# EUROPEAN CENTRAL BANK

EUROSYSTEM

# THE IMPACT OF SOVEREIGN WEALTH FUNDS ON GLOBAL FINANCIAL MARKETS

by Roland Beck and Michael Fidora

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In 2008 all ECB publications feature a motif taken from the €10 banknote.

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## ABSTRACT

This paper analyses the impact of sovereign wealth funds (SWFs) on global financial markets. It presents back-of-the-envelope calculations which simulate the potential impact of a transfer of traditional foreign exchange reserves to SWFs on global capital flows. If SWFs behave as CAPM-type investors and thus allocate foreign assets according to market capitalisation rather than liquidity considerations, official portfolios reduce their "bias" towards the major reserve currencies. As a result, more capital flows "downhill" from rich to less wealthy economies, in line with standard neoclassical predictions. More specifically, it is found that under the assumption of SWFs investing according to market capitalisation weights, the euro area and the United States could be subject to net capital outflows while Japan and the emerging markets would attract net capital inflows. It is also shown that these findings are sensitive to alternative assumptions for the portfolio objectives of SWFs. Finally, the paper discusses whether a change in net capital flows triggered by SWFs could have an impact on stock prices and bond yields. Based on an event study approach, no evidence can be found for a stock price impact of non-commercially motivated stock sales by Norway's Government Pension Fund.

Keywords: Sovereign wealth funds, capital flows, foreign exchange reserves, financial markets.

JEL: F30, F40, G15.

## NON-TECHNICAL SUMMARY

Sovereign wealth funds (SWFs) which manage the foreign assets of national states have recently emerged as a significant class of global investors. Indeed, such funds are already of a financially significant size, currently probably managing between USD 2 and 3 trillion. Sustained accumulation of foreign assets could transform several SWFs into important market players as their financial assets under management could soon exceed those of the largest private asset managers and pension funds.

The policy issues arsing from the emergence of SWFs as large global financial players range from concerns over a lack of transparency and a reversal in privatisations to risks to global financial stability. For example, SWFs could contribute to an unwinding of global imbalances through a diversification out of US dollar- denominated government bonds in which the bulk of traditional reserves is invested. Another concern relates to the question of whether such funds might distort asset prices through non-commercially motivated purchases or sales of securities.

There is indeed a lack of transparency in the majority of SWFs. In fact, the seven least transparent SWFs are estimated to account for almost half of all SWFs' holdings. These appear to be those of countries with relatively lower levels of institutional development. From a policy perspective these patterns raise concerns since a lack of accountability and transparency of SWFs may give rise to a further mounting of protectionist pressures in the advanced economies.

Transfers of foreign assets from traditional central bank reserve portfolios into SWFs would result in large rebalancing flows as the asset allocation of such funds tends to be less constrained, e.g. by liquidity considerations, and less risk averse than that of central banks. The paper presents scenarios which indicate that a re-balancing through SWFs might trigger a diversification not only out of US dollar assets

but also out of euro assets, given that official reserves are currently overweight in euro area and US government bonds. Emerging market economies, and also Japan, may receive a larger share of SWF investment over time. At the global level, this would also imply that more capital would flow from developed to emerging and developing countries.

However, such calculations ignore the reserve currency role of the US dollar and also the euro which may remain important for some SWFs. Moreover, the scenarios cannot fully consider that SWFs may face restrictions regarding the currency composition of their investments as a large-scale shift of SWFs out of US dollar and euro assets is likely to prove incompatible with their own governments' exchange rate and monetary policy objectives. Furthermore, SWFs may also pursue other objectives, such as hedging against oil price fluctuations. In a scenario in which SWFs were to underweight oil stocks, the portfolio shares of Japanese, euro area and, to a lesser extent, US stocks would tend to rise at the expense of UK and emerging market stocks.

While in general a rebalancing of global capital flows could affect asset prices, a more specific concern relates to the question of whether SWFs might distort asset prices through non- commercially motivated purchases or sales of securities. Although the price impact of most SWFs is impossible to assess given the lack of information on their investments, there is no evidence for a price impact in a case study of non-economically motivated large-scale stock sales by Norway's Government Pension Fund.

Over the longer run, any impact of SWFs on global financial market structure and stability will depend critically on the motives underlying the investment decisions of such funds. While fully return and risk-motivated investments may affect financial stability rather positively due to the long-term investment horizon of such funds, non-commercial motives might have a negative impact on financial stability.

# I INTRODUCTION

Sovereign wealth funds (SWFs), broadly defined as public investment agencies which manage part of the (foreign) assets of national states, have recently attracted considerable public attention. While such national investment vehicles have been operated by many countries for decades, SWFs have only recently become important players in global financial markets. In fact, the history of SWFs dates back to at least 1953 when, according to the Kuwait Investment Authority, the "Kuwait Investment Board was set up with the aim of investing surplus oil revenues to reduce the reliance of Kuwait on its finite oil resource". The more recent rise of SWFs is mainly linked to the accumulation of sizeable foreign exchange reserves by emerging market economies as, over the past few years, an increasing number of such countries have created new SWFs to accumulate foreign assets and to improve the return on traditional foreign exchange reserves.[1]

Although there exists no commonly accepted definition of SWFs, three elements can be identified that are common to such funds: First, SWFs are state-owned. Second, SWFs have no or only very limited explicit liabilities and, third, SWFs are managed separately from official foreign exchange reserves.[2] In addition, most SWFs share certain characteristics that originate in the specific nature of SWFs. For example, the lack of explicit liabilities (or the stretched-out maturity of liabilities) favours the pursuit of long-term investment strategies, as implemented by most SWFs.[3] In this respect, sovereign wealth funds differ from sovereign pension funds that operate subject to explicit liabilities and a continuous stream of fixed payments, making sovereign wealth funds more similar to private mutual funds.[4] Second, the absence of explicit liabilities also has a bearing on the willingness to take risk, as standard portfolio theory predicts a higher share of fixed income securities for funds that are subject to recurring payments. Finally, most sovereign wealth funds appear to have substantial exposure to foreign investments or are even entirely invested in foreign assets.

The main group of countries that have established SWFs are resource-rich economies which currently benefit from high oil and commodity prices. In these countries, SWFs partly also serve the purpose of stabilising government and export revenues which would otherwise mirror the volatility of oil and commodity prices.[5] Another purpose of such funds in resource-rich countries is the accumulation of savings for future generations as natural resources are non-renewable and are hence anticipated to be exhausted after some time.[6] Prominent examples of such SWFs include Norway's Government Pension Fund, investment agencies set up by member countries of the Gulf Cooperation Council (GCC), such as the Abu Dhabi Investment Authority (ADIA) which manages the foreign assets of the Emirate of Abu Dhabi in the United Arab Emirates (UAE), and the Russian oil stabilisation fund which has recently been partly transformed into a fund for future generations.

A second group of countries, most notably in Asia, has established SWFs because reserves are being accumulated in excess of what may be needed for intervention or balance-of-payment purposes. The source of reserve accumulation for these countries is mostly not linked to primary commodities but rather related to the management of inflexible exchange rate regimes.

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1   For an overview of foreign exchange reserve accumulation, see European Central Bank (2006).
2   The IMF Committee on Balance of Payments Statistics is currently working on a precise and operational definition in order to enhance the reporting in this area.
3   The lack of explicit liabilities is not a necessary condition for financial institutions to have a long-term investment horizon. For example, traditional banks often transform short-term liabilities into long-term assets. Nevertheless, from a balance sheet perspective, a low degree of short-term liabilities favours the pursuit of long-term strategies.
4   Pension funds often match their fixed liabilities that imply a stream of future payments with investments into fixed coupon-bearing bonds.
5   For a discussion on the relation between oil stabilisation funds and fiscal policy, see, for example, Barnett, Davis and Ossowski (2001) and Barnett and Ossowski (2002).
6   This is the case for many oil producers who, in order to avoid sharp adjustments of fiscal policy once oil reserves are depleted, accumulate financial assets during the period in which they produce oil. Thus, oil wealth is gradually transformed into financial wealth, leaving the country's overall wealth unchanged and preserving it for future generations.

