Are Sovereign Wealth Funds' Investments Determined by Macroeconomic Factors?

Bertrand Candelon* Malik Kerkour† Christelle Lecourt‡

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Abstract

In this paper, we examine empirically the macroeconomic determinants of sovereign wealth funds' (SWFs) investments. Using both a novel dataset of SWF investments and a dynamic panel tobit model, we evaluate the role of structural macroeconomic factors (as governance, democracy,..) in the decision to invest between SWFs and targeted countries. Considering a large panel (73 countries over the period $1989 - 2011$), we find that indeed SWFs take into account macroeconomic characteristics to decision wether or not the should invest in a particular country. It is also interesting to observe that whereas exchange rate stability matters when the targeted country is Europe or North American, structural factors as democracy or governance and crude oil prices turn out to be the strategic variable for the rest of the world. Finally, financial factors do not show to affect the decision, but rather the amount to be to invest of the SWF.

JEL: F30, F31, G15.

Keywords: Sovereign wealth funds, targeted country, macroeconomic factors, dynamic panel Tobit model .

*University Maastricht, Department of Economics, P.O. Box 616, MD6200 Maastricht, The Netherlands.

†*Corresponding author*. University of Namur (FUNDP) and University of Maastricht. Address: Rempart de la Vierge 8, B-5000 Namur, Belgium. Email: malik.kerkour@fundp.ac.be. All errors remain the responsibility of the corresponding author.

‡Center for Research in Finance and Management (CeReFIM), University of Namur.

1 Introduction

Sovereign wealth funds (SWFs), defined as public investment agencies which manage part of the assets of national states, have recently attracted considerable public attention. The resources controlled by these funds, estimated to be USD 4.16 trillion by the Sovereign Wealth Funds Institute, have grown sharply over the past decade and this amount is projected to grow as much as USD13 trillion in the next ten years.[1] While the size and rapid growth of SWFs suggest that they have become major players in the world, buying large stakes in companies and giving government's exposure to sectors they may otherwise be unable to achieve, their objectives and behavior are not well understood. In particular, the opaqueness surrounding their structure and activities is a major concern in host countries, as it is unclear whether SWFs behave like governments or institutional investors.

Existing empirical research on SWFs offers evidence about whether and how SWFs create value by investing in publicly traded companies. A number of papers use event study methodology to analyze the short and long-term valuation impact of SWF investments. The majority of them conclude that SWF investments in publicly traded companies yield significantly positive announcement period abnormal returns, followed by negative long-run returns over the three years holding periods (see among others Fotak et al., 2008; Dewenter et al., 2009; Fernandes, 2009; Karolyi and Lia, 2009; Kotter and Lel, 2009; Knill et al., 2009; Sun and Hesse, 2009; Bortolotti et al., 2010a). Another type of studies stress the determinants of SWF investment allocations, rather than test whether these SWFs are value-creating investors (see among others Lyons, 2007; Balding, 2008; Aizemann and Glick, 2008; Chhaochharia and Leuven, 2009; Bernstein et al., 2009). This second stream of research examines in particular what drives SWFs to invest in firms and what role these investors play in it. It turns out that the main motivation for SWF investments is, like other fund managers, a risk-return objective and the primary source of variation in SWF investment choices concerns the financial characteristics of the firm. In particular, Fernandez and Eschweiler (2008) conclude that firms with higher analyst coverage are significantly more likely to have an SWF as an investor. Several other papers find that SWF investments are influenced not only by financial but also by

[1] Jen (2007) estimates that SWF global assets will total USD 12 trillion in 2015 whereas Lyons (2007) projects a total of USD 13 trillion in 2017.

political or geographical considerations. Bernstein et al. (2009) find that politician-influenced funds tend to invest in the highest P/E industries. In the same way, Knill et al. (2009) suggest that SWFs are more likely to invest in countries with which they have weaker political relations. Lyons (2007) suggests that SWF investments should be focused in the West and in the emerging countries which are likely to see stronger rate of growth than OECD countries. At last, Chhaochharia and Leuven (2009) find that SWFs tend to invest to diversify away from industries at home but that they do so predominantly in countries that share the same culture, suggesting their investment rules are not entirely driven by profit maximizing objectives.

Related to this second type of literature, the aim of this paper consists in analyzing the driving factors of SWF foreign investments and examine how the decision to invest abroad could be affected by macroeconomic factors of the targeted countries. Our contribution compared to this recent literature is threefold. First, we consider the determinants of SWF investments other than financial and more precisely measures of economic, legal and political development of the targeted country. Contrary to the existing literature stressing the firm characteristics as determinants of SWF strategy, we try to explain that SWFs tend to invest abroad by considering the macroeconomic characteristics of the invested country. Second, we use both a recent dataset of SWF investments and extend the dynamic panel tobit model developed by **?** to allow for the presence of fixed effects. Third, we consider the period 1989-2011, including the recent sub-prime crisis, that enables to consider the SWF investment strategy during the crisis.

Anticipating on our findings, it turns out that macroeconomic factors (exchange rate stability, gdp per capita, government stability, governance and democracy) are determinant variables for the SWF to decide to invest whereas financial returns are not. Besides, whereas exchange rate stability matters when the targeted country is Europe or North American, structural factors as democracy or governance and crude oil price turn out to be the strategic variable for the rest of the world.

The paper is organized as follows. In Section 2, we review the literature of research on SWFs. Section 3 provides some details regarding the data. Section 4 presents the dynamic panel tobit model used and Section 5 reports our empirical findings. Finally, Section 6 concludes.

2 Literature review of research on sovereign wealth funds

The huge increase of SWFs observed the last five last years has fueled up economic literature.[2] Table 1 lists in an exhaustive way all the empirical studies which can be classified into two groups: The first one analyzes the short and long-term valuation impact of SWF investments on asset prices through event study methodology (Beck and Fidora, 2008; Dewenter et al., 2009; Fotak et al., 2008; Kotter and Lel, 2009; Knill et al., 2009) or indirect measures such as Tobin's Q (Fernandes (2009)). The second one focuses on the determinants of SWFs investment allocations rather than test whether these funds are value-creating (Lyons, 2007; Balding, 2008; Aizemann and Glick, 2008; Chhaochharia and Leuven, 2009; Bernstein et al., 2009; Dick and Morse, 2010).

2.1 Empirical studies analyzing the value-creation of SWFs

The aim of these studies is to measure via an event-study methodology the reaction of investors after the announcement of a SWF taking participation in the capital of a company. The majority of these studies conclude that SWF investments in publicly traded companies yield significantly positive announcement period abnormal returns, followed by negative long-run returns over the three years holding periods, i.e. SWFs do not create value. In particular, Beck and Fidora (2008) analyze the impact of the announcements of disinvestments made by the Norwegian SWF on stock prices. They conclude that these announcements have no effect on stock prices, as they are made after the disinvestments have been ended. In the same way, using 75 investments done by 16 SWFs in public firms, Fotak et al. (2008) try to assess the short-term and long-term effect of these SWF acquisitions and find non linear effect, i.e. positive in the short-term and negative in the long-term. Knill et al. (2009) analyze whether SWF investments stabilize or destabilize trading in both the target firms' shares and the targets' home markets once the SWF deal is announced. Using a sample of 232 SWF investment announcements and a limited Granger causality analysis, they find that SWF investments Granger-cause the firm level return/risk relation to deteriorate for some firms, concluding that these investments are destabilizing. At last, employing 802 investments by 33 SWFs over the period 1985-2009, Bortolotti et al. (2010a) and Bortolotti et al. (2010b) find that target firms experience much larger, significantly negative abnormal returns over one and two

[2]To our knowledge, there are very few published articles in this domain, except Dewenter et al. (2009).

