
# Thesis

# Do Sovereign Wealth Funds pursue a Corporate Social Responsibility investment strategy?

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# Contents

## Introduction

This thesis purpose is to analyze the Sovereign Wealth Funds (SWFs) investment behavior for what concerns Corporate Social Responsibility (CSR) investing. With CSR investing is intended that SWFs prefer to invest in firms which show high ESG (Environmental Social Governance) performances. ESG and CSR, therefore, mean the same thing and in the following thesis they will be used as synonymous. Both ESG and CSR measure of how good the firms address environmental, social and governance issues that arise in their operations which may be, for instance, how much pollution they produce, how healthy is the employee's environment and how fair and transparent are the relation between the firm and its stakeholders. A high ESG score indicates that the firm is doing well in the issues mentioned above while a low score means that the firm can do better in improving the quality of its operations. The ESG score range goes from 0 to 100. The aim of this thesis is to discover if high ESG score firms attract SWFs' money. This is relevant given the large size of SWFs and the peculiarity of their owners, the governments.

The thesis is composed by two parts. The first part consists in a literature review of papers addressing SWFs as their main object of study. In particular, I addressed the papers that study the drivers of SWFs' investment decisions and the papers whose aim is to describe SWFs nature, financial performance and governance quality. This is done in order to provide a complete and exhaustive overview of such large and increasingly important investors in current financial markets.

Then is presented the research question, which ask if firms with high CSR score are more likely to attract SWFs' investment, this is the content of the second part. The estimator implemented to study such research question is a maximum likelihood logit regression in which an indicator variable, which states if the firms are owned by a meaningful percentage by SWFs, is regressed against the firm's ESG score and additional control variables that the previous literature has shown to be drivers of SWFs investment decisions. The thesis will also try to answer if SWFs actively engage firms in order to increase their ESG score. To answer this research question will be used a Granger causality test. I also explored the possibility that more transparent SWFs tend to invest more than the others SWFs in high ESG score firms. The procedure is as follow: SWFs will be divided

in groups on the basis of their transparency score using the Truman transparency score. Then such groups will be analyzed separately using the same methodology used to answer the first research question (maximum likelihood logit regression) to observe the differences among the coefficients on the ESG score across the groups.

The main result of this thesis is that, in general, SWFs tend to invest more in firms with high ESG score. Evidence of this is provided by the fact that the coefficient on the ESG score is positive and significant in the main regressions even after controlling for many possible drivers of SWFs investment decisions and many endogeneity problems. Furthermore the results of the Granger causality test show that SWFs either do not succeed or do not engage firms in the attempt to increase their ESG score. Finally my research shows that highly transparent SWFs are more likely to invest in firms with high ESG score.

# 1. Definitions, size and role of SWFs

## *1.1 Some SWFs definitions*

To start the study of the SWFs it is appropriate to illustrate some SWFs definitions that provide the scaffolding for this literature review. There are many definitions of SWFs and this already gives us something to think about, i.e. the elusive nature of such investment funds. According to Alhashel (2015), SWFs are "state-owned investment vehicles that invest globally in various types of assets ranging from financial to real alternative assets". This definition is the most basic, it gives the fundament of SWFs nature: who is the owner and what it does. Kotter and Lel (2011) go deeper and define SWFs as "government-owned investment vehicles with no explicit liabilities to their owners other than internal to government, significant exposure to high-risk foreign assets, and long-term investment horizon". This second definition gives some additional information: the type of investment that it does and its investment horizon. Now it is clear that SWFs are not meant to invest only domestically but, instead, one of their fundamental role is to invest abroad with a very long investment horizon in order to achieve a variety of objectives that will be exposed in paragraph 2.2 . The next definitions, provided by Dick and Morse (2011) in the appendix, provide a differentiation of SWFs from other investment funds: (a) wholly owned by a sovereign government, but organized separately from the central bank or finance ministry; (b) an investment fund rather than an operating company; (c) an investor that makes international and domestic investments in variety of risky assets, (d) and is charged with seeking a commercial return; and (e) a wealth fund rather than a pension fund – not financed with contributions from pensioners and does not have a stream of liabilities committed to individual citizens and state-owned enterprises. These last definitions start to clarify the uniqueness of SWFs and the fact that they perform a complex, unclear, multifunction role in the economy.

## *1.2 Sovereign Wealth Funds size and presence in financial markets*

Next, it is appropriate to present why SWFs are so relevant in modern financial markets. This is both because of their size and because of the peculiarities of their owner, the government. Generally, the government ownership is associated with inefficiencies in most of the literature because is believed that political objective will prevail over the maximization of the company value. This damages both the shareholders and the

stakeholder's interests. In addition, government ownership is associated with passivity regarding good corporate governance practices. Therefore, it is very important to clarify if SWFs ownership is a detriment to the firm the SWFs invests in, this will be clarified in section 3 in which alternative hypotheses will be tested and among them there is also one that sees Government ownership as beneficial for the firms and their shareholders. Determine which hypothesis prevails is even more important if one considers the size of such investment fund. SWFs have an impressive size: recent estimates indicate that SWFs hold an aggregate US $9 trillion in invested funds (Jaye, (2016)). This is huge considering that it is roughly half of the US GDP. Other estimates reduce the value to around 6 trillion (Fotak, Gao, Megginson (2016)) which is still a very large amount of assets worldwide. Moreover, Bagnall and Truman (2013) confirms that SWFs are a large and important component of international portfolio investment. They report that SWFs assets are already more than twice as large as the global pension fund industry. SWFs are concentrated in Asia and Middle East, these regions accounting the majority of SWFs in terms of asset size. Commodity-financed SWFs represent around a half of the entire global SWF portfolio. UAE, China, Saudi Arabia, Kuwait, Norway, and Singapore own the largest SWFs. In addition, note the presence of SWFs in several emerging economies, such as Russia, Iran, Brazil, Mexico, Ghana, and Nigeria, which are trying to invest wealth abroad to diversify their sources of revenue. More SWFs, younger and smaller, were recently founded by local politicians for protectionist reasons to counter SWFs from Asia and Middle East. Indeed the literature results show that SWFs target either the financially-distressed, cash-constrained, large, multinational firms with poor performance abroad, with a preference for those located in financially developed countries (Kotter and Lel (2010), Chhaochharia and Laeven (2008)).

### *1.3 The role of SWFs in the government plan and its limits*

As Bernstein, Lerner and Schoar (2013) point out, SWFs are an excellent opportunity for nations with high variance in public revenues to ensure a steady cash flow. Such countries, without a fund to direct investments, could waste their income from natural resources in inefficient project. SWFs instead invest in financial to pursue long-term benefits. They have no short-term liabilities. However there are concerns about lack of transparency and political capture: funds with political leaders on their boards may be tempted to shore-up domestic firms as they succumb to political pressure. Moreover SWFs

may be used as a tool to shape the economic landscape of a nation using the fund to indirectly influence the economy and disrupt markets mechanisms. This way the state planners direct the economy toward a path different from the one which the market would spontaneously generate. In this sense, SWFs are the best candidate to disguise a state intervention in the economy as a market dynamic because they are a fund supposed to pursue purely financial gain. How to discern if this is the case? What really SWFs pursue? This can be answered looking at SWFs investments. Indeed if empirically is shown that SWFs invest in companies which correspond to the ones cited in the state plan for the economy then it is likely that SWFs invest in order to pursue state planner objective making them the third century form of state planning of the economy. Looking at the Chinese experience this may be a boosts to economic performance. More on this will be treated in section 2.

### *1.4 How the SWFs are sponsored*

Fotak, Gao, Megginson (2016) states that most SWFs are sponsored mainly in two way: revenue from the sale of natural resources, such as oil, natural gas, and coal; foreign currency reserves from persistent and large positive net export.. Bertoni and Lugo (2015), however, document a third, still relatively rare but growing, source of SWF financing: the use of debt. They find that non-commodity-based SWFs are more likely to use debt as an alternative way to increase the size of their asset under management when they cannot receive stable capital injections from the governments. In addition, SWFs in countries with underdeveloped bond markets have more incentive to use debt in order to facilitate the development of these markets. Last, SWFs with strategic investment styles tend to use debt because it can provide them more financial flexibility and help them optimize the cost of financing. The use of debt is still an uncommon and under-researched phenomenon in the SWF literature.

## 2. SFWs' Investment Objectives and Policies

### *2.1 SWFs' nature*

The nature of SWF can be summarized as that of a large financial player seeking large returns or to pursuit political agendas. Fotak, Gao, Megginson (2016) point out that most SWFs equity investments in publicly traded firms involve cross-border purchases of sizeable minority stakes (median around 20%) in target firms. A large literature has been

produced in an attempt to clarify whether SWFs pursuit purely financial objectives or others goals which can undermine their effectiveness at producing financial returns. Even if Del Guercio and Hawkins (1999) and Woitdke (2002) stress in their papers the similarities in their investment decision between SWFs and other internationally active investment vehicles such as pension funds, buyout funds and mutual funds, this looks like old fashion. More recent papers point out that SWFs investment decisions are more flexible and less transparent than mutual funds' decisions, this adds up to the peculiarity of their owner, the Government. As Ang (2010) emphasizes, this makes their management fundamentally different from ordinary investment management companies because SWFs have much more flexibility than other funds. Many papers express concern for some SWFs in particular, stressing the need for more transparency Truman (2011), Blundell-Wignall, Hu, Yermo (2008), Gieve (2008), Alhashel (2015). To measure the SWF transparency score ad hoc transparency indexes have been developed for SWFs, such as the *Truman Transparency Index.*

### *2.2 SWFs' functions*

A Sovereign Wealth Fund may be used to pursue a wide range of different goals, for instance they may be used to diversify and optimize the risk-return features of the government's portfolio, to stabilize the economy in an intergenerational perspective (e.g. when a government revenues are heavily dependent from a non-renewable natural resources), to exploit perceived skills or superior information the government has about particular industries, to influence the long-term industrial mix in their home country and to promote a hidden political agenda which can include: influencing the technology used by target firms, changing their preference about the employment level or changing their product mixes in order to achieve political objective rather than financial ones. Furthermore, SWFs can be used in foreign politics: China *State Administration of Foreign Exchange* (SAFE), a Chinese SWF, agreed to purchase 300 million Costa Rica bonds at the condition that they switch diplomatic recognition from Taiwan to the People Republic of China. Martin (2010) notes, indeed, that the international financial community is concerned that Chinese SWFs will acquire control over strategically important natural resources, obtain access to sensitive technology, and/or disrupt international financial markets. This is already happening for what concerns some critical elements used to produce smartphones and high-tech products.