As the authorities have become more comfortable with reserve levels, foreign assets have been moved to specialised agencies which often have explicit return objectives and may invest in more risky assets than central banks. Prominent examples include funds that have been operating for decades, such as the Singapore Government Investment Company (GIC), but also more recently established funds such as the Korea Investment Corporation (KIC), and the investment portfolio of the Exchange Fund managed by the Hong Kong Monetary Authority. Recently also China established a new investment agency, the China Investment Corporation (CIC), responsible for the management of a portion of Chinese foreign reserves.[7]

The policy issues arsing from the emergence of SWFs as large global financial players range from concerns over a lack of transparency and a reversal in privatisations, to risks to global financial stability. For example, some observers have suggested that SWFs, through more return-oriented investment strategies, could contribute to an unwinding of global imbalances through a diversification out of US dollar-denominated government bonds in which the bulk of traditional reserves is invested. Another concern relates to the question of whether such funds might distort asset prices through non-commercially motivated purchases or sales of securities.

This paper aims to shed light on some of these aspects by first exploring the available evidence on the size and investment strategies of SWFs including a discussion of transparency issues (Section 2). Section 3 presents illustrative back-of-the-envelope calculations in order to assess the potential impact of the accumulation of foreign reserves in SWFs – rather than traditional foreign exchange reserves – on global capital flows. Section 4 reviews the available evidence on the potential impact of changes in net capital flows triggered by SWFs on stock prices and bond yields. Finally, Section 5 presents a case study on Norway's SWF and examines the potential impact of

non-commercially motivated stock sales on the respective stock prices. Section 6 concludes with a preliminary summary assessment of the impact of SWFs on global financial markets.

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7   In Japan – the second largest holder of official foreign exchange reserves of more than USD 900 billion – the effectiveness of traditional reserve management has also recently been discussed. Furthermore, South Korea has announced plans to double the size of the sovereign wealth fund that manages part of its reserves by 2010 and similar steps are being considered in a number of other countries in the region such as Taiwan, Vietnam and India.

## 2 SOVEREIGN WEALTH FUNDS IN GLOBAL FINANCIAL MARKETS

Based on a combination of private and official sources, SWFs are estimated to have accumulated between at least USD 2 and 3 trillion, compared with around USD 6 trillion in traditional foreign exchange reserves.[8] However, even this range estimate is subject to considerable uncertainty as only a small fraction of SWFs report on the size of their portfolio.

Comparing the level of traditional foreign exchange reserves with assets managed in SWFs, two observations stand out (see Chart 1): Some countries have been accumulating foreign assets in SWFs for a long time and therefore hold relatively modest levels of foreign exchange reserves (e.g. members of the Gulf Cooperation Council like the UAE and Kuwait). In contrast, other countries have accumulated sizeable holdings of traditional foreign exchange reserves – most likely in excess of precautionary levels – but only recently created SWFs with relatively modest levels of assets under management (e.g. China and Russia). Therefore, many observers expect that these countries may in the future increasingly accumulate foreign assets in SWFs or even shift traditional reserve assets into such funds.

Table 1 provides a breakdown of major SWFs with estimates of total assets under management (see Box 1 for a more detailed description of major SWFs). Oil exporters, mostly from the Middle East, but also Norway's sizeable Government Pension Fund, are estimated to account for the largest part of total assets managed by SWFs, probably between USD 1,200 and 2,200 billion, although this estimate is subject to large uncertainty. A smaller fraction, of around USD 600 billion, is accounted for by Asian emerging economies, most notably Singapore, which has been running SWFs since the 1970s. But also mature economies, other than Norway, have set up SWFs, mostly to save receipts from the

**Chart 1 Sovereign wealth funds and official foreign exchange reserves**



(USD billions)

■ SWFs
▬ official foreign exchange reserves

1 UAE    5 China
2 Norway    6 Hong Kong
3 Singapore    7 Russia
4 Kuwait
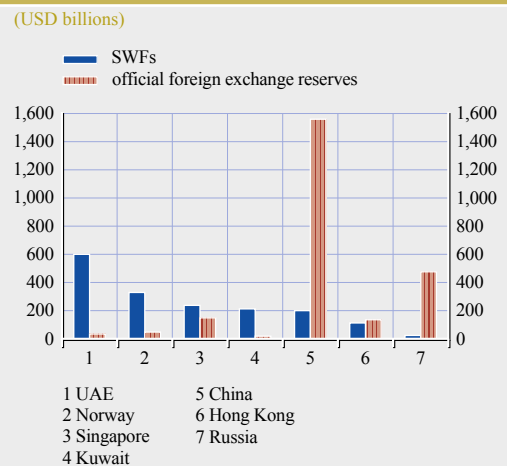
Sources: IMF and authors' estimates based on various national sources.

exploitation of natural resources. In sum, a plausible estimate of total assets managed by SWFs ranges from USD 2 to 3 trillion.

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8  We avoid double-counting by excluding funds which also qualify as official reserves. For example, Russia's current oil stabilisation fund is – in the form of government deposits – the balance sheet liability counterpart to the central banks' foreign assets which are counted as official foreign exchange reserves.

Box 1

## SELECTED SOVEREIGN WEALTH FUNDS

### Singapore

The Government of Singapore owns two independent SWFs. The first, Temasek Holdings, was founded in 1974 to manage part of the Government's revenues. To satisfy legal requirements in issuing bonds, Temasek first reported its accounts to the public in 2004. Total annualised returns have been 18% per annum since inception and currently the fund has a net asset value of around USD 108 billion. Although Temasek originally invested domestically, foreign investments now account for more than half of its total portfolio, concentrated in emerging Asia, especially China, Taiwan and Korea and, from a sectoral viewpoint, in the financial and telecommunications industries. Temasek claims not to "direct the commercial or operational decisions of our portfolio companies, except where shareholder approval is specifically required".

In 1981 a second SWF, the Government Investment Company (GIC), was set up to manage part of Singapore's foreign exchange reserves. Although its accounts are not published, GIC reports managing a portfolio of "more than USD 100 billion". The GIC's investment target is to achieve a real return of above GDP-weighted G3 inflation. GIC claims to have constantly exceeded the benchmark return.

### Hong Kong

Reserve management in Hong Kong is centralised in the Hong Kong Monetary Authority's Exchange Fund. The fund is split into a "backing portfolio" consisting of traditionally managed foreign exchange reserves, which fully back the Hong Kong dollar monetary base, and an actively managed "investment portfolio". Management of the investment portfolio is partly carried out by Hong Kong Monetary Authority staff and external fund managers. The latter are responsible for the management of all equity investments, which account for around a third of the investment portfolio.

### Russia

Russia introduced a formal Oil Stabilisation Fund in January 2004 with the aim of saving the fiscal windfall gains from high oil prices. Prior to that, Russia used to operate a less formal framework aimed at smoothing the macroeconomic impact of oil price fluctuations ("special reserve"). The Oil Stabilisation Fund is mainly financed from two sources: oil export custom duties in excess of a reference price and the mineral extraction tax. In addition, the unspent fiscal surplus of the previous fiscal year is added to the Oil Stabilisation Fund. Accumulated funds may be used to finance the federal budget deficit if the oil price falls below the reference price. If the Oil Stabilisation Fund's balance exceeds RUB 500 billion, these funds can be used to prepay external debt. Since February 2008 the fund is split into a "Reserve Fund" and a "Future Generations Fund". The Future Generations Fund can invest in sticky assets but has so far maintained a prudent asset allocation. At the same time, the Reserve Fund continues to invest in low-yielding, low-risk government bonds.

**Norway**

Norway's Government Pension Fund was established in 1990. Since January 2006, this fund includes the Government Pension Fund–Global (formerly Government Petroleum Fund, established in 1990) and the Government Pension Fund–Norway (formerly National Insurance Scheme Fund). The fund receives central government revenues from petroleum activities. As regards its objectives, the fund is used primarily as a savings fund for future generations. Only the expected real return of the fund can normally be transferred to the central government budget and used for general budgetary purposes. The Government Pension Fund–Global attained a portfolio value of around USD 373 billion at end-2007. The day-to-day management is delegated to Norges Bank but the ultimate responsibility lies with the Ministry of Finance, which issues guidelines for the investment of the fund's capital in shares and other securities abroad. Its institutional set-up is often quoted as a benchmark in terms of transparency and accountability. The fund publishes quarterly and annual reports which include a detailed disclosure of assets under management, the currency and asset class composition of the portfolio down to company level and a standardised reporting of its performance against a benchmark.

