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Determinants of Partial Versus Full Cross-Border Acquisitions for Sovereign Wealth Funds

J. Amar*, M. Arouri†, G. Dufrénot‡ and C. Lecourt§

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Abstract

In this paper, we investigate 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. Using an original dataset of SWF acquisitions over the period 2000-2015, a Two-Part Fractional Regression (TP-FRM) Model is estimated to account for both the fractional nature of the dependent variable as well as the separation between the decision to invest and that concerning the share of equity invested. We find that the decision to invest and the decision on the share of equity to be acquired are two distinct processes. We also find that SWFs take the investment decision in cross-border target firms by trying to reduce transaction costs and information asymmetry according to the cross-border acquisition theory, and also by taking the legal and institutional environment of the host 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 financial consideration.

JEL classification: F310; F31; G15

Keywords: Sovereign Wealth Funds; Cross-Border Acquisitions; 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 10.2 trillion in December 2021. This growth has been caused by periods of high oil prices, financial globalization, and sustained large global imbalances.¹ Recently, SWFs have attracted considerable public attention. While their size and rapid growth suggest that they have become major world players that 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 a recipient country's economy has emerged as a political issue"* (Greene and Yeager, 2008). This is due to the fact that they 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.

The investment strategies used by SWFs have received some attention in the literature.² 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. The first research question in many studies is whether SWFs behave like other institutional investors by basing their investment strategies solely on financial motives (Fernandes, 2014; Fotak et al., 2008; Kotter and Lel, 2011; Megginson et al., 2013). Another related research question is whether the funds' investment strategies are based on non-financial but macroeconomic, political or institutional considerations. Some assess whether these factors are macroeconomic (Amar et al., 2019; Boubakri et al., 2016; Chhaochharia and Laeven, 2009; Ciarlone and Miceli, 2016; Megginson et al., 2013) or political (Bernstein et al., 2013; Carpentier 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). 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

¹According 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 tripled since the beginning of the financial crisis (source: www.swfinstitute.org).

²See the recent surveys of (Megginson and Fotak, 2015) and (Megginson and Gao, 2019).

over the target firm, investment requirements, and risk. 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 cross-border acquisitions (CBA) literature and entry mode choice theory, we try 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. The central open questions addressed are:

1. Are the decision to invest abroad and the decision of the choice of the entry mode based on financial characteristics of the target firm or is the decision to invest taken at the country-level or sector-oriented?
2. 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?
3. Are the decision to invest abroad and the decision of the choice of entry two distinct processes?

To take into account the fractional nature of the dependent variable, as well as the sequentiality in the investment decision and those concerning the share of equity to be invested, we estimate a Two-Part Fractional Regression Model (TP-FRM) introduced by [Papke and Wooldrige \(1996\)](#) and developed by [Ramalho and Silva \(2009\)](#). This model is appropriate as it allows us to test whether the factors that determine the investment 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).

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 mis-specification problem. Our results also show that SWFs take the investment decision in cross-border target firms by trying to reduce transaction costs and information asymmetry according to the cross-border acquisition theory, and also by taking the legal and institutional

environment of the host 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 financial consideration.

This paper is organized as follows. The next section presents the theoretical framework on the SWF acquisition dual decision process where a simple theoretical model of SWF portfolio international investment is developed and the most relevant research studies on the entry mode decision are discussed. Section 3 introduces the data and provides descriptive statistics. Section 4 presents the econometric model and reports the empirical findings. Section 5 concludes.

2 Theoretical framework on the SWF acquisition dual decision process

In the various studies conducted on the choice of the entry mode related to mergers and acquisitions (M&A), 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). Referring to the theories predominantly used in M&A research such as institutional theory, transaction cost theory and resource-based-view theory³, we theoretically and empirically test whether SWFs take their investment decision (on the target firm/country choice and on the size of the stake) only for financial considerations or if they follow other objectives such as economic diversification, stabilization, political or strategic objectives.

2.1 A theoretical model of SWF portfolio international diversification

The following simple model examines whether SWFs behave like any other rational institutional investor. We assume that a rational investor invests only for financial considerations (mean-variance portfolio optimization) and does not follow other objectives (economic diversification, stabilization, political or strategic objectives...).

Consider that investors can invest in both domestic assets D and foreign assets F . If a SWF behaves rationally and targets a mean-variance optimal portfolio (i.e. it invests only for pure financial considerations), it chooses weights in D and F that maximize its expected utility function U .

Denote by X_F the share invested in foreign assets and $X_D = (1 - X_F)$ the share invested in the domestic

³According 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.

assets. The utility function to be maximized is:

$$U = U(E(\tilde{W}_{t+1}/\Omega_t), Var(\tilde{W}_{t+1}/\Omega_t)) \quad (1)$$

where W_{t+1} is the total wealth to be invested by the SWF in time t , Ω_t the information available in t and $X_t = (X_{Dt}, X_{Ft})$ the vector of weights where $X_{Dt} + X_{Ft} = 1$.

Let $R_t = (R_{Dt}, R_{Ft})$ denote the vector of returns on D and F . Expected returns and variances on the SWF's investments are given by:

$$E(\tilde{W}_{t+1}/\Omega_t) = W_t(1 + X_t' E(\tilde{R}_{t+1}/\Omega_t)) \quad (2)$$

$$Var(\tilde{W}_{t+1}/\Omega_t) = W_t^2 Var(X_t' \tilde{R}_{t+1}/\Omega_t) = W_t^2 X_t' Var(\tilde{R}_{t+1}/\Omega_t) X_t \quad (3)$$

The maximization of the SWF's expected utility leads to the following first order condition:

$$X_{Ft} = \frac{(E(\tilde{R}_{F,t+1}/\Omega_t) - E(\tilde{R}_{D,t+1}/\Omega_t))/\gamma + \frac{Var(\tilde{R}_{D,t+1}/\Omega_t) - Cov(\tilde{R}_{D,t+1}, \tilde{R}_{F,t+1}/\Omega_t)}{Var(\tilde{R}_{F,t+1} - \tilde{R}_{D,t+1}/\Omega_t)}}{Var(\tilde{R}_{F,t+1} - \tilde{R}_{D,t+1}/\Omega_t)} \quad (4)$$

where $\gamma = -2\frac{u''}{u'}W$ is the relative risk aversion coefficient.

