

ESCAPING FINANCIAL CRISES? MACRO EVIDENCE BASED ON SWFs' INVESTMENT BEHAVIOUR

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Abstract

The paper investigates the determinants of Sovereign Wealth Funds' (SWFs) investment activity at a macro level, with a special emphasis on the possible reaction to a financial crisis hitting a potential target economy. The analysis relies upon a specifically-built proprietary database, which encompasses 1,903 acquisition deals spanning the period 1995-2010 and involving 29 out of the 59 existing SWFs. According to a three-stage modelling approach, we find out that this class of investors prefers to invest in countries characterised by a higher degree of economic development, where financial markets are thicker and more liquid, where institutions are more effective in terms of protection of legal rights, which are characterized by a more stable macroeconomic environment. Most importantly, and in stark contrast with the extant empirical literature on other relevant institutional investors, SWFs seem to engage in a 'contrarian' investment behaviour, by increasing their acquisitions in countries where crises hit. Capital flows stemming from SWFs' acquisition activity worldwide, therefore, may end up having a stabilizing role on local markets during periods of financial turmoil, protecting the targeted countries from foreign shocks, instead of propagating them globally.

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1. Introduction

The article investigates the determinants of Sovereign Wealth Funds' (SWFs) investment choices at a macro level, i.e. in terms of the characteristics of the target country. Within this general framework, the paper assesses whether SWFs follow the procyclical investment behaviour which seems to be typical of other institutional investors by divesting from countries where crisis hits, thus propagating the transmission of shocks globally.

SWFs are state-owned investment vehicles which manage portfolios of financial instruments partly denominated in foreign currency. They derive their wealth from commodity revenues or from balance of payments or fiscal surpluses.

Interest in the investment behaviour of SWFs has increased rapidly over the last ten years, given their growing presence in financial markets, particularly in the equity ones¹: according to the specifically built proprietary dataset used in this paper – encompassing 1,903 equity acquisitions spanning the period 1995–2010 – SWFs reached the peak of their investment activity in international equity markets in 2007, with investment totalling \$124 billion.

SWFs' assets under management (AuM) reached \$4.7 trillion at end-2011, a figure larger than that of other important institutional investors like private equity funds or hedge funds. In spite of their growing size, academic research on SWFs is fairly limited. This is partly due to information gaps: most funds, indeed, publish only very limited information about their investment activity and portfolio structure and dimension. This has raised concerns amongst politicians, the public and international financial institutions that they could be pursuing hidden strategic objectives instead of the declared return maximization targets.

Given their size, it is critical to understand which variables might determine SWFs' investment choices and also whether they contribute to exacerbating crises, propagating shocks through international financial markets from one country to another. Anecdotal evidence (Ciarlone and Miceli, 2013) suggests that SWFs followed a countercyclical approach during the recent financial crisis, when they invested in bank stocks rescuing liquidity stripped western financial institutions. By means of a more robust econometric approach, the objective of this paper is to assess whether this *prima facie* evidence of SWFs acting as stabilizing actors during episodes of crises is confirmed or, alternatively, whether SWFs behave like other classes of institutional investors which divest from countries where crisis hits, thus propagating shocks on a global scale.

By means of a three-stage modelling approach, we find evidence that SWFs are more likely to invest in countries characterised by a higher degree of economic development, deeper and more liquid financial markets, a more effective protection of property rights, a more stable macroeconomic environment. Another, and in some sense more important, result relates to the sign and significance of the crisis dummy series. According to our estimation results, a country experiencing a financial crisis – anyhow defined – is more likely to attract equity acquisitions by SWFs. Independently from the econometric specification, the crisis dummy always plays a positive and highly significant role in affecting the likelihood of a country being targeted by SWFs' investment activity. This result shows that SWFs behave in a countercyclical way in their equity acquisition strategy: in stark contrast with the extant empirical literature about other major institutional investors – clearly showing the existence of a procyclical investment activity in times of financial stress – SWFs seem to engage in a ‘contrarian’ behaviour by increasing their acquisitions in countries where crises hit. Capital flows stemming from SWFs' investment activity, therefore, may end up having a stabilizing role on local markets during periods of financial turmoil, protecting the targeted countries from foreign shocks instead of propagating them globally.

¹ Equities, indeed, do represent an important share of SWFs' portfolios: in the average, this share is estimated to be between 50-55 percent, with the exception of a few funds which are not allowed to trade in equities.

The contribution of the paper is twofold. On the one side, it provides further development for the literature on SWFs by identifying the determinants of their investment choices at a country level. On the other side, it contributes to the literature on the behaviour of institutional investors showing that this class of investors do not exacerbate, or propagate, financial shocks globally. Our study is the first one, according to our knowledge, which deals with these particular aspects of SWFs' investment activity.

The paper proceeds as follows. Section 2 provides background information on SWFs. Section 3 summarizes the literature on SWFs and on institutional investors' behaviour in terms of procyclicality. Section 4 describes the dataset, considering both the dependent and the independent variables. Section 5 presents the main feature of the three-stage modelling approach along with the estimation results. Section 6 reports a set of robustness checks. Section 7 concludes.

2. Background information on SWFs

SWFs are state-owned investment vehicles which manage portfolios of financial instruments partly denominated in foreign currency. They derive their wealth from commodity revenues or from balance of payments or fiscal surpluses (IMF, 2008).

SWFs share some common characteristics that make them worth considering as a single group of investors (Quadrio Curzio and Miceli, 2010). To begin with, all SWFs are government-owned investment funds. Second, a significant share of their portfolios is invested in foreign assets. Third, they are not subject to short-term withdrawals, i.e. they have no explicit liabilities to their owners, which gives them a typical long-term investment horizon. Fourth, they are separately managed from official reserves, even when they are administered within the central bank. Finally, they are clearly differentiated from other state-owned entities, such as state-owned enterprises and public pension funds.

The last decade witnessed an impressive growth of this phenomenon, both in terms of the size of their AuM and in terms of number of new funds established worldwide. The total amount of AuM increased from \$500 billion in 1995 to almost \$4.7 trillion in 2011, while a large fraction (47 percent) of all the SWFs existing nowadays was established between 2000 and 2008 (Ciarlane and Miceli, 2013). Funding for this rapid growth has been made possible by the increasing oil revenues and by the accumulation of foreign currency reserves through interventions in foreign exchange markets.

Based on the characteristics outlined above, it is possible to pinpoint 59 SWFs in 2011, with an estimated total amount of AuM of almost \$4.7 trillion, a figure that corresponds to 7 percent of the world GDP and 3 percent of the total stock of global financial activities in the same year (Ciarlane and Miceli, 2013). Their size is significant when compared to that of other important institutional investors, like private equity funds (which manage an estimated total amount of assets of \$2.6 trillion) or hedge funds (\$1.8 trillion); it remains not trivial even when confronted with the actual global financial giants, i.e. pension funds (with \$30 trillion of AuM), insurance companies (\$25 trillion) and mutual funds (\$25 trillion). Another relevant characteristic is the high degree of concentration: the 10 largest SWFs hold almost 80 percent of total assets, the first 15 almost 90 percent. From all these figures it is possible to realize how significant the SWFs' financial firepower is.

Table 1 lists the first 30 SWFs ranked by their respective AuM along with the country of origin, the year of inception and the source of their wealth, where C stands for 'commodity' (mostly oil and gas) and NC stands for 'non-commodity' (mostly trade balance or fiscal surpluses). Considering all the existing 59 SWFs, nearly 40 percent of the total assets belong to SWFs located in Asia. Some of the largest, in fact, are the Chinese SAFE Investment Company, the China Investment Corporation, and the Singaporean Government Investment Corporation and Temasek; typically, they do not derive their wealth from commodity exports, but rather from balance of payments surpluses. Middle Eastern SWFs follow suit, managing another big

share (35 percent) of total assets mostly stemming from oil-related revenues; the largest ones are represented by the Saudi Arabian Monetary Agency, the Abu Dhabi Investment Authority, the Kuwait Investment Authority and the Qatar Investment Authority. European SWFs were estimated to manage another 15 percent of total assets, with the biggest players being the Norwegian Pension Fund and the two Russian National Wealth Fund and Reserve Fund; all of them are commodity-based SWFs.

In the medium- to long-run, SWFs are expected to grow further, albeit at a slower pace. According to some recent estimates (Castelli and Tagliapietra, 2012), SWFs' total AuM may reach \$10 trillion by the end of 2016; this forecast highlights that SWFs will grow at a faster pace than other financial investors. Given their current size, and their expected rate of growth, they appear to be particularly well-equipped to navigate financial markets, especially in periods of financial crises.