**Table 1 The world's largest sovereign wealth funds**

(USD billions)

| Country | Fund | Assets in USD billion | Foreign investment | Equity investment |
|---|---|---|---|---|
| **Oil exporters** | | **1240-2220** | | |
| UAE | Abu Dhabi Investment Council | 400-800 | high | high |
| Norway | Government Pension Fund - Global | 373 | high | medium |
| Saudi Arabia | SAMA | 300 | high | low |
| Kuwait | Kuwait Investment Authority | 213 | high | high |
| UAE | Investment Corporation of Dubai | 20-80 | high | high |
| Qatar | Qatar Investment Authority | 20-60 | high | high |
| Libya | Libya Investment Authority | 20-60 | high | high |
| Brunei | Brunei Investment Agency | 10-50 | high | high |
| Norway | Government Pension Fund - Norway | ~20 | low | medium |
| Russia | Future Generations Fund | ~24 | high | high |
| Kazalkhstan | National Oil Fund | 22 | high | low |
| Malaysia | Khazanah Nasional Berhad | ~18 | low | high |
| **East Asia** | | **~585** | | |
| China | China Investment Corporation | ~200 | high | high |
| Singapore | Government Investment Company | ~130 | high | high |
| Hong Kong | Exchange Fund Investment Portfolio | ~112 | high | low |
| Singapore | Temasek Holdings | ~108 | medium | high |
| Korea | Korea Investment Corporation | ~20 | high | high |
| Taiwan | National Stabilisation Fund | ~15 | low | high |
| **Others** | | **~138** | | |
| Australia | Government Future Fund | ~49 | medium | medium |
| United States | Alaska Permanent Fund | ~38 | medium | medium |
| United States | Permanent University Fund | ~20 | medium | medium |
| United States | New Mexico State Investment | ~16 | medium | medium |
| Canada | Alberta Heritage | ~15 | medium | medium |
| **Total** | | **1963-2943** | | |

Sources: Authors' assessment based on various national sources.
Notes: Figures are only rough approximations. "High" and "low" refer to shares above two-thirds and below one-third, respectively.

Despite the scarce information available, two main traits of the portfolio composition of SWFs can be identified: First, the largest part of SWFs' holdings is accounted for by foreign investment, although some SWFs either restrict their portfolio to domestic assets or diversify across both foreign and domestic assets.

Second, the share of risky assets in sovereign wealth funds' portfolios appears to be substantial, most likely in excess of half the total assets. In fact, there is some evidence that SWFs have been concentrating their investments in the financial sector. Since 2007, the majority of major SWF investments that were made

## Table 2 SWF's major cross-border equity investsments

(2007-2008Q1)

| Sovereign wealth fund | Acquired company | Transaction value | |
| --- | --- | --- | --- |
| | | *(in USD billion)* | *(in % of firm value)* |
| GIC of Singapore | UBS | 9.8 | 8.6 |
| Abu Dhabi Investment Council | Citigroup | 7.6 | 4.9 |
| GIC of Singapore | Citigroup | 6.9 | 4.4 |
| Investment Corporation of Dubai | MGM Mirage | 5.1 | 9.5 |
| China Investment Company | Morgan Stanley | 5.0 | 9.9 |
| Temasek (Singapore) | Merril Lynch | 5.0 | 11.3 |
| Qatar Investment Authority | Sainsbury | 3.7 | 25.0 |
| KIA (Kuwait) | Merril Lynch | 3.4 | 7.0 |
| China Development Bank | Barclays | 3.0 | 3.1 |
| China Investment Company | Blackstone | 3.0 | 10.0 |
| Investment Corporation of Dubai | London Stock Exchange | 3.0 | 28.0 |
| Temasek (Singapore) | China Eastern Air | 2.8 | 8.3 |
| SAFE (China) | Total | 2.8 | 1.6 |
| SAFE (China) | British Petroleum | 2.0 | 1.0 |
| KIC (Korea) | Merril Lynch | 2.0 | 4.3 |
| Temasek (Singapore) | Barclays | 2.0 | 1.8 |
| Qatar Investment Authority | London Stock Exchange | 2.0 | 20.0 |
| Temasek (Singapore) | Standard Chartered | 2.0 | 5.4 |
| undisclosed "Middle East investor" | UBS | 1.8 | 1.6 |
| Abu Dhabi Investment Council | Carlyle Group | 1.4 | 7.5 |
| Investment Corporation of Dubai | Och-Ziff Capital Management | 1.3 | 9.9 |
| Investment Corporation of Dubai | Mauser Group | 1.2 | 100.0 |
| Investment Corporation of Dubai | Alliance Medical | 1.2 | 100.0 |
| GIC of Singapore | Myer Melbourne | 1.0 | 100.0 |
| China Citic Securities | Bear Stearns | 1.0 | 6.0 |
| Borse Dubai | Nasdaq | 1.0 | 19.9 |
| Investment Corporation of Dubai | Standard Chartered | 1.0 | 2.7 |
| Investment Corporation of Dubai | Almatis | 1.0 | 100.0 |
| GIC of Singapore | Merrill Lynch Financial Centre | 1.0 | 100.0 |
| Investment Corporation of Dubai | Barney's New York | 0.9 | 100.0 |
| Investment Corporation of Dubai | EADS | 0.8 | 3.1 |
| GIC of Singapore | Hawks Town | 0.8 | 100.0 |
| Investment Corporation of Dubai | ICICI Bank Ltd | 0.8 | 2.9 |
| Temasek (Singapore) | Tokyo Westin | 0.7 | 100.0 |
| Mubadala Development Comp. (UAE) | Advanced Micro Devices | 0.6 | 8.0 |
| GIC of Singapore | WestQuay Shopping Centre | 0.6 | 50.0 |
| Investment Corporation of Dubai | Sony | 0.5 | 1.0 |
| Qatar Investment Authority | OMX | 0.5 | 10.0 |
| GIC of Singapore | British Land | 0.3 | 3.0 |
| Investment Corporation of Dubai | Metropole Hotel | 0.3 | 100.0 |
| GIC of Singapore | Kungshuset | 0.2 | 100.0 |
| SAFE (China) | Commonwealth Bank of Australia | 0.2 | 0.3 |
| SAFE (China) | Australia and New Zealand Banking Group | 0.2 | 0.3 |
| SAFE (China) | National Australia Bank | 0.2 | 0.3 |
| GIC of Singapore | Roma Est Shopping Centre | 0.1 | 50.0 |
| Temasek (Singapore) | 9You Online Games | 0.1 | 9.4 |
| **Total** | | **91.5** | |

Sources: Company websites and media reports.

## Table 3 Stock prices and CDS spreads of selected banks around time of SWF investment

| | Stock price January 2006 - April 2008 (US dollar/ euro) | | | | CDS Spread January 2006 - April 2008 (basis points) | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | High | Low | Average | Announcement of SWF investment | High | Low | Average | Announcement of SWF investment |
| Citigroup[1] | 56.4 | 18.6 | 45.0 | 30.7 | 226.6 | 6.8 | 35.7 | 95.5 |
| Citigroup[2] | 56.4 | 18.6 | 45.0 | 26.9 | 226.6 | 6.8 | 35.7 | 83.7 |
| Merril Lynch[3] | 97.5 | 39.9 | 74.2 | 53.9 | 338.8 | 15.3 | 60.9 | 132.9 |
| Morgan Stanley[4] | 74.1 | 36.4 | 57.9 | 55.0 | 297.3 | 17.8 | 55.7 | 97.2 |
| UBS[5] | 63.0 | 23.5 | 51.2 | 49.2 | 225.3 | 4.5 | 26.1 | 50.8 |

Sources: Bloomberg and authors' calculations.
Note: The date of the investments and the respective SWFs are shown in the footnotes below.
1) 26 Nov. 2007 (ADIA).
2) 15 Jan. 2008 (GIC).
3) 24 Dec. 2007 (Temasek).
4) 24 Dec. 2007 (CIC).
5) 10 Dec. 2007 (GIC).

public were placed in financial institutions and five large international banking corporations alone received more than USD 45 billion from SWFs. In this respect, the large weight of financial institutions in SWF investments – while only to some extent reflecting the high weight of this sector in global capital markets – might support the view that SWFs could act as a stabilising force in global financial markets. In fact, SWFs appear to have taken stakes in globally operating banks when their stock prices and CDS spreads were negatively affected by the financial market turmoil (see Table 3). This

could be an indication that some SWFs pursue mean-reverting investment strategies. However, the stabilising market impact of these investments has been short-lived, as stock prices tended to decline further following the SWF acquisitions while CDS spreads narrowed moderately.

