# Country Factors and Investment Decision-Making Process of Sovereign Wealth Funds $\stackrel{\bigstar}{\Rightarrow}$

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# Abstract

We examine in this paper the complex decision-making processes that lead to investment location choice of Sovereign Wealth Funds (SWFs). Using a two-tiered dynamic Tobit panel model, we find that country-level factors do not have the same impact on the investment decision and the amount to invest and that SWFs tend to invest more frequently and with higher amounts in countries in which they already have invested. More specifically, we find that SWFs prefer to invest in countries with higher political stability, whereas they are more prone to investing for large amounts in countries that are less democratic and more financially opened. Our results also lend support to the idea that SWFs are prudent in the choice of target country concerning their investment decision but behave as more opportunistic investors concerning the amounts to be invested.

# JEL classification: C33; C35; E61; G23; F39; G38

Keywords: Sovereign Wealth Funds; Targeted Countries; Macroeconomic country Factors; Two-Tiered Dynamic Tobit Panel Model

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# 1. Introduction

Sovereign wealth funds (SWFs), that are public investment agencies managing part of the assets of national states, have recently attracted considerable attention in the literature. Many countries have set up government-owned SWFs for different macroeconomic purposes, such as stabilisation, saving for future generations and investments in long-rung economic projects (such as infrastructure or education). The resources controlled by these funds, estimated to be USD 7.3 trillion by the Sovereign Wealth Funds Institute in June 2016, have tremendously grown over the past decade, benefitting from high oil prices, financial globalisation and sustained global large imbalances. This amount is expected to reach USD 13 trillion in the coming ten years.<sup>1</sup> While the size and rapid growth of SWFs suggest that they have become major players in the finance 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 appear as a major concern in host countries, for which it is unclear whether SWFs behave like governments or institutional investors.

Following the rapid expansion of SWFs, financial economists attempted to understand better the decisions taken by this new class of investors. This task is not easy because some SWFs are particularly opaque on their objectives or their functioning. In addition, the whole process of investment decision strategy is complex in the sense where it combines several dimensions that may potentially interact. A first important dimension regarding the SWFs investment activity concerns the determinants of investment decision: Why do SWFs invest in target firms? In which country do they concentrate their investments? Although these questions have been extensively explored over the recent years in the empirical

<sup>&</sup>lt;sup>1</sup>According to the Sovereign wealth Fund Institute, the assets managed by these funds were estimated to be USD 3.2 trillion in September 2007, which means that the size of these funds have more than doubled since the beginning of the financial crisis (source: www.swfinstitute.org).

literature, much still need to be known to fully understand the behavior and investment strategy of this fast growing investor. Most studies generally try to connect the investment's decision with the characteristics of the target countries, by investigating in particular the factors driving SWF investment in foreign targets countries. Some papers assess whether these factors are macroeconomic (Ciarlone and Miceli (2014) [14], Knill et al. (2012b) [30], or Megginson et al. (2013) [34]) or political (Bernstein et al. (2013) [6], Knill et al. (2012b) [30]). Other empirical studies have also stressed the link between the characteristics of the fund like for example its size, its degree of opacity, the nature of the fund (commodity versus non-commodity) and its investment decision (Knill et al. (2012a) [29]). These studies conclude that SWFs investments could be distorted by the characteristics of the fund and the targeted countries and especially by political and agency considerations.

Another dimension involved in the SWF's investment decision-making process pertains to the way they are going to invest. In what type of firms to invest? For what amount? Existing empirical studies dealing with this dimension generally focused on the financial characteristics of the firm (for example the size and the risk of the firm) as determinant of SWF strategy (Bernstein et al. (2013) [6]). In the same spirit, Johan et al. (2013) [26] attempt to measure the choice of SWFs for investing in public versus private global firms and show that SWFs invest not only in privately held firms, but also in privately held firms internationally.

The aim of this paper is to contribute to this existing literature to understand better what are the decision-making process that leads to investment location decision of this this new class of investors. More specifically, we develop an approach that takes into account the fact that the decision to invest abroad for a SWF is the outcome of a complex decision making process in the sense that it has to decide if it intervenes or not in a particular country and once it has decided to invest how much it wants to invest. In particular, we investigate whether and to which extent country-level factors play a role in this investment decision-making process. As SWFs are investment funds owned by the government and have a capacity to operate over a long-term investment horizon, we analyse whether they act as prudent investors compared to other internationally active investors by preferring to invest in countries in which they have either information advantage or perceived familiarity in terms of macroeconomic, institutional and cultural characteristics.

Using a new database over the recent period 2000 - 2014, we examine 609 foreign equity investments done by 29 SWFs from 15 countries in 72 target countries. Based on the recent paper of Xun and Lubrano (2015) [37], we adopt a sophisticated two-tiered dynamic panel Tobit model in order to estimate: i) in one equation the decision of the SWFs to invest in a particular country and in the second equation the amounts to be invested that are conditional on the investment decision; ii) the dynamic component in the model.

We contribute to the existing literature in several ways. First, we shed light on the country-level factors governing the SWFs cross-border investment decision. In particular, we try to explain the motivation of SWFs to invest in one particular country by considering geographic, economic and institutional distances between acquiring and target countries. Second, we estimate jointly the decision of investment and on the amounts to be invested. For that, we estimate a two-tiered Tobit model with panel data in order to take into account the temporal dimension in the SWF's investment decision as well as the unobserved heterogeneity between the different SWFs. At last, we also include a dynamic term in the panel model in order to investigate whether SWFs tend to invest more frequently and with higher amounts in countries in which they already have invested. To our knowledge, no paper on SWFs specifically adresses the question of the decision-making process that leads to investment location choice of SWFs.

Anticipating on our findings, we find that SWFs investments are driven by country-level factors. This paper also shows that the determinants of the investment decision are different from those driving the amount of the investments, motivating hence the use of the two-tiered Tobit panel model to investigate this issue. In particular, our results lend support to the idea that SWFs are prudent in the choice of target country concerning their investment decision but behave as more opportunistic investors concerning the amounts to be invested. At last, our findings exhibit a persistence in SWF investment strategy, which means that SWFs have a tendency to invest again and for the same amounts in the following years in the target country once the decision to invest has been taken.

The paper is organized as follows. Section 2 introduces the theoretical framework as well as the hypotheses for analyzing SWFs investment decisions abroad. Section 3 provides some details regarding the data. Section 4 presents the econometric methodology (two-tiered dynamic panel Tobit model), Section 5 reports our empirical findings and Section 6 concludes.

# 2. Theoretical framework and empirical hypotheses

There is an extensive recent literature that investigates what factors might be driven the SWF's investment decision and asks whether SWFs differ from other large institutional investors with respect to the choice of target firms and the amount to invest. Some papers focus on the investment decision between domestic versus foreign assets (Bernstein et al. (2009) [6] and Curto (2010) [18]) or on the main drivers of domestic investments (Gelb et. al. (2014) [23]). Among those focusing on cross-border investments, some papers find that some of these factors are purely financial, in the sense that the decision is taken on the basis of financial characteristics of the targeted firm (Heaney, Li and Valencia (2011) [24], Dyck and Morse (2011) [21], Bernstein et al. (2013) [6], Megginson et al. (2013) [34]), while other studies conclude that SWFs equity allocation is not fully explained by firm-level determinants (Avendano (2012) [4], Chhaochharia and Laeven (2009) [13], Ciarlone and Miceli (2014) [14] or Knill et al. (2012b) [30] among others). In particular, some of these papers find that SWF cross-border investments are distorted by political or agency considerations (Avendano and Santiso (2009) [3], Knill et al. (2012b) [30]) and Bernstein et al. (2013) [6]) or are influenced by a cultural bias (Chhaochharia and Laeven (2009) [13]). Unlike these studies, the recent study of Megginson et al. (2013) concludes that SWFs act purely as commercial investors facilitating cross-border corporate investments. Table in Appendix 2 gives a summary of all these studies and their contrasted results.

The conclusion according to which SWF investment decisions are dissimilar to those of the institutions can be explained by the fact that a SWF is a sovereign-owned institution which may be managed either by the ministry of finance or by a board composed of government officials. Unlike other funds, the politics or the structure of the fund owned/controlled directly by the government may influence asset allocation decisions. In terms of social welfare, governments should have broader goals than wealth maximisation of the firm, like for example the development of national economy or the maximisation of the employment level. But they also might go away from their goals through their rent-seeking attitude. As SWFs are state-owned actors, they might be incited to deviate from the objectives normally associated with private-sector investors and make investment decisions other than financial. Related to this literature, we shed light on the determinants of cross-border SWF investment decisions by considering all country-factors, that's economic, political, institutional, cultural and geographical factors. More precisely, like Knill et al. (2012b) [30] who consider the political distance between acquiring and target countries, we test whether the characteristics and attributes (in terms of geographic distance but also macroeconomic, institutional and cultural characteristics) of the target country are different from the SWF countries.