Along with their number and dimension, and given their growing relevance for financial market developments, the interest in their structural characteristics and investment behaviour has rapidly increased over the last decade. However, academic research on SWFs has been fairly limited up to now, largely reflecting deep data gaps: most SWFs, in fact, publish only very limited information about their investment objectives, dimension and structure of their portfolios; some SWFs do not even disclose the amount of their assets. This has raised concerns amongst politicians, the public opinion and international financial institutions that they could be pursuing hidden strategic objectives, instead of the presumed classic return maximization targets.²

3. Review of the literature

The extant literature on SWFs mainly focuses on the implications of their investment activity for the stock performance of target firms. Several studies analyse how the market valuation of a firm's shares may react following an equity acquisition from a SWF: empirical evidence on this point suggests the existence of a positive impact on target firms' stock prices in the (very) short-run (Kotter and Lel, 2011; Bortolotti *et al*, 2010; Dewenter *et al*, 2010; Sun and Hesse, 2009), while no reaction at all (Dewenter *et al*, 2010; Chhaochharia and Laeven, 2010; Kotter and Lel, 2011) or even a negative reaction in the long-run (Bortolotti *et al*, 2010).

Only few papers focus on the factors which may attract the interest of SWFs (Kotter and Lel, 2011), or whether these factors may differ from those of other important institutional investors such as mutual funds (Boubakri *et al*, 2011) or pension funds (Chhaochharia and Laeven, 2010). In these papers, determinants of SWFs' investment activity are considered mostly at a micro level, i.e. with reference to the characteristics of the target firms,³ while very little attention is given to a more macro dimension in terms of country characteristics.⁴ Actually, there have been some attempts to accompany the micro with a more macro approach (Chhaochharia and Laeven, 2010; Kotter and Lel, 2011; Knill *et al*, 2012), but the attention has focused on a very small set of variables which are decided upon from an *ex-ante* point of view. Chhaochharia and Laeven (2010) introduce the stock market turnover, the rate of inflation, the level of GDP per capita and the 'law and order' tradition of a country, which turned out to be the only significant macro determinant. Kotter and Lel (2011) suggest a possible role for the stock market capitalization and the rule of law, finding

² The fierce debate about SWFs' potentially dangerous investment behaviour induced the IMF to establish, in 2008, a dedicated international working group (IWG); the participants, including representatives from SWFs themselves, issued a code of conduct, commonly known as 'Santiago Principles', outlining a series of principles and practices to be adopted on a voluntary basis (Generally Accepted Principles and Practices – GAPP).

³ Typical determinants at the firm-level are market capitalization, leverage, cash-assets ratio, sales growth, intangible assets ratio, ROA, ROE, turnover, book-to-market, returns.

⁴ Typical determinants at the country-level are the degree of economic development, the size of stock markets, the degree of legal rights protection.

out that only the former is statistically significant, with a positive sign. Knill *et al.* (2012) assess the significance of bilateral economic and political relations between the country of the acquirer SWF and that of the target firm in influencing the likelihood of SWFs' investments. Finally, in a study concerning the broader category of government-controlled acquirers (including SWFs), Karolyi and Liao (2010) find no significant differences in a set of cross-country macroeconomic determinants of cross-border acquisitions – such as the level of economic and financial development of the target country, the quality of its legal institutions and accounting standards – between government-controlled and private acquirers.

In the analysis that follows, we try to fill this gap by means of an approach completely focused on a broad range of macro variables. First of all, we enrich the list of potential determinants of SWFs' investment activity by resorting to the results of the relatively larger literature about equity allocation worldwide (e.g. Chan *et al.*, 2005) and cross-border equity flows (e.g. Portes and Rey, 2005), which offers the chance to test the significance of a richer set of macroeconomic and institutional variables. Moreover, we do not impose any alleged relationship between SWFs' investment activity and this ample set of potential determinants from the outset, but we let the model to decide – in some sense – which variables may turn out to be truly significant by means of a modified general-to-specific empirical approach, based on 'horse-race' regressions. Finally, within this general framework, we are particularly interested in assessing how SWFs behave during periods of financial crisis.

Ample evidence suggests that the financial system is inherently procyclical (Borio *et al.*, 2001), with total gross capital flows retrenching significantly during crises especially when particularly severe (Broner *et al.*, 2013). Institutional investors are characterised by a long-term investment horizon: from a theoretical point of view, therefore, they should be able to ride out the short-term volatility in asset prices and to be less affected by procyclicality in their investment activity. Recent financial stress episodes have demonstrated, instead, quite the opposite.

A broad literature has flourished about institutional investors' procyclical behaviour, which may be hinted to as both shock-transmitters and shock-amplifiers. Institutional investors, for instance, may engage in 'momentum' trading, systematically buying 'winners' and selling 'losers' in response to the distribution of past returns, and this behaviour seems to be particularly strong during periods of financial crisis (Kaminsky *et al.*, 2004). Also, institutional investors may engage in 'herding' behaviour (Lakonishok *et al.*, 1992; Grinblatt *et al.*, 1995; Wermers, 1999; Sias, 2004), contributing to the propagation of a crisis. The latter may indeed trigger herd activity away from the crisis hit country, producing a contagion effect which spreads its adverse consequences to neighbouring economies (Chian and Zheng, 2010).

The work by Papaioannou *et al.* (2013) offers clear evidence of the procyclical behaviour of major institutional investors during the recent global financial crisis; this evidence is particularly clear for mutual funds, which massively divested from crisis-hit markets after the collapse of Lehman Brothers in September 2008. The work by Raddatz and Schmukler (2011), based on an extensive set of micro-level data on mutual funds investment in bond and equity markets, reinforces this conclusion by analysing the strategic interactions between investors and managers: both of them respond to country returns and crises, and adjust their investments substantially through large portfolio reallocations, reducing their exposure to countries during bad times and increasing it when conditions improve. Capital flows from mutual funds, therefore, do not have a stabilizing role and expose countries in their portfolios to foreign shocks.

Considering SWFs' structural characteristics – i.e. their long-term investment horizon, the objective to preserve wealth for future generations, and the absence of any obligation to redeem – they should be well equipped to avoid the procyclicality of investment choices during episodes of financial crisis. On this point, nevertheless, the extant anecdotal evidence is mixed. While Kunzel *et al.* (2011) provide support of some SWFs liquidating their positions in an effort to support domestic economies or to increase the share of liquid instruments in their portfolios, Ciarlone and Miceli (2013) offer alternative evidence about SWFs'

countercyclical behaviour linked to their massive investment in bank stocks during the recent financial crisis. In our view, these different conclusions may be reconciled by considering the different time frame analysed in the two studies: SWFs acted countercyclically when they invested in bank stocks at the outset of the crisis, while the liquidations shortly afterwards seemed to have been procyclical.

To our knowledge, there is not a piece of literature aimed at evaluating – by means of an econometric approach – whether SWFs' investment behaviour is procyclical or not. The only study in this field is Miceli (2013), who investigates SWFs' acquisition activity in equity markets with the objective to assess whether there is evidence of 'herding' or not. By means of a broad dataset of SWFs' equity acquisitions and sales, the study proves that this class of investors, differently from mutual funds, does not herd in equity markets. This result is particularly relevant for our article, since it provides evidence that SWFs do not contribute to propagate crisis through herding behaviour. Our study is the first one to deal with the particular aspect of SWFs' investment procyclicality, by assessing whether the occurrence of a crisis may affect the likelihood of a country being targeted by SWFs' equity acquisitions.

4. Data

4.1 *The dependent variable and some descriptive statistics*

In this section we present the database from which we extrapolated the dependent variable, providing as well some descriptive statistics on SWFs' investment activity. The dependent variable is a binary outcome assuming the value of 1 if a country received investment by at least one SWF in the respective year and 0 otherwise. The series of SWFs' equity acquisition deals has been drawn from a specifically built database, which combines information stemming from three main sources: the Fondazione Eni Enrico Mattei (FEEM) Monitor on SWF's transactions (covering 1,273 deals by SWFs between May 1985 and June 2010), the Standard & Poors' Capital IQ M&A and the Thomson One Banker M&A.⁵ For the latter two databases, a name search was performed for each of the existing 59 SWFs covering the period between January 1995 and December 2010 and including also the funds' known subsidiaries.⁶ After merging together the three data sources, duplicates were deleted. In addition to eliminating duplicates and records with no sufficient information, the following types of deals have also been deleted: withdrawn, cancelled, pending, intended, rumour, discontinued rumour, intra-group deals, mergers and joint-ventures. Finally, deals involving transfers between related subsidiaries of a given SWF have been deleted as well, since they configure intra-group transactions not relevant for the purpose of this analysis. As a result, the dataset consists of 1,903 acquisition deals spanning the period January 1995–December 2010. Deals included in the dataset encompass purchases in listed and unlisted equity across a broad range of countries and sectors.