Equation 4 shows that if the SWF invests only for pure financial considerations, then the demand for foreign assets grows with the expected excess returns between foreign and domestic assets. The lower the SWF's risk aversion coefficient, i.e. γ , the greater the response of the demand for foreign assets to this excess return. The demand for foreign assets increases also with the volatility of domestic assets and decreases with that of foreign assets.

Table 1 reports the average observed weight invested in foreign assets by SWFs in the countries of our sample for which data is available as well as expected weights given by Equation 4 for different risk aversion coefficients. Domestic assets are proxied by national stock market indexes and foreign assets by the MSCI World Market index. Results suggest that, in most cases, the percentages SWFs invest in foreign assets are different from the percentages that we could expect if we assume that SWFs consider only returns and risks when they make their investment decisions.

2.2 Entry mode decision studies

2.2.1 Firm-level factors as determinants of the cross-border percentage ownership acquisition

In the literature on CBA, the 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;

Table 1: Observed and expected weights invested in foreign assets by SWFs in each country

This table reports the average observed weight invested in foreign assets by SWFs in each country and the expected weights given by Equation 4 for different risk aversion coefficients (5, 9, 15 and 30). For each country, domestic assets are proxied by the national market index and foreign assets by the MSCI world market index. Monthly indexes over the period 2000-2015 are sourced from MSCI and expressed in USA dollars.

	Observed average weight	Expected weights			
	(%)	Risk aversion coefficient 5	Risk aversion coefficient 9	Risk aversion coefficient 15	Risk aversion coefficient 30
Australia	40.46	76.83	62.87	55.89	50.66
Bahrein	54.55	100.00	100.00	100	92.86
China	24.20	80.03	72.29	68.42	65.52
France	57.67	63.84	52.10	46.23	41.83
Ireland	22.22	46.26	49.82	51.71	53.07
Italy	24.84	85.92	74.10	68.18	63.75
Kazakhstan	65.87	78.68	78.65	78.63	78.62
Korea	100.00	80.00	71.23	66.85	63.56
Kuwait	60.42	100.00	100.00	88.34	78.78
Malaysia	38.90	100.00	100.00	89.07	70.32
New-Zealand	85.71	65.04	63.86	63.29	62.82
Oman	100.00	100.00	100.00	100.00	96.32
Qatar	100.00	100.00	100.00	100.00	93.85
Russia	50.00	95.53	85.76	80.88	77.22
Saudi Arabia	50.00	94.42	87.01	83.31	80.54
Singapore	82.53	100.00	83.10	69.70	59.65
UAE	78.69	82.89	83.57	83.91	84.17

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., 2019; 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 uncertainty 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).

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 (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 firms⁴.

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&D-intensive industries and 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 home 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.

2.2.2 Target 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 (Cuyppers 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,

⁴In the same way, Boubakri et al. (2016) find that SWFs should less likely be attracted by large and liquid target firms than pension funds.

2004; Cheung et al., 2012; Gawellek et al., 2021). 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.

Institutional structure of the host countries in CBA and in particular their laws and regulation should influence the entry mode choice (North, 1990; Brouthers, 2013). Transaction cost theory assumes that a secure institutional structure will promote cross-border investment. For example, 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. 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.

2.2.3 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 (Stein and Daude, 2001; 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.⁵ 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 Regulation⁶ 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.

Another determinant of the mode of entry listed in the literature on M&As is the access to natural resources. [Cheung et al. \(2012\)](#) find that the natural resources consideration plays a significant role in deciding both the location and the amount of the country's investment like China in target emerging countries (Africa). 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

⁵For 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.

⁶Regulation (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.

Table 2: Explanations for the share of equity sought in CBA by SWFs

Theoretical Perspective	Expected Results	Related literature
Transaction costs theory / Information asymmetry theory Transaction costs theory influences the entry mode choice of foreign acquirers. 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.	SWFs will seek a lower share of equity in cross-border target firms with relatively poorly performance. SWFs will seek a lower share of equity in cross-border target highly leveraged firms.	Chen and Hennart (2004) Zhu et al (2011) Chari and Chang (2009)
	SWFs will seek a lower share of equity in cross-border target large firms.	Hennart and Reddy (1997) Chari and Chang (2009) Ferreira and Matos (2008)
	SWFs will seek a lower share of equity in cross-border target firms with high intensive R&D.	Chen and Hennart (2004) Chari and Chang (2009) Ferreira et al (2014)
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.	SWFs will seek a higher share of equity if the target firm is located in a country that is stable.	North (1990) Brouthers (2013) Williamson (1985)
	SWFs entering countries with few legal restrictions on mode of entry will seek a greater share of equity in target firms	North (1990) Brouthers (2013) Williamson (1985)
	SWFs will seek a lower share of equity in overseas target operating in strategic industries (other than industries dependent on commodities)	Stein and Daude (2001) Globerman and Shapiro (2002) Wehrle and Pohl (2016)
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 revenues. 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.	SWFs will seek lower (resp. higher) equity shares in cross-border strategic sectors related to commodities.	Bremmer (2010) Karolyi and Liao (2017) Avendano (2012)

3 Data and descriptive statistics

3.1 SWF cross-border acquisition's 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 website⁷, 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 SWFs⁸, 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.⁹ 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 database Factiva to verify the transactions identified and completed missing acquisitions.¹⁰ 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).¹¹ 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

⁷<http://www.swfinstitute.org/>.