The phenomenon of home and familiarity bias in decision making has been largely studied in the empirical literature on Foreign direct investments (FDIs) or trade (see among others Anderson and Van Wincoop (2003) [2], Stulz and Williamson (2003) [36] and Kang and Kim (2008) [28]). All these papers conclude that managers who make the decision regarding FDIs have a strong preference to invest in countries that are close to their and with social and cultural familiarity. In particular, many studies find that the geographical distance is an important determinant of the cross-border equity flows (see among others Solnik (2008) [35] and Coeurdacier et al. (2009) [15]). Concerning SWFs, Chhaochharia and Laeven (2009) [13] show that cross-border SWF investment stakes are most importantly explained by geographic distance, ethnicity, language and religion. As SWFs are investment funds owned by the government and have a capacity to operate over a long-term investment horizon, they should be more risk averse compared to other investors. That means that they should prefer to invest in regions or countries in which they have either information advantage or perceived familiarity in terms of cultural, institutional or macroeconomic characteristics. For that, we take into account the differences in terms of political, financial and religious risk between SWF countries and target countries:

# H1 - SWFs tend to invest in countries which share the the same macroeconomic, geographical, institutional and cultural characteristics as their.

If cultural, institutional and macroeconomic differences are associated with more asymmetric information, we would expect that the more the target country shares similar characteristics to the SWF country, the more the fund will tend to invest in this country. In the same way we predict that closer geographic proximity will be associated with more investment deals between country pairs.

Note that the hypothesis H1 does not give information on the way SWFs are going to invest. Once the decision to invest or not in a particular country has been taken on a macroeconomic perspective, the amount to invest is decided by SWFs. In line with Knill et al. (2012b) [30] and Ciarlone and Miceli (2014) [14], we consider the complex decision making process of SWFs by specifying two stages.<sup>2</sup> In the first stage, the SWF chooses the country in which it will invest. In the second stage, the SWF decides how much it will invest. Ignoring the two-stage nature of the investment decision assumes that the country factors have the same impact in both stages:

# H2 - Target country factors do not have the same impact on the investment decision and the amount to invest.

Related to H1, if a SWF chooses to invest in a country sharing similar characteristics, it is likely that it will continue to invest in this country in the future because it is already informed about this target country. In this way, it avoids search and informational costs for investing in this country. We would like to test if there is a learning effect in the SWF investment decision making-process, in the way that once an investment decision is taken, it is likely that the following years the SWF still invests in the same country for similar amounts:

# H3 - SWFs tend to invest more frequently and with higher amounts in countries in which they already have invested.

We expect that once an investment decision is taken, it is likely that the following years the SWF continues to invest in the same target country for similar amounts as learning effect.

<sup>&</sup>lt;sup>2</sup>However, Knill et al. (2012b) [30] estimate a Cragg model with cross-section and not panel data and without dynamic component in their model. Ciarlone and Miceli (2014) [14] use panel data but they analyze the decision to invest and the amount to be invested using two different models.

# 3. Data and descriptive analysis

### 3.1. The SWF sample

There is no consensus, in either the academic or practitioner literature, on exactly what is a SWF. Most definitions of SWFs suggest that these are "state owned funds that obtain their funding from their foreign-currency reserves or commodity export revenues; in certain instances, government budget surpluses and pension surpluses can be transferred to SWFs" (IMF (2008) [25], Butt et al. (2008) [9]). Considering the lack of consensus on the definition of a SWF as well as the lack of transparency in the methodologies used in the existing empirical literature to collect data, we have decided to construct a unique database from scratch using the following methodology.<sup>3</sup>

We collect the list of SWFs by using different sources in order to have the most complete list. We consider indeed that a SWF is an investment vehicle that manages part of the State's wealth. In a first instance a preliminary sample is built based on the SWF Institute, the Sovereign Wealth Fund Center and the International Forum on Sovereign Wealth Funds. It is then combined with the names of funds published by JP Morgan (Fernandez and Eschweiler (2008) [22]), Catalano (2009) [10], Lyons (2007) [32] and the websites of the SWFs (see the Appendix 1 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. Moreover, we consider a fund as active if it has made at least one publicly-reported investment internationally. As many funds have been created and announced on the websites but are not active, this search yields a sample of 92 funds, but only 29 of these funds from 15 countries are retained for the analysis.<sup>4</sup>

 $<sup>^{3}</sup>$ For example, the Sovereign Investor Institute's Sovereign Wealth Center includes 32 funds in its database whereas the SWF Institute retains 78 SWFs.

<sup>&</sup>lt;sup>4</sup>As our analysis focuses on the investment amounts, we only retain cross-border transactions for which the deal value is available.

# 3.2. Investment data

We construct our sample of SWFs investments in listed firms by using two different sources. First, a search in four financial databases (SDC Platinum, Zephyr, Capital IQ and Thomson Reuters Eikon) of all known SWFs and their subsidiaries is performed in order to identify transactions involving SWFs. Second, we use the online database Factiva to complete the missing acquisitions. Investment data are extracted for both the SWFs and their wholly owned subsidiaries.<sup>5</sup> The features of each transaction are collected: information about the targeted firms (name, country), information about the SWFs (name, subsidiary, country), the date of the transaction, the pre- and post-acquisition share of the investment in the target firm and the value of the deal.

Table 1 presents summary statistics - overall and by year - on the number and total value of cross-border SWF deals. The combined sample of both sources from 2000 to 2013 allows to capture 609 cross-border acquisitions with a total value of USD 278,406 million by 29 SWFs.<sup>6</sup> As described in Table 1, the number of SWF cross-border investments tremendously increased from 2005 to 2007 with fast-growing influxes of revenue combined with the search for better returns and reached a peak in 2007, with 118 investments representing about 19% of the total of the foreign transactions over the period 2000-2013.<sup>7</sup> During the crisis, many funds shifted their investment strategies, retreating from foreign markets and increasing domestic investments. The number of foreign investments sharply drop in 2008 even if the volume of investment activity remained substantially high (the total value of SWFs investments in 2008 represents 21.1% of the total value of SWFs investments over the

<sup>&</sup>lt;sup>5</sup>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.

<sup>&</sup>lt;sup>6</sup>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 55,000 investments with stake's size less than 2%). This is the reason why we choose to remove it to the database. All the investments and their market value are given by the Norway's Government Pension Fund Global on its website: http://www.nbim.no/en/Investments/holdings.

<sup>&</sup>lt;sup>7</sup>In 2007, SWFs emerged as major players on the world financial markets, mostly when they pumped USD 60 billion into Western banks during the financial meltdown.

period 2000-2013). In the recent years, SWFs continue to intervene actively abroad both in number and in amounts, with 15% of the total of the foreign transactions for only year of 2012.

Table 2 presents the distribution of SWF cross-border investments in value and amounts done by the 15 SWF countries and shows that the majority of the most active SWFs are located in Asia and in the Middle East. Singapore made more cross-border investments than any other country (265 foreign deals which represents 43.5% of all SWF investments by number and 36.07% by value) followed by SWFs from the United Arab Emirates (21.8% of deals, 30.8% of value)<sup>8</sup>, Qatar (14.3% of deals, 12.07% of value) and China (7.1% of deals, 12.4% of value). We can observe that funds of Kuwait made few investments compared to the others (2,3% of deals) but with large amounts (4.43% of all investments by value).

At last, Table 3 outlines the geographical distribution of SWF country investments by number (Panel A) and by amount (Panel B) in target firm regions. The clear trend revealed by this table is the SWF's preference to invest in the developed countries of North America (18.23% of total deals, 27.63% of value) and West Europe (26.6% of total deals, 32.91% of value), particularly in the English common law countries of Canada, the United States and Great Britain. This is clearly the case for SWFs from the United Arab Emirates, Qatar, China and to a lesser extent Singapore which have invested (in number and in value) in both regions over this period. The other target regions are Far East (14.78% of total deals, 9.33% of value) and Indian Subcontinent (13.63% of total deals, 6.12% of value). The fact that the majority of SWFs investments are targeted towards developed countries with safe institutions, high revenues and financial regulation reveal that macroeconomic factors matter in their investment decision. The second less clear trend is the tendency of SWFs to invest in their own geographical region. More precisely, SWFs from Middle East and South Asia

<sup>&</sup>lt;sup>8</sup>The Abu Dhabi Investment Authority (ADIA) is considered as the second biggest fund.

also have a preference to invest in their own geographical region even if they seem to have a strategy of geographical diversification. Note that geographical diversification of SWF crossborder investments is sometimes really different in number and in amounts, which suggests that the SWF decision to invest in a particular country and the decision about the amount to invest in this country are not based on the same criteria. A revealing example is the only stake done by the fund of Qatar in Central and South America but for an impressive amount of USD 2,716 million.<sup>9</sup>

# 4. Methodology: The Two-Tiered Dynamic Tobit Panel Model

Before describing the two-tiered dynamic Tobit panel model, let us consider the onetiered dynamic Tobit model for panel data and autocorrelated errors developed by Chang (2011a) [11] which is written as:

$$y_{it}^* = x_{it}\beta + y_{it-1}\lambda + \epsilon_{it},\tag{1}$$

$$y_{it} = max(y_{it}^*, 0), \tag{2}$$

where  $y_{it}^*$  is a latent dependent variable,  $x_{it}$  a vector of exogenous variables,  $y_{it}$  an observed dependent variable and  $\epsilon_{it}$  an idiosyncratic error which varies across time and individuals. The error term is assumed to have the following autoregressive structure:

$$\epsilon_{it} = c_i + u_{it},\tag{3}$$

where  $c_i$  is an unobserved individual random effect which is constant over time,  $u_{it}$  is an idiosyncratic error which varies across time and individuals.