Table 1: List of the literature on SWF research

Reference	Database	Period	Methodology [*and main results*]
Aizenman and Glick (2008)	27 SWFs studied	1985-2008	Cross-section and panel regression [*Countries with SWFs score lower than do industrial countries for various governance measures; the governance performance of SWFs is weakly correlated with measures of national governance; at last, the practices of SWF investments differ from those of pension funds in industrial countries.*]
Avendano and Santiso (2009)	14,000 holdings by 17 SWFs	2008	Descriptive analysis [*SWF investment decisions do not differ greatly from those of other investment allocations.*]
Balding (2008)	7 SWFs and their portfolio	2008	Descriptive analysis [*SWFs appear to act as investors and the common estimates fail to accurately control for certain financial assets and therefore skew their estimates of sovereign wealth funds.*]
Beck and Fidora (2008)	Announcements of disinvestments made by the Norwegian SWF		Event study [*Announcements of disinvestment have no effect on stock prices.*]
Bernstein et al. (2009)	2,662 investments by 29 SWFs	1984-2007	Weighted probit model [*High levels of home investments by SWFs, particularly those with the active involvement of political leaders, are associated with trend chasing and worse performance.*]
Bortolotti et al. (2009)	802 investments by 33 SWFs	1985-2009	Event study analysis and cross-sectional regressions [*Longer-term post-acquisition target performance is related to SWF characteristics and to their level of involvement.*]
Butt et al. (2008)	17 major SWFs studied	Since 2005	Descriptive analysis [*The authors describe and summarize the salient characteristics of major SWFs.*]
Chhaochharia and Leuven (2009)	30,000 equity investments made by 4 SWFs	1998-2007	Bilateral regression analysis and event study [*SWFs tend to invest to diversify away from industries at home but that they do so predominantly in countries that share the same culture, suggesting their investment rules are not entirely driven by profit maximizing objectives.*]
Clark and Monk (2009)	146 asset managers used by SWFs	2009	Survey analysis [*SWFs perform well their fiduciary duties and have positive implications for the asset management industry.*]
Dewenter et al. (2009)	227 SWF equity purchases and 47 divestments	1996-2008	Event study [*They find significantly positive abnormal returns (AR) for SWF investments and negative AR for divestments.*]
Dick and Morse (2010)	The 20 major funds	1989-2008	Regression analysis [*It is necessary to adress the significant heterogeneity across funds. SWFs have a more pronounced impact on industries central to industrial plans and on local and regional markets than a general effect on the efficiency of capital markets.*]
Fotak et al. (2008)	75 investments in public firms by 16 SWFs	1989-2008	Event study [*While they find an average abnormal return of +1% for targets on the day in which the SWF investments are announced, over two years after the transaction, the abnormal buy-and-hold returns average -41%.*]
Fernandes (2009)	8,000 holdings in 58 countries	2002-2007	Tobin's Q [*Firms with higher ownership by SWFs have better firm valuations and operating performance.*]
Kotter and Lel (2009)	417 SWF investments	1980-2009	Event study [*SWFs tend to invest in financially distressed, large and multinational companies with low performance.*]
Knill et al. (2009)	232 SWF investment announcements	Through 2008	Event study and Granger causality test [*Investments by SWFs are followed by a decline in the return of the target firm as well as the market and a volatility of the local market unchanged.*]
Le Borgne and Medas (2007)			Descriptive analysis [*The poor performance of SWFs in the Pacific island countries is related to the weakness of public financial management systems and the lack of spending controls*]
Miracky et al. (2008)	27 SWFs studied	2000-2008	Report with descriptive analysis [*SWFs invest in domestic and emerging countries and do not appear to be investing for political motives.*]
FEEM (2009)	27 SWFs studied	2008	Annual Report [*The volume of SWFs investment activity remained substantial in 2008.*]

years following the initial SWF investment, while the purchase announcements yield small but significantly positive stock returns.

Several papers obtain more contrasted results concerning the SWF performance. Two other papers on the effect of SWFs stakes on stock returns are by Dewenter et al. (2009) and Kotter and Lel (2009). Dewenter et al. (2009) test the impact of SWF investments on target firms and provide evidence consistent with the tradeoff between the monitoring and lobbying benefits versus tunneling and expropriation costs of SWFs as block holders. Using a sample of 227 SWF equity purchases and 47 divestments over the period 1996-2008, they find significantly positive abnormal returns for SWF investments and significantly negative abnormal returns for divestments. They also find that SWFs are active investors, with slightly more than half of the target firms experiencing one or more events indicative of SWF monitoring activity or influence. in the same spirit, Kotter and Lel (2009) analyze whether the investment strategies and performance of SWFs are friends or foes to target firms, i.e. do they create value through their investments? Focusing on 417 SWF investments from 1980 through February 2009, they conclude that SWFs, when they invest, convey a positive signal to market participants about the target firm and increased SWF transparency is enjoyed by both the SWF and existing shareholders. Nevertheless, contrary to Dewenter et al. (2009), they find that SWFs are passive investors. The paper of Fernandes (2009) is radically different from the others both in its methodology and its findings. Using a sample of 8,000 SWF holdings in 58 countries over the period 2002-2007, the author analyzes how operating and financial performance changes after a SWF investment. Estimating target firms' Tobin's Q, the author finds that firms with higher SWF ownership have better firm valuations and operating performance. Furthermore, SWFs do not invest in firms in high-tech industries or those operating in areas involving intensive research and development.

2.2 Empirical studies analyzing the strategies of SWF investments

Another piece of the literature attempted to analyze the strategies and the determinants of SWF investment allocations, rather than test whether these SWFs are value-creating investors. This second type of empirical research examines in particular what drives SWFs to invest in firms and what role these investors play.

Aizemann and Glick (2008) examine the determinants of 27 SWFs and do a comparison between measures of the governance and transparency of SWFs and national governance standards. They find that SWF countries, and more particularly fuel-exporting countries, are characterized by relatively low democracy performance but a better governance on average than other developing countries. They also conclude that there is a weak correlation between the governance performance of SWF and measures of national governance. At last, there is a clear difference between the practices of many large existing SWFs and those of pension funds in industrial countries.

The paper of Bernstein et al. (2009) focuses on examining SWFs as private equity investors, analyzes the direct private equity investment strategies across SWFs and compare them to the funds' organizational structures. Based on a sample of 2662 investments by 29 SWFs over the period 1984-2007, the authors analyze how the funds vary in their investments styles and performance across different geographies and governance structures. They find that SWFs are more likely to invest at home (abroad) when (foreign) equity prices are higher. The funds where politicians are involved in the investment policy have a much higher likelihood of investing at home than abroad. This result suggests that SWF investments are distorted by political or agency considerations.