In addition, available data on some of the more transparent funds, such as Singapore's Temasek and US endowment funds, as well as anecdotal evidence on Middle East oil exporters' investment projects, indicate that private equity, real estate and emerging market investments account for a significant part of at least some SWF portfolios. Hence, the information available on the world's largest SWFs suggests that, with respect to investment style, these differ substantially from traditional foreign exchange reserves and are instead comparable to private asset managers, in particular mutual funds.

As regards the relative size of SWFs, total SWF assets are relatively small compared with the more than USD 50 trillion of funds managed by the private asset management industry (Chart 2).[9] However, the largest SWFs already now manage portfolios that are in the order of magnitude of the biggest private investment companies and could in the future – to the extent that external surpluses are increasingly accumulated in SWFs or that existing reserves are shifted to SWFs –

## Chart 2 Sovereign wealth funds in comparison
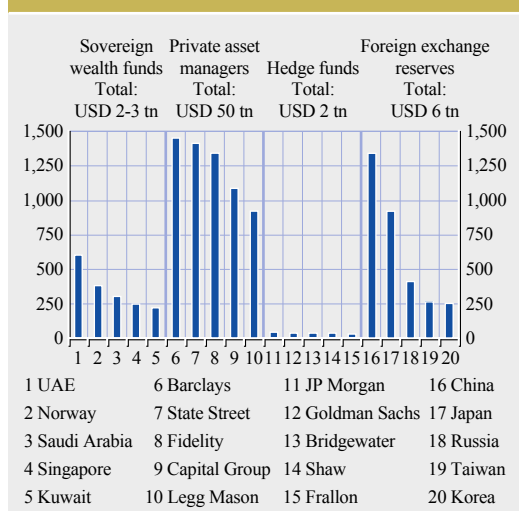


Source: Author's estimates based on various national sources, Investor Magazine, IMF.
Note: Top 5 investors for each investor type.

| 1 UAE | 6 Barclays | 11 JP Morgan | 16 China |
| 2 Norway | 7 State Street | 12 Goldman Sachs | 17 Japan |
| 3 Saudi Arabia | 8 Fidelity | 13 Bridgewater | 18 Russia |
| 4 Singapore | 9 Capital Group | 14 Shaw | 19 Taiwan |
| 5 Kuwait | 10 Legg Mason | 15 Frallon | 20 Korea |

9   In Chart 2, we have considered the mid-point of the range in Table 1 as the best available estimate for total SWF assets.

**Chart 3 Transparency and institutional development**

x-axis: transparency of sovereign wealth fund
y-axis: quality of legal system

x-axis: transparency of sovereign wealth fund
y-axis: democracy accountability



Sources: Truman (2007), International Country Risk Guide.
Note: Higher values indicate a "better" score.
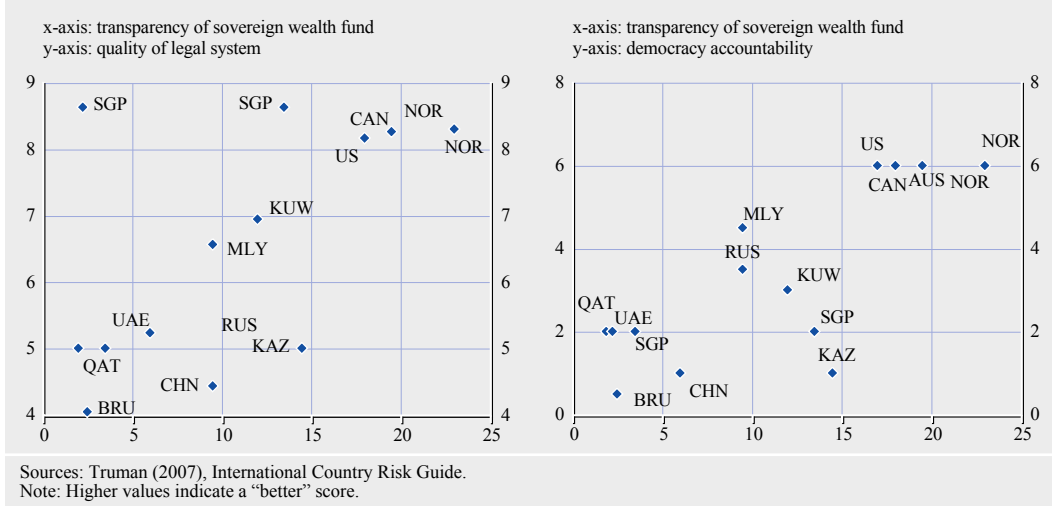
even exceed the largest private investment managers' portfolios.[10]

The growing importance of SWFs raises a number international policy issues. In fact, state-controlled foreign investments may be sensitive both from a political perspective and from an economic point of view, as the lack of transparency of SWFs gives room for concerns about the motivation of these funds' investments and may hence, in turn, aggravate protectionist pressures. In fact, the issue of SWFs has been discussed in various international fora. In its Heiligendamm declaration of September 2007, the G7 stated that any restrictions on SWF investments should be minimised and only "apply to very limited cases which primarily concern national security". In addition, the G7 called upon the OECD and the IMF to identify best practices upon the recipient and investor side and both organisations are currently developing Principles for recipient countries and SWFs.

In order to address one of the main concerns of policy-makers, to what extent SWFs are indeed non-transparent is examined below in more detail, as well as if low disclosure practices for SWFs are related to other institutional factors in the respective countries. Using the corporate governance index for SWFs proposed by Truman

(2007) as a yardstick for transparency, the seven most non-transparent SWFs – which basically do not publish any information on their portfolios – account for almost half of all SWFs holdings. In order to shed some light on the potential sources of the lack of transparency, Chart 3 compares the transparency indicator to two indicators of institutional development: (i) an index of the quality of the legal system and (ii) an index of the democratic accountability of the government.

Despite the remarkable degree of heterogeneity in transparency, there appears to be a systematic pattern as the lowest transparency scores are attained by economies with either low scores in the quality of a the legal system or democratic accountability. From a policy perspective these patterns raise concerns since a low degree of accountability vis-à-vis the public, in combination with low corporate governance standards, may facilitate the pursuit of strategic objectives through SWFs.[11] Such concerns, in turn, may trigger protectionist pressures.

10 Note that, in contrast to most SWFs, some of the private asset managers shown in Chart 2 – in particular hedge funds – are often highly leveraged and hence a comparison of assets under management may overstate the relative significance of SWFs.
11 In this context it should be noted that these objectives can also be pursued through other mechanisms, such as foreign direct investment by state-owned companies.

## 3 SOVEREIGN WEALTH FUNDS AND GLOBAL CAPITAL FLOWS

In order to gauge the impact of SWFs on global financial markets, it is useful to consider how an increasing accumulation of assets in SWFs could change the pattern of global capital flows. In fact, countries with large "excess reserves", i.e. reserves in excess of traditional balance of payments needs, may opt for a more return and less liquidity-oriented portfolio allocation of these assets. Therefore, a comparison of traditional reserve portfolios and market capitalisation-based portfolios can provide an indication of the direction of future capital flows.[12]

First, excess reserves of major emerging markets are identified using two traditional rule-of-thumb measures.[13] Table 4 shows that the magnitude of excess reserves is indeed substantial, estimated to exceed USD 3 trillion or more than half of total official foreign exchange reserves to date.

