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Reevaluating the Roles of Large Public Surpluses and Sovereign Wealth Funds in Asia

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Abstract

This paper discusses the increasingly important roles of Asian official institutions in the new global financial landscape and the reasons that have led to the build-up of massive public surpluses. We re-examine the role of sovereign wealth funds (SWFs) as the de facto "global lender of last resort" during the recent financial crisis. Specifically, we analyze SWFs' balance sheet characteristics, target allocations strategies, strategic agendas and political realities, management philosophies, and other real-world challenges, both before and after the crisis. Part of our analysis incorporates data which includes announced deals, regulatory filings, balance sheet information, and actual performance data made available by specific SWFs. We also point out a logical inconsistency in the common application of the Berk-Green alpha argument to the management of SWFs. For instance, the recent work done by Ang, Goetzmann, and Schaefer (2009) suggests limited or no evidence that alpha-seeking activities have impacts on SWF performance. We argue that the problem may be partially due to the choice of an appropriate performance benchmark for such large, non-commercial mandates. Finally, we propose a set of principles to construct a fair performance benchmark for SWFs.

Keywords: Sovereign wealth funds, Performance attribution, Asset allocation, Berk-Green alpha, Public surpluses, Asian official institutions

JEL Codes: F33, F32, F31

1. Roles of Asian Official Institutions in the New Global Financial Landscape

Since the onset of the financial crisis, the helpful questions no longer revolve around whether Asia is important or when Asia will become a global financial powerhouse. The practical and pressing agenda of the moment is how to further integrate a now-confident Asia into the global financial system in a constructive and mutually beneficial manner. Many of the regional-level issues as identified by the June 2010 joint Asian Development Bank (ADB)-Earth Institute report (Sachs, Kawai, Lee, and Woo 2010) have been known for some time. Surprisingly, research and policy literature that offers pragmatic roadmaps and rigorous solutions is only beginning to emerge. This paper aims to summarize the issues and to make an initial attempt to answer some of the pressing questions.

1.1 Historical Reasons for the Build-Up of Large Public Surpluses

To understand sovereign wealth funds (SWFs), we must first understand the historical context that has precipitated the massive build-up of large public surpluses. Generally speaking, sovereign wealth funds fall into two categories: i) funds that aim to convert physical wealth (often mineral wealth) into financial wealth and preserve such wealth in a trust format for the benefit of multiple generations; and ii) funds that manage pools of excess reserves used to support domestic currencies in order to ensure financial stability, as well as provide for some level of fiscal contingency.

The existence of the first type of SWF is an historical artifact: SWFs offer, from a national balance sheet perspective, a mechanism for diversification away from over-concentration in mineral wealth. This wealth can then be managed in a trust format for the benefit of multiple generations, and the infamous Dutch disease[3] thereby avoided. The existence of the second type of SWF deserves more scrutiny. If foreign exchange markets are perfectly efficient then classical theories of international economics and comparative advantage suggest that no country should run up consistent trade surpluses and build up massive official reserves. When a net exporter's goods and currency become more expensive, due to eventual demand pressures, the importer may find domestic goods become relatively cheaper, or the exporter may begin investing surpluses into production activities inside the importer country in order to meet demand with lower production costs. This point leads some commentators to suggest that the real cause of the build-up of massive imbalance is the lack of flexibility in certain segments of the global exchange rate regime.

[3] The Dutch disease refers to the phenomena that the revenue from selling a country's natural resources will make the nation's currency stronger, therefore, making exports more expensive and eventually hurting the manufacture sector. The term was first used by the Economist ("The Dutch Disease" (November 26, 1977). The Economist, pp. 82-83.)

Let's imagine the following hypothetical scenario: foreign exchange markets are reasonably efficient. There is no capital control. Producers in exporting countries are allowed to invest their surpluses into hard assets held by or located in importer countries. Importer countries (typically with greying populations) in turn pay for their imports by liquidating hard assets. Under such a scenario, any large export-driven trade surpluses will be counterbalanced by investment outflows, and there is no obvious reason for a massive build-up of official reserves. Is there anything inherently wrong with such a scenario, as long as domestic investors are reasonably sophisticated about investing overseas, and the state still has some financial reserves to use both as a precautionary measure and a way to diversify the economy? Also, in which other ways is the world deviating from this hypothetical scenario, ways which have led to the build-up of massive public surpluses and the associated distortions in the global balance of payments, besides in the manner laid out in typical arguments regarding inefficient foreign exchange markets and inflexible exchange rate regimes?

1.2 A Consequence of Failed Market Liberalization?

In one of the most celebrated arguments against unfettered liberalization, Stiglitz, Ocampo, Spiegel, and French-Davis (2006) argue that the Washington Consensus has placed unwarranted faith in the role of markets. The authors further argue that structural policies, such as capital market liberalization, are blunt instruments that have often been implemented with adverse consequences for economic stability and long-term growth.

Global imbalances of payments are unlikely to disappear overnight by any capital market liberalization measures. Further, such imbalances of payments have created serious consequences for the global economy and will continue to do so for some time. For one thing, the massive public surpluses among Asian countries have allowed certain governments to run unsustainable fiscal deficits. Moreover, Asian countries still have fresh memories of their own financial crisis in the 1990s, when certain governments in the region ran out of official reserves to support their own currencies. Because the potential social and economic costs of a financial rescue can be traumatic, few Asian countries nowadays want to entertain the remote possibility of insolvency, no matter how much more efficient foreign exchange markets have become. The practical policy question now is not whether Asian countries should build up “rainy day” public surpluses, but rather how much is enough, and at which point does the size become too massive and create more problems of distortion than it solves?

In theory, every country in the world can print a certain amount of domestic currency and exchange it for foreign currencies in order to build up an official reserve. These pools can be used by each central bank to facilitate more efficient settlements of day-to-day cross-border transactions. As long as these pools of official reserves are kept away from general circulation in the real economy—in the past, official reserves have usually been invested only in government bonds—the act of printing money to create such pools should have limited inflationary impacts on domestic economies as governments are simply holding each other's bonds. What might be

a reasonable operational size for such artificial pools? One may argue that a "virtual" arrangement as such, in the form of a bilateral currency swap facility, already exists today. Under such an arrangement, there is no obvious reason to draw any amount (from the swap line) larger than what would be necessary for aggregated settlements of day-to-day transactions, so that the practical operational size of such pools can be determined empirically.[4]

The real problem with the simplistic model described above is that some debtor governments may decide to use the money raised from selling bonds to other central banks to finance their own massive fiscal deficits. This is, in effect, equivalent to one country in the model above "selling down" its reserves unilaterally, and doing so can result in monetary expansion in the real economy. In this case, all other countries will end up with a higher-than-warranted allocation of that country's currencies in their respective pools. Further, the net-saver countries in the above model may also decide to use their reserves to invest in tangible assets instead of holding government bonds, i.e., the pools in the model above become an increasingly significant part of the real economy. At which point will these economies begin to face a real risk of the Dutch disease?

At the end of the day, there may be some natural and logical reasons for every major region of the world to maintain a pool of official reserves in currencies other than their own. The recent Greek crisis has also shown that the Euro does not yet offer a credible alternative to the United States (US) dollar as a reserve currency. Unless Asian countries begin to use a specific Asian currency or a basket of Asian currencies as the region's anchor currency, it is far from clear what credible alternatives there are for central banks around the world to stop using the US dollar as their primary store of value. Another practical issue with this simplistic model is that there is no credible Asian currency or currency basket for non-Asian central banks to hold, while Asian countries are "stuck" with using US dollars as their primary store of value. As a consequence, the one-way build-up of massive dollar-dominated public surpluses in Asia will remain an economic fact of life into the foreseeable future.

1.3 Beyond Wealth Preservation and Stabilization of Domestic Economies

At the height of the recent financial crisis, many Western financial institutions at risk of collapsing sought help from Asian official institutions to finance their rescue packages. Estimates of the total amount of recapitalization required to restore the global financial system to its former (pre-Basel-II) state of health are roughly in the trillion-dollar range (Lee 2009). Given that only the Asian official institutions will have balance sheets large enough to supply such an astronomical amount of capital, they are expected to play a critical role in the recapitalization of the global financial system. There are practical advantages in defining such a role for Asian official institutions, as well as the potential responsibilities and obligations

[4] One example is the recent announcement by the People's Bank of China and the Monetary Authority of Singapore to set up a bilateral currency swap facility for the purpose of promoting bilateral trade and direct investment.

involved. It is often impossible for any rescuer to time its intervention at the precise bottom of a collapsing stock market. The public is also not known for making charitable comparisons to the proverbial alternative of "doing nothing", so the ensuing market volatility often leads to a public outcry about the "misuse" of public coffers by the rescuers. Finally, certain basic criteria must be met before launching any rescue—unlike the International Monetary Fund (IMF) Executive Board, a collection of independent Asian official institutions may not all agree on how best to make certain difficult choices between moral hazards and long-term economic malaise.

From an institutional perspective, there are also practical reasons for Asian SWFs to better define their de facto role as global lenders of last resort, beyond their established role of providing stability for their own domestic economies. Later in the paper, we will reference research that suggests evidence of limited alpha[5] being available to SWFs: indeed, their returns are thought to be driven primarily by asset allocation. An SWF also cannot engage in typical trading-oriented hedging activities because the notional amount that they would be required to take short positions in may be large enough to crash the market, thereby defeating the purpose of the hedge. As a result, one pragmatic hedging technique that can be pursued by an SWF is to act as the global lender of last resort, in order to avoid any potential collapse of the global economy. This is still a better alternative to holding worthless IOUs: usually, net-saver countries have no interest in seeing their customers stop buying their goods and services, at least not before the appropriate adjustments have been made. In other words, it is conceivable for mega-sized, public investors in Asia to play a stabilizing role in the global financial system. In fact, Hu Xiaolian, Deputy Governor of the People's Bank of China, the People's Republic of China's (PRC's) central bank, proposed the possible creation of a "superfund" with dual market stabilization and profit-seeking objectives (Hu 2009). This kind of structure would allow Asian official institutions to herald the reform of financial markets and their regulations, however many have good reason to be wary of potential domination by a single country or a handful of countries. These are some of the pragmatic policy issues that will be explored and expanded on in this paper, and which should also form the subject of future research.

[5] Alpha usually refers to the risk-adjusted abnormal, non-systematic return from factor models, such as the CAPM or the Fama-French three-factor model.

2. Investment Purposes of SWFs as Managers of Large Public Surpluses

2.1 Optimal Portfolio Strategies

Research in optimal portfolio strategies by Merton (1998) describes how long-term wealth managers should consider not only contemporaneous asset holdings, but also the potential substitution effects that arise from anticipated inflow and outflow characteristics. Lee (2006) expanded on Merton's basic model in order to better understand optimal asset allocation from a national balance sheet perspective, with the assumption that the global economy is populated by three types of countries (Figure 1):

1. **Group A**—Countries with abundant natural resources;
2. **Group B**—Countries with abundant productive labor that favor the production of manufactured goods; and
3. **Group C**—Countries with abundant intangible assets, such as intellectual property, scientific and technical leadership, high value-added managerial skills, and capital market expertise in, for example, stock markets, hedge funds, and venture capital investments.