### *2.3 Theoretical challenge in modelling SWFs investment strategy*

SFWs' natural scope is to maximize the utility functions of the owners who, in SWFs case, are the governments around the world. The Utility functions of the governments are very complex and partially unknown, therefore it is a titanic challenge to build a maximization model of the portfolio weights using a SWFs specific Utility function in a Mean-Variance framework. What can be done instead is to conjecture the optimal weights using the market capitalization weights or the mean weights of similar large institutional investor and then compare them to the actual SWFs weights. The difference between them can be regressed against any explanatory variables in the attempt to find significant coefficient on the explanatory variables can explain the difference between SWFs investment strategies and the ones of acknowledged unbiased financial investors. Alternatively they can use the standard mean-variance maximizer utility function. In such way, researchers avoid the theoretical challenge to build a meaningful utility function for the SWFs.

An example of a framework in which the researchers can determine the biases of SWFs portfolios is provided by Chan, Covrig, and Ng (2005), in their version of the Cooper and Kaplanis (1986) model. In their work, the researchers inserted in the standard Utility function of a mean-variance maximizer a variable called *deadweight costs*, which are the peculiar costs that investor $i$ bear for investing in country $j$ without earning any rewards for such costs Such variable is used to explain the difference between the optimal and the actual portfolio. The framework is as follows: assume that a representative investor in country $i$ maximizes the expected return of his portfolio investments for a given level of variance and for a given a vector $c$ of deadweight costs:

Max:

$$(w_i'R - w_i'c_i) \qquad (1)$$

subject to

$$w'V\,w = \sigma \qquad (2)$$

$$w'I = 1\,, \qquad (3)$$

where $w_i$ is a column vector containing portfolio weights, $R$ is a column vector of pre-tax expected returns, $c_i$ is a column vector of deadweight costs, with $c_i$ the deadweight cost of

investor *i* of investing in country *j*, $V$ is the variance-covariance matrix of gross returns of the risky securities, $\sigma$ is the given constant variance, and $I$ is a unity column vector. Setting the derivative of the Lagrangean of the above maximization problem with respect to $w_i$ to zero, it follows that the optimal portfolio for investor *i* is:

$$w_i = (V^{-1}/\rho)(R - c_i - \lambda_i I) \qquad (4)$$

where

$$\lambda_i = (I'V^{-1}(R - c_i) - \rho)/I'V - I$$

and ρ and $\lambda_i$ are the Lagrange multipliers on equations (2) and (3), respectively.
Aggregating the individual portfolio holdings gives the market clearing condition for the world capital market equilibrium:

$$\Sigma\, \pi_i\, w_i = w^* \qquad (5)$$

where $\pi_i$ is the proportion of world's wealth owned by country *i*, $w^*$ is a column vector of world market capitalization shares, with $w_i^*$ country *i*'s share in world market capitalization. Defining *z* as the global minimum-variance portfolio, $z = V^{-1}I\ /(I'V^{-1}I)$, and combining equations (4) and (5), we obtain after tedious calculations:

$$\rho V\,(w_i - w^*) = (\Sigma\, \pi_i\, c_i - c_i) - z'\,(\Sigma \pi_i\, c_i - c_i)I \qquad (6)$$

This last equation shows that with non-zero deadweight costs, the portfolio holdings of each investor will deviate from the world market portfolio. Using this framework the researcher can regress the left-hand-side of equation (6) against explanatory variables, which are the actual deadweight costs. Note that there is no need to use country level weights; the same exercise can be performed using firm level weights or any other possible level of accuracy. The regression can include as explanatory variables geographical distance, cultural differences as well as measures of legal enforcement, economic and financial development or any other variable that can be conjectured as a deadweight cost. Here is an example of what a regression emerging from this framework may looks like:

$$log\left(\frac{w_i}{w_i^*}\right) = c + \beta_1\, cultural\ differences_i + \beta_2\, ESG\ score_i + .. + \beta_n\, capital\ control_i$$

However, the final regression also needs to be accurately tuned. Indeed it is challenging to build a regression which controls for every endogeneity problem that may arise from the dataset or from the proposed model itself. In other words, there can be a covariance between the proposed explanatory variable and another, not considered, variable which may be the true explanatory variable. It is essential, therefore, to control for the most obvious explanatory variable such as the financial development or the legal enforcement when testing hypotheses such as presence of hedging demand with respect to the SWFs government revenues or the presence of an investment bias toward countries with specific cultural traits.

### *2.4 Papers whit similar approach*

Hammer, Kunzel, Petrova (2008) examine the framework and tools used by SWFs to asses and achieve their goals based on a detailed survey. Their results show that SWFs have a specific investment objectives in place, adopt an asset approach (mean-variance style) in determining their asset allocation strategy, and, for their risk management, they utilize common risk measures (e.g., credit ratings, value-at-risk models, tracking errors, duration, and currency weights), and they have explicit limits in their investment classes and instruments. But even if researchers are tempted to treat SWFs as a monolithic entity there are differences among them: Aizenman and Glick (2009) take a different perspective and show that SWFs objective are not universal and, on the contrary, are tied to the country specific political and social goals. In their paper, they derive the optimal asset allocation for both SFW and Central Bank of a hypothetical nation, assuming that these two institutions receive their investment objective from the Treasury. They show *how the differences between the strategies of the Central bank and SWF are affected by government delegation of responsibilities and by various parameters of the economy*, such as: the volatility of equity returns and the total amount of public foreign assets available for management. Other studies have focused on macroeconomic and geopolitical determinants, such studies yield that SWFs prefer to invest in countries with a higher degree of economic development, larger and more liquid financial markets, with institutions that offer better protection of legal rights and a more stable macroeconomic environment (Candelon, Si, Arezki (2011); Caner, Grennes, Tuzova., (2011); Ciarlone and

Miceli (2016)). Moreover using the same research papers behind the previous results one can claim that SWFs are indeed incentivized to invest in companies belonging to strategic sectors and who are facing financial difficulties or cash constraints, therefore especially during downturn periods, i.e. when stocks are cheaper.

### *2.5 The investment style of SWFs*

Consistently with the previous results, Ciarlone and Miceli (2016) show that SWFs tend to engage in contrarian investment behavior, i.e. tend to invest in countries that are experiencing financial turmoil. Their results show that in doing so SWFs could have a stabilizing role on the target financial market. Moreover they note that SWFs behave differently if compared to other large institutional investors who have a strongly pro-cyclical behavior, evidence of the pro-cyclical behavior of large institutional investor is provided by Papaioannou, Park, Pihlman, van der Hoorn (2013) and Raddatz and Schmukler (2011). This result places SWFs in a niche among large investors and makes them very important in modern financial markets, where volatility is very high and firms often experience financial turmoil. In a paper from Ciarlone and Miceli's (2016) the explanatory variable used to explain SWFs investment decisions are 22 and could be categorized into six families: economic development, stock market development, openness to trade and financial flows, investor protection, quality of institutions, and 'other' variables. On the left-hand-side of the main regressions, the independent variable is a dummy that states if the firm has been invested in by a SWF or not. The methodology used in this paper to address the research question is peculiar. They run a three-step regression. In the first one they regressed one explanatory variable at a time searching for significance, then in the second step they run group-wise or 'horse-race' regressions between similar variables, i.e. they group in families all the variables that got through the first step and run new regressions for each of these groups. Finally, they combine the most powerful explanatory variables in the final general model. The results of the model show a positive and significant coefficient on the dummy variable that indicates the presence of financial turmoil in the market of target firm, on the market capitalization of the firm's market and on legal enforcement; negative the effect of inflation in the country firm, as expected.

### *2.6 SWFs' investment Objectives and Goals*

In this section, SWFs behavior is analyzed and the main question is: do SWFs invest to pursuit financial or political goal? This is a very important question because it is a first step toward a better understanding of such funds and the answer is strictly related with the question of the next section in which is considered the impact of such funds on target firms. In the following lines, the papers that answer the question will be examined in detail, with emphasis on their methodology and on the independent variables they use to control for endogeneity issues that may arise from the dataset. The first paper this section address is Megginson, You, Han (2013); it brings some evidence that SWFs act as objective, commercially oriented global investors managing their nation's wealth as financial fiduciaries. In this paper, researchers explored two hypotheses. The first one is the investment facilitation hypothesis, which posits that SWFs are purely commercial investors facilitating cross-border corporate investment. This suggests that the increasing impact of SWFs on global M&A and financial markets will increase investment opportunities for corporations and build bridges for corporate internationalization. Secondly, they test the political influence hypothesis, which posits that SWFs invest in strategic foreign industries to pursue political objectives, rather than being driven strictly by economic motivations. In the regression framework, they used three main families of explanatory variables: the degree of economic development, the degree of commercial openness of the acquirer economy and the characteristics of the SWF taken into consideration (among these is the level of government involvement). In the first set of regressions, they regressed the percentage of all the cross border investments in a given country attributable to single SWFs against the SWFs' characteristics, the economic environment and the capital market development. The results show that SWFs make investment decisions principally for commercial purposes because the coefficient of economic development are statistically significant. They also explored a second hypothesis, i.e. the political one, and in order to do so they used as the dependent variable the value of strategic investment (investment in finance, energy, transportation, aerospace) as a percentage of the total cross-border investment value of that SWF. As independent variables, they used similar variables to the ones in the first regression. The results show that, again, the economic development variables are positively associated with SWF investing in strategic sector while government involvement variable is negative and insignificant. Taken together, these findings are not consistent with the political

influence hypothesis and instead suggest that SWFs make cross-border transactions principally or solely for commercial rather than political reasons. Then they take the target country's perspective. The regressions test the links between SWF investment and target country investor protection, economic performance, and capital market development. The findings are that the coefficient on market development and on stock market turnover are statistically significant, providing evidence for the commercial facilitation hypothesis. Finally, they test the hypothesis that SWFs tend to invest in countries geographically close or with the same religion or culture. In order to test this hypothesis they use, in a regression framework, as dependent variable the value of investments in a target country as a percentage of that SWFs total investment value; the independent variables are dummies which indicate the cultural, geographical and religiosity closeness of the target versus acquirer country. In this framework, they controlled for investor protection, financial development of the target country and the level of trade between the target and the acquirer country. The results show that SWFs are indeed more likely to invest in countries that share the same culture, and their investment values will be higher if the bilateral trade between acquirer and target country is higher. However, the results also show that geographic proximity does not lead to significantly higher SWF investment. The conclusion of the paper support the investment facilitation hypothesis, but fail to support the political influence hypothesis, suggesting that SWFs act as purely commercial investors facilitating cross-border corporate investment. Moreover they find that SWFs from countries with high levels of openness and economic development, but with less developed local capital markets, will make more cross-country transactions, while target countries with higher levels of investor protection and more developed capital markets will attract more SWF investment.

