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# Determinants of Large Versus Small Cross-Border Acquisitions for Sovereign Wealth Funds

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## Determinants of Large Versus Small Cross-Border Acquisitions for Sovereign Wealth Funds

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#### Abstract

We examine the determinants of equity shares purchased by Sovereign Wealth Funds (SWFs). Based on the literature of cross-border acquisitions and entry mode choice theory, we shed light on the real drivers of these state-owned funds when they buy small or large stakes in cross-border target firms, for example: is the decision based on the target firm's characteristics? At a country-level? Is the decision sector-oriented? Or, are there financial, economic or political motives for the entry mode choice decision? Using a two-part fractional regression model together with an original dataset of SWF acquisitions and a control group of 6551 observations over 2000–2015, we find that the decision to invest and the decision on the share of equity to be acquired are two distinct processes. Therefore, ignoring the two-stage nature of the investment decision would lead to serious misspecification problems. Our results support most hypotheses derived from cross-border acquisition theory, which indicates that SWFs take the investment decision in cross-border target firms by trying to reduce transaction costs and information asymmetry, and also by taking the legal and institutional environment of the country into consideration. However, the fact that they do not hesitate to take large shares or to acquire targeted firms that are considered to be strategic and located in politically unstable countries suggests that their motives may go beyond pure profit maximization.

JEL classification: F310; F31; G15

*Keywords*: Sovereign Wealth Funds; Cross-Border Acquisitions; Fractional Regression Models; Entry Mode Choice.

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### 1 Introduction

Sovereign Wealth Funds (SWFs) have grown quite substantially since 2007, with resources estimated to be USD 8.4 trillion in February 2020. This growth has been caused by periods of high oil prices, financial globalization, and sustained large global imbalances.<sup>1</sup> Recently, SWFs have attracted considerable public attention. While their size and rapid growth suggest that they have become major world players, and have bought large stakes in companies and have given many governments exposure to sectors that 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 for host countries because it obscures what drives the SWFs' decisions: "the prospect of significant investments by SWFs potentially giving foreign countries control over important parts of an investee country's economy has emerged as a political issue" (Greene and Yeager, 2008).

While there is an extensive literature that has investigated SWF investment decision-making processes, only a few papers have tried to explain the shares of equity sought in SWFs Cross-Border Acquisitions (CBA).<sup>2</sup> According to Miracky et al. (2008), SWFs have tended to acquire larger shares (higher than 10%) in cross-border firms since the early-2000s and have an "appetite for controlling stakes". This is an important issue because it is clear that entry mode choice (partial or complete ownership, partial or large stakes) can attract hostility from host-country governments. Thus, understanding the patterns and motivations of SWFs' decision to purchase a given percentage of equity in cross-border targets is an important and understudied topic.

On the basis of the CBA literature and entry mode choice theory, we develop and test hypotheses to explain the shares of equity sought by SWFs in cross-border target firms. More specifically, we shed light on the determinants of SWFs' decisions to acquire a specific stake in cross-border target firms. We also address a number of open questions, for example: is the decision based on the target firm's characteristics? Is the decision taken at the country-level? Is the decision sector-oriented? Are there financial, economic or political motives for the entry mode choice decision, such as a greater industrial diversification or a downstream value-chain integration strategy? Or, is there a bias towards investment in strategic industries?

To take into account the fractional nature of the dependent variable, as well as the separation between the investment decision and those concerning the share of equity to be invested, we estimate a two-part version of the Fractional Response Model (FRM) of Papke and Wooldrige (1996), as developed by Ramalho and Silva (2009). The choice of this model allows us to test whether the factors that determine the investment

<sup>&</sup>lt;sup>1</sup>According to the SWF 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 has more than doubled since the beginning of the financial crisis (source: www.swfinstitute.org).

 $<sup>^{2}</sup>$ The main exception is the study of Karolyi and Liao (2017), which is based on state-owned companies and not only on SWFs.

decision in a target firm are different from those that explain the share of equity to be sought. For example, SWFs can decide to invest in one particular target firm based more on a country-level factor (e.g., the target country's openness degree to foreign investments, the economic, political and financial stability of the target country, or its level of wealth) whereas the decision of the share of equity to be sought could be based more specifically on firm-level or sector-level factors (e.g., conditional to the investment decision, they decide to acquire a higher share of equity in firms with high financial performance or based in strategic sectors). Another advantage of this model is that the conditional expectation of the fractional dependent variable is modeled without relying on strong assumptions about the distribution of this variable.

Without anticipating our results, we find that the investment decision and the decision on the share of equity to be acquired are two distinct processes, which suggests that ignoring the two-stage nature of the investment decision produces a serious misspecification problem. Our results support most hypotheses derived from CBA theory, indicating that SWFs take the investment decision in cross-border target firms by trying to reduce transaction costs and information asymmetry, and by taking into account the legal and institutional environment of the country. However, the fact that they do not hesitate to take large shares in firms considered as strategic and located in politically unstable countries suggests that their motives may go beyond pure profit maximization.

This paper is organized as follows. The next section presents the theoretical framework, the mechanisms operating behind the decisions of the stake to be purchased in cross-border acquisitions and it also formulates the hypotheses. Section 3 describes the data. Section 4 discusses the methodology and it also reports the empirical findings.

### 2 Hypotheses on the SWF acquisition dual decision process

#### 2.1 Entry mode decision theories

SWFs represent a particular category of institutional investors: they are owned by government or sovereign entities, and are either managed by them or on behalf of them (Dewenter et al (2010)). Unlike other funds or other government acquirers, the politics or the structure of the funds owned/controlled directly by the government may influence the asset allocation decision. In terms of social welfare, governments have broader goals than wealth maximization, such as the development of the national economy and maximization of employment levels.

The investment strategies used by SWFs have received some attention in the literature (see the recent surveys by Megginson and Fotak (2015) and Megginson and Gao (2019)). While some works analyse how these funds should invest, there are others that show how they invest in practice. One of the main topics related to the SWF's investment strategy is on how they select the countries and companies in which they invest. Are their investment strategies based only on financial motives? Or, are they also based on macroeconomic, political or institutional considerations? Most studies have attempted to identify the main factors driving SWF's investment decisions. Some assess whether these factors are macroeconomic (Amar et al. (2018), Boubakri et al. (2016), Chhaochharia and Laeven (2009), Ciarlone and Miceli (2016), Megginson et al. (2013)) or political (Bernstein et al. (2013), Carpantier et al. (2018), Knill et al. (2012)). Other empirical works stress the link between fund characteristics, such as size, degree of opacity, origins (commodity versus non-commodity) and the investment decision (Avendano (2012), Knill et al. (2012), Megginson et al. (2013)). These studies conclude that the investments made by SWFs are influenced by the characteristics of the SWF and the target country. A final dimension of the SWF investment decision-making process is whether they prefer investing in a particular type of firm. Existing empirical work that examines these aspects focuses on the target firm financial characteristics as determinants of SWFs investments (Fernandes (2014), Fotak et al. (2008), Kotter and Lel (2011), Megginson et al. (2013)).

All of the literature on cross-border SWF investments focuses on the determinants of the investment decision, but they tend to ignore the issue concerning the entry mode choice (partial or complete ownership, small or large stakes). However, the level of ownership is important for foreign market entry because it has implications for control over the target firm, investment requirements, and risk.<sup>3</sup> In work on entry related to CBA, entry modes are placed on a continuum ranging from non-ownership modes (licensing, exports), to partial ownership modes (green-field investments, joint-ventures, equity alliances), to complete ownership (mergers and acquisitions).<sup>4</sup>

In this paper, we build on the entry mode decision theories to derive our hypotheses on the size of the stakes in cross-border SWFs investments. Our proposed hypotheses are derived from theories that are predominantly used in M&A research, such as institutional theory, transaction cost theory and resource-basedview theory.<sup>5</sup> The hypotheses and related theoretical explanations are discussed next, and are summarized in Table 1.

### 2.2 Investment decision versus decision to acquire a certain stake size

As in Knill et al. (2012) and Amar et al. (2018), we consider the SWF's investment decision as a complex decision-making process by considering two distinct decisions: 1) the investment decision in which the SWF

 $<sup>^{3}</sup>$ As rightly underlined by one referee, there is a fundamental difference between "large stakes", which has a financial connotation, and "controlling stakes", which has a political connotation (voting rights). In this paper, we focus on the determinants of the size of the stake acquired by SWFs and not specifically on "controlling stakes".

<sup>&</sup>lt;sup>4</sup>See reviews in the entry mode literature by Brouthers (2013), Chen and Hennart (2004), Morschett et al. (2010), Raff et al. (2009), Tihanyi et al. (2005) and Zhao et al (2004).