2.2 Types of SWFs

Lee (2006) further assumed that one dominant country in Group C issues the major trade settlement currency in this global economy. Lee was able to demonstrate by analysis using empirical examples how each of these country groupings would choose the following asset allocation policy responses:

1. **Group A**—These resource-rich countries are naturally "long" resources and "long" the settlement currency (as a result of selling their natural resources). Their appropriate diversification policy is to sell resources forward and invest their settlement currency reserves by buying manufacturing goods and intangible assets.
2. **Group B**—These manufacturing powerhouses are naturally "short" resources and "long" the settlement currency (as a result of producing and selling their manufacturing goods). Their appropriate diversification policy is to buy resources as well as intangible assets.
3. **Group C**—The primary "exports" of these countries are intangible assets, such as equity and debt papers. Their appropriate diversification policy is to develop more value-added services (and hence intangible assets) that correlate with resources and manufacturing. An

example could be to develop advanced oil/gas services sectors and expertise in managing the complex logistics of global manufacturing.

What is still missing from the above analysis is the potential impact of immigration and knowledge transfer—in particular the flow of skills and expertise from Group C countries to Group A and B countries, which results in the distinctions between groups A, B, and C becoming increasingly blurred. That there will be Group A and Group B countries accumulating large public surpluses to invest in debt and equity papers issued by Group C countries is a natural outcome of this model. The picture portrayed above works well until one of the following breakpoints are reached: i) certain Group A countries start running low in natural resources; or ii) certain Group C countries start running into a crisis of market confidence. Group B countries are in a slightly more enviable position because manufacturing can always be retooled (despite the costs involved) and there will always be a minimum level of demand for certain manufactured goods. By comparison, the available corrective actions may be relatively limited when natural resources are depleted or when the market no longer has confidence in the valuation of certain types of intangible assets.

2.3 Real-World Challenges

The most common challenges faced by typical Group A countries, especially those in the Middle East, are shortages in intellectual capital and other means of production outside of mineral wealth extraction. The Dubai experience has shown that using massive wealth to buy talents from around the world does not necessarily result in a transfer of skills and knowledge to the local economy. Their policy challenge is to avoid wasteful spending and over-reliance on one or two sectors (such as property) which may eventually grind to a halt when generous financing runs out, as a result of exogenous factors such as the commodity price cycle.

For those export-driven manufacturing economies expecting US dollar-based receipts while importing commodities as raw materials, their practical policy goals are to reinvest US dollar receipts into hard assets such as commodities while capturing knowledge for the creation of value-adding intangible assets, so as to develop other options to acquire such assets other than buying them from foreign countries. The PRC's long-term oil deals with Kazakhstan and the private equity nature of resource-related deals sought by the China-Africa Development Fund are examples of such policies.

As mentioned, the most significant monetary expansionary pressure may come from debtor governments deciding to use the funds raised from the selling of bonds to other central banks to finance massive fiscal deficits. By contrast, when investments are well directed to productive foreign sectors or complementary domestic sectors, and only a relatively modest portion of the total official reserves are used in SWF-like investments, there is no obvious historical evidence suggesting any automatic increase in the risk of developing the Dutch disease.

Ang, Goetzmann, and Schaefer (2009) compiled a detailed analysis based on the historical

return patterns of Norway's SWF, the Norwegian Government Pension Fund—Global—and found limited evidence (if any) that Norway has benefited from any alpha-seeking activities. The fund's returns appear to be driven primarily by asset allocation. This observation is consistent with theories on the overcrowding of "alpha", in that state investors at sizes comparable to the whole market cannot be expected to significantly outperform the market itself. However, later in this paper, we will point out a potential weakness in this argument when applied to SWFs.

In summary, there are only so many alpha-seeking activities that an SWF can meaningfully engage in (either domestically or internationally) without increasing the risk of the Dutch disease. So far, such activities appear to have relatively insignificant impacts on the performances of SWF portfolios. Since SWF returns are primarily driven by asset allocation, the focus of our analysis in the remaining sections will be on the potential impact of taking portions of the money originally intended for the purchase of foreign government bonds by central banks and allocating them to non-government bond markets such as equities, commodities, and real estate.

3. Impact of the Financial Crisis on SWFs

3.1 Impact of the Financial Crisis on Asian Official Reserves

Emerging Asian countries' official reserves come mainly from foreign exchange purchases made by their central banks. Official reserves have quadrupled since the end of the 1997 financial crisis and reached the equivalent of about 5% of global gross domestic product (GDP) (in nominal terms) at the end of 2007 (IMF 2009). This leads to the natural question of whether the aggregate pool of official reserves is proportional to what is required for precautionary purposes. Traditional measures of reserve adequacy include the ratio of reserves to short-term external debts, the reserves-to-M2[6] ratio, and the number of months of imports that reserves can pay for. Using these measures, Park (2008a) argued that Asia's reserves have far exceeded the levels adequate for insurance purposes.

In a separate IMF report, however, Ruiz-Arranz and Zavadjil (2008) suggested the contrary. The authors argued that much of the increase in Asia's foreign reserves can be explained by an optimal insurance model under which the reserves serve as a steady source of liquidity to cushion the impact of sudden changes in capital flows. Their paper shows that the large build-ups of foreign currency reserves in the majority of Asian countries, with the exception of the PRC, is actually not too high and that these countries can benefit from higher reserves in terms of reduced borrowing costs.

During the 1997 financial crisis, Asian countries' foreign currency reserves experienced a sharp decline as shown in Figure 2, below.

[6] M2 refers to money and quasi money that comprise the sum of currency outside banks, demand deposits other than those of the central government. Reserves comprise holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange.

The sharp decline in reserves can be explained by two reasons. First, certain US fixed income securities previously thought to have implied guarantees from the US Government experienced a temporary price shock, however, eventually many of them bounced back as the uncertainty dissipated. Second, the relative strength of the US dollar as a safe-haven currency during this period also created a dramatic markdown of the non-dollar-based assets held by certain central banks.

3.2 Post-Crisis Roles of Asian SWFs

Whether the amount of Asian official reserves is sufficient in thepost-crisis period remains an open question. Moreover, readers should note that only a handful of Asian countries have reserves large enough to invest excess amounts (over and above what is necessary for precautionary purposes) in SWFs, which typically aim for higher returns than government bond yields by investing in "non-risk-free" assets. Finally, many of these SWFs experienced dramatic drawdowns and then subsequent bounce-backs. Some SWFs learned the hard way that there could be heavy political costs when facing massive drawdowns, regardless of whether the drawdowns were within expectations or whether the funds were successful in recovering from the drawdowns.

In the run-up to the financial crisis, a key factor contributing to significant surpluses/deficits in the global balance of payments was inflexible exchange rate policy. The persistent imbalance has in turn allowed certain countries to run unsustainable fiscal policies. The resulting negative feedback cycle may have gone too far and on for too long to allow for effective correction by monetary policies and other relevant forms of policy cooperation. In a way, the very existence of SWFs is a by-product of this seemingly unhealthy phenomenon.

The pragmatic issue at hand is how one can practically get out of this quagmire. In order to make the necessary adjustments to the global balance of payments, there must be a viable alternative to what has effectively been a regime of pegged currencies in Asia. This is particularly true for the PRC. Even a hint of slowing in its purchase of an ever-growing stockpile of US Treasury securities can send Treasury prices tumbling. This situation cannot be sustained forever without a potential debasement of the US dollar, which is hardly in the interests of either the US or the PRC. If it is seen as problematic to even suggest a potential decrease in the total amount of official reserves, perhaps a smarter alternative would be to begin taking some of the excess official reserves (i.e., those above and beyond what is reasonably needed for precautionary purposes) to invest in the growth of certain strategic sectors and to acquire hard assets overseas, rather than letting the stockpile of Western government debts grow in perpetuity. This may mean enlarging the roles of SWFs in managing Asia's excess official reserves.

In the post-crisis era, another key question faced by SWFs is what level of risk is really

manageable and/or hedgeable for any outsized net exporter of capital? How does one maintain the value of assets denominated in currencies that have a potential risk of debasement? Also, is there any practical solution to address the economic, financial, and political implications of massive foreign exchange hedging transactions? If it is not feasible for Asian institutions to rely on operating defensively, then perhaps the practical alternative is for them to operate offensively, by looking for allocation policies that will maximize the possibilities of stimulating global growth and therefore recovery. Ultimately, only when a credible Asian alternative is available can Asian public surpluses be invested in Asian assets instead of Western government bonds as a means of restoring the global balance of payments. This calls for Asian SWFs to play a role in the growth and development of Asian financial markets in general, and of Asian bond markets in particular.

3.3 Potential Reactions from Western Institutions

Is the simple solution of agreeing to a more flexible exchange rate regime a practical one? What are the potential financial consequences for Western governments in dire need of debt financing, if all of a sudden certain effectively pegged Asian currencies are allowed to float? Moreover, saving, or lack thereof, is a social behavior that is unlikely to respond to regulations or government policies alone. Without the growth of net savings to pay off national debts, the imposition of stringent fiscal and tax policies in the midst of a recession is a proven recipe for electoral failure. After all, can Western governments only do so much to encourage savings and investment amongst their greying populations?

There are no hard and fast answers to these difficult policy questions. One thing is certain: to cope in the current environment, Western institutions must go beyond PRC-bashing and better coordinate their policy responses with Asian SWFs. In particular, there is ample recognition within policy circles that Asian SWFs in effect financed the rescues of many Western banking institutions, despite massive political pressures from their domestic populations. Yet, some of the countries represented are notably absent in the G20 post-crisis process and they have enjoyed limited upside benefits from financing rescue packages. Until there is an effective solution to what may be seen as a one-sided situation, there will be negative implications for Western institutions that may have future needs for emergency financing from Asian SWFs.

4. SWFs as Major Investors after the Financial Crisis

In the new global financial landscape, the historical and geographical preference for market liquidity still lingers in the West, while the ultimate concentration of surplus wealth has now shifted toward the East. Such cross-border capital flows create a variety of new market realities for SWFs as major post-crisis investors.

4.1 Size

The massive size of the SWFs creates two issues:

1. Whether there may be too many SWFs and/or they are too big (as a percentage of aggregate official reserves) and thus they create potential for the Dutch disease. Even if the proceeds are invested overseas, today's global business environment means the money will eventually find a way to flow back to Asia. There may also be a need for countries to define the level of official reserves required for precautionary needs, beyond which only the excess should be invested in a SWF.

2. If there are too many SWFs and/or they are too big, eventually the net flow into investable instruments will erode the aggregated returns (the total amount of economic rent that flows from aggregated global economic activities) available to everyone. One may argue that this is not necessarily true, based on the successful track records of large SWFs. Large SWFs, such as the Government of Singapore Investment Corporation (GIC) and Temasek Holdings, have proven to be able to produce returns that are competitive with their smaller counterparts. In addition, there may be a logical inconsistency in automatically assuming that investment inflows by SWFs will drive down the total amount of alpha available to all investors. Their investments are often of such sizes that, if their holdings work out, the returns will lift the entire market, and therefore the typical liquid market benchmark portfolios will benefit as well. So, the real issue here is the appropriate choice of a performance yardstick for SWFs.

4.2 Strategic Agendas and Political Realities

There is significant heterogeneity among SWFs with respect to their investment objectives. As instruments of the state, many of them have strategic agendas that must also bear political realities in mind. Unlike commercial hedge funds or mutual funds, where the investment objective is to seek the best risk-adjusted returns, SWFs serve the nation and support the state economy. Operators must be realistic about the fact that a certain level of drawdowns might lead to a public outcry, or that one or two failed investments may test the limits of public

patience regardless of how successful the fund has been. This has been a particularly sensitive issue for some Asian SWFs since the financial crisis, due to the highly visible initial losses that followed the bailing out of certain Western financial institutions.