Another paper that addresses a similar research question is Dyck and Morse (2011). This paper provides an important contribution to the study of SWFs as they focus in determining the explanatory power of country specific industrial plan with respect to SWF portfolios, using a novel, hand-collected dataset of SWF investments in public equities, private firms and real estate. Their research yield that SFWs' investment decision are well explained using both financial portfolio investor objectives and state industrial planner objectives. To obtain such results they controlled for many factors. First, they controlled for the hedging demand using a set of covariance of fiscal revenues and return of industry-geography "bins" indicators of financial assets. Then, they also controlled for

the risk appetite of SWFs using three measures: national wealth, the non-financial standard deviation of the income and the amount of fixed income held in both the SWF and foreign reserves as proxies. In order to check the presence of an allocation similar to the one of a financial return maximizer, and so the presence of financial objective in SWFs investment decisions, they inserted in the regressions, as a benchmark, the proportion of world capitalized value in the asset class or the "de-home-biased" allocation of large pension plans that meet similar criteria as their SWFs in terms of size and assets category. Their intentions are to check the coefficients of such benchmark weights in order to discover if they explain SWFs weights. Regarding the measure of state planning influence in the investment decisions of SWFs, they inserted in the regressions of their paper three proxies explained in the following lines. Their primary resource of information is the national, not only SWFs', Strategic Plan for the nation if there is one, and, if so, on the specific industries highlighted in that plan. As a second measure they introduce the variable Perceived Market Failure which is an ex ante measure of the degree of potential justification for government intervention in industries on market failure grounds. A third state planning variable is labeled Perceived Skill. Perceived Skill refers to the possibility that the state possesses superior information and potential skills in an industry. They also interacted the last variable with an indicator variable for domestic, regional and foreign investment in order to discern whether this perceived skill is a driver of investments only domestically or in foreign markets as well. The result on the last question is that it varies depending on the SWFs taken into consideration. In the end, both measures, financial portfolio objective and industrial planner objectives, explain 14.4% of SWF portfolio variation. Of this, industrial planning accounts for 45%.

### *2.7 The importance of Hedging*

Are SWFs used to hedge the governments' revenues? Chhaochharia and Laeven (2008) find partial evidence that SFWs are used to hedge the government's pre-existing positions on some assets (e.g. its holding of natural resources or its national one industry oriented economy) with a standard hedging strategy: use financial markets to invest in financial instruments whose returns have a low correlation with the government pre-existing positions obtaining, this way, a hedging. Their results show that, yes, SWFs tend to diversify from industry at home but with a bias toward countries with same cultural

traits, in particular religion is a key predicting variable, and tend to avoid investing in country who are major trading partners. This function performed by SWFs is essential to economies which rely on volatile and/or few industries to produce income. Indeed SWFs are very useful and handy when it comes to hedge, evidence of this is provided also by the fact that Dyck and Morse (2011) control, when testing for the state planner hypothesis, for many possible hedging pattern in the SWFs investments.

### *2.8 Other Biases in SWFs' investment strategies*

Dyck and Morse (2011) find other biases when checking for SWFs investment preferences after controlling for their risk preferences: SWFs allocate 21% of their portfolios (in both private and public equity) to the finance industry and they own nearly 5% of the public equity capitalization in finance. Other than finance, the industries favored by SWFs include energy, transportation, and telecommunications; industries that are viewed as infrastructure and aid in development across a set of industries. Surprisingly, they find also a significant home bias and industry tilts which are in the opposite direction to what would be implied if SWFs were focused on hedging domestic income risk thus indicating that hedging is not their focus. To explain this, they suggest that SWF may be used as a tool to exploit perceived skills the state has in particular industries or superior information it has about particular industries, similar explanation for this bias is given by Massa and Simonov (2006). Diversification is, however, a task still performed, not completely opposing Chhaochharia and Laeven (2008) results. Fotak, Gao, Megginson (2016) provide a more recent evidence on SWFs investment biases. They show a "shift to domestic investment" pattern, as well as an industry preference change from the financial to the real estate sector.

Summary Table of section 2

| SWFs are more likely to invest in: | Papers | SWFs are less likely to invest in: |
|---|---|---|
| countries with:<br>+a higher degree of economic development,<br>+Larger and more liquid financial markets<br>+Institutions that offer better protection of legal rights<br>+More stable macroeconomic environment | Candelon, Si, Arezki (2011) | |
| +Financial industry<br>+Energy industry<br>+Transportation industry<br>+Telecommunications industry<br>+Financial portfolio investor objectives<br>+State industrial planner objectives<br>+Home bias | Dick and Morse (2011) | |
| +Hedging from home industry<br>+Same religion<br>+Same cultural traits | Chhaochharia and Laeven (2008) | -Major trading partner |
| +Higher levels of investor protection<br>+More developed capital markets | Meggingson,You, Han (2013) | |
| +Contrarian strategy firms<br>+Countries that are experiencing financial turmoil<br>+ High market capitalization of the firm's market<br>+High firm country legal enforcement | Ciarlone and Miceli (2016) | -Inflation |
| From other sections | | |

| | | |
|---|---|---|
| firms with:<br>+High dividends<br>+High growth and leverage<br>+Knowledge-based | Gangi, Meles, Mustilli, Grazian o, Varrone (2018) | |

# 3. Financial impact of SWFs' investment in firms

## *3.1 The main Research Question of this section and its issues.*

In this section are analyzed the potential implications of a SWF investment in a firm. In order to do so will be explored many alternative hypotheses on the impact that SWFs may have on firms. Many possible scenarios open, given the peculiarity of the investor, the government; especially if one considers that SWFs often take large positions in the companies they invest in putting at risk the independence of the board because of the presence of one predominant owner which may impose his private interest (in this case the government interest). Without a doubt, studying the phenomena of the financial impact of SWFs' investment on firms becomes very complex when the risk of tunneling and the risk of SWFs taking active investment behavior at the detriment of the other shareholders increase, but not everything about SWFs ownership in a firm is negative. If, on one hand, the governments may have non-financial goals, such as ESG investing and industrial plan objectives, that are not consistent with the maximization of the firm value, on the other hand a government ownership may signal the presence of a long-term, committed and powerful investor who can ultimately increase the value of the firm with his support. Therefore, it is predictable that the results of the existing literature are mixed. Indeed, researchers are divided between those who claim that SWFs have a positive effect considering the liquidity and the credibility provided, and those who claim instead that SWF investment have a negative effect taking into consideration the tunneling costs.

## *3.2 Two opposite views*

SWFs have the size and the capabilities to monitor and influence the management of the firms they invest in therefore, a priori, two different scenarios can be expected. In the first one, the target firm deteriorates its operational and financial performances due to state ownership and to agency conflicts that arise because of the pursuing of extra-commercial objective; these can be of various nature and can include the pursuit of a political agenda. According to Bernstein, Lerner and Schoar (2013), long-term performance (price/earnings) of target firms worsens when politicians are involved in the SWF management and Chen, El Ghoul, Guedhami, and Wang (2017) find that the sensitivity of the firm gain from an investment of a large institutional investor is reduced with state ownership, and this is critical given that SWF are wholly state owned. In the

second scenario, SWFs ownership in a firm is associated with better firm's financial and operational performances due to the monitoring role of SWFs and by its engaging actively in the management of the company. Furthermore, the improvement of firm's performance can be also due to government favoritism and financial support provided through the SWF, e.g. Bertoni and Lugo (2014) find that target companies experience reductions in their credit risk and Dewender, Han, Malatesta (2010) note that the managers of the SWFs are government insiders who may influence government policies and regulation affecting targeted firms.

### *3.3 The signaling role of large institutional investor and the expropriation risk*

A generic way to look at the dynamics that unfold when a large investor makes an investment in a firm is provided by Sheifer and Vishny (1986). They sustain that if large investors possess superior information, then their transactions will affect firm values through signaling and as large investors, they are also more likely to monitor. Nevertheless, they recognize that large shareholders may use their power to expropriate minority shareholders thus decreasing the overall value of the firm. The empirical evidence on this topic is large and mixed, in the following paragraphs of this section other paper will be analyzed more in detail and they will provide different evidence about firm with SWFs ownership.

### *3.4 Evidence from papers, short vs long time horizon*

Bortolotti, Fotak, Megginson and Miracky (2010) performing event study analysis using a sample of 235 SWF acquisitions of equity stakes in publicly traded companies around the world document a significantly positive mean abnormal return of about 0.9% around the announcement date. However, they find that one-year matched-firm abnormal returns of SWFs average is deeply negative and significant (-15.49%), suggesting that equity acquisitions by SWFs are followed by deteriorating firm performance. Moreover, in cross sectional analysis, they find weak evidence of benefits associated with a monitoring role of SWFs and evidence consistent with agency costs created by conflicts of interest between SWFs and minority shareholder. This thesis is adverse by Dewender, Han and Malatesta (2010) who sustain that these results have a bias in the fact that a large number of targeted firms had exceptional performance in the period before the SWF investment which therefore invalidate a standard market model as a tool to compute the normal returns in

the event study framework. Also Fotak, Gao, Megginson find in their paper a positive announcement period stock price increase of 1-3%. This, however, is significantly lower than the 5% abnormal return documented for stock purchases by comparable privately owned financial investors in recent studies, indicating the presence of a "Sovereign Wealth Fund discount."