<sup>&</sup>lt;sup>9</sup>Qatar Holding invested USD 2,716 million in Banco Santander Brazil, which represents 5% of stakes.



Figure 1: SWF investment decision-making process

One potential restriction of traditional Tobit models lies in the fact that the decision related to y = 0 versus y > 0 is inseparable from the decision concerning the amount of ygiven that y > 0. In order to relax this restriction, Cragg (1971) [17] proposed a two-tiered model to allow the parameters which characterize the decision regarding y > 0 versus y = 0to be distinct from the parameters that determine the decision regarding how much y is given that y > 0. We can say that traditional Tobit models can be viewed as a special case of the Cragg's two-tiered model. That means that the Cragg's two-tiered model is based on two assumptions. First, a Probit model gives the probability of a zero observation with the first tier parameters and then the density of the dependent variable that is conditional on being a positive observation is truncated at zero and characterized by the second tier parameters. Chang (2011b) [12] extended the Cragg's model by introducing the dynamic component in the model. It has to be noticed that we include the same explanatory variables in each step of the two-tiered model.

In our specification, if we consider  $y_{ij,t}$  an observed dependent variable representing the USD average amount of investments in country *i* from SWFs in country *j* in year *t*, the SWFs investment decision should be considered as a two-step process : the first step is a binary decision : either  $y_{ij,t} > 0$  or  $y_{ij,t} = 0$ . This is only in a second instance, once the green light for the investment has been given, that the SWF decides about the amount to be invested in the specific country. Figure 1 illustrates the SWF investment decision-making process taken into account in a two-tiered model.

Taking into account the rich dynamic structure in the model allows to test the persistence phenomenon in the investment decision process, i.e. the fact that SWFs may invest again and for the same amounts in the following years in the same target country once the decision to invest has been taken. The introduction of lagged dependent variable and serially correlated errors in a dynamic panel Tobit model has the effect of making not applicable the conventional estimation techniques used in the panel data models. Chang (2011b) [12] proposes to estimate the dynamic Tobit panel model with the random effects approach. The random effects estimators are obtained through maximizing the corresponding likelihood function by specifying the distribution of the error conditional on the regressors. However, the dimension of the integral involved in the calculation of the likelihood function of the dynamic Tobit model, which is as large as the number of censoring periods in the model, makes this likelihood function usually intractable. To deal with this problem, Chang (2011b) [12] proposes a maximum simulated likelihood procedure through the correlated random effects approach for the two-tiered dynamic Tobit model using the Geweke-Hajivassiliou-Keane (GHK) simulator. In a very recent paper, Xun and Lubrano (2015) [37] show however that the use of Heckman's initial conditions combined with latent state dependence leads to computational difficulties and a wrong specification of the true state dependence. They thus propose to follow the treatment of initial values proposed by Wooldridge (2005) [38].

We consider a two-tiered dynamic Tobit panel model initiated by Chang (2011a,b) [11, 12] and completed by Xun and Lubrano (2015) [37].

We then estimate :

First tiered 
$$\Leftrightarrow P(y_{ij,t}^* > 0)$$
  
Second tiered  $\Leftrightarrow E(y_{ij,t}^* | y_{ij,t}^* > 0)$ 

$$(4)$$

using the following modelisation of  $y_{ij,t}^*$ :

$$y_{ij,t}^* = x_{ij,t}'\beta + y_{ij,t-1}\lambda_1 I_{ij,t}(y_{ij,t-1>0}) + \lambda_2 I_{ij,t}(y_{ij,t-1=0}) + c_i j + u_{ij,t}$$
(5)

With  $I_{ij,t}$  the indicator function defined as :

$$I_{ij,t} = \begin{cases} 1 & for \quad y_{ij,t}^* > 0 \\ 0 & for \quad y_{ij,t}^* = 0 \end{cases}$$

For the two-tiered model, using Wooldridge's approach for initial conditions, the  $c_i$  are extended as follows. For the decision to invest, we have :

$$c_{i1} = d_i + y_{ij,0}\delta_{11}I_{ij,t}(y_{ij,0} > 0) + \delta_{12}I_{ij,t}(y_{ij,0} = 0)$$
(6)

while for the amount to be invested :

$$c_{i2} = d_i + y_{ij,0}\delta_{21}I_{ij,t}(y_{ij,0} > 0) + \delta_{22}I_{ij,t}(y_{ij,0} = 0)$$
(7)

Using four different  $\delta s$  allow for a better modeling of the influence of the initial conditions.

To estimate the model, Chang (2011b) [12] proposes to maximize the log-likelihood function simulated through procedures based on a recursive algorithm formulated by the Geweke-Hajivassiliou-Keane simulator.

The simulated likelihood function with R simulation draws based on the GHK simulator for country pair ij can be described as :

$$L_{i} = \frac{1}{R} \sum_{r=1}^{R} \prod_{t=1}^{T} [f^{(r)}(y_{ij,t}|y_{ij,t-1}, d_{i}, x_{ij,t})]^{I_{ij,t}} \times [P^{(r)}(I_{ij,t} = 0|y_{ij,t-1}, d_{i}, x_{ij,t})]^{1 - I_{ij,t}}$$
(8)

In our specification, the two-tiered structure implies that the probability of the investment decision  $(Prob(y_{ij,t}^*) > 0)$  is computed with a first set of parameters  $(\lambda_1^1, \lambda_1^0, \beta_1)$ , while the amount to be invested (i.e. the conditional expectation of  $y_{ij,t}$ ), conditioned on the decision of investment is determined by a second set of parameters  $(\lambda_2^1, \lambda_2^0, \beta_2)$ . As we have two equations and we do the distinction between censored and uncensored events, we have four different values for the  $\lambda$ s when using Wooldridge's specification for the initial values.<sup>10</sup> These four parameters indicate respectively the persistence of the investment decision and the amount invested. All the other parameters (error variances of  $d_i$  and  $u_{it}$  and  $\zeta$ ) are common to both steps.

To sum up, the choice of the two-tiered dynamic Tobit model in panel offers many advantages to better evaluate the decision-making process that leads to investment location of SWFs. First, the "two-tiered" dimension allows to tease the distinction between the decision and how much the SWF invests. Second, the SWF decision to invest in a particular country may also be persistent over time. It means that if a first investment has been made in year t, intimacy links are created and it is likely that the SWFs will invest again in the future. Therefore, the dynamic component is included via an autoregressive term in the first but also the second decision. At last, the panel dimension in the model allows to take into account two central aspects: i) the temporal dimension that is necessary for explaining the number of SWFs cross-border investments by year in our sample; ii) the unobserved heterogeneity between the different SFWs. This hypothesis is fundamental because SWFs form a heterogeneous group of investors, explained with respect to the various sources of their funds, their size in terms of assets under management, their organisational structure, their governance

<sup>&</sup>lt;sup>10</sup>The interpretations of the true state dependence terms are straightforward: They control for the level of state dependency of previous state (dependents on whether it was an occurred event  $I(y_{i,t-1} > 0)$  or a null event  $I(y_{i,t-1} = 0)$ , since an occurred event and a null event has different nature as well as different recorded scaling) upon current state.

and their assigned objectives. In the same way, the inclusion of individual random effects in the panel model allows to control for omitted variables.

# 5. Empirical part

# 5.1. Description of the macroeconomic variables

The two-tiered dynamic Tobit panel model described in equations (4) and (5) is estimated for a large set of explanatory variables covering the macroeconomic, geographic, financial, institutional and cultural sectors. The selected macroeconomic variables are the annual GDP growth rate (GDP), the inflation rate (INFLATION) and the real effective exchange rate returns (*REER*). As financial variable, we consider the Chinn-Ito index (*KAOPEN*) measuring the country's degree of capital account openness. Institutional variables measuring the level of political risk are corruption (CORRUPTION) and the government stability (GOVSTAB).<sup>11</sup> POLITY is the democracy level difference between the SWF country and target country as defined by the polity IV database. *RELIGION* is a dummy variable equal to one if the nations have the same major religion and zero otherwise. DIST is a variable measuring the geographic distance between acquiring and target country. As in Karolyi and Liao (2017) [27] and Knill et al. (2012b) [30], we use for these variables the difference between the SWF and target nation. Analyzing country-pairs is necessary to calculate the bilateral "difference" between explanatory variables as well as the dependent variable. We try to test whether geographic distance but also variables illustrating economic and institutional distance are determinants of SWF investment decision as in a gravity model.<sup>12</sup> Country-pairs variables are computed as:<sup>13</sup>

<sup>&</sup>lt;sup>11</sup>As GOV STAB represents the government ability to carry out its declared program, and its ability to stay in office, this variable is generally lower for democratic countries than for autocratic regimes.

<sup>&</sup>lt;sup>12</sup>Gravity models are often used in the international trade literature in order to analyse the determinants of bilateral trade flows. However, this type of model is not well suited for SWF investment flows that are frequently equal to zero.

<sup>&</sup>lt;sup>13</sup>Country-pairs variables measuring the geographic, economic and institutional distance between the SWF country and the host country, have also been tested in absolute value. Results of the model with all these variables taken in absolute value are unchanged. They are not reported in the paper to save space but are available upon request.

$$x_{ij,t} = x_{j,t} - x_{i,t} (9)$$

with j = 1, ..., 15 the SWFs countries and i = 1, ..., 72 the target countries.