<sup>&</sup>lt;sup>5</sup>According to Ferreira et al (2014), there is no single theory dominant in M&A research, but only four theories that are predominantly used: agency theory, institutional theory, transaction cost theory and resource-based-view theory.

chooses the country and the firm in which it will invest; and 2) conditional to the first decision, the SWF decides how much equity shares it will acquire in the target firm. Ignoring the two-stage nature of the investment decision assumes that factors explaining this decision have the same impact during both stages. In our empirical analysis, the first decision is modeled as a binary choice model and the second decision is modeled as a fractional regression model that explains the % of shares to be acquired by SWFs in one particular target firm conditional upon the decision to invest in that firm.<sup>6</sup> Based on this, our aim is to test the following hypothesis:

H1 - The determinants of a SWF's investment decision in a cross-border target firm are different from the determinants explaining the decision to acquire a certain stake size.

## 2.3 Target firm-level factors as determinants of the cross-border percentage ownership acquisition

In the literature on CBA, transaction cost theory states that the costs of finding, negotiating, and monitoring the actions of potential target firms influence the entry mode choice (Agarwal et al. (1992), Hennart and Reddy (1997), Williamson (1985)). The acquisition decision is subject to valuation problems because the target firm knows more than the acquirer about the value of its assets. This asymmetric information about the target firm's assets makes it difficult for acquirers to choose good-quality targets, which creates an "adverse selection" or "lemon" type problem ((Akerlof (1970); Balakrishnan et al. (1993)) and can prevent the sale. To overcome information asymmetry and mitigate adverse selection hazard, the acquirer must bear the substantial costs in pre-screening and appraisal of the target firm's assets. According to Chen and Hennart (2004), smaller stakes can mitigate the valuation and adverse selection problems caused by asymmetric information.

Because CBA are characterized by high information asymmetry, foreign investors have less knowledge about and less experience of cross-border business, and may also have less knowledge about the value of the target firm (Balakrishnan et al. (1993); Reuer et al. (2000)). If we consider that SWFs behave like prudent investors with a long term investment horizon (Amar et al. (2018), Fernandes (2014), Kotter and Lel (2011)), the portion of equity that a long-run investor would be willing to buy will vary with the degree of information asymmetry. Greater information asymmetry will generate greater uncertainty about the target firm and will be associated with willingness to buy a lower share of the equity.

Drawing on the stream of CBA research that suggests that information asymmetry increases with un-

 $<sup>^{6}</sup>$ Knill et al. (2012) estimate a Cragg model and Amar et al. (2018) estimate a two-tiered Tobit model. Both models are based on a Tobit model in the second equation because they consider the decision of the amount to be invested and not the decision on the % of share to be acquired.

certainty about the value and performance of the target firm (Chari and Chang (2009), Chen and Hennart (2004), Zhu et al (2011)), we expect that institutional investors such as SWFs will prefer to take a low rather than large share of a cross-border target firm that is either not performing well and/or is financially distressed, which is consistent with the "prudent man" rules according to which institutional investors have a tendency to invest in companies with investment opportunities and proven profitability (Ferreira and Matos (2008)):

H2.1 - SWFs will seek a lower (resp. greater) share of equity in cross-border target firms with relatively poor (resp. high) performance.

H2.2 - SWFs will seek a lower (resp. greater) share of equity in cross-border target highly (resp. low) leveraged firms.

Target firm size is also an important factor in the investment decision because this will have an impact on liquidity and transaction costs. The existing CBA literature is more contrasted concerning the relationships between the number of equity shares to acquire and the size of the target firm. On the one hand, some studies conclude that public acquirers are more likely than private firms to acquire liquid target firms, and consequently larger firms (see among others Avendano (2012), Dahlquist and Robertson (2001), Ferreira and Matos (2008), Gomper and Metrick (2001), Karolyi and Liao (2017), Massa and Xu (2013)). There are several reasons for this. First, they typically look for liquid targets firms that allow them to sustain their future growth. Second, they can benefit from reputational effect resulting from the transaction, which enhances their reputation and prestige. On the other hand, according to the transaction cost and information asymmetry theory, acquirers may prefer smaller targets because they are less intricate and less difficult to integrate following an acquisition than larger firms. Target information asymmetry should therefore be negatively associated with deal size (Borochin et al. (2019)). In the same way, when the target firm is large and non-divisionalized, it is more difficult and expensive to disentangle desired assets from non-desired assets, and hence acquirers would prefer to invest a lower share of equity in larger target firms than in smaller firms (Chari and Chang (2009), Hennart and Reddy (1997)). According to Ferreira and Matos (2008), institutional investors will prefer to hold fewer shares of firms that are closely held or that are associated with concentrated control rights, which is the case in large firms. Concerning SWFs, they are known to have higher capacities to absorb short-term liquidity shocks compared to other institutional investors and they are less involved in monitoring activities (Bortolotti et al. (2015)). Consequently, they should be less likely to acquire large and liquid firms than small and less liquid firms<sup>7</sup>:

H3 - SWFs will seek a lower (resp. greater) share of equity in cross-border target large (small) firms.

 $<sup>^{7}</sup>$ In the same way, Boubakri et al. (2016) find that SWFs should less likely be attracted by large and liquid target firms than pension funds.

Another important factor that tends to increase information asymmetry and transaction costs for acquirers is the valuation of the knowledge assets of the target firms. These types of assets characterize R&Dintensive industries and they are usually difficult to value, which creates greater uncertainty concerning the value of the target. The value of such a target firm is indeed more closely tied to its growth opportunity than to its assets in place, and therefore it is difficult to estimate the transferability of this knowledge during the process of negotiation (Coff (1999), Reuer et al. (2004)). To minimize adverse selection hazards in acquiring foreign target firms in R&D industries, acquirers may prefer to opt for smaller stakes (Chen and Hennart (2004), Chari and Chang (2009)). According to the resource-based view theory, M&As are vehicles that are used by acquirers to learn and augment their knowledge, resources and capabilities, especially for acquiring resources and knowledge that are not available in the factor market (Ferreira et al (2014)). As far as SWFs are concerned, they can be initiated to acquire knowledge or technology that are unavailable in their own country, which is the case for SWFs from emerging countries, or to use knowledge-seeking investments to source technical diversity. However, because they cannot efficiently value knowledge assets of target firms, they should try to reduce the adverse selection problem and information asymmetry by investing a lower share of equity:

H4 - SWFs will seek a lower (resp. greater) share of equity in cross-border target firms with (resp. low) high intensive R&D.

## 2.4 Country-level factors as determinants of the cross-border percentage ownership acquisition

Similar to firm-specific factors, better knowledge about the target country can help to reduce the bargaining and transaction costs that are associated with greater information asymmetry between the SWF and the target firm in international takeover bids. Acquirers entering foreign markets are also likely to face high levels of exogenous uncertainty, which increases the investment risk (Cuypers and Martin (2006)). In the institutional theory and entry mode literature, one source of exogenous uncertainty is the economic, financial and political risk related to the target country (Brouthers et al. (2000), Chari and Chang (2009), Zhao et al (2004)). This literature suggests that acquirers will prefer large ownership in less risky markets (i.e., countries with stable economic, financial and political conditions) to obtain a higher return. They are likely to prefer smaller stakes in countries characterized by high investment risks. Higher political uncertainty in the target country in the form of high levels of corruption, weak enforcement laws and lack of democratic accountability will reduce the probability of full control acquisition (Reddy et al. (2016); Xie et al (2017)). CBA will be affected by political uncertainty in the form of a different regulatory regime and increased risk of expropriation. Meanwhile, the effect of economic and financial risks associated to target countries is less clear. While some studies find a positive association between economic and financial performance of the host country and the preference for full ownership (Ang et al. (2017); Chen and Hennart (2004); Pan (1996)), others suggest that a greater (lesser) economic/financial distance between the home and the host countries is more likely to affect the likelihood of partial (full) acquisition (Brouthers et al. (2000)). Relying on this literature, we expect that SWFs will seek to increase the share of equity in firms located in economically, financially and politically stable countries:

H5 - SWFs will seek a higher (resp. lower) share of equity if the target firm is located in a country that is stable (resp. unstable).