### *3.5 The importance of transparency, of the monitoring role and of the size of SWF*

Kotter and Lel (2011) investigate the price reaction on the announcement date and find that SFWs investment in a firm increase its market value, probably because of the possibility of raising more capital after the investment as suggested by Fernades (2014), but the increase in value is greater when the SWF involved is more transparent. Furthermore, they find no long-term improvement of firm performance and governance regardless of the level of transparency, similar results yields Giannetti and Laeven (2008) who also add that the size of the fund investing has predictive power to explain abnormal return given that larger funds are more likely to incur in monitoring cost. Also Bortolotti, Fotak, Megginson (2015) show that returns following SFWs investment announcement are positive but lower than peer private-sector investment even after controlling for target and deal characteristic. They address government ownership as the main cause of the lower returns. In order to achieve non-endogenous results they controlled for differences in the observations using a propensity-score weighting of observations and matched the deal characteristic with a control sample. It is worth to say that even after these precautions the firms targeted by SWFs are still different, namely they are more profitable (higher ROA) and larger in terms of total assets. Furthermore, they noticed that the discount is greater when larger and controlling stakes are acquired by highly politicized SWFs and, conversely, is smaller in the case of funds enjoying a higher degree of independence from the sponsoring government, most notably the Norwegian Government Pension Fund-Global (GPFG), this is consistent with the tunneling and political influence hypotheses. To study the differences in operating performances they use a difference-in-difference estimation method. Difference-in-differences analysis reveals a decline in return on assets, sales growth, and market-to-book ratios over time horizons spanning up to three years after the SWF investment. Finally, regression analysis of operating performance confirms that larger stakes acquired by funds subject to political interference are associated with lower future profitability and growth. This, again, supports the

political influence hypothesis in which the large stake is used to negatively influence the performance of target firms in order to pursue political goals.

### *3.6 More evidence from papers, trade-off between risk and return*

Knill, Lee, Mauk (2012) also check the financial performance of firms which have received a SWF investment and they find that target firm raw returns decline following SWF investment, they also document that risk declines but not enough to compensate for the drop in return. In their results SWF investment is associated with a reduction in the compensation of risk over the 5 years following acquisition, indeed the results of their regression of the Sharpe Ratio and Appraisal value yield an economically and statistically significant negative coefficient on the SWF indicator variable. Moreover using a multinomial model they find that large shareholding are positively associated with worse firm performances, consistently with Dewender et al. (2010) and Sheifer and Vishny (1986) (large shareholders detrimental active investment). Fernandes (2014) challenges the claims that SWFs expropriate minority investors and pursue political agendas. The main finding of his paper is that SWF ownership is associated with positive changes in both corporate market values and operating returns. In support of these findings, the author also identifies three important ways that SWFs work to increase the performance and value of the companies they invest in, i.e. SWF act as: long-term equity-holders that provide a stable source of financing; representatives of deep pools of international capital in search of global diversification opportunities that are likely to provide companies with a lower-cost (as well as more "patient") source of equity capital; a politically well-connected strategic investors that enable their companies to leverage important connections when accessing new product markets.

### *3.7 Alternative hypothesis, the non-monotonic relation*

Dewender, Han and Malatesta (2010) investigate the possibility of a non-monotonic reaction function to SFWs investment. They conjecture that the reaction of the price is increasing until the stake acquired goes over a certain critical value which would allow the SWF to expropriate minority shareholders and therefore would increase the expected tunneling losses which exceed the expected benefits brought by new investor. Moreover, they check if there are other benefits than the potential benefits that the firm could gain from SWF ownership discussed above, for example they examine the possibility

that SWFs may be informed before other investors about governments' action affecting firms' value but they found evidence that reaction to SWF investment in its home country are insignificantly different from the ones in foreign countries thus invalidating the hypothesis. Their main result is that SWFs investment (divestment) announcement are followed by highly significant positive (negative) cumulative abnormal return (CARs), they also find evidence of the non-monotonic reaction hypothesis using the CARs as a dependent variable and Share Bough and Share Bought squared as independent variable, similar results and methodology for divestment. These results are consistent with Sheifer and Vishny (1986). They finally find some evidence of a positive relation between the Truman score (Truman 2009) and post-acquisition stock performance suggesting that more transparent SWFs perform better in the long run.

### *3.8 More recent evidence: taking into account crash risk*

Park, Xu and In (2018) find evidence that SWF investment generally underperform the local market index portfolio, in their words: "*After considering the decomposition of performance measures using a benchmark sample to control for target and deal characteristics, the causal effect of SWF investments on firm value is significantly negative for the two-year period*". They match returns of SWF investment at different time horizons with the benchmark's returns of investment with similar target and deal characteristic and find, indeed, that SWF investment have a sizable value-destroying effect on target firms in the long run. They also run a regression with binary variables to capture the SWF's effect on CARs and BHAR, in this framework they use Weighted Least Square to control for deal characteristic and target differences between SWF and benchmark investments. In this regression they significantly find that the effect of an SWF investment on the firm's performances is decreasing as the stake acquired increase especially for investment in country with low investor protection, these results are consistent with Dewender et al. (2010). They also examine the risk of crash in relation with the SWF investment using as crash risk indicators the negative coefficient of skewness of firm-specific weekly returns, which is computed, by taking the negative of the third moment of firm specific weekly returns for each year and normalizing it by the standard deviation of firm-specific weekly returns raised to the third power, and the down-to-up volatility of firm-specific weekly returns. They computed the median of the differences of these measure before and after the investment both for the benchmark sample and the SWFs sample in a crisis period and

in a normal period. Their results show that SWF investments increase the crash risk of target firms during non-crisis periods due to their opaque nature and limited monitoring ability. However, during crisis periods, the certification effect of SWFs outweighs their negative effects, leading to a reduction in crash risk, differently from what happens for other institutional investors. Overall, "*SWF investments do not seem to behave similarly to private institutional investments*", they conclude.

### *3.9 Differences among Sovereign Wealth Funds*

Another paper tries to look at the phenomena considering that SWFs are not a monolithic entity (as suggested by a vast literature: Dyck and Morse (2011); Kunzel, Lu, Petrova, Pihlman, (2011), Al-Hassan, Papaioannou, Skancke, Sung (2013); Bertoni and Lugo (2014); Aguilera, Papaioannou, Skancke (2016)). The paper has been written by Gangi, Meles, Mustilli, Graziano, Varrone (2018) and it investigates if and how differences among SWFs influence their investment determinants and financial performance. First they construct a large sample of companies (386 unique firms) targeted by SWFs over the period 2000 to 2016 and for which there are accounting data starting from five years before until five years after the investment. Second, they classify these firms in various subgroups based on the type of SWF that has made the investment, they categorized the SWFs according to their objective (i.e. saving funds, reserve funds, multi-objective funds and development funds) and their source of funding (i.e. commodity funds and non-commodity funds). For the determinants, they find SWFs are particularly attracted by firms that pay high dividends, that have high growth and leverage and that are knowledge-based. Also, they are more inclined to invest in emerging economies and during crisis periods. Then they go deeply at disentangle the determinants at the fund-type level: only saving funds and reserve funds are strongly attracted by better-performing firms in terms of profitability; except for development funds, all SWFs are encouraged to select firms that pay high dividends; all SWFs tends to invest in highly leveraged firms; saving funds and multi-objective funds are more inclined to target firms with high growth rates; reserve funds uniquely prefer firms incorporated in non-emerging countries. Then using a Difference-in-difference methodology they checked the performances of the target firms of all types of SWFs and they acknowledged, based on their results, that target firms over-perform control firms prior to the SWF investment and that firm performance decreases subsequent SWF investment. Then they split again the sample based on the SWFs

categorization and they find that reserve funds and saving funds are less associated with negative performances than development and multi-objective funds, moreover both commodity and non-commodity funds target firms experience lower return with respect to the control group. For the robustness check they perform a propensity score matching technique and the results are consistent with the previous ones. In their work they conjecture that the deterioration of performances is caused by a detrimental activism of the SWFs.

### *3.10 The firm cost of equity after SWFs' investment*

Boubarek , Boubakri, Grira and Guizani (2018) investigate the impact of sovereign wealth fund (SWF) investment on ex ante (implied) cost of equity capital of targeted firms using an international sample of 310 targets involved in 403 SWF deals and their matched firms, they find that targeted firms exhibit, on average, higher cost of equity financing than their peers after the announcement date. This ownership characteristic puts opposing forces on investors' expectations and hence on the rate of return that they require. On the one hand, the implicit government guarantee (through SWF ownership) that protects firms in case of distress may be of value to investors, leading to a potential positive impact on firms' financing conditions (lower cost of equity) (i.e., soft budget constraint view). On the other hand, government ownership discourages other shareholders within a firm from exerting their monitoring role and acts as a deterrent for other potential acquirers in the market (i.e., political view). This in turn results in excessive risk-taking behavior by managers and hence in a *higher cost of equity financing*. The evidence is that SWF targets exhibit, on average, a higher financing equity cost one year, two years, and three years after deals. They use implied cost of equity as a metric since it overcomes the limitations of using observed returns. Beck and Fidora (2008) conduct a country case study of Norway's SWF and ask whether the exclusion from the fund's portfolio of companies that violate the ethical guidelines of the ministry of finance generate price pressures on them, their findings suggest no significant negative abnormal returns following the divestment of these companies.