Deals in the dataset refer to 29 SWFs out of the existing 59. The 29 SWFs of the sample totalled \$3.75 trillion of AuM, almost 80 percent of the total assets owned by all SWFs. In terms of value, acquisitions totalled \$513.2 billion, corresponding to 1,448 deals out of 1,903.⁷ The 29 SWFs included in the sample are reported in Table 2, along with their country of origin. The most represented are the Singaporean Temasek and GIC, followed by the Malaysian Khazanah, the Dubai's Istithmar, the Chinese CIC and several other

⁵ The Monitor-FEEM SWF transaction database uses multiple public sources including financial databases (Bloomberg, SDC Platinum and Zephyr M&A), disclosures from fund websites, information aggregators (Lexis Nexis and Factiva) and other internet sources (Zawya.com, Sovereign Wealth Fund Institute).

⁶ For example, Temasek makes some investments through its subsidiaries, such as Vertex Venture Holdings or Aranda Investments.

⁷ Only 1,448 deals out of 1,903 are considered for calculating the amounts because the remaining deals do not report any amount. For the transactions characterized by multiple investors/sellers, the amount related to the specific SWF was separated from the total amount of the deal. In case the amount attributable to the single SWF was not specified, the total figure of the deal was divided by the number of participants.

Middle Eastern funds (QIA from Qatar and Mubadala from the UAE). SWFs from Asia appear to be the most active ones, even if this could depend on their higher level of transparency especially when compared with the Middle Eastern funds. This ranking is similar if we consider the amount of deals.

In the time frame considered, SWFs spread their acquisitions throughout 102 countries, with the United States leading the ranking with 328 deals or 17 percent out of the total (Table 3). In terms of number of deals the Asian markets received more investments, followed by North America (mostly US) and the European Union, which is in turn the leading region in terms of total amount of deals (Table 4). Table 5 shows that SWFs preferred developed economies, which accounted for almost 60 percent of the whole number of deals and 67 percent of the total amount invested; this trend is confirmed even after the recent financial crisis, in spite of the fact the turmoil hit especially the advanced economies. To conclude with, Table 6 hosts some other interesting descriptive statistics on the available sample of deals' value.

4.2 The independent variables

In this section we introduce some explanatory variables and discuss how they are expected to affect international investment activity by SWFs. Drawn mainly from the extant empirical literature on M&A operations and cross-border equity flows, we resort to 20 potential explanatory variables, which could be categorized into the following six families: economic development; stock market development; openness to trade and financial flows; investor protection; quality of institutions; 'other' variables. Particular attention in the econometric procedure will be given to the series concerning the chronology of financial crises. Table 7 hosts a brief description of these potential determinants of SWFs' investment activity, along with their respective source.

First of all, we conjecture that a country's ability to draw investment flows (both direct and portfolio) from abroad and, therefore, to attract attention from SWFs, ought to be affected by its advancement in economic development. We use several measures of economic development. The first two are the per-capita gross domestic product (measured at PPP) and its relative growth rate, with the series obtained from the IMF's World Economic Outlook database. The third measure is the country credit rating, based on a scale of 0-100 as assessed by the Institutional Investor Magazine. Finally, we also include a dummy variable equalling 1 for an advanced economy and 0 otherwise.

It is then reasonable to expect that investors tend to allocate their wealth in more developed stock markets because of the respective higher liquidity and lower transaction costs. We resort to two measures of stock market development. The first one is the relative size of the stock market of any given country, measured by the stock market capitalization as a percentage of the country's GDP; the second one is the turnover ratio, defined as the ratio of the total value of stocks traded to the average market capitalization in any given country. Both these measures are taken from the World Bank's World Development Indicators database.

Although controls to the free movement of goods and capitals have been greatly reduced in many economies, some of them still place restrictions on foreign equity investment and capital flows, as well as resort to some sort of tariff barriers to international trade to protect domestic strategic industries. Conceivably, these aspects can still affect the decision to invest in a certain country. In order to shed light on this hypothesis, we employ two rather standard measures of 'openness' to the international movement of goods and capital: the sum of exports and imports, on the one side, and the flows of inward direct investments, on the other side, both scaled to the country's GDP. All the series come from the IMF's World Economic Outlook database.

The extant empirical literature has established that financial markets are more developed in countries where investors' rights are more protected: the seminal papers by La Porta *et al.* (1997, 1998) suggest that

the security of property rights, enforced by the rule of law, provides the foundation for both economic freedom and the efficient operation of markets. The implication, therefore, is that investors are more willing to invest in countries with stronger property rights. In order to tackle this aspect, we resort to four different measures of investor protection. The first three variables are published by the Economic Freedom Network and are aimed at measuring, respectively, the degree of protection of property rights,⁸ the legal enforcement of contracts,⁹ the overall integrity of the legal system.¹⁰ The last indicator captures the degree of protection of shareholders' rights, based on a scale of 0-10 as assessed by the IMD in its World Competitiveness Yearbook.

The fifth family hosts variables aimed at measuring the quality of the (political) institutions in a target country. The first four indicators are obtained from the World Bank's Worldwide Governance Indicators: a government effectiveness index, which captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies; a corruption perception index, which measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests; a regulatory quality index, which hints to the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development; a rule of law index, which captures perceptions of the extent to which agents have confidence in, and abide by, the rules of society, and in particular the quality of contract enforcement, the police and the courts, as well as the likelihood of crime and violence. The fifth and last measure is a business freedom index assessed by the Heritage Foundation, an overall indicator of the efficiency of government regulation of business which can assume values between 0 and 100, with 100 equalling the freest business environment. Again, we predict the existence of a positive relationship between equity investment flows, among which SWFs' ones, and the variables belonging to this family.

In addition to the above variables, we include several other factors that have the potential of explaining the investment activity by SWFs. As found out in the extant empirical literature (Erel *et al.*, 2009), differences in stock market returns and in exchange rates may explain a large part of the level of cross-border merger activity between country pairs, stemming from overall differences in investor sentiment and from currency movements that are more than warranted by changing underlying economic conditions. Therefore, assuming that SWFs would be no differently affected by these variables than corporate acquirers, we predict that stock returns of the target country indices (average annual local-currency stock market returns) would be associated with more acquisition activity if investors are trend-chasers, while the relative depreciation of the target country currency (the average annual nominal exchange rate return with respect to the US dollar) would be associated with more investment activity. Finally, we also control for price (and, more generally, macroeconomic) stability in the target country using the CPI inflation rate: high and volatile rates of inflation distort relative prices, alter the fundamental terms of long-term contracts, and make it virtually impossible

⁸ This measure is from the Global Competitiveness Report question: "Property rights, including over financial assets, are poorly defined and not protected by law (=1) or are clearly defined and well protected by law (=7)". Higher ratings are therefore associated with a stronger protection of property rights.

⁹ This indicator is based on the International Country Risk Guide Political Risk Component I for Law and Order: "Two measures comprising one risk component. Each sub-component equals half of the total. The 'law' sub component assesses the strength and impartiality of the legal system, and the 'order' sub-component assesses popular observance of the law". Higher ratings are therefore associated with a stronger enforcement of contracts.

¹⁰ This component is based on the World Bank's Doing Business estimates for the time and money required to collect a clear-cut debt. More precisely, zero-to-10 ratings are constructed for a) the time cost (measured in number of calendar days required from the moment the lawsuit is filed until payment) and b) the monetary cost of the case (measured as a percentage of the debt). These two ratings are then averaged to arrive at the final rating for this sub-component.

for individuals and businesses to plan sensibly for the future. We therefore envisage the existence of a negative relationship between SWFs' investment activity and inflation.¹¹

In order to shed light on the relationship between SWFs' acquisitions and a country experiencing a financial crisis, we also include a dummy variable that equals one for the year(s) a country experiences such a negative event. The country-crisis series are obtained by merging up two different chronologies, the first one built by Laeven and Valencia (2008) and the second one by Reinhart (2010) and Reinhart and Rogoff (2011).¹²

Table 8 provides descriptive statistics for the variables listed above.

