

THE FINANCIAL IMPACT OF SOVEREIGN WEALTH FUND INVESTMENTS IN LISTED COMPANIES

Veljko Fotak
Doctoral Candidate
University of Oklahoma

Bernardo Bortolotti
Executive Director
Fondazione Eni Enrico Mattei (FEEM)
Professor of Economics
Università di Torino

William Megginson
Professor and Rainbolt Chair in Finance
University of Oklahoma
Fulbright Tocqueville Distinguished Chair in American Studies
Université Paris-Dauphine

Revised draft: June 19, 2008

Abstract

This paper initiates empirical research on the financial impact and wealth effects of Sovereign Wealth Fund (SWF) investments in the stock of listed companies around the world. SWFs have recently gained media attention because of concerns about their large size (USD 3.3 trillion), extremely rapid growth rates, and lack of transparency. We analyze asset allocation by fund and find a significantly positive 1% mean abnormal return upon announcement of 75 SWF acquisitions of equity stakes in publicly traded companies around the world. We note that SWFs are typically long term investors who, due to both political pressures and size of holdings, are often unwilling to quickly unwind their positions. However, two-year abnormal returns of SWFs average a significantly negative 41%, suggesting equity acquisitions by SWFs are followed by deteriorating firm performance.

Please address correspondence to:

William L. Megginson
Price College of Business
307 West Brooks, 205A Adams Hall
The University of Oklahoma
Norman, OK 73019-4005
Tel: (405) 325-2058; Fax: (405) 325-7688
e-mail: wmegginson@ou.edu
website: <http://faculty-staff.ou.edu/M/William.L.Megginson-1>

THE FINANCIAL IMPACT OF SOVEREIGN WEALTH FUND INVESTMENTS IN LISTED COMPANIES *

Abstract

This paper initiates empirical research on the financial impact and wealth effects of Sovereign Wealth Fund (SWF) investments in the stock of listed companies around the world. SWFs have recently gained media attention because of concerns about their large size (USD 3.3 trillion), extremely rapid growth rates, and lack of transparency. We analyze asset allocation by fund and find a significantly positive 1% mean abnormal return upon announcement of 75 SWF acquisitions of equity stakes in publicly traded companies around the world. We note that SWFs are typically long term investors who, due to both political pressures and size of holdings, are often unwilling to quickly unwind their positions. However, two-year abnormal returns of SWFs average a significantly negative 41%, suggesting equity acquisitions by SWFs are followed by deteriorating firm performance.

JEL Classification: G32, G15, G38

Keywords: Sovereign wealth funds, International financial markets, Government policy and regulation

* We thank Valentina Milella and Blaine Stansel for research assistance with this project. We also benefited from comments offered by Wolfgang Bessler, Cecilia Chen, John Earle, Oral Erdogan, Andrea Goldstein, Ron Jarmin, Koen Schoors, Paola Subacchi, and participants in the Comparative Analysis of Enterprise Data 2008 conference (Budapest) and the 2008 Financial Management Association European meeting (Prague), and seminar participants at the Université Paris-Dauphine, the University of Maastricht, and Ludwig-Maximilians-Universität München. This manuscript was completed while Bill Megginson was the Fulbright Tocqueville Distinguished Chair in American Studies at the Université Paris-Dauphine, and the financial support of the Fulbright Commission is gratefully acknowledged.

The Financial Impact of Sovereign Wealth Fund Investments in Listed Companies

Perhaps we should call it the “return of state capitalism.” However phrased, we have recently witnessed the profound rise of sovereign wealth funds as major international investors and the focus of global media and political attention. The term “Sovereign Wealth Fund” (SWF) has been recently coined and no consensus has yet been reached on its exact meaning.¹ In the present discussion, we paraphrase and slightly modify a definition given by Truman (2007a): we define a “Sovereign Wealth Fund” as a pool of domestic and international assets owned and managed by governments to achieve a variety of economic and financial objectives, including the accumulation and management of reserve assets, the stabilization of macroeconomic effects and the transfer of wealth across generations.² We summarize the defining criteria in Table 1 [from the Sovereign Wealth Fund Institute (2008)].

**** Insert Table 1 about here ****

SWFs are not a new phenomenon, yet they have recently been the subject of renewed interest by the press, by politicians and by institutions. Notably, academia has been much slower to react. After offering a brief overview of the SWF phenomenon, we examine this renewed level of interest. We summarize the main SWF-related topics recently discussed in the press and in extant corporate finance research and note that most of the published articles have assumed negative tones, often without much theoretical or empirical support.³ In particular, the most commonly raised concern regards their potential impact on the companies in which they invest.⁴ Yet, this concern appears in direct contrast with a large body of academic literature which predicts that investments by large institutional shareholders will have a positive impact on firm profitability. Shleifer and Vishny (1986) present a theory of the relationship between shareholder size and corporate governance.⁵ In particular, they point to the fact that small shareholders lack incentives to monitor managerial performance and they relate this to a free-rider

¹ The first documented use of the term “Sovereign Wealth Fund” is attributed to Razanov (2005).

² Please note, Truman (2007) includes government pension funds in the SWF category. We explicitly exclude government pension plans, with the notable exception of Norway’s Government Pension Plan. We include the latter in our study as its unusual asset allocation and focus on profitability make it more similar to other SWFs rather than to other government pension plans. In addition, we exclude funds directly managed by central banks, as those often have very different priorities, such as the funding of specific projects or the development of specific economic sectors.

³ For example, see Summers, Lawrence, “Sovereign Wealth Funds Shake the Logic of Capitalism”, *Financial Times*, July 30, 2007.

⁴ For example, see Weisman, Steven R., “Concern about ‘Sovereign Wealth Funds’ Spreads to Washington”, *International Herald Tribune*, August 20, 2007 and Guha, Krishna, “Warning over Sovereign Wealth Funds”, *The Financial Times*, June 22, 2007.

⁵ Shivdasani (1993), Kaplan and Minton (1994), Kang and Shivdasani (1995), Dennis and Serrano (1996), Gillian and Starks (1998), Gillian and Starks (2000), Gorton and Schmid (2000), Franks and Mayer (2001), Yafeh and Yosha (2003), Hartzell and Starks (2003), among others, provide support to the monitoring theory of Schleifer and Vishny (1986).

problem. They suggest that the presence of large shareholders offers a partial solution to the free-rider problem and greatly improves monitoring, since large shareholders have much stronger monitoring incentives. Since SWFs are large institutional shareholders likely to acquire sizable stakes, the theory developed by Shleifer and Vishny (1986)--which we will henceforth label the “monitoring hypothesis”--predicts an increase in the value of equity of companies in which SWFs acquire a significant equity stake.

On the other hand, concerns echoed by both regulators and by market participants find support in the agency cost theory developed by Jensen and Meckling (1976). Bergstrom and Rydqvist (1990), Barclay and Holderness (1992) and Zingales (1994), among others, empirically test and find support for large shareholders imposing agency costs on firms. Applied to the framework of large shareholders, the agency cost theory predicts that large investors might force the company to act in their own interest, against the interests of other investors, employees or managers. SWFs are particularly likely to impose agency costs on acquired firms, since as state-owned funds their motives might not always be consistent with risk-adjusted profit maximization. In addition, by virtue of their lack of transparency, they could impose agency costs simply because of the uncertainty associated with their behavior as shareholders. Additional agency costs would then lead to a decrease in the value of equity. Accordingly, we analyze firm profitability, proxied by stock returns, subsequent to a SWF investment. We find that abnormal buy-and-hold returns on shares of equity of firms targeted by SWFs average negative 41% over two years. We interpret this result as strong evidence of SWFs leading to deteriorating firm performance and we conclude that SWFs have a negative impact on firm profitability, by imposing additional agency costs. Yet, while we expect such an effect to be stronger the larger the share of equity acquired by the SWF, in a cross sectional study we fail to find evidence supporting this expectation. We also document that the detrimental effect of SWF investments does not differ across SWFs and is not related to the governance, accountability and transparency of the fund itself, as measured by Truman (2007b and 2008).

In addition, we investigate whether the market correctly anticipates the potential impact of SWF investments on target firms. We believe it to be of particular interest to examine if the market is correctly pricing the effect of SWF investments, or whether it is reacting to irrational fears echoed by the press and by regulators. Indirectly, we test the semi-strong version of Fama’s efficient market hypothesis (Fama 1970). Surprisingly, we find stocks of targeted corporations exhibiting positive abnormal returns averaging about 1% on the day on which the SWF investment is announced. We interpret the latter result as indicating that investors welcome SWFs as shareholders – yet, given their negative long-term impact, we fail to explain why the market appears to have such a positive, optimistic attitude.

The present study adds to the literature on the impact of large institutional shareholders, by providing new evidence regarding the benefits associated with better monitoring and the additional

agency costs that are created.⁶ In addition, it sheds some light on the potential impact of SWF investments on listed companies, which should be of great interest to both market participants and market regulators. Finally, we offer a test of the efficient market hypothesis in its semi-strong version in a novel setting.

This manuscript is structured as follows. Section I offers a brief overview of Sovereign Wealth Funds. Section II contains a review of the extant literature on SWFs, and on the impact of large shareholders on firm performance. Section III formally develops testable hypotheses. Section IV describes our data. Section V focuses on the empirical results from both short and long-term event studies. Section VI concludes. Appendix A contains a review of the literature on two types of funds closely related to SWFs, commodity stabilization funds and state budget stabilization funds. Appendix B outlines the methodology employed in the computation of abnormal returns.

I. What are Sovereign Wealth Funds—and why do we Care?

As previously mentioned, the descriptive term “sovereign wealth fund” has been coined only recently [Razanov (2005)]. Previously, those funds were often labeled “stabilization funds.” While SWFs are a heterogeneous phenomenon, most share common origins; in the majority of cases, SWFs are an evolution of funds whose primary purpose was revenue stabilization. That is, governments whose revenue streams are dependent on the value of one underlying commodity have engaged in diversification of investments with the goal of stabilizing revenues. Accordingly, most SWFs have been established in countries that are rich in natural resources, with oil-related SWFs being the most common ones (in the case of Arab Gulf countries, ex-Soviet republics and Norway), but other sources of funding include diamonds, copper and other raw materials in a few African and South-American countries. A second category of SWF is related to the accumulation of foreign currency as a result of substantial net exports, especially in the cases of China, Singapore and other East-Asian exporters.

Truman (2007a, 2007b) offers a review of the history of SWFs. The first such fund was established by Kiribati, a tiny Pacific island nation, to manage revenues from phosphate deposits (guano). A large number of those funds were established during the 1970s, as rising oil prices led to a build-up of oil export revenues. While growth of SWFs was stagnant in the 1980s and 1990s, at least a dozen new SWFs have been established since 2000. Table 2 lists the largest SWFs, their launch year and estimated

⁶ A number of studies have examined the issue of costs and benefits of having large shareholders by directly examining the link between shareholder concentration and firm performance. Stulz (1988) presents a model of the relationship between ownership concentration and firm performance. His model of the relationship between ownership concentration and profitability was validated by subsequent empirical studies, including Morck, Shleifer, Vishny (1989), Wruck (1989) and McConnell and Servaes (1990). Burkart, Gromb and Panunzi (1997) present a similar model in which they consider the tradeoff between benefits of concentrated ownership (better monitoring) and associated costs (threat of expropriation).

size, as reported by Truman (2008). Since consensus has not yet been reached on the exact definition of a SWF, estimates of the total size of SWFs vary widely as well. By reliable estimates, SWFs nowadays manage approximately US\$ 3 trillion of assets, with the most recent authoritative estimate by International Financial Services London giving an early-2008 figure of \$3.3 trillion.⁷ The sheer size of SWFs, while making them an important player in markets, has to be evaluated in respect to other investment vehicles. As depicted in Figure 1, the aggregate size of SWFs (US\$ 2.1 trillion in early 2007, as per Lyons) is still much smaller than the aggregate assets of either pension funds (circa US\$ 21 trillion) or mutual funds (circa US\$ 17 trillion), but larger than the aggregate size of all hedge funds (at about US\$ 1.5 trillion) and private equity funds. Lyons (2007) offers an interesting comparison of the size of individual SWFs to that of other asset management funds, which we report in Figure 2. From the latter figure we can infer that the influence of individual SWFs should still be less than that of big asset management funds.