According to North (1990) and Brouthers (2013), it is necessary to take account of both transaction cost theory and institutional theory because the host country institutions include their laws and regulation. Transaction cost theory assumes that a secure institutional structure will promote cross-border investment. Meanwhile, market-based agreements exemplify a secure institutional structure (North (1990), Williamson (1985)). However, in some countries, the institutional structure can be a barrier to entry in the form of legal restrictions on ownership, which restricts the entry mode choice. This applies to the case for SOEs and SWFs, which represent the national interests of their home states and are perceived by target countries as political entities. Thus, institutional theory would suggest that the entry mode choice will vary depending on the institutional context. Related to institutional theory, we expect that SWFs will seek a lower (resp. greater) share of the equity in firms in target countries with many (resp. few) legal restrictions on mode of entry:

H6 - SWFs entering countries with few (resp. many) legal restrictions on mode of entry will seek a greater (resp. lower) share of the equity in the target firm.

## 2.5 Sector-level factors as determinants of the cross-border percentage ownership acquisition

There is an extensive literature on the rationale for foreign investment. Some authors (see, among others, Stein and Daude (2001) and Globerman and Shapiro (2002)) show that market-unfriendly policies, such as regulatory burden, are one of the main barriers to foreign investment. Despite the potential for mutual gains, foreign investors and host governments have diverging interests: while investors aim to maximize returns, governments have more complex preferences. Although most (especially developed) countries agree about the importance of investment freedom, Wehrle and Pohl (2016) show that since the mid-2000s many countries have increasingly introduced regulation to control foreign investments in the pursuit of national

security. Most of these regulations are aimed at controlling investment in specific sectors that are considered strategic.<sup>8</sup> In addition, the investor's nationality and status (public versus private) are essential criteria in most countries' investment policies related to national security. For example, most European Union (EU) countries only apply these restrictions to non-EU or European Free Trade Association countries.

Finally, some regulations are specific to Government-Controlled Investors (GCIs) and SWFs. In Australia and the United States, GCIs' investments are systematically subject to regulatory approval and the restrictions are even heavier in the case of majority acquisitions. A recent EU Regulation<sup>9</sup> sets specific requirements for qualifying holdings depending on the size of the acquired stake (up to 20%, between 20% and 50% and higher than 50%) and the status of the acquirer (SWFs are required to provide some additional information). For example, the Committee on Foreign Investment in the US (CFIUS) sets specific requirements for investments by government-controlled acquirers.

Given that SWFs have to meet strong regulatory requirements when investing abroad and (particularly) if they are seeking to acquire large holdings, they need to consider these constraints in their investment strategies. Consequently, we expect SWFs will seek to acquire smaller stakes in strategic industries.

H7 - SWFs will seek lower (resp. higher) equity shares in overseas firms in strategic (resp. non-strategic) sectors.

According to the resource-based view theory, M&As can be viewed as vehicles by government-controlled acquirers to have access to natural resources. Shi et al. (2016) argue that the level of opposition faced by a government-controlled acquirer from the target country will be weaker in the presence of higher resources complementarity between the home and host countries. Resource complementarity refers to the degree to which the public acquirer possesses the resources needed by the target country: if the home country has the resources and capabilities desired by the target country, then the level of resources complementarity is high. In contrast, if the countries have high levels of resources and industry complementarities, then this will reduce the barriers imposed by the target country in the case of a full control CBA in this strategic sector, with the aim of a downstream integration of the value-chain. For SWFs, their preferences will not be the same depending on the source of their proceeds. Commodity-based funds should try to diversify away their commodity risk by investing in non-commodity-related sectors or by acquiring lower shares of equity in commodity-related sectors (Bremmer (2010), Karolyi and Liao (2017), Scherer (2009)). In contrast, non-commodity-based funds should seek to assure their access to natural resource endowments by investing in commodity-related sectors. However, according to the resource-based view theory, because there is no

 $<sup>^{8}</sup>$ For instance, French Decree No. 2014/079 specifies that foreign investments in transport, water, energy, electronic communications, public health and activities of vital importance as specified in the Defense Code will require authorization.

 $<sup>^9\</sup>mathrm{Regulation}$  (EU) 2017/1946 of 11 July 2017 supplementing Directives 2004/39/EC and 2014/65/EU.

resource complementarity between the home and host countries, it would be difficult for the state owned fund to acquire higher equity shares in strategic commodity-based sectors that are highly regulated by target nations. Based on these arguments, we expect that SWFs will seek lower (resp. higher) equity shares in cross-border strategic sectors related to commodities, hence:

H8 - SWFs will seek lower (resp. higher) equity shares in cross-border strategic sectors related to commodities.

#### **INSERT TABLE 1 HERE**

### **3** Data and descriptive statistics

#### 3.1 SWF CBA data

There is no absolute consensus from either the academic literature or practitioners on the definition of a SWF. The International Monetary Fund (IMF (2008)) has proposed a definition that has become generally exploited, which states that "SWFs are government-owned investment funds established for a variety of macroeconomic purposes". Due to the lack of absolute agreement about what defines a SWF and the lack of transparency in the data collection methods in the existing empirical literature, we decided to construct a database from scratch, using the following methodology. First, to obtain as complete a list as possible, we conducted a search of all existing SWFs using various sources. We began with a preliminary sample of SWFs collected from the SWF Institute website<sup>10</sup>, based on combining the names of funds published by JP Morgan (Catalano (2009), Fernandez and Eschweiler (2008)), Lyons (2007)) and the individual SWFs' websites. Some SWFs were referred to by different names. To eliminate duplicates, we consulted the websites of these funds. This search yielded a sample of 92 SWFs<sup>11</sup>, only a few of them were active in the sense where they had been involved in at least one publicly reported international investment.

The empirical literature shows the huge difference in the sizes of available datasets on SWF transactions.<sup>12</sup> To obtain a reliable dataset, we manually constructed a sample of CBA carried out by the 92 SWFs described earlier, during the period 2000–2015, using two sources of data: first, we collected data to identify transactions involving SWFs from the Thomson Reuters Eikon M&A financial database; and second, we used the online

<sup>&</sup>lt;sup>10</sup>http://www.swfinstitute.org/.

<sup>&</sup>lt;sup>11</sup>See Amar et al (2019) for more details on the definition of SWF and the construction of the sample.

<sup>&</sup>lt;sup>12</sup>Dewenter et al (2010) collected a sample of 996 transactions covering the period 1997–2008. Kotter and Lel (2011) study 503 SWF investments over the period 1980 to 2009. Knill et al. (2012) use a sample of 900 acquisitions of public and private target firm's stockholdings by SWFs, over the period 1984–2009. For the period 1980–2012, Bortolotti et al. (2015) use a sample of 1,018 investments while Murtinu and Scalera (2016) built a sample of 716 investments (474 cross-border) during 1997–2013. Another stream of work employs much larger datasets on SWF shareholdings rather than transactions, with some samples exceeding 20,000 companies (Avendano (2012), Avendaño and Santiso (2009)), Dyck and Morse (2011), Fernandes (2014)).

database Factiva to verify the transactions identified and completed missing acquisitions.<sup>13</sup> As mentioned by Karolyi and Liao (2017), unfortunately we must rely on the subsample of target firms for which we have public data, which dramatically reduces the number of SWFs cross-border acquisitions made in public and private target firms over the period 2000–2015 (643 to 274 corporate deals).<sup>14</sup> Similar to the entry mode literature, we do not focus on post-acquisition shares but we focus instead on equity shares sought by SWFs at the time of the transaction. This means that we do not take into account takeover strategies that involved several steps.

To avoid the pitfall of bias in selecting the firms included in our analysis, we use a control sample of companies in which SWFs could potentially invest. Consequently, we use the entire Datastream Global Equity Indices constituent list as a proxy for the universe of firms in which SWFs could invest.<sup>15</sup>. Because firm-level data are unavailable for all of these firms over the period 2000–2015, we ultimately retain 6,551 firms in our empirical analysis.

Figure 1 depicts the distribution of the equity shares sought by SWFs. The size of the average share acquired is 13% and we observe a fairly large standard deviation of 21%. This figure shows the huge deviation in the frequency of SWFs shares size acquired in cross-border target firms, with 50% of very small acquisitions (less than 5%) and 4% of full acquisitions.

#### **INSERT FIGURE 1 HERE**

#### 3.2 Explanatory variables

Relying on the literature reviewed in Section 2, we employ several variables that can potentially explain the size of the share acquired by the SWF in a cross-border company. These variables relate to: i) firm-level factors; ii) country-level factors; and iii) sector-level factors. A complete description of these variables is presented in Table 2.

#### **INSERT TABLE 2 HERE**

*Firm-level factors* 

 $<sup>^{13}</sup>$ The features of each transaction were gathered and include information on the target firms (firm name and country), information on the SWFs (name, subsidiary and country), date of the transaction, share acquired in the target firm and value of the deal. We dropped observations with missing data on the transaction share. We also dropped observations with missing/unavailable data for the variables of interest.