We also consider control variables representing the SWF characteristics like the size of the fund (LARGE), the origin of the fund (COMMODITY) and the presence of politicians on the board (*POLITICIANS*). *LARGE* is a dummy variable equal to one if the assets under management of a SWF are superior to USD 100 billion. COMMODITY is a dummy variable equal to one if the funds originate from natural resources, and *POLITICIANS* is a dummy variable that indicates if there is a presence of politicians in the governance of the fund. We predict the variable LARGE positively related to SWF investment decision and mostly to the amount decision. We expect COMMODITY to be positively related to SWF investment decision abroad as countries with natural resource rent need to cover from commodity prices fluctuations and to prevent from Dutch disease. More precisely, a commodity SWF that invests the proceeds from natural resources and fiscal surplus wholly abroad can mitigate the Dutch Disease phenomenon and related macroeconomic consequences due to diversification effect.<sup>14</sup> We also expect the variable *POLITICIANS* negatively related to investment decision: SWFs with greater political involvement tend to support domestic firms rather than investing abroad, as found by Bernstein et al. (2013) [6]. Appendix B reports the source and the definition of each variable employed in our study. The correlation between these variables is low, stressing that the information does not need to be condensed in a subset of variables.<sup>15</sup>

Table 4 reports the summary statistics concerning the variables of the model. First, we can see that our panel data are extremely large (14,924 observations) compared to other

 $<sup>^{14}</sup>$ See Corden and Neary (2012) [16] for more details on this question.

<sup>&</sup>lt;sup>15</sup>For sake of space we do not report the correlation coefficients, but these results are available upon request from the authors.

studies based on cross sectional data.<sup>16</sup> Second, the proportion of country-years with SWF investment is 2,1%, which means that 97,9% of the dependent variable observations are equal to zero. The fact that the dependent variable is left censored at zero with a great number of observations equal to zero justifies the choice of the Tobit model described above. Concerning SWFs characteristics, 96% of SWFs countries have at least one SWF managed by politicians and 86% have at least one large-sized SWF (upper to USD 100 billion). If we look at differences between target and acquiring countries characteristics, only 9% of acquiring countries have invested in countries with the same language but 17% of them invest in countries which share a common religion.<sup>17</sup> Concerning the geographic distance, only 7% of the investments are made in close countries (less than 1,000 miles), which means that SWFs seem to be indifferent to the geographical distance in their investment decision making-process. Finally, we notice that 40% of the investing countries have at least one set up a SWF (Das et al. (2009) [19]).

#### 5.2. Results

# 5.2.1. One-tiered versus two-tiered dynamic Tobit panel model

We would like to test the fact that target country factors do not have the same impact on the investment decision and the amount to be invested as justified in our Hypothesis 2. For that, we have estimated both models for comparison: the one-tiered dynamic Tobit model for panel data and individual random effects developed by Chang (2011a) [11] described above in Equation (1) and (2) and the two-tiered dynamic panel Tobit model initiated by Chang (2011a,b) [11] [12] and completed by Xun and Lubrano (2015) [37] described in equations (4) and (5). As explained above, unlike the one-tiered model, the two-tiered model allows the parameters which characterize the decision regarding y = 0 versus y > 0 to be separate from the parameters which determine the decision regarding how much y is given that y > 0.

 $<sup>^{16}</sup>$  For example, Knill et al. (2012b) [30] have 3,752 observations and Karolyi and Liao (2017) [27] 1,482 observations in their model.

 $<sup>^{17}\</sup>mathrm{As}$  only 9% of acquiring countries invest in target countries with the same language, we do not consider this variable in the model.

We implement Wooldridge's initial conditions with censoring for the lags for the one-tiered and the two-tiered models. The results of the one-tiered and two-tiered dynamic panel Tobit models with individual random effects are reported in Table 5.

Several elements illustrates the performance of the two-tiered dynamic Tobit panel model compared to the one-tiered. First, the log-likelihood function has a much higher value than that of the corresponding one-tiered model. Second, this model relaxes many constraints allowing the asymmetric effects between the two equations to be captured. In particular, variables capturing political distance between both countries like *POLITY* and *GOVSTAB* or the variable measuring the country's degree of capital account (KAOPEN) are significant in the two-tiered model but not in the one-tiered. At last, the individual effect parameters  $(\lambda' s)$  are significant in the two-tiered model but not in the one-tiered, which means that the dynamic component in the model is significantly different to zero only when we consider the two-tiered model. This suggests that ignoring the two-stage nature of the investment decision and assuming that the country factors have the same impact in both stages as in a one-tiered Tobit model is therefore a restrictive approach and leads to biased conclusion, which confirms our Hypothesis 2. Our result also confirms the significance of the lagged dependent variable in the two-tiered panel model compared to the one-tiered panel model, meaning that the dynamic component is crucial in the SWF's investment decision process and should be taken into account in the two-tiered model.

# 5.2.2. Results of the two-tiered dynamic Tobit panel model

Results of the two-tiered dynamic Tobit model with panel data are given in Table ??. Panel A displays the results of the first stage (investment decision) and Panel B the results of the second stage (the decision about the amount to invest). The same explanatory variables have been included in each step of the two-tiered model. For both equations, we include in the first column all the possible explanatory variables, corresponding to the full model. We then report the estimates of different restricted versions of this model with variables estimated one by one (columns (2) to (6)). Columns (7) gives the results of the parsimonious model.

First, we find that most of country-pair variables are significant both in Panel A and in Panel B, which means that country factors (macroeconomic, geographical, institutional and cultural factors) turn out to be key determinants of SWFs investments. This result is also in line with the conclusions of some recent studies according to which SWFs motivations may be non-financial (Chhaochharia and Laeven (2009) [13], Bernstein et al. (2013) [6] or Knill et al. (2012b) [30]). The importance of country factors constitutes also a key point in order to evaluate the role of SWFs investments in crisis periods. If they were exclusively driven by the quest of financial returns they could be a destabilizing force for financial markets. On the contrary we show that macroeconomic determinants are crucial for SWFs. Such a finding tends to support the idea that SWFs investments follow long run horizon strategies, constituting hence potential market stabilizers in turmoil period.

Second, our estimations indicate that: i) country-level factors have a positive impact not only on the investment decision, but also on the amount decision to be invested which is conditional on the investment decision. This is clearly the case for the variable *POLICY* which is significant in both equations; ii) these country factors driven the SWF investment decision are not the same as the ones used to fix the amount to be invested, which is consistent with Hypothesis 2. More precisely, we find that the financial openness index KAOPEN does not matter for the decision to invest whereas a high difference in the financial openness index between the SWF and target country tends to decrease the average value of the deal. On the contrary, higher government stability difference (*GOVSTAB*) increases the probability of a SWF investment but does not affect the amount to be invested. In support of this result, Knill et al. (2012b) [30]) find that bilateral political relations between SWF and target countries are an important determinant of why SWFs invest in a given country but they matter less in determining how much to invest. On the basis of our results, we can conclude that the complex decision-making process of SWFs that lead to investment location choice implies to disentangle the determinants driven the SWF investment decision of those used to fix the amount to be invested.

Regarding hypothesis 1 which stresses that SWFs tend to invest in countries which share the same macroeconomic, geographical and institutional characteristics, we find some contrasted results concerning macroeconomic and cultural factors. While the variable *GDP* is never significant, we observe that the coefficient for *REER* is significantly positive in Panel B but not in Panel A whereas it is the reverse for the variable *INFLATION*. This suggests that the greater is the difference in terms of *REER*, the more a SWF tends to invest large amounts. On the contrary, the greater the difference in terms of inflation, the more likely a SWF is to invest. These results can be interpreted as the fact that SWFs may prefer to invest in countries that do not share the same macroeconomic characteristics as theirs. As seen in previous section, the majority of the most active SWFs are located in Asia and in the Middle East and show a clear preference to invest in developed countries (North America and West Europe) that have a more stable economy both in terms of inflation and exchange rates.

Concerning cultural factors, unlike Chhaochharia and Laeven (2009) [13] and Bernstein et al. (2013) [6], we do not find some empirical supports that SWFs are focused on countries which share the cultural characteristics as theirs or are geographically close to theirs (the variables *RELIGION* and *DIST* are not significant both in Panel A and in Panel B). This result does not corroborate the idea that SWFs invest having in mind religious or cultural proselytism (Islamic finance). In a same way, we do not find some evidence of a home or a region bias in the SWF investment policy. However, hypothesis 1 is well supported by our results concerning political and institutional factors. The significance of *POLITY*, *GOV STAB*, *KAOPEN* and *POLITICIANS* clearly reveal that country factors are essential in the SWFs investment decision process. More specifically, we find that *POLITY* and *KAOPEN* are negatively related to SWFs investments (decision and/or the amount to be invested), meaning that SWFs are more likely to invest in countries with which they have lesser differences in the democracy level as well as in the financial openness. The first result, which is consistent with Karolyi and Liao (2017) [27], means that SWFs prefer to invest in countries with which they have similar levels of democracy.<sup>18</sup> Moreover, the variable *GOV STAB* is positively related to SWFs investment decision but does not have an impact on the amounts to be invested, which means that a SWF is more likely to invest in a country when the government stability is different. Contrary to Bernstein et al. (2013) [6], we find that the presence of politicians in the fund significantly influences the decision to invest abroad.<sup>19</sup> At last, the characteristics of the fund itself like its size or its origin (commodity fund or not) do not seem to influence its investment strategy.