****** Insert Table 2 about here ******

****** Insert Figures 1 and 2 about here ******

In recent years, a combination of trends has led to a very rapid accumulation of reserves in those funds. The most relevant trends include rising oil prices, but also rising prices for other raw materials (often attributed to China's fast economic growth) and the negative balance of payment of Western countries, especially the United States, which has inflated the currency reserves of Asian exporters (particularly dollar-denominated reserves). Swelling reserves have been coupled with other trends. On one side, aging populations have led to a desire for higher returns, in anticipation of increased pension liabilities and, in response, governments have searched for new investment options offering potentially higher returns. On the other hand, a series of factors has made international investments less problematic. In particular, Truman (2007a) cites "increased global integration, substantial elimination of restrictions on international capital flows, technological innovation, [...] recognition that diversification contributes to increased investment returns, loosening of 'home bias' in investment decisions." Fast accumulation of reserves, coupled with a swelling appetite for returns, has led to a dramatic increase in the rate of acquisitions. Figure 3 depicts SWF investments by year. Recognizing that the actual growth rates are going to be extremely sensitive to macroeconomic factors, in particular the price of oil, Jen (2007a) estimates that SWFs will grow in the next decade at around US\$40 billion per year, concluding that the pool of assets managed by SWFs could reach US\$12 trillion by 2015 (Jen 2007b). That would constitute

⁷ See Willman, John, 2008, "Sovereign Wealth Funds Grow to \$3,300bn," *Financial Times* (March 30 2008), from the www.ft.com website. The Sovereign Wealth Fund Institute, which uses a more inclusive definition of SWFs, gives their total size as US\$3.778 trillion.

about 10% of global financial assets, and his estimate was posited before oil prices topped \$100 per barrel. If today's oil price of \$125-plus holds, annual SWF cash inflows could become truly enormous.

**** Insert Figure 3 about here ****

In political terms, recent interest is apparent. Examples include the 2006 purchase by Tamasek Holdings, a Singaporean state-owned investment company, of a stake in a company owned by the prime minister of Thailand. The subsequent demonstrations were so vocal they led to the ousting of the prime minister a few months later in a military coup. Political opposition is exemplified by Chancellor Angela Merkel who, in June 2007, publicly complained about Russian SWFs buying pipelines and energy infrastructure in Europe. With SWFs growing rapidly in size and scope, the global political outcry is likely to grow even louder. Nor is the political debate limited to countries being targeted by SWFs as possible investment locations; earlier in 2007, the Chinese press very vocally criticized the purchase of a ten percent stake in Blackstone, which has since led to substantial paper losses. Political interest is also exemplified by a recent surge of discussions regarding SWFs in the US Congress. In particular, the U.S. Senate Committee on Banking, Housing and Urban Affairs met in November 2007 to discuss the impact of SWFs and other foreign government investments in the US.⁸ The meeting stressed the benefits of foreign investment in the United States, but also called for an increased level of transparency by SWFs, as a means to prevent excessive protectionism of national markets.

II. Literature Review

A. Sovereign Wealth Funds – Recent Interest

In recent months, the popular press and the general public have become extremely active in discussing the potential impact of SWFs.⁹ For the most part, the press has depicted SWFs in negative tones, and most of the debate has focused on the perceived problems associated with the growth of SWFs. The issues that have been raised include the possibility that SWF assets could be used to further political purposes and target strategic acquisitions¹⁰, the risk of equity price bubbles due to the sheer size of their

⁸ The hearing title was “Sovereign Wealth Fund Acquisitions and other Foreign Government Investments in the U.S.: Assessing the Economic and National Security Implications”. Transcripts and video feeds of the hearing are available at: <http://banking.senate.gov/index.cfm?Fuseaction=Hearings.Detail&HearingID=287>

⁹ The Sovereign Wealth Fund Radar (<http://www.swfradar.com/>), a website monitoring discussion about SWFs, links over 1,200 articles published on English-speaking media between October 2007 and February 2008. A search of the *Financial Times* website (www.ft.com) yielded 1,884 hits, just for the string “sovereign wealth funds”, and all since May 1, 2007—the date when *FT* first used the term in an article.

¹⁰ For example, Summers, Lawrence, “Sovereign Wealth Funds Shake the Logic of Capitalism”, *The Financial Times*, July 30, 2007 and Weisman, Steven R., “Concern about ‘Sovereign Wealth Funds’ Spreads to Washington”, *International Herald Tribune*, August 20, 2007.

investments¹¹ and the related decline in demand for Treasury bonds¹², the risk of an increase in volatility of financial markets¹³, the possibility that SWFs might have a detrimental effect on corporate governance because of political motives or lack of sophistication¹⁴ and, finally, the risk of the emergence of a new form of financial protectionism as a reaction to SWFs.¹⁵ The criticism most often mentioned is the lack of transparency by SWFs, which is unquestionably true.¹⁶ Aside from a few notable exceptions (principally the Norwegian pension and oil stabilization funds), SWFs have been extremely reluctant to disclose any information about their investment policies or returns. Consequently, there is broad agreement that SWFs should become more transparent and disclose their strategies and holdings—and there is some evidence that this is occurring. At the end of February, the Abu Dhabi Investment Authority (ADIA), the world's largest SWF, sent a letter to regulators in key countries specifying what its investment policies will be and promising greater disclosure. The potential benefits of SWF investments generally receive much less attention. The most often cited benefit is an expected increase in liquidity of financial markets, especially in the private equity industry.¹⁷

While academia has been slow to react to this renewed interest in SWFs, corporate research on the topic has recently started to emerge. As noted previously, Razanov (2005) offers the first definition of the term “Sovereign Wealth Fund,” claiming that SWFs “*are neither traditional public-pension funds nor reserve assets supporting national currencies,*” but funds set up with one or more of the following objectives: “*insulate the budget and economy from excess volatility in revenues, help monetary authorities sterilize unwanted liquidity, build up savings for future generations, or use the money for economic and social development*”. Razanov points out that most of those funds are not new, but he justifies the renewed interest by an increase in the number of SWFs around the world, by their rapid asset accumulation, and by the sheer size of those funds. In addition, Razanov lists the major SWFs and attempts to estimate the size of each; cumulatively, he estimates the total asset pool managed by SWFs to be at least \$895 billion (in 2005). In a subsequent article (Razanov, 2007), the author claims that the most important step in designing a fund is defining its liability profile. Accordingly, he classifies SWFs in five categories: stabilization/buffer funds, endowment funds, pension reserve funds, development funds and government holding funds. Yet, he does recognize that “*Stabilization Funds are a class of their own and*

¹¹ Kambayashi, Satoshi, “The World’s Most Expensive Club”, *The Economist*, May 24, 2007.

¹² Lynch, David J., “U.S.: Secretive Global Funds May Hurt Treasuries Market”, *USA Today*, June 21, 2007.

¹³ Guha, Krishna, “Warning over Sovereign Wealth Funds”, *The Financial Times*, June 22, 2007.

¹⁴ Weisman, Steven R., “Concern about ‘Sovereign Wealth Funds’ Spreads to Washington”, *International Herald Tribune*, August 20, 2007.

¹⁵ Sesit, Michael R., “Sovereign Wealth Funds are Starting to Dominate Global Finance”, *International Herald Tribune*, June 18, 2007 and Lynch, David J., “U.S.: Secretive Global Funds May Hurt Treasuries Market”, *USA Today*, June 21, 2007.

¹⁶ Simonds, David, “China Takes the Bank”, *The Economist*, July 26, 2007.

¹⁷ Lina Saigol, “Banks Rush to Form SWF Teams”, *The Financial Times*, September 2, 2007. Also see Lina Saigol, “Banks Rush to Form SWF Teams”, *The Financial Times*, September 2, 2007.

stand out compared to all other fund types. The reason is that, while all other funds are managed primarily for long-term return and wealth maximization, Stabilization Funds have as their primary objective risk management". As we will discuss, while a formal definition of SWFs does not yet exist, nowadays the consensus seems to be to exclude stabilization funds from the broad SWF category.

Morgan Stanley Research Global was quick to focus on the topic as well, with a series of papers by Stephen Jen describing SWFs and their potential impact. In Jen (2006), the author follows the definition of SWFs given by Razanov (2005), but does point that, with the permanent raise in oil prices, most oil stabilization funds have evolved into "wealth-accumulation" funds. Similarly, he notes that most official currency stabilization funds of Asian countries have outgrown their liquidity needs. Accordingly, he predicts that some Asian currency stabilization funds will change priorities, emphasizing capital appreciation. In particular, Jen points to the likelihood of China establishing a wealth-accumulation SWF and estimates the total size of SWFs at US\$ 1.4 trillion.

Jen returns to this topic multiple times in 2007. First, in Jen (2007a), the author focuses on Russia establishing a SWF denominated Future Generations Fund; Jen estimates the size of this fund at about US\$30 billion and predicts it will grow by about US\$ 40 billion per year. He also predicts that Japan will likely follow Russia's example. In addition, the author dwells into the potential impact of SWFs on financial markets, and predicts this will lead to increased demand for risky assets, a rising risk of financial protectionism, and a potential increase in the volatility of financial markets. Jen concludes by calling for more transparency in the management of SWFs. In Jen (2007b), the author attempts to estimate the future growth of SWFs. He concludes that SWFs could reach a total size of US\$ 12 trillion by 2015. In addition, Jen reiterates his concerns about the risk of financial protectionism as a reaction to the size and lack of transparency of SWFs. In Jen (2007c), the author explores the likelihood of Japan establishing a SWF, by pointing out that Japan has excess reserves, greatly exceeding what needed for pure currency stabilization, while being exposed to strong pressures to maximize returns. In particular, Jen argues that Japan still has a weak fiscal position, that a likely appreciation of the Yen would translate into valuation losses in its reserve holdings and that the aging population will exert more pressures on the national budget. Jen returns to this topic once more in Jen (2007d) to explore the macroeconomic impact of SWFs. In particular, the author emphasizes the likelihood of a migration of funds from the US dollar and Euro to emerging market currencies, predicting upward pressures on the latter. Jen and St-Arnaud (2007) offer a new estimate of the size and future growth of SWFs but then focus on the implications of the rapid growth of SWFs. In particular, the authors discuss the increased demand for risky assets and the implications for US Treasuries and for the US dollar; they conclude that the drop in demand for US Treasuries due to funds moving into equity will not be dramatic and that the likelihood of a depreciation of the US dollar due to divestiture from US markets is very low. The impact of the shift from Treasuries

to equity is the topic of Jen and Miles (2007), where the authors estimate that the shifting pattern in demand (increased demand for risky assets and decreased demand for debt instruments) is likely to lower the required return on equity by 50-70 basis points while increasing bond yields by 30-40 basis points, over the next ten years. Accordingly, they predict that the equity risk premium would fall by 80-110 basis points while average P/E ratios should rise by 5-10%.

Two other institutional studies discussing SWFs in general terms were published in 2007. Truman (2007a) returns to the issue of defining SWFs. In particular, Truman distinguishes between stabilization funds, aiming at providing liquidity and characterized by low-risk investments, and SWFs, which he claims have longer term investment objectives and are invested in a broader array of instruments. But the author does emphasize that the distinction is not always clear and that most funds share characteristics of both stabilization and wealth-appreciation funds. Truman proceeds by listing the major SWFs and by estimating the cumulative size of those at approximately US\$ 2 trillion; the author concludes by restating the commonly shared concerns (size of SWFs, lack of transparency, the potential for market disruption and the risk of political interference), arguing that SWFs need to increase their own level of transparency. Kern (2007) presents another general discussion of SWFs, but he accepts the wider definition given by Razanov (2005), including stabilization funds. Accordingly, his estimate of the current size of SWFs is larger, at US\$ 3 trillion. Kern raises concerns similar to those mentioned in the previously discussed literature [e.g., Jen and St-Arnaud (2007) and Truman (2007a)], but he also points to potential benefits of SWFs. In particular, he claims that SWFs are likely to increase financial stability because of their long term investment outlook and little concern for liquidity. He also points to SWFs' managers being very sophisticated investors likely to lead to improvements in the quality of corporate governance and to the fact that SWFs are likely to increase demand for banking and investment-related services, thus accelerating the pace of financial market development in oil-rich and Asian countries.