4.3 Balance Sheet Characteristics

Compared to commercial institutions, SWFs also have different balance sheet characteristics. For instance, during the financial crisis, SWFs were able to act as a liquidity provider for certain assets sold in distress without regular mark-to-market. Therefore, using the same set of performance measures for SWFs, such as outperformance against traditional liquid market benchmarks, may not be entirely appropriate. In addition, the type of hard assets that make investment sense to SWFs are the ones that facilitate economic growth and generate steady incomes, e.g., long-term commodity contracts, intercontinental rail networks, or mega-sized real estate deals. These investment deals may not have any liquid comparables available to construct performance benchmarks.

4.4 Change in Management Strategies

Since the onset of the financial crisis, the public (in Western societies in particular) has become slightly more open to the idea of state ownership as a means to ensure the stability of the banking system. At the same time, there has been a structural change in fund operations. Before the crisis, there was a trend toward SWFs trying to adopt the operation strategies of commercial funds, essentially trying to mimic the operations of a handful of trillion-dollar-sized fund managers. During the crisis, some SWFs found out the hard way that such strategies might not have fully considered low-probability but high-impact tail events such as the crisis itself. Increasingly, their management thinking and risk management techniques have begun to move away from those of the commercial funds and to focus more on macro issues, systematic risk, and stabilizing roles.

4.5 Regulatory Environment

First, will Western-style, post-crisis regulations, such as the Wall Street Reform and Consumer Protection Act (2009), present threats or opportunities to Asia? The tension around this issue has been most prominently displayed in the recent saga of the new hedge fund regulations proposed by the European Union—determined Asian investors, irritated by "unequal" treatment, are looking to find ways around these proposed regulations. While there are obvious arguments in favor of uniformity in market regulations, tax laws, and accounting frameworks, the more realistic question in any region as diverse as Asia (in terms of differing levels of financial sophistication) is which subset of regulations can be effectively harmonized?

This is not a hypothetical question. Asia will eventually respond to the lack of its own

settlement currency. In the end, it will come up with either a single dominant currency or some form of currency basket. Like the European Monetary Union, the first stop on the Asian path to an eventual monetary union will be a form of economic union, in which there must be some degree of harmonization of financial and economic rules in the region.

Some SWFs still complain that they face too many restrictions on their activities, such as the security review requirements laid down by the US' Committee on Foreign Investment. While many western societies still find foreign state ownership of their companies repulsive, some SWFs are increasingly vocal that they are getting a one-sided deal. However, both the investor and the investee must find a win-win balance if any arrangements are to create long-term mutual benefits. As long as such investments can meet adequate state security protection requirements, and the SWFs primarily act as financial investors, there is no reason to leave any opaque approval processes—which clearly do not help when there is a need to launch emergency rescues—in place. Otherwise, SWFs will be forced to invest only as passive investors or by using "blind trusts".

Finally, researchers must also account for the cultural dimension when answering such policy questions, because there are deep-seated differences in the way Asians define and respond to long-term risk. Patience for accepting long-term risk may have the unintended consequences of creating herd mentality and potential misallocation on a large, systematic scale. In the extreme, Asia's aversion to making structural shifts in response to short-term market fluctuations may spread the "Japan problem" to other Asian countries in decades to come, i.e., where accumulated wealth is not able to supply the goods and services to support a rapidly aging population, partly because of traditional saving and spending patterns.

5. Evaluating Recent Direct Investments made by SWFs in Asia

Since the recent financial crisis, SWFs have emerged as dominant players in the global financial market by injecting large amounts of capital into distressed financial institutions. On one hand, SWFs are large players in the market with the strategic advantage of long investment horizons and no imminent calls for capital. This allows them to sit out longer in market downturns or even to trade against market trends. On the other hand, SWF investments may increase market volatility because of their collective size. In this section, we examine the basic trends in SWF investment before and after the financial crisis. Specifically, we study two aspects of SWF investment: first, we explore the extent to which SWFs act as a stabilizing force in uncertain markets by studying changes in investment styles among the major Asian SWFs before and after the crisis; second, we reevaluate the performance of SWFs by factor attribution. Although any conclusions are only suggestive at this stage, given the preliminary nature of our data, the results raise important questions about major trends in the investment strategies of SWFs.

Previous studies in the small but growing literature on sovereign wealth funds have focused on the price impacts and return performances of SWF investments. Most of the empirical studies have been hampered by the lack of publicly available data. Using a hand-collected sample of 166 SWF investment and divestment transactions from 1990 to 2009, Sun and Hesse (2009) found positive event period returns for SWF investments and little negative impact for their divestments. They thus conclude that there is no evidence of a significant destabilizing effect from SWF investments. Dewenter, Han, and Malatesta (2009) find similar positive announcement returns. We argue that examining the short-term price impacts of SWF investments is an indirect approach to studying their stabilization effects.

5.1 Data

The data used for this study comes from a professional information provider that combines information on sovereign wealth fund investment worldwide. We include the largest ten SWFs in Asia. Among them are Abu Dhabi Investment Authority, SAMA Foreign Holdings, SAFE Investment Company, China Investment Corporation, Government of Singapore Investment Corporation, Kuwait Investment Authority, National Social Security Fund, Temasek Holdings, Qatar Investment Authority, Korea Investment Corporation. We retrieved 1736 direct investment announcements of these funds from January, 1984 to December, 2010.

Table 1 describes the SWFs included in this study and the number of their direct investments in the sample. The two Singapore SWFs, Temasek and GIC, are most active with the greatest number of transactions in the sample. Other newly established SWFs from China and South Korea are also picking up momentum in investment activities. We are also quite pleased by the

fact that the data contains 132 investment transacionts by Abu Dhabi Investment Authority, which is one of the most opaque funds.[7] Table 2 and 3 describe the location of the target firms, with the greatest number of investment taking place in Asia (30.61%), Europe (38.27%) and North American (28.24%), confirming the anecdotal evidence that Asian SWFs have a preference to invest in western developed countries and their home economies. This is also seen from Table 3 in the sense that the United Kingdom (33.37%) and the United States (26.8%) receive the most number of transactions. These two countries account for almost half of the transactions in the database. Table 4 and 5 describe the type and the industry of SWF investment. Most of the transactions in this database are acquisitions of publicly listed equity, comprising 84.1% of the total transactions. One must note that this does not imply that SWFs' investment is mainly in the public equity market.[8] In terms of the target industry, financials (16.65%), industrials (14.06%), real estate (10.14%), consumer discretionary (9.1%) and energy (8.53%) are the top five sectors of SWF investment.

Figure 3 shows the number of SWF investment transactions across years. We see that SWF investment activities increased significantly after year 2007, both in terms of the number of investment transactions and the investment amount as illustrated in Figure 4.

We also observe a noticeable increase in the direct investments of SWFs in the financial sector over the years (Figure 5), confirming the fact that during the financial crisis distressed financial institutions sought help and received capital injections from large Asian sovereign wealth funds. We observe a shift in investment activities from the energy and real estate sectors to the financial sector (Figures 6 and 7).

Are sovereign wealth funds are big deal? Partial answer to this can be provided by looking at the ownership of the firms they invest in. Anecdotal evidence suggests that SWFs are often dominant shareholders and have large bargaining power in major corporate decisions. Our data adds evidence to this observation. Table 6 shows the average percentage of shares acquired in SWF investment transactions and the average percentage of shares they own post transaction. We see that for an average transaction, SWFs acquire at least 2-3% of the target firms. Some SWFs, mostly from Middle East countries such as Abu Dhabi and Qatar, acquire as much as 50% in an average transaction. The two Singapore funds – GIC (16.99%) and Temasek (20.96%), also take large positions in their investment.

We also wish to analyze the SWFs' direct investment in domestic versus foreign markets. Previous studies have identified major differences in the investment strategies of Asian SWFs when compared to funds from other parts of the world. When studying the direct investments made by the major SWFs between 1984 and 2007, Bernstein, Lerner, and Schoar (2009) found that 75.7% of Asian funds' direct investments were within Asia, with 37.4% of investments

[7] Abu Dhabi Investment Authority receives a score of 3 out of 10 for the Linaburg Maduell transparency index.

[8] Bernstein, Lerner and Schoar (2009) study SWF investments in the venture capital and private equity market and identify 2662 transactions from 1984 to 2009 by 29 SWFs around the world.

being made in the home nation of the fund. In contrast, Middle Eastern funds invested mostly in other regions, such as in Europe, North America, and Australia, with only 9.0% of investments being made in their home countries.[9] Western SWFs, which are much smaller in general than the Middle Eastern funds, invest mostly in the West, with 94% of investment occurring in the home country.

Our findings are somewhat different from those in Bernstein, Lerner and Schoar (2009) that focus on the private equity market. Table 6 shows that the majority of Asian SWF investments are cross-border acquisitions.[10] The investments, however, follow an interesting pattern. Middle East countries, such as Abu Dhabi, Kuwait and Qatar, have a tendency to invest mainly in European countries, whereas East Asian countries, such as China and Korea, invest heavily in North America. The two Singapore funds, invest most in Asia than other funds in the sample, with GIC investing more in Europe and Temasek concentrating on North America. This observation is inline with the predictions of the Lee (2006) model as elaborated in Section 2.2.

The capital flows of major SWFs undoubtedly have major implications for the regional economy in which the funds invest. Funds that invest heavily in the domestic economy may be more sensitive to the social needs of the nation. Whether this regional investment pattern has changed and, if so, how the changes correlate with overall market uncertainty and global political economy remain interesting and important questions.

5.2 Evidence: Direct Investments in Periods under Different Market Regimes

This empirical analysis assesses how these large Asian SWFs react to different market regimes. Before the financial crisis, SWFs were often viewed as a threat to global financial stability. These fears seem both exaggerated and somewhat unjustified, especially since SWFs have recently injected large amounts of capital into distressed financial institutions. As argued in the previous sections, such rescuing acts can also be thought of as natural hedges for these mega-sized SWFs. As a preliminary analysis, we use the Chicago Board Options Exchange (CBOE) Volatility Index (VIX) as a measure of market uncertainty and examine the timing of SWF investments under different market conditions. We find that the correlation between the number of SWF investments and the VIX index (Figure 10) is 40% during the pre-crisis period (January 2005 to August 2008) and –19% during the crisis period (September 2008 to December 2009).

[9] Many SWFs are not supposed to invest in assets located in their own countries by mandate, but such restrictions are increasingly problematic as businesses are increasingly global in nature. Total isolation is neither practical nor feasible. In addition, some SWFs have origins as investment vehicles holding stated-owned companies. While some degree of diversification is often seen as desirable, for strategic reasons they are expected to maintain a certain level of state ownership in those domestic companies.

[10] China's National Social Security Fund, however, invests solely in the domestic market and is a notable exception.

Understanding the long-term price impacts and macroeconomic implications would require a much more comprehensive study with a broader set of data on stock returns, transaction volumes, exchange rates, and capital inflows. Although it is hard to draw firm conclusions for overall global and regional financial stability based on our sample of 126investment transactions, we find some evidence that the SWFs may have changed investment styles before and after the crisis. However, we have found limited objective evidence that these SWFs provide global financial stability in periods of high market uncertainty, especially during the recent crisis. This is not to suggest that SWFs have not contributed to global financial stability when compared to the proverbial alternative of "doing nothing"—we are simply stating that no objective evidence has been found based on analysis of the available data, given the lack of objective data available on the alternative scenario of "doing nothing."

