graph 1). Economic Group's liaison with mining companies indicates further significant increases in mining investment and output are likely in coming years. The industry likely to see the largest increase in investment is LNG, with much of this investment to be financed from abroad.



RIA currently estimates that investment in the LNG sector alone could peak at around 2½ per cent of GDP within a few years time before tapering off. To put this in perspective, total foreign direct investment in Australia has averaged 2 percent of GDP over the past 20 years, with a very wide range between -½ and 6 per cent of GDP over this period (Graph 2). However, around half of

equipment investment has historically been spent on imported goods and services, which significantly mitigates the macroeconomic effects of these investment inflows.

Graph 2
Foreign Direct Investment



The export boom is expected to be of a much longer duration than the investment boom, and because of this is likely to have more significant structural effects on the Australian economy. For example, initial sales of LNG contracts are for 20 years or so, but some planned LNG projects have reserves that may last in excess of several decades. RIA estimates that LNG exports will increase from around 20 million tonnes per annum (Mtpa) in 2009, representing 3 per cent of total exports by value, to be three or four times larger over the next decade or so. If this were to occur, LNG would approach iron ore and coal in terms of its contribution to Australia's export earnings.

Portfolio Diversification

Capital inflows to Australia may also increase if the trend towards greater global portfolio diversification continues. Public portfolio inflows could increase if reserve managers diversify some of their portfolio away from the US dollar, euro and Japanese yen. This possibility has become more prominent in recent years with the decline in the share of the United States in global GDP and the increased willingness of policy makers in large emerging market economies to raise the possibility that the US dollar will not be the sole reserve currency in the longer-term. Private portfolio inflows could increase as part of a continuation in the reduction of home bias seen over the past two decades and as foreign investors increase portfolio investment in Australia in anticipation of the resource boom.

At the end of December 2009, Australian financial assets held by foreigners stood at almost US\$1.7 trillion, which suggests that the share Australian assets in foreigners' portfolios is around 1.8 per cent (see Table 1).² To get some idea of the potential size of capital inflows arising from portfolio diversification, we assume an increase of 0.2 percentage points in the share of Australian assets in international portfolios over a two year period. This implies quarterly inflows of US\$29 billion, or over 10 per cent of GDP.³ Assuming the allocation adjustment only occurs for

² This figure excludes foreign financial assets held by Australians.

³ Assuming a stable exchange rate.

foreign exchange reserve portfolios (US\$8.1 trillion as at December 2009), for which no information about the share of Australian-dollar assets is available, implies additional inflows of US\$2 billion on average per quarter (0.7 per cent of GDP). To put this scenario in perspective, Australia's total financial inflows have averaged 10.5 per cent of GDP over the past two years (Graph 3). This suggests that a portfolio reallocation could produce sizable capital flows.

To the extent that any potential inflows are not offset by an increase in capital outflows, for example through larger portfolio capital outflows by Australian investors, there is likely to be an increase in domestic asset prices, including the exchange rate.

Foreign Financial Assets

as at end December 2009

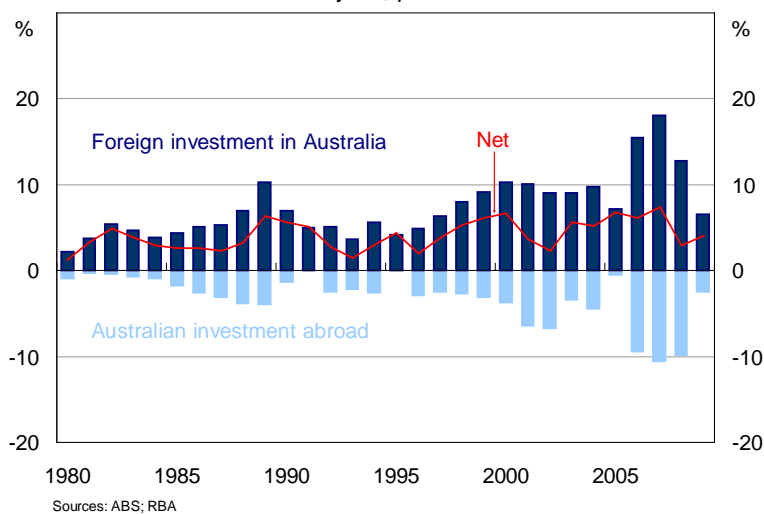
	US\$bn	Share	Flows US\$bn	Quarterly inflow US\$bn
World ex Australia	98071			
Australian gross liabilities	1729	1.8%		
0.2ppt increase in Australia's share over 2 years				
Australia	1961	2.0%	232	29