Farrell, Lund, Gerlemann and Seeburger (2007) do not directly discuss SWFs; rather, their study is an analysis of how financial markets are being changed by the growing size of oil-rich countries, Asian reserves, hedge funds and private equity. Yet, the authors do recognize that a significant amount of reserves by oil-rich countries and by Asian exporters are being invested in funds which are subordinating risk management and liquidity to pure returns, which they deem "Sovereign Wealth Funds", following the more restrictive definition by Truman (2007). They predict that those emerging players in global markets are likely to lead to an increased demand for risky assets and to higher financial market volatility. They also cite the lack of transparency by SWFs as a pressing concern, compounded by the likelihood of the funds being used for political, rather than economic, motives. A report to the US Congress by Truman (2007b) and a subsequent update (Truman 2008) offers both an additional description of SWFs and a

detailed analysis of SWF practices. He uses the latter to score each SWF along four dimensions: structure; governance; accountability and transparency; and behavior.

Finally, Butt, Shivdasani, Stendevad and Wyman (2008) offer an interesting description of the SWF phenomenon, summarizing the salient features of SWFs and echoing the most common concerns, while Blundell-Wignall, Hy and Yermo (2008) offer a brief description of SWFs, focusing on the differences between the latter and public pension funds. Balding (2008) offers a portfolio analysis of several of the largest SWFs.

B. Large Institutional Shareholders and Corporate Governance

One of the concerns commonly expressed regarding SWFs is their potential impact on corporate governance. In particular, it has been noted that many SWFs originate from oil rich countries and from Asian exporters. With some exceptions, both categories are dominated by countries with relatively undeveloped financial markets and institutions. Accordingly, it has been questioned whether SWF managers are sophisticated enough to properly exercise their role as shareholders, both in terms of voting and in terms of monitoring. The only direct objection to the argument is brought by Kern (2007), as he claims that most SWFs are managed by very sophisticated teams which are, according to the author, likely to improve corporate governance.

While academic literature has not so far addressed the impact of SWFs on corporate governance, there is a large body of research focusing on the effect of large institutional shareholders on the latter. Shleifer and Vishny (1997) extensively survey prior theory and empirical evidence in a survey of the literature on corporate governance. Two sections of the survey deal specifically with the impact of large shareholders; the consensus is that large shareholders do improve monitoring of managers, but also introduce new agency costs, as they have incentives to expropriate both minor shareholders and creditors.

Shleifer and Vishny (1986) present a theory of the relationship between shareholder size and corporate governance. In particular, they point to the fact that small shareholders lack incentives to monitor managerial performance and they relate this to a free-rider problem. They suggest that the presence of large shareholders would offer a partial solution to the free-rider problem and greatly improve monitoring. Shivdasani (1993) offers the first empirical evidence for the theory presented in Shleifer and Vishny (1986) by showing that, in US corporations, large shareholders increase the likelihood of a hostile takeover. Kaplan and Minton (1994) focus on Japanese firms and find that those with large shareholders are more likely to replace managers in case of poor performance. Their results are confirmed by a similar study by Kang and Shivdasani (1995). Denis and Serrano (1996) collect data on US corporations and conclude that the likelihood of a change in management after a defeated takeover attempt is higher in poorly performing companies with large shareholders. Gillan and Starks (1998) present a survey on the

literature and empirical evidence regarding the impact of shareholder activism by both individuals and institutional investors. They conclude that, while some short-term market reaction has been documented, there is little evidence of improvements in long-term operating or stock-market performance. Gillan and Starks (2000) focus on proposals by both individual and institutional investors, and find that success of proposals depends on sponsor identity, issue type, prior performance and time period. They document weak market reactions, highly dependent on the sponsor. Active individual investors receive less support for proposals, but their proposals lead to a small positive market reaction. Proposals by active institutional investors receive more support and are more likely to be adopted, but are associated with small, negative market reactions. Gorton and Schmid (2000) document the performance of German firms in 1974 and find that those with large block holders exhibit superior performance, which they attribute to better corporate governance. Franks and Mayer (2001) also examine German corporations and find that the presence of large shareholders increases turnover of directors. Yafeh and Yosha (2003) observe Japanese firms and find that the presence of large shareholders greatly reduces discretionary spending, offering further indirect evidence for the link between large shareholders and quality of corporate governance. Hartzell and Starks (2003) find that institutional ownership concentration is positively related to the pay-for-performance sensitivity of executive compensation and negatively related to the level of compensation; they interpret these results as supporting the monitoring hypothesis.

The articles surveyed above focus on the beneficial impact of large investors on corporate governance, as most of the related literature has, yet several other studies point to the costs associated with large institutional shareholders. Theoretical arguments focus on two main sources of costs. First, Demsetz and Lehn (1985) hypothesize and find that large investors are not sufficiently diversified and thus aim for an excessive reduction of company-specific risk, thus becoming excessively conservative. Subsequent empirical studies have confirmed their findings. A second problem is associated with the risk that large investors will force the company to act in their own interest, against the interests of other investors, employees or managers. The theory regarding conflicts of interest and the related agency costs relates to Jensen and Meckling (1976). A few papers have examined the latter issue by focusing on premiums paid for the acquisition of large blocs of shares, with the underlying hypothesis being that this premium reflects additional value created through ownership of a large portion of the company. Bergstrom and Rydqvist (1990) focus on Sweden and find no such premiums, concluding that there is no strong evidence for expropriation of small shareholders by large blockholders. Barclay and Holderness (1989) analyze the pricing of block trades of common stock of NYSE and Amex corporations, and find that these blocks are priced at an average premium of 20%. But their sample includes only 63 trades concentrated in the years 1978-1982. Barclay and Holderness (1992) re-examine this topic with a larger sample of 106 trades between 1978 and 1982. Their empirical findings confirm the existence of a large-

block premium, yet the authors observe that minority shareholders receive the same price per share in a merger or tender offer as large block holders, suggesting that minority holders benefit as well. They conclude that no value is transferred from small shareholders to large blockholders. Zingales (1994) estimates the value of the voting premium on the Milan stock exchange; observing that the premium is larger than the one observed in US-based stock markets, he concludes that the risk of expropriation of minority shareholders is larger in Italy.

A handful of studies have examined the issue of costs and benefits of having large shareholders by focusing on the link between shareholder concentration and firm performance. Stulz (1988) presents a model of the relationship between ownership concentration and firm performance. Based on his model, higher ownership concentration leads to higher profitability, because of reduced agency costs. However, as ownership concentration increases, the largest owners gain incentives to generate private benefits not shared by minority shareholders. This model of the relationship between ownership concentration and profitability was validated by subsequent empirical studies, including Morck, Shleifer, Vishny (1989), Wruck (1989) and McConnell and Servaes (1990). Burkart, Gromb and Panunzi (1997) present a similar model in which they consider the tradeoff between the benefits of concentrated ownership (better monitoring) and associated costs (threat of expropriation).

Overall, evidence from the literature on large institutional shareholders and corporate governance points to likely benefits associated with ownership concentration, in particular a lower cost of capital. On the other hand, the same studies emphasize the dangers of excessive ownership concentration, as it can lead to higher incentives for expropriation of minority shareholders and bondholders by large block holders. The present study offers new evidence in support of the agency cost theory and sheds some light on the actual impact of SWF investments.

III. Testable Hypotheses

Following extant financial literature, we use abnormal stock returns as a proxy for the impact of SWF investments.¹⁸ If the monitoring hypothesis holds, we would expect positive abnormal stock returns in the period following SWF investments reflecting increased equity value due to improved corporate governance. Additionally, the monitoring hypothesis implies that a larger share of equity would provide a stronger incentive and thus a stronger impact; accordingly, we would expect positive abnormal returns to

¹⁸ For example, Desai and Jain (1999) use long-run abnormal returns to evaluate firm performance following spinoffs and Del Guercio and Hawkins (1999) use long-run abnormal returns to gauge the impact of activist pension funds on firm performance.

be proportional to the share of equity acquired. We formulate two testable hypotheses to uncover whether the monitoring hypothesis applies to SWFs:

*H1: SWF investments lead to positive abnormal stock returns for target firms' shares.*¹⁹

H2: Abnormal stock returns are positively related to the share of equity acquired.

On the other hand, if the agency theory holds, we would expect increasing agency costs following SWF investments and, thus, negative abnormal returns. Also, we would expect that a larger share of equity would lead to a greater possibility of expropriation of small shareholders and, thus, to higher agency costs and to a stronger impact on firm performance (larger negative abnormal returns). In addition, we would expect the magnitude of the negative impact on firm performance to depend on the extent to which SWFs do exercise proper corporate governance and on their level of transparency.²⁰ Accordingly, we hypothesize:

H3: SWF investments lead to negative abnormal stock returns for target firms.

H4: Abnormal stock returns are negatively related to the share of equity acquired.

H5: Abnormal stock returns are positively related to the quality of corporate governance of the investing fund.

H6: Abnormal stock returns are positively related to the level of transparency of the investing fund.

If the effect of SWF investments was rationally predicted by markets, we would expect a market reaction to take place at the time of the announcement of the acquisition, without any further long-term adjustments. Hence, abnormal returns around the announcement date, without any additional long-term abnormal returns, would offer evidence in support of a rational reaction. If, on the other side, markets are responding to irrational fears, we would expect negative abnormal stock returns around the announcement date followed by positive abnormal stock returns over the following period. Accordingly, we test:

¹⁹ For the sake of brevity, we will from here onwards refer to firms whose equity shares have been acquired by SWFs as “target firms.”

²⁰ Truman (2007b and 2008) scores SWF on corporate governance, and the score is based on four main questions: (1) is the role of the government in setting investment strategy clearly established? (2) Is the role of managers in executing the investment strategy clearly established? (3) Does the SWF have in place and publicly available guidelines for corporate responsibility? And (4) does the SWF have ethical guidelines that it follows? We hypothesize that SWFs with lower governance scores impose higher agency costs on firms. Truman (2007) also scores SWFs on their level of transparency. We also hypothesize that a lower level of transparency would constitute a higher threat to minority shareholders and thus increase agency costs.

H7: SWF investments lead to abnormal stock returns for target firms around the announcement date and no subsequent long-term abnormal stock returns.

H8: SWF investments lead to negative abnormal stock returns for target firms around the announcement date and subsequent positive long-term abnormal stock returns.

IV. Data and Methodology

We collect investment dates, announcement dates, name of the acquiring fund, name of the acquired target, country of incorporation of the target and acquired share of equity from multiple sources: the Securities Data Company (SDC) database, direct disclosures by SWFs, the financial press²¹ and dedicated web sites.²² We restrict the sample to purchases of shares of equity of publicly traded firms, disregarding direct investments and debt financing. We obtain historical stock prices for targeted firms from *Bloomberg*. We exclude observations for firms whose historical stock prices are not available on *Bloomberg*.

Our final sample contains 75 observations; of those, only 53 are used for the long-term event study, as 22 investments are too recent to allow for a long-term investigation. Those 75 investments originate from 16 SWFs and are related to 62 target companies in 23 countries. Investments in our sample span the period 1989-2008, with some clustering in recent years, reflecting the increased level of SWF activity; approximately half of our sample relates to the years 2004-2008. The number of investments by each SWF and in each target country is reported in Table 3; note that in 23 of the 75 investments the country of origin of the SWF is the same as the country of incorporation of the target. This evidence should dispel one myth commonly cited in the press--that SWFs invest exclusively in foreign assets.