5. Estimation procedure and results

The entire dataset includes information about these 20 potential regressors, in addition to the financial crises series, for the entire universe of countries (both advanced and emerging) which appears in the World Economic Outlook of the IMF (187 economies in total).¹³ In this way, we hope to circumvent any possible critique relating to a country sample-selection bias which would have emerged if, for instance, we had relied only on the subsample represented by the economies actually targeted by SWFs' equity investment activity.

To identify which variables turn out as effective determinants of the probability that a country would be a recipient of SWFs' investment activity, we employ a modified general-to-specific modelling approach which, proceeding along a three-stage strategy, allows to test a rather large number of potential regressors while maintaining a reasonable sample size. At the first stage, we run individual regressions for each of the 20 variables independently from one another, excluding those that turn out to be insignificant in determining the probability of a country becoming target of SWFs' acquisitions. This, of course, may raise some issues concerning omitted variables which, on their turn, may render coefficient estimates biased and inefficient leading to the exclusion of variables that should be otherwise retained (Visco, 1978): we are well aware of this drawback, which is addressed in the final step of the modelling approach. At the second stage, we run group-wise or 'horse-race' regressions between similar variables, i.e. we group in families – essentially according to their nature – all the variables that got through the first stage and run new regressions for each of these groups. As in the first stage, we retained only those variables that turned out to be significant. At the third and final step, we combine the best performers from each group into a general model; moreover, we restore variables that were found to be significant in the literature but were dropped in either the first or the second step.¹⁴

¹¹ Stock market indexes in local currency are obtained from Datastream; real exchange rates from the Bank of International Settlements; inflation rates from the IMF's World Economic Outlook database.

¹² The Laeven and Valencia's database is focused only on the timing of 'systemic banking' crises, while Reinhart and Rogoff's contemplates many other types of crisis: currency, debt (external and domestic) and inflation.

¹³ These potential explanatory variables differ substantially in terms of availability, with a joint sample for all of them mustering only 450 observations: the panel available for estimation, therefore, is highly unbalanced.

¹⁴ This is essentially done in order to avoid the so-called omitted-variable bias, which arises when a significant explanatory variable is not taken into account in the regression, determining a significant correlation between the other regressors and the residual term. The omitted-variable bias is still more worrisome in nonlinear estimation, such as the one we are performing here, since unlike ordinary least squares it is present whether or not the omitted regressors are correlated with the included ones. Two problems may arise in connection with the omitted variable bias. On the one hand, variables that are not part of the true model may be retained because the bias, induced by some omitted variable, makes them look significantly different from zero. This problem should be mitigated by the fact that the model is at last estimated using a larger set of regressors (in the second and third phase) that, hopefully, includes most of the true variables. On the other hand, the bias may cause the rejection of a variable that is part of the data generating process. This problem is addressed by adding variables that dropped out during the specification process but nonetheless may be important especially when signalled by the literature on international determinants of equity flows.

The model is estimated using a logit approach which, compared to the probit one, typically performs better when the dependent variable is not evenly distributed between the two possible outcomes.¹⁵ Regressions include both country and country-year fixed effects (C-FE and CT-FE), with standard errors clustered at the country level and heteroskedasticity consistent.

Based on the variable-by-variable and ‘horse-race’ regressions, we ended up with a smaller set of variables to be employed in a ‘general’ model, which is then tested down to arrive at our preferred specification.¹⁶ From the list of variables measuring economic development, the per-capita GDP appears best suited to explain SWFs’ equity investment activity for both the C-FE and CT-FE specifications. From the list of indicators measuring the degree of stock market development, we retained the stock market capitalization in the C-FE case, along with the turnover ratio in the CT-FE one. From the family of variables gauging the degree of openness to trade and financial flows, the openness to trade in the C-FE procedure and the flow of FDI in the CT-FE one appear to have a good explanatory power for the probability of being targeted by a SWF. From the list of measures of the degree of investor protection, the property rights index published by the Economic Freedom Network turned out to be statistically significant in both the econometric specifications; in the same vein, from the family of variables gauging the institutional quality of a potential target country we retained the regulatory quality index produced by the World Bank to be included in the final ‘general’ model. Finally, from the list of ‘other’ variables, the foreign exchange return and the inflation rate survived the first two stages of our three-stage modelling approach in the C- and CT-FE case, respectively.

These nine variables are then grouped together in the final stage of our modelling approach leading to the results hosted in the first two columns of Table 9, where the difference between specification (a) and (b) lies in the presence of country or country-year fixed effects:¹⁷ almost all the families of potential determinants of SWFs’ acquisitions are represented in the table by at least one indicator per family in one of the two specifications, confirming that our starting intuition was indeed correct.

To begin with, SWFs seem more likely to invest in countries characterised by a higher degree of economic development: the GDP per capita, in fact, turns out to be positively related to the probability of being targeted by their investment activity, and statistically significant in the specification with C-FE. This result is consistent with the *prima-facie* evidence stemming from a visual inspection of our dataset, according to which SWFs have invested more – and in larger amounts – in the advanced economies subsample. Second, SWFs’ equity acquisitions are more frequent in those countries characterised by more developed financial markets: the stock market capitalization in the C-FE specification, along with the turnover ratio in the CT-FE one, turn out to be significant in positively affecting the likelihood of receiving SWFs’ equity acquisitions (in line with the results of Kotter and Lel, 2011). The degree of a country’s openness to international trade and capital flows, turns out to be positively related to the chances of being targeted by a SWF, even if neither the openness to trade nor the amount of FDI to GDP were statistically significant in the two specifications. SWFs seem to invest more in those countries characterised by a more effective protection of property rights, as witnessed by the positive sign, and high significance, of this variable in both the C- and CT-FE specifications. Finally, a less stable macroeconomic environment, as witnessed by higher inflation rates, negatively affects SWFs’ equity acquisitions; at the same time, an appreciating exchange rate is positively related to the probability of receiving an investment acquisition, although being not statistically significant.

¹⁵ In our dataset equity investments by the available sample of SWFs represent only 29 percent of all possible outcomes.

¹⁶ The results for the first two stages of the modelling approach are not reported here for the sake of brevity, but are available from the authors upon request.

¹⁷ The three stages horse-race procedure has been performed separately for both the model with the country fixed-effect and the model with the country and year fixed-effects.

Another, and in some sense more important, result of our three-stage modelling approach relates to the crisis dummy series: according to the estimation results, a country experiencing a financial crisis is more likely to attract equity acquisitions by SWFs. Independently from the econometric specification, the crisis dummy always plays a positive and highly significant role in affecting the likelihood of a country being a target of SWFs' investment activity. This result reinforces the conclusion according to which SWFs do represent a category of institutional investors on their own. It is in stark contrast with the results of the large body of empirical literature reviewed in Section 3, which hints to a procyclical behaviour of the major institutional investors during periods of financial stress. SWFs – being to a certain extent immune from the noisy interactions between investors and managers that characterize the activity, for instance, of mutual funds during periods of financial distress – actually seem to engage in a ‘contrarian’ investment activity, i.e. an investment style that goes against prevailing market trends by buying assets in countries hit by the crisis. Capital flows stemming from SWFs, therefore, may have a stabilizing role on financial markets counteracting the transmission of shocks from one country to another one.

One may wonder whether our general conclusions still hold in the two different country groups: we offer evidence of this analysis in the last four columns of Table 9 which are dedicated, respectively, to the advanced and emerging economies. Our general conclusion about the relevance of financial market development in positively affecting the likelihood of being targeted by SWFs still holds for both the country groupings. However, several differences emerge. First, the likelihood that a SWF would invest in an advanced economy is positively related to the level of openness – the FDI/GDP variable in the CT-FE regression is positive and significant – and to a better regulation of the business environment. Second, the degree of investor protection – through a proper legal enforcement of contracts and the safeguard of property rights – turns out to be a more relevant class of determinants in attracting SWFs' investment into emerging economies. Third, the financial crisis dummy still holds its positive sign in both the country groups, but it turns out to be significant only in the emerging countries category. This apparently odd result, can be rationalised as follows. The SWFs' investment activity directed towards advanced economies is more closely linked to the higher degree of economic development, to deeper and more liquid financial markets, to a higher level of openness to trade and financial flows and to a freer business environment; and this independently on a country experiencing a financial crisis, which is to say that the attractiveness of acquiring equity holdings in an advanced economy does not depend on the occurrence of such a negative event. On the contrary, experiencing a financial crisis, with the adverse impact on asset valuations that typically follows through, becomes a relevant factor in the case of emerging economies since it gives SWFs the chance to acquire, at distressed prices, stakes in firms characterised by high growth opportunities.