5.3 Evidence: Performance and Factor Attributions

As argued in Park (2008b), the risks and returns of SWFs may have large repercussions for a state's economic stability. SWFs are set up by governments to seek excess returns for the nation's foreign reserve surpluses, some of which originate from foreign exchange market interventions by central banks. Such interventions often result in the central banks' borrowing foreign currencies from the commercial banking system. If these investments go sour, commercial banks may also suffer the consequences. In this way, according to Park, the performance of SWFs becomes an important source of regional financial stability.

We are not in perfect agreement with Park's logic, but his policy insights seem generally valid. In the next section, we wish to evaluate the performance of the investments of Asian SWFs before and after the crisis. Furthermore, we investigate whether SWFs can be seen to withdraw their investments from more liquid markets, such as the equity market, and shift their investments to alternative markets in periods of high market uncertainty.

6. Preliminary Statements on Possible "Alpha Overcrowding," Leading to Rethinking of the Performance Objectives of SWFs

In a liquid and active marketplace for publicly traded securities, potential gains from fundamental research or speculative profits are easily competed away by a large number of investors. Long-term mandates and an absence of current cash liabilities allow SWFs to focus on alternative asset classes with long verification horizons. Furthermore, as pointed out in Shleifer and Vishny (1997), markets may stay irrational longer than an investor can stay solvent due to various limits to arbitrage. This also gives SWFs a strategic benefit over smaller investors who cannot afford to sit through market downturns.

The large size of the funds is another advantage which provides economies of scale, the ability to actively influence corporate management, and greater bargaining power. Indeed, Dewenter, Han, and Malatesta (2009) find that SWFs adopt an active role in their target firms. In addition, some argue that the management of SWFs comes with a stronger public service ethos which helps to mitigate the agency problems that usually challenge delegated investment management. All these comparative advantages of SWFs provide a basis for the potential development of strategies that could contribute to fund performance.

Indeed, the outstanding track record of the two most successful SWFs from Singapore, the GIC and Temasek Holdings—the market value of Temasek grew by 18% on an annual compounding basis between 1974 and 2006—led many other Asian countries to set up their own SWFs. Existing evidence on the overall performances of SWFs, however, is rather disappointing. Recent studies show essentially zero or negative long-run performances of SWF investments (Bortolotti, Fotak, Megginson, and Miracky 2008; Kotter and Lel 2010; Dewenter, Han and Malatesta 2009). In a report on the performance evaluation of the Norwegian Government Pension Fund, Ang, Goetzmann, and Schaefer (2009) also concluded that active portfolio management had played a very small role in the fund's performance to date. Much of the fund's returns came from exposures to risk factors.

Given the multiple strategic benefits of SWFs, what is driving what seems to be the long-term underperformance of certain SWF investments? If the Efficient Market Hypothesis holds, security prices reflect all the information about their fundamentals. Active management, therefore, has little potential to add to the value of the fund. It is impossible for any investor to beat the market. Over the years, researchers have identified various market frictions that limit market efficiency, such as trading constraints, information costs, agency problems, and capital restrictions. Existing empirical evidence, however, shows that it is rare for an active manager to consistently deliver excess risk-adjusted returns.

The Efficient Market Hypothesis has focused on whether security prices will deviate from their

fundamental economic values. An equally important question from an investor's perspective is whether, if the market is not perfectly efficient, active management can take advantage of this inefficiency. This question is referred to as the "agency problem" as proposed by Ross (1973): in a principal(investor)-agent(manager) setting, which incentive structures will result in the principal sharing a meaningful portion of the agent's gains? This is a common challenge faced by delegated investment management. In the case of SWFs, these funds are state-owned institutions which will be backed by their respective governments in the event of unfavorable contingencies. This may create a moral hazard problem in the sense that the fund may take unduly high risks in pursuit of high returns, under the assumption that the government will always bail them out when things go wrong. Such a moral hazard problem, along with inadequate risk management, can result in excessive risk-taking behavior. One often-cited example (which may or may not be the result of inadequate risk management) is the US$3 billion investment by the China Investment Corporation in Blackstone in May 2007, which eventually lost 70% of its value. Along the same lines, Le Borgnes and Medas (2008) studied the performances of SWFs in the Pacific Island countries and suggested that weak public financial management systems, lack of spending controls, and, in some cases, rigid operational rules may explain the poor performances of these funds in achieving their investment goals.

6.1 Berk-Green Alpha as Applied to the Sovereign Wealth Management Context

Aside from agency costs, moral hazards, and other frictions in organizational structures, a highly influential paper by Berk and Green (2004) argued that in an economy with rational, profit-maximizing investors, active management does not deliver excess returns, even by a skilled manager who may initially generate superior returns. Their model allows for some managers to have greater talents and be better managers than others. These managers are rewarded for information production and keep economic rents for their skills. However, small investors compete away all the excess returns. In equilibrium, any gains from active management do not flow to the investors.

One underlying assumption behind this theory is that the managers are limited by investment technology that has diminishing returns to scale: the managerial ability to generate excess returns cannot be effectively employed at an arbitrarily large scale. When the amount of money under management reaches a certain size, additional flows to the fund reduce the expected return of the overall portfolio. Such an assumption is consistent with the observed decentralization of the professional money management industry. In fact, institutions are known to divest from investment managers in order to avoid "concentration risk" even when the underlying investments are individual funds that are separate legal entities.

Using a comprehensive set of hedge fund data over a ten-year period (January 1995 to December 2004), Fung, Hsieh, Naik, and Ramadorai (2008) found no detectable alphas in the sample period. In addition, they found that capital inflows to a fund led to lower alpha, and lower alpha persistence, which is consistent with Berk and Green's (2004) prediction. The

findings by Fung, Hsieh, Naik, and Ramadorai (2008) were particularly striking in light of the fact that the estimated net alpha to the investor was getting visibly smaller at the same time as the hedge fund industry was going through an explosive growth period. This gives some empirical credibility to the general idea that there may be a finite amount of alpha available to all investors. The fact that investors of the size of SWFs are dabbling in hedge funds, particularly the trading-oriented ones, may create a no-win situation for all investors (Lee 2010). This theory has important implications regarding the size of SWFs. Do the massive volumes of assets under management eliminate the potential gains to be made from active management? Will optimal asset allocation solve this problem?

6.2 The Case of Temasek Holdings

To partially answer the questions posed above, we have constructed a test case by analyzing the performance of Temasek Holdings. The performance graph shown in Figure 12 is taken from information made public by Temasek Holdings in its 2010 Annual Report.[11]

Temasek is known to have a set of internal allocation targets based on a combination of 40% in Asia (excluding Japan and Singapore), 30% in Singapore, 20% in Organisation for Economic Co-operation and Development (OECD) economies, and 10% in the rest of the world, with a focus on Latin America and Africa. Based on these internal targets, we used a basket of liquid-market proxies, as shown in Table 7, to construct a benchmark performance time series. Latin America and Africa are considered to be primarily a resource “play," thus we feel that the most appropriate liquid-market proxy in such a case would be the Goldman Sachs Commodity Index (GSCI). In addition, we further optimize the asset allocation of the composite benchmarks using a commercial optimizer, based on the two schemes as described in Lee (2006) and Lee, Rogal, and Weinberger (2010), using an allocation range of 0% to 40%. These approaches are consistent with the typical asset allocation methodologies used by long-term investors to manage real-life multi-asset portfolios. The resulting optimized allocations, as shown in Table 8, are found to show superior return-to-drawdown characteristics. Figure 13 is constructed to further compare the performance based on the balance sheet values of Temasek (published in its Annual Report) with these synthetic benchmarks. We believe that balance sheet values give a reasonably accurate picture of Temasek's net asset values (NAVs) in a manner consistent with the typical NAV reporting done by any commercial institutional asset manager, such as a hedge fund. All performance figures are scaled to 100 at the end of March 2005, which coincides with the fiscal year end of Temasek Holdings.

Some interesting observations from Figure 13 include:

1. **Prior to 2008**—There is almost no observable alpha in Temasek's portfolio before the dramatic events of 2008.
2. **Gains in 2008**—Since our analysis was based on a straightforward currency translation

[11] Available from http://www.temasekreport.com/2010/documents/full_annual_report2010.pdf

without any currency hedging, and Temasek's portfolio was likely to have some degree of currency hedging, the gains in 2008 may be partially due to Temasek gaining from currency hedging after the significant strengthening of the Singapore dollar.

3. **Drawdown in 2009**—Notice that Temasek's drawdown is significantly milder than its synthetic benchmarks based on liquid-market proxies. However, a meaningful portion of Temasek's portfolio is private, and Temasek's fiscal-year-end results were not released until August of 2009, by which time the markets had experienced a meaningful recovery. It is certainly not unheard of for privately-held investments to report retroactive valuations to reflect improved market sentiments, although such a practice may not necessarily be reflected in this case. We are simply posing a fair question based on common market practice.

4. **Rebounds in 2010**—Notice how the public markets did not recover their full losses from the end of March in 2008 to the end of March in 2010, while Temasek did. It would be interesting to further attribute the superior performance of Temasek to: i) currency gains; ii) any possible “cushioning" in valuations by privately-held investments; or iii) superior alpha selection.

6.3 In Search of Appropriate Performance Measures for SWFs

In light of the facts and analysis above it seems puzzling that, with all the comparative advantages of SWFs over other investors in the market, there is no significant evidence that SWFs deliver positive long-run overperformance. Although there are potential drawbacks to each of the distinctive features of these government-owned funds, we feel that one problem may lie in not having the right set of performance measures to evaluate the unique nature and purpose of SWF investments.

SWFs are set up to serve a nation by preserving wealth across generations. Compared to commercially-delegated investment institutions, whose only purpose is to seek the highest available financial returns for their investors, SWFs generally have to operate according to a slightly different political agenda that provides strategic benefits to the nation's economy. These investments by all means serve the funds' only investors—the people of the nation—however, the financial profits that come along with these strategic benefits may not be apparent in a short-term horizon, over which most of the existing performance evaluation methodologies are applied. While the potential long-run financial benefits of these strategic investments are hard to measure, at the minimum any short-term performance measures should not penalize SWFs for meeting these longer-term strategic objectives. In particular, the long-horizon nature of SWF investments should be taken into special consideration for fund managers' performance evaluations. Otherwise, the finite tenure of fund managers and endowment monitors will only encourage significant short-term risk-averse behaviors, which may erode the strategic benefits of being able to invest with long-term horizons. Such problems should be properly addressed when searching for suitable performance evaluation measures for fund managers responsible for SWF investments.

From a pure financial economics perspective, the massive size of SWF investments creates another challenge for performance evaluation of “active” management. “Active” management can be measured by the difference between the returns on a fund and the returns on the benchmark portfolio. If the fund manager passively invests according to the benchmark, the “active return” of the fund would be zero. Traditional performance measures are benchmarked against the market of liquid securities. During the financial crisis, these systematic factors, which explain a significant component of performance, fared very poorly. In addition, the massive size of SWF investments may have a large price impact on these benchmark measures.