****** Insert Table 3 about here ******

As reported in Table 4, the average (median) firm value of the target is approximately US\$ 3.65 billion (US\$ 1.02 billion), the average (median) share of the firm acquired is 13.9% (7.9%) and the average (median) value of the transaction is US\$ 620 million (US\$ 47.6 million). Clearly, SWFs tend to be large investors, capable of affecting the quality of corporate governance of the target.

****** Insert Table 4 about here ******

We report type of investment in Table 5. A plurality of the transactions in our sample (34) are privately negotiated purchases. In addition, we report the industrial sector classification of the target firm,

²¹ We use two databases, *Factiva* and *Lexis Nexis*, to search for the keywords “Sovereign Wealth Fund” or for the actual name of the fund involved. The list of names of funds are also used as keywords to compile Table 2.

²² In particular, <http://www.swfradar.com/> and <http://www.swfinstitute.org/research/fxr.php>.

obtained from SDC, in Table 6. Note that a large number (33) of SWF investments in our sample are related to finance and banking (12 targets are listed as ‘Commercial Banks, Bank Holding Companies’, 2 as ‘Holding Companies, Except Banks’ and 11 as ‘Investment & Commodity Firms, Dealers, Exchanges’). In addition, we obtain historical market indices for each of the 23 countries of incorporation of the target firms in our sample from Bloomberg or, when not available, from Yahoo Finance; the indices used are listed in Table 6.

****** Insert Tables 5 and 6 about here ******

V. Empirical Results

A. Long-Term Impact

We study the long term impact of SWFs by computing buy-and-hold abnormal returns of the target stock over 30, 60, 120, 240 (approximately one year) and 480 (approximately two years) trading days following the SWF investment. The methodology employed involves using a market model with country-specific indices as market proxies (as reported in Table 7), and with the estimation period spanning 200 days ending 60 days prior to the SWF investment. More details about the computation of buy-and-hold abnormal returns are given in *Appendix B*. We compute Patell’s z-scores and generalized sign z-scores to test for the significance of the average abnormal buy-and-hold returns. Results, reported in Table 8, indicate that, in the two years (one year) following SWF investment, shares of target firms average an abnormal buy-and-hold return of negative 40.96% (negative 18.17%), which is statistically significant at the 10% (10%) level and clearly economically significant as well. Only 18 of the 53 abnormal buy-and-hold returns are positive over two years, which leads to a nonparametric sign test significant at the 10% level. Similar results are reported for shorter time horizons as well. We plot average abnormal buy-and-hold returns for different time horizons in Figure 4. We do not report results for time horizons longer than two years, as that reduces our sample to too few observations (as many of our observations are fairly recent); yet, we observe that the negative performance persists up to three years subsequent to the SWF investment. We reject hypotheses H1 and H2 and accept hypothesis H3, concluding that SWF investments lead to negative long-term performance of target firms.

****** Insert Tables 7 and 8 about here ******

****** Insert Figure 4 about here ******

We note that a portion of our observations displays negative buy-and-hold abnormal returns of an extreme magnitude. In particular, we note that 11 observations in our sample have 2-year buy-and-hold

abnormal returns smaller than negative 100%²³. Once we isolate those 11 observations (identified in *Table 9*), the rest of the sample displays no significant long-term buy-and-hold abnormal returns (results are not reported here, for brevity, but are available upon request). Seven of these eleven extreme underperformers are acquisitions made by Singapore-based SWFs.

**** **Insert Table 9 about here** ****

We analyze abnormal buy-and-hold returns computed over the two years following the SWF investment within an ANOVA framework, in order to determine whether long-term impact differs by SWF. In unreported results, we find insufficient evidence to conclude that the long-term returns differ by fund. Similarly, in unreported analyses, we regress abnormal buy-and-hold returns computed over the same time interval against an intercept, against the proportion of shares acquired and against Truman's scores for SWF governance and accountability and transparency. None of the results are statistically significant. We also add, as a predictor, the square of the proportion of shares acquired to check for possible non-linear effects, in accordance with Stulz (1988). The results are unchanged, as none of the dependent variables appear to have any statistically significant predictive power. We reject hypotheses H4, H5 and H6, concluding that no relationship exists between the magnitude of the abnormal return following SWF investment and the share of equity acquired, the governance of the investing SWF and the level of transparency of the investing SWF.

B. Initial Market-Reaction

We analyze the short-term market reaction to SWF investments by computing mean abnormal returns of the target's stock for the day on which the announcement is first made and by computing mean cumulative abnormal returns for the three days surrounding the announcement. The methodology employed involves using a market model with country-specific indices used as market proxies (as reported in *Table 7*), and the estimation period spans 200 days ending 60 days prior to the SWF investment announcement. More details about the computation of abnormal returns and cumulative abnormal returns, and the respective averages, are given in *Appendix B*.

As reported in *Table 10* and *Table 11*, abnormal returns are positive on the event date for 46 of 75 stocks of target firms, with a mean value of 0.94%; we plot mean cumulative abnormal returns in *Figure 5*. Results are significant in parametric (nonparametric) tests at the 1% (5%) level. We end up rejecting both hypotheses H7 and H8, observing that the initial market reaction appears to be significantly positive.

²³ We remind the reader that buy-and-hold abnormal returns can be smaller than negative 100%, since those are computed by subtracting a function of the market compounded return from the firm's compounded return; for more details, please refer to *Appendix B*.

****** Insert Tables 10 and 11 about here ******

The positive short-term market reaction is puzzling, considering the strong evidence of a detrimental impact of SWFs on long-term firm profitability. Given the recent investments by SWFs in the US financial sector, when banks were in desperate need of liquidity, we investigate whether the positive market reaction is due to SWFs commonly investing in distressed companies in urgent need of liquidity. Accordingly, we compute mean cumulative abnormal return over the 60 and 30 days preceding the acquisition. As reported in Table 8, there is strong evidence of *positive* mean cumulative abnormal returns of firms receiving SWF investments prior to the acquisition, in contrast with our hypothesis.²⁴ While we are forced to conclude that the positive short-term market reaction is not due to liquidity influxes in distressed companies, we are unable to offer a valid explanation for the positive short-term market reaction. The issue warrants further investigation, which we are pursuing.

VI. Conclusions

We consider this study a first empirical analysis of the Sovereign Wealth Fund phenomenon. We list the major funds and analyze their size and discuss estimates of future growth. We find that, despite significant interest by both media and legislators, very little formal research has been conducted on SWFs, so we offer a review of the existing non-academic discussion and then measure the impact of SWFs on the subsequent performance of the listed companies in which they invest.

We offer some evidence on the mechanics of SWF investments. We document that SWFs purchase, on average, almost 19% of shares outstanding of the target company. Also, we find that a large number of acquisitions are clustered in the finance and banking sector and that SWFs tend to invest through privately negotiated transactions. Finally, we document that SWFs tend to invest in firms whose stock price has appreciated over the past 60 trading days.

We offer two plausible but conflicting theories of how SWFs could impact firm governance. On one hand, we hypothesize that SWFs might act as monitors, hence improving governance and profitability. As a counter-argument, we hypothesize that SWFs might impose goals and priorities not consistent with the maximization of firm profits, leading to increased agency costs and declining firm profitability. We analyze firm profitability, proxied by stock returns, over two years subsequent to the initial SWF investment and find evidence of the fact that SWFs lead to deteriorating firm performance. In particular, we find average abnormal buy-and-hold returns equal to negative 40.96% over the 480 trading days after the SWF investment. Accordingly, we conclude that SWFs have a negative impact on firm

²⁴ In unreported results, we employ ANOVA methods to test whether market reaction varies by SWF, but find insufficient evidence to conclude that it does.

profitability, perhaps by imposing additional agency costs. While we cannot exclude the possibility of benefits related to monitoring, the net effect is negative and points to the fact that whatever benefits might be associated with additional monitoring are overshadowed by a much stronger effect due to conflicting priorities. Yet, we should note that, in the cross-section, we fail to find any relation between the share of equity acquired and subsequent abnormal returns. Similarly, we fail to find a relationship between the governance and transparency of the SWF and its long-term impact on firm profitability. We hold that this failure is due to the limited sample size and to a lack of variability of the predictors; we plan to return to this topic after building a larger sample.

We document the reasons why SWFs are feared by regulators and we hypothesize that markets would react negatively to equity investments by SWFs in light both of their detrimental long-term effect and of their lack of transparency. However, we find that, on average, stocks of targeted corporations exhibit *positive* abnormal returns on the day the SWF investment is announced equal to almost 1%. We interpret this as evidence that investors appear to welcome SWFs as shareholders--yet, given their negative long-term impact, we fail to explain why the markets appear to have such a positive, optimistic attitude. We believe that the issue deserves further investigation.

Appendix A: Literature Review on Commodity Stabilization Funds and State Budget Stabilization Funds

Commodity Stabilization Funds

The formal definition of SWFs is still open for debate. In particular, disagreement focuses on whether stabilization funds should be included or treated as a separate category, due to their different priorities. While the consensus seems to be towards separating SWFs and stabilization funds into two categories, we should not ignore the branch of financial literature focusing on commodity stabilization funds.

Commodity stabilization funds are national investment funds whose main purpose is to offset revenue declines due to falling commodity prices or production levels; most such funds are employed by countries whose budgets are highly dependent on natural resources, such as oil, copper, diamonds or others. Most of the existing literature regarding commodity stabilization funds has focused on their efficiency and on the related size question (that is, on whether current stabilization funds are under- or overcapitalized). As we have seen, the consensus in SWF-related corporate and institutional research is that much of the growth in revenue-seeking SWFs will originate from a reallocation of assets from stabilization funds; accordingly, the issue of optimal size of stabilization funds is very relevant to the overall discussion on SWFs.

Arrau and Stijin (1992) focus on the optimal rules for deposits and withdrawals into commodity stabilization funds, assuming that the goal of the latter is hedging against a fall in income from commodity exports. Using the Chilean Copper Stabilization Fund as an example, the authors argue that the actual accumulation of foreign assets has been much larger than the optimal level estimated by their model. Similarly, they claim that oil exporters maintain stabilization reserves well in excess of what predicted by their model, but they do concede that higher-than-predicted funds can be justified by fund or economic externalities. As mentioned, their model is very relevant to any estimation of future growth of SWFs, as it points to the likelihood that excess funds from stabilization funds will be allocated to revenue-oriented SWFs. Stijin and Panos (1994) reach similar conclusions while focusing on the specific case of Venezuela. In particular, they argue that revenue shocks due to oil price changes are best offset by the use of a mixture of stabilization and revenue-seeking investment instruments. Fasano (2000) reviews the operations and experience of commodity stabilization funds in Norway, Chile, Venezuela, Oman and the State of Alaska. He observes that all stabilization funds have been successful in helping to stabilize national budget during declines in commodity prices; yet, he notes that the degree of success is highly dependent on how committed governments have been to enforcing the priorities of the funds. He notes that political interference is often a damaging force, especially as politicians are tempted to use the

accumulated reserves for purposes other than revenue stabilization, such as the financing of pet projects; accordingly, the funds that perform best are those with strict rules regarding withdrawals. His findings add strength to the concerns regarding political influence in SWFs and emphasize the need for careful regulation. His discussion does not directly address the issue of optimal size of stabilization funds. Bartsch (2006) presents a new model based on Monte Carlo simulations for the estimation of the reserves needed to stabilize fiscal spending when government revenues are highly dependent on oil prices. He applies his model to the case of Nigeria and finds that, in order to stabilize fiscal spending for the next five years, Nigeria would require a fund of US\$ 16-18 billion. Given that the size of Nigeria's stabilization fund in 2006 was approximately US\$ 6 billion, his finding casts doubts on the commonly held assumption that the growth of return-seeking SWFs will be fuelled by reallocation of excessive stabilization funds.