6. Robustness tests

In this section we examine the sensitivity of our general conclusions to a series of robustness checks linked to alternative estimation procedures, different time spans, presence of a lagged dependent variable, with the results of all these robustness checks hosted in Table 10.¹⁸

A first test consists in changing the econometric procedure. Up to now, we have used a fixed-effect estimator – reinforced with robust standard errors – which typically controls for all unit-specific factors, observable or not, that are constant over time, therefore removing a potentially large source of omitted variable bias. Fixed-effect estimators are based on the hypothesis that the unit-specific effect is correlated with each explanatory variable; whether this is not the case, using the fixed-effect transformation to eliminate the unobservable component would result in inefficient estimators. In order to tackle this point, in

¹⁸ As before, the sub-columns *a* and *b* throughout the tables report the estimates obtained with country and country-year fixed effects.

the first column of Table 10 we reported the estimation results obtained by supplanting country fixed with country random effects, which nevertheless confirm the main conclusions seen before. SWFs are more likely to invest in countries characterised by more developed financial markets and a more effective protection of property rights; at the same time, though not statistically significant, a deeper economic development, more openness to the movement of goods and capitals and an appreciating exchange rate preserves their positive sign in affecting the probability of being targeted by a SWF. It is also confirmed the conclusion according to which experiencing a financial crisis would positively affect the likelihood of being targeted by SWFs' investment.¹⁹ Actually, a classic Hausman test would lead to reject the hypothesis that the random effect is the preferred model, so we can be fairly confident upon our initial estimation results based on a fixed effect estimator.

A second set of robustness checks has to do with the time dimension of the sample, which may be dealt with in two different ways. On the one hand, one may argue that the availability of information about SWFs' investment activity cannot be considered to be evenly distributed along the entire time span of the sample. Apart from the fact that SWFs themselves are intrinsically not transparent in their investment decisions, the interest lifted in both international financial institutions and academia, along with the need for more information about their portfolios, is indeed a relatively recent phenomenon. In other words, one may argue that the main estimation results might be affected by a sort of sample-time selection bias, i.e. might depend on the fact that the presence of certain SWFs, and not others, in the early years of the sample is not properly 'random'. We tackle this potential critique in the second column of Table 10, which reports the results of our preferred specifications when estimated only in the subperiod 2001-2010.²⁰ On the other hand, we also would not want that our main results might be driven only by the episodes witnessed in the very last years of the sample, i.e. by the rush made by many SWFs to acquire large stakes in distressed banking institutions of many advanced economies after the onset of one of the most severe financial crises in modern ages. We deal with this aspect in the third column of Table 10, which hosts the logit estimates obtained by removing the observations pertaining to the last four years of our sample.

Again, the main general conclusions about the factors driving SWFs' international investment activity are still there and valid. There is one point, nevertheless, that merits attention here. The statistical significance of the effect that a country experiencing a financial crisis might have on the likelihood of being targeted by a SWF turns out to be greatly downsized when the estimation procedure is run in the subperiod 1995-2006. The crisis dummy ends up being not significant in the country fixed effects case, and significant at the ten percent level in the country-year fixed effects. Nevertheless, running a joint test to assess the significance of the dummies for all years would suggest that the year fixed effects are indeed necessary. The conclusion, therefore, is again that experiencing a financial crisis has a positive and significant relationship with the likelihood of being targeted by some SWF: the inclusion of the last four years makes this relationship even more significant.

In the same vein, a third type of robustness test relates to the presence of an autoregressive component in the set of regressors: one may wonder, whether there is a sort of 'inertia' in the SWFs' investment activity, i.e. whether – once an equity investment is carried out – SWFs become in a sense 'accustomed' to the main economic and structural features of a given country, and go on investing there. We deal with this hypothesis in the very last columns of Table 10: again, the main stocktaking of the econometric procedure is preserved

¹⁹ In order to make this conclusion more robust, we have also re-run all the three-stage modelling approach under the hypothesis of random, instead of fixed, effects. Results, which are not reported here for the sake of brevity but are available from the authors upon request, confirm the main conclusions.

²⁰ Actually, the procedure of testing the significance of the preferred specifications has been repeated also for other different time spans, i.e. 2002-2010, 2003-2010, 2004-2010; moreover, as with the case of random fixed effects, a new horse race for the period 2001-2010 has been performed. Again the estimation results, which are not reported here for the sake of brevity but are available from the authors upon request, confirm the main conclusions.

in terms of the general goodness of the selected families in explaining SWFs' investment behaviour as well as the role played by the onset of a financial crisis in a given country.

7. Conclusions

With \$4.7 trillion of AuM, SWFs are important players in financial markets. For this reason, it is important to understand the determinants at the base of their investment choices together with their possible aptitude to amplify financial fluctuations and propagate shocks globally, as it has been witnessed for other classes of institutional investors.

This paper analyses the macro determinants of SWFs' investment activity in terms of the country characteristics of the target firms. Using a three-stage modelling approach, and coherently with our priors, in the average of the 187 countries at our disposal we find evidence that SWFs are more likely to invest in countries characterised by a higher degree of economic development, more developed financial markets, a more effective protection of property rights, a more stable macroeconomic environment. Moreover, SWFs seem more likely to invest in countries where they have already invested.

The key finding of the empirical procedure, relates to the impact of the crisis dummy series. The econometric analysis, clearly shows that a country experiencing a financial crisis is more likely to attract equity acquisitions by SWFs. Independently from the econometric specification, time horizons, country groupings, presence of an autoregressive component, the crisis dummy always plays a positive and highly significant role in affecting the likelihood of a country being targeted by SWFs' investment activity.

This conclusion stands in stark contrast with the empirical evidence on other classes of institutional investors – above all mutual funds – which have been shown to follow a procyclical investment activity in times of financial stress. We may conclude, therefore, that SWFs seem to engage in a ‘contrarian’ behaviour by increasing their acquisitions in countries where crisis hit. Capital flows stemming from their investment activity, therefore, may end up having a stabilizing role on local markets during periods of financial turmoil, protecting the targeted countries from foreign shocks instead of propagating them globally.

Table 1. The 30 largest SWFs

SWF name	Country of origin	Estimated total assets (USD billions)	Year of inception	Fund source
SAFE Investment Company	China	568	1997	NC
Norwegian Government Pension Fund – Global (NGPF-G)	Norway	554	1990	C
SAMA Foreign Holdings	Saudi Arabia	533	-	C
Abu Dhabi Investment Authority (ADIA)	UAE - Abu Dhabi	450	1976	C
China Investment Corporation (CIC)	China	410	2007	NC
Kuwait Investment Authority (KIA)	Kuwait	296	1953	C
HK Monetary Authority – Investment Portfolio (HKMA)	China-HK	293	1998	NC
Government Investment Corporation (GIC)	Singapore	248	1981	NC
Temasek Holdings	Singapore	157	1974	NC
National Social Security Fund (NSSF)	China	135	2000	NC
Qatar Investment Authority (QIA)	Qatar	100	2005	C
National Wealth Fund (NWF)	Russia	87	2008	C
Australian Government Future Fund (AGFF)	Australia	75	2006	NC
Investment Corporation of Dubai (ICD)	UAE – Dubai	70	2006	C
International Petroleum Investment Company (IPIC)	UAE - Abu Dhabi	65	1984	C
Libyan Investment Authority (LIA)	Libya	65	2006	C
Revenue Regulation Fund	Algeria	57	2000	C
Kazakhstan National Fund	Kazakhstan	53	2000	C
Mubadala Development Company	UAE - Abu Dhabi	48	2002	C
Korea Investment Corporation (KIC)	Korea	43	2005	NC
Alaska Permanent Fund (APF)	USA	41	1976	C
Khazanah Nasional	Malaysia	35	1993	NC
Brunei Investment Agency (BIA)	Brunei	30	1983	C
State Oil Fund (SOFAZ)	Azerbaijan	30	1999	C
Reserve Fund	Russia	25	2008	C
Oil Stabilization Fund	Iran	23	1999	C
National Pensions Reserve Fund (NPRF)	Ireland	18	2001	NC
New Zealand Superannuation Fund (NZSF)	New Zealand	16	2001	NC
Alberta's Heritage Fund	Canada	16	1976	C
New Mexico State Investment Council	US New Mexico	14	1958	NC

This table presents the 30 largest SWFs ordered by AuM at end 2011, along with information on the country of origin, year of establishment, source of wealth (with 'C' for commodity-based SWFs and 'NC' for all the remaining features).