Chhaochharia and Leuven (2009) analyze how and why SWFs make their investment allocation decisions. The authors construct a large sample (about 30 000 observations) of equity investments made by four SWFs (Norway's Government Pension Fund Global, the National Pension Reserve Fund of Ireland, the Alaska Permanent Fund and the New Zealand Superannuation Fund) over the period 1998-2007 and find that common cultural traits like religion are a determinant of these funds' investments. This suggests that the four funds studied have a tendency to "invest in the familiar" like other institutional investors (private and public institutional investors also studied for comparison). Another revealing conclusion is that these funds have a tendency to invest in developed markets (the United States and United Kingdom) and in financial firms, but are less present in private equity, oil and gas companies and in unethical industries. Close to the paper of Chhaochharia and Leuven (2009), Dick and Morse (2010) focus on a larger set of SWF investments (international and domestic traded equities, private equities, investments in private equity and real estate) for explaining the portfolio choices of the 20 major funds. They conclude to the significant heterogeneity across funds. They also find that these funds have a deeper impact on industries central to industrial plans and on local and regional markets than a general effect on the efficiency

of capital markets.

As well as the academic studies surveyed above, there are several recent descriptive papers explaining the rise of SWFs. We can cite among others the papers made by the Monitor Group (Miracky et al., 2008; Mattei, 2009), the OECD (Avendano and Santiso (2009)) and some isolated papers: Balding (2008) describes the portfolio of the largest SWFs. Butt et al. (2008) summarize the key characteristics of the SWFs, discuss the determinants of their investment choices as well as the implications for corporations and governments. Le Borgne and Medas (2007) look at the effectiveness of the SWFs from the pacific island countries in meeting the objectives set for them and their impact on fiscal management and outcomes. At last, Clark and Monk (2009) survey the asset managers used by the SWFs and analyze how they perform their fiduciary duties.

2.3 Contribution of the paper in contrast with the literature

Related to this second stream of literature cited above, this paper paves the way for a third route that how these investments decision could be affected by strategic factors other than financial like macroeconomic factors of targeted countries. The specificity of this new line of research lies in the fact that we consider the determinants of SWF investments other than financial and more precisely measures of economic, legal and political development of the targeted country. Contrary to the existing literature, we try to explain that the investment decision depends on macroeconomic structural factors but not on financial returns.[3]. Concerning the methodology, we use a panel probit model with unobserved heterogeneity and serially correlated errors in order to analyze the determinants and the dynamics of SFW investments abroad for a panel of developing and emerging target countries. In this model, we pay special attention both to the serial dependence inherent to SWF investment allocations, i.e. the fact that a SWF will take a decision to invest abroad by taking into account his past investment decisions, and to the persistent heterogeneity across countries. The dynamic panel finds its justification in the inertia in the investment strategy of the SWF. Once an investment decision is taken, it is likely that the following years the SWF still invest in the country. At last, another contribution of this paper is to consider the post-crisis period (until

[3]Chhaochharia and Leuven (2009) use also determinants other than financial like cultural traits of the target country but they exclude macroeconomic determinants and their analysis focuses on only the four funds described above.

end 2010) in order to test whether SWFs continued to invest abroad.

3 Data and descriptive analysis

A SWF can be broadly defined as government-owned investment funds that make long-term domestic and international investments in search of commercial returns. More precisely, Mattei (2009) gives five criteria for defining a SWF: 1) it is wholly owned by a sovereign government; 2) it is distinct from the central bank or finance ministry in order to protect it from excessive political influence, 3) it does not have predominant pension obligations; 4) it invests in a variety of financial risky assets in search of commercial returns; 5) it has made a great proportion of its publicly-reported investments internationally[4].

To analyze the direct investment strategies of SWFs, we combine two sets of data: data concerning the SWFs themselves and the direct investments that the funds made.

3.1 The SWF sample

We collect the list of SWFs by using different sources in order to have the most complete list. We start with a preliminary sample of SWFs given on the SWF Institute website by combining the names of funds published by JP Morgan (Fernandez and Eschweiler (2008)), SWF special report (Catalano (2009)), Lyons (2007), **?** and the websites of the SWFs (see the Appendix for the complete list of SWFs and information regarding country of origin, the estimated fund size, the source of funding and the year in which the fund was established). Sometimes different names for the same SWF are found; in this case, we employ the fund website to eliminate duplicates. For selecting the SWFs, we use the selection criteria given by Mattei (2009) described above and we consider a fund as active if it has made at least one publicly-reported investment. As we can see in the Table 9 in appendix, many funds have been created and are announced on the websites but are not active. Several funds are defined as SWFs even though it is sometimes ambiguous. It is the case for the Emirates within the UAE that are not organized in a federal level but are comparable in terms

[4]This criteria is not included in the definition given by SWF Institute which defines a SWF as a state-owned investment fund composed of financial assets such as stocks, bonds, real estate, or other financial instruments funded by foreign exchange assets; http://www.swfinstitute.org.

of decision rights to those of a sovereign authority. These funds are the Abu Dhabi Investment Authority, The Investment Corporation of Dubai, Mubadala Developement Company, the International Petroleum Investment Corporation (IPIC), Ras Al Khaimah Investment Authority, Dubai Holding[5] and Dubai World. This search yields a sample of 84 funds from 52 countries, but only 42 of these funds are retained for the analysis because considered as active[6].

3.2 Investment data

We construct our sample of SWF investments in listed firms by using different sources: i) information from three financial databases (SDC Platinum, Zephyr and Capital IQ), ii) the online database Factiva which offers a wide choice of search tools and includes news reports by newswires (Dow Jones, Reuters, Dow Jones, Business Wire and numerous publications like The Wall Street Journal, Financial Times,..); iii) fund disclosures including annual reports, press releases and informations from their websites. We extract investment data for both the SWFs and their subsidiaries defined as entities in which the fund holds at least a 50% ownership stake (Bernstein et al. (2009))[7]. To extract direct transactions of SWFs as well as transactions involving SWF subsidiaries, several verifications have been done: first, we select only achieved deals in our database (we exclude rumors, agreement and sales). Second, we compare the information given in each database in order to check its reliability (date and type of transaction, % of ownership stake). At last, we verify our list of SWF subsidiaries by using fund websites.

Table 2 details the number of investments by each SWF in publicly traded firms by distinguishing the number of domestic and foreign investments and the average value of the stakes[8] between

[5]Dubai Holding is a holding company that belongs to the Government of Dubai; Sheikh Mohammed bin Rashid Al Maktoum as the Ruler of Dubai holds the majority of the company.

[6]Our search criteria allows to consider several SWFs which are not retained by Mattei (2009) but which respect nevertheless the five criteria described above for defining a SWF and have been active internationally. Examples of these funds are International Petroleum Investment Co., Dubai World and Kingdom Holding Company that have invested a lot abroad.

[7]Newswires cited above report information regarding the name of the fund, the name of the subsidiary, the name of the target firm and the size of the stake.

[8]This average value is to taken with caution because the amounts of the investments are not given systematically in the database. It allows however to have an average valuation of the investments, even if this figure should be increased. In the case of our study, we focus on the number of investments only because we search for explaining

December 1989 and December 2010. We identify a sample of 1123 investments in firms with publicly-traded stock by SWFs other than Norway's GPFG [9], including respectively 849 and 274 foreign and domestic investments. This testifies to the strategy of a great number of funds to invest abroad. The two singaporean funds, Temasek Holdings and GIC, are by far the most active stake acquirers (290 and 206 investments with an average value of 422 and 377$ million respectively). The two chinese funds, SAFE Investment Company and China Investment Corporation (CIC), are the largest acquirers in value ($4605 and $1482 million in average respectively) even if they rank only at the 15th and 21th in terms of the number of investments.[10] Other active funds are the malaysian fund Khazanah Nasional (73 transactions), Dubai World (65 investments), funds of Abu Dhabi (Mubadala Development Company and Abu Dhabi Investment Authority (with respectively 58 and 47 transactions) and Qatar Investment authority (54 investments). There are asian and Middle East funds that are the most active compared with those of the developed countries (except the fund of Norway).