Overall, the studies regarding stabilization funds are inconclusive in terms of size – it is still unclear whether stabilization funds truly are overcapitalized. The need for careful regulation and for insulation of the funds from political influence emerges clearly and is directly applicable to SWFs.

State Budget Stabilization Funds

A second topic that has been discussed in academic literature is the effectiveness of budget stabilization funds of US states. Sobel and Holcombe (1996) first observe the rapid growth of budget stabilization funds in US states, citing the 1980-1982 and 1990-1991 recessions as the prime movers of this recent trend; notably, while only a handful of such funds existed prior to the 1990s, over three-quarter of US states adopted some form of budget stabilization fund by 1996. The authors develop a measure of degree of fiscal stress, apply it to US states during the 1990-1991 recession and then examine whether states with budget stabilization funds did experience less fiscal stress. They conclude that funds with proper control structures (in particular, mandatory deposit rules) were successful in reducing fiscal stress. Nevertheless, they note that budget stabilization funds were not sufficiently large to completely eliminate fiscal stress. Their findings bear two implications for SWFs: first of all, political interference is a potential problem, most easily solved by imposing restrictions on deposits and withdrawals of funds; second, budget stabilization funds for US states appear to require more funding, casting doubt on the commonly held belief that most stabilization funds are currently overcapitalized. Levinson (1998) focuses on the effect of balanced budget requirements on state spending and observes that the latter induce increased volatility in spending; yet, in his sample, stabilization funds (which he calls “rainy day” funds) smooth out cyclical variation and weaken the effect of budget balance requirements. The same results are further discussed by Knight and Levinson (1998). Further support for the effectiveness of budget stabilization

funds is offered by Knight and Levinson (1999); the authors find that states with rainy day funds save more and thus have more funds available to offset economic cycles. Additional evidence for the effectiveness of budget stabilization funds is offered by Dougals and Gaddie (2002); while the authors do find that budget stabilization funds are successful in stabilizing spending, they do contradict Sobel and Holcombe (1996) in so far that they find no correlation between stabilization of spending and characteristics of the fund. Wagner (2003) disagrees with the previous results indicating that stabilization funds are successful; he tests whether stabilization funds are better at insulating budgets from commodity price changes than regular savings. He finds that monies in general funds are perfect substitutes for budget stabilization funds, concluding that the latter fail at providing stabilization benefits. In addition, Wagner addresses previous studies and finds that most fail to account for non-stationarity of data-series; he concludes that, once accounting for stationarity, there is no evidence that stabilization funds have been successful at smoothing output.

Appendix B – Abnormal Return Computation in Eventus, from Cowen (2007)

Assume that security returns follow a single factor market model,

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \epsilon_{jt},$$

where R_{jt} is the rate of return of the common stock of the j^{th} firm on day t ; R_{mt} is the rate of return of a market index on day t ; ϵ_{jt} is a random variable that, by construction, must have an expected value of zero, and is assumed to be uncorrelated with R_{mt} , uncorrelated with R_{kt} for $k \neq j$, not autocorrelated, and homoskedastic. β_j is a parameter that measures

the sensitivity of R_{jt} to the market index. Define the *abnormal return* (or *prediction error*) for the common stock of the j^{th} firm on day t as:

$$A_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt}), \quad (\text{A.1})$$

where the coefficients $\hat{\alpha}_j$ and $\hat{\beta}_j$ are ordinary least squares estimates of α_j and β_j .

The *average abnormal return* (or *average prediction error*) AAR_t is the sample mean:

$$AAR_t = \frac{\sum_{j=1}^N A_{jt}}{N}, \quad (\text{A.2})$$

where t is defined in trading days relative to the event date (e.g. $t = -60$ means 60 trading days before the event).

Over an interval of two or more trading days beginning with day T_1 , and ending with T_2 , the *cumulative average abnormal return* is

$$CAAR_{T_1, T_2} = \frac{1}{N} \sum_{j=1}^N \sum_{t=T_1}^{T_2} A_{jt}. \quad (\text{A.3})$$

Over an interval of two or more trading days beginning with day T_1 , and ending with T_2 , the *buy-and-hold abnormal return* is

$$\begin{aligned} BHAR_{j, T_1, T_2} = & \left[\prod_{t=T_1}^{T_2} (1 + R_{jt}) - 1 \right] - \left[(1 + \hat{\alpha}_j)^{(T_2 - T_1 + 1)} - 1 \right] \\ & - \hat{\beta}_j \left[\prod_{t=T_1}^{T_2} (1 + R_{mt}) - 1 \right]. \end{aligned} \quad (\text{A.4})$$

The *average compounded abnormal return* is is

$$ACAR_{T_1, T_2} = \frac{1}{N} \sum_{j=1}^N BHAR_{j, T_1, T_2}. \quad (\text{A.5})$$

References

- Arrau, Patricio and Stijn Claessens, 1992, Commodity Stabilization Funds, The World Bank Policy Research Working Paper Series 835.
- Balding, Christopher, 2008, A portfolio analysis of sovereign wealth funds, Working paper, University of California-Irvine.
- Barclay, Michael J. and Clifford G. Holderness, 1989, Private Benefits from Control of Public Corporations, *Journal of Financial Economics*, Volume 25, Issue 2, Pages 371-395.
- Bartsch, Ulrich, 2006, How Much is Enough? Monte Carlo Simulations of an Oil Stabilization Fund for Nigeria, IMF Working Paper 06/146.
- Bergstrom, Clas and Kristian Rydqvist, 1990, Ownership of Equity in Dual-class Firms, *Journal of Banking and Finance*, Volume 14, Issues 2-3, Pages 255-269.
- Blundell-Wignall A., Yu-Wei Hu, Juan Yermo, 2008, Sovereign Wealth and Pension Fund Issues, OECD Working Papers on Insurance and Private Pensions, No. 14.
- Burkart, Mike, Denis Gromb and Fausto Panunzi, 1997, Large Shareholders, Monitoring, and the Value of the Firm, *The Quarterly Journal of Economics*, Volume 112, Issue 3, Pages 693-728.
- Butt, Shams, Anil Shivdasani, Carsten Stendevad and Ann Wyman (2008), Sovereign Wealth Funds: A Growing Force in Corporate Finance, *Journal of Applied Corporate Finance*, Volume 20, Issue 1, Pages 73-83.
- Campbell, J., Lo and A.C. Mackinlay, 1997, *The Econometrics of Financial Markets*, Princeton University Press.
- Cowen, Arnold R., 2007, *Eventus 8.0 User's Guide*, Cowen Research LC, Ames, Iowa.
- Del Guercio, Diane and Hawkins, Jennifer, 1999, The Motivation and Impact of Pension Fund Activism, *Journal of Financial Economics*, Volume 52, Issue 3, Pages 293-340.
- Demsetz, Harlold and Kenneth Lehn, 1985, The Structure of Corporate Ownership: Causes and Consequences, *The Journal of Political Economy*, Volume 93, Issue 6, Pages 1155-1177.
- Denis, David J. and Jan M. Serrano, 1996, Active Investors and Management Turnover Following Unsuccessful Control Contests, *Journal of Financial Economics*, Volume 40, Issue 2, Pages 239-266.
- Desai, Hemang and Prem C. Jain, 1999, Firm Performance and Focus: Long-Run Stock Market Performance Following Spinoffs, *Journal of Financial Economics*, Volume 54, Issue 1, Pages 75-101.
- Douglas, James W. and Ronald K. Gaddie, 2002, State Rainy Day Funds and Fiscal Crises: Rainy Day Funds and the 1990-1991 Recession Revisited, *Public Budgeting & Finance*, Volume 22, Number 1, Pages 19-30.
- Fama, Eugene F., 1965, The Behavior of Stock Market Prices, *Journal of Business*, Volume 38, Pages 34-105.
- Farrell, Diana, Susan Lund, Eva Gerlemann and Peter Seeburger, 2007, *The New Power Brokers: How Oil, Asia, Hedge Funds, and Private Equity are Shaping Global Financial Markets*, McKinsey Global Institute.
- Fasano, Ugo, 2000, Review of the Experience with Oil Stabilization and Savings Funds in Selected Countries, IMF Working Paper 00/112.
- Franks, Julian and Colin Mayer, 2001, Ownership and Control of German Corporations, *Review of Financial Studies*, Volume 14, Pages 943-977.

- Gillan, Stuart L. and Laura T. Starks, 1998, A Survey of Shareholder Activism: Motivation and Empirical Evidence, *Contemporary Finance Digest*, Volume 2, Issue 3, Pages 10-34.
- Gillan, Stuart L. and Laura T. Starks, 2000, Corporate Governance Proposals and Shareholder Activism: the Role of Institutional Investors, *Journal of Financial Economics*, Volume 57, Issue 2, Pages 275-305.
- Gorton, Gary and Frank A. Schmid, 2000, Universal Banking and the Performance of German Firms, *Journal of Financial Economics*, Volume 58, Issues 1-2, Pages 29-80.
- Hartzell, Jay C. and Laura T. Starks, 2003, Institutional Investors and Executive Compensation, *Journal of Finance*, Volume 58, Issue 6, Pages 2351-2374.
- Jen, Stephen L., 2007a, Russia: The Newest Member of the 'SWF Club', Morgan Stanley Research Global.
- Jen, Stephen L., 2007b, How Big Could Sovereign Wealth Funds Be by 2015?, Morgan Stanley Research Global.
- Jen, Stephen L., 2007c, Why Japan Should Have Its Own Sovereign Wealth Fund, Morgan Stanley Research Global.
- Jen, Stephen L., 2007d, Sovereign Wealth Funds – A Game Changer, Working Paper.
- Jen, Stephen L. and Charles St-Arnaud, 2007, Tracking the Tectonic Shift in Foreign Reserves and SWFs, *Morgan Stanley Research Global*.
- Jen, Stephen L. and David K. Miles, 2007, Sovereign Wealth Funds and Bond and Equity Prices, *Morgan Stanley Research Global*.
- Jensen, Michael C. and Meckling, William H., 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics*, Volume 3, Pages 303-360.
- Kang, Jun-Koo and Shivdasani, Anil, 1995, Firm Performance, Corporate Governance, and Top Executive Turnover in Japan, *Journal of Financial Economics*, Volume 38, Issue 1, Pages 29-58.
- Kaplan, Steven N. and Bernadette A. Minton, 1994, Appointments of Outsiders to Japanese Boards: Determinants and Implications for Managers, *Journal of Financial Economics*, Volume 36, Issue 2, Pages 225-258.
- Kern, Steffen, 2007, Sovereign Wealth Funds – State Investments on the Rise, Deutsche Bank Research.
- Knight, Brian and Arik Levinson, 1998, Fiscal Institutions in U.S. States, Working Paper.
- Knight, Brian and Arik Levinson, 1999, Rainy Day Funds and State Government Savings, *National Tax Journal*, Volume 5, Issue 3, Pages 459-472.
- Levinson, Arik, 1998, Balanced Budgets and Business Cycles: Evidence from the States, *National Tax Journal*, Volume 51, Issue 4, pages 715-732.
- Lyons, Gerald, 2007, State Capitalism: The Rise of Sovereign Wealth Funds, Testimony before the Committee on Banking, Housing and Urban Affairs, United States Senate, November 14, 2007.
- McConnell, John J. and Henri Servaes, 1990, Additional Evidence on Equity Ownership and Corporate Value, *Journal of Financial Economics*, Volume 27, Issue 2, Pages 595-612.
- Morck, Randall, Andrei Shleifer, and Robert W. Vishny, 1989, Alternative Mechanisms for Corporate Control, *American Economic Review*, Volume 79, Issue 4, Pages 842-853.
- Razanov, Andrew, 2005, Who Holds the Wealth of Nations, *Central Banking Journal*, Volume XV, Number 4.