Table 2. Acquiring SWFs in the sample

SWF name	Country of origin	Number of deals	Amount (USD millions)
Temasek Holdings	Singapore	760	93,488
Government Investment Corporation (GIC)	Singapore	280	79,436
Khazanah Nasional	Malaysia	144	17,311
Istithmar World	UAE - Dubai	123	17,850
China Investment Corporation (CIC)	China	121	79,622
Qatar Investment Authority (QIA)	Qatar	88	77,958
Mubadala Development Company	UAE - Abu Dhabi	67	20,500
Libyan Investment Authority (LIA)	Libya	59	5,774
International Petroleum Investment Company (IPIC)	UAE - Abu Dhabi	48	29,060
Kuwait Investment Authority (KIA)	Kuwait	45	12,914
Abu Dhabi Investment Authority (ADIA)	UAE - Abu Dhabi	44	20,505
Investment Corporation of Dubai (ICD)	UAE - Dubai	31	14,606
Brunei Investment Agency (BIA)	Brunei	15	773
Oman Investment Fund	Oman	11	1,472
Australian Government Future Fund (AGFF)	Australia	10	2,493
Korea Investment Corporation (KIC)	Korea	10	2,676
RAK Investment Authority	UAE – Ras al Khaimah	8	348
National Pensions Reserve Fund (NPRF)	Ireland	5	19,943
National Social Security Fund (NSSF)	China	5	2,845
New Zealand Superannuation Fund (NZSF)	New Zealand	5	1,298
Norwegian Government Pension Fund – Global (NGPF-G)	Norway	4	719
State Capital Investment Corporation	Vietnam	4	0
State General Reserve Fund	Oman	4	1,221
Alaska Permanent Fund (APF)	USA	3	890
Bahrain Mumtalakat Holding Company	Bahrain	3	340
Public Investment Fund (PIF)	Saudi Arabia	3	4,266
HK Monetary Authority – Investment Portfolio (HKMA)	China - HK	1	4,689
SAMA Foreign Holdings	Saudi Arabia	1	-
State Oil Fund (SOFAZ)	Azerbaijan	1	150
TOTAL		1,903	513,146

This table presents the distribution of the acquisition deals for the 29 SWFs in the sample both in terms of number of deals and amount.

Table 3. Country of target firms by number of deals and amount

Country	Number of deals	Amount (USD millions)	Country	Number of deals	Amount (USD millions)	Country	Number of deals	Amount (USD millions)
USA	328	74,380	South Africa	9	884	Estonia	2	-
Singapore	193	18,805	Turkey	9	1,919	Iceland	2	34
China	157	69,246	Austria	8	1,477	Lebanon	2	236
Malaysia	122	12,714	Mexico	8	884	Maldives	2	-
UK	122	67,787	Norway	8	1,376	Mauritius	2	-
India	94	4,116	Sweden	8	5,999	Slovenia	2	-
UAE	81	20,521	Egypt	7	305	Zambia	2	266
Australia	69	23,556	Taiwan	7	3,104	Bangladesh	1	118
Hong Kong	63	11,925	Israel	6	10	Benin	1	-
France	55	8,060	Portugal	6	-	Bosnia-Herzegovina	1	-
Indonesia	45	8,134	Saudi Arabia	6	4,364	Brunei	1	0.02
Thailand	36	5,354	Jordan	5	920	Chad	1	90
Germany	30	27,019	Tunisia	5	45	Comoros	1	9
South Korea	29	4,474	Bermuda	4	6,164	Congo	1	-
Canada	27	15,334	Libya	4	2,263	Djibouti	1	234
Japan	25	6,505	Luxembourg	4	2,005	Eritrea	1	-
Italy	24	4,743	Morocco	4	490	Ghana	1	-
Ireland	19	20,031	Sudan	4	149	Greece	1	-
Denmark	16	1,180	Algeria	3	930	Guernsey	1	779
Switzerland	15	28,811	Argentina	3	348	Iran	1	0.1
Vietnam	15	300	Armenia	3	200	Iraq	1	-
Pakistan	13	1,505	Cayman Islands	3	402	Ivory Coast	1	-
Belgium	12	3,241	Czech Republic	3	8	Kenya	1	9
Philippines	12	454	Finland	3	384	Montenegro	1	32
Qatar	12	16,327	Georgia	3	145	Mozambique	1	-
Spain	12	5,269	Hungary	3	746	Niger	1	-
Bahrain	11	1,040	Kazakhstan	3	1,039	Palestine	1	245
New Zealand	11	1,737	Malta	3	318	Romania	1	-
Russia	11	1,070	Rwanda	3	114	Senegal	1	2
Brazil	10	3,807	Uganda	3	88	Seychelles	1	-
Kuwait	10	893	Bahamas	2	333	Slovakia	1	-
Chile	9	582	Bulgaria	2	39	Tanzania	1	4
Netherlands	9	3,926	Channel Islands	2	3	Yemen	1	300
Oman	9	396	Colombia	2	30	Zimbabwe	1	61

This table reports the distribution of the acquisitions deals (both in terms of number of deals and amount) by target countries.

Table 4. Geographic region of target firms

Geographic region	Number of deals	Amount (USD millions)
Asia	818	147,792
North America	355	89,714
European Union	346	152,231
MENA Region	169	49,286
Australia – Pacific	80	25,293
Europe – Other	56	34,370
Latin America	41	12,549
Sub-Saharan Africa	38	1,909
TOTAL	1,903	513,146

This table reports the distribution of the acquisition deals (both in terms of number of deals and amount) by geographic region of target firms.

Table 5. Country economic group of target firms

Geographic region	Number of deals	Amount (USD millions)
Advanced G7 Economies	611	203,829
Other advanced economies	518	138,853
Emerging and Developing economies	774	170,463
TOTAL	1,903	513,146

This table reports the distribution of the acquisition deals by group of country of target firms (both in terms of number of deals and amount). The country grouping comes from IMF's WEO database, Groups and Aggregates

Table 6. Statistics on deals' value

Total value of deals (USD millions)	513,146
N° of deals with value	1,448
Total number of deals	1,903
Average size of deals (USD millions)	354
Minimum size of deals per fund (USD millions)	0.0085
Maximum size of deals x fund (USD millions)	20,000
 N° of target countries	 84
Most represented country target	US
Amount invested in the most represented country target (USD millions)	74,380

This table reports some descriptive statistics of the sample including only those deals reporting the amount of the transaction.

Table 7. Description of the independent variables

Family	Variable	Description	Source
Economic development	<i>Advanced country dummy</i>	Equals 1 for an advanced economy and 0 otherwise.	WEO (IMF)
	<i>Country credit rating</i>	The level of credit rating of the target country. Rating on a scale of 0-100	IMD
	<i>GDP (at PPP) growth</i>	The annual growth rate of the real GDP (in PPP) of the target country.	WEO (IMF)
	<i>GDP (at PPP) per capita</i>	The logarithm of the real per capita GDP (in PPP) of the target country.	WEO (IMF)
Stock market development	<i>Stock market capitalization to GDP</i>	Stock market capitalization of the target country as a percentage of the country's GDP.	WDI (WB)
	<i>Turnover ratio</i>	Ratio of the total value of stocks traded to the average market capitalization in the target country.	WDI (WB)
Openness to trade and financial flows	<i>Foreign direct investment (scaled to GDP)</i>	The flows of inward direct investments in the target country scaled to the country's GDP.	WEO (IMF)
	<i>Exports and imports (scaled to GDP)</i>	The sum of exports and imports of the target country scaled to the country's GDP.	WEO (IMF)
Investor Protection	<i>Integrity of the legal system</i>	This indicator is based on the World Bank's Doing Business estimates for the time and money required to collect a clear-cut debt. More precisely, zero-to-10 ratings are constructed for a) the time cost (measured in number of calendar days required from the moment the lawsuit is filed until payment) and b) the monetary cost of the case (measured as a percentage of the debt). These two ratings are then averaged to arrive at the final rating for this sub-component.	Economic Freedom Network
	<i>Legal enforcement of contracts</i>	This indicator is based on the International Country Risk Guide Political Risk Component I for Law and Order: "Two measures comprising one risk component. Each sub-component equals half of the total. The 'law' sub component assesses the strength and impartiality of the legal system, and the 'order' sub-component assesses popular observance of the law". Higher ratings are associated with a stronger enforcement of contracts.	Economic Freedom Network
	<i>Property rights</i>	This measure is from the Global Competitiveness Report question: "Property rights, including over financial assets, are poorly defined and not protected by law (=1) or are clearly defined and well protected by law (=7)". Higher ratings are associated with a stronger protection of property rights.	Economic Freedom Network
Quality of institutions	<i>Shareholders' rights</i>	This indicator captures the degree of protection of shareholders' rights, based on an executive survey answering the question "Shareholders' rights are sufficiently implemented" and is measured on a scale of 0-10.	IMD
	<i>Business freedom</i>	This is an indicator of the efficiency of government regulation of business which can assume values between 0 and 100, with 100 equaling the freest business environment.	Heritage Foundation
	<i>Corruption perception</i>	This indicator measures the extent to which public power in the target country is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.	WGI (WB)
	<i>Government effectiveness</i>	This indicator captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies in the target country.	WGI (WB)
Others	<i>Regulatory quality</i>	This indicator captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	WGI (WB)
	<i>Rule of law</i>	This indicator captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	WGI (WB)
	<i>Exchange rate return</i>	Average annual nominal exchange rate return of the currency of the target country with the dollar.	IMF, Datastream
Crisis Dummy	<i>Inflation</i>	The level of inflation in the target country measured by the annual percentage change in the CPI index.	WEO (IMF)
	<i>Stock market return</i>	The average annual local-currency stock market indices returns in the target country.	Datastream
		Dummy variable that equals one for the year(s) a country experiences a financial crisis (banking, currency, debt (external and domestic), inflation, stock market crisis).	Laeven and Valencia (2008); Reinhart (2010); Reinhart and Rogoff (2011).