Hypothesis 3 deals with the autoregressive terms and assumes that when a SWF is investing in a country it is likely that it will invest again in the future. In other words, the autoregressive coefficients ( $\lambda's$ ) will be significantly different from 0. It appears that indeed in Panel A only  $\lambda_1$  is significant. It indicates that a SWF tends thus to reinvest in a country where it has already invested. We also observe that  $\lambda_2$  is not significantly different from 0, which indicates that there is no investment barrier for countries where SWFs have never invested in. For Panel B, both  $\lambda_1$  and  $\lambda_2$  are significant, supporting the idea of an inertia in the amount invested by SWFs.

<sup>&</sup>lt;sup>18</sup>Knill et al. (2012b) [30]) find however that POLITY is positively related to SWF investment (decision and the amount to be invested).

<sup>&</sup>lt;sup>19</sup>Note however that we don't take into account the SWF decision of investment at home unlike Bernstein et al. (2013) [6].

# 5.3. Some refinement on country-pair variables

Results found in Tables 5 allow to know if country-pairs variables are significant but not to deduct what is the sense of the difference: does the probability of investment done by the SWF country (decision and/or the amount to be invested) tend to increase or decrease when the difference between SWF country factors and those of target country is negative (positive)? For that, country-pair variables described in Equation (5) were split in order to determine if there is a difference in favor of the acquirer or of the host country:

$$x_{ij,t,+} = x_{j,t} - x_{i,t} \qquad with \quad x_j > x_i \tag{10}$$

$$x_{ij,t,-} = x_{j,t} - x_{i,t} \qquad with \quad x_j < x_i \tag{11}$$

The results are displayed in Tables 7. Panel A displays the results of the first stage (investment decision) and Panel B the results of the second stage (the decision about the amount to invest). These new results confirm the role of political and institutional variables in the attraction of SWFs: stability of the government, democracy index and degree of capital account openness. In particular, we find that political stability of the target country is expected a factor that contributes to the attractiveness when acquirer country is less stable politically (GOV STAB+ is positive and highly significant in Panel A).

Once again, we find that the determinants driven the SWF investment decision are not the same as the ones used to fix the amount to be invested. More precisely, POLITY- and KAOPEN+ are negative and significant in panel B, which means that SWFs are more prone to investing for large amounts in countries that are less democratic and more financially opened. Strikingly, KAOPEN- is significantly positive in panel A whereas KAOPEN+ is significantly negative in panel B. This result means that the degree of financial openness of the target country matters for both the SWFs investment decision and the amount to be invested.

# 6. Conclusion

One of the great fears surrounding SWF cross-border investments and well document in the academic literature is that these will be made for non-financial motives but for other motives. This paper aims to shed light on the question of the motivation of SWFs in their investment decision and more precisely whether country-level factors like macroeconomic, political, institutional or cultural factors can explain this decision. More specifically, we develop an approach that takes into account the fact that the cross-border investment decision for a SWF is the outcome of a complex decision making process. To do so, we propose a two-tiered dynamic Tobit panel model recently developed by Chang (2011b) [12] and extended by Xun and Lubrano (2015) [37], which allows to test three important aspects in this decision making process: i) the independence of the SWF decision of where and how much to invest (which justifies the choice of the two-tiered model); ii) the persistence phenomenon in the investment decision which is accounted in the dynamic dimension of the model; iii) the inclusion of the temporal dimension as well as the unobserved heterogeneity in the dependent variable taken into account in the panel dimension of the model.

Several insights emerge from our analysis. From an econometric perspective, the key insight from this paper is that the choice of the model allows to estimate independently the decision of where and how much to invest. The results of the analysis indicate that the determinants driven the SWF investment decision are not the same as the ones used to fix the amount to be invested. This suggests that ignoring the two-stage nature of the investment decision and assuming that the country factors have the same impact in both stages as in a Tobit model is therefore a restrictive approach. On the basis of our results, we can conclude that country-level factors are key determinants not only of the investment decision but also of the amount decision to be invested. In the same spirit, we find that the dynamic component in the two-tiered panel model is crucial, suggesting that SWFs have a tendency to invest again and for the same amounts in the following years in the target country once the decision to invest has been taken.

The results of the model also suggest that country-level factors can affect the SWF investment decision which means that financial motives are not the exclusive target of their investment strategy. In particular, we find that SWF investments are driven by macroeconomic, political and institutional considerations. The findings regarding macroeconomic variables show that more mature economies tend to attract SWF investments. Our findings additionally show that SWFs where politicians are involved have a much greater likelihood of investing abroad and they tend to attract by countries with higher political stability. At last, we find that SWFs are more prone to investing for large amounts in countries that are less democratic and more financially opened, which means that the determinants driven the investment decision are not the same as the ones used to fix the amount to be invested. Taken as a whole, our results lend support to the idea that SWFs are safe in the choice of target countries concerning their investment decision but behave as more opportunistic investors concerning the amount to be invested. Our results shed new light on SWFs investment strategy for regulators seeking to enhance financial stability, motivating, in line with the Santiago principles, a better evaluation of macroeconomic risks.

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#### Table 1: Annual Distribution of SWF Foreign Investments

This table presents the number of deals and the total deal value by year of cross-border investments led by SWFs (excluding Norway). Column 3 gives the proportion of the number SWFs investments made year t among all the investments made over the period 2000-2013. Column 5 gives the proportion of the value of SWFs investments made year t among the total value of SWFs foreign investments over the period 2000-2013.

Year	Number of	Proportion	Total value of	Proportion
	foreign investments	(Number of deals)	foreign investments (USD million)	(Amount)
2000	17	2.8%	3,665.9	1.3%
2001	4	0.7%	9,260.7	3.3%
2002	8	1.3%	898.9	0.3%
2003	13	2.1%	2,713.3	1.0%
2004	13	2.1%	$5,\!108$	1.8%
2005	42	6.9%	11,727	4.2%
2006	87	14.3%	20,885.3	7.5%
2007	118	19.4%	43,302.7	15.6%
2008	36	5.9%	58,860.4	21.1%
2009	34	5.6%	$21,\!415.4$	7.7%
2010	60	9.9%	24,911.5	8.9%
2011	41	6.7%	28,238.2	10.1%
2012	94	15.4%	$32,\!539.1$	11.7%
2013	42	6.9%	$14,\!880.3$	5.3%
Total	609	100%	278,406.7	100%

#### Table 2: Geographic Distribution of SWF Foreign Investments - Acquirer country

This table presents the number of deals and the total deal value by country of cross-border investments led by SWFs (excluding Norway) over the period 2000-2013. Column 3 gives the proportion of the number SWFs investments made by SWFs from country j among all the investments made over the period 2000-2013. Column 5 gives the proportion of the value of SWFs investments made by SWFs from country j among the total value of SWFs foreign investments over the period 2000-2013.

	Number of	Proportion	Total value of	Proportion
	foreign investments	(Number of deals)	foreign investments (USD million)	(Amount)
Australia	4	0.7%	477.8	0.17%
Bahrain	1	0.2%	46.0	0.02%
China	43	7.1%	34,521.9	12.4%
France	2	0.3%	167	0.06%
Kazakhstan	2	0.3%	299.1	0.11%
Kuwait	14	2.3%	12,340.8	$4,\!43\%$
Libya	7	1.1%	1,054.3	0.38%
Malaysia	25	4.1%	5,108.7	1.83%
New Zealand	3	0.5%	184.7	0.07%
Oman	16	2.6%	1,916.3	0.69%
Qatar	87	14.3%	33,600.9	12.07%
Saudi Arabia	4	0.7%	376.2	0.14%
Singapore	265	43.5%	100,422.4	36.07%
South Korea	3	0.5%	2,146.5	0.77%
UAE	133	21.8%	85,744.2	30.8%
Total, excluding Norway	609	100%	278,406.7	100%

This tables present the number and value of cross-border investments made by SWFs originated from country j to target firms in region k over the period 2000-2013. Panel A gives the number of deals, Panel B gives the total amount invested in USD billion. Table 3: Geographical Distribution of SWF Foreign Investments - Number and Average Value of Foreign Investments