For these reasons, the authors propose the following set of principles to construct a fair performance benchmark for SWFs:

1. Discourage SWFs from simply piling into equities or any other “vogue" investments;
2. Encourage “alpha" investments that can promote national economic development;
3. Encourage investments in sectors complementary to national balance sheets to create natural diversification effects;
4. Discourage domination of benchmark setting by countries with large public reserves (e.g., the PRC), as this may lead countries with smaller public reserves to feel that such a benchmark is irrelevant to their needs; and
5. Base measures on reasonably liquid assets with regular mark-to-market values.

One possible approach is to create a peer benchmark by value-weighing the asset allocations of all major SWFs. SWFs smaller than, say, US$100 billion in net asset values will be rescaled to US$100 billion to ensure that they are given a meaningful minimum weight. In each asset class, a fixed number (e.g., 100) of “investable" assets that are most heavily invested in by SWFs will be selected to represent the performance of that asset class. Doing so will construct a peer performance index that satisfies most if not all of the conditions stated above.

7. Executive Summary and Policy Recommendations

In theory, every country in the world can print a certain amount of domestic currency and exchange it for foreign currencies in order to build up an official reserve. Such pools can be used by each central bank to facilitate more efficient settlements of day-to-day cross-border transactions.

As long as these pools of official reserves are kept away from general circulation in the real economy—in the past official reserves were usually invested only in government bonds—the act of printing money to create such pools should have limited inflationary impacts on domestic economies when governments are simply holding each other's bonds.

The picture portrayed above is distorted in today's world because: i) some debtor governments have decided to use the money raised from the selling of bonds to other central banks to finance massive fiscal deficits; ii) the net-saver countries may also decide to use their reserves to invest in tangible assets instead of holding government bonds; and iii) one key "saver" region in the world has yet to offer a credible anchor currency that central banks from other regions can hold as a store of value. This combination results in monetary expansion in the real economy. Massive public surpluses among Asian countries have allowed certain governments to run unsustainable fiscal deficits and, realistically, this situation cannot be improved upon overnight. In fact, it could be problematic to even suggest a potential slowdown in the purchase of certain Western government debts.

Accordingly, our policy recommendations in response to the evolving roles of Asian sovereign wealth funds (SWFs) in the post-crisis world are:

1. **There may be a certain optimal size for each SWF**—Asian SWFs present a smart means through which a portion of a state's excess official reserves (i.e., above and beyond what is reasonably needed for precautionary purposes) can be used to invest in growth in certain strategic sectors and to acquire hard assets overseas, instead of letting the stockpile of Western government debts grow in perpetuity. However, there is a real risk of the Dutch disease if SWFs are allowed to grow too big, especially since "ring-fencing" domestic investments[12] may be impractical in today's global business environment.

2. **Focus on asset allocation, not alpha**—A recent study based on the historical return patterns of the Norwegian sovereign wealth fund found limited evidence (if any) that Norway had benefited from any alpha-seeking activities. The fund's returns appear to be driven

[12] This refers to the investment practice of avoiding all domestic investments. In today's global business environment, doing so may be impractical because an investment entity may still be exposed to domestic activities by multinational company with many different global operation centers.

primarily by asset allocation. This observation is consistent with theories and evidence on the overcrowding of “alpha,” in that state investors at sizes that represent significant portions of the entire market cannot be expected to significantly outperform the market itself.

3. **Focus on sectors complementary to national balance sheets**—Many Asian countries are manufacturing powerhouses that are naturally “short” resources and “long” the global trade settlement currency (as a result of producing and selling their manufacturing goods). Their appropriate diversification policy, from a national balance sheet perspective, is to buy resources as well as intangible assets. Until certain market breakpoints are reached, it is a natural outcome for resource-rich countries and manufacturing powerhouses to accumulate large public surpluses and to invest them in debt and equity papers issued by developed economies.

4. **Manage drawdown from the long side of the balance sheet**—In theory, SWFs are large players in the market with the strategic advantage of long investment horizons and no imminent calls for capital. This allows them to sit out longer in market downturns, or even to trade against market trends. In practice, some SWFs learned the hard way that there could be heavy political costs when facing massive drawdowns, regardless of whether the drawdowns were within expectations, and regardless of whether the funds were successful in recovering from the drawdowns. SWFs also cannot engage in typical trading-oriented hedging activities because the notional amounts that they would be required to take short positions in might be large enough to crash the market. Therefore, SWFs must focus on managing their potential drawdowns from the long side of their balance sheets.

5. **Define SWFs' de facto role as global lender of last resort**—One pragmatic hedging technique that can be pursued by an SWF is to act as the global lender of last resort, in order to avoid any potential collapse of the global economy. There are practical advantages in defining such roles for Asian official institutions, as well as the potential responsibilities and obligations involved. Certain basic criteria must be met before launching any rescue—unlike the International Monetary Fund (IMF) Executive Board, a collection of independent Asian official institutions may not all agree on how best to make certain difficult choices between moral hazards and long-term economic malaise. Also, SWFs must see some potential upside benefits from financing rescue packages before they will agree to finance future rescue packages for Western institutions.

6. **Develop suitable performance measures**—Traditional performance measures based on outperformance relative to a global market benchmark often fail to consider the following: the size of investments that may have significant market impacts, flexibility to invest in illiquid assets, long-term investment horizons, and diversification/strategic benefits to the overall state economy. There is a need to reconcile the long-term nature of SWF investments against certain existing liquid market benchmarks, which cater to the shorter-term horizons of commercial fund managers’ performance evaluations and career concerns.

7. **Develop a credible Asian asset market**—Ultimately, only when a credible Asian alternative is available can Asian public surpluses be invested in Asian assets instead of Western

government bonds, and in this way possibly restore the global balance of payments. This calls for Asian SWFs to play a leading role in the growth and development of Asian financial markets in general, and Asian bond markets in particular.

8. **Coordinate the relevant post-crisis regulatory responses**—To succeed in the current environment, Western institutions must go beyond PRC-bashing and better coordinate their policy responses with Asian SWFs. Western-style, post-crisis regulations can present both threats and opportunities to Asia. This tension is most prominently displayed in the recent saga regarding the new hedge fund regulations proposed by the European Union, wherein determined Asian investors, irritated by "unfair" treatments, are searching for ways to work around the proposed EU regulations. While there are obvious arguments in favor of uniformity in market regulations, tax laws, and accounting frameworks, the more realistic question in any region as diverse as Asia (in terms of differing levels of financial sophistication) is which subset of regulations can be effectively harmonized.

9. **Increase transparency of security regulations that restrict state investments**—Some SWFs still complain that they face too many restrictions arising from vaguely worded security regulations. While many western societies still find foreign state ownership of their companies repulsive, some SWFs are increasingly vocal that they are getting one-sided deals. As long as such investments can meet adequate state security protection requirements and the SWFs primarily act as financial investors, there is no reason to leave any opaque approval processes in place. These also clearly do not help when there is a need to launch emergency rescues.

10. **Foster the public's better understanding of the important roles played by SWFs**—It is often impossible for any rescuer to time their intervention at the precise bottom of a collapsing market, so the post-rescue market volatility often leads to a public outcry regarding the "misuse" of public coffers by the rescuer, however well-intended their initial actions may have been.. These misperceptions limit SWFs' freedom to act decisively during crises, and they could be partially corrected by educating the public about the important stabilizing roles played by SWFs.

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Figure 1: Lee (2006) Model of Country Types in the Global Economy

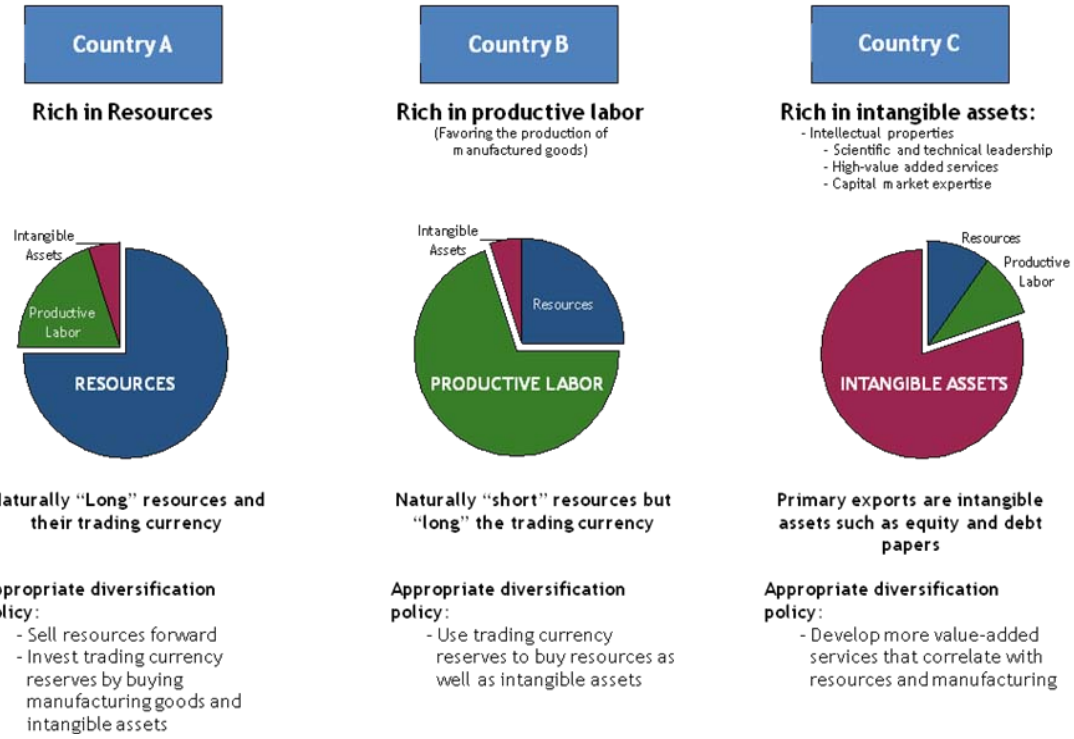

Figure 2: Changes in Emerging Asia's Foreign Exchange Reserves, Jan 2007–Mar 2009
(year-on-year percentage change)