<sup>&</sup>lt;sup>14</sup>According to Karolyi and Liao (2017), corporate deals fall by almost 90% because the unavailability of firm-specific variables in the Thomson Reuters database. Kotter and Lel (2011) have the same problem of availability of data but only mention the number of firms in which SWFs could invest (including their control sample).

 $<sup>^{15}</sup>$ This is also called the World Market Index at level 1. These indices are composed of 7,138 firms from 53 countries and 170 sectors worldwide and covers for each market a minimum 75-80% of total market capitalization

Considering H2.1, the first firm-level factor we consider is firm performance, measured by net income by assets (ROA) and net income by equity (ROE). Based on H2.2, our second factor is leverage, which is defined as total debt divided by the market value of equity (Debt/Equity) and the total debt divided by the total capital (Debt/Capital). To test H3, we use two different proxies of the size of the target firm: the logarithm of total market value of the company (Market Cap.) and the logarithm of total assets (Assets). The last firm-level characteristic that we consider is the ratio of intangible assets to total assets (Intang./Assets) to proxy for the intensity of know-how and R&D of the target company (see H4).

#### Country-level factors

To test whether SWFs seek larger shares in firms located in stable countries (see H5), we include three variables that can be used to proxy the stability of the target country: *Pol.Stab.* (respectively, *Fin.Stab.* and *Eco.Stab.*) that are indices assessing the political (resp. financial and economic) stability of the target country. Similarly, we use three variables measuring the extent of legal restrictions imposed by the target country in *H6*: *Inv. Freedom*, which is in index evaluating a variety of regulatory restrictions typically imposed on investment; *Fin. Freedom*, which is an indicator of banking efficiency and a measure of the financial sector's freedom from government control and interference; and *Prop. Rights*, which is an indicator assessing the extent to which the country's legal framework allows individuals to acquire, hold and utilize private property, secured by clear laws, enforced effectively by government.

#### Sector-level factors

In line with H7, we consider three dummy variables to test whether SWFs target strategic industries in their investment and allocation decisions. As defined by Fama and French (1997), we consider the following sectors as strategic: aerospace and defense, telecommunication equipments, chemicals, banks, industrial transportation, telecommunication service providers, industrial materials, and the commodity sectors (oil, gas & coal and industrial metals & mining). Given that SWFs may originate from countries that are highly dependent from commodities, we do the distinction between strategic sectors that are related to commodities (*Commodity*) from other strategic sectors. We also include two different dummy variables considering either the five first sectors listed earlier (*Strategic*) or a wider version adding telecommunication service providers and industrial materials to the five strategic sub-sectors listed earlier (*Strategic2*).

#### Control variables

We include three variables to control the economic situation of the target country: the logarithm of GDP

per capita (GDP/Capita), as a proxy of the economic development/wealth level of the target country; GDP growth (GDP Growth), as a proxy of the level of economic growth; and the real effective exchange rate of the target country (REER).<sup>16</sup>

#### 3.3 Descriptive statistics

Table 3 presents the median values of the explanatory variables described earlier by making the distinction between firms in which SWFs did not invest over the period and target firms in which SWFs have invested over the period. The binary part in this table refers to the decision to invest or not, whereas the fractional part is related to the decision on the stake size, with illustrative intervals: less than 10%, between 10% and 50% and higher than 50%.

#### INSERT TABLE 3 HERE

This table shows several relationships that are expected according to our hypotheses. For example, even if SWFs tend to target firms with large size, they seek to take small shares of equity (less than 10%) in this type of firm (consistent with H3), as well as in firms intensive in R&D (consistent with H4). However, unlike H2.2, they seem to increase their shares of equity in leveraged firms. If SWFs seem to have a preference for target countries with economic, financial and political stability and few legal restrictions, then this is not so clear concerning the decision on the stake size if we refer to these statistics. They are attracted to investments in strategic sectors and this is particularly true for investments in commodity-related sectors (25.5% of the firms targeted by SWFs are in a sector related to commodities whereas only 6.2% of the control sample operate in this sector). However, they seek to hold lower shares of equity in these strategic sectors, which is consistent with H7 and H8.

Overall, these statistics suggest that the investment decision and the decision on the stake size are differently explained by our explanatory variables, as expected in H1. This is the reason why we propose an empirical approach that allows us to separate the investment decision from the investment share decision.

## 4 Methodology and results

We first present our empirical approach, based on the two-part fractional regression model of Ramalho et al. (2011). We chose this model because we wish to deal both with the fractional nature of our dependent variable, a percentage bounded between zero and one, and the dual nature of the investment decision, given that we need to decide both on whether to invest or not and on the share to purchase.

 $<sup>^{16}</sup>$ Erel et al (2012) find that acquirers are more likely to invest from countries with appreciating currencies.

#### 4.1 Econometric model

Our variable of interest is the share of equity invested by SWFs in cross-border target firm. This is a proportion defined and observed only on the standard unit interval (i.e.,  $0 \le y \le 1$ ), which is also called a fractional variable. It is well-known that linear models are not well-suited for estimating the effects of explanatory variables on fractional dependent variables because the conditional expectation of a variable bounded between 0 and 1 cannot be a linear function of its parameters. The choice of the two-limit Tobit model (with data censoring at 0 and 1) might be an alternative because it takes into account the bounded nature of the dependent variable, but the concentration of values at 0 and 1 in our context does not result from a censoring mechanism as such. The tobit model would help in inferring the effect of explanatory variables on the latent variable (instead of the censored observed one), while our objective is mainly to infer the same effect on the genuine observed percentages.

In this context, Papke and Wooldrige (1996) proposed the fractional regression model (FRM), which overcomes the limits of linear and tobit models, and specifically deals with dependent variables defined on the unit interval. The FRM requires the assumption of a functional form for y that imposes the desired constraints:

$$E(y \mid x) = G(x\theta) \tag{1}$$

where  $G(\cdot)$  is some nonlinear function satisfying  $0 \le G(\cdot) \le 1$ . The potential specifications for  $G(\cdot)$  include any cumulative distribution functions, including the standard logit and probit where  $G(x\theta) = e^{x\theta}/(1 + e^{x\theta})$ and  $G(x\theta) = \Phi(x\theta)$ , respectively. There are also alternatives, such as the loglog, where  $G(x\theta) = e^{e^{x\theta}}$ , and complementary loglog, where  $G(x\theta) = 1 - e^{-e^{x\theta}}$  (hereafter cloglog). Contrary to logit and probit, which are symmetric functions around the point 0.5, the loglog and cloglog are asymmetric functions: the former (later) increasing more sharply (slowly) at small values of  $G(\cdot)$  and slowly (sharply) at values close to 1.

This model addresses the fractional nature of our dependent variable but it does not account correctly for the dual nature of the investment decision. SWFs must first decide on whether to invest in a specific target, and they must then decide how much to invest. A two-part version of the FRM (hereafter 2P-FRM) was thus proposed by Ramalho and Silva (2009), which allows us to separate the investment decision from the investment share decision.

In our empirical analysis, it is important to distinguish the investment decision in a target and the decision concerning the % of share to be acquired in this target. Ignoring the two-stage nature of the investment decision assumes that factors explaining this decision have the same impact during both stages. The two-part model also allows us to mitigate the endogeneity that would arise if we were exclusively focusing on the second part of the model. This simplification would indeed induce a potential selection bias because investees are not necessarily representative of the full universe of firms.

The first part, or decision, is modeled as a binary choice model where

$$y^* = \begin{cases} 0 & \text{if } y = 0 \\ 1 & \text{if } y \in (0, 1] \end{cases}$$
(2)

and

$$Pr(y^* = 1 \mid x) = E(y^* \mid x) = F_{P1}(x\beta_{bin})$$
(3)

where  $F_{P1}(\cdot)$  is some nonlinear function satisfying  $0 \le F_{P1}(\cdot) \le 1$  (such as logit, probit, loglog or cloglog functions) and where P1 stands for "Part 1" of the 2P-FRM. This binary model is estimated by maximum likelihood. The second decision is specified as a FRM that explains the % of share to be acquired by SWFs in one particular target where

$$E(y \mid x, y \in (0, 1]) = F_{P2}(x\beta_{frac}) \tag{4}$$

where  $F_{P2}(\cdot)$  is, as earlier, some nonlinear function satisfying  $0 \le F_{P2}(\cdot) \le 1$  (such as logit, probit, loglog or cloglog functions) and where P2 stands for "Part 2" of the 2P-FRM. This fractional part is estimated by Bernoulli-based quasi-maximum likelihood (see Ramalho et al. (2011) for details).