⁸See Amar et al (2019) for more details on the definition of SWF and the construction of the sample.

⁹Dewenter 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; ?; Dyck and Morse, 2011; Fernandes, 2014).

¹⁰The 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.

¹¹According 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).

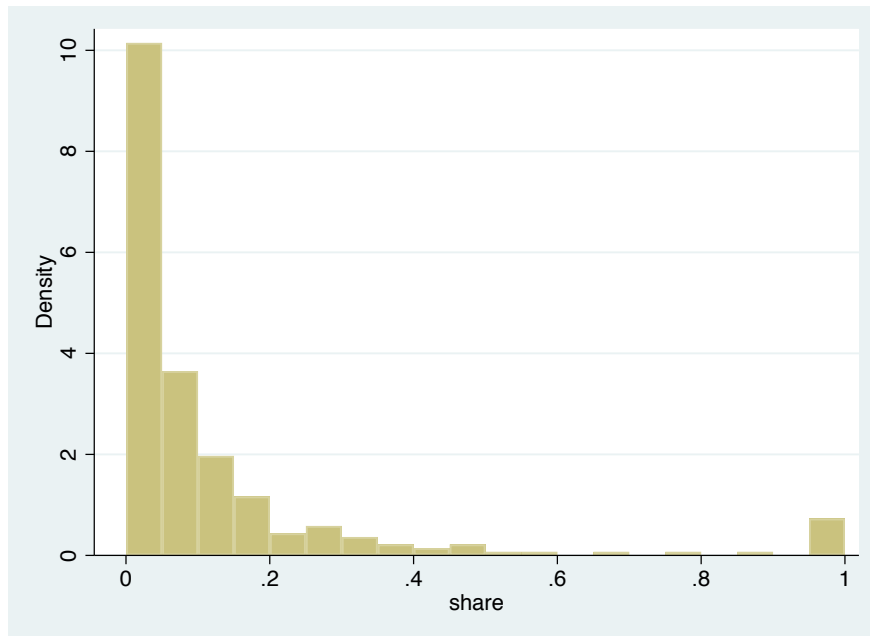


Figure 1: Dispersion of the share acquired by SWFs over the period 2000–2015

several steps.¹²

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.¹³ 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.

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 3.

¹²As the aim of the paper is to explain what are the drivers of SWFs when they buy small or large stakes in cross-border target firms, we exclude disinvestments because the determinants to explain the decision to partially or fully divest shares in cross-border firms are not the same.

¹³This 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

Table 3: Description of the variables

Variables	Description	Source
<i>Firm-level factors</i>		
<i>ROA</i>	Return-on-Assets of the company.	Worldscope
<i>Debt/Capital</i>	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
<i>Market Cap.</i>	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
<i>Intang./Assets</i>	Ratio of the total intangible assets to the total assets of the company.	Worldscope
<i>Country-level factors</i>		
<i>Eco. Stab.</i>	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
<i>Fin. Stab.</i>	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
<i>Pol. Stab.</i>	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, Internal 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
<i>Fin. Freedom</i>	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
<i>Inv. Freedom</i>	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
<i>Prop. Rights</i>	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 more certain the legal protection of property, the higher a country's score.	The Heritage Foundation
<i>Sector-level factors</i>		
<i>Strategic</i>	Dummy variable that equals 1 if the targeted firm operates in one of the following strategic sector: aerospace and defense; telecommunication service providers; telecommunications equipment; oil, gas and coal; chemicals.	Authors' analysis
<i>Strategic2</i>	Dummy variable that equals 1 if the targeted firm operates in one of the following strategic sector: aerospace and defense; telecommunication service providers; telecommunications equipment; chemicals.	Authors' analysis
<i>Strategic5</i>	Dummy variable that equals 1 if the targeted firm operates in one of the following strategic sector: aerospace and defense; telecommunications equipment; chemicals.	Authors' analysis
<i>Commodity</i>	Dummy variable that equals 1 if the target firm operates in a sector related to commodities, and 0 otherwise.	Authors' analysis
<i>Control variable</i>		
<i>GDP/capita</i>	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

Firm-level factors

The first firm-level factor we consider is firm performance, measured by net income by assets (*ROA*).¹⁴ Our second factor is leverage, which is defined as the total debt divided by the total capital (*Debt/Capital*).¹⁵ We also consider the logarithm of total market value of the company (*Market Cap.*) as a proxy of the size of the target firm.¹⁶ 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.

Country-level factors

To test whether SWFs seek larger shares in firms located in stable countries, 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: *Inv. Freedom*, which is an 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 order to test whether SWFs target strategic industries in their investment and allocation decisions, we consider three dummy variables. 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 three different dummy variables considering different part of the strategic sectors listed above (*Strategic*, *Strategic2* and *Strategic5*).¹⁷

¹⁴Firm performance may also be proxied by net income by equity (*ROE*). We tested it in our estimates and find similar results which are available upon request

¹⁵An alternative proxy is the total debt divided by the market value of equity (*Debt/Equity*). We tested it in our estimates and find similar results which are available upon request.

¹⁶We alternatively used the logarithm of total assets (*Assets*). We find similar results which are available upon request.

¹⁷We also tested two additional dummy variables. *Strategic3* includes the following sectors: aerospace and defense; telecommunication service providers; telecommunications equipment; and chemicals. *Strategic4* includes the following sectors: aerospace and defense; telecommunications equipment; oil, gas and coal; and chemicals. The results are not conclusive. They have not been included in the paper but are available on request.