As for the portfolio allocation of reserves and SWF assets, we assume that foreign exchange reserves are allocated across currencies as reported in the IMF's COFER database (Table 5, Panel A). As a long-run benchmark portfolio for SWFs, we take a ten-year average of global market capitalisation weights, broadly in line with the available evidence discussed in Section 2 (Table 5, Panel B).[14] A further rationale for taking market capitalisation as a benchmark allocation for SWFs follows the argument, discussed in detail above, that in principle SWFs aim to follow a portfolio allocation strategy similar to that of private asset managers, which in turn is broadly mirrored in market capitalisation shares, provided that the assumptions of the traditional international Capital Asset Pricing Model (CAPM) hold.[15]

A comparison of Panels A and B allows a simple back-of-the-envelope calculation of the capital flows resulting from a potential shift out of foreign exchange reserves into SWFs to be performed. In a first step, we estimate the amounts invested in the various markets by applying the shares reported in Panel A to our

**Table 4 Excess reserves in emerging Asia and oil-exporting economies**

(in USD billions)

|  | Reserves | 3-months imports | Short-term external debt | Excess reserves |
|---|---|---|---|---|
| China | 1,559 | 254 | 231 | 1,306 |
| Russia | 420 | 70 | 53 | 350 |
| Saudi Arabia | 276 | 34 | 22 | 242 |
| Taiwan | 261 | 67 | 26 | 194 |
| Korea | 244 | 109 | 3 | 135 |
| India | 202 | 72 | 15 | 129 |
| Brazil | 175 | 37 | 66 | 110 |
| Algeria | 99 | 10 | 0 | 90 |
| Libya | 79 | 6 | 1 | 73 |
| Singapore | 149 | 85 | 40 | 64 |
| Others | 959 | | | 332 |
| **Total** | **4,322** | | | **3,023** |

Sources: IMF (WEO) estimates for 2007 and authors' calculations.
Note: Excess reserves are computed as the difference between foreign exchange reserves and the maximum of three-month import values and total short-term external debt.

estimate of global excess reserves. In a second step, we compute an alternative asset allocation by applying the benchmark weights of Panel B. The difference between the amounts invested in each market under the two allocations yields a back-of-the-envelope estimate for potential net capital flows. Our benchmark results are presented in Scenario A of Table 6. Three main findings stand out:

First, a reallocation of excess reserves would trigger net capital outflows out of US assets at an order of magnitude of around USD 500 billion. This net outflow is entirely due to the large reduction in demand for US bonds, which currently are still the main investment target of most official foreign exchange reserve managers. However, as SWFs shift capital from less risky

12 A similar approach is taken by Jen (2007).
13 Excess reserves are defined as foreign exchange reserves is excess of both (i) the difference between actual foreign exchange reserves and the value of three months of imports; and (ii) the difference between actual foreign exchange reserves and total short-term external debt.
14 In fact, taking into account that the new investments of SWFs would span over a long time horizon, current market capitalisation weights are unlikely to still be accurate. In addition, SWFs may have an impact on market capitalisation weight through their own investment decisions, thus generating "second-round effects" which SWFs would ideally also factor into their optimal portfolio considerations.
15 See, for example, Solnik (1974) and Roll (1977).

## Table 5 Benchmark allocations for foreign exchange reserves and SWFs

(percentages)

|  | US | Euro area | Japan | UK | Others |
|---|---|---|---|---|---|
| **Panel A: Actual allocation of emerging economies' foreign exchange reserves** | | | | | |
| Stock market | 0 | 0 | 0 | 0 | 0 |
| Bond market | 60.5 | 28.6 | 2.6 | 5.9 | 2.4 |
| **Panel B: SWFs (assumed to be invested according to market capitalisation)** | | | | | |
| Stock market | 44.5 | 15.1 | 9.5 | 7.7 | 23.2 |
| Bond market | 41.7 | 24.9 | 15.9 | 4.3 | 13.2 |

Sources: IMF (COFER) and authors' estimates.

bond markets to more risky equity markets, the outflow out of the US bond market is partly offset by an inflow into US equity markets, given the large size of US equity markets, which currently account for roughly 45% of world stock market capitalisation.

Second, this simple exercise also suggests net capital outflows out of euro area assets. As Table 6 shows, the net inflow into euro area equities of around USD 200 billion would be more than offset by net outflows from euro area bonds of around USD 400 billion. In other words, official reserve assets are currently more overweighted in euro area bonds than underweighted in euro area

equities, when taking portfolios based on market capitalisation as a benchmark.

Third, the counterpart of these net outflows from the United States and the euro area are mainly Japan and emerging economies, reflecting the relatively large weight of these countries in global capital markets compared with their negligible role as reserve currencies. In fact, aggregating net capital flows of developed countries (i.e. the United States, the euro area, the UK and Japan) shows that capital would flow from developed to "other", i.e. emerging and developing, countries. This finding is in line with standard neoclassical predictions according to which capital should

## Table 6 Simulation of net capital flows for reallocation of reserves towards SWFs

(in USD billions)

| Scenario A: Benchmark results for diversification across regions and markets | US | Euro area | Japan | UK | Others | Total |
|---|---|---|---|---|---|---|
| Stock market | 538 | 183 | 115 | 93 | 281 | 1,209 |
| Bond market | -1,073 | -413 | 210 | -100 | 167 | -1,209 |
| Total | -534 | -230 | 325 | -7 | 447 | |
| **Scenario B: Share of US/euro securities in bond holding unchanged** | | | | | | |
| Stock market | 538 | 183 | 115 | 93 | 281 | 1,209 |
| Bond market | -732 | -346 | -31 | -71 | -29 | -1,209 |
| Total | -193 | -163 | 83 | 22 | 252 | |
| **Scenario C: Diversification only between US and euro area bond markets** | | | | | | |
| Stock market | 0 | 0 | 0 | 0 | 0 | 0 |
| Bond market | -142 | 142 | 0 | 0 | 0 | 0 |
| Total | -142 | 142 | 0 | 0 | 0 | |
| **Scenario D: Diversification only between US and euro area** | | | | | | |
| Stock market | 804 | 273 | 0 | 0 | 0 | 1,077 |
| Bond market | -817 | -260 | 0 | 0 | 0 | -1,077 |
| Total | -13 | 13 | 0 | 0 | 0 | |

Source: Authors' estimates.

indeed flow from rich to poor countries because of higher returns to capital in the latter. In fact, one element of the so-called "Lucas paradox" according to which capital tends in reality to rather flow "uphill" has in recent years been the accumulation of foreign exchange reserves by emerging and developing countries.[16] Such purchases of foreign exchange generate – when invested in the major reserve currencies – a capital outflow from developing to developed countries. The resulting "reserve portfolio bias" stems from the fact that emerging and developing countries have so far played only a negligible role as issuers of reserve currencies due to a lack of financial development – in particular in terms of large and liquid capital markets. In a situation in which SWFs behave as CAPM-type investors and thus allocate foreign assets according to risk and return rather than liquidity considerations, official portfolios lose this "bias" towards the major reserve currencies. As a result, more capital flows "downhill". In fact, anecdotal evidence as well as some available data on Singapore's Temasek suggest that many SWFs indeed have an already high exposure to emerging markets.[17]

An alternative scenario accounts for the fact that under a fixed exchange rate regime the optimal weight of anchor-currency denominated bonds may be higher as these tend to reduce the volatility of the portfolio.[18] In order to account for this effect, Scenario B of Table 6 assumes that the fraction that remains invested in bond markets is not reallocated according to market capitalisation weights but continues to be invested across currencies like traditional foreign exchange reserves, i.e. roughly two-thirds in US and one-third in euro area securities. However, this assumption does not qualitatively change the findings with respect to the previous scenario, as outflows from the euro area bond market still offset the inflow in the euro area equity market. Hence, even modest shifts out of bonds and into equities by official investors could trigger an outflow out of euro area assets given that the euro area accounts for a smaller share of the global stock market.