While the sample covers the transactions since 1989 until the recent period 2010, more than 80% of the transactions were after 2002 and more than 50% of the domestic and foreign transactions have been done between 2007 and 2010, as described in Table 3 and illustrated in Figure 1. SWF investments grew dramatically from 2004 to 2008 with fast-growing influxes of revenue combined with the search for better returns. The number of SWF transactions reached a peak in 2008, with 156 investments representing about 13% of the total of the transactions[11]. Despite the crisis, the volume of investment activity remained substantial, showing that the global economic crisis has

the decision of investment of SWFs abroad. The amounts of investments are given here as indication because it is difficult to rank the different funds in terms of their activities without doing the link between the number and the value of investments.

[9]The Norway's Government Pension Fund Global (GPFG) has done a great number of small stakes in listed companies overall the considered period through open market share purchases (more than 55000 investments with stake size less than 2%). This is the reason why we choose to remove it to the database.

[10]The largest of any SWF is the fund of Hong Kong, the Monetary Authority IP with an average value of $4689 million for only two foreign investments (the bigger investment is in HSBC Holdings with a total value of $4688 million) and the second is the fund of Ireland, The National Pension Reserve Fund, with an average value of $4652 million for one domestic investment.

[11]In 2008, SWFs emerged as major players on the world financial stage, mostly when they pumped $60bn into Western banks during the financial meltdown.

Table 2: Number of SWF investments

Country sub-national affiliation	Fund name	Number of investments	Number of foreign investments	Number of domestic investments	Average value $US millions
Singapore	Temasek Holdings	290	227	63	422
Singapore	Government of Singapore Investment Corporation (GIC)	206	198	8	376
Malaysia	Khazanah Nasional (BHD)	73	24	49	223
UAE - Dubai	Dubai World	65	58	7	306
UAE - Abu Dhabi	Mubadala Development Company	58	41	17	1025
Qatar	Qatar Investment Authority (QIA)	54	43	11	1171
UAE - Abu Dhabi	Abu Dhabi Investment Authority (ADIA)	47	47	0	980
UAE - Dubai	Dubai Holding	42	39	3	741
Saudi Arabia	Kingdom Holding Company (KHC)	41	34	7	119
UAE - Abu Dabi	International Petroleum Investment co. (IPIC)	38	36	2	1116
France	Strategic Investment Fund	35	2	33	42
China	China Investment Corporation (CIC)	33	14	19	1452
Libya	Libyan Investment Authority (LIA)	16	16	0	144
Kuwait	Kuwait Investment Authority (KIA)	15	13	2	977
Oman	Oman Investment Fund	13	13	0	196
Kazakhstan	Samruk Kazyna National Wealth Fund	11	4	7	546
China	National Social Security Fund	11	1	10	NA
China	SAFE Investment Company	8	3	5	4605
Brunei	Brunei investment agency (BIA)	7	7	0	111
South Korea	Korea Investment Corporation (KIC)	6	4	2	716
Australia	Australian Future Fund	5	3	2	342
New Zealand	Superannuation Fund	4	0	4	200
UAE - Dubai	Investment Corporation of Dubai (ICD)	4	2	2	100
Oman	State General Reserve Fund	4	3	1	80
Australia	Queensland Investment Corporation	4	2	2	NA
Vietnam	State Capital Investment Corporation	4	0	4	NA
USA	Alaska Permanent Fund	3	0	3	575
UAE - Ras Al Khaimah	Ras Al Khaimah Investment Authority (RAK)	3	3	0	200
Papua New Guinea	Mineral Resource Stabilization Fund	3	1	2	3
Tawan	National Stabilisation Fund (development fund of Taiwan)	3	1	2	NA
Hong Kong	Monetary Authority IP	2	2	0	4689
Saudi Arabia	Public Investment Fund	2	0	2	760
Bahrain	Mumtalakat Holding Company	2	1	1	506
Australia	Victorian Funds Management Corporation	2	1	1	196
Kazakhstan	Kazakhstan National (oil) Fund	2	1	1	NA
Saudi Arabia	SAMA Foreign Holdings	2	2	0	NA
Ireland	National Pensions Reserve Fund	1	0	1	4652
Azerbaijan	State Oil Fund (SOFAZ)	1	1	0	NA
China	Africa Development Fund	1	1	0	NA
UAE	Emirates Investment Authority	1	1	0	NA
USA	New Mexico Permanent Trust Funds	1	0	1	NA
		1123	849	274	27582

played a profound effect on their investment strategies. During the crisis, many funds shifted their investment strategies, retreating from foreign markets and increasing domestic investments. The number of foreign investments reached a peak in 2007 (with 127 deals representing 82% of total investments in 2007) and begun to drop sharply in 2008. In the same time, domestic investments by SWFs continued to grow since 2007 and made up about 40% of all deals in 2009. SWFs withdrew from the market in 2010, with a decrease of 40% of foreign investments and 17% of domestic transactions compared to 2008.

Table 3: Annual Distribution of SWF Investments in Listed firm stocks

Year	Number of investments	Number of foreign investments	Number of domestic investments	Average value $US millions
1989	2	1	1	136.55
1990	2	2	0	NA
1991	7	7	0	228.7653
1992	15	7	8	73.73351
1993	6	4	2	182.7658
1994	17	17	0	59.97625
1995	15	9	6	14.25575
1996	24	13	11	51.22417
1997	33	28	5	82.64963
1998	18	16	2	668.1361
1999	22	17	5	176.9076
2000	45	40	5	208.5363
2001	15	9	6	1381.243
2002	25	17	8	89.50391
2003	41	33	8	188.6963
2004	65	50	15	461.2806
2005	103	79	24	250.8338
2006	114	90	24	476.2708
2007	155	127	28	975.775
2008	156	121	35	1606.948
2009	142	90	52	578.9171
2010	101	72	29	467.4475

INSERT FIGURE 1

Table 4 presents the geographic distribution of SWF investments in listed company by sorting 73 target firm countries into 8 regions (Africa, Asia, Europe, Middle East, South America, North America, Indian Subcontinent and Oceania). Asia is the main destination of equity investments for SWFs with 37% of total investments (411 of 1123), followed by Europe with 25% of total investments (242 of 1123), North America with 16% (179 of 1123) and the Middle East with 11% (118 of 1123). In Asia, China is the most popular target country with 10% in terms of number of investments (China is classified second in terms of number of deals over the period) whereas in

North America, the United States is the most popular target nation with 14 % of total investments. Singapore ranks third in number (9% of the investments) and the United Kingdom ranks fourth (8% of the investments).