- Razanov, Andrew, 2007, Sovereign Wealth Funds: Defining Liabilities, State Street Global Advisors.
- Sobel, Russel L. and Randall G. Holcombe, 1996, The Impact of State Rainy Day Funds in Easing State Fiscal Crises during the 1990-1991 Recession, *Public Budgeting & Finance*, Volume 16, Number 3, Pages 28-48.
- Shivdasani, Anil, 1993, Board Composition, Ownership Structure, and Hostile Takeovers, *Journal of Accounting and Economics*, Volume 16, Issues 1-3, Pages 167-198.
- Shleifer, Andrei and Robert W. Vishny, 1986, Large Shareholders and Corporate Control, *Journal of Political Economy*, Volume 94, Issue 4, Pages 461-488.
- Shleifer, Andrei and Robert W. Vishny, 1997, A Survey of Corporate Governance, *The Journal of Finance*, Volume 52, Number 2, Pages 737-783.
- Stijin, Claessens and Varangis Panos, 1994, Oil Price Instability, Hedging, and an Oil Stabilization Fund, The World Bank Policy Research Working Paper Series 1290.
- Stulz, René M., 1988, Managerial Control of Voting Rights, *Journal of Financial Economics*, Volume 20, Pages 25-54.
- Truman, Edwin M., 2007a, Sovereign Wealth Funds: The Need for Greater Transparency and Accountability, Peterson Institute for International Economics Policy Brief.
- Truman, Edwin M., 2007b, Sovereign Wealth Fund Acquisitions and Other Foreign Government Investments in the United States: Assessing the Economic and National Security Implications, Testimony before the Committee on Banking, Housing and Urban Affairs, United States Senate, November 14, 2007.
- Truman, Edwin M., 2008, A Blueprint for Sovereign Wealth Fund Best Practices, Peterson Institute for International Economics Policy Brief.
- Yafeh, Yishay and Oved Yosha, 2003, Large Institutional Shareholders and Banks: Who Monitors and How?, *The Economic Journal*, Volume 113, Issue 484, Pages 128-146.
- Wagner, Gary A., 2003, Are State Budget Stabilization Funds only the Illusion of Savings? Evidence from Stationary Panel Data, *The Quarterly Review of Economics and Finance*, Volume 43, Issue 2, pages 213-238
- Wruck, Karen, 1998, Equity Ownership Concentration and Firm Value; Evidence from Private equity Financings, *Journal of Financial Economics*, Volume 23, Issue 1, Pages 3-28.
- Zingales, Luigi, 1994, The Value of the Voting Right: A Study of the Milan Stock Exchange Experience, *Review of Financial Studies*, Volume 7, Issue 1, Pages 125-48.

Table 1. Investment Vehicle Characteristics (Source: Sovereign Wealth Fund Institute)

This table summarizes the criteria used in classifying SWFs and in discriminating between SWFs, state owned enterprises and public pension funds.

	Sovereign Wealth Fund	State Owned Enterprise	Public Pension Fund
Asset Ownership	Government	Primarily Government	Pension Members Fund Defined Benefit Obligations
Primary Purpose	Varies Commodity / Non- Commodity	Varies Government / Corporate Earnings	Pension Contributions
Funding Source			
Government Control	Total	Significant	Insignificant
Disclosure	Varies	Varies	Transparent
Investor Class			
Growth	High	Steady	Steady
Example	ADIA China Investment Corporation Temasek Holdings Kuwait Invesmtnet Authority	Chinalc Rosneft EDF - Electricite de France SA Banco de Amazonia	CalPERS CalSTRS NYSTRS Teacher Retirement System of Texas

Table 2. Major Sovereign Wealth Fund (Source: Truman, 2008)

This table lists the largest SWFs and offers information regarding country of origin (*Country*), fund name (*Fund Name*), the year in which the fund has been established (*Date Establish*) the principal source of funding for the fund (*Source of Funds*) and estimated fund size in US\$ billions (*Current Size \$US Bn*).

Country	SWF Name	Date Establish	Source of Funds	Current Size US\$ Bn
Algeria	Revenue Regulation Fund	2000	Natural resources	47
Azerbaijan	State Oil Fund, Republic of Azerbaijan	1999	Natural resources	2
Botswana	Pula Fund	1993	Natural resources	7
Brunei Darussalam	Brunei Investment Agency	1983	Natural resources	35
Canada	Alberta Heritage Savings Trust Fund	1976	Natural resources	17
Chile	Economic and Social Stabilization Fund	2006	Natural resources	15
China	China Investment Corporation	2007	Foreign exchange reserves	200
China	Shanghai Financial Holdings	2007	Fiscal surpluses	1
Gabon	Fund for Future Generations	1998	Natural resources	0.4
Hong Kong	Exchange Fund Investment Portfolio	1993	Forex reserves, fiscal surpluses	139
Iran	Oil Stabilization Fund	2000	Natural resources	10
Kazakhstan	National Fund, Republic of Kazakhstan	2000	Natural resources	23
Kiribati	Revenue Equalization Reserve Fund	1956	Natural resources	1
Korea	Korea Investment Corporation	2005	Foreign exchange reserves	30
Kuwait	Kuwait Investment Authority	1953	Natural resources	213
Libya	Libyan Investment Authority	2006	Natural resources	50
Malaysia	Khazanah Nasional	1993	Fiscal surpluses	18
Mexico	Oil Income Stabilization Fund	2000	Natural resources	5
Nigeria	Excess Crude Account	2003	Natural resources	17
Norway	Government Pension Fund-Global	1990	Natural resources	375
Oman	State General Reserve Fund	1980	Natural resources	13
Qatar	Qatar Investment Authority	2005	Natural resources	60
Russia	National Welfare Fund	2008	Natural resources	32
Russia	Reserve Fund	2008	Natural resources	128
São Tomé & Príncipe	National Oil Account	2004	Natural resources	0.02
Saudi Arabia	Saudi Arabian Monetary Agency	1952	Natural resources	270
Singapore	Government of Singapore Investment Corporation	1981	Foreign exchange reserves, fiscal surpluses, employee contributions	200 to 330
Singapore	Temasek Holdings	1974	Government enterprises	110
Sudan	Oil Revenue Stabilization Account	2002	Natural resources	0.1
Timor-Leste	Petroleum Fund	2005	Natural resources	2
Trinidad and Tobago	Heritage and Stabilization Fund	2007	Natural resources	2
United Arab Emirates	Emirates Investment Authority	2007	Natural resources	n.a.
UAE (Abu Dhabi)	Abu Dhabi Investment Authority & Council	1976	Natural resources	500 to 875
UAE (Abu Dhabi)	International Petroleum Investment Comp	1984	Natural resources	12
UAE (Abu Dhabi)	Mubadala Development Company	2002	Natural resources	10
UAE (Dubai)	DIFC Investments	2006	Natural resources	n.a.
UAE (Dubai)	Dubai International Capital	2004	Natural resources	13
UAE (Dubai)	Investment Corporation of Dubai	2006	Natural resources	82
UAE (Dubai)	Istithmar World	2003	Natural resources	12
United States	Alaska Permanent Fund	1976	Natural resources	37
United States	Permanent Mineral Trust Fund (Wyoming)	1974	Natural resources	4
United States	Severance Tax Permanent Fund (New Mexico)	1973	Natural resources	5
Venezuela	Macroeconomic Stabilization Fund	1998	Natural resources	1
Venezuela	National Development Fund	2005	Natural resources	21
Total				\$2,972

Table 3. Investments by SWF and by Target Country

This table lists the number of investments by found and by the country of incorporation of the target firm. Shaded cells indicate investments for which SWF country and target country coincide.

SWF Country	SWF Name	Target Country																				TOTAL			
		Australia	Austria	Bahamas	China	Egypt	Hong Kong	India	Indonesia	Italy	Jordan	Malaysia	New Zealand	Papua New Guinea	Philippines	Singapore	South Korea	Spain	Sweden	Switzerland	Thailand		Taiwan	United Kingdom	United States
Brunei	Brunei Investment Agency									1															1
China	China Investment Corporation																							1	1
Kuwait	Kuwait Investment Authority																							1	1
Libya	Libyan Arab Foreign Investment								1																1
Malaysia	Khazanah Nasional Bhd							2	1			3													6
Malaysia	Permodalan Nasional Bhd											13													13
New Zealand	Auckland Regional Holdings											1													1
New Zealand	National Provident Fund												1												1
Qatar	Qatar Investment Authority																	1						1	2
Singapore	GIC	2					1				4			1					1	3				6	18
Singapore	Temasek Holdings	1			1		1	1			1				5	2					1	1	3	18	
United Arab Emirates	ADIA	1				2											1						1	1	6
United Arab Emirates	Dubai World																							1	1
United Arab Emirates	IPIC		2																						2
United Arab Emirates	Istithmar			1																				1	2
United Arab Emirates	Mubadala Development																							1	1
TOTAL		4	2	1	1	2	1	4	2	1	1	21	1	1	1	5	2	1	1	1	3	1	2	16	75

Table 4. Acquisitions Details

This table lists mean and median firm value (*Firm Value*), percentage of shares acquired (*% of Shares Acquired*) and transaction value (*Value of the Deal*), by SWF.

SWF Country	SWF Name	Transaction Value (US\$ Million)					Share Acquired (%)					Firm Value (US\$ Million)				
		N	Mean	Min	Median	Max	N	Mean	Min	Median	Max	N	Mean	Min	Median	Max
Brunei	Brunei Investment Agency	1	112.00	112.00	112.00	112.00	1	37	37	37	37	0	NA	NA	NA	NA
China	China Investment Corporation	1	5,000.00	5,000.00	5,000.00	5,000.00	1	9.9	9.9	9.9	9.9	0	NA	NA	NA	NA
Kuwait	Kuwait Investment Authority	0	NA	NA	NA	NA	0	NA	NA	NA	NA	0	NA	NA	NA	NA
Libya	Libyan Arab Foreign Investment	0	NA	NA	NA	NA	1	26.3	26.3	26.3	26.3	0	NA	NA	NA	NA
Malaysia	Khazanah Nasional Bhd	5	NA	NA	NA	NA	6	29.9	3.99	9.36	100	3	11,992	1,776	6,121	28,079
Malaysia	Permodalan Nasional Bhd	8	89.40	4.42	36.40	419.10	13	17.69	0.15	7.26	77.9	7	857	224	306	3,235
New Zealand	Auckland Regional Holdings	1	120.20	120.20	120.20	120.20	1	20	20	20	20	1	671	671	671	671
New Zealand	National Provident Fund	1	15.18	15.18	15.18	15.18	1	19	19	19	19	0	NA	NA	NA	NA
Qatar	Qatar Investment Authority	0	NA	NA	NA	NA	1	9.98	9.98	9.98	9.98	0	NA	NA	NA	NA
Singapore	GIC	15	687.00	2.46	22.00	9,760.00	18	6.65	0.044	5	20	9	2,907	206	586	21,296
Singapore	Temasek Holdings	8	NA	NA	NA	NA	14	14.25	0.05	6.25	100	5	3,929	1,028	2,442	10,503
United Arab Emirates	ADIA	3	2,511.00	12.60	20.90	7,500.00	5	5.91	0.77	7.6	8	2	1,163	336	1,163	1,990
United Arab Emirates	Dubai World	0	NA	NA	NA	NA	1	9.5	9.5	9.5	9.5	0	NA	NA	NA	NA
United Arab Emirates	IPIC	2	136.00	14.70	136.00	257.00	2	9.8	6.6	9.8	13	0	NA	NA	NA	NA
United Arab Emirates	Istithmar	0	NA	NA	NA	NA	0	NA	NA	NA	NA	0	NA	NA	NA	NA
United Arab Emirates	Mubadala Development	1	622.30	622.30	622.30	622.30	1	8.84	8.84	8.84	8.84	1	11,164	11,164	11,164	11,164
TOTAL		46	620.00	0.42	47.6	9,760	66	13.91	0.044	7.9	100	28	3,641	206	1018	28,079

Table 5. Investment Type

This table reports how many investments in our sample are classified as tender offers, open market purchases or privately negotiated purchases, classified by SWF.