Control variables

In order to control the economic situation of the target country we include the logarithm of GDP per capita (*GDP/Capita*) as control variable.

3.3 Descriptive statistics

Table 4 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%.

Table 4: 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 terminology (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 $0 < y < 10\%$, $10\% \leq y < 50\%$ and $y \geq 50\%$.

	Binary part		Fractional part		
	$y = 0$	$y > 0$	$0 < y < 10\%$	$10\% \leq y < 50\%$	$y \geq 50\%$
<i>ROA</i>	5.16	5.64	5.67	3.47	4.87
<i>Debt/Capital</i>	33.05	37.78	32.76	44.71	33.89
<i>Market Cap.</i>	14.17	15.24	16.02	13.88	14.13
<i>Intang./Assets</i>	2.57	3.97	5.43	1.88	1.01
<i>Pol. Stab.</i>	0.82	0.81	0.80	0.76	0.79
<i>Eco. Stab.</i>	0.77	0.78	0.78	0.77	0.77
<i>Fin. Stab</i>	0.72	0.74	0.76	0.74	0.72
<i>Prop. Rights</i>	76.25	90.00	85.00	70.00	80.00
<i>Fin. Freedom</i>	60.63	70.00	70.00	60.00	70.00
<i>Inv. Freedom</i>	63.13	75.00	70.00	70.00	70.00
<i>Strategic</i>	17%	45.3%	40.4%	15.2%	7.2%
<i>Strategic2</i>	19.5%	19.7%	18.4%	8.8%	5.2%
<i>Strategic5</i>	14.7%	15.3%	14.7%	6.9%	5.2%
<i>Commodity</i>	6.2%	25.5%	22.1%	6.5%	2.0%

This table shows several relationships that are expected. 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 firms, as well as in firms intensive in R&D. Surprisingly, 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 by 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.

Overall, these statistics suggest that the investment decision and the decision on the stake size are differently explained by our explanatory variables. 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.

4.1 Econometric model

Our variable of interest is the share of equity purchased by SWFs in cross-border target firm. This is a proportion defined and observed only on the standard unit interval (i.e., $0 \leq y \leq 1$), 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:

$$E(y | x) = G(x\theta) \tag{5}$$

where $G(\cdot)$ is some nonlinear function satisfying $0 \leq G(\cdot) \leq 1$. 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).¹⁸

¹⁸Contrary 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

$$y^* = \begin{cases} 0 & \text{if } y = 0 \\ 1 & \text{if } y \in (0, 1] \end{cases} \quad (6)$$

and

$$Pr(y^* = 1 | x) = E(y^* | x) = F_{P1}(x\beta_{bin}) \quad (7)$$

where $F_{P1}(\cdot)$ is some nonlinear function satisfying $0 \leq F_{P1}(\cdot) \leq 1$ (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

$$E(y | x, y \in (0, 1]) = F_{P2}(x\beta_{frac}) \quad (8)$$

where $F_{P2}(\cdot)$ is, as earlier, some nonlinear function satisfying $0 \leq F_{P2}(\cdot) \leq 1$ (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

$$E(y | x) = F_{P1}(x\beta_{bin})F_{P2}(x\beta_{frac}) \quad (9)$$

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 (5)

and (9), we can clearly see that neglecting the dual nature of the SWFs decision can lead to misspecification.¹⁹

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 Wooldridge (1996) and Ramalho et al. (2011)). We more specifically test $H_0 : \gamma_1 = \gamma_2 = 0$ in $E(y | x) = G(x\theta + \gamma_1(x\hat{\theta})^2 + \gamma_2(x\hat{\theta})^3)$. Rejection of the null hypothesis implies rejection of the functional specification²⁰.

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 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 $G_1(x\theta + [(\hat{G}_2 - \hat{G}_1)\hat{g}_1^{-1}]\gamma)$, where $\hat{g}_1 = \frac{\partial G_1(x\theta_1)}{\partial x\theta_1}$. 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

Table 5 reports the marginal effects and z-ratios of the TP-FRM model. The estimates of different versions of this model with alternative explanatory variables are reported in different models (model 1 to 3). In each model, column (1) displays the results of the first stage (investment decision) described by equation (7) and column (2) the results of the second stage (the decision concerning the size of the stake), described by equation (8). The same explanatory variables have been included in both equations of the model.

The reported numbers in Table 5 are average marginal effects. However, since they show single estimates, it is necessary to also propose a graphical interpretation of the results. Figures 2 to 8 give the average predicted probability to invest (part (a) of the figures) and the predicted probability of shares acquired (part (b) of the figures) for different values of significant explanatory variables.²¹ Estimates are displayed with

¹⁹We could also have estimated a Generalized Two-Part FRM (see Wulff (2019)) which models the correlation between the two decisions. However, this specification imposes very strong constraints on the second equation since it needs an exclusion restriction to be identified. Yet, the purpose of this paper is precisely to identify the determinants of the share acquired by SWFs. We have nevertheless tested the GTP-FRM which is not conclusive since the correlation coefficient is not significantly different from 0. In this case, the TP-FRM is the best choice. Results are not presented here in order not to alter the readability of the paper but are available on request.

²⁰The results are clearly in favor of the probit specification (see Table 5).

²¹The tables give average effects, which may mask heterogeneity depending on the values taken by the explanatory variables. Their interpretation must therefore be completed by graphical analyses.

the confidence intervals.