Table 8. Descriptive statistics of the independent variables

Family	Variable	Obs.	Mean	Median	Min.	Max.
Economic development	<i>Advanced country dummy</i>	2,992	0.1	0.0	0.0	1.0
	<i>Country credit rating</i>	944	62.0	67.9	0.0	96.4
	<i>GDP (at PPP) growth</i>	2,910	6.4	6.2	-55.6	154.4
	<i>GDP (at PPP) per capita</i>	2,862	8.6	8.7	5.4	11.4
Stock market development	<i>Stock market capitalization to GDP</i>	1,654	51.5	30.4	0.0	606.0
	<i>Turnover ratio</i>	1,584	48.6	24.1	0.0	1,612.9
Openness to trade and financial flows	<i>Foreign direct investment (scaled to GDP)</i>	2,724	4.9	2.8	-15.6	528.1
	<i>Exports and imports (scaled to GDP)</i>	2,899	88.1	80.2	14.0	445.8
Investor protection	<i>Integrity of the legal system</i>	1,459	6.3	6.7	0.0	10.0
	<i>Legal enforcement of contracts</i>	1,221	4.6	4.6	0.0	10.0
	<i>Property rights</i>	1,282	5.5	5.3	0.9	9.6
	<i>Shareholders' rights</i>	719	6.5	6.6	0.0	8.9
Quality of institutions	<i>Business freedom</i>	2,423	64.7	67.4	18.0	100.0
	<i>Corruption perception</i>	2,212	-0.1	-0.3	-2.1	2.6
	<i>Government effectiveness</i>	2,207	0.0	-0.2	-2.3	2.4
	<i>Regulatory quality</i>	2,207	0.0	-0.2	-2.7	2.3
	<i>Rule of law</i>	2,234	-0.1	-0.2	-2.2	2.0
Others	<i>Exchange rate return</i>	2,929	-3.3	-0.4	-97.9	96.1
	<i>Inflation</i>	2,895	13.9	4.5	-72.7	4,146.0
	<i>Stock market return</i>	1,203	16.2	13.6	-92.6	912.3
Financial crisis dummy		2,576	0.3	0.0	0.0	1.0

Table 9. Determinants of the likelihood of being targeted by SWFs' acquisitions: final specification

Family	Variable	Entire country sample		Country subsamples			
				Advanced economies		Emerging economies	
		(a)	(b)	(a)	(b)	(a)	(b)
Economic development	<i>Advanced country dummy</i>	–	–	–	–	–	–
	<i>Country credit rating</i>	–	–	–	–	–	–
	<i>GDP (at PPP) growth</i>	–	–	–	–	–	–
	<i>GDP (at PPP) per capita</i>	0.444*	0.025 (0.262)	0.287 (0.938)	–	0.243 (0.346)	0.105 (0.303)
Stock market development	<i>Stock market capitalization to GDP</i>	0.006*** (0.002)	0.008*** (0.003)	0.007** (0.003)	0.006** (0.003)	0.005** (0.002)	0.004 (0.003)
	<i>Turnover ratio</i>	–	0.010*** (0.002)	0.011*** (0.002)	0.008*** (0.002)	–	0.009*** (0.003)
Openness to trade and financial flows	<i>Foreign direct investment (scaled to GDP)</i>	–	0.017 (0.012)	–	0.040** (0.017)	–	–
	<i>Exports and imports (scaled to GDP)</i>	0.003 (0.003)	–	0.003 (0.004)	–	0.003 (0.007)	–
Investor protection	<i>Integrity of the legal system</i>	–	–	–	–	–	0.129 (0.143)
	<i>Legal enforcement of contracts</i>	–	–	–	–	–	0.377*** (0.148)
	<i>Property rights</i>	0.329*** (0.077)	0.194* (0.104)	0.137 (0.207)	-0.088 (0.200)	0.322*** (0.090)	–
	<i>Shareholders' rights</i>	–	–	–	–	–	–
Quality of institutions	<i>Business freedom</i>	–	–	0.055** (0.020)	0.067** (0.027)	–	–
	<i>Corruption perception</i>	–	–	–	–	–	–
	<i>Government effectiveness</i>	–	–	–	–	-0.370 (0.521)	–
	<i>Regulatory quality</i>	-0.392 (0.301)	-0.249 (0.314)	–	–	–	0.081 (0.378)
	<i>Rule of law</i>	–	–	–	–	–	–
Others	<i>Exchange rate return</i>	0.007 (0.007)	–	–	–	0.015* (0.008)	–
	<i>Inflation</i>	–	-0.085*** (0.025)	–	–	–	–
	<i>Stock market return</i>	–	–	–	0.002 (0.006)	–	–
Financial crisis dummy		0.480*** (0.161)	0.434** (0.216)	0.411 (0.292)	0.021 (0.399)	0.521** (0.216)	0.526* (0.302)
Constant		-7.316*** (2.367)	-3.022** (1.569)	-10.301 (8.334)	-7.140** (2.537)	-5.571* (3.221)	-6.655** (2.722)
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects		No	Yes	No	Yes	No	Yes
Clustered std. errors (country)		Yes	Yes	Yes	Yes	Yes	Yes
Number of observations		876	823	314	298	606	522
Pseudo R-squared		0.153	0.211	0.258	0.346	0.163	0.237

This table presents logit estimates of the likelihood of being targeted by SWFs. The dependent variable is the target dummy that equals one if a country receives a SWF investment in a given year and zero otherwise. In parentheses are *t*-statistics based on standard errors adjusted for target country clustering and heteroskedasticity. *** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level.

Table 10. Determinants of the likelihood of being targeted by SWFs' acquisitions: robustness checks