Summary Table of section 3

| SWFs' investment has a positive effect | Papers | SWFs' investment has a negative effect |
|---|---|---|
| | Boubarek , Boubakri, Grira and Guizani (2018) | -higher cost of equity |
| +reserve fund<br>+saving fund | Gangi, Meles, Mustilli, Graziano, Varrone (2018) | -development fund<br>-multi-objective fund |
| +less crash risk during financial turmoil | Park, Xu and In (2018) | -significantly negative financial performance |
| +if small investment<br>+investment (divestment) announcement are followed by highly significant positive (negative) cumulative abnormal returns (CARs)<br>+government favoritism | Dewender, Han and Malatesta(2010) | -If the investment is large |
| | Knill, Lee, Mauk (2012) | -SWF investment is associated with a reduction in the compensation of risk over the 5 years following acquisition<br>-Large shareholding are positively associated with worse firm performance |

| | | |
|---|---|---|
| +higher firms' market value after SWFs' investment | **Kotter and Lel (2011)** | |
| +higher return around the announcement date of SWFs' investment | **Bortolotti, Fotak, Megginson and Miracky (2010)** | -One-year matched-firm abnormal returns of SWFs average is deeply negative and significant |
| | **Bernstein, Lerner and Schoar (2013)** | -Long-term performance (price/earnings) of target firms worsens when politicians are involved in the SWF management |
| SWF act as:<br>+Long-term equity-holders that provide a stable source of financing;<br>+Representatives of deep pools of international capital in search of global diversification opportunities<br>+Politically well-connected strategic investors<br>+better corporate market values<br>+better operating returns | **Fernandes (2014)** | |

# 4. Active Investment and SWFs

## *4.1 Active investment in CSR as long term investment strategy*

A growing proportion of pension funds, insurance companies, endowment funds, sovereign funds, and other investors is engaging with public firms on CSR issues (Goldstein 2011). Indeed it is in the interest of large institutional investors to make sure that externalities from firms around the world are minimized when bad and maximized when good, such investors holds a major share of their portfolio in equities and are, therefore, very exposed to equity risk. Increasing their exposure to high CSR performances equities help them consolidate and stabilize the long-term performance of their portfolio. However just investing in high CSR firms may be not enough, is their interest also to push CSR scores up globally and therefore they need to actively invest, i.e. get involved in the management of the target firms to increase the firm's CSR performances.

## *4.2 Evidence from CSR engagements (CSR investing)*

Let's now examine some evidence on actual CSR engagements. Dimson, Karakaş, Li (2015) investigate the market reaction to engagement that aim to increase firm corporate social responsibility using a sample of US equity. Engagements address environmental, social, and governance concerns. They observe that target firms have *larger size, older age, lower sales growth, higher liquidity, more analyst following, larger market share in the industry, and lower return on assets*, relative to the benchmark firms. Furthermore, they report that successful (unsuccessful) engagements are followed by positive (zero) abnormal returns. *Success in engagements is more probable if the engaged firm has reputational concerns and higher capacity to implement changes*. They also find that collaboration by the asset manager with other activist investors and/or initiatives plays an important part in the asset manager's engagement strategies. In the univariate analysis using a chi-square test, they observe that cooperation with hard collaborators (collaboration based on partnership of the asset manager with activist investors), compared with soft collaborators (asset manager who benefit from the promotion of ESG principles), leads to a higher success rate, as the former are activist investors, whereas the latter are passive principals. Therefore, we should expect a higher rate of success engaging firms where the investor can collaborate with other activist investors, when the firm has

reputational concern and when it's easier to implement changes. Moreover, based on their results, we can conjecture that the activism is prompted also by short term return seeking.

### *4.3 A peculiarity of SWFs*

Rose (2008) sustains that SWFs prefer a passive approach to avoid political backlash. Indeed investigation and concerns may be prompted by the acquisition of a control block of shares of a firm by a SWF. It would be seen suspiciously because a foreign government owns it; consequently, SFWs are un-incentivized to actively invest, especially in strategic industries. Thus, the SWFs active investment theory seems to be obsolete as well as opposed by politicians in the country of the target, this makes it very unlikely for SWFs to be effective and systematic in executing an active investment strategy.

### *4.4 Evidence from papers on SWF active investments*

Nevertheless Dewender et al.(2010) find in their paper evidence of SWF active investment. They have observed that investment transaction are followed by events indicative of SWF monitoring, lobbying or possible tunneling affecting the target firm. However, they *do not report any evidence of SWFs active investment to increase CSR scores*. Also Gangi et al. (2018) suggest that SWFs are not necessarily passive investors; rather, some of them become actively involved in the management or monitoring of the target firms with negative effects on their performance, this is partly consistent with Dewender et al. (2010): the worse performances can be prompted by tunneling activities by SFWs.

### *4.5 Active investment strategy at the asset level*

For what concerns the asset level investment strategy of SWFs, a recent evidence is provided by one of the latest studies of the sector by *Invesco*, the *Atlanta* asset manager. In the study is highlighted the negative trend for managed active fund which are no more able to attract SWFs as clients. SWFs are instead attracted by the transparency and value for money of passive investment, it is reported that more than half (56 per cent) of SWFs plan to increase their exposure to smart beta (passive investment strategy) in the next three years, shifting holdings from active strategies and vanilla-market, capitalization-weighted funds.

# 5. SWFs Governance

## *5.1 Introduction to this section*

Corporate governance has been studied extensively, and good practices have been shown to be important for shareholder value (Shleifer and Vishny 1997; Gompers, Ishii, Metrick 2003; Bebchuk, Cohen, Ferrell 2009, among others) therefore is important to check what the determinants of SWFs' governance are.

## *5.2 The determinants of SWFs' governance quality*

The determinants of quality governance are examined in the following paper. Aggarwal and Goodell (2014) investigate the determinants of SWFs governance and how it might be related to national culture, institutions, and SWFs characteristics. Using data on 49 large SWFs from 33 countries and controlling for relevant variables, their paper examines national institutions, culture, and SWF characteristics as determinants of SWF governance. They evidence, importantly for the first time, that *national culture matters greatly in determining SWF governance*. Specifically, in addition to a few other expected variables, they evidence a *negative association of SWF governance with the national cultural dimension of power distance and individualism; and a positive association with the national cultural dimensions of long-term orientation and uncertainty avoidance*.

## *5.3 The importance of coordination with other government institutions*

Moreover an IMF working paper from Al-Hassan, Papaioannou, Skanke and Sung (2013) underline that the SWFs' governance should be structured in a manner that enhance and improve the coordination with other government institutions. SWFs assets can indeed have a significant effect on public finance, monetary condition, and external account and balance sheet linkages with the rest of the world. Namely, Fiscal Policy may be affected by SWF funding and withdrawal rule, Monetary Policy may be impacted by wide fluctuations in fiscal revenues and Exchange Rate variations could be mitigated by investing the SWFs resources abroad.

# 6. Corporate Social Responsibility behavior impact on firms performances

## *6.1 Introduction to this section*

Corporate Social Responsibility (CSR) or Environmental, Social, Governance (ESG) may be defined, consistent with McWilliams and Siegel (2001), as actions on the part of a firm that appear to advance the promotion of some social good beyond the immediate interests of the firm/shareholders and beyond legal requirements. That is, CSR activities of companies are those that exceed compliance with respect to environmental or social regulations, in order to create the perception or reality that these firms are advancing a social goal. Since this thesis wants to analyze whether SWFs invest in CSR it is appropriate to examine the literature that search for links between CSR and firms' performances. This will allow discerning if SWFs investing in CSR is a result of political influence or the result of the pursuit of other, maybe financial, goals. Note that financial goals are not necessarily seeking for higher returns but may be the research of a reduction of risk. The finding of this section will inform us of the properties of CSR investing and will ultimately allow us to look deeper into SWFs ultimate goals if this thesis will find a consistent CSR investing pattern among SWFs.

## *6.2 Views on why investors should pursue a CSR investing strategy*

In such a framework, it is interesting to consider the literature on why CSR investing is becoming so important among the mutual fund industry. The literature provides three main answers to the question why mutual funds pursue a CSR focus in their investment strategy. A first explanation is that funds want to pursue non-financial goal (Riedl and Smeets, 2017). A second explanation is that investment policies with a CSR focus can help mutual funds attract additional investment thus increasing fund flows (Ammann, Bauer, and Muller, 2018). A third explanation is that CSR investment policies provide risk-mitigation benefits (Nofsinger and Varma, 2014). Benabou and Tirole (2010) offer different views on CSR investing. One view is that CSR practices allow management to take a long-term perspective and maximize intertemporal profits, consistent with the interests of universal owners (large institutional investors). A second view is that socially responsible businesses act as an efficient channel to express personal values on behalf of their stakeholders, which may be regarded as a form of delegated philanthropy. A third is

that CSR reveals insider-initiated corporate philanthropy or a managerial agency problem. Theories of CSR (McWilliams and Siegel (2001); Bagnoli and Watts (2003)) conjecture that companies engage in "profit-maximizing" CSR, based on anticipated benefits from these actions. Examples of such benefits might include reputation enhancement, the potential to charge a premium price for its product(s), or the enhanced ability to recruit and retain high quality workers.

### *6.3 Determinants of CSR investing*

Liang and Renneboog (2016) find that a firm's corporate social responsibility (CSR) performance and its country's legal origin are strongly correlated. This relation is valid for various CSR ratings coming from several large datasets that comprise more than 23,000 large companies from 114 countries. They find that CSR is more strongly and consistently related to legal origins than to "doing good by doing well"-factors, and is also mostly linked to firm and country characteristics such as ownership concentration, political institutions, and degree of globalization. In particular, companies from common law countries have lower level of CSR than companies from civil law countries, and Scandinavian civil law firms assume highest level of CSR. This link between legal origins and CSR seems to be explained by differences in ex post shareholder litigation risk as well as in stakeholder regulations and state involvement in the economy. Evidence from quasi-natural experiments such as scandals and natural disasters suggest that civil law firms are more responsive to CSR shocks than common law firms, and such responsiveness is not likely driven by declining value of the market shares following the shock. Their results are produced using as regression techniques OLS, random-effects generalized least squares (GLS), and random-effects ordered probit models.