In reality, major shifts in the composition of sovereign portfolios will only occur gradually over a longer run. In fact, SWFs may find it difficult to fully diversify across regions according to market capitalisation weights and may hence, in the short run, only invest in the largest and most liquid markets. Therefore, Scenario C in Table 6 illustrates how an initially limited diversification could play out on global bond markets over the short run if SWFs invest only in US and euro area bond markets while it is assumed that the other regions receive no additional capital flows. In this case, the overweight US dollar assets in foreign exchange reserves would lead to net outflows of the US bond market of around USD 150 billion, which would have to be absorbed entirely by the euro area bond market, given the relatively larger market capitalisation of euro area bond markets than reflected in the actual allocation of foreign exchange reserves. The magnitude of capital outflows from the United States into the euro area, however, depends largely on the assumption that additional funds are not invested in equity markets. Scenario D of Table 6 shows that, to the extent that funds are invested partly in equities, capital flows into the euro area are much smaller. Assuming that 40% are invested in equities, the simulation suggests virtually no net flows from the United States to the euro area.
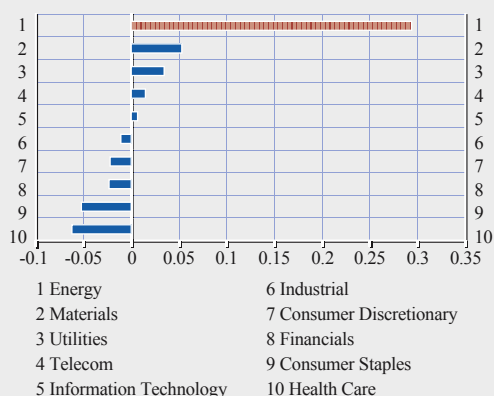
Obviously, the asset allocation of SWFs may also reflect other considerations. For example, oil-exporting countries may want to use their SWF assets to hedge against oil price fluctuations. In this case, standard portfolio theory would suggest that the SWFs should underweight assets that are strongly correlated with oil prices. As shown in Chart 4, daily returns on energy stocks are correlated with oil

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16 This observation has already been made by Prasad, Rajan and Subramanian (2007) and Bracke, Bussière, Fidora and Straub (2008). The broader academic literature on the Lucas paradox has mainly focused on private capital flows and the fact that risk-adjusted returns to capital in developing countries may not be as high as suggested by a low capital/labour ratio. The latter may stem from private capital flows, referring to institutional deficiencies in developing countries such as repeated defaults on government debt (Gertler and Rogoff, 2000) or the risk of expropriation (Stulz, 2006).

17 In the case of Temasek, emerging economies are even clearly overweight, accounting for 40% of the total portfolio against a portfolio weight of only 20% of OECD economies excluding Korea.

18 See Beck and Rahbari (2008) and Fidora, Fratzscher and Thimann (2007).

**Chart 4 Correlation of sector returns with oil prices**



1 Energy
2 Materials
3 Utilities
4 Telecom
5 Information Technology
6 Industrial
7 Consumer Discretionary
8 Financials
9 Consumer Staples
10 Health Care

Sources: Bloomberg and authors' calculations.
Notes: The sectoral indices are the MSCI World sector indices. The correlations have been computed for daily returns between 1 January 1995 and 6 February 2008.

**Chart 5 Share of oil company stocks in total market capitalisation**

x-axis: % of total market capitalisation



1 UK
2 Others
3 World
4 US
5 Euro area
6 Japan
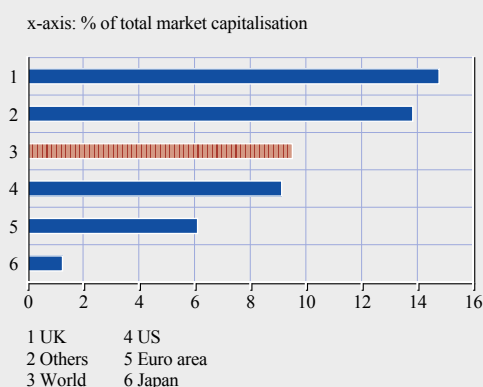
Sources: Datastream and ECB calculations.
Note: Market capitalisation figures refer to Q4 2006.

price returns. Therefore, an investment strategy that underweights energy stocks would reduce the variance of a typical SWF portfolio.

Underweighting energy stocks would also have an important implication for the geographical portfolio allocation of SWFs, since the share of energy companies in total market capitalisation differs widely across regions (Chart 5). Therefore, such a strategy would tend to raise the portfolio shares of Japanese, euro area and, to a lesser extent, US stocks at the expense of UK and other (mostly emerging market) stocks. More generally, SWFs may also wish to exploit other positive or negative correlations between assets in their national balance sheet and marketable assets such as company stocks.

Our simulations are subject to overly simplifying assumptions and several caveats. First, diversification strategies as simulated above may be incompatible with some countries' macroeconomic and exchange rate policies. In fact, large shifts out of US dollars could trigger an appreciation of domestic currencies against the US dollar, requiring increased intervention to stem this appreciation.[19] In addition, liquidity considerations may still be of

relevance for some SWFs.[20] In particular funds that have been established for macroeconomic stabilisation objectives could continue to invest in highly liquid instruments and hence remain overweight in US dollar and euro bonds. As a result, inertia in the currency composition of foreign assets could play out more notably than assumed in Scenario B. Also, reference currency considerations could lead to different allocations by sovereign wealth funds – in particular in countries which have increased the share of the euro in their exchange rate baskets (e.g. Russia). For example, using the local currency as the reference currency in countries with pegged or managed exchange rates leads to large optimal portfolio weights of foreign assets denominated in the respective anchor currency.[21]

19 See also the literature on the so-called "Bretton Woods II" system, which argues that emerging market central banks might therefore find it difficult to diversify their foreign exchange reserves (e.g. Dooley, Folkerts-Landau, Garber, 2004).
20 See Chinn and Frankel (2006) on the determinants of reserve currencies.
21 See Beck and Rahbari (2008) and Fidora, Fratzscher and Thimann (2007).

## 4 THE IMPACT ON EXCHANGE RATES AND ASSET PRICES

The question as to whether capital flows triggered by investments of SWFs can impact financial market prices is extremely difficult to answer or even quantify. So far, no rigorous study has been performed to address this question. A review of related literature suggests that SWFs could have an impact on asset prices and exchange rates through price pressures or a change in risk aversion.

A direct impact on asset prices or exchange rates through price pressures triggered by SWF demand (e.g. equities) or supply (e.g. government bonds) is only conceivable if the demand curve in the respective markets is downward-sloping. While there is some empirical evidence for price pressures in certain markets, it remains controversial how persistent such effects are (see Box 2). In addition, studies aimed at examining the impact of capital flows on asset prices have been confronted with endogeneity and identification challenges, since it is uncertain whether capital flows into specific markets because investors expect a high return or whether the returns are affected by the capital flows.[22]

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22 Among the studies surveyed in Box 2, Froot, O'Connell and Seasholes (2001) and Warnock and Warnock (2006) address these endogeneity issues to some extent.

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### PRICE PRESSURES IN FINANCIAL MARKETS: A SURVEY OF THE LITERATURE

According to the efficient market hypothesis, demand curves for financial assets are horizontal. However, a large body of empirical literature has documented the existence of downward-sloping demand curves and "price pressure" in financial markets. Conceptually, the price pressure hypothesis is closely related to the notion of imperfect substitutability between financial assets, as pointed out first by Scholes (1972). In particular, it has been found that large block trades may have an impact on asset prices. Due to the difficulty of disentangling price pressure and information effects, empirical research on the issue has often studied the price impact of announcements which are unlikely to contain new information about the assets.

### Equity markets

In the earlier literature on price pressures, researchers have documented individual stock price reactions to large block trades.[1] However, these price reactions may also reflect new information about the respective stocks. Therefore, subsequent "event studies" have examined the price impact of stock inclusions into major stock market indices and found significant price pressure effects in an environment where information effects probably play almost no role.[2] Several other earlier studies, however, find little support for the price-pressure

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1 Negative (positive) price reactions to large block sales (purchases) have been documented by Scholes (1972), Holthausen, Leftwich and Mayers (1984) and Mikkelson and Partch (1985).

2 See Harris and Gurel (1986) as well as Shleifer (1986). According to the findings by Harris and Gurel, immediately after an addition is announced, stock prices increase by more than 3%. This increase is nearly fully reversed after two weeks. In Shleifer's event study, stocks newly included in the Standard and Poor's 500 Index reaped a significant positive abnormal return at the announcement of the inclusion and this return did not disappear for at least ten days after the inclusion.

hypothesis and a downward-sloping demand curve.[3] More recently, more convincing support for downward-sloping demand curves for stocks in a case which appears unambiguously free of information has been provided by Kaul, Mehrotra and Morck (2000). Outside the framework of event studies Levin and Wright (2006) examine downward-sloping demand curves for stocks econometrically. In addition, Froot, O'Connell and Seasholes (2001) find that portfolio inflows have positive forecasting power for future equity returns, in particular in the emerging markets.