SWF Country	SWF Name	Acquisition Method				Total
		Tender Offer	Open Market Purchase	Privately Negotiated Purchase	Not Available	
Brunei	Brunei Investment Agency			1		1
China	China Investment Corporation			1		1
Kuwait	Kuwait Investment Authority				1	1
Libya	Libyan Arab Foreign Investment				1	1
Malaysia	Khazanah Nasional Bhd	1	1	3	1	6
Malaysia	Permodalan Nasional Bhd	3	2	6	2	13
New Zealand	Auckland Regional Holdings	1				1
New Zealand	National Provident Fund		1			1
Qatar	Qatar Investment Authority			2		2
Singapore	GIC		9	7	2	18
Singapore	Temasek Holdings		3	8	7	18
United Arab Emirates	ADIA		2	3	1	6
United Arab Emirates	Dubai World				1	1
United Arab Emirates	IPIC			2		2
United Arab Emirates	Istithmar				2	2
United Arab Emirates	Mubadala Development			1		1
TOTAL		5	18	34	18	75

Table 6. Acquisitions by Industry Sector of Target

This table reports how many target firms belong to each industry sector (from Securities Data Corporation).

Target Industry Sector	Number of firms
Agriculture, Forestry, and Fishing	4
Business Services	2
Commercial Banks, Bank Holding Companies	12
Construction Firms	3
Credit Institutions	2
Educational Services	1
Electronic and Electrical Equipment	2
Holding Companies, Except Banks	2
Insurance	1
Investment & Commodity Firms, Dealers, Exchanges	11
Machinery	1
Metal and Metal Products	1
Mining	2
Oil and Gas; Petroleum Refining	4
Prepackaged Software	1
Real Estate; Mortgage Bankers and Brokers	6
Retail Trade-Eating and Drinking Places	1
Stone, Clay, Glass, and Concrete Products	1
Telecommunications	1
Textile and Apparel Products	1
Transportation and Shipping (except air)	1
Transportation Equipment	3
Wholesale	1
Wood Products, Furniture, and Fixtures	1
Not Available	10
TOTAL	75

Table 7. Market Indices

This table lists the indices used as benchmarks in the computation of abnormal returns, by country of incorporation of the target.

Target Country	Index
Australia	All Ordinaries
Austria	ATX
Bahamas	NA - Used USA's S&P 500
China	Shanghai Composite
Egypt	CMA General
Hong Kong	Hang Seng
India	BSE 30
Indonesia	Jakarta Composite
Italy	S&P Mib 45
Jordan	Jordan AFM
Malaysia	KLSE Composite
New Zealand	NZSE 50
Papua New Guinea	NA - used Australia's All Ordinaries
Philippines	Manila SE All-Share Index
Singapore	Strait Times
South Korea	Seoul Composite
Spain	Madrid General
Sweden	OMX Stockholm 30
Switzerland	Swiss Market SSMI
Taiwan	Taiwan Weighted
Thailand	SET General Index
United Kingdom	FTSE 100
United States	S&P 500

Table 8. Long-Term Impact

This table reports long-horizon event study results. *Interval* indicates the time interval of interest, relative to the date of the SWF investment (day 0). *N* reports the number of observations. *Mean Compounded Abnormal Return* reports average abnormal buy-and-hold returns computed as described in *Appendix B*. *Positive* and *Negative* report, respectively, the number of positive and negative abnormal buy-and-hold returns for the period of interest. *Patell Z* reports the result of Patell's Z-score computed to test the statistical significance of the mean abnormal buy-and-hold return relative to the period of interest. *Generalized Sign Z* reports the results of a generalized nonparametric sign test for the significance of the mean abnormal buy-and-hold return relative to the period of interest. Significance is denoted as follows: "*" indicates significance at the .1 level; "**" indicates significance at the .05 level; "***" indicates significance at the .01 level.

Interval	N	Mean Compounded Abnormal Return	Positive	Negative	Patell Z	Generalized Sign Z
(+1,+480)	53	-40.96%	18	35	-1.969 *	-1.886 *
(+1,+240)	53	-18.17%	22	31	-1.849 *	-0.785
(+1,+120)	53	-11.37%	24	29	-2.394 **	-0.234
(+1,+60)	53	-6.58%	20	33	-2.190 *	-1.335
(+1,+30)	53	-2.85%	25	38	-1.641	0.041

Table 9. Extreme Negative Long-Term Performers

Table 9 identifies the SWF acquisitions leading to the most extreme underperformance, measures as 2-year buy-and-hold abnormal returns. *Investment Date* indicates the date on which the SWF investment was made. *Target Name* indicates the name of the target firm. *Target Nation* indicates the country in which the target is incorporated. *Target Industrial Group* indicates the industrial group of the target. *Acquirer Name* reports the name of the investing SWF, while *Acquirer Country of Origin* indicates the country of origin of the investing SWF.

Investment Date	Target Name	Target Nation	Target Industrial Group	Acquirer Name	Acquirer Country of Origin
03/02/89	Harrisons Malaysian Plantation	Malaysia	Natural Resources	Permodalan Nasional Bhd	Malaysia
08/02/96	Thai Danu Bank PCL	Thailand	Financial	GIC	Singapore
04/29/98	Thai Farmers Bank PCL	Thailand	Financial	GIC	Singapore
09/28/99	Land & Houses PCL	Thailand	Financial	GIC	Singapore
02/08/00	Turkish Investment Fund Inc.	United States	NA	Kuwait Investment Authority	Kuwait
01/09/03	ICICI Bank Ltd	India	Financial	GIC	Singapore
07/15/04	Kerzner International Limited	Bahamas	NA	Istithmar	Utd Arab Em
07/30/04	Shell Refining Co Bhd	Malaysia	Natural Resources	GIC	Singapore
08/24/04	Hana Bank	South Korea	Financial	Temasek Holdings	Singapore
02/05/05	Equinix Inc	United States	Services	Temasek Holdings	Singapore
10/06/05	Lippo Bank Tbk PT	Indonesia	Financial	Khazanah Nasional Bhd	Malaysia

Table 10. Mean Cumulative Abnormal Returns

This table reports short-horizon event study results. *Interval* indicates the time interval of interest, relative to the date of announcement of the SWF investment (day 0). *N* reports the number of observations. *Mean Cumulative Abnormal Return* reports average abnormal cumulative returns computed as described in *Appendix B*. *Positive* and *Negative* report, respectively, the number of positive and negative cumulative abnormal returns for the period of interest. *Patell Z* reports the result of Patell's Z-score computed to test the statistical significance of the mean cumulative abnormal return relative to the period of interest. *Generalized Sign Z* reports the results of a generalized nonparametric sign test for the significance of the mean cumulative abnormal return relative to the period of interest. Significance is denoted as follows: “*” indicates significance at the .1 level; “**” indicates significance at the .05 level; “***” indicates significance at the .01 level.

Interval	N	Mean Compounded Abnormal Return	Positive	Negative	Patell Z	Generalized Sign Z
(-60,0)	75	4.61%	47	28	1.602	2.789 **
(-30,0)	75	0.18%	39	36	-0.355	0.937
(-1,+1)	75	0.71%	43	32	1.559	1.863 *
(0,0)	75	0.94%	46	29	6.044 ***	2.557 **

Table 11. Market Reaction, Short-Term

This table reports event study results, by day. *Day* indicates the day of interest, relative to the date of announcement of the SWF investment (day 0). *Mean Abnormal Return* reports average abnormal returns computed as described in *Appendix B*. *% Positive* reports the proportion of positive abnormal returns for the day of interest. *Patell Z* reports the result of Patell's Z-score computed to test the statistical significance of the average abnormal return. *Generalized Sign Z* reports the results of a generalized nonparametric sign test for the significance of the average abnormal return. "*" indicates significance at the .1 level; "***" indicates significance at the .05 level; "****" indicates significance at the .01 level.

Day	Mean Abnormal Return	% Positive	Patell Z	Generalized Sign Z
-10	-0.01%	52.11%	0.222	0.883
-9	0.12%	55.41%	1.22	1.469
-8	-0.05%	53.33%	0.488	1.119
-7	0.60%	61.33%	3.138 ***	2.507 **
-6	-0.46%	38.81%	-2.262 *	-1.325
-5	-0.08%	43.06%	0.287	-0.651
-4	-0.44%	44.44%	-2.535 **	-0.415
-3	0.56%	49.32%	1.892 *	0.416
-2	0.53%	51.43%	1.176	0.762
-1	-0.19%	47.14%	-0.875	0.043
0	0.98%	64.00%	6.434 ***	2.97 **
1	-0.09%	45.83%	-2.782 **	-0.179
2	0.22%	44.44%	0.772	-0.415
3	-0.16%	49.32%	0.425	0.416
4	0.27%	43.06%	1.51	-0.651
5	-0.56%	41.33%	-2.839 **	-0.964
6	0.08%	45.21%	-0.545	-0.288
7	-0.39%	32.00%	-1.365	-2.583 **
8	0.16%	51.39%	0.626	0.766
9	-0.03%	54.41%	-0.352	1.244
10	0.13%	54.17%	0.508	1.238

Figure 1. Assets Under Control, by Fund Type (Source: The Economist)

This figure plots assets under control of different investment vehicles.

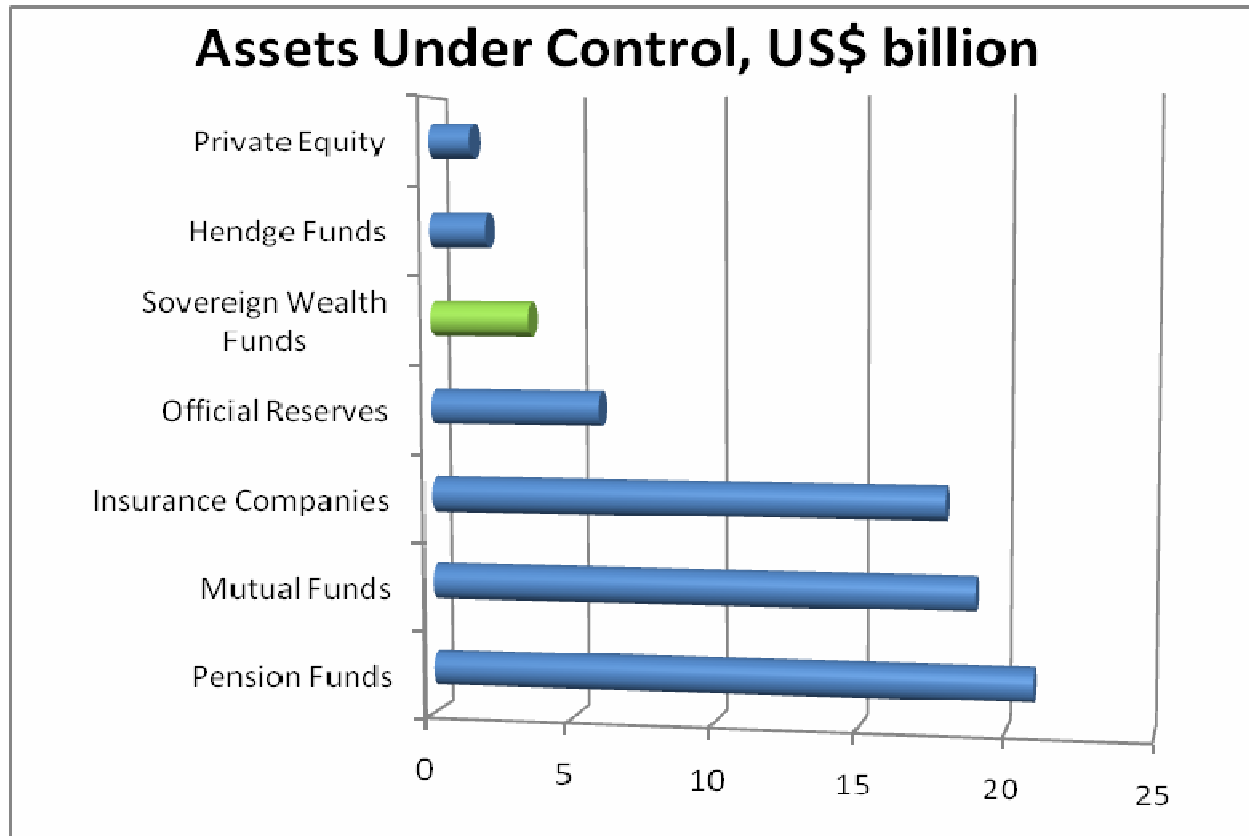


Figure 2 – Assets Under Control, by Fund (Source: Lyons, 2007)

This figure plots assets under control of individual asset managing firms, SWFs and pension funds.