### *6.4 Evidence from papers on firm with strong CSR practices.*

A paper from Poddi and Vergalli (2009) find that CSR firms have better long run performances. In particular they find that firms' with high CSR performances obtain higher sales and profits due to the reputation effect of their corporate social responsibility involvements or programs, as well as a reduction of long run costs and increased socially responsible demands. Ferreira et al. (2008) support these findings by observing that large firms benefit in the form of positive long-run stock performance following certification of quality management. Zsolnai (2006) states as well that "caring organizations are

rewarded for the higher costs of their socially responsible behavior by their ability to form commitments among owners, managers, and employees and to establish trust relationships with customers and sub-contractors". These views of positive relation between CSR performance and financial performance are not supported by all the literature; for instance, Becchetti, Di Giacomo and Pinnacchio (2005) investigate whether inclusion and permanence in the *Domini social index* affects corporate performance on a sample of around 1,000 firms in a 13-year interval by controlling for size, industry, business cycle and time invariant firm idiosyncratic characteristics. The presence in the Domini index increase the total sales per employee but reduce return on equity for large firms and for firms investing in R&D. However these lower returns are accompanied by relatively lower conditional volatility and lower reaction to extreme shocks with respect to the control sample. Becchetti and Ciciretti (2006) analyze the performance of a large sample of Social Responsible (SR) stocks relative to a control sample of equivalent size for 14 years. They find that individual SR stocks have on average significantly lower returns and unconditional variance than control sample stocks when controlling for industry fixed effects. This result is paralleled by descriptive evidence on the lower (daily return) mean and variance of the buy-and-hold strategies on the SR portfolio with respect to those on the control portfolio. Moreover, they find that individual social responsible stocks are significantly less risky when controlling for conditional heteroscedasticity, there are no significant differences in risk adjusted returns between the two buy and hold strategies (SR and control sample) on both portfolios and, finally, the high CSR performance portfolio exhibits significantly lower exposition to systematic non-diversifiable risk. Yongtae Kima, Haidan Lib, Siqi Lic (forthcoming), instead, investigate whether corporate social responsibility (CSR) mitigates or contributes to stock price crash risk. Crash risk, defined as the conditional skewness of return distribution, captures asymmetry in risk and is important for investment decisions and risk management. They show that if socially responsible firms commit to a high standard of transparency and engage in less bad news hoarding, they will have lower crash risk. They find that firms' CSR performance is negatively associated with future crash risk after controlling for other predictors of crash risk. Moreover, the mitigating effect of CSR on crash risk is more pronounced when firms have less effective corporate governance or a lower level of institutional ownership.

### *6.5 Where to expect high CSR performances*

Heal (2004) analysis suggests that there is a resource-allocation role for CSR programs in cases of market failure through private-social cost differentials and in cases where distributional disagreements are likely to be strong. Therefore, firms for which these cases hold have the greatest incentive to have high CSR performances which increase their corporate profit by avoiding loss in the form of goodwill, reputations, and generates brand equity, improve employee productivity and reduce risk. He also argues that high CSR can decrease the cost of capital through the impact of Social Responsible Investing, whose presence among SWFs this thesis attempt to look for.

### *6.6 The causality relation*

Neilling and Webb (2009) in their work use a Granger causality fixed effect approach and, using a time series fixed effects approach, they find that the causality between CSR and financial performance is much weaker than previously thought. This approach, developed by Granger (1969), involves regression models of the form:

$$FIN.PERF_t = \alpha + \beta_1 FIN.PERF_{t-1} + \beta_2 CSR.SCORE_t + \beta_3 CSR.SCORE_{t-1} + e_t$$

If the coefficients $\beta_2$ or $\beta_3$ are significantly different from zero, it is inferred that CSR performance ‘‘Granger causes’’ financial performance. In their estimation neither b.2 nor b.3 are significantly different from zero, they deduce that CSR performance do not produce higher financial performance. In the paper they also find (little) evidence of causality between financial performance and narrower measures of social performance that focus on stakeholder management. They state: “Our results suggest that strong stock market performance leads to greater firm investment in aspects of CSR devoted to employee relations, but that CSR activities do not affect financial performance”. They conclude by saying that a broader set of CSR activities is driven more by unobservable firm characteristics than by financial performance. Their results are aligned with other papers findings (Becchetti, Di Giacomo and Pinnacchio (2005); Becchetti and Ciciretti (2006)) in which high CSR is not related with higher financial returns. Therefore these paper results lead us believe that SFWs eventual investments in CSR firms are more likely to aim at risk mitigation rather than to increase financial gains.

### *6.7 The ESG (CSR) disclosure signaling role in the market*

Fatemi, Glaum, Kaiser (2018) investigate the impact of ESG(CSR) performance and the interaction of their level of disclosure with firms valuations measured as *Tobin's Q*. They address the possible endogeneity of ESG disclosure variable resulting from omitted variables or from simultaneity by using an instrumental variables approach. If, for example, firm value affects ESG disclosure, then the latter will be correlated with the error term in a regression of firm value on ESG disclosure, and the estimated coefficient will be biased and inconsistent. They use three different instrumental variable: the existence of a CSR committee on the board of directors, the dispersion of analysts' earnings forecasts, and the concentration of a firm's stock ownership. Their results show that firms with high ESG strength increase firms' valuation but when put in relation with the level of disclosure the effect became negative. They explain it suggesting that the market may believe that the firms is overinvesting in ESG or that the firm is attempting to cover up for a lack of depth in its ESG actions with "too much talk". Furthermore, mirroring the previous results, a weakness in ESG score is associated with lower firm valuation and its interaction with the level of disclosure yield a positive coefficient. Other regressions show that these relations are much less strong for high-disclosure firms. It follows that the negative impact of ESG concerns on firm value is much less pronounced for firms that disclose more. One possible explanation is that by properly framing the appropriateness of its operations and its ESG policies, the firm succeeds in its efforts to legitimate its behavior and to affect investor expectations. Alternatively, the firm may convince investors that it has made credible commitments to overcome ESG weaknesses in the future.

### *6.8 The risk mitigation role of CSR in Hedge Funds investment strategy*

Duanmua, Huangb, Lic, and McBrayerd (2019) evidence that CSR investing can be used to mitigate the risk when funds invest in the stock market. In their words: "We find that the increases in CSR investment are consistent with hedge funds utilizing CSR strategies as a form of risk mitigation. Specifically, hedge funds with higher weighted CSR scores exhibit significantly lower risk factor loadings than funds with lower weighted CSR scores". Therefore we can conclude that also SWFs may use CSR as a form of risk mitigation.

# 7. Research question

## 7.1 First research question

The first research question reads: there is a positive and significant statistical relation between SWFs investment decisions and CSR score of firm SWFs invest in? A first approach to answer the research question can be translated in the test for the null hypothesis that the coefficient on the ESG score is equal to zero in a regression in which the dependent variable is an indicator variable equal to one if the firm is owned by a meaningful percentage by SWFs and equal to zero otherwise. For this model, I created an indicator variable which is equal to one if the share owned by SWFs are at least 1% of the shares of the firm and equal to zero otherwise. To create such indicator variable with the one percentage point discriminator threshold I first sum the ownership percentage of the single SWFs to create an aggregate ownership of SWFs, then from this variable I create the indicator variable. At a first glance, I do not distinguish among SWFs but I treat them as a monolithic entity for what concerns the hypothesis of this test which is about CSR investing. Indeed the aim of this thesis is to understand if SWFs are structurally inclined to invest in high CSR performance firms or not, therefore there is no need to distinguish among them. These research question is relevant because we want to understand if large institutional investors owned by governments care about the social impact that firms have on the society when making investment decisions. Moreover, if the hypothesis is true, we can assess that firms that want to increase their chances to attract a SWFs investment should increase their CSR score. Moreover, this research is the first step in a research field that aim to discern if government owned funds may be effective in shifting upward, globally, the CSR score of firms by providing capital and validation of quality to firms that show high CSR performances.

## 7.2 Motivations on why SWFs may invest in firms with high CSR score

The motivations behind SWFs structural CSR investing behavior could be many. SWFs are government owned and therefore may want to pursue social goals as well as financial ones therefore they invest in high CSR firm because this way they accomplish the mission of pursuing social goals. This could be another form of state welfare. Of course, in general, by investing in a firm SWFs give it financial support and, if it is not motivated by financial considerations, this may be seen as a state aid to private firms which can be

source of many inefficiencies. However, CSR performances are recognized to be even more important than financial performances when it comes to provide to employees a healthy work environment and when it comes to natural environment protection. Better still, looking at the issue more accurately, one can argue that this could be a "safe" route for governments whose goal is to influence the economy because investing through SWFs do not subtract the firm from the market reactions and control, this way mitigating the harmful effect of a state intervention in the economy. Moreover, the state intervention is about pursuing an investment strategy which reward firms who show to have a social responsible behavior recognized by the market and not by the government itself. Another motivation behind the CSR investing strategy could be the search of less risky investment because the governments do not want to load too much risk on financial portfolios paid with taxpayers' money. The academic literature has proven high CSR firms to be much less risky than comparable firms with lower CSR score (Becchetti, Di Giacomo and Pinnacchio (2005); Becchetti and Ciciretti (2006); Yongtae Kima, Haidan Lib, Siqi Lic(forthcoming)). The presence of high CSR score decrease both the risk expressed as variance of firm's returns and as crash risk measured as the negative of the skewness of firms return. Therefore a CSR investing strategy could be a way for SWFs to mitigate financial risk. A third reason that may push SWFs to invest in high CSR score firms is reputational concerns. Public opinion can influence the decisions of policymakers who may decide to shut down, reorganize or decrease the funds allocated to the SWFs. Therefore, SWFs may be incentivized to invest in high CSR firm as a form of self-promotion of their reputation. A fourth the theory that explains why large institutional investors may prefer to invest in high ESG score firms is that this strategy allows large equity holder to consolidate equities performance in the long run. High CSR firms are able to minimize the negative externalities and maximize the positive externalities of their operations and therefore are more rooted into their territory and have a larger and more committed community of stakeholders. High CSR firms are more valuable for the society in general and therefore are more stable from many points of view; this helps them to be less exposed to scandals and to sudden drop in value. Large institutional investors therefore prefer to invest in high CSR score firms in order to help to move equities, globally, toward a path of more responsible behavior and this way they help consolidate their financial performance in the very long term, reducing the risk borne by large equity holder as large institutional investors.