## Bond markets

Changes in government bond yields and the yield curve have traditionally been linked to the announcement of macroeconomic news.[4] A recent study shows that "orderflow imbalances" significantly affect government bond yields on days without major macroeconomic announcements (Brandt and Kavajecz, 2004). In addition, Warnock and Warnock (2006) provide econometric evidence for foreign official purchases of US government bonds having a large and significant impact on US bond yields. Krishnamurthy and Vissing-Jorgensen (2007) study a case in which the aggregate demand curve for the convenience provided by Treasury debt (e.g. through high liquidity) is downward sloping.[5] Changes in the supply of Treasury debt are used to trace out the demand for convenience. Interestingly, disaggregated estimates of convenience demand suggest that the demand for Treasury debt from foreign official holders (i.e. central banks) is very inelastic, consistent with the view that a stable demand for US assets has helped to finance the US current account deficit. An exit of foreign central banks from the US Treasury market would prompt US investors to buy these securities, but at a lower price, implying a rise in US government bond yields.

## Foreign exchange markets

In foreign exchange markets, the early portfolio balance literature has motivated downward-sloping demand curves by postulating imperfect substitutability between domestic and foreign bonds. However, the traditional portfolio balance approach enjoyed little empirical support. The resilience of foreign exchange markets is also at the core of the literature on central bank interventions (e.g. Dominquez, 2003). While the conceptual case for the effectiveness of sterilised interventions has remained controversial, recent empirical studies do provide evidence for an exchange rate effect of such interventions. Besides the traditional portfolio effect, central bank intervention may also have an impact on the exchange rates as it reveals information about future monetary policy through a "signalling effect". Therefore, studies on central bank interventions have remained ambiguous about the nature of the exchange rate effect. The surge in gross cross-border capital flows since the 1990s has

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3   Hess and Frost (1982), using data on new issues of utility stocks, find that rates of return appear to be uncorrelated with the size of the new issue. Jain (1987) provides evidence that excess returns following the S&P decisions to include or exclude stocks in its indexes is not explained by the price pressure hypothesis. Kalay and Shirnrat (1987) find that an announcement of new equity issues has not only a negative effect on stock prices but also a significant negative effect on bond prices. They interpret this as being consistent with the information hypothesis because new equity issues lead to a reduction in firm value and, thus, a negative effect on bond price.

4   Strong empirical support for the impact of macroeconomic announcement on bond yields is found, for example, by Fleming and Remolona (1997, 1999). For a theoretical model relating macroeconomic news to bond yields, see Piazzesi (2003).

5   As a consequence, corporate bond spreads are not only driven by default risk and a risk premium, but also by the convenience yield of US Treasuries. Therefore, a low (high) US debt/GDP ratio has historically been associated with high (low) corporate bond spreads, as in this situation the marginal convenience of US Treasury debt is high, causing the price of Treasuries to rise (fall) and their yields to decline (rise).

triggered renewed interest in the portfolio channel for exchange rates.[6] At the same time, the market microstructure literature has highlighted that currency order flows are strongly correlated with exchange rate returns (Evans and Lyons, 2002). Finally, recent event studies on foreign exchange markets also find indications for price effects. Hau, Massa and Peress (2005) show that a redefinition of the MSCI international equity index – which has implied large changes in the representation of different countries – led to strong exogenous equity flows by index funds and an appreciation of the respective exchange rates.

6 Hau and Rey (2003) provide micro foundations to the portfolio balance theory and derive a positive correlation between capital flows and exchange rate returns. Froot and Ramadorai (2004) document, in a VAR framework, persistent exchange rate effects related to institutional investor flows. Using a new identification approach, Hau and Rey (2004) find that portfolio flow shocks appreciate the exchange rate and generate excess returns in foreign equity markets.

The emergence of SWFs as the main managers of foreign assets could also have an impact on asset prices through a rise in global risk aversion, given their return-orientation and longer-term investment horizon. In the literature, the pricing of risky assets relative to safe assets, often phrased in terms of the "equity premium", has been linked to the average level of risk aversion. In such an environment, growing SWFs could trigger a decline in risk aversion at the global level, which would lead to a rise in bond yields and a decline in the equity premium.[23]

Most empirical estimates on the yield impact of US Treasury buying by foreign central banks range from around 20 to around 100 basis points (see Table 7). As discussed in Section 3, these flows could be reversed to some extent if excess reserves are transferred to SWFs. Therefore, such estimates can also be considered as an estimate of the possible rise in bond yields due to the emergence of SWFs.

### Table 7 The effect of foreign central bank buying on US Treasury yields

(in basis points)

| Source | Estimated reduction |
|---|---|
| Banque de France (2005) | 125 |
| Bernanke et al. (2004) | 50-100 |
| BIS (2006) | ~ 0 |
| Goldman Sachs (2004) | 40 |
| IXIS (2005) | 75 |
| JP Morgan (2005) | 30-50 |
| Krishnamurthy and Vissing-Jorgensen (2007) | 20-55 |
| Merrill Lynch (2005) | 30 |
| Morgan Stanley (2005) | 100-150 |
| PIMCO (2005) | 100 |
| Roubini and Setser (2005) | 200 |
| Truman (2005) | 75 |
| Vanguard Group (2005) | ~ 0 |
| Warnock and Warnock (2006) | 90 |

23 In the context of SWFs, Jen and Miles (2007) argue that according to a modified version of the Barro (2005) model, the growing importance of SWFs could considerably drive down global risk aversion, raising US government bond yields by 30-40 basis points and the price-earnings ratio by 5-10%.

# 5 A CASE STUDY ON PRICE PRESSURE: NORWAY'S GOVERNMENT PENSION FUND

This section examines the potential impact of portfolio rebalancing of SWFs on asset prices using data on Norway's SWF, for which detailed information on the portfolio composition is available. In particular, we examine whether large-scale equity sales of the Government Pension Fund due to non-economic motives can have a significant impact on equity prices. Norway's Ministry of Finance has established Ethical Guidelines for the Government Pension Fund-Global that allow for the exclusion of a stock from the SWF's portfolio based on non-economic considerations. An "Advisory Council" within the Ministry of Finance has been mandated to review the fund's investments and assess whether these might "imply an unacceptable risk of complicity" in the violation of the ethical principles underlying the Fund's Ethical Guidelines. Upon the Advisory Council's recommendation, the Ministry of Finance can exclude a particular company's stocks from the Fund's investment universe.

The timing of the process of exclusion of a particular corporation's stocks from the Fund's investment universe is as follows: first, the Advisory Council issues a recommendation to exclude a particular stock from the Fund's investment universe. This recommendation is initially not published. The Ministry of Finance then decides on whether to exclude the company from the portfolio and instructs Norges Bank to divest from the respective company within a deadline of, on average,
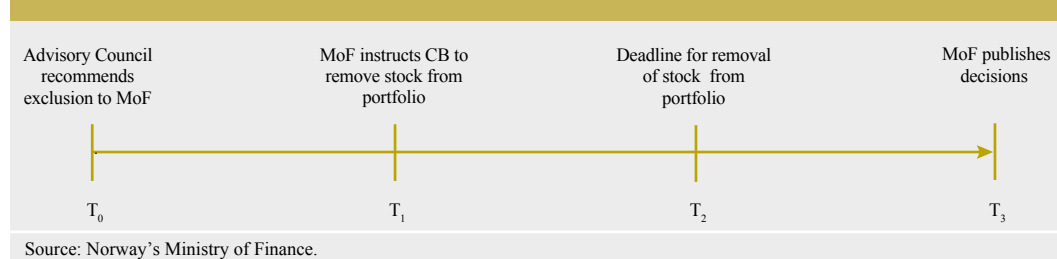
around two months. Once the stocks have been excluded from the Fund's portfolio the exclusion is announced to the public.

The Ministry of Finance has so far always followed the Advisory Council's recommendations and instructed Norges Bank to exclude companies in 28 cases, mostly on account of their involvement in the diffusion of certain military armament but also because of the violation of human rights and environmental considerations.[24]

The exclusion of securities from the Fund's investment universe constitutes a natural experiment that is particularly well-suited for analysing the potential impact of the investment behaviour of SWFs on financial markets for two reasons: first, the exclusion is based on purely non-economic criteria. Hence, the exclusion is unlikely to reflect the Fund's expectations or private information on future performance. Second, the timing and modalities of the exclusion enable two potential channels through which the exclusion might have an impact on the stocks returns to be distinguished: (i) during the period within which Norges Bank divests from a particular stock, abnormal returns on the company's stocks would reflect the pure impact of the *decrease in demand*; (ii) on the day of the public announcement of the exclusion, abnormal returns can be interpreted as a *signalling impact*

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24 This includes Singapore Technologies Engineering, which had been excluded by the Petroleum Fund Advisory Commission on International Law, the predecessor of the Advisory Council. The exclusion of Kerr McGee was revoked on 24 May 2006.