We finally find that

$$E(y \mid x) = F_{P1}(x\beta_{bin})F_{P2}(x\beta_{frac})$$
(5)

which shows that the conditional expected investment share ultimately depends on both the investment decision (part 1 of the model) and the quantity decision (part 2 of the model). By comparing the equations (1) and (5), we can clearly see that neglecting the dual nature of the SWFs decision can lead to misspecification.

Our model selection process relies on tests and information criteria. We will rely on two sets of tests to determine: first, the best functional forms (logit, probit, loglog or cloglog); and second, the dual versus single nature of the decision process.

We first rely on the Regression Equation Specification Error Test (RESET), which is a general test for functional misspecification that is applicable to binary and fractional models (see Papke and Wooldrige (1996) and Ramalho et al. (2011)). We more specifically test  $H_0$ :  $\gamma_1 = \gamma_2 = 0$  in  $E(y \mid x) = G(x\theta + \gamma_1(x\hat{\theta})^2 + \gamma_2(x\hat{\theta})^3)$ . Rejection of the null hypothesis implies rejection of the functional specification. The notation used for presenting this test relies on Equation (1) of the FRM but is similarly applicable to parts 1 and 2 of the 2P-FRM (Eq. (2) and (3)).

Because different specifications can be found to be relevant, we need to make a choice and thus rely on the *P*-test statistic proposed by of Davidson and MacKinnon (1981), which allows us to compare nonlinear models. Contrary to RESET tests, which consider separately parts 1 and 2 of the 2P-FRM, the *p*-test may be applied to the full specification of the two part model and thus compare the relevance of the two-part model with the one-part model. In this framework, we test  $H_0: G_1(x\theta_1)$  against  $H_1: G_2(x\theta_2)$ . In other words, we check if we should reject model  $G_1(\cdot)$  for model  $G_2(\cdot)$ . We test this in practice by describing the null as  $H_0: \gamma = 0$  in  $G_1(x\theta + \left[(\hat{G}_2 - \hat{G}_1)\hat{g}_1^{-1}\right]\gamma)$ , where  $\hat{g}_1 = \frac{\partial G_1(x\hat{\theta}_1)}{\partial x\hat{\theta}_1}$ . Model 2,  $G_2(x\theta_2)$ , is preferred to model 1,  $G_1(x\theta_1)$ , if the null hypothesis is rejected.

#### 4.2 Empirical results

The results of the two-parts fractional regression model are given in Tables 4 and 5. Table 4 displays the results of the first stage (investment decision) described by equation (3) and Table 5 gives the results of the second stage (the decision concerning the size of the stake), described by equation (4). The same explanatory variables have been included in both equations of the model. For both equations, we include in the first column the general model with explanatory variables corresponding to the full set of hypotheses. We then report the estimates of different versions of this model with alternative explanatory variables (in model (2) ROE instead of ROA, in model (3) Debt/Equity instead of Debt/Capital, in model(4) Assets instead of Market Cap....). As explained earlier, the two-part models not only allow us to consider the investment decision and the allocation decision as distinct but they also avoid the Heckman selection bias in the data in the sense that we can not explain the decision of the shares to be acquired for firms that have not been acquired.<sup>17</sup>

#### **INSERT TABLES 4 AND 5 HERE**

Several insights emerge from our analysis. First, we find that SWFs take into account not only target firm-level factors for their decision to invest and/or their decision concerning the size of shares but also country-level and sector-level factors.

Second, our estimation results indicate the following: i) target, country and sector-level variables have a significant impact not only on the investment decision but also on the choice of the size of the stake. This is clearly the case for the variables *Market Cap*, *Debt/Capital*, *Pol. Stab* and *Commodity*, which are significant in both equations. ii) These factors driving the SWF investment decision are not the same as those used to set the % of shares to be acquired, which is consistent with our hypothesis 1. More precisely, we find that the variable *ROA* does not matter in the decision of the shares to be acquired (significant only at 10 %) but has an influence on the investment decision (significant at 1%), while it is the reverse for the variables *Strategic* and *Prop. Rights*. iii) The same factors driving the investment and allocation decisions can have opposite effects. For example, *Pol. Stab*. has a positive effect on the investment decision is the allocation decision. In light of our results, we can conclude that the SWF's investment decision is the

<sup>&</sup>lt;sup>17</sup>We thank the remark of one of the referees for the choice of this model and for this last point.

outcome of a complex decision-making process and it is essential to distinguish the factors that explain the decision to invest from those that determine the nature of the shares to be acquired (partial or full).

Concerning target firm-level factors, such as Kotter and Lel (2011) and Bernstein et al. (2013), we find that SWFs target larger firms with poor performance and which are financially distressed.<sup>18</sup> In contrast, the choice of the two-step fractional regression model allows us to show that, once the decision to invest is taken, they prefer to increase their shares of equity in target firms without financial difficulties (*Debt/Capital* is significantly positive while *ROA* is only significantly negative at 10% in Table 5). This result is consistent with *H*2.2, according to which SWFs act like "the prudent man" rule concerning their allocation decision by increasing their shares of equity in cross-border target firms that are not financially distressed and which have a proven profitability. In the same way, even if they target larger firms, they will seek a lower share of equity in large firms according to the cost transaction theory because smaller targets are less intricate and difficult to integrate than larger firms, which supports *H*3. This result is robust to the choice of variables to proxy the size of the target firms (*Market Cap.* and *Assets* are both significantly negative at 1% in Table 5). We have found no empirical support that SWFs are focused on firms with high R&D in their investment strategy, whatever the type of decision (the variable *Intang./Assets* is never significant in Tables 4 and 5).

Concerning country-level factors, only political stability of the target country matters in the SWFs decision-making process, not the economic or financial stability. Again we find different results for the investment decision and the decision of the stake's size. While the government stability of the target country is positively associated to the investment decision, it is the reverse for the decision on the shares to be acquired (*Gov. Stab.* is significantly positive in Table 4 and negative in Table 5). This means that SWFs will seek to invest in countries with high political stability but do not hesitate to take higher stakes of equity in countries with lesser political stability, which is not consistent with H5. This result suggests that the decision of entry mode choice in a target firm by a SWF is not only based on country risk considerations. As far as legal restrictions, we find that they influence SWFs investment decision, which is consistent with Johan et al. (2013). More precisely, our results suggest that financial and investment freedoms of the target country are important criteria for the SWFs investment decision but not for the decision on the stake's size. In contrast, property rights restrictions will impact the decision of the stake's size but not the investment decision (the variable *Prop. Rights* is significantly positive in Table 5 but not significant in Table 4). This result suggests that when there are fewer restrictions on property rights in the target country, the size of the share will be greater, which is consistent with H6.

When we examine whether SWFs tend to target strategic sectors other than those related to commodities (aerospace and defense, telecommunication and utilities, chemicals, banks and industrial transportation), we

 $<sup>^{18}</sup>$ SWFs target firms with high leverage with the aim of restructuring the management, adding value and potentially selling the firm once it has become profitable.

find that the strategic sector dummy is not significant in Tables 4 but is significantly positive in Table 5. This means that strategic industry sectors are generally not targeted by SWFs but, when it is the case, they try to acquire large shares in these sectors, despite the regulatory requirements in place in some countries. Consistent with some studies on SWFs (Boubakri et al. (2016), Fernandez and Eschweiler (2008), Karolyi and Liao (2017)), this result implies that geopolitical issues are considered in the investment decision-making process for these state owned funds.<sup>19</sup> The results are quite different for strategic Commodity-based sectors (sectors related to oil, gas and coal, industrial metals and mining) because if we find that SWFs are more likely to invest in these strategic sectors, then they will seek to acquire lower equity shares with a aim of industrial diversification strategy (*Commodity* is significantly positive in Table 4 and negative in Table 5, which is consistent with H8). This result is in line with Karolyi and Liao (2017), who find that government-controlled cross-border acquisition activity represents an arm of a government's industrial diversification program and therefore that government-led activity should be higher between countries with more dissimilar industrial structures.

With respect to control variables, the variable GDP/Capita is highly significantly positive in both equations, meaning that the overall level of target country economic development appears to drive SWFs crossborder acquisitions. This result suggests that SWFs not only concentrate their investments specifically in more developed countries but do not hesitate to increase their shares of equity in these countries.<sup>20</sup>

#### 4.3 Robustness analysis

To test the appropriateness of the two-part specification of the fractional regression model, as well as the best functional forms (logit, probit, loglog or cloglog) of this model, we implement two sets of specification tests: the RESET and P-tests described in the section Methodology. The results of these specification tests are given in Table 6.