Several insights emerge from our analysis. First, we find that firm-level, country-level and sector-level variables have a significant impact on both the investment decision and the choice of the size of the stake. This is clearly the case for the variables *Debt/Capital*, *Market Cap*, *Pol. Stab*, *GDP/Capita* and *Commodity*, which are significant in both equations. In addition, our results suggest that factors driving SWFs investment decision are not the same as those used to set the size of the shares acquired. More precisely, we find that the variables *ROA*, *Inv. Freedom* and *Fin. Freedom* do not matter in the decision of the shares to be acquired but has an influence on the investment decision, while it is the reverse for the variables *Strategic 5* and *Prop. Rights*. Interestingly, the signs of the marginal effects are systematically opposite between the decision to invest and the decision of the shares to be acquired. This results is clearly illustrated in the graphs of the predicted probabilities of significant explanatory variables (Figures 2 to 8). This interesting result clearly reveals that decision criteria are different when SWFs have to decide to invest abroad or not and when they have to decide to take small or large stakes in target firms. In light of our results, we can conclude that the SWF's investment decision is the 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).

Regarding target firm-level factors, we find that SWFs are more likely to target large firms with poor performance and which are financially distressed.²² Figure 4a clearly shows the important decrease of the predicted probability to invest when the *ROA* increases: the probability to invest is around 0.05 when the *ROA* of the target firm is close to 0% and it decreases to 0.01 when the *ROA* is close to 50%. This result is consistent with existing literature (Bernstein et al., 2013; Kotter and Lel, 2011). 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 with small size and without financial difficulties. In particular, we see in Figure 3b that for a market capitalisation of targeted firms around 5%, the predicted shares acquired is 0.8 but when the market capitalisation increases, the predicted shares acquired drastically decreases, with a level of around 0 when the market capitalisation is around 20%. This means that 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 preferably with small size. As expected in the theoretical section, these results reveal that SWFs take their decision concerning the entry mode choice (partial versus full entry) by trying to reduce transaction costs and information asymmetry according to the cross-border acquisition theory.

²²SWFs target firms with high leverage with the aim of restructuring the management, adding value and potentially selling the firm once it has become profitable.

Concerning country-level factors, the two-stage procedure reveals a complex risk effect as 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. 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 if this country has a high level of income (the variable *GDP/Capita* is significantly positive whereas the variable *Pol. Stab.* is significantly negative in the second equation). Figure [fig:plotmargin5](#) clearly illustrates the opposite effect of the variable *Pol. Stab.* on the two decisions: when the political stability of the targeted country is around 0.44, the probability to invest is close to 0, whereas the probability of the share to be acquired is close to 0.6. When the political stability of the targeted country is around 0.8, the probability to invest is close to 0.6, whereas the probability of the predicted share acquired decreases to 0.1. This result suggests that political risk considerations appear quite important in deciding the entry mode choice (small versus large stakes) in a target firm. Consistent with [Johan et al. \(2013\)](#), we find that legal restrictions influence SWFs investment decisions. More precisely, our results suggest that financial and investment freedom of the target country is an important criterion 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. Figure [5b](#) shows that improving property rights rules increases the probability of the % of share acquired: when the property right score equals 5, the predictive probability of the share acquired is around 0.05 but when the property rights score is close to 95, the predictive probability of the share acquired increases up to 0.18. As expected, a secure institutional structure with clear property rights rules will promote large stakes for SWFs. This result suggests that SWFs take the legal and institutional environment of the country into consideration in their allocation decision.

When we examine whether SWFs tend to target some specific strategic sectors which do not relate to commodities (aerospace and defense, telecommunications equipments and chemicals). We find that the strategic sector dummy (*Strategic5*) is not significant in the investment decision but is significantly positive in the decision of the shares to be acquired. 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.²³ 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

²³According to [Fernandez and Eschweiler \(2008\)](#), by buying sizeable stakes in corporations, it is possible for SWFs to appropriate minority shareholders and pursue interests other than maximizing portfolio performance.

to acquire lower equity shares with the aim of industrial diversification strategy (*Commodity* is significantly positive in the investment decision and negative in the decision of the shares to be acquired. 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. As expected in the theoretical model developed in previous section, these results show that SWFs have consideration other than financial when they take their decision to buy equity shares in target firms.

At last, in order to test the appropriateness of the two-part specification of the fractional regression model, we implement the RESET specification test described in the section Methodology. The results of these specification tests are given in Table 5. We find that the choice of a Probit model is justified for the fractional part of the TP-FRM model.

Table 5 also displayed results of the p -tests which are clearly in favor of the TP-FRM against a one-part FRM.

Table 5: Marginal effects of the 2P-FRM

This table presents the results of the 2P-FRM in which the dependent variable is the equity shares sought by SWFs in foreign companies. The coefficients are marginal effects. Numbers in bold refer to the coefficients that are significant at least at 10% level of significance.

Columns (1) refer to the decision to invest.