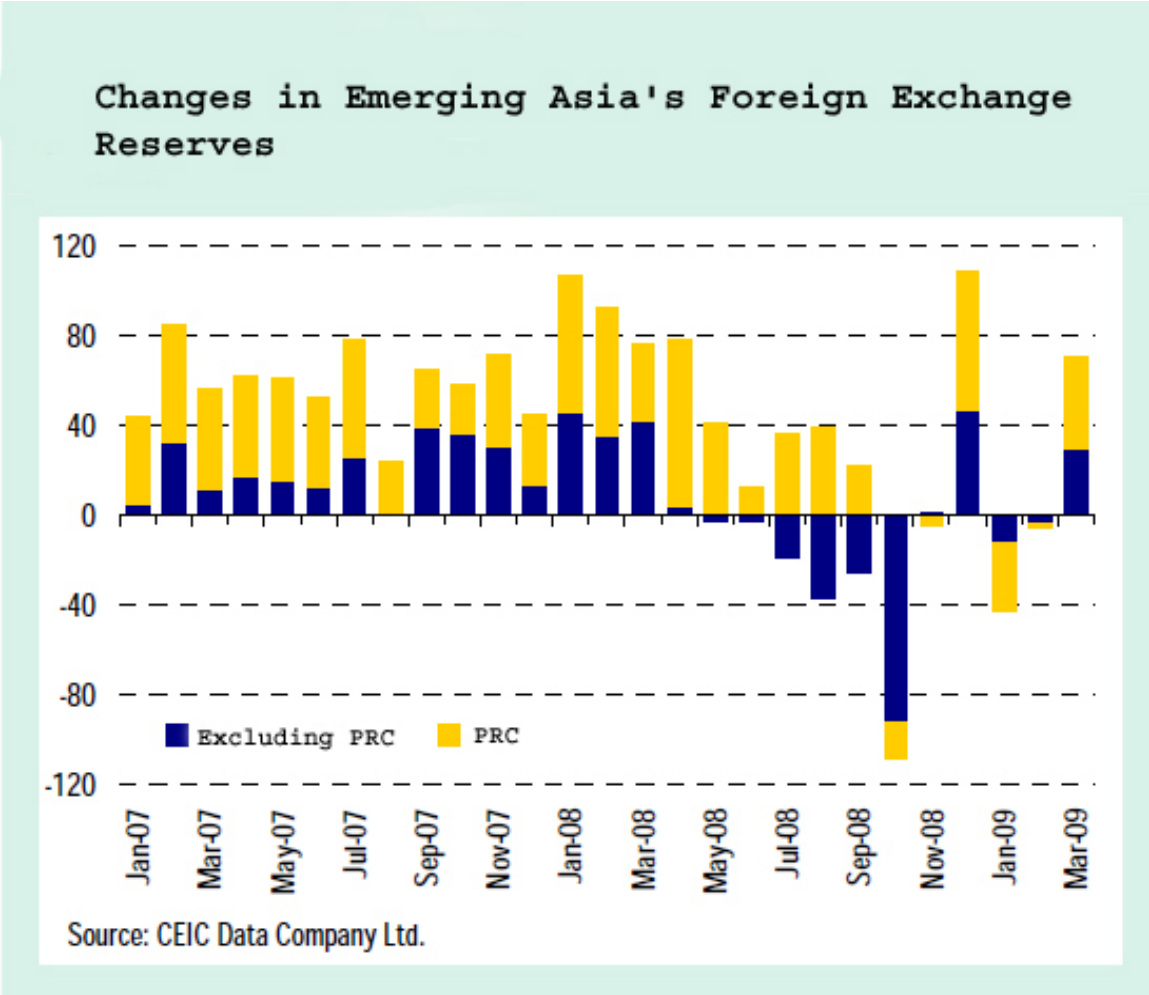

Figure 3: Total number of SWF investments across years

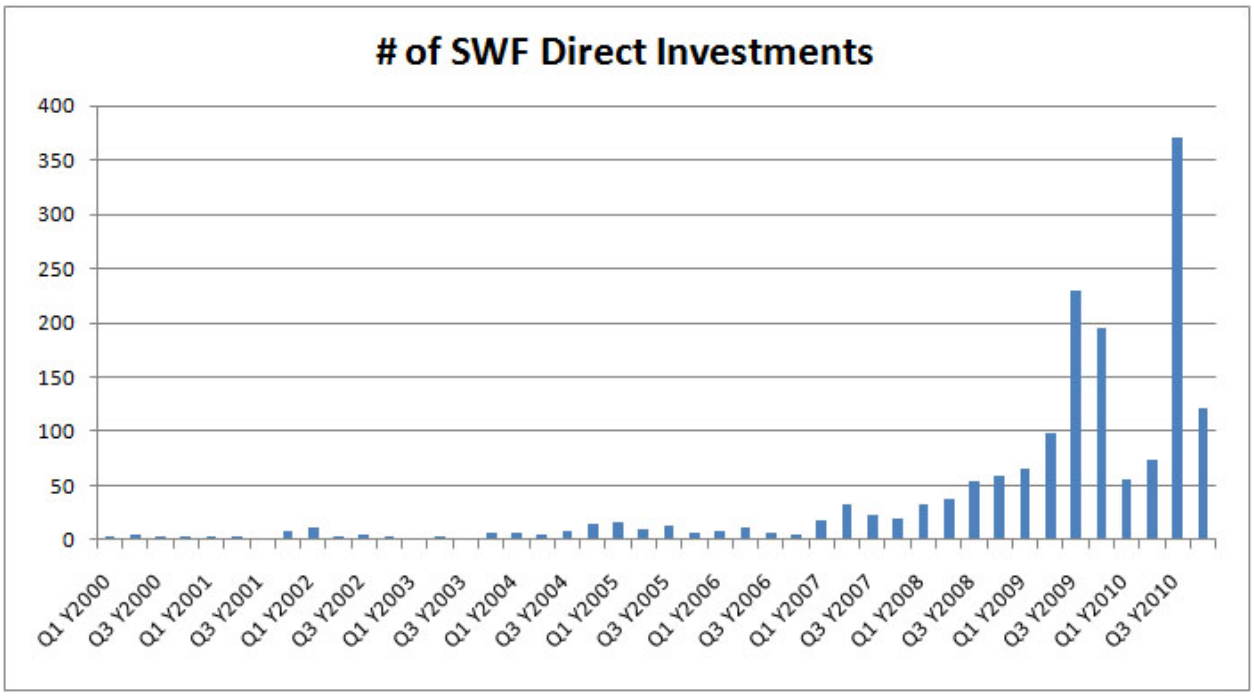

Figure 4: Total SWF investment in USD billions

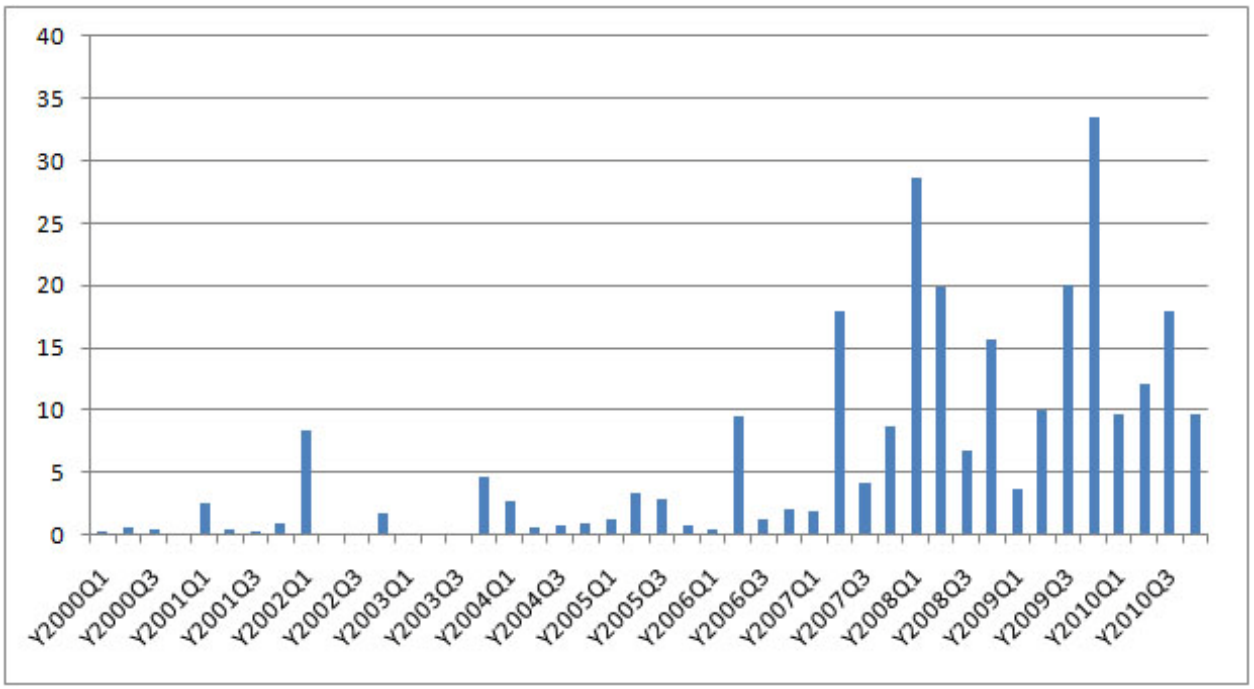

Figure 5: SWF investment in the financial sectors in USD billions

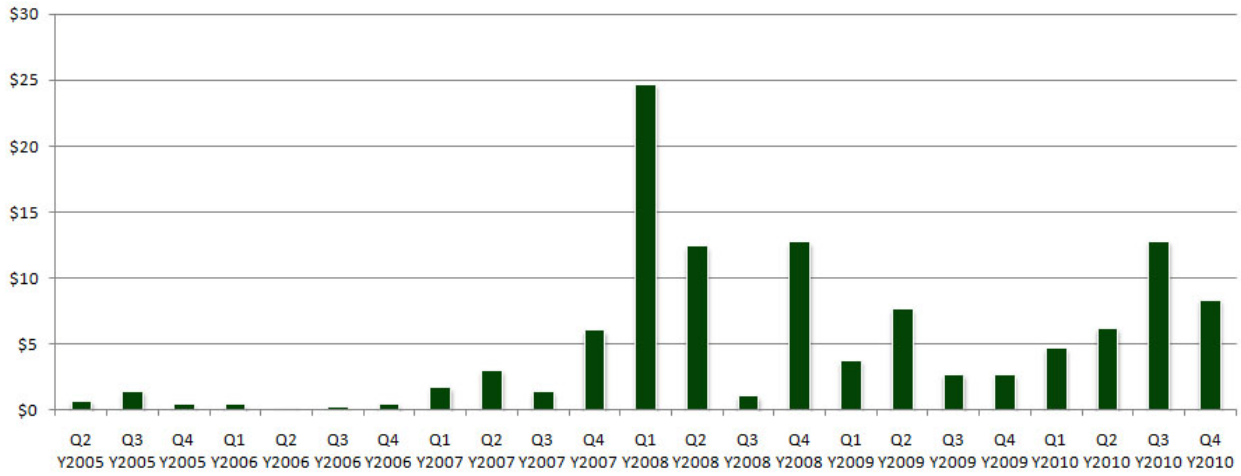

Figure 6: SWF investment in the energy sectors in USD billions

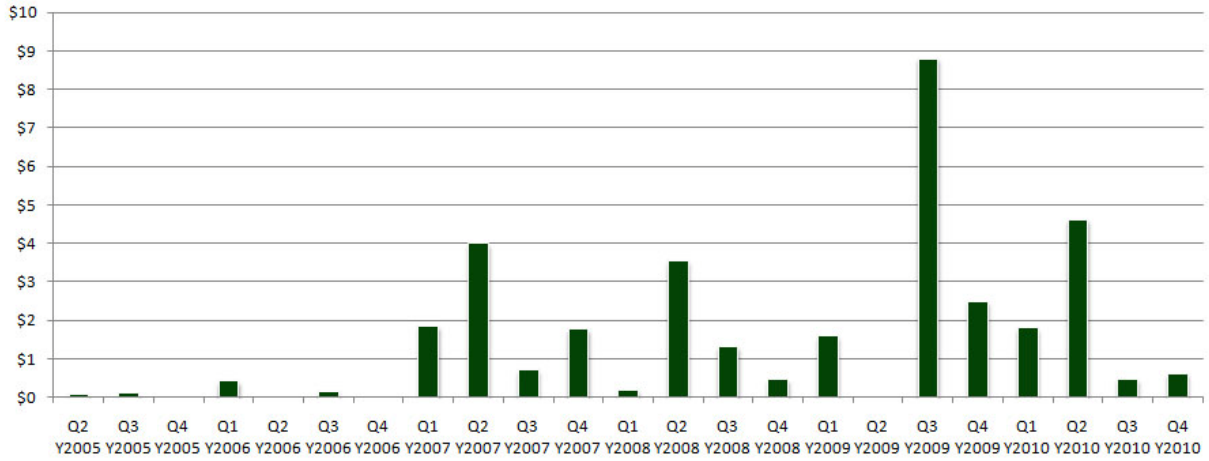

Figure 7: SWF Investments in real estate in USD billions

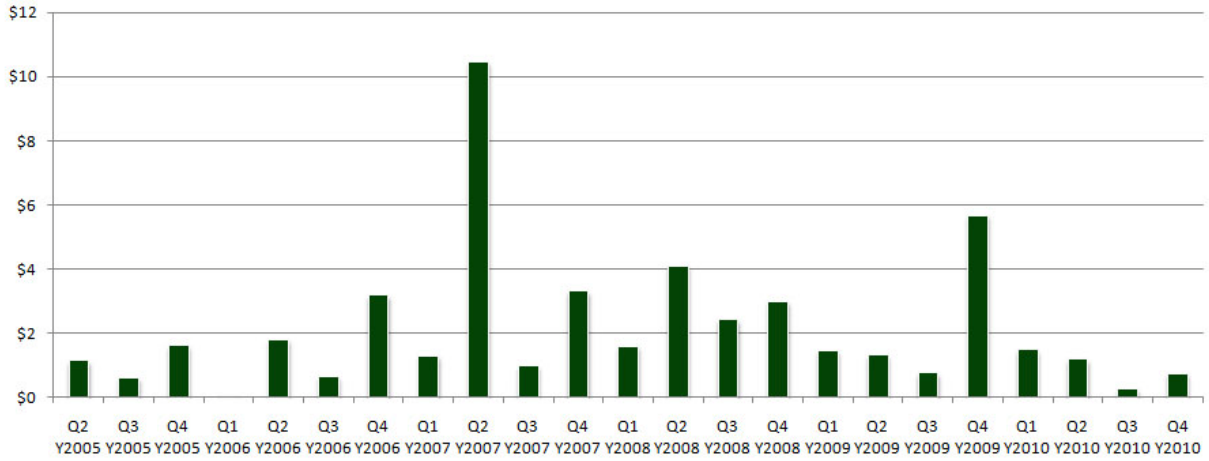