According to the RESET tests, all functional forms (logit, probit, loglog and cloglog) are appropriate for the 1P-FRM because the p-values are all larger than 10%. We get the same results for the binary part of the 2P-FRM but we find that logit and probit functions are not appropriate for the fractional part of the 2P-FRM with p-values below 1%. The best functionals forms for the second part are first the cloglog (p-value equal to 15%) and then the loglog (with p-value equal to 8%). We will thus consider these two functional forms.

We then implement the P-tests to first compare the 1P-FRM (based on logit, probit, loglog and cloglog)

<sup>&</sup>lt;sup>19</sup>According to Fernandez and Eschweiler (2008), by buying sizeable stakes in corporations, it is possible for SWFs to expropriate minority shareholders and pursue interests other than maximizing portfolio performance.

 $<sup>^{20}</sup>$ To save space, we do not report the results of other control variables *REER* and *GDP Growth* that are always not significant. In the same way, we do not report marginal effects of the regression models to save space but they are available upon request.

versus 2P-FRM (based on logit, probit, loglog and cloglog). The 16 bilateral tests all lead to the rejection of the 1P-FRM and to the choice of the 2P-FRM. This clearly supports our hypothesis that the decisions to invest and to acquire a certain stake size are two distinct decisions.

We also compare the respective logit, probit, loglog and clolog versions of the 2P-FRM. We find that probit and loglog versions are the only ones that are never rejected against alternative versions (p-values all larger than 10%). Combined with the results of the RESET test, we take the 2P-FRM based on loglog specification as our baseline model.

#### **INSERT TABLE 6 HERE**

We finally compare the marginal effect  $\partial E(y \mid x)/\partial x_j$  of our baseline model with alternative specifications, namely the linear model (OLS), the two-limit tobit model (with truncation at zero and one) which is an alternative model of the 2P-FRM, the 1P-FRM based on loglog specification and the 2P-FRM based on probit (the best competitor to the loglog specification according to the P-test) specification. We first find that the linear model is an approximation quite far from what we get when accounting appropriately for the fractional nature of the dependent variable. We then see that taking the probit or loglog specification does not change the size of the marginal effects but slightly affects the size of the effect. We finally see that the tobit model departs quite substantially from the marginal effects obtained by the other approaches.<sup>21</sup> The normality assumption of the tobit model together with the implicit assumption of data censoring do not correctly capture the dependence of the variables.

#### **INSERT TABLE 7 HERE**

## 5 Conclusions

One of the main concerns about SWF's strategy, which has been widely studied in the literature, is what drives their investment strategy. However, only a few papers have tried to explain the decision on the share size of these CBAs. This paper aims to shed light on the drivers behind the SWF's decisions to acquire partially or fully cross-border target firms. In particular, we develop an approach that takes into account the fractional nature of the dependent variable (i.e., the share size), as well as the separation between the investment decision and the one concerning the share of equity to acquire. To do so, we estimate a two-step fractional regression model based on Papke and Wooldrige (1996) and developed by Ramalho and Silva

<sup>&</sup>lt;sup>21</sup>Stavrunova and Yerokhin (2012) also find that the two-limit tobit model is rejected in favor of 2P-FRM.

(2009), which allows us to separate the treatment of investment and allocation decisions.

Several insights emerge from our analysis. From an econometric perspective, the key insight from this paper is that the choice of the model allows us to identify the factors that drive the decision to acquire a certain stake size in a manner that is distinct from the decision to invest in a particular target. The different specification tests done on the two-step fractional regression model compared to the one-step ones confirm that this model provides a convenient econometric framework to explain the SWF's decision of the share size to be acquired in cross-border target firms. This finding suggests that ignoring the two-stage nature of the investment decision produces a serious misspecification problem

The results of our analysis indicate that the firm, country, and sector-level factors driving the SWF investment decision are not the same as those used to determine the share size to be acquired in a target firm. More precisely, while SWFs target larger firms with poor performance and financial distress, they are more prudent on the allocation decision by increasing their shares of equity in cross-border target firms, preferably with small size, that are not financially distressed and have a proven profitability. The result of the model also suggests that SWFs will seek to take higher shares of equity in firms located preferably in countries with high economic development, with few legal restrictions in terms of property rights. However, they do not care about the political stability of the target country. Strategic industry sectors are generally not targeted by SWFs but, when it is the case, they try to acquire large shares in these sectors, despite the regulatory requirements in place in some countries, with the exception of strategic sectors related to commodities, where they seem to be pursuing an industrial diversification strategy. There is no shortage of examples in the news that can illustrate our results, such as Qatar Investment Authority (QIA) which has done the acquisition of the popular football club Paris St. Germain, bought most of luxury hotels in Paris and took large shares in french strategic companies like Total or Lagardere.

Overall, our results support most tested assumptions derived from CBA's theory, which indicates that SWFs take the investment decision in cross-border target firms by trying to reduce transaction costs and information asymmetry, and by taking into account the legal and institutional environment of the country. However, the fact that they do not hesitate to take large shares or to acquire targeted firms considered as strategic and located in politically unstable countries suggests that their motives may go beyond pure profit maximization.

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Figure 1: Dispersion of the share acquired by SWFs over the period 2000-2015

	Û. Û.		-	$\widehat{\pm}\widehat{\pm}\widehat{\pm}\widehat{\pm}$	$\widehat{\pm}\widehat{\pm}\widehat{\pm}$	(-	Ĵ
Variables and pre- dicted relationships to share of equity sought	ROA/ROE Debt/equity or debt/capital	Total of of assets Market capitalization	Total of intangible assets	Political Stability Financial Stability Economic Stability	Investment freedom Financial freedom Property rights	Strategic	Commodity
	(2004) (2011) (2009)	$(1997) \\ (2009) \\ (2008)$	(2004) (2009)	$(1990) \\ (2013) \\ (1985)$	$(1990) \\ (2013) \\ (1985)$	(2001) (2002) (2016)	(2010) (2017) (2012)
Related literature	Chen and Hennart Zhu et al Chari and Chang	Hennart and Reddy Chari and Chang Ferreira and Matos	Chen and Hennart Chari and Chang Ferreira et al (2014)	North Brouthers Williamson	North Brouthers Williamson	Stein and Daude Globerman and Shapiro Wehrle and Pohl	Bremmer Karolyi and Liao Avendano
Hypothesis	H2.1 - SWFs will seek a lower share of equity in cross- border target firms with relatively poorly performance. H2.2 - SWFs will seek a lower share of equity in cross- border target highly leveraged firms.	H3 - SWFs will seek a lower share of equity in cross-border target large firms.	H4 - SWFs will seek a lower share of equity in cross-border target firms with high intensive R&D.	H5 - SWFs will seek a higher share of equity if the target firm is located in a country that is stable.	H6 - SWFs entering countries with few legal restrictions on mode of entry will seek a greater share of equity in target firms	H7 - SWFs will seek a lower share of equity in overseas target operating in strategic industries (other than indus- tries dependent on commodities)	H8 - SWFs will seek lower (resp. higher) equity shares in cross-border strategic sectors related to commodities.
Theoretical Perspective	Transaction costs theory / Information asymmetry theory Transaction costs theory influences the entry mode choice of foreign acquirens. The more the acquisition is associated with high information asymmetry, the smaller the share of equity sought. A high performance of the targeted company or a low	leveraged firm decreases information asymmetry. In the same way, target information asymmetry should therefore be positively associated with the size of the target firm, as well as with the degree of R&D in this target.		Institutional theory In the institutional theory, one source of exogenous uncertainty is economic, financial, and political risk related to the target country. According to this theory, acquirers will prefer partial	acquisition when entering countries characterized by high investment risks; that is, in countries with unstable economic, financial and political conditions. Meanwhile, the institutional structure in some countries may provide barriers to entry such as legal restrictions on ownership so that the mode of entry is	constrained. Such regulatory constraints are generally more stringent when it comes to investments in strategic sectors, and more particularly in the case of government-controlled acquirers such as SWFs.	Resource base view theory and industrial diversification strategy Public acquirers, such as SWFs, may seek to diversify the home country industry base by targeting foreign firms in industries where the home country is under-represented. Commodity-based funds should pursue an international diversification strategy to reduce the dependence on one commodity and stabilize their rev- enues. According to the resource-based view theory and industrial diversification strategy, we suggest that SWFs will try to diversify the home country industrial base by seeking a lower share of the equity in strategic sectors related to commodities.