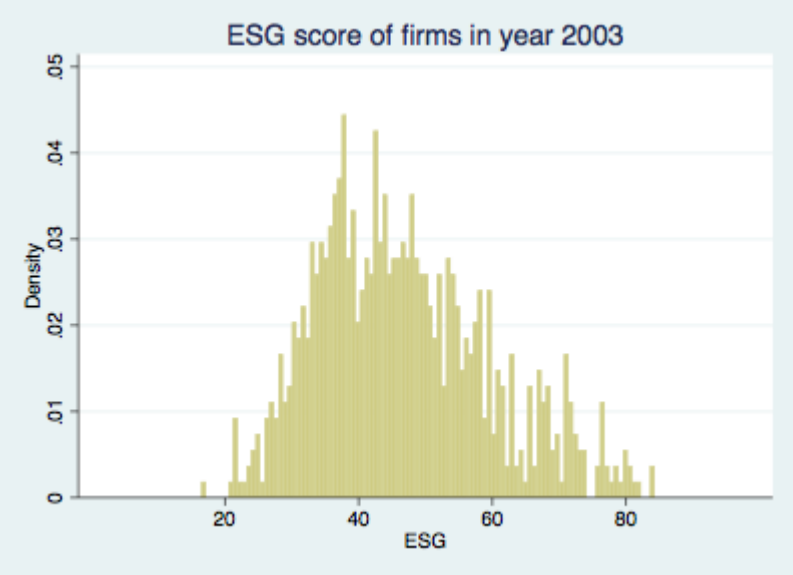
### 7.3 Second research question

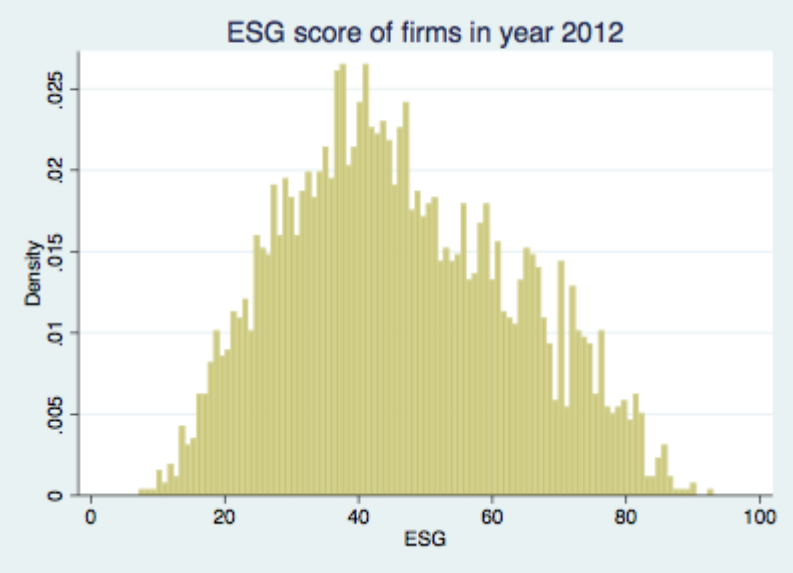
A second research question addressed in this thesis, instead, ask if SWF actively engage firms in an attempt to increase their CSR performance. This can be motivated by any of the previous motivation. Indeed the same motivations apply if the SWFs invest a priori in high CSR performances firms or if instead engage the firm to increase its CSR performances. Maybe the SWFs target low CSR firms because SWFs consider their CSR score unacceptably low and want to improve it because of the pursuit of social goals or the pursuit of the self-promotion agenda.

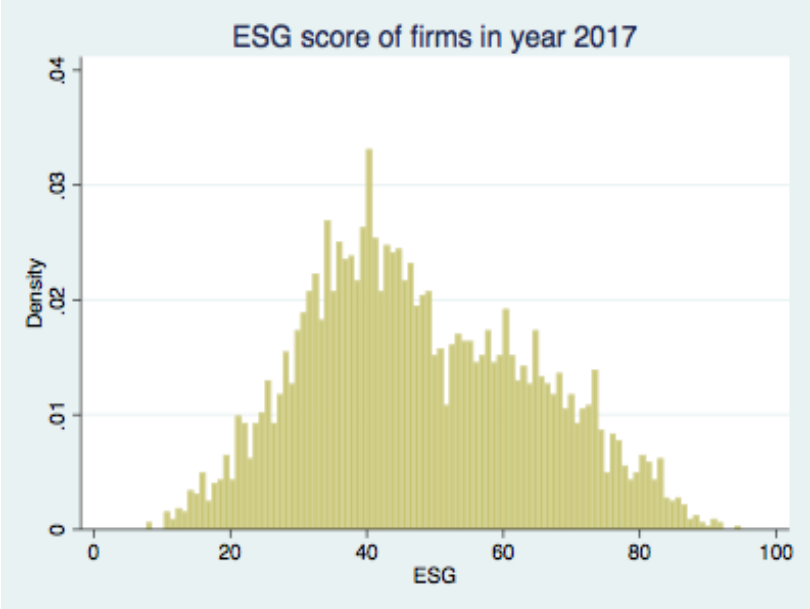
### 7.4 Causality problem

A problem that may arise in the research is: is CSR causing the investment of SWFs? Or is the opposite? Are firms aware of a possible CSR investing behavior of SWFs and therefore may decide to increase their CSR score in order attract SWFs money? Since there is a broad number of large institutional investor which are investing in CSR I cannot exclude that firms increase their CSR score to attract investment. However, this is not a concern in my analysis because if the firms are aware of a possible CSR investing behavior by large institutional investor then it means that this behavior exists and my research question is answered. Therefore, I do not need to worry about this causality problem because my research is not about causality but about investment behavior.

The causality problem however arise in the second research question in which I attempt to discern if SWFs actively engage firms in order to increase their CSR score. This causality problem will be handled using the Granger causality technique which request to include in the regression the lagged value of the dependent variable ($\Delta$CSR) in order to control for trends in such variable explained by the lagged value of the variable itself. Descriptive statistics presented below show that firms have increased their CSR score overtime, indeed the skewness of the distribution of ESG score increases overtime, if SWFs have increased their exposure to equities in the same period this combination of events may lead to the false belief that SWFs may be responsible for this increase. To deal with the possible endogeneity problem that arise from this trend I will use year fixed effects to isolate the trend effect from the effect of SWFs ownership on firms. Follow histograms that show the increase in ESG score of firms over the years.


ESG score of firms in year 2003
Density
0
.01
.02
.03
.04
.05
20
40
60
80
ESG


ESG score of firms in year 2012
Density
0
.005
.01
.015
.02
.025
0
20
40
60
80
100
ESG


ESG score of firms in year 2017
Density
0
.01
.02
.03
.04
0
20
40
60
80
100
ESG

# 8. Data

## *8.1 Data description*

For this thesis I used a large set of data. The data are from Factset and Datastream. Factset provide information about the ownership of firms by SWFs, this is the first piece of the dataset used in this thesis. The SWFs for which data have been collected are 24; a list is presented below. Datastream, more specifically Thomson-Reuters' ASSET4, provide instead the ESG scores and other firms characteristics of firms comprised in the first piece of the dataset. Then these two dataset are merged to obtain a first draft of a data set. The data set contains information about 7784 firms from 83 countries at 1 year frequency and cover the period 2003/2017. Specifically the second half of the data set contains information about each firm ESG/CSR score, nationality, sector, price, market value, dividend yield, leverage, ROA, sales growth, cash to asset ratio, operating income, value of intangible assets, CAPEX, total assets, market to book ratio, ROE and sales. Unfortunately data are jeopardized, i.e. there are missing variable on firms ESG score and other firms characteristic in a random fashion. Therefore the data set can be classified as an unbalanced panel data set. From this data set I selected the most powerful explanatory variable in explaining SWFs ownership based on the previous literature findings to be used in the regression that checks if high CSR scores attract SWFs' investment. TABLE I provide the definitions of the variables that will be used in the main regressions, these are the variables of interest and the control variables, i.e. the variables that the literature has shown to be more powerful in predicting SWFs investment behavior.

TABLE I

| **Main Variables** | |
|---|---|
| *SWFs % Ownership* | % Ownership stake SWFs have of a target firm |
| *SWFs 1% Ownership indicator* | Indicator variable equal to 1 if SWFs % Ownership is at greater or equal to 1% and equal to 0 otherwise |
| *SWFs 5% Ownership indicator* | Indicator variable equal to 1 if SWFs % Ownership is at greater or equal to 5% and equal to 0 otherwise |
| *ESG* | Thomson Reuters Asset 4® ESG score of target firm |
| *Δ ESG* | Difference in ESG score compared to ESG score of the previous year. |
| *SWFs % Ownership transformed* | % Ownership stake SWFs have of a target firm, transformed using a inverse logit trasformation |
| *ESG transformed* | Thomson Reuters Asset 4® ESG score of target firm, transformed using a inverse logit trasformation |
| **Control Variables** | |
| *Log market value* | Logarithm of market value (share price * number of outstanding shares) in millions. Used to proxy target firm size. |
| *ROA* | Calculated by dividing a company's annual earnings by its total assets. Used as an indicator of firm performance. ROA is displayed as a percentage. |
| *Sales Growth* | Annual growth in sales. Used to proxy firm performance. Displayed as percentage. |
| *Dividend Yield* | The ratio of a company's annual dividend divided by their share price. Used to proxy payout policy of target firms. Displayed as percentage. |
| *Leverage* | Leverage ratio, calculated by dividing a firm's debt by the firm's equity. Used to measure the firm's ability to access debt capital and of the probability of financial distress. Displayed as percentage. |
| *Cash Assets ratio* | Cash & cash equivalents divided by total assets. Used to measure the degree of financial constraints as it indicates a firm's liquidity or ability to pay short-term obligations. Displayed as percentage. |
| *Market to Book ratio* | Market to book ratio of firm, calculated as market value of equity divided by book value of equity. Used to determine under- or overvaluation of a target firm. Displayed as percentage. |
| *Intangible Assets ratio* | Intangible Assets divided by Total Assets. Used to proxy the degree of sensible know-how that the firm posses. The higher the ratio the higher the sensible knowledge that firms has. |
| *Dum Crisis* | Is an indicator variable. It equals 1 when the observation belongs to a period of crisis (2008-2009) and equal to 0 otherwise |

List of SWFs used in the analysis

| |
|---|
| Norges Bank Investment Management |
| China Investment Corp. (Investment Management) |
| Abu Dhabi Investment Authority (Investment Management) |
| Kuwait Investment Authority (Investment Management) |
| Saudi Arabian Monetary Agency (Investment Management) |
| Hong Kong Monetary Authority (Investment Management) |
| SAFE Investment Co. Ltd. |
| GIC Pte Ltd. (Investment Management) |
| Temasek Holdings Pte Ltd. (Investment Management) |
| National Council for Social Security Fund |
| Qatar Investment Authority (Investment Management) |
| Public Investment Fund (Investment Management) |
| Public Investment Corporation (SOC) Ltd. |
| Korea Investment Corp. (Investment Management) |
| Future Fund Management Agency |
| Alaska Permanent Fund Corp. |
| Brunei Investment Agency (Investment Management) |
| Texas Permanent School Fund |
| Khazanah Nasional Bhd. (Investment Management) |
| Guardians of New Zealand Superannuation |
| State General Reserve Fund of Oman (Investment Management) |
| China-Africa Development Fund Co., Ltd. (Invt Mgmt) |
| Palestine Investment Fund (Investment Management) |
| State Capital Investment Corp. (Investment Management) |