Figure 8: SWF investments in the domestic and foreign markets in USD billions

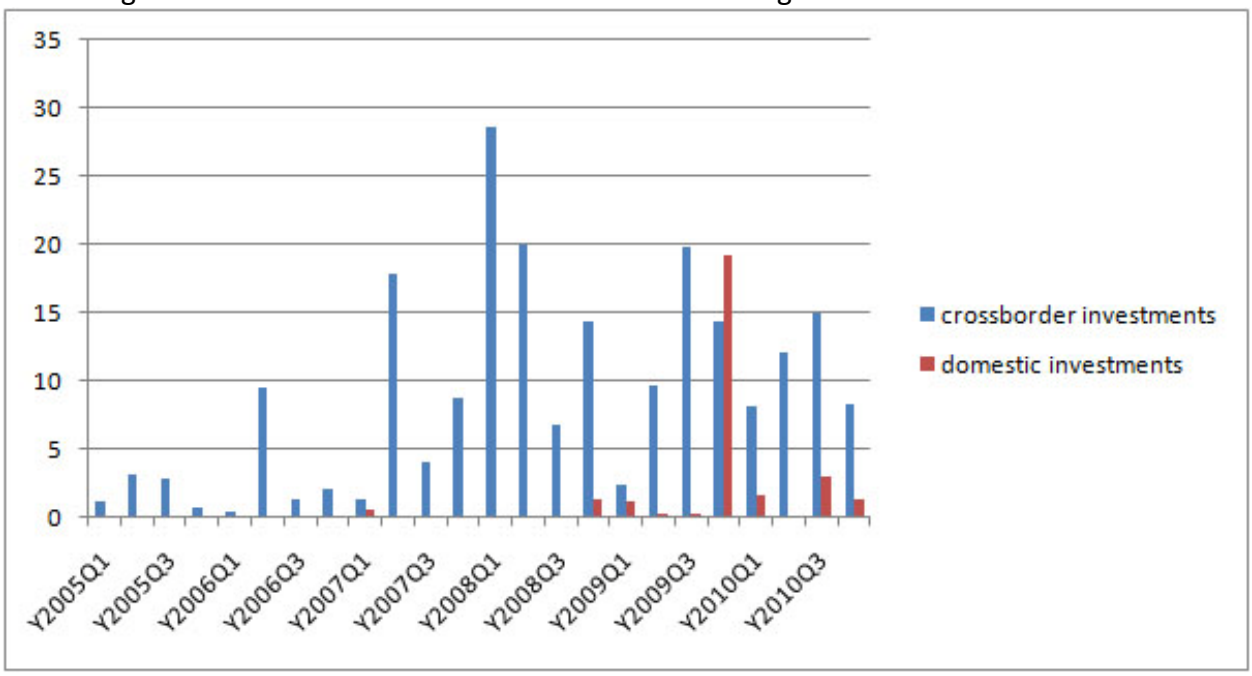

Figure 9: Number of SWF investment transactions in the domestic and foreign markets

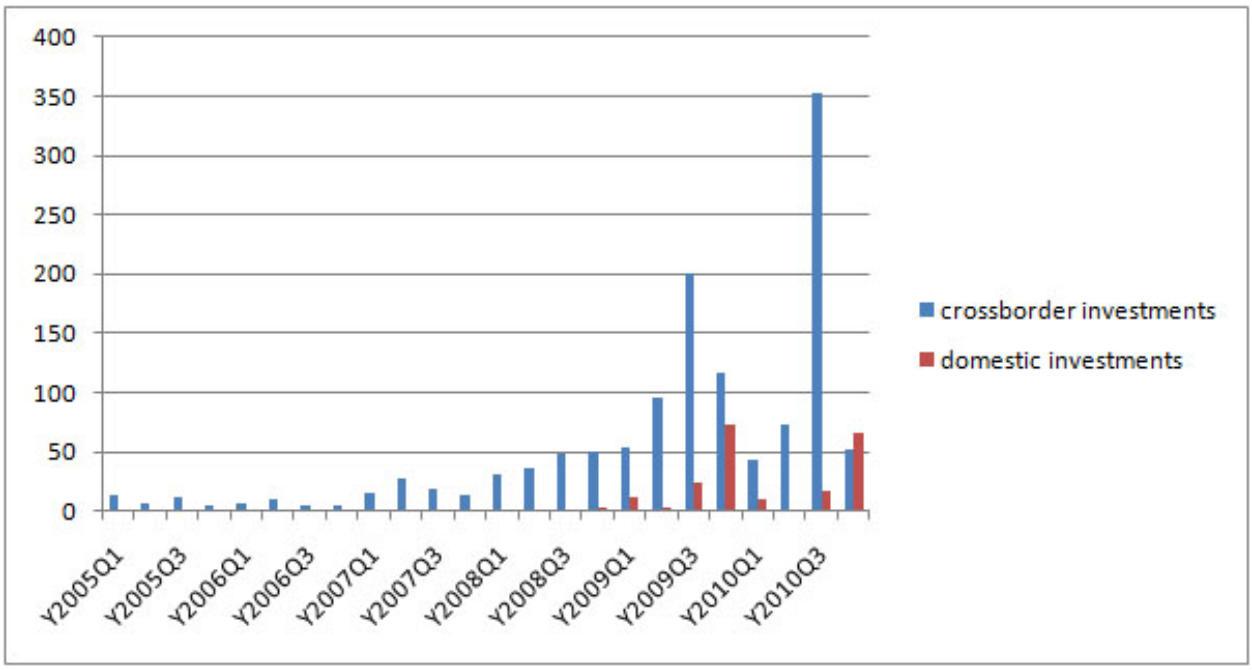

Figure 10: SWF Investments and the VIX Index

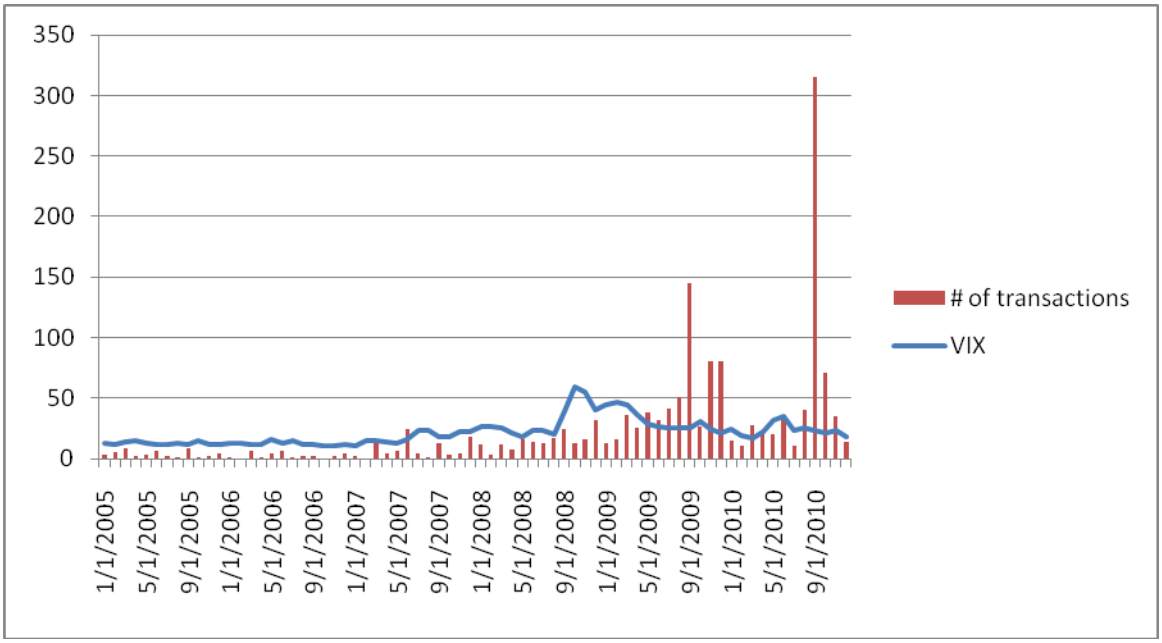

Figure 11: SWF total investment in USD billion and the VIX index

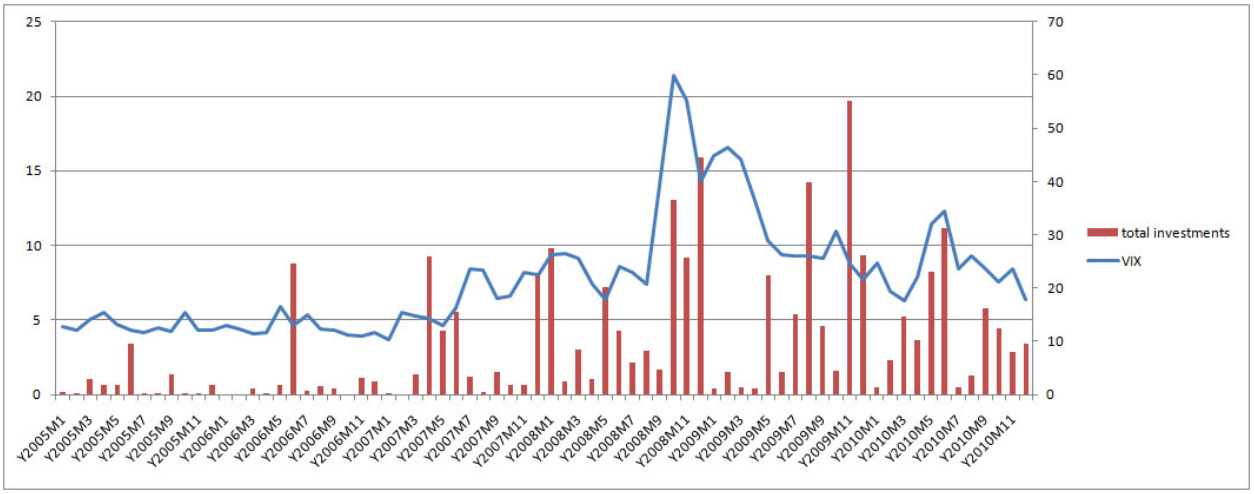

Figure 12: Temasek's Portfolio Value as published in Temasek Holdings' 2010 Annual Report (Available from http://www.temasekreport.com/2010/portfolio/inception.html)