**Chart 6 Timing of the exclusion of stocks from the Fund's investment universe**



| Advisory Council recommends exclusion to MoF | MoF instructs CB to remove stock from portfolio | Deadline for removal of stock from portfolio | MoF publishes decisions |
| $T_0$ | $T_1$ | $T_2$ | $T_3$ |

Source: Norway's Ministry of Finance.

**Table 8 Stock performance during divestment period and upon announcement of exclusion**

| | Divestment period | | | | Anouncement day | | | |
|---|---|---|---|---|---|---|---|---|
| | Equity return | Benchmark return | Excess return | p-value | Equity return | Benchmark return | Excess return | p-value |
| Alliant Techsystems Inc. | 9.9 | 4.4 | 5.5 | 0.65 | 0.2 | -0.2 | 0.3 | 0.86 |
| BAE Systems Plc | 10.3 | 12.9 | -2.6 | 0.76 | 2.6 | 2.4 | 0.1 | 0.93 |
| Boeing Co. | 3.4 | 5.6 | -2.2 | 0.83 | 0.1 | 0.2 | -0.1 | 0.99 |
| DRD Gold Ltd. | -16.0 | 10.5 | -26.4 | 0.37 | 2.3 | 1.6 | 0.7 | 0.91 |
| EADS Co. | 6.3 | 9.7 | -3.4 | 0.81 | 0.2 | 2.3 | -2.1 | 0.32 |
| Finmeccanica Sp. A. | -1.2 | 3.9 | -5.1 | 0.67 | 0.3 | -0.1 | 0.5 | 0.77 |
| Freeport McMoRan Copper & Gold Inc. | -0.4 | 1.4 | -1.8 | 0.92 | -0.6 | 0.9 | -1.5 | 0.58 |
| General Dynamics Corp. | 4.1 | 2.8 | 1.3 | 0.89 | 0.2 | -0.3 | 0.5 | 0.73 |
| Honeywell International Corp. | 3.8 | 4.4 | -0.6 | 0.96 | 0.0 | -0.1 | 0.1 | 0.98 |
| Kerr McGee Corp. | -4.7 | 2.7 | -7.4 | 0.36 | -1.2 | 0.5 | -1.7 | 0.49 |
| L3 Communications Holdings Inc. | 6.5 | 5.1 | 1.3 | 0.93 | -0.3 | 0.0 | -0.3 | 0.90 |
| Lockheed Martin Corp. | -3.0 | 3.4 | -6.4 | 0.56 | -0.7 | -0.3 | -0.4 | 0.83 |
| Northrop Grumann Corp. | 11.7 | 4.3 | 7.4 | 0.54 | -0.8 | 0.0 | -0.8 | 0.72 |
| Poongsan Corp. | 8.0 | 3.8 | 4.2 | 0.80 | -1.5 | 0.0 | -1.5 | 0.53 |
| Raytheon Co. | 0.0 | 1.4 | -1.4 | 0.92 | 0.3 | -0.3 | 0.7 | 0.77 |
| Safran S.A. | 5.2 | 2.0 | 3.3 | 0.88 | 1.4 | -0.2 | 1.5 | 0.58 |
| Thales S.A. | 10.0 | 7.5 | 2.4 | 0.86 | 0.9 | 1.7 | -0.7 | 0.72 |
| United Technologies Corp. | 11.2 | 6.8 | 4.3 | 0.69 | 1.1 | 0.9 | 0.2 | 0.90 |
| Wal-Mart de Mexico S.A. | 1.0 | -2.6 | 3.6 | 0.75 | -0.1 | 1.1 | -1.2 | 0.47 |
| Wal-Mart Stores Inc. | -1.3 | -13.2 | 11.8 | 0.17 | 2.1 | 3.3 | -1.2 | 0.50 |

Sources: Bloomberg, Standard and Poor's, authors' calculations.
Note: p-values below 10%, 5% and 1% indicate statistically significant excess returns at the 10%, 5% and 1% level, respectively.

due to the reaction of other market participants to the announcement.

We follow a simple methodology that allows for an identification of abnormally high or low returns that cannot be explained by overall market factors but are idiosyncratic to the stock. We employ an augmented capital asset pricing model (CAPM) that relates the return of a given equity r to two explanatory factors: (i) the return of a domestic equity index RM, capturing financial market developments in

$$r_t = a + \beta^M R_t^M + \beta^S R_t^S + \varepsilon_t$$

the economy, and (ii) the return of a sector-specific index RS, capturing sector-specific developments.[25]

(1) From equation (1) parameter estimates are obtained for a sample of daily observations ranging from 2000 up to the date of exclusion. From these, expected returns E(r) are calculated for the period during which a particular equity was being removed from the Fund's portfolio as well as for the day on which the exclusion

was revealed to the public. In a second step, we test (i) whether the realised cumulated return over the period during which the equity was being excluded is significantly different from the expected cumulated return based on the econometric model; and (ii) whether the realised return on the day on which the exclusion was made public is significantly different from the expected return based on the econometric model.[26]

Table 8 reports abnormal returns during the divestment period for the 20 stocks that have been excluded during 2005–06. Overall the results indicate no significant effect of the Fund's divestment on the performance of the analysed stocks. Out of the 20 stocks, only ten underperformed their respective benchmarks during the divestment period and only nine stocks recorded a negative excess return on

25 Sectoral and country indices are taken from Standard and Poor's.
26 Assuming identically and independently normally distributed residuals in equation (1), i.e. $\varepsilon_t \sim N(0,\sigma^2)$, excess returns over the divestment period and on the day of publication of the exclusion follow a normal distribution.

the day the exclusion was made public. None of the negative excess returns is statistically significant.

To sum up, we find no evidence of a significant impact of non-economically motivated investment behaviour of SWFs on financial markets. However, it should be recalled that the process of divestment by Norway's SWF is intentionally designed to avoid any downward price pressure in order to minimise the losses from divestment. As regards broader conclusions from this case study, it should be stressed that other SWFs could hold larger amounts of individual stocks than Norway's SWF.[27] The same applies to other large market players such as private asset managers.

27 Norway's Government Pension Fund held, on average, around 0.5% of the market capitalisation of the respective companies, roughly equivalent to the daily turnover of an average stock. In comparison, the combined value of global sovereign wealth funds may reach up to 3% of global financial assets.

## 6 CONCLUDING REMARKS

Sovereign wealth funds have been investing governments' foreign assets for decades. However, it is only in recent times that such funds have emerged as managers of large "excess reserves" and other foreign assets. A transfer of sizeable amounts of traditional foreign exchange reserves to these investment vehicles may have an impact on the global financial landscape since such funds are likely to pursue an investment strategy that differs considerably from that of central banks.

Whether a change in the global financial structure will have a significant impact on financial stability will depend critically on the motives underlying the investment decisions of such funds. In fact, SWFs may contribute to a widening of the long-term investor base for risky assets such as stocks, corporate bonds, emerging market assets, private equity and real estate. In this regard, such funds could exert a stabilising effect on financial markets, in particular as SWFs are typically not leveraged. In addition, SWFs may contribute to a more efficient sharing and diversification of risk at the global level.

On the other hand, other investment motives (e.g. when SWF acquisitions are driven by political considerations) could potentially lead to excessive risk-taking and a distortion of asset prices. For instance, some observers have expressed a concern that certain SWFs may be prone to an abrupt selling of assets, thereby contributing to market volatility. Other observers have warned that some SWFs may acquire stakes in companies of sensitive industries, and possibly bail out or support local firms for non-economic reasons. However, there is so far no firm evidence of such investment patterns which would also negatively impact market integrity.

On balance, several potential channels through which the emergence of SWFs as large global players may affect the global financial system can be identified. In this respect, it is of particular importance that SWFs be sufficiently transparent on their size, asset allocation and investment motives so as to assuage concerns about potentially distorting the effects of SWFs and to reduce uncertainty in financial markets.

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