Panel A: Number of Investments

					Ta	rget firm re	gions								
	Africa	Carribean	Central & South	Central	Central	East	Far	Indian	Middle	North	North	Oceanic	South East	West	Total
SWF countries		West indies	America	Asia	Europe	Europe	$\operatorname{East}$	$\operatorname{Sub}\operatorname{continent}$	East	America	Europe	Bassin	Asia	Europe	
Australia	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
$\operatorname{Bahrain}$	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
China	80	1	1	7	0	0	2	0	0	12	0	4	2	9	43
France	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
${ m Kazakhstan}$	0	0	0	0	0	0	0	0	1	0	0	0	0	1	7
Kuwait	0	0	0	0	0	0	c,	2	7	ß	0	0	0	2	14
Libya	1	0	0	1	0	0	0	0	0	1	0	0	0	4	7
Malaysia	0	0	0	0	0	0	ъ	7	4	0	0	0	6	0	25
New Zealand	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
Oman	0	0	0	0	0	1	0	7	1	0	0	1	2	4	16
Qatar	0	0	1	0	0	0	1	4	7	7	1	0	2	69	87
Saudi Arabia	1	0	0	0	0	0	0	0	1	1	0	0	0	1	4
Singapore	ŝ	0	5	7	1	0	73	53	0	49	7	21	28	28	265
South Korea	0	0	0	0	0	0	0	0	0	n	0	0	0	0	6
UAE	4	0	4	0	2	0	5	10	10	29	S	9	16	42	133
Total	17	1	11	10	c,	1	06	83	21	111	x	32	59	162	609
Proportion	2.79%	0.16%	1.81%	1.64%	0.49%	0.16%	14.78%	13.63%	3.45%	18.23%	1.31%	5.25%	9.69%	26.60%	100%

Panel B: Value of Investments

					Ta	rget firm re	egions								
	Africa	Carribean	Central and South	Central	Central	East	Far	Indian	Middle	North	North	Oceanic	South East	West	Total
SWF countries		West indies	America	Asia	Europe	Europe	East	$\operatorname{Subcontinent}$	East	America	Europe	Bassin	Asia	Europe	
Australia	0	0	0	0	0	0	0	0	0	0	0	0	0	477.8	477.8
$\operatorname{Bahrain}$	0	0	0	0	0	0	0	0	0	0	0	0	0	46	46
China	1,258.5	850.1	200	6,622.1	0	0	1262.5	0	0	15,987.7	0	1,1670.0	1,004.4	6,166.5	34,521.9
France	0	0	0	0	0	0	0	0	0	167	0	0	0	0	167
${ m Kazakhstan}$	0	0	0	0	0	0	0	0	166	0	0	0	0	133.1	299.1
Kuwait	0	0	0	0	0	0	981	3,600	117	6,450	0	0	0	1,193.8	12, 340.8
Libya	44.8	0	0	300	0	0	0	0	0	319.7	0	0	0	389.8	1,054.3
Malaysia	0	0	0	0	0	0	352.7	603.3	730.1	0	0	0	3,422.6	0	5,108.7
New Zealand	0	0	0	0	0	0	1.8	0	0	182.9	0	0	0	0	184.7
Oman	0	0	0	0	0	128.8	0	434.1	79	0	0	2.5	85.5	1, 186.5	1,916.3
Qatar	0	0	2,719	0	0	0	78	800	246.8	1,957.8	44	0	2,389	25,366.3	33,600.9
Saudi Arabia	7,625	0	0	0	0	0	0	0	155	200	0	0	0	153.6	376.2
Singapore	2,693	0	1,010,0	412	43	0	21,700.5	6,000	0	24,268.4	360.9	16,683.0	4,256.0	22,994.5	100,422.4
South Korea	0	0	0	0	0	0	0	0	0	2,146.5	0	0	0	0	2,146.5
UAE	9	0	750.2	0	361	0	1,590.8	5,598.15	929.7	25, 249	6, 126.4	3,402.9	8,211.9	33,518.2	85,744.2
Total	4,010.0	850.1	4,679.2	7335.1	404	128.8	25,967.3	17,035.5	2,283.6	76,929.0	6,531.3	21,258.4	19,369.3	91,625.1	278,406.7
Proportion	1.44%	0.31%	1.68%	2.63%	0.15%	0.05%	9.33%	6.12%	0.82%	27.63%	2.35%	7.64%	6.96%	32.91%	100%

#### **Table 4: Summary Statistics**

This tables provides the summary statistics for the variables used in our two-tiered dynamic Tobit model. SWF DUMMY is a dummy variable that takes the value or one if there is at least one SWF investment in country i over the period 2000-2013, and zero otherwise. The statistics of this variable are calculated using all possible country pairs. The statistics of the other variables are calculated using all country pairs between which there have been at least one transaction over the period 2000-2013. SWF DEAL is the number of SWF investments in the bilateral pair for target country i, SWF nation j and time t. SWF AMOUNT is the amount of SWF investments in the bilateral pair for target country i, SWF nation j and time t. DIST is the geographic distance between country i and country j. CLOSE is a dummy that takes the value of one if the potential target nation is within 1,000 miles of the SWF nation. GDP is the GDP growth rate difference between the SWF and target nation. INFLATION is the Inflation rate difference between the SWF and target nation. REER is the real effective exchange rate difference between the SWF and target nation. KAOPEN is the financial openness index difference between the SWF and target nation. POLITY is the Polity IV index of authority of a regime difference between the SWF and target nation. GOV STAB is the government stability index difference between the SWF and target nation. CORRUPTION is the corruption index difference between the SWF and target nation. RELIGION is a dummy that takes the value of one if the target nation and the SWF country have the same predominant religion, zero otherwise. LANGUAGE is a dummy that takes the value of one if the target nation and the SWF country have the same predominant language, 0 otherwise. LARGE is a dummy variable that takes the value of one if the SWFs' assets under management are above USD100 billion, zero otherwise. POLITICIANS is a dummy variable that takes the value of one if the SWF have at least one politician on his board. COMMODITY is a dummy variable that takes the value of one if the SWF's assets come from commodity, zero otherwise.

	Mean	Median	Min	Max	Std Dev
SWF DUMMY	0.021	0	0	1	0.14
SWF DEAL	1.94	1	1	40	2.74
SWF AMOUNT	499.26	168.25	0.152	9,760	1,003.86
DIST	$6,\!619.64$	$5,\!414.37$	327.46	$17,\!595.10$	$4,\!191.05$
CLOSE	0.07	0	0	1	0.26
GDP	2.69	2.70	-12.82	24.16	5.48
INFLATION	-0.007	-0.19	-25.40	12.24	4.98
REER	4.82	1.06	-31.81	217.28	17.66
POLITY	-0.54	-0.6	-1	0.8	0.39
KAOPEN	0.12	0	-0.84	1	0.46
RELIGION	0.17	0	0	1	0.38
LANGUAGE	0.09	0	0	1	0.28
GOV STAB	1.98	2.13	-4.46	5.92	1.87
CORRUPTION	-0.23	-0.10	-3.5	3.5	1.64
COMMODITY	0.42	0	0	1	0.49
LARGE	0.86	1	0	1	0.35
POLITICIANS	0.96	1	0	1	0.21

#### Table 5: One-tiered and two-tiered dynamic Tobit panel results

This table reports results for the one-tiered and two-tiered dynamic panel tobit models. Column (2) gives the results of the one-tiered model, columns (3) and (4) report respectively the results for the first equation (decision to invest) and the second equation (amount to be invested) of the two-tiered model. The summary statistics of these variables are presented in Table 4. Appendix 3 presents details on variables construction.

	One-ti	er		Two	-tier	
	2		Equatio	on 1	Equatio	on 1
CONSTANT	-112.600	***	-5.6680	***	14.749	***
	[20.330]		[0.4553]		[0.711]	
INFLATION	1.0870	**	0.0023	**	-0.0013	
	[0.3593]		[0.0079]		[0.0237]	
REER	-0.1304		0.0026		0.0166	**
	[0.0705]		[0.0019]		[0.0063]	
	11 0000		0.9967	***	1 6910	***
POLITY	-11.6000		-0.8367	-111-	-1.6312	-111-
	[6.349]		[0.2465]		[0.4714]	
KAODEN	14 8500	*	0.2040		0.0840	***
KAOI EN	[7 252]		[0.1870]		[0.3402]	
	[1.202]		[0.1079]		[0.3402]	
GOVSTAB	1 6390		1 1410	***	0.0520	
dovbinb	[0.8935]		[0.0353]		[0.0740]	
	[010000]		[0.0000]		[0101 10]	
POLITICIANS	15.1500	*	0.3371	*	-0.0768	
	[7.0250]		[0.1436]		[0.2713]	
	[]				[]	
DIST	-0.0011	*	-0.0001		-0.0001	
	[0.0005]		[0.0001]		[0.0001]	
GDP	0.0230		-0.0001		-0.0089	
	[0.2170]		[0.0065]		[0.0211]	
CORRUPTION	-1.7880		0.0066		-0.0060	
	[1.6400]		[0.0536]		[0.1069]	
RELIGION	-1.0280		-0.2148		-0.1517	
	[1.3340]		[0.2004]		[0.3693]	
LADCE	20,0000	***	0.0401		0.0000	
LARGE	30.0000	-111-	0.0491		-0.2088	
	[8.0330]		[0.1044]		[0.1987]	
COMMODITY	28 120	**	0.1817		0 1470	
COMMODITI	-28.130		-0.1017		-0.1479	
	[9.1100]		[0.1195]		[0.2256]	
$\lambda_1$	-37.9600		0.1108	***	0.0843	**
<i>N</i> 1	[34 5900]		[0.0150]		[0.0263]	
	[01:0000]		[ [0.0100]		[0.0200]	
$\lambda_2$	7.3310		0.3811		1.4477	**
	[5.8070]		[0.2416]		[0.4956]	
	[- 20.0]		[]		[]	
			1			
Log-likelihood	-2,331.1	21		-1,79	00.16	

\* Significant at 10%; \*\*significant at 5%; \*\*\* significant at 1%. Standard errors are in brackets.