Columns (2) refers to % share acquired

	Model 1		Model 2				Model 3					
	(1)		(2)		(1)		(2)		(1)		(2)	
	Coeff	z-ratio	Coeff	z-ratio	Coeff	z-ratio	Coeff	z-ratio	Coeff	z-ratio	Coeff	z-ratio
<i>ROA</i>	-0.0013	-3.92	0.0002	0.15	-0.0013	-3.92	0.0002	0.15	-0.0012	-3.80	0.0003	0.24
<i>Debt/Capital</i>	0.0003	3.68	-0.0004	-1.75	0.0003	3.68	-0.0004	-1.75	0.0003	3.39	-0.0005	-1.87
<i>Market Cap.</i>	0.0138	8.87	-0.0420	-5.04	0.0138	8.87	-0.0420	-5.04	0.0130	8.35	-0.0435	-5.51
<i>Intang./Assets</i>	-0.0001	-0.65	-0.0003	-0.27	-0.0001	-0.65	-0.0003	-0.27	-	-	-	-
<i>Strategic</i>	-0.0046	-0.73	0.0471	1.42	-0.0046	-0.73	0.0471	1.42	-	-	-	-
<i>Strategic2</i>	-	-	-	-	-0.0046	-0.73	0.0471	1.42	-	-	-	-
<i>Strategic5</i>	-	-	-	-	-	-	-	-	-0.0016	-0.23	0.0765	2.03
<i>Commodity</i>	0.0493	6.99	-0.0729	-1.88	0.0493	6.99	-0.0729	-1.88	0.0520	7.22	-0.0617	-1.91
<i>GDP/capita</i>	-0.0227	-4.42	0.0837	2.76	-0.0227	-4.42	0.0837	2.76	-0.0302	-5.89	0.0820	3.53
<i>Pol.Stab.</i>	0.1396	1.99	-1.3617	-3.06	0.1396	1.99	-1.3617	-3.06	0.1765	2.65	-0.9595	-2.93
<i>Eco.Stab.</i>	0.0154	0.26	0.1959	0.55	0.0154	0.26	0.1959	0.55	-	-	-	-
Financial stability	0.0232	0.59	0.1971	0.72	0.0232	0.59	0.1971	0.72	-	-	-	-
<i>Inv.Freedom</i>	0.0007	2.73	0.0008	0.72	0.0007	2.73	0.0008	0.72	0.0000	0.11	0.0001	0.11
<i>Prop.Rights</i>	-0.0003	-0.91	0.0030	2.09	-0.0003	-0.91	0.0030	2.09	-0.0002	-0.85	0.0018	1.67
<i>Fin.Freedom</i>	-	-	-	-	-	-	-	-	0.0007	2.59	0.0006	0.41
AIC	-14.69				14.69				-14.61			
BIC	-14.67				-14.67				-14.60			
RESET test	Stat	p-value			Stat	p-value			Stat	p-value		
1 part model	1.51	0.22			1.51	0.22			3.95	0.04		
Frac. part of TP-FRM	24.89	0.00			24.89	0.00			3.13	0.07		
P-tests												
FRM vs TP-FRM	3.31	0.07			3.31	0.07			0.95	0.33		

Figure 2: Predicted changes in probability and share acquired with *Debt/Capital*

Figure 2a (respectively 2b) presents the predicted probability to invest (resp. share acquired) depending on the debt-to-capital ratio of the target company. These estimates are based on Model 3 (see Table 5).

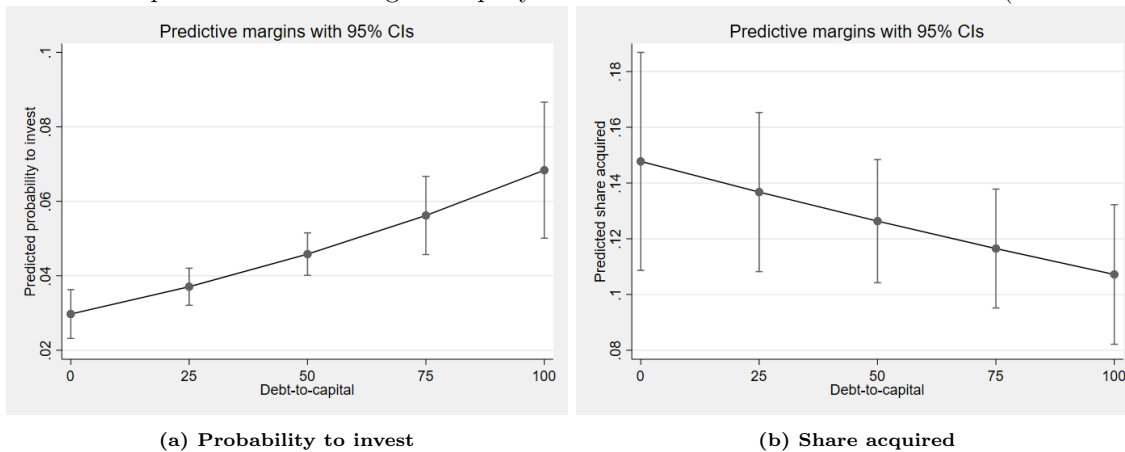


Figure 3: Predicted changes in probability and share acquired with *MarketCap*.

Figure 3a (respectively 3b) presents the predicted probability to invest (resp. share acquired) depending on the market capitalisation of the target company. These estimates are based on Model 3 (see Table 5).

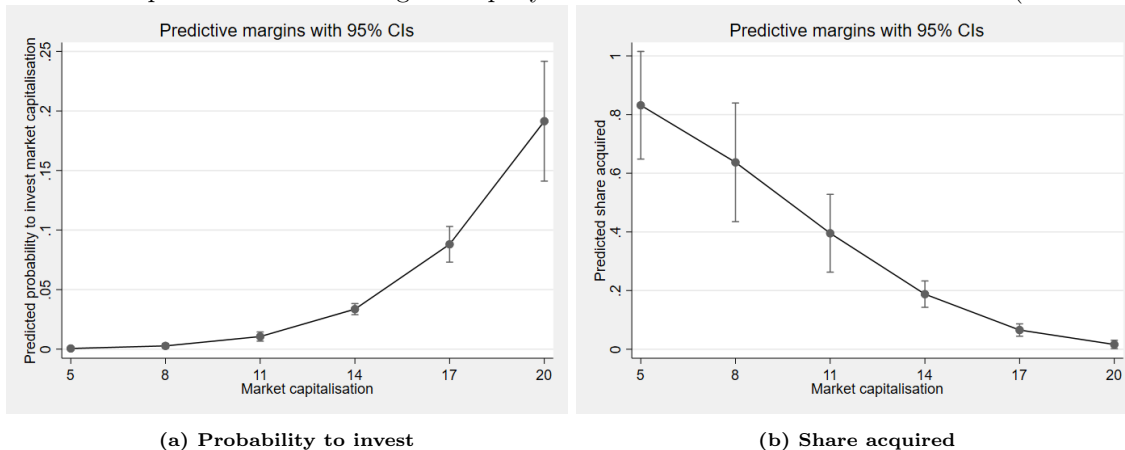


Figure 4: Predicted changes in probability and share acquired with *ROA*

Figure 4a (respectively 4b) presents the predicted probability to invest (resp. share acquired) depending on the return on assets of the target company. These estimates are based on Model 3 (see Table 5).