Table 4: Geographic distribution of SWF investments

Country of SWF	Total	Target firm countries, Foreign SWFs investments							
		Africa	Asia	Europe	Middle Eeast	South America	North America	Indian Subcontinent	Oceania
Abu Dhabi	146	5	13	45	41	3	27	3	9
Australia	11			6					5
Azerbaijan	1				1				
Bahrain	2			1	1				
Brunei	7		1	2	1				3
China	55	2	40	3		1	8		1
Dubai	111	2	15	33	25		27	7	2
France	35			34			1		
Ireland	1			1					
Kazakhstan	13		8	3	1		1		
Kuwait	15	1	3	1	4		6		
Malaysia	73		62		4		2	5	
New Zealand	4								4
Oman	17		3	6	2			5	1
Papua New Guine	3						1		2
Qatar	54		6	28	14	2	3	1	
Saudi Arabia	45	3	2	8	21		11		
Singapore	496	2	249	60	1	8	83	61	32
South Korea	6		3				3		
Taiwan	3		2				1		
UAE	1				1				
USA	4						4		
Vietnam	4		4						
libya	16	3		11	1		1		
total	1123	18	411	242	118	14	179	82	59

4 Methodology: Dynamic panel Tobit model

Let us consider the dynamic panel with random effect we would like to estimate.

$$\begin{aligned} y_{it}^{*} &= x_{it}\beta + y_{i,t-1}^{*}\lambda + \varepsilon_{it} \\ y_{it} &= \max(y_{it}^{*}, 0), \quad t = 1, ..., T \quad i = 1, ..., N, \end{aligned} \tag{1}$$

where y_{it}^{*} is a latent dependent variable, x is a vector of exogenous variables, and y_{it} represents an observed dependent variable. Let us assumed that ε_{it} is distributed according to the multivariate normal distribution. The component d_i is an unobserved individual specific random effect which is constant over time, and u_{it} is an idiosyncratic error

The random effect is characterized by the following properties :

$$E[d_i|x_{i1}, ..., x_{iT}] = 0, \qquad E[u_{it}|d_i, x_{i1}, ..., x_{iT}] = 0, \tag{2}$$

$$E[d_i^2|x_{i1}, ..., x_{iT}] = \sigma_d^2, \qquad E[u_{it}^2|d_i, x_{i1}, ..., x_{iT}] = \sigma_u^2, \tag{3}$$

$$E[d_i d_j|x_{i1}, ..., x_{iT}] = 0, \qquad E[u_{it}u_{js}|d_i, x_{i1}, ..., x_{iT}] = 0. \tag{4}$$

Under this specification, the covariance structure of the random effect model can also be represented as :

$$V(\varepsilon_{it}) = \begin{pmatrix} (\sigma_d^2 + \sigma_u^2) & \sigma_d^2 & \cdots & \sigma_d^2 \\ \sigma_d^2 & (\sigma_d^2 + \sigma_u^2) & \ddots & \vdots \\ \vdots & \ddots & \ddots & \sigma_d^2 \\ \sigma_d^2 & \cdots & \sigma_d^2 & (\sigma_d^2 + \sigma_u^2) \end{pmatrix} = \begin{pmatrix} \sigma_\varepsilon^2 & \rho\sigma_\varepsilon^2 & \cdots & \rho\sigma_\varepsilon^2 \\ \rho\sigma_\varepsilon^2 & \sigma_\varepsilon^2 & \ddots & \vdots \\ \vdots & \ddots & \ddots & \rho\sigma_\varepsilon^2 \\ \rho\sigma_\varepsilon^2 & \cdots & \rho\sigma_\varepsilon^2 & \sigma_\varepsilon^2 \end{pmatrix}$$

? proposes a computationally robust simulation estimator for this dynamic panel Tobit model. It consists in a recursive algorithm formulated by Geweke-Hajivassiliou-Keane and Gibbs sampling simulators.

Broadly speaking, a censoring indicator function I_{it} defined as

$$I_{it} = \left\{ \begin{array}{lll} 0 & if & y_{it}^* = 0 \\ 1 & if & y_{it}^* > 0 \end{array} \right\},$$

is introduced and for each simulation (r), the simulated log-likelihood $\widehat{l}_r(\theta)$, where $\theta = (\beta, \lambda, \sigma_\epsilon^2, \rho)$ takes the following form:

$$\widehat{l}_R(\theta) = \sum_{i=1}^{N} log \left[\frac{1}{R} \sum_{r=1}^{R} \prod_{t=1}^{T} \left[f\left(y_{it} | y_{i,t-1}, y_{i,t-1}^{*(r)} \right) \right]^{I_{it}} . \left[P\left(I_{it} = 0 | y_{i,t-1}, y_{i,t-1}^{*(r)} \right) \right]^{1-I_{it}} \right]. \quad (5)$$

A particular attention has to be paid to censored variables. If we consider that censoring occurs at time t, we have $t_1, ..., t_{m_i}$ censored observations for individual i ($m_i \leq T$). $\xi_{it}^{(r)}$ is then generated from the uniform random number generator on [0,1] for each censoring variables and the shocks $\eta_{it}^{(r)}$ are drawn from a truncated normal distribution.

The simulated log-likelihood boils down to

$$\begin{aligned} \widehat{l}_R(\theta) \quad = \quad & \sum_{i=1}^{N} log \left[\frac{1}{R} \sum_{r=1}^{R} \prod_{t=1}^{T} \left[\frac{1}{A_{tt}} \phi \left(\frac{y_{it} - x_{it}\beta - y_{i,t-1}^{*(r)}\lambda - \sum_{k=1}^{t-1} A_{tk}\eta_{ik}^{(r)}}{A_{tt}} \right) \right]^{I_{it}} \right. \\ & \left. \times \left[\Phi \left(\frac{-x_{it}\beta - y_{i,t-1}^{*(r)}\lambda - \sum_{k=1}^{t-1} A_{tk}\eta_{ik}^{(r)}}{A_{tt}} \right) \right]^{1-I_{it}} \right], \end{aligned} \quad (6)$$

where A is a Cholesky decomposition of $V(\varepsilon_{it})$, ϕ the p.d.f. and Φ the c.d.f. of a gaussian distribution.

Fixed effect model

Nevertheless, **?** does not extend his methodology to consider the fixed effect. We proposed to investigate this issue introducing correlated random effect via an unobserved and constant individual specific random disturbance c_i, which can be interpreted as a fixed effect. Model (1) becomes hence

$$y_{it}^{*} = x_{it}\beta + y_{i,t-1}^{*}\lambda + c_i + u_{it} \quad (7)$$

$$y_{it} = \max(y_{it}^{*}, 0). \quad (8)$$

Following **?**, **?** and **?**, the unobserved individual heterogeneity c_i can be assumed to be correlated with the exogenous variable x_{it} and take the following form :

$$c_i = \omega_0 + \omega\overline{x}_i + d_i, \qquad \overline{x}_i = \frac{1}{T}\sum_{t=1}^{T} x_{it}. \quad (9)$$

In such a case the simulated likelihood (6) can be rewritten as:

$$\begin{aligned} \widehat{l}_R(\theta) &= \sum_{i=1}^{N} log\left[\frac{1}{R}\sum_{r=1}^{R}\prod_{t=1}^{T}\left[\frac{1}{A_{tt}}\phi\left(\frac{y_{it} - x_{it}\beta - y_{i,t-1}^{*(r)}\lambda - x_i\omega - \sum_{k=1}^{t-1} A_{tk}\eta_{ik}^{(r)}}{A_{tt}}\right)\right]^{I_{it}}\right. \\ &\quad \left.\times\left[\Phi\left(\frac{-x_{it}\beta - y_{i,t-1}^{*(r)}\lambda - x_i\omega - \sum_{k=1}^{t-1} A_{tk}\eta_{ik}^{(r)}}{A_{tt}}\right)\right]^{1-I_{it}}\right]. \end{aligned} \quad (10)$$

5 Empirical part

5.1 Description of the macroeconomic variables

In the econometric model described in Model (1), the dependent variable y_{it}^{*} represents the number of foreign purchases done by SWFs in the target countries from December 1989 to December 2010. 73 target countries are considered. The explanatory variables that belong to the vector of exogenous variables x are supposed to describe the economic and institutional factors of the target countries: *GDP, Government Stability*, *Exchange Rate Stability*, *Crude Oil Price*, *Governance* and *Democracy*. The financial aspect is also taken into account as determinant of the SWFs foreign investments by considering the MSCI World index and a dummy variable representing the crisis financial period. In order to avoid endogeneity issues, the lagged variables (except the dummy variable) are used in the model. Table 5 reports the source and the definition of each variable employed in our study.