#### Table 6: Two-Tiered Dynamic Tobit Panel Results

This table reports results for the panel analysis of investment decision (Panel A: first equation of the twotiered tobit model) and the average amount invested by SWFs (Panel B: second equation of the two-tiered tobit. Column (1) gives the results of the full model, columns (2) to (6) report the estimates of different restricted versions of this model with variables estimated one by one. Columns (7) gives the results of the parsimonious model. The summary statistics of these variables are presented in Table 4. Appendix 3 presents details on variables construction.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
CONSTANT	-5.6680*** [0.45531]	-5.3350*** [0.3772]	$-5.4006^{***}$ [0.3551]	-5.8073*** [0.3339]	-5.8922*** [0.4083]	$-5.8619^{***}$ [0.4328]	-5.7969*** [0.4588]	
INFLATION	$0.0023^{**}$ [0.0079]	$0.0241^{**}$ [0,0078]					$0.0254^{*}$ [0.1116]	
REER	0.0026 [0.0019]		0.0022 [0.0016]				0.0024 [0.0032]	
POLITY	-0.8367*** [0.2465]			-1.1362*** [0.1740]			-0.8155** [0.2566]	
KAOPEN	$0.3040 \\ [0.1879]$				-0.0399 $[0.1808]$		0.2446 [0.1570]	
GOV STAB	$0.141^{***}$ [0.0353]					$\begin{array}{c} 0.2081^{***} \\ [0.0331] \end{array}$	$0.1276^{***}$ [0.0370]	
POLITICIANS	$0.3371^{*}$ [0.1436]						0.2322 [0.1384]	
DIST	-0.0001 [0.0001]							
GDP	-0.0001 $[0.0065]$							
CORRUPTION	0.0066 [ $0.0536$ ]							
RELIGION	-0.2148 [0.2004]							
LARGE	0.0491 [0.1044]							
COMMODITY	-0.1817 [0.1193]							
$\lambda_1$	$0.1108^{***}$ [0.0150]	$0.1320^{***}$ [0.0155]	$0.1369^{***}$ [0.0151]	$\begin{array}{c} 0.1325^{***} \\ [0.0154] \end{array}$	$\begin{array}{c} 0.3943^{***} \\ [0.0616] \end{array}$	$\begin{array}{c} 0.3821^{***} \\ [0.0488] \end{array}$	$\begin{array}{c} 0.1141^{***} \\ [0.0209] \end{array}$	
$\lambda_2$	0.3811 [0.2416]	$0.4798^{*}$ [0.2345]	$0.5454^{*}$ [0.2325]	$0.5240^{*}$ [0.2326]	0.4204 [0.2843]	0.1925 [0.2124]	0.4398 [0.3320]	

Panel A : decision to invest (first equation)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CONSTANT	$14.749^{***}$ $[0.7112]$	$14.440^{***}$ [0.5287]	$\begin{array}{c} 14.3271^{***} \\ [0.5205] \end{array}$	13.5139*** [0.4828]	-0.1999 [0.2878]	-0.5977 $[0.5682]$	$14.2596^{***}$ [0.6837]
INFLATION	-0.0013 [0.0237]	$0.0463^{*}$ [0.0205]					0.0112 [0.0187]
REER	$0.0166^{**}$ [0.0063]		$0.0180^{**}$ [0.0611]				$0.0149^{*}$ [0.0071]
POLITY	$-1.6312^{***}$ [0.4714]			$-2.0217^{***}$ [0.2931]			-1.5655*** [0.3970]
KAOPEN	-0.984** [0.3402]				-1.5821*** [0.3199]		-1.0810*** [0.3193]
GOV STAB	0.052 [0.0740]					$0.1801^{**}$ [0.0549]	0.0406 [0.0680]
POLITICIANS	-0.0768 [0.2713]						0.0212 [0.2596]
DIST	-0.0001 [0.0001]						
GDP	-0.0089 $[0.0211]$						
CORRUPTION	-0.006 [0.1069]						
RELIGION	-0.1517 $[0.3693]$						
LARGE	-0.2088 [0.1987]						
COMMODITY	-0.1479 [0.2238]						
$\lambda_1$	$0.0843^{**}$ [0.0263]	$\begin{array}{c} 0.1144^{***} \\ [0.0247] \end{array}$	$0.1175 \\ [0.0241]$	$\begin{array}{c} 0.1103^{***} \\ [0.0240] \end{array}$	$0.4538^{***}$ [0.0532]	$0.4900^{***}$ [0.0764]	$0.0838^{*}$ [0.0377]
$\lambda_2$	$1.4477^{**}$ [0.4956]	$2.0140^{***} \\ [0.4552]$	2.0512*** [0.4462]	$\frac{1.9122^{***}}{[0.4412]}$	$1.9828^{***}$ [0.3127]	2.2383*** [0.4137]	1.4461* [0.6393]
$\sigma_u$	$1.5030^{***}$ [0.0564]	$\frac{1.5840^{***}}{[0.0637]}$	$1.5676^{***}$ [0.0556]	$1.5475^{***}$ [0.0684]	$\frac{1.5107^{***}}{[0.0525]}$	$\frac{1.5645^{***}}{[0.0671]}$	$\begin{array}{c} 1.4860^{***} \\ [0.0524] \end{array}$
$\sigma_d$	$1.598^{***}$ [0.1614]	-1.632*** [0.1730]	$-1.6242^{***}$ [0.1685]	1.6193*** [0.1002]	$2.1375^{***}$ [0.1274]	$\frac{1.9666^{***}}{[0.2193]}$	$\begin{array}{c} 1.5778^{***} \\ [0.1613] \end{array}$
ζ	8.4075*** [0.0537]	183.80000*** [0.0559]	305.14803*** [0.0533]	312.6726*** [0.0562]	318.0181*** [0.0405]	$\begin{array}{c} 134.5328^{***} \\ [0.0455] \end{array}$	10.4812*** [0.0495]
Log- Likelihood	-1,790.16	-2,040.09	-2,042.39	-2,012.29	-1,990.08	-1,975.75	-1,911.33
Iterations	697	472	522	476	388	406	532

Panel B: Amounts to be invested (second equation)

\* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Standard errors are in brackets.

### Table 7: Two-Tiered Dynamic Tobit Panel Results - Robustness checks

This table reports results for the panel analysis of the decision to invest and the average amount invested by SWFs taking into account the sign of the difference. The explanatory variables (x) have been calculated with the following formula :  $x_{ij} = x_j - x_i$  where *i* is the target country and *j* is the acquirer country. We then decided to reestimate the model taking into account both the cases in which  $x_j > x_i$  (*xij*+) and  $x_j < x_i$ (*xij*-). Column (1) gives the results for Panel A (decision to invest) and column (2) gives the results for Panel B (amounts to be invested).

	Panel A	Panel B
CONSTANT	$-4.7568^{***}$ [0.4211]	$14.4400^{***}$ $[0.5287]$
INFLATION+	0.0260 [ $0.0189$ ]	-0.0249 $[0.0347]$
INFLATION-	$0.0503^{**}$ [0.0175]	0.0193 [0.0379]
REER+	0.0119 [0.0075]	0.0329 [0.0228]
REER-	-0.0046 [0.0040]	-0.0016 [0.0089]
POLITY+	-0.7578 $[05999]$	-1.5032 [1.1601]
POLITY-	-0.3437 [0.3747]	-1.3609** [0.4734]
KAOPEN+	-0.0257 [0.3392]	$-1.6370^{***}$ [0.4533]
KAOPEN-	$1.0905^{***}$ [0.3065]	0.1158 [0.5093]
GOV STAB+	$\begin{array}{c} 0.1768^{***} \\ [0.0391] \end{array}$	$0.0800 \\ [0.0741]$
GOV STAB-	0.0519 [ $0.0969$ ]	-0.3367 [0.2006]
$\lambda_1$	$0.084^{**}$ [0.0741]	$0.0807^{**}$ [0.0245]
$\lambda_2$	$\begin{array}{c} 0.2078^{***} \\ [0.2345] \end{array}$	1.4329** [0.4466]
$\sigma_u$	1.470 $[0.0]$	)4*** 491]
$\sigma_d$	1.498 [0.1	81*** 266
ζ	56.84 [0.0	40*** 564]
Log-Likelihood	-185	33.78
Iterations	5	38

\* Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Standard errors are in brackets.