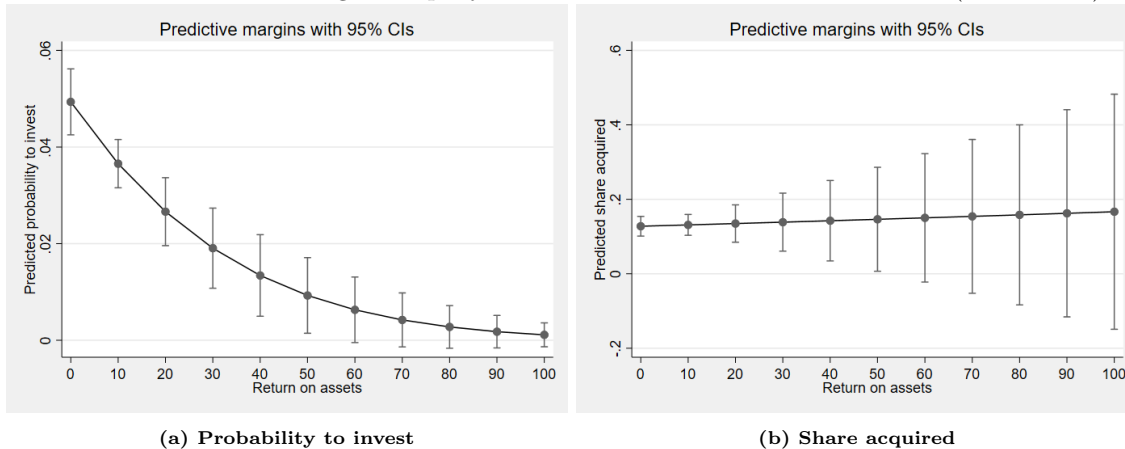


Figure 5: Predicted changes in probability and share acquired with *Prop.Rights*

Figure 5a (respectively 5b) presents the predicted probability to invest (resp. share acquired) depending on the level of protection of private property of the target country. These estimates are based on Model 3 (see Table 5).

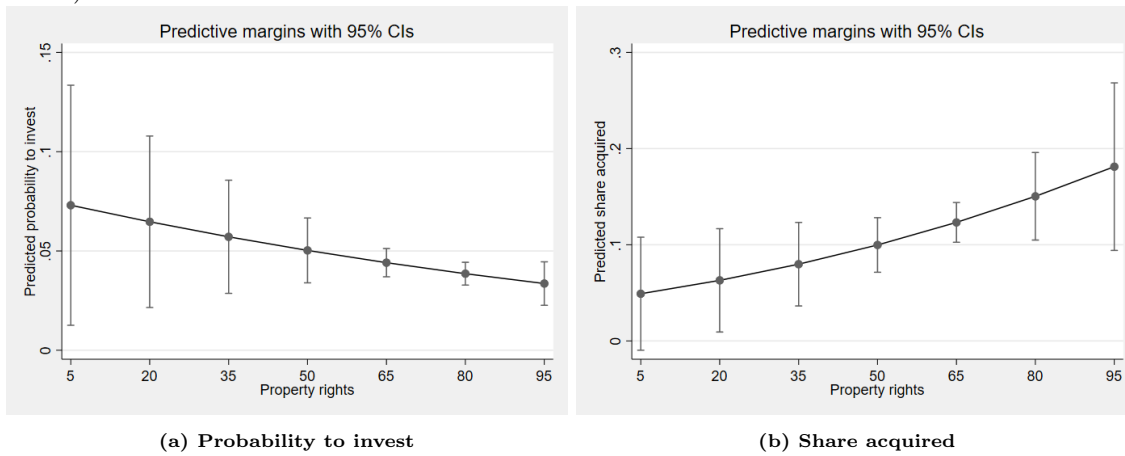


Figure 6: Predicted changes in probability and share acquired with *Inv.Freedom*

Figure 6a (respectively 6b) presents the predicted probability to invest (resp. share acquired) depending on the level of Investment Freedom of the target country. These estimates are based on Model 3 (see Table 5).