Table 5: Description of the explanatory variables used in the model

Variable	Source	Description
$GDPpc^*_{i,t-1}$	ICRG	The lagged value of GDP per head. The annual GDP per head is expressed as a percentage of the average of the estimated total GDP of the target country. The variations of the GDP per head are calculated on a scale between 0 and 5, where a higher (lower) score means a high (low) GDP.
$Gov.Stability^*_{i,t-1}$	ICRG	The lagged value of "Government Stability" of the target country. The variable measures the government's ability to carry out its declared program and its ability to stay in office. The risk rating is the sum of 3 subcomponents, each with a maximum score of 4 points and a minimum of 0 point. A score of 4 points equates to Very Low Risk and a score of 0 point to Very High Risk.
$Exch.RateStability^*_{i,t-1}$	ICRG	The lagged value of "Exchange Rate Stability" of the target country. The appreciation or depreciation of a currency against the US dollar over a 12-month period is calculated as a percentage change. The exchange rate movements are expressed on a scale between 0 and 10, where a higher (lower) score means low (high) exchange rate variations.
$Crudeoil_{t-1}$	Global Financial Data	The lagged value of the Brent Crude in USD
$Governance^*_{i,t-1}$	ICRG and Cheung (2010)	The lagged value of the sum of two indicators ("law and order" and "bureaucracy quality") provided by ICRG. The first indicator assesses (on a 6 point scale) the strength and impartiality of the legal system and the second the institutional strength and quality of the bureaucracy (on a 4 point scale).
$Democracy^*_{i,t-1}$	ICRG	The lagged value of "Democracy" of the target country. This variable measures how responsive government is to its people: the less responsive it is, the more likely it is that the government will fall in a non-democratic society. This variable is expressed on a 6 point scale, with the higher (lesser) number of point is assigned to more (less) democracy.
$RdtMSCI_{t-1}$	Datastream	The lagged value of the annual MSCI World index return (inflation adjusted).
Crisis07		Dummy variable equal to 1 for years after 2007, 0 otherwise.
Crisis08		Dummy variable equal to 1 for years after 2008, 0 otherwise.
Crisis09		Dummy variable equal to 1 for years after 2009, 0 otherwise .

5.2 Results

The dynamic panel model is estimated with random effect like described in equations (1)-(2) as well as with fixed effect (equations (7)-(8)). We also do the comparison between the dynamic model and the static one. Table 6 and Table 7 report the estimation results of the panel model with explanatory variables estimated individually in Table 6 and the full model in Table 7.[12]. In both tables, we present the results for the 73 target countries panel model and for the country panel split in two parts: the advanced economies (United States, Canada, European countries) and the rest of the world (emerging countries). Different results emerge from these tables.

- First, the autoregressive term is always significant (around 0.30 i.e, it takes on average 3 years on average for a SWF decision to change). It motivates for the use of a dynamic panel vs the static one. Such a finding is corroborated by a log-likelihood test reported in Table 8 rows 1-3. Economically such a result finds its justification in the inertia in the investment strategy of sovereign wealth fund. Once an investment decision is taken it is likely that the following years the SWF still invest in the country. Of course, we consider here exclusively the decision to invest or not, but not the amount of capital.

- It is also noticeable that the investment decision does depend on macroeconomic structural factor but not on financial returns.[13] This result constitutes a novelty as it is the first one to highlight a macroeconomic dimension in the investment strategy of the SWF. Such a finding may sound quite controversial in the light of the numerous papers (see among others Fotak et al., 2008; Dewenter et al., 2009; Fernandes, 2009; Karolyi and Lia, 2009; Kotter and Lel, 2009; Knill et al., 2009; Sun and Hesse, 2009; Bortolotti et al., 2010a) stressing the firm characteristic as the determinant of SWF strategy. Instead of being in opposition, we see our findings as a complementary approach which consists in investigating the decision of a SWF to invest or not in a particular country. Once the decision taken, the amount of investment is determined at the micro-level in line with traditional finance strategy.

[12] In order to save space, we report only the sign and the significance level of explanatory variables in Table 6 but all the results are available upon request.

[13] Two different financial returns have been considered (the $SP500$ and the MSCI World index return) leading to qualitatively identical results.

- Looking at the full panel, it turns out that all macroeconomic variables are positively significant except "exchange rate stability". The positive sign is logical given the way the variables are defined. A higher degree of GDP growth per capita, government stability, democracy and governance stimulate the SWF to invest in the country. The case of crude oil is less evident as it only concerns a small subset of countries which are oil producers. Exchange rate stability does not seem to be a significant factor of decision, which does not signify that it may play a role to determine the amount to be invested in the country by the SWF. SWFs have had a tendency to invest abroad at the beginning of the financial crisis in 2007 (the dummy variable "crisis07" is positively significant) and less during the crisis in 2008-2009 as described in Table 3 and illustrated in Figure 1.[14]

- At last, to better grasp the importance of these macroeconomic factors in the SWF investment strategy, the country panel is split in two parts (on one side, the advanced economies, i.e., United-states, Canada and European countries, on the other side, the rest of the world). It appears that homogeneity is clearly rejected and disparities between these two groups of countries are observed. Whereas exchange rate stability is the main determinant for investing in the advanced economies, institutional factors (Democracy, government stability, governance) are key factors in the rest of the world. Such a finding appears to be logical as in the US, Canada and EU these factors are traditionally and historically at the high level, which is not the case in emerging countries.

6 Conclusion

We collect new data on investments by SWFs to study the investment strategy of SWFs and estimate a dynamic probit model with 73 target countries panel. Several insights emerge from our analysis.

First, we find that the dynamic component in the panel model is important, suggesting that SWFs have a tendency to invest again in the following years in the target country once the decision to invest has been taken.

[14]The dummy variables "crisis08" and "crisis09" are never significant and removed from the estimates.

Second, our results show that SWFs largely invest to diversify away from industries at home but that they do so predominantly in countries that show economic as well as institutional stability, suggesting that their investment rules are not entirely driven by profit maximizing objectives.

At last, splitting the country panel in two parts (advanced economies versus emerging countries) enables us to conclude that the SWFs take their decision to invest in these two geographical zones by basing on different criteria. Whereas exchange rate stability is the main determinant for investing in the advanced economies, institutional factors (Democracy, government stability, governance) are key factors in the rest of the world. Such a finding appears to be logical as in the US, Canada and EU these factors are traditionally and historically at the high level, which is not the case in emerging countries.

We interpret ours findings as a complementary approach to previous empirical findings on the SWFs investment behavior which stress the firm characteristic as the determinant of SWF strategy. Once the decision to invest has been taken, the amount of investment is determined at the micro-level in line with the traditional finance strategy.