Sources: ABS, IMF and RBA

Graph 3

Private Capital Flows

Financial year; per cent of GDP



Sources: ABS; RBA

Macroeconomic Effects

In the case of a resource boom, a real exchange rate appreciation will be required to balance the external accounts. The increase in spending on non-tradeables results in an increase in the price of non-tradeables relative to tradeables. Importantly, there is also a loss of international price competitiveness for other tradeable sectors of the economy, resulting in a decline in the output for these sectors. This redistribution effect will not be equally distributed, with capital intensive and imported-input heavy sectors possibly being better off due to the fall in the relative price of imports (Corden, 1982). In the short-term the redistribution effects will be exacerbated by any rigidities in the labour market and are more likely to add to inflationary pressures the closer the economy is to capacity.

The size of the real appreciation and resulting redistribution will depend on a number of factors. The first factor is the size of the capital inflows and the extent to which these inflows are used to purchase domestic resources. As discussed above, a significant portion of FDI inflows are likely to be used for spending on imports, dampening the necessary adjustment in the real exchange rate. In addition, Australian subsidiaries that own the LNG infrastructure and receive the export receipts are likely to return some portion of the profits to their overseas parents and shareholders, resulting in larger income payments to non-residents.

The second factor is the expected duration of the mining boom, which will affect the extent to which the increase in income will be consumed or saved. For example, if Australian residents, including the public sector, view an export boom as temporary they may increase their savings rather than increasing consumption. This means that an equivalent amount of investment can be funded domestically rather than through a capital inflow, which will reduce the extent of the real appreciation.

Net portfolio capital inflows could prompt further real exchange rate appreciation if the portfolio investments do not add to the productive capacity of the economy, and instead generate upward pressure on asset prices and increased consumption. Saborowski (2009) points out that deep, well-developed financial markets should ensure that capital inflows go to the most productive use. However, Reinhart and Reinhart (2008) find that in advanced economies a period of higher than usual capital inflows is typically accompanied by higher GDP growth and a run up in asset prices, such as equities and house prices, followed by a reversal at the end of the inflow episode. This suggests that some policy response may be required.

Policy Options

In the near-term, irrespective of whether the changes to the balance of payments are best characterised as temporary or permanent, there will be a role for monetary and fiscal policy to address 'standard' macroeconomic effects arising from stronger demand. Under a flexible exchange rate regime, the central bank continues to have full control of monetary policy and can set policy to maintain an inflation target. If the inflation target is set in terms of aggregate CPI, rather than non-tradeable CPI, it is not clear what the appropriate policy response will be given that inflation for some consumption goods is falling as a result of the nominal exchange rate appreciation, while for others is rising.

In the case of a long-lived resource boom, there are several additional considerations for fiscal policy. First, the Government needs to decide how it should respond to the increase in royalties and tax revenues. The literature on resource booms highlights the dangers of increasing government spending one-for-one with the increase in revenue, especially in situations where the boom is long-lived but not permanent. In particular, governments have historically found it difficult to cut back on spending when higher revenues from royalties and tax receipts decline as the boom peters out.

Another argument for not increasing spending one-for-one, even when the boom is expected to be long-lived, is that macroeconomic instability can arise if the revenue streams are volatile, as is often the case given the volatility of commodity prices. One solution to this is to smooth these cyclical effects using a stabilisation fund.⁴ However, if commodity prices remain high for a sustained period of time and the stabilisation fund becomes a large share of a country's public wealth it may no longer be optimal to invest all the money in highly liquid, capital preserving assets as is typical for this type of fund. For this reason, it is not uncommon for stabilisation funds to evolve into sovereign wealth funds (SWF) with a long-term wealth accumulation objective. A SWF may be used for

⁴ See Clifton, K (March 2010), "The Role of Sovereign Wealth Funds in Managing Commodity Revenues", internal note.

domestic investment that increases the productive capacity of the economy or to invest into a portfolio of foreign financial assets providing the government with a sustainable source of income. Offshore investment has the advantage that it will reduce the upward pressure on the real exchange rate and resulting negative effects on the tradeable and import competing sectors.