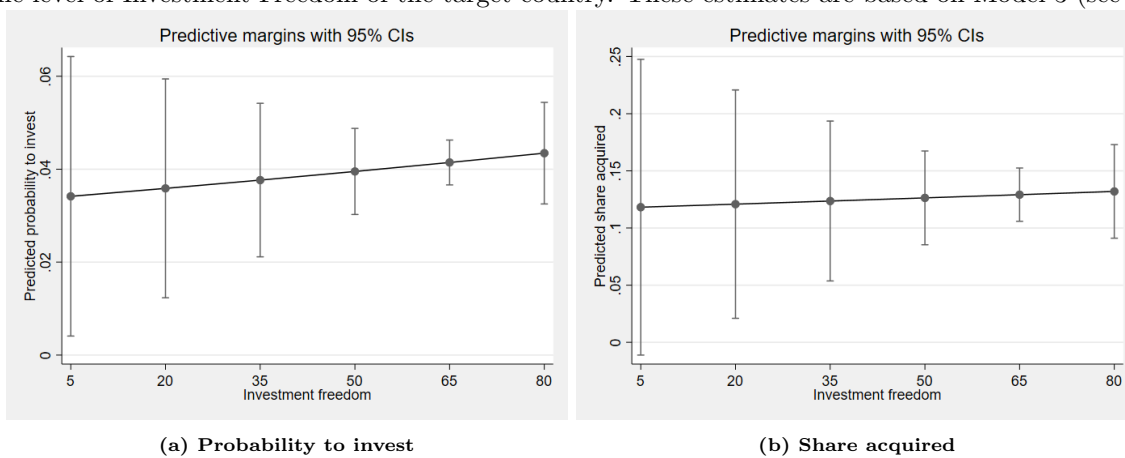


Figure 7: Predicted changes in probability and share acquired with *Fin.Freedom*

Figure 7a (respectively 7b) presents the predicted probability to invest (resp. share acquired) depending on the level of protection of Financial Freedom of the target country. These estimates are based on Model 3 (see Table 5).

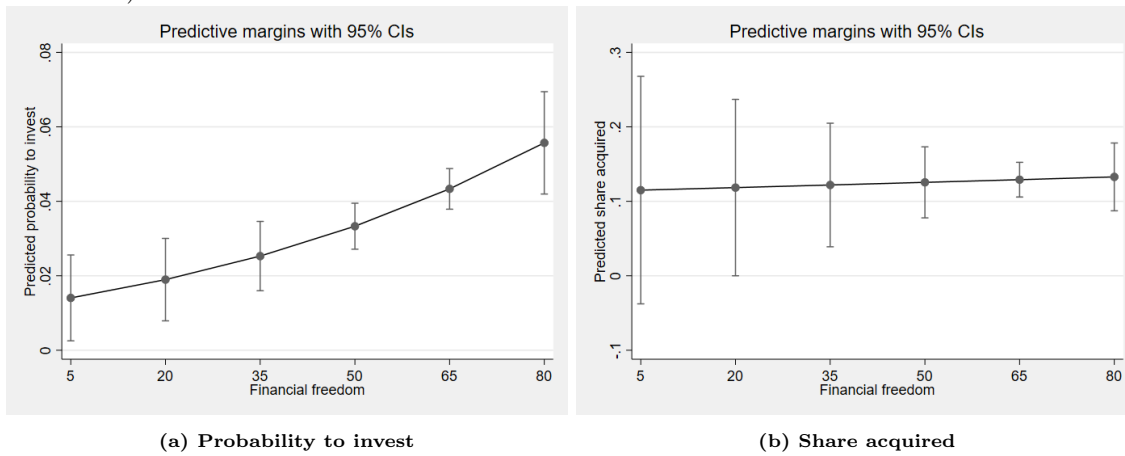
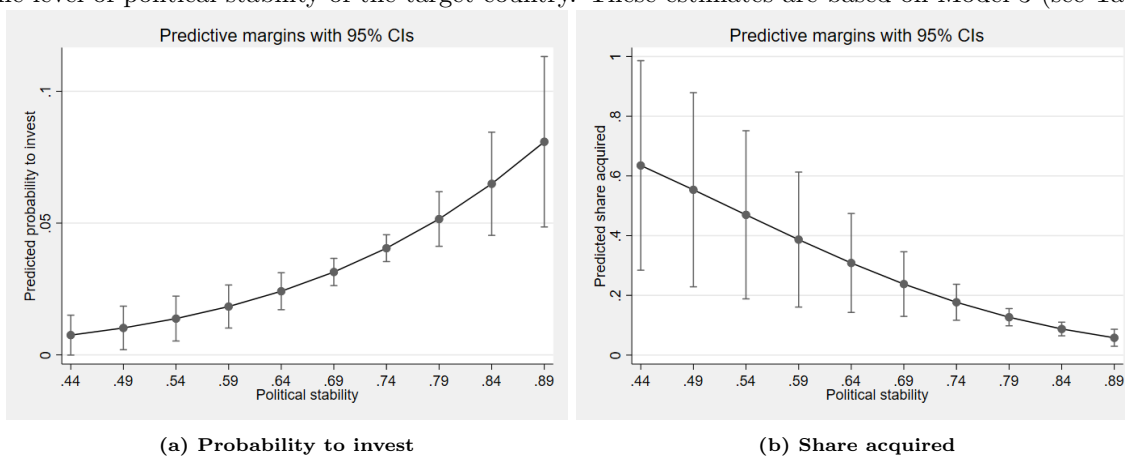


Figure 8: Predicted changes in probability and share acquired with *Pol.Stab.*

Figure 8a (respectively 8b) presents the predicted probability to invest (resp. share acquired) depending on the level of political stability of the target country. These estimates are based on Model 3 (see Table 5).



5 Conclusion

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 [Ramalho and Silva \(2009\)](#), 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 only different from those used to determine the share size to be acquired in a target firm but also they generally have opposite effects. More precisely, while SWFs target larger firms with poor performance and financially distressed, 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. The results of the model also suggest that SWFs will seek to take higher shares of equity in firms located preferably in countries with high economic development and with high legal protections in terms of property rights. However, if SWFs preferably make their decision to invest in politically stable countries, we find the opposite effect for the decision on the share to be acquired. 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 TotalEnergies or Lagardere.

Overall, we find that SWFs take the investment decision in cross-border target firms by trying to reduce

transaction costs and information asymmetry according to CBA's theory, and by taking into account the legal and institutional environment of the country. However, as suggested in our theoretical model, 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 financial considerations.

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