Table 6: Estimation results (individual models)

	DynRE			DynFE			StaRE		
$GDPpc^*_{i,t-1}$	++	+	+++	+	0	0	0	+	++
$Gov.Stability^*_{i,t-1}$	+++	+++	+++	0	0	0	++	+++	+++
$Exch.RateStability^*_{i,t-1}$	0	0	+	+++	++	++	0	0	0
$Crudeoil_{t-1}$	+++	+++	+++	0	0	0	+++	+++	+++
$Governance^*_{i,t-1}$	++	0	0	0	++	0	+++	0	++
$Democracy^*_{i,t-1}$	++	++	+++	0	0	0	+++	+	+
$RdtMSCI_{t-1}$	0	0	+	0	0	0	0	0	0
$Crisis07$	+++	+++	+++	++	++	+++	0	0	++
$y_{i,t-1}$	+++	+++	NA	+++	+++	NA	+	+++	NA

Note: Positive (resp. negative) coefficients significant at 1%, 5% and 10% are indicated with +++ (resp. —), ++ (resp. –) and + (resp. -), and by 0 when coefficients are not significant.

Table 7: Estimation (full model):1989-2010

	Europe & North America				Rest of the World				All Countries			
	dynamic		static		dynamic		static		dynamic		static	
	FE	RE	RE	FE	FE	RE	RE	FE	FE	RE	FE	RE
$GDPpc^*_{i,t-1}$	0.129	0.171**	0.384***	0.230**	0.115*	0.049	0.081	0.132*	0.122***	0.087**	0.147***	0.141***
	[0.094]	[0.079]	[0.089]	[0.100]	[0.062]	[0.049]	[0.059]	[0.071]	[0.046]	[0.037]	[0.054]	[0.046]
$Gov.\ Stability^*_{i,t-1}$	0.030	0.011	-0.001	0.026	0.161***	0.155***	0.233***	0.218***	0.118***	0.111***	0.164***	0.184***
	[0.049]	[0.045]	[0.049]	[0.052]	[0.037]	[0.036]	[0.042]	[0.040]	[0.028]	[0.027]	[0.031]	[0.032]
$Exch.Rate\ Stability^*_{i,t-1}$	0.115*	0.148**	-0.030	0.076	0.004	0.002	0.088*	0.006	0.052	0.056*	0.049	0.094**
	[0.067]	[0.067]	[0.071]	[0.068]	[0.041]	[0.038]	[0.048]	[0.045]	[0.034]	[0.032]	[0.038]	[0.040]
$Governance^*_{i,t-1}$	-0.117	-0.060	-0.206***	-0.142	0.107*	0.111**	0.048	0.114	0.036	0.028	0.051	-0.039
	[0.092]	[0.073]	[0.071]	[0.103]	[0.065]	[0.049]	[0.056]	[0.074]	[0.051]	[0.036]	[0.060]	[0.042]
$Democracy^*_{i,t-1}$	-0.031	-0.004	0.156	-0.053	0.127**	0.126***	0.213***	0.159**	0.096*	0.074*	0.121*	0.177***
	[0.132]	[0.120]	[0.140]	[0.148]	[0.062]	[0.046]	[0.058]	[0.070]	[0.054]	[0.039]	[0.063]	[0.051]
$Crude\ Oil_{t-1}$	0.013	0.011	0.015	0.016*	0.030***	0.030***	0.023***	0.035***	0.021***	0.024***	0.028***	0.021***
	[0.010]	[0.009]	[0.009]	[0.010]	[0.008]	[0.008]	[0.008]	[0.008]	[0.006]	[0.006]	[0.006]	[0.006]
$Return\ MSCI\ World_{t-1}$	0.150	0.195	-0.455	0.086	-0.015	0.003	-0.541	-0.151	0.020	0.069	-0.101	-0.494*
	[0.328]	[0.331]	[0.367]	[0.329]	[0.297]	[0.296]	[0.333]	[0.300]	[0.225]	[0.225]	[0.231]	[0.257]
crisis07	0.493**	0.467**	0.703***	0.708***	0.166	0.182	0.564***	0.380**	0.344**	0.272*	0.544***	0.687***
	[0.219]	[0.217]	[0.228]	[0.216]	[0.181]	[0.180]	[0.200]	[0.182]	[0.142]	[0.140]	[0.142]	[0.157]
constant	-3.033	-2.359***	-1.498	-2.322	-0.432	-4.025***	-5.879***	-0.478	-0.425	-3.405***	-0.660	-4.998***
	[2.740]	[0.904]	[1.012]	[3.966]	[1.197]	[0.551]	[0.635]	[1.651]	[1.144]	[0.412]	[1.546]	[0.501]
y_{it-1}	0.296***	0.309***	-	-	0.281***	0.274***	-	-	0.291***	0.308***	-	-
	[0.091]	[0.090]	-	-	[0.066]	[0.064]	-	-	[0.053]	[0.051]	-	-
σ_ε	1.131***	1.186***	0.986***	1.474***	1.425***	1.459***	1.185***	1.750***	1.406***	1.391***	1.824***	1.151***
	[0.196]	[0.206]	[0.073]	[0.266]	[0.192]	[0.189]	[0.072]	[0.232]	[0.157]	[0.144]	[0.199]	[0.0545]
ρ	0.233***	0.254***	0.841***	0.382***	0.138***	0.158***	0.782***	0.253***	0.207***	0.193***	0.331***	0.837***
	[0.083]	[0.086]	[0.144]	[0.085]	[0.049]	[0.049]	[0.108]	[0.055]	[0.049]	[0.043]	[0.048]	[0.089]
log-Like	-299.63	-301.47	-312.7	-305.24	-552.76	-555.47	-580.45	-561.28	-862.93	-863.35	-878.68	-906.99

1,000 Monte Carlo data sets were created, the values are given as SDs, $[J^{-1}]$. A coefficient significant at 1%, 5% and 10% is indicated by $***$, $**$ and $*$.

7 Appendix

Table 8: Hausman Specification Test : random vs fixed effect

Dynamic model, α=5%		
Europe-North America	Rest of the world	All countries
0.9986	0.7315	1