A second role for fiscal policy during a resource boom is to manage the redistributive effects of the real exchange rate appreciation. If the resource boom is long-lived, there is no case for resisting the inevitable redistribution effects as the economy will be shifting to the production of a more valuable and profitable combination of goods and services. However, the case for using fiscal policy to manage the structural changes in the economy is strong. Such policies may aim to minimise unemployment resulting from rigidities in the labour market, such as increased spending on retraining programs.

If the boom is short-lived, the consensus in the literature is that the only effective way of ameliorating the redistribution effects of a sustained real appreciation is tighter fiscal policy; that is, reducing government spending beyond simply offsetting higher tax receipts. Temporary subsidies to the non-resources tradeable sector and/or tariffs to protect the import competing sector may also be used to counteract the effects of a higher real exchange rate during the boom. However, as Gregory (1976) points out, government assistance cannot be provided to all other export and import competing industries simultaneously: assistance to one industry represents a tax on others and therefore assistance all round is self defeating.

The policy options for directly influencing the real appreciation of the exchange rate, with a view to ameliorating the redistribution effects, are limited. There is little empirical support for using sterilised accumulation of foreign exchange reserves to lean against the nominal exchange rate appreciation. Mondiel and Reinhart (1999) find that sterilised intervention increases capital inflows further by reducing the foreign exchange risk faced by investors. There is also evidence that sterilised intervention results in a shift in the composition of capital inflows from FDI towards portfolio inflows. A further consideration is that the cost of intervention: currently the difference between the return on foreign assets and the cost of borrowing in the domestic economy is negative for Australia. However, a case for shorter-term sterilised intervention can be made if consumption increases in anticipation of an increase in export revenue, because the effects of the exchange rate appreciation will be apparent before the offsetting benefits of higher export income.

A final alternative to restrict large net portfolio capital inflows is capital controls. One recent example is Brazil's decision to impose a 2 per cent tax on foreign purchases of equity and debt securities in an attempt to slow the appreciation of the Brazilian real. The effectiveness of such controls is questionable, particularly in the long-run. Empirical studies, such as Cardarelli et al (2009), find little evidence that capital controls have a significant impact on the exchange rate beyond a limited period. In addition, capital controls tend to generate distortions as firms seek to circumvent them, with the incentives to do so greater if the controls are viewed as permanent rather than temporary.

Summary

We examine the impact of two potentially significant developments on Australia's balance of payments. Firstly significant increases in investment in LNG and other resource projects, particularly over the next decade, are likely to result in large foreign direct investment inflows as well as increased export receipts and government revenues. Furthermore, a pick-up in investment in the commodities sector may encourage increased portfolio inflows as foreign investors anticipate a resources boom. Secondly, we consider the impact of an increase in portfolio inflows over the longer-term as the trend towards greater global portfolio diversification continues.

The appropriate response of policy makers to these potential developments, will depend on the size of the capital flows, their expected duration and the amount of adjustment that is required. In particular, if the flows associated with a resource boom are large and are not expected to be permanent, policy makers may want to limit the resulting exchange rate appreciation to mitigate undesirable distributional effects on the rest of the economy. However, if the resource boom is expected to be long-lived, policy makers may wish to focus more on easing the necessary structural change. An increased global allocation to Australian financial assets for the purposes of portfolio diversification is likely to occur gradually, limiting the need for a direct policy response.

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Papua New Guinea and Dutch Disease

The Papua New Guinean (PNG) Government approved two major liquid natural gas (LNG) projects in December 2009. These projects are expected to result in significant capital inflows over their 30 year life and therefore place upward pressure on the real exchange rate. A real exchange rate appreciation stemming from a resources boom can lead to 'Dutch disease', a phenomenon where other export and import-competing sectors are harmed. The PNG Government is examining options to manage the LNG revenues and limit the extent of the real exchange rate appreciation. The formation of a Sovereign Wealth Fund (SWF) is the most likely option.

Policy Options

The PNG Treasury and Bank of PNG have formed a joint Working Group to canvass possible options available to the Government for managing the upcoming LNG revenues and limiting the extent of Dutch disease.¹⁰ The most likely course of action will be the establishment of a sovereign wealth fund (SWF) with both stabilisation and savings objectives.¹¹ This type of SWF aims to reduce the impact of volatile commodity revenues on government spending and the economy through the accumulation of assets when commodity revenues are high, and allowing the government to draw down on the fund when commodity revenues are low. However, over time the government aims to run budget surpluses, therefore accumulating assets in the SWF. The returns on these assets can provide a stable source of income and help the economy reduce its reliance on mineral revenues. Norway's 'Government Pension Fund – Global' is an example of such a fund.