Table 1: Explanations for the share of equity sought in CBA by SWFs

#### Table 2: Description of the variables

Variables	Description	Source
Firm-level fac	tors	
ROA	Return-on-Assets of the company.	Worldscope
ROE	Return-on-Equity of the company.	Worldscope
Debt/Equity	Ratio of the total debt to the total equity of the company.	Worldscope
Debt/Capital	Ratio of the total debt to the total capital of the company. For the sample of companies in which a SWF invested over the period, we consider the average Debt/Capital over the previous three years. For the control sample we consider the average Debt/Capital over the period.	Worldscope
Assets	Logarithm of the total assets of the company which represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets converted to U.S. dollars using the year end exchange rate. For the sample of companies in which a SWF invested over the period, we consider the average total assets over the previous three years.	Worldscope
Market Cap.	Logarithm of the market capitalization of the company which represents the total market value of the company based on year end price and number of shares outstanding converted to U.S. dollars using the year end exchange rate. For companies with more than one type of common/ordinary share, market capitalization represents the total market value of the company.	Worldscope
Intang./Asset	sRatio of the total intangible assets to the total assets of the company.	Worldscope
Country-level	factors	
Eco. Stab.	Composite index ranging from 0 to 1 assessing a country's current economic strengths and weaknesses. This index includes the following components: GDP per head, GDP growth, Inflation, Budget Balance and Current Account. The higher the index, the more stable the country.	ICRG database
Fin. Stab.	Composite index ranging from 0 to 1 assessing a country's ability to pay its way. This index includes the following components: Foreign Debt, Current Account, International Liquidity and Exchange Rate Stability. The higher the index, the more stable the country.	ICRG database
Pol. Stab.	Composite index ranging from 0 to 1 assessing the political stability of a country. This index includes the following components: Government Stability, Socioeconomic Conditions, Investment Profile, Inter- nal Conflict, External Conflict Corruption, Military in Politics, Religious Tensions, Law and Order, Ethnic Tensions, Democratic Accountability and Bureaucracy Quality. The higher the index, the the more stable the country.	ICRG database
$Fin. \\ Freedom$	Indicator of banking efficiency and a measure of independence from government control and interference in the financial sector. The index ranges from 0 to 100. The higher the index, the less the restrictions.	The Heritage Foundation
Inv. Freedom	Indicator of regulatory restrictions that are imposed on investments by the target firm's home country. The index ranges from 0 to 100. The higher the index, the less the restrictions.	The Heritage Foundation
Prop. Rights	Index that assesses the extent to which a country's legal framework allows individuals to acquire, hold, and utilize private property, secured by clear laws that the government enforces effectively. The index ranges from 0 to 100. The higher the index, the less the restrictions.	The Heritage Foundation
Sector-level fa	ctors	
Strategic	Dummy variable that equals 1 if the targeted firm operates in one of the five following strategic sector: aerospace and defense, telecommunication equipments, chemicals, banks, industrial transportation.	Authors' analy- sis
Strategic 2	Dummy variable that equals 1 if the targeted firm operates in one of the five following strategic sector: aerospace and defense, telecommunication equipments, chemicals, banks, industrial transportation, Telecommunications Service Providers, Industrial Materials.	Authors' analy- sis
Commodity	Dummy variable that equals 1 if the target firm operates in a sector related to commodities, and 0 otherwise.	Authors' analy- sis
Control variat	les	
REER	Real effective exchange rate of the company's home country.	Bruegel
GDP/capita	Logarithm of the GDP per capita of the target firm's home country in constant 2010 USD. For the sample of companies in which a SWF invested over the period, we consider the average over the previous three years. For the control sample, we consider the average over the period.	The World Bank
GDPGrowth	Annual percentage growth rate of GDP of the target firm's home country. For the sample of companies in which a SWF invested over the period, we consider the average over the previous three years. For the control sample, we consider the average over the period.	The World Bank

#### Table 3: Descriptive statistics of the explanatory variables

This table presents the median values of the explanatory variables discriminating by y, that is the share acquired by the SWF. The terminolog (binary, fractional) refers to the two-part fractional regression model used in the paper (see Methodology section). The binary part relates to the decision to invest (y = 1) versus no investment (y = 0). The fractional part refers to the decision on the size of the stake acquired where we use as illustrative intervals 0 < y < 10%,  $10\% \le y < 50\%$  and  $y \ge 50\%$ .

	Binar	y part		Fractional part	
	y = 0	y > 0	0 < y < 10%	$10\% \leq y < 50\%$	$y \ge 50\%$
ROA	5.16	5.64	5.67	3.47	4.87
ROE	10.52	9.06	9.38	9.53	6.58
Debt/Capital	33.05	37.78	32.76	44.71	33.89
Debt/Equity	54.63	49.88	47.69	59.63	53.78
Market Cap.	14.17	15.24	16.02	13.88	14.13
Assets	14.37	16.02	16.90	14.46	13.60
Intang./Assets	2.57	3.97	5.43	1.88	1.01
Pol. Stab.	0.82	0.81	0.80	0.76	0.79
Eco. Stab.	0.77	0.78	0.78	0.77	0.77
Fin. Stab	0.72	0.74	0.76	0.74	0.72
Prop. Rights	76.25	90.00	85.00	70.00	80.00
$Fin.\ Freedom$	60.63	70.00	70.00	60.00	70.00
$Inv.\ Freedom$	63.13	75.00	70.00	70.00	70.00
Strategic	14.7%	15.3%	14.7%	6.9%	5.2%
Strategic2	17.9%	17.5%	16.2%	8.8%	5.2%
Commodity	6.2%	25.5%	22.1%	6.5%	2.0%

Table 4: Part 1 of the two-part fractional regression model (2P-FRM) - SWFs' decision to invest This table presents the SWFs' binary decision to invest, as estimated with the part 1 of the 2P-FRM with loglog specification (see Eq. 3) and as based on a transaction sample collected over the 2000-2015 window. The dependent variable is a dummy equal to 0/1 if the SWF does not / does invest in the target. Column (1) gives results of the benchmark model. Columns (2) to (9) give results of various alternative specifications where hypothesis specific proxies are replaced by alternative ones. Refer to Table 2 for variable definitions. N stands for total number of observations and N1 for the total number of acquisitions. T-statistics based on robust standard errors are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ROA	-0.009 ***		-0.009 ***	-0.006 ***	-0.009 ***	-0.009 ***	-0.009 ***	-0.009 ***	-0.009 ***
	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Debt/Capital	0.003 ***	0.004 ***		0.002 **	0.003 ***	0.002 ***	0.003 ***	0.003 ***	0.003 ***
	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Market Cap.	0.104 ***	0.110 ***	0.104 ***		0.100 ***	0.106 ***	0.105 ***	0.103 ***	0.106 ***
	(0.013)	(0.015)	(0.013)		(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Intang./Assets	-0.001	-0.002	-0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Pol. Stab.	1.827 ***	0.925	1.611 ***	1.084 *	. ,	. ,	1.824 ***	1.810 ***	1.853 ***
	(0.581)	(0.604)	(0.576)	(0.570)			(0.525)	(0.520)	(0.584)
Prop. Rights	0.002	0.002	0.003	-0.001	0.006 ***	0.004 **	· /	× ,	0.002
1 0	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)			(0.002)
Strategic	-0.060	-0.048	-0.022	-0.088	-0.062	-0.052	-0.066	-0.065	· /
0	(0.058)	(0.059)	(0.056)	(0.061)	(0.057)	(0.057)	(0.057)	(0.058)	
Commodity	0.490 ***	0.039	0.477 ***	0.543 ***	0.484 ***	0.479 ***	0.486 ***	0.478 ***	0.483 ***
	(0.064)	(0.091)	(0.064)	(0.063)	(0.063)	(0.063)	(0.063)	(0.063)	(0.064)
GDP/Capita	-0.289 ***	-0.243 ***	-0.293 ***	-0.107 ***	-0.207 ***	-0.175 ***	-0.299 ***	-0.305 ***	-0.291 ***
- / - 1	(0.042)	(0.045)	(0.043)	(0.038)	(0.033)	(0.037)	(0.041)	(0.042)	(0.043)
ROE	(010)	-0.001	(01010)	(01000)	(0.000)	(0.00.)	(0.0)	(01012)	(010-0)
		(0.001)							
Debt/Equity		(01002)	0.000						
Doot/Equity			(0,000)						
Assets			(0.000)	0 083 ***					
1100000				(0.011)					
Fin Stab				(0.011)	0.270				
r m. stab.					(0.271)				
Eco Sta					(0.211)	0.634			
Leo. Sta.						(0.452)			
Inv Freedom						(0.102)	0.004 **		
mv. rreedom							(0.002)		
Fin Freedom							(0.002)	0.005 ***	
r ini. r recuolin								(0.000)	
Stratogic?								(0.002)	-0.083
Strategicz									(0.054)
N	6551	6357	6551	6754	6551	6537	6551	6551	6551
N1	274	181	274	236	274	260	274	274	274
Log-lik	$-1.0e \pm 0.3$	-743 776	$-1.0e \pm 0.3$	-920 650	$-1.0e \pm 0.3$	-979 231	$-1.0e \pm 0.3$	$-1.0e \pm 0.3$	$-1.0e \pm 0.3$
AIC	2047 600	1507 551	2071 387	1861 299	2057 777	1978 462	2043 601	2039 933	2046 370
BIC	2115 474	1575 124	2139 261	1929 478	2125 650	2046 314	2111 475	2107 807	2114 243
ROE Debt/Equity Assets Fin. Stab. Eco. Sta. Inv. Freedom Fin. Freedom Strategic2 N N1 Log-lik. AIC BIC	6551 274 -1.0e+03 2047.600 2115.474	(0.045) -0.001 (0.001) (0.001) (0.001) (0.001) (0.001) (0.001) (0.001) (0.001)	-0.233 (0.043) 0.000 (0.000) (0.000) 6551 274 -1.0e+03 2071.387 2139.261	(0.038) (0.038) (0.011) (0.011) (0.011) (0.011) (0.011) (0.038) (0.038) (0.038) (0.038) (0.038) (0.038) (0.038) (0.038)	0.270 (0.033) 0.270 (0.271) 6551 274 -1.0e+03 2057.777 2125.650	0.634 (0.634 (0.452) 6537 260 -979.231 1978.462 2046.314	0.004 ** (0.041) 0.004 ** (0.002) 6551 274 -1.0e+03 2043.601 2111.475	0.005 **** (0.042) 0.005 **** (0.002) 6551 274 -1.0e+03 2039.933 2107.807	-0.231 (0.043) (0.043) (0.043) (0.054) (0.054) (0.054) (0.054) (0.054) (0.054) (0.054) (0.054) (0.043)