Appendix 1. List of SWFs and sources

Country sub-national affiliation	Fund name	Source	Assets under management (USD BN)	Founding date	Source of funds	Active funds
Algeria	Revenue Regulation Fund	SWF Institute	56.7	2000	Oil	No
Algeria	Reserve fund of Algeria	SWF Institute	NA	NA	NA	No
Angola	Reserve Fund for Oil	Monitor - FEEM	NA	2004	Unknown	No
Australia	Australian Future Fund	SWF Institute	72.9	2004	Non-commodity	yes
Australia	Queensland Investment Corporation	JP Morgan (2008)	65	1992	Fiscal	yes
Australia	Victorian Funds Management Corporation	JP Morgan (2008)	36	1994	Fiscal	yes
Azerbaijan	State Oil Fund (SOFAZ)	SWF Institute	2	1999	Oil	yes
Bahrain	Mumtalakat Holding Company	SWF Institute	9.1	2006	Oil	yes
Botswana	Pula Fund	SWF Institute	6.9	1994	Diamonds	No
Brazil	Sovereign Fund of Brazil	SWF Institute	11.3	2008	Non-commodity	No
Brunei	Brunei investment agency (BIA)	SWF Institute	30	1983	Oil	yes
Canada	Alberta Heritage Fund	SWF News	14.4	1976	Oil	No
Chad	Revenue management plan	SWF news	NA	NA	NA	No
Chile	Pension Guarantee Fund	Lyons (2007)	1.42	2006	Fiscal	No
Chile	Pension Reserve and Social and Economic Stabilization Fund	SWF Institute	21.8	1985	Copper	No
China	Africa Development Fund	SWF Institute	5	2007	Non-commodity	yes
China	China Investment Corporation (CIC)	SWF Institute	200	2007	Fiscal/Reserves	yes
China	National Social Security Fund	SWF Institute	146.5	2000	Non-commodity	yes
China	SAFE Investment Company	SWF News	567.9	1997	Non-commodity	yes
Colombia	Oil Stabilization Fund	JP Morgan (2008)	2	1995	Oil	No
Equatorial Guinea	Fund for Future	SWF News	NA	NA	NA	No
France	Strategic Investment Fund	SWF Institute	28	2008	Non-commodity	yes
France	Pension Reserve Fund	JP Morgan (2008)	51	2001	Fiscal	No
Gabon	Fund for Future Generations	JP Morgan (2008)	0.5	1998	Oil	No
Ghana	Petroleum Funds	SWF Institute	NA	2011	Oil	No
Hong Kong	Monetary Authority IP	SWF Institute	292.3	1993	Non-commodity	Yes
Hong Kong	Hong Kong Exchange Fund	JP Morgan (2008)	182	1935	Fiscal/Reserves	No
Indonesia	Government Investment Unit	SWF Institute	0.34	2006	Non-commodity	No
Iran	Foreign Exchange Reserve Fund	SWF Institute	NA	1999	Non-commodity	No
Iran	Oil Stabilization Fund	SWF Institute	23	1999	Oil	No
Iraq	Development Fund for Iraq	JP Morgan (2008)	8	2003	Oil	No
Ireland	National Pensions Reserve Fund	SWF Institute	31	2001	Fiscal	Yes
Kazakhstan	Samruk Kazyna National Wealth Fund	SWF Institute, EG Capital (2009)	29	2008	Oil	Yes
Kazakhstan	Kazakhstan National (oil) Fund	SWF Institute	38.6	2000	Oil, gas, metal	yes
Kiribati	Revenue Equalisation Reserve Fund	SWF Institute	0.4	1956	Phosphates	No
Kuwait	Kuwait Investment Authority (KIA)	SWF Institute	296	1953	Oil	Yes
Libya	Libyan Investment Authority (LIA)	SWF Institute	70	2006	Oil	Yes
Malaysia	Khazanah Nasional (BHD)	SWF Institute	36.8	1993	Non-commodity	Yes
Malaysia	Terengganu Investment Authority	SWF News	3	2008	Oil	No
Mauritania	National Fund for Hydrocarbon Reserves (NFHR)	SWF Institute	¿0.3	2006	Oil, Gas	No
Mexico	Oil (Income) Stabilisation Fund	SWF Institute	6	2000	Commodity	No
Mongolia	Human Development Fund	SWF News	2.5	2013	Mining Royalties	No
New Zealand	Superannuation Fund	SWF Institute	12.1	2003	Non-commodity	Yes
Nigeria	Excess Crude Account	JP Morgan (2008)	13	2004	Oil	No
Nigeria	Nigerian Sovereign Investment Authority	SWF Institute	NA	2011	Oil	No
Norway	Government Pension Fund Global	SWF Institute	571.5	1990	Oil	Yes
Norway	Government Petroleum Insurance Fund	EG Capital (2009)	2.3	1986	Oil	No
Oman	Oman Investment Fund	SWF Institute	NA	2006	Oil	Yes
Oman	State General Reserve Fund	SWF Institute	8.2	1980	Oil, Gas	Yes
Palestine	Palestine Investment Fund (Palestinian Territory)	SWF News	NA	NA	NA	No
Papua New Guinea	Mineral Resource Stabilization Fund	SWF News	NA	NA	NA	yes
Qatar	Qatar Investment Authority (QIA)	SWF Institute	85	2005	Oil	Yes
Russia	National Welfare Fund	SWF Institute	89.6	2008	Oil	No
Russia	Stabilization Fund of the Russian Federation	SWF Institute	52.9	2004	Oil	No

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Appendix 1 (Con't). List of SWFs and sources

Country sub-national affiliation	Fund name	Source	Assets under management (USD BN)	Founding date	Source of funds	Active funds
Sao Tome and Principe	National Oil Account	SWF News	NA	2004	Oil	No
Saudi Arabia	Public Investment Fund	SWF Institute	5.3	2008	Oil	yes
Saudi Arabia	SAMA Foreign Holdings	SWF Institute	472.5	NA	Oil	Yes
Saudi Arabia	Kingdom Holding Company (KHC)	SWF Institute	25	1980	Oil	Yes
Singapore	Government of Singapore Investment Corporation (GIC)	SWF Institute	247.5	1981	Non-commodity	Yes
Singapore	Temasek Holdings	SWF Institute	157.2	1974	Non-commodity	Yes
South Korea	Korea Investment Corporation (KIC)	JP Morgan (2008)	20	2006	Fiscal/Reserves	Yes
Sudan	Oil Revenues Stabilization Account	SWF News	NA	NA	NA	No
Tawan	National Stabilisation Fund	SWF News	NA	NA	NA	yes
Thailand	SWF presumed	SWF Institute				No
Timor-Leste	Timor-Leste Petroleum Fund	SWF Institute	6.3	2005	Oil, gas	No
Trinidad and Tobago	Heritage and Stabilization Fund	SWF Institute	2.9	2000	Oil	No
Turkmenistan	Stabilization Fund	SWF News	NA	NA	NA	No
UAE - Abu Dhabi	Abu Dhabi Investment Authority (ADIA)	SWF Institute	627	1976	Oil	Yes
UAE - Abu Dhabi	Abu Dhabi Investment Council (ADIC)	SWF Institute	NA	2007	Oil	No
UAE - Dubai	Dubai Holding	JP Morgan (2008)		2004		Yes
UAE - Dubai	Dubai World	SWF Institute	NA	2004	Oil	Yes
UAE - Dubai	Investment Corporation of Dubai (ICD)	SWF Institute	82	2006	Oil	Yes
UAE	Emirates Investment Authority	SWF Institute	NA	2007	Oil	Yes
UAE - Abu Dabi	International Petroleum Investment co. (IPIC)	SWF Institute	58	1984	Oil	Yes
UAE - Abu Dhabi	Mubadala Development Company	SWF Institute	13.3	2002	Oil	Yes
UAE - Ras Al Khaimah	Ras Al Khaimah Investment Authority (RAK)	SWF Institute	1.2	2004	Oil	Yes
USA	Alaska Permanent Fund	SWF Institute	40.3	1976	Oil	yes
USA	Alabama Trust Fund	SWF News	NA	NA	NA	No
USA	New Mexico State Investment office trust	SWF News	NA	NA	NA	No
USA	New Mexico Permanent Trust Funds	JP Morgan (2008)	16	1958	Fiscal	yes
USA	Permanent Wyoming Mineral Trust Fund	SWF Institute	4.7	1974	Minerals	No
Venezuela	Macroeconomic stabilization fund (FEM)	SWF Institute	0.8	1998	Oil	No
Venezuela	National Development Fund	JP Morgan (2008)	15-20	2005	Oil/Reserves	No
Vietnam	State Capital Investment Corporation	SWF Institute	0.5	2005	Non-commodity	Yes

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