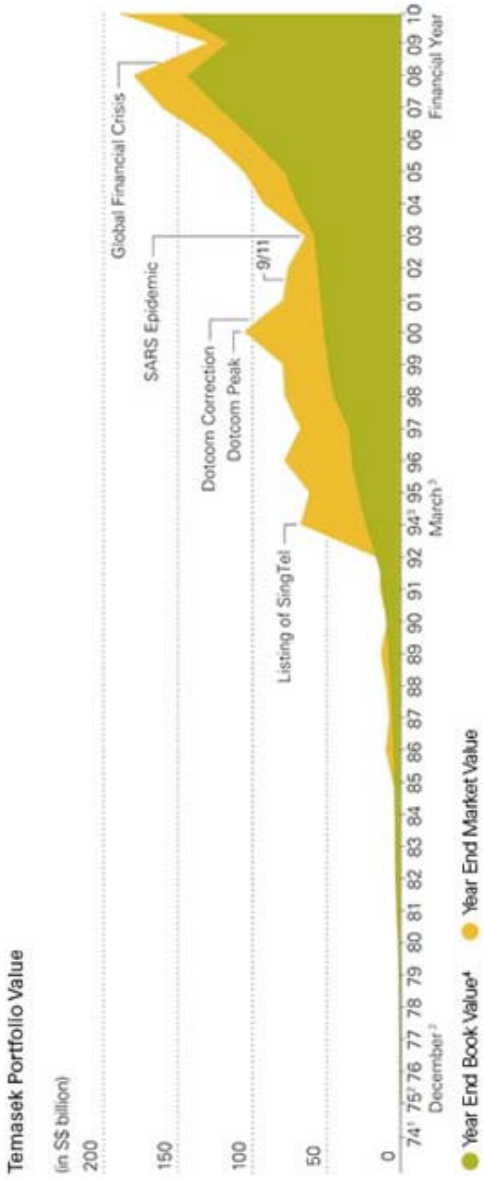

Figure 13: Temasek Holdings' Balance Sheet Values Relative to Synthetic Benchmarks, Mar 2005–Sep 2010
(US$, assuming no currency hedging)

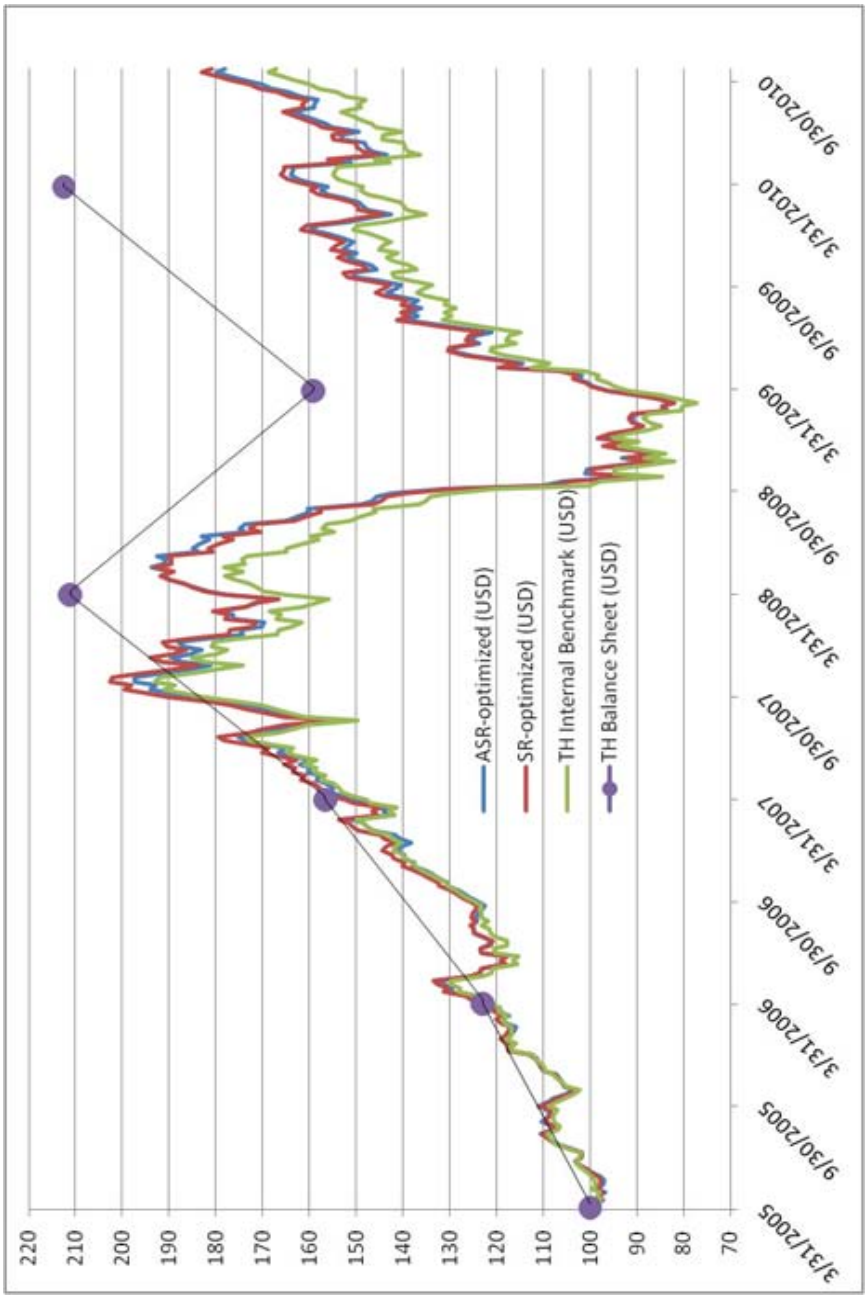

Table 1: Sovereign wealth funds in the study

Country	Sovereign Wealth Fund	Inception	Funding Source	Funding Level (US$ billion)	Number of observed transactions
UAE-Abu Dhabi	Abu Dhabi Investment Authority	1976	Oil	$627	132
UAE-Saudi Arabia	SAMA Foreign Holdings	n/a	Oil	$439.1	39
PRC	SAFE Investment Company	1997	Non-Commodity	$347.1	66
PRC	China Investment Corp.	2007	Non-Commodity	$288.8	84
Singapore	Govn't of Singapore Investment Corp.	1981	Non-Commodity	$247.5	369
Kuwait	Kuwait Investment Authority	1953	Oil	$202.8	262
PRC	National Social Security Fund	2000	Non-Commodity	$146.5	162
Singapore	Temasek Holdings	1974	Non-Commodity	$133	292
Qatar	Qatar Investment	2005	Oil	$65	57
South Korea	Korea Investment Corporation	2005	Non-Commodity	$37	263

PRC = People's Republic of China

Table 2: Distribution of the target firm location

Target firm location	# of transactions	Percent
Africa	11	0.63%
Asia	531	30.61%
Europe	664	38.27%
North America	490	28.24%
Oceania	28	1.61%
South America	11	0.63%

Table 3: Top 10 countries of target firms

Target country	# of transactions	Percent
United Kingdom	579	33.37%
United States	465	26.8%
China	222	12.8%
Singapore	87	5.01%
Taiwan	53	3.05%
India	51	2.94%
Malaysia	38	2.19%
Australia	27	1.56%
Canada	15	0.86%
Japan	15	0.86%

Table 4: Distribution of the type of investment transaction

Investment Type	# of transactions	Percent
Listed Equity	1460	84.1%
Real Estate	125	7.2%
Unlisted Equity	105	6.05%
Infrastructure	20	1.15%
Convertible	19	1.09%
Fixed Income	4	0.23%
Other	3	0.17%

Table 5: Distribution of the target sectors

Sector – Target	# of transactions	Percent
Financials	289	16.65%
Industrials	244	14.06%
Real Estate	176	10.14%
Consumer Discretionary	158	9.1%
Energy	148	8.53%
Information Technology	142	8.18%
Materials	139	8.01%
Consumer Staples	106	6.11%
Healthcare	86	4.95%
Telecommunications	56	3.23%
Utilities	50	2.88%
Retail	39	2.25%
Infrastructure	35	2.02%
Media and Entertainment	25	1.44%
High Technology	23	1.32%
Consumer Products and Services	14	0.81%
Technology	3	0.17%
Consumer Goods	1	0.06%
Consumer Services	1	0.06%
N/A	1	0.06%

Table 6: Sovereign wealth fund investments

Sovereign Wealth Fund	Average % of shares acquired	Average % of shares owned post transaction	% of cross border investments	Asia	Europe	North American	Other
Abu Dhabi Investment Authority	19.77%	19.02%	100%	8.70%	78.99%	5.80%	6.52%
SAMA Foreign Holdings	0.35%	3.23%	100%	94.87%	5.13%	0%	0%
SAFE Investment Company	2.14%	16.97%	100%	0%	100%	0%	0%

China Investment Corp.	3.91%	5.99%	91.67%	15.48%	9.52%	72.62%	2.38%
Govn't of Singapore Investment Corp.	16.99%	15.75%	95.12%	38.04%	48.37%	8.42%	5.17%
Kuwait Investment Authority	4.71%	2.68%	99.24%	2.67%	93.51%	3.82%	0%
National Social Security Fund	1.8%		0%	100%	0%	0%	0%
Temasek Holdings	20.96%	16.97%	78.42%	48.29%	3.08%	45.21%	3.42%
Qatar Investment	53.82%	60.21%	86.44%	23.73%	54.24%	8.47%	13.56%
Korea Investment Corporation	1.28%	0.68%	99.24%	1.52%	5.70%	92.40%	0.38%

Table 7: Temasek Holdings' Internal Benchmarks

Geographical Region	Internal Target	2010 Allocation	Liquid Market Proxy
Asia (excl. Japan and Singapore)	40%	46%	MSCI Asia (excl. Japan)
Singapore	30%	32%	Straits Times Index
OECD Economies	20%	20%	S&P500 Index
Others	10%	2%	GS Commodity Index

OECD = Organisation for Economic Co-operation and Development

Table 8: Temasek Holdings' Internal Benchmarks and Optimized Allocations

Liquid Market Proxy	Internal Target	Sharpe-Ratio	Alternative Sharpe-Ratio
		Optimized	Optimized
MSCI Asia (excl. Japan)	40%	40%	33%
Straits Times Index	30%	40%	40%
S&P500 Index	20%	0%	0%
GS Commodity Index	10%	20%	27%