Table 5: Part 2 of the two-part fractional regression model (2P-FRM) - SWFs' decision on the stake size This table presents the SWFs' fractional decision on the stake to purchase, as estimated with the part 2 of the 2P-FRM with loglog specification (see Eq. 4) and as based on a transaction sample collected over the 2000-2015 window. The dependent variable is the post-transaction share owned by the SWF in the target, a continuous variable defined over the unit interval. Column (1) gives results of the benchmark model. Columns (2) to (9) give results of various alternative specifications where hypothesis specific proxies are replaced by alternative ones. Refer to Table 2 for variable definitions. N stands for total number of observations and N1 for the total number of acquisitions. T-statistics based on robust standard errors are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ROA	-0.002 *		0.000	-0.000	-0.002	-0.002	-0.002	-0.001	-0.002 *
	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Debt/Capital	-0.002 ***	-0.002 **	· /	-0.001	-0.001 **	-0.001 **	-0.001 **	-0.001 **	-0.002 **
	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Market Cap.	-0.162 ***	-0.143 ***	-0.157 ***		-0.155 ***	-0.162 ***	-0.162 ***	-0.162 ***	-0.159 ***
-	(0.029)	(0.035)	(0.030)		(0.030)	(0.032)	(0.030)	(0.030)	(0.029)
Intang./Assets	-0.001	0.003	-0.002	-0.002	0.000	-0.000	-0.001	-0.001	-0.001
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Pol. Stab.	-3.877 ***	-2.105 *	-3.645 ***	-4.759 ***			-2.903 ***	-2.849 ***	-3.976 ***
	(1.282)	(1.275)	(1.256)	(1.514)			(1.097)	(1.053)	(1.282)
Prop. Rights	0.008 **	0.006	0.006 *	0.011 **	0.001	0.003			0.008 **
	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.003)			(0.004)
Strategic	0.319 **	0.262 *	0.299 **	0.301 *	0.296 **	0.307 **	0.299 *	0.301 *	
	(0.152)	(0.142)	(0.153)	(0.167)	(0.147)	(0.146)	(0.154)	(0.156)	
Commodity	-0.251 **	0.151	-0.247 **	-0.326 ***	-0.266 **	-0.265 **	-0.259 **	-0.276 ***	-0.260 **
	(0.107)	(0.178)	(0.111)	(0.112)	(0.116)	(0.106)	(0.107)	(0.106)	(0.107)
GDP/Capita	0.324 ***	0.242 ***	0.346 ***	0.318 ***	0.151 **	0.120	0.337 ***	0.333 ***	0.327 ***
	(0.077)	(0.075)	(0.077)	(0.114)	(0.061)	(0.078)	(0.081)	(0.090)	(0.078)
ROE		0.001							
		(0.002)							
Debt/Equity			-0.000						
			(0.000)						
Assets				-0.130 ***					
				(0.024)					
Fin. Stab.					0.096				
					(0.610)				
Eco. Stab.						-0.025			
						(0.849)			
Inv. Freedom							0.004		
							(0.004)		
Fin. Freedom								0.004	
								(0.005)	
Strategic2									0.264 *
									(0.139)
N	6551	6357	6551	6754	6551	6537	6551	6551	6551
N1	274	181	274	236	274	260	274	274	274
Log-lik.	-77.089	-52.357	-77.654	-66.260	-78.672	-75.539	-77.495	-77.449	-77.302
AIC	174.178	124.713	175.309	152.519	177.345	171.078	174.990	174.898	174.605
BIC	210.309	156.698	211.440	187.157	213.476	206.685	211.121	211.029	210.736

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

#### Table 6: Specification tests

This table presents the p-values of RESET tests and P-tests. These tests are detailed in the Methodology section (see also Ramalho et al., 2011). Regarding RESET tests, Columns (1) to (4) correspond to the functional forms to be tested. Rejection of the null is to be interpreted as a rejection of the model with this functional form. Regarding P-tests, Columns (1) to (4) correspond to valid models under the alternative hypothesis. Rejection of the null hypothesis is to be interpreted as rejection of the model in favor of the alternative model (column model). Models estimated with the benchmark set of explanatory variables.

RESET tests	logit	probit	loglog	clolog
1 part models	0,136	0,1559	0,2059	0,1375
Binary part of 2 parts models	0,5832	0,9907	0,3937	0,3407
Fractional part of 2 parts models	0,0023 ***	0,0032 ***	0,0791 *	0,1477
P-tests	2-part logit	2-part probit	2-part loglog	2-part cloglog
1 part logit model vs	0,0598 *	0,0493 **	0,0339 **	0,0654 *
1 part probit model vs	0,0692 *	0,0575 *	0,043 **	0,0687 *
1 part loglog model vs	0,0726 *	0,0617 *	0,0514 *	0,0683 *
1 part cloglog model vs	0,0606 *	0,0501 *	0,0341 **	0,0669 *
2 part logit model vs	-	0,0916 *	0,0421 **	0,2786
2 part probit model vs	0,7122	-	0,3848	0,8441
2 part loglog model vs	0,7213	0,5516	-	0,6597
2 part cloglog model vs	0,0698 *	0,0445 **	0,031 **	-

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

#### Table 7: Marginal effects - model comparison

This table presents the unconditional marginal effect of the explanatory variables on the expected target shares purchased by the SWFs,  $\partial E(y \mid x)/\partial x_j$ . Column (1) reports results obtained by OLS for the linear regression model. Column (2) reports for the two limits (at 0 and 1) tobit model. Column (3) reports the 1P-FRM based on loglog specification. Column (4) reports the 2P-FRM model based on probit specification (as was suggested as a valid alternative to our benchmark model in Table 6). Column (5) reports our benchmark model combining the columns (1) of Tables 4 and 5 (see Eq. 5).

	OLS	Tobit	1P-FRM	2P-FRM-probit	2P-FRM-loglog
ROA	-0,020	-0,00235	-0,009	-0,015	-0,017
Debt/Capital	0,003	0,00085	0,002	0,001	0,003
Market Cap.	-0,011	0,04616	0,000	0,021	0,023
Intang. /Assets	-0,002	-0,00053	-0,002	-0,002	-0,003
Pol. Stab	-1,819	0,70537	-1,309	-0,913	-0,603
Prop. Rights	0,018	0,00175	0,015	0,012	0,011
Strategic	0,138	0,03353	0,157	0,280	0,207
Commodity	0,490	0,03856	0,356	0,517	$0,\!608$