Given PNG's heavy reliance on mineral revenues it is likely that all proceeds arising from resource commodities will be included in the scope of the SWF, not just those from the LNG projects. The SWF is likely to invest solely in offshore markets, which will have the benefit of reducing the upward pressure on the real exchange rate and therefore Dutch disease.

Timor-Leste is another example of a small, developing country that is using a SWF to manage large commodity revenues.¹² However, in this case, the issue of a Dutch disease is of less relevance given the fact that the current account is now dominated by oil and gas (IMF, 2009). Also, the non-oil export sector is very small and is concentrated in crop commodities (mainly coffee) for which price developments tend to be largely determined by supply factors. Nonetheless, given official dollarisation, the operation of the SWF in conjunction with fiscal policy is essential to ensuring external stability.

A sound fiscal framework is necessary for a SWF to achieve its objectives, as the operation of the SWF does not ensure a sustainable level of government expenditure.¹³ Despite the substantial investment and development needs in PNG, the economy has limited capacity to absorb additional amounts of government spending without risking high inflation. PNG's current fiscal policy is formulated according to its Medium Term Fiscal Strategy (MTFS).¹⁴ Under the MTFS, spending from mineral revenue is limited to 8 per cent of GDP. Given the expected boost to GDP from the LNG projects, a continuation of the MTFS will allow for a large increase in government spending. The Working Group is considering the appropriateness of the MTFS in light of the expected LNG revenues.

The composition of government expenditure will also have a bearing on the extent of the real exchange rate appreciation and severity of Dutch disease encountered during a resources boom (McKinley, 2005). Directing spending towards tradeables, including capital imports, and investments that boost the productivity of the domestic economy will reduce the upward pressure on the real exchange rate and alleviate inflationary pressures.

Another role for fiscal policy during a resource boom is to manage the redistributive effects of the real exchange rate appreciation. If the resource boom is long-lived, as is expected in PNG, there is no case for resisting the inevitable redistribution effects as the economy will be shifting to the production of a more valuable and profitable combination of goods and services. However, there is a strong case for using fiscal policy to manage the structural changes in the economy.

¹⁰ The Working Group is seeking feedback from international organisations including the IMF, World Bank and Asian Development Bank.

¹¹ For further discussion of SWFs see Clifton (2010), "[The Role of Sovereign Wealth Funds in Managing Commodity Revenues](#)", internal note.

¹² The Petroleum Fund was established in 2005.

¹³ See Clifton (2010) for further discussion.

¹⁴ The MTFS began in 2008.

In terms of monetary policy, sterilised accumulation of foreign exchange reserves is one option that has been used historically to limit the real exchange rate appreciation and Dutch disease. However the empirical evidence shows that sterilised intervention is ineffective, particularly when the capital inflow is long-lived (Cardarelli et al, 2009 and Mondiel and Reinhart, 1999). In addition, in the case of PNG, sterilised intervention would have a high cost, because the return on foreign assets is currently lower than the cost of borrowing in the domestic economy.

The objective of monetary policy in PNG is price stability. Acknowledging the major effects of the LNG projects on domestic demand, the Bank of PNG will define price stability as inflation rates of around 8 per cent, compared with the 5-6 per cent range of the past decade (Bakani, 2010). This approach is consistent with IMF research which supports higher, but still single-digit, inflation targets for low income countries such as PNG (IMF, 2005). A scarcity of domestic resources means that maintaining recent rates of inflation in PNG during the LNG boom would likely require high real interest rates, which may result in loss of output.

Summary

Two major LNG projects are expected to generate significant capital inflows for PNG in coming decades. The Government will be a major beneficiary of revenues from these projects and, if managed carefully, these revenues have the potential to raise the living standard of the population. However, previous resources booms highlight the need for careful management of these windfall gains. Government officials in PNG are canvassing possible options to manage the upcoming LNG revenues, with the most likely course of action being the establishment of a SWF. The aim of the SWF would be to smooth the LNG revenues available to the government budget as well as saving a portion of these revenues for future generations. Offshore investment of the SWF's assets would help to reduce the upward pressure on the real exchange rate and lower the risk of Dutch disease. In addition, fiscal rules are being reviewed to ensure government spending remains at a level that is sustainable and consistent with price stability. In terms of monetary policy, the Bank of PNG has increased the rate of inflation at which they define price stability.

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