Family	Variable	Random effects	Entire country sample					
			Superiod 2001-2010		Superiod 1995-2006		Lagged dep. vbl.	
			(a)	(b)	(a)	(b)	(a)	(b)
Lagged dependent variable	—	—	—	—	—	—	1.316*** (0.224)	1.216*** (0.252)
Economic development	<i>Advanced country dummy</i>	—	—	—	—	—	—	—
	<i>Country credit rating</i>	—	—	—	—	—	—	—
	<i>GDP (at PPP) growth</i>	—	—	—	—	—	—	—
	<i>GDP (at PPP) per capita</i>	0.556 (0.387)	0.444* (0.262)	0.019 (0.206)	0.122 (0.270)	-0.231 (0.214)	0.181 (0.204)	-0.034 (0.173)
Stock market development	<i>Stock market capitalization to GDP</i>	0.010*** (0.003)	0.006*** (0.002)	0.010*** (0.003)	0.006*** (0.003)	0.009*** (0.004)	0.006*** (0.002)	0.008*** (0.003)
	<i>Turnover ratio</i>	—	—	0.010*** (0.003)	—	0.010*** (0.003)	—	0.010*** (0.002)
Openness to trade and financial flows	<i>Foreign direct investment (scaled to GDP)</i>	—	—	-0.006 (0.022)	—	0.026 (0.017)	—	0.013 (0.013)
	<i>Exports and imports (scaled to GDP)</i>	0.005 (0.005)	0.003 (0.003)	—	0.001 (0.003)	—	0.000 (0.002)	—
Investor protection	<i>Integrity of the legal system</i>	—	—	—	—	—	—	—
	<i>Legal enforcement of contracts</i>	—	—	—	—	—	—	—
	<i>Property rights</i>	0.636*** (0.136)	0.329*** (0.077)	0.245** (0.108)	0.352*** (0.089)	0.404*** (0.145)	0.361*** (0.066)	0.250** (0.099)
	<i>Shareholders' rights</i>	—	—	—	—	—	—	—
Quality of institutions	<i>Business freedom</i>	—	—	—	—	—	—	—
	<i>Corruption perception</i>	—	—	—	—	—	—	—
	<i>Government effectiveness</i>	—	—	—	—	—	—	—
	<i>Regulatory quality</i>	-0.644 (0.452)	-0.392 (0.301)	-0.400 (0.354)	-0.162 (0.329)	-0.290 (0.344)	-0.348 (0.246)	-0.387 (0.274)
	<i>Rule of law</i>	—	—	—	—	—	—	—
Others	<i>Exchange rate return</i>	0.012 (0.012)	0.007 (0.007)	—	-0.010 (0.010)	—	0.012 (0.009)	—
	<i>Inflation</i>	—	—	-0.074** (0.027)	—	-0.057** (0.029)	—	-0.086*** (0.026)
	<i>Stock market return</i>	—	—	—	—	—	—	—
Financial crisis dummy		0.779*** (0.274)	0.480*** (0.161)	0.637*** (0.232)	0.146 (0.269)	0.530* (0.318)	0.418** (0.179)	0.469** (0.236)
Constant		-11.028*** (3.368)	-7.316*** (2.367)	-3.585** (1.670)	-4.554* (2.416)	-2.254 (1.612)	-5.397*** (1.798)	-3.025** (1.379)
Country fixed effects	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	—	No	Yes	No	Yes	No	Yes	Yes
Clustered std. errors (country)	—	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	876	805	757	509	487	876	823	
Pseudo R-squared	—	0.174	0.220	0.149	0.165	0.154	0.211	

This table presents logit estimates of the likelihood of being targeted by SWFs. The dependent variable is the target dummy that equals one if a country receives a SWF investment in a given year and zero otherwise. In parentheses are *t*-statistics based on standard errors adjusted for target country clustering and heteroskedasticity. *** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level.

References

- Borio C., Furfine C, and P. Lowe, (2001), Procyclicality of the Financial System and Financial Stability: Issues and Policy Options, BIS Paper 1.
- Bortolotti B., Fotak V., Megginson W. and Miracky W. (2010). Sovereign Wealth Fund Investment Patterns and Performance. Fondazione Eni Enrico Mattei, Nota di Lavoro 22.2009.
- Boubakri N., Cosset J. and Samir N. (2011). Sovereign Wealth Funds Acquisitions: A Comparative Analysis with Mutual Funds, International Finance Review 12, 355-389.
- Broner, F. A., Didier T., Erce A., and S.L. Schumukler, (2013), Gross Capital Flows: Dynamics and Crises, Journal of Monetary Economics, Volume 60 (January), Issue 1, 113–133.
- Castelli M. e Tagliapietra S. (2012). How big could SWFs be by 2016? In Castelli M. e Scacciavillani F., The new economics of Sovereign Wealth Funds, The Wiley Finance Series, John Wiley & Sons, New York.
- Chan K., Kovrig V. and NG L., (2005), What Determines the Domestic Bias and Foreign Bias? Evidence from Mutual Fund Equity Allocations Worldwide, The Journal Of Finance, Vol. LX, No. 3, 1495-1534.
- Chhaochharia V. and Laeven L. (2010). The Investment Allocation of Sovereign Wealth Funds. Available at:
http://cgf.columbia.edu/files/papers/Laeven_The_Investment_Allocation_of_Sovereign_Wealth_Funds.pdf
- Chiang, T.C., and D. Zheng, (2010), An Empirical Analysis of Herd Behavior in Global Stock Markets, Journal of Banking & Finance, Vol. 34 (August), No. 8, 1911–21.
- Ciarlone A., Miceli V., (2013), Le strategie di portafoglio dei fondi di ricchezza sovrani e la crisi globale, Questioni di Economia e Finanza (Occasional Papers) N. 156, April 2013, Banca d'Italia.
- Dewenter K. L., Han X. and Malatesta P.H. (2010). Firm Values and Sovereign Wealth Fund Investments. Journal of Financial Economics, 98, Issue 2, pp. 256-278.
- Erel, Isil, Rose C. Liao, and Michael S. Weisbach., (2009), World Markets for Mergers and Acquisitions, NBER Working Papers 15132, National Bureau of Economic Research.
- Grinblatt, M., Titman, S. and Wermers, R., (1995), Momentum Investment Strategies, Portfolio Performance and Herding: a Study of Mutual Fund Behaviour, American Economic Review, 85(5), 1088-1105.
- IMF, 2008, Sovereign Wealth Funds – Generally Accepted Principles and Practices, October.
- Kaminsky G., Lyons R. and S.L. Schmukler, (2004), Managers, investors, and crises: mutual fund strategies in emerging markets, Journal of International Economics 64, 113 – 134.
- Karolyi G.A. and Liao R.,(2010), What is Different about Government-Controlled Acquirers in Cross-Border Acquisitions?, Working Papers 2010.38, Fondazione Eni Enrico Mattei.
- Knill A., Lee B., and N. Mauck, (2012), Bilateral political relations and sovereign wealth fund investment, Journal of Corporate Finance, 18, 108–123.
- Kotter J. and Lel U. (2011). Friends or Foes? Target Selection Decisions of Sovereign Wealth Funds and Their Consequences, Journal of Financial Economics 101, 360–381.
- Kunzel P., Lu Y., Petrova I. and Pihlman J. (2011). Investment Objectives of Sovereign Wealth Funds – A Shifting Paradigm. IMF Working Paper, WP/11/19
- Lakonishok, J., Shleifer, A. and Vishny, R.W., (1992), The Impact of Institutional Trading on Stock Prices. Journal of Financial Economics, 32(1), 23–43.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, (1997), Legal determinants of external finance, *Journal of Finance* 52, 1131-1150.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, (1998), Law and finance, *Journal of Political Economy* 106, 1113-1155.

Laeven, L., Valencia, F., (2008), Systemic banking crises: a new database. Working Paper No. 08/224, International Monetary Fund, Washington, DC.

Miceli, V., (2013), Do sovereign wealth funds herd in equity markets?, *Quantitative Finance*, Vol. 13, No. 10, 1503–1518.

Papaioannou M.G., Park J., Pihlman J., and H. van der Hoorn, (2013), Procyclical Behavior of Institutional Investors During the Recent Financial Crisis: Causes, Impacts, and Challenges, IMF Working Paper, WP/13/193.

Portes R. and Rey H., (2005), The determinants of cross-border equity flows, *Journal of International Economics*, 65 (2005), 269– 296.

Quadrio Curzio A. and Miceli V. (2010). Sovereign Wealth Funds - A complete Guide to State-owned Investment Funds, Harriman House, UK.

Raddatz, C., and S.L. Schmukler, (2011), On the international transmission of shocks: micro-evidence from mutual fund portfolios, NBER working paper, N° 17358.

Reinhart, Carmen M., (2010) , “This Time is Different Chartbook: Country Histories on Debt, Default, and Financial Crises,” NBER Working Paper 15815.

Reinhart, Carmen M. and Kenneth S. Rogoff, (2011), From Financial Crash to Debt Crisis, *American Economic Review*: Vol. 101 No. 5.

Sias R.W., (2004), Institutional Herding, *The Review of Financial Studies*, Vol. 17, No. 1, 165-206

Sun, T. and Hesse, H. (2009), Sovereign Wealth Funds and Financial Stability - An Event Study Analysis, IMF Working Paper, WP/09/239.

Visco I., (1978), “On obtaining the right sign of a coefficient estimate by omitting a variable from the regression”, *Journal of Econometrics*, No. 7, pp. 115-117.

Wermers, R., (1999), Mutual Fund Herding and the Impact on Stock Prices. *Journal of Finance*, 54(2), 581-622.