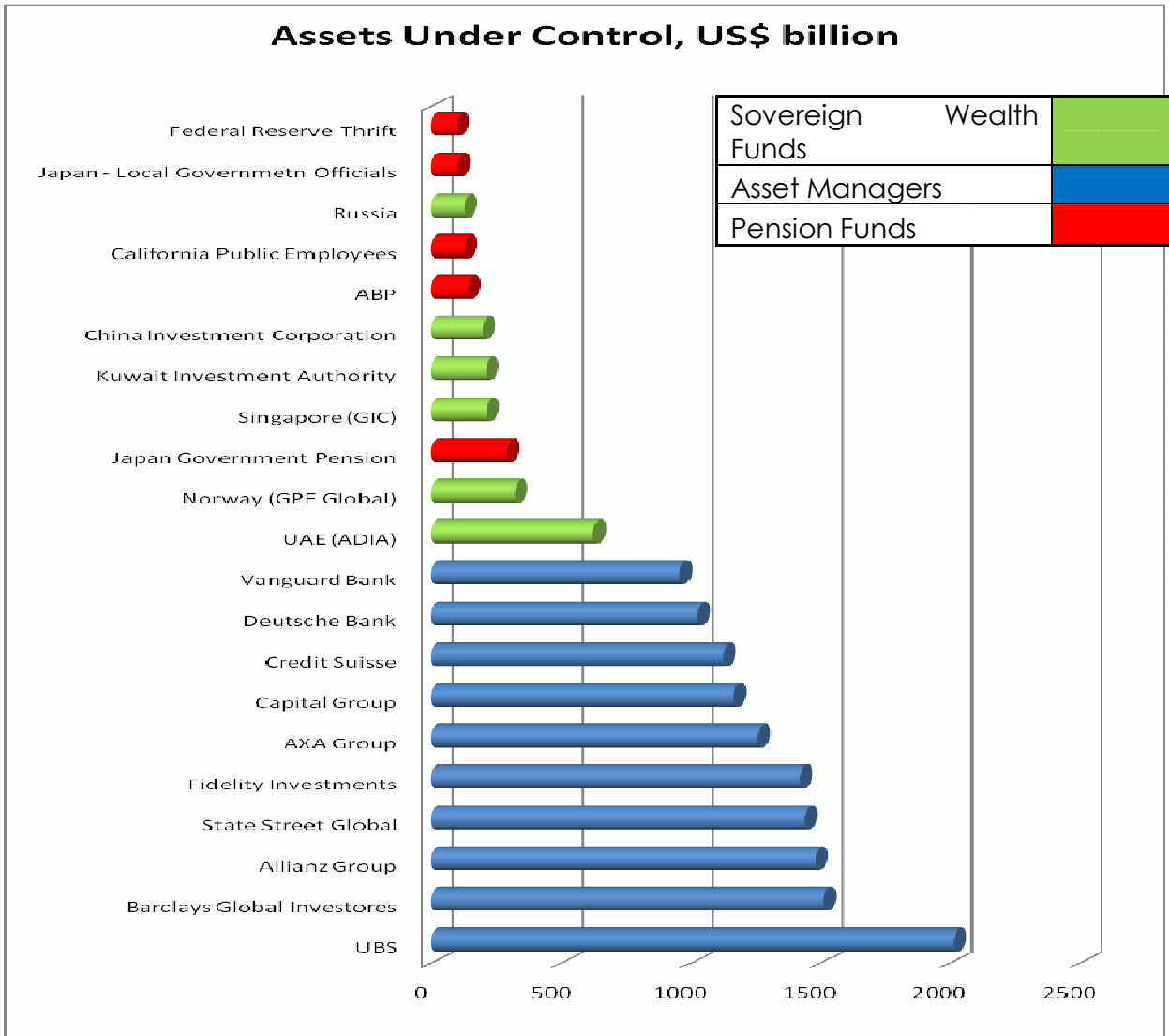


Figure 3. SWF Acquisitions, by year (Source: Lyons, 2007)

This figure plots estimated SWF acquisitions, by year.

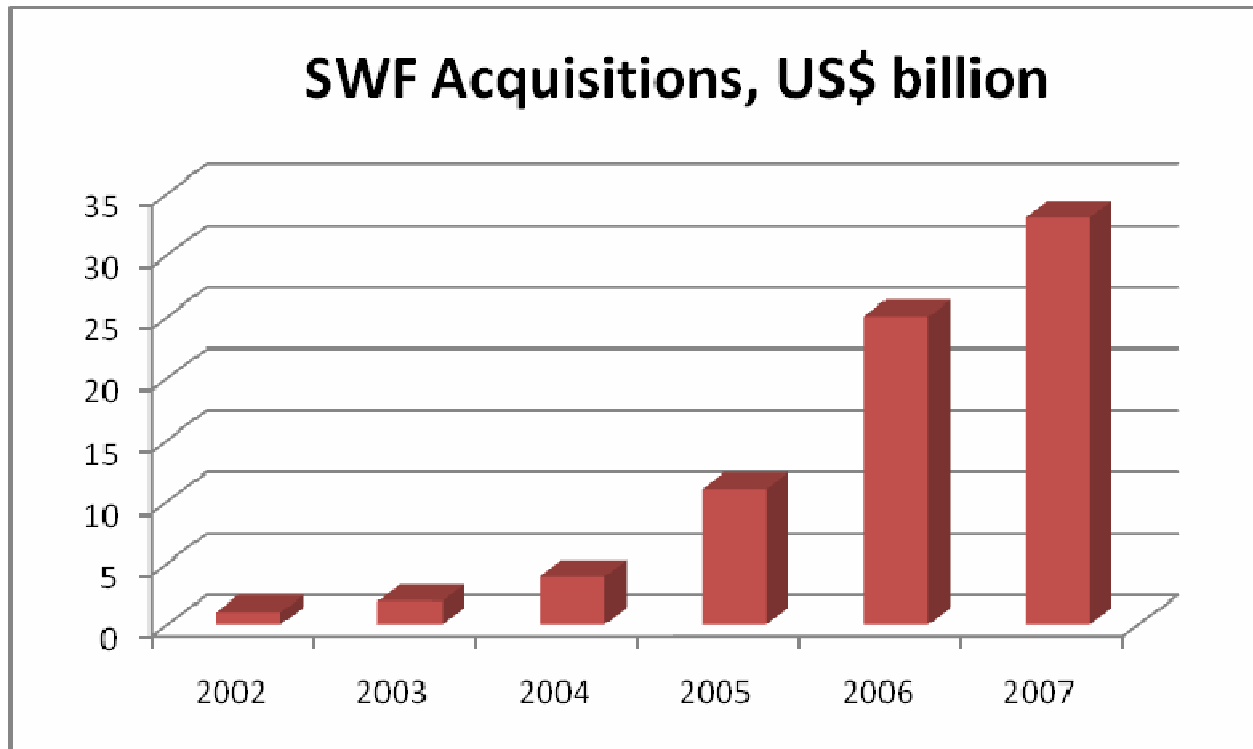


Figure 4 – Mean Abnormal Buy-and-Hold Returns, Long-Term

This figure plots average abnormal buy-and-hold returns, computed as described in *Appendix B*, against the day relative to the date of the SWF investment (day 0).

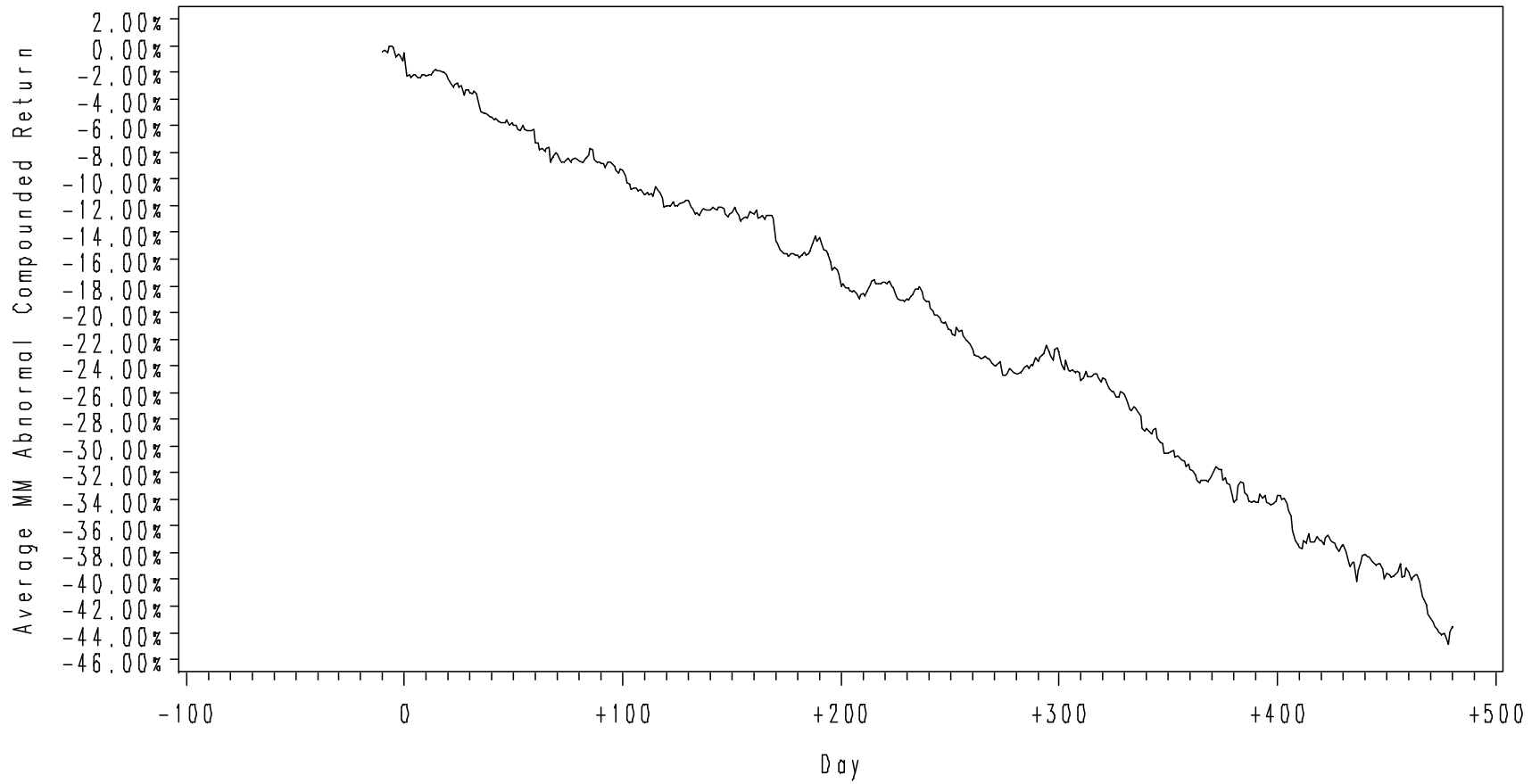


Figure 5 – Mean Abnormal Returns, Short-Term.

This figure plots daily abnormal returns against the day relative to the date of the SWF investment (day 0).