		Appendi	c 1. List of SV	$v \mathbf{Fs}$		
Country	Fund name	Assets Under Management	Founding date	Source of the funds	Policy purpose	Presence of politicians in the SWF board
Australia	Queensland Investment Corporation	70.6	1992	Fiscal	Unknown	Yes
Australia	Victorian Funds Management Corporation	46.6	1994	Unknown	Unknown	No
Australia	Australian Future Fund	95	2006	Non-commodity	Saving	No
Bahrain	Bahrain Mumtalakat Holding Company	10.5	2006	Non-commodity	Saving Reserve investment	Unknown
China	China Investment Corporation	652.7	2007	Non-commodity	Reserve investment	Yes
China	China SAFE Investment	567.9	1997	Non-commodity	Reserve investment	$\gamma_{es}$
China	National Social Security Fund	201.6	2000	Non-commodity	Reserve investment	Yes
China	China-Africa Development Fund	J.	2007	Non-commodity	Reserve investment	Yes
France	France Strategic investment fund	25.5	2008	Non-commodity	Pension reserve	Yes
Kazakhstan	Samruk Kazyna National Wealth Fund	77.5	2008	Non-commodity	Stabilisation Saving Pension reserve	No
Kuwait	Kuwait Investment Authority	548	1953	Oil and gas	Stabilisation Saving	Yes
libya	Libyan Investment Authority	66	2006	Oil and gas	Saving	Yes
Malaysia	Khazanah Nasional	40.5	1993	Non-commodity	Saving	No
New Zealand	New Zealand Superannuation Fund	28.98	2001	Non-commodity	Pension reserve	Yes
Oman	State General Reserve Fund	13	1980	Oil and gas	Stabilisation Reserve investment	No
Oman	Oman Investment Fund	6	2006	Oil and gas	Reserve investment	No
Qatar	Qatar Investment Authority	170	2005	Oil and gas	Saving Reserve investment	No
Saudi Arabia	Kingdom Holding	19.6	1996	Oil and gas	Reserve investment	Unknown
Singapore	Government of Singapore Investment Corporation	320	1981	Non-commodity	Saving Reserve investment	No
Singapore	Temasek	177	1974	Non-commodity	Saving Reserve investment	No
South Korea	Korea Investment Corporation	72	2005	Non-commodity	Reserve investment	Yes
UAE	Dubai Holding	NA	2004	Oil and gas	Unknown	Yes
UAE	Dubai World	NA	2004	Oil and gas	Reserve investment	Yes
UAE	Abu Dhabi Mubadala Development Com- pany	60.9	2002	Oil and gas	Reserve investment	No
UAE	Abu Dhabi International Petroleum Invest- ment Company	68.4	1984	Oil and gas	Reserve investment	Yes
UAE	Abu Dhabi Investment Authority	773	1976	Oil and gas	Saving Reserve investment	Yes
UAE	Ras-al-Khaimah Investment Authority	1.2	2005	Oil and gas	Reserve investment	No
UAE	Investment Corporation of Dubai	70	2006	Oil and gas	Reserve investment	No
UAE	Abu Dhabi Investment Council	06	2007	Oil and gas	Reserve investment	Yes

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Appendix	

Title	Authors	Year	Model	Endogeneous variable	Explanatory variables	Main Results
The investment strategies of SWF	Bernstein, Lerner and Scholar	2013	Cross-section OLS Regression	Acquisition stake	Political fac- tors	The involvement of external managers and the presence of politicians on the board lead to smaller acquisitions but the impact of politicians compared to external managers is weaker.
SWF: their investment strategies and perfor- mance	Chhaochharia and Laeven	2009	Cross-section gravity model	log difference between the share of country j in to- tal equity investment by SWFs from country i and the share of country j in the world equity market	Financial, geographi- cal, cultural factors	SWFs tend to invest in countries that share a common culture but this cultural bias disappear with repeated investments. SWFs display industry bias (more investments in oil company stocks) and tend to invest mostly in large capitalization stock.
What is different about government-controlled ac- quirers in cross-border ac- quisitions	Karolyi and Liao	2017	Cross section Logit model	Dummy variable equal to 1 if the firm is targeted by a SWFs and 0 if it is targeted by other government-controlled en- tities	Financial factors	SWFs are more likely to be influenced by market valuations relative to other government-led acquirers. There are impor- tant differences between government led acquirers and SWFs. SWF-led acquisitions are less likely to fail, they are more likely to pursue acquirers that are larger in total assets and with fewer financial constraints.
Bilateral Political Rela- tions and SWF investment	Knill, Lee and Mauck	2012	Cross-section Tobit and Cragg Models	Investment amount	Economic, Financial, Institutional, political and geographical factors	Economic factors are negatively related to the investment de- cision of SWFs whereas the geographical and institutional dis- tances are positively related to the decision to invest. Political relations are an important factor in where SWFs invest but matter less in determining the size of the investment.
SWF Investments: from firm-level preferences to natural endowments	Avendano	2012	Cross-section regression and gravity model	Bilateral holding	Economic and financial factors	SWF equity allocation is not fully explained by firm-level de- terminants. Other factors related to diversification and natural endowments (e.g. forest areas, fuel exports), partially explain the shift of SWF equity investments towards commodity and natural resource sectors.
Are SWFs' investments politically biased? A comparaison with mutual funds	Avendano and Santiso	2009	Descriptive anal- ysis	N/A	Political fac- tors	SWFs and mutual funds investments converge when looking at the political profile of targeted countries.
Determinants of SWF cross-border investments	Megginson, You and Han	2013	Cross-section To- bit model	Ratios based on the amount invested by SWFs	Economic, financial, geographical and cultural factors	From the target countrys perspective, high levels of investor protection, strong economic performance, and well developed local capital markets attract higher levels of inbound SWF investment. Moreover, SWFs are likely to invest in countries sharing the same culture, and investment value will be higher if the bilateral trade between the acquirer and target countries puely commercial investors facilitating cross-border corporate investment.
Determinants of SWF in- vestment in private equity vs. public equity	Johan, Knill and Mauck	2013	Probit model	Dummy variable equals to 1 if the target firm is pri- vate and 0 otherwise	Financial, geographical and cultural factors	Cross-border investment by SWFs involves target nations where investor protection is low. SWFs are more likely to invest in private equity when the bilateral political relations between the countries are low. Cultural differences are posi- tively related to the decision to invest in private equity abroad.
Are SWFs contrarian in- vestors	Ciarlone and Miceli	2014	Panel probit and tobit models	Investment decision and the share of equity invest- ment in country j at time t on total equity invest- ments by all SWFs at time t	Economic, financial and institutional factors	SWFs prefer to invest in countries with a higher degree of eco- nomic development, larger and more liquid financial markets, institutions that offer better protection of legal rights, and a more stable macroeconomic environment.

Appendix 2. Literature review

	Source	ign	is a	ob- Maps of World mla Par- des.	luct World Bank Development Indi- cators	) to World Bank Development Indi- cators	5 41 Bruegel	me, Center for Systemic Peace	get ry's tues ther	ant CIA World Factbook	get ICRG try ants ther	RG ICRG the	ues SWF Institute SWFs' websites	are SWF Institute SWFs' websites	1 of SWF Institute
Appendix 3. Description of the variables	Definition	Number of deals in which the target is from country i and the acquirer is a Sovere Wealth Fund from country j	Average value of the deals in which the target is from country i and the acquirer Sovereign Wealth Fund from country	Geographic Distance in kilometers between the capital of countries i and j. We tained latitude and longitudes of capital cities of each country and apply the form : 6378* arcos [sin(lat Acquirer) * sin(lat Target) + cos (lat Acquirer) * cos (lat Tget) * cos (lat Target - lon Acquirer)], where lat and lon are latitudes and longitud (Following the methodology of Knill and al., 2012)	Difference in the Average Annual Real Growth Rate of the Gross Domestic Prod from 2000 to 2013 between acquirer and target country.	Difference in the Inflation Rate measured by the Consumer Price Index from 2000 2013 between acquirer and target country.	Annual Consumer Price Index Based Real Effective Exchange Rates considering trading partners from 2000 to 2013 taken in difference between countries j and i.	Polity score of the Polity IV Project that captures the level of authority of a reginanging from -10 (hereditary monarchy) to 10 (consolidated democracy), taken difference between countries j and i.	Difference in the Normalized KAOPEN index taken between acquirer and tar country. Initially introduced by Chinn and Ito (2006), this index measures a count degree of capital account openness. As the index is not available for 2013, the val for this year has been estimated by the authors (linear interpolation). The hig the index is, the more the country is financially opened.	Dummy variable which is equal to 1 if country i and j has the same predomin religion and 0 otherwise.	Difference in the ICRG Government Stability index between acquirer and tan country. The ICRG government stability index assesses both the ability of a coun to carry out its declared program, and its ability to stay in office. The subcompone are: i)Government Unity; ii) Legislative Strength; iii) Popular Support. The hig the index is, the lower is the risk (ranging from 0 to 12).	Difference in ICRG Corruption index between acquirer and target country. The IC corruption index assesses the corruption within the political system. The higher index is, the lower is the corruption (ranging from 0 to 6).	Dummy variable that is equal to 1 if the SWF's funds come from commodity reven (oil, gas, minerals) and 0 otherwise.	Dummy variable that is equal to 1 if the assets under management of a SWF superior to USD 100 billion, and 0 otherwise.	Dummy variable that is equal to 1 if there is at least one politician on the board
	Code	SWF DEALS	SWF AMOUNT	DIST	GDP	INFLATION	REER	POLITY	KAOPEN	RELIGION	GOV STAB	CORRUPTION	COMMODITY	LARGE	POLITICIANS
	Variable	Number of deals from country j to country i	Average value of deals from country j to coun- try i	Geographic proximity	GDP Growth Differ- ences	Inflation Rate Differ- ence	Real Effective Ex- change Rate Differ- ences	PolityIV Democracy Index Differences	KAOPEN Index Dif- ferences	Religion Dummy	Government Stability Index Differences	Corruption Index Dif- ferences	Origin of the Funds Dummy	Size of the Fund Dummy	Presence of Politicians

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3. I
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