To test the hypothesis of SWFs pursuing CSR investing the variables that the literature has shown to be more powerful in explaining SWFs investment behavior will be added as independent variable in the main regression for the hypothesis test to control for possible endogeneity problem. Therefore in the main regression there will be more than just ESG score as independent variable. This is because it is appropriate to control for other potential explanatory variable when testing hypotheses on the investing behavior of SWFs. In other words, many variables can be the true drivers of SWFs investment decisions and, therefore, if they are not added in the main regression the coefficient on the ESG, which is the focus of this thesis, may be biased because of endogeneity. Endogeneity problem arise when the firms ESG score covariates with other firm characteristic which may leads to the false belief that SWFs invest in a firm for its high ESG when the truth is that SWFs invest because of, for instance, the firms sales growth or other firm characteristic. Not all of the variables contained in the data set are included because not all of them can reasonably be drivers of SWFs investment decisions. If too many variables

are added to the regression it can result in a dispersion of predictive power which may lead the regression to become just a mathematical exercise and not a meaningful statistical research. Indeed in the regression will be added only the variables that have a solid motivation on why they should be drivers of SWFs investment decisions. The following table provides descriptive statistics for the variables that the literature has shown to be more powerful in explaining SWFs investment behavior.

**TABLE II**

**Summary statistics**

| | N | Mean | St.Dev | min | Median | max |
|---|---|---|---|---|---|---|
| SWF Ownership | 75063 | 1.356 | 2.083 | .001 | .76 | 13.877 |
| ESG | 37560 | 46.597 | 16.404 | 5.24 | 44.54 | 95.66 |
| log market value | 94469 | 7.221 | 1.599 | -4.605 | 7.172 | 13.675 |
| Sales Growth | 94708 | 16.29 | 38.213 | -47.47 | 8.39 | 258.21 |
| Leverage | 98099 | 79.485 | 96.16 | 0 | 45.97 | 365.85 |
| Intangible Asset Ratio | 81962 | 26.916 | 34.367 | 0 | 8.877 | 97.458 |
| Dum Crisis | 115020 | .133 | .34 | 0 | 0 | 1 |
| Dividend Yield | 94599 | 2.042 | 2.262 | 0 | 1.45 | 11.46 |
| Cash Assets ratio | 82489 | 35.932 | 24.189 | 0 | 30.82 | 100 |
| Market to Book ratio | 92306 | 2.725 | 2.954 | -.54 | 1.81 | 19.36 |
| ROA w | 94460 | 5.501 | 9.497 | -40.37 | 5.12 | 34.65 |

From the summary statistics we observe that the dataset contains many missing values, indeed for only 37560 observation there are available information on ESG score when the dataset should comprise 116760 (number of firms * number of years) observation if it was complete. Data on Leverage, Dividend Yield, Intangible Asset Ratio and Sales Growth are winsorized. In Particular Dividend Yield and Sales Growth are winsorized with cuts at first and 99th percentile; Leverage is winsorized with cuts at fifth and 95th percentile; Intangible asset ratio is winsorized with cuts at first and 87th percentile; ROA and Market to Book Ratio are winsorized with cut at first and 99th percentile. The data are winsorized to prevent my results to be driven by extreme values. These extreme observation appear to be more present specifically for the variables Leverage and Intangible Asset Ratio and therefore for these variables the winsorization applied is stronger.

**TABLE III**
**Summary statistics SWFs**

| | N | Mean | St.Dev | min | Median | max |
|---|---|---|---|---|---|---|
| Norges Bank Investment Management | 66518 | .909 | .846 | .001 | .669 | 4.149 |
| China Investment Corp. | 2517 | 2.442 | 3.861 | .038 | 1.708 | 51.515 |
| Abu Dhabi Investment Authority | 804 | 1.399 | 3.118 | .001 | .408 | 33 |
| Kuwait Investment Authority | 1804 | .781 | 1.585 | .004 | .289 | 14.729 |
| Saudi Arabian Monetary Agency | 1248 | 1.318 | 1.209 | .002 | 1.254 | 9.09 |
| Hong Kong Monetary Authority | 8 | .906 | .516 | .004 | .86 | 1.506 |
| SAFE Investment Co. Ltd. | 531 | .988 | .526 | .013 | .911 | 4.98 |
| GIC Pte Ltd. (Investment Management) | 3075 | 1.965 | 2.783 | .007 | .737 | 25.288 |
| Temasek Holdings Pte Ltd | 587 | 6.944 | 12.607 | .001 | 1.821 | 68.318 |
| National Council for Social Security | 509 | 4.068 | 4.061 | .021 | 2.523 | 39.372 |
| Qatar Investment Authority | 108 | 8.087 | 5.107 | .003 | 7.88 | 21.186 |
| Public Investment Fund | 13 | 14.164 | 18.2 | 8.5 | 8.5 | 74.309 |
| Public Investment Corp. | 1800 | 8.74 | 5.97 | .079 | 7.867 | 68.654 |
| Korea Investment Corp. | 2173 | .056 | .072 | .001 | .038 | 1.881 |
| Future Fund Management Agency | 15 | 7.985 | 5.571 | 1.627 | 7.229 | 17.847 |
| Alaska Permanent Fund Corp. | 6 | .023 | .007 | .013 | .023 | .03 |
| Brunei Investment Agency | 34 | .035 | .036 | .003 | .033 | .178 |
| Texas Permanent School Fund | 7624 | .1 | .038 | .005 | .09 | .255 |
| Khazanah Nasional Bhd | 163 | 21.405 | 23.589 | .133 | 10.224 | 86.811 |
| Guardians of New Zealand Superannuation | 43380 | .045 | .396 | .001 | .006 | 20 |
| State General Reserve Fund of Om | 24 | 10.175 | 8.597 | 1.173 | 7.972 | 30 |
| China-Africa Development Fund, Ltd. | 2 | 10.211 | 0 | 10.211 | 10.211 | 10.211 |
| Palestine Investment Fund | 29 | 16.704 | 10.644 | 8.015 | 9.469 | 51.671 |
| State Capital Investment Corp. | 12 | 13.241 | 12.951 | 5.55 | 6.063 | 34.712 |

From the descriptive statistics about the sample on SFWs ownership we note that there is one fund who dominates the sample which is *Norge Bank Investment Management* which 66518 observation and a mean of 0.91 percentage point of share ownership. This dominance will play a role in the robustness check of my analysis. Then it can be observed that most of the funds are from developing countries except for Texas Permanent School Fund, Alaska Permanent Fund, Hong Kong Monetary Authority and Norges Bank Investment Management. Follows a table which shows the percentage of the variable SWFs % Ownership addressable to *Norge Bank Investment Management .*

**TABLE IV**

Descriptive statistics SWFs

| | N | Mean | St.Dev. | Median | Max | Min |
|---|---|---|---|---|---|---|
| Norges Bank Investment Management Holding as a percentage of the Total SWFs hold | 75063 | 0.80 | 0.36 | 0.99 | 1.00 | 0.00 |

**TABLE V**
**Matrix of correlations**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) SWF % Ownership | 1.000 | | | | | | | | | | | | |
| (2) SWF 1% Ownership indicator | 0.558 | 1.000 | | | | | | | | | | | |
| (3) SWF 5% Ownership indicator | 0.827 | 0.259 | 1.000 | | | | | | | | | | |
| (4) ESG | 0.058 | 0.078 | 0.033 | 1.000 | | | | | | | | | |
| (5) log market value | -0.069 | -0.054 | -0.047 | 0.182 | 1.000 | | | | | | | | |
| (6) Sales Growth | -0.001 | 0.005 | -0.002 | -0.011 | -0.015 | 1.000 | | | | | | | |
| (7) Leverage | -0.002 | 0.013 | -0.012 | 0.035 | 0.008 | -0.005 | 1.000 | | | | | | |
| (8) Intangible Assets Ratio | 0.040 | 0.093 | -0.014 | 0.055 | 0.087 | -0.009 | 0.146 | 1.000 | | | | | |
| (9) Dum Crisis | -0.028 | -0.005 | -0.034 | -0.022 | -0.005 | -0.003 | -0.005 | 0.005 | 1.000 | | | | |
| (10) Dividend Yield | 0.070 | 0.075 | 0.044 | 0.095 | -0.029 | -0.010 | 0.079 | 0.095 | 0.123 | 1.000 | | | |
| (11) Cash Assets Ratio | -0.075 | -0.093 | -0.043 | -0.116 | 0.069 | 0.014 | -0.120 | -0.096 | -0.062 | -0.117 | 1.000 | | |
| (12) Market to Book ratio | 0.014 | 0.010 | -0.003 | -0.010 | 0.174 | 0.001 | 0.141 | 0.055 | -0.028 | -0.093 | 0.141 | 1.000 | |
| (13) ROA | 0.049 | 0.043 | 0.027 | -0.002 | 0.210 | 0.017 | -0.192 | -0.001 | 0.052 | 0.113 | 0.054 | 0.324 | 1.000 |

From the correlation matrix I note that the ESG score correlates positively with all the three variables of SWFs Ownership. Such variables moreover correlates negatively with the log market value, with the Dum crisis and with the Cash Asset ratio. This may indicate that SWFs have lower exposure toward large firms, disinvest during period of crisis and tend to have smaller shares of ownership in firms with high Cash Assets ratio. The negative covariance with the crisis indicator variable is not expected since previous literature have shown that SWFs tend to invest more in crisis periods because shares are cheaper (Ciarlone and Miceli(2016)). SWFs Ownership variables instead, correlates positively with Intangible Assets Ratio, Dividend Yield and ROA. This instead lead us to suspect that SWFs tend to invest more in knowledge based firms, in well established firms with high dividends and in profitable firms. Moreover, we observe that ROA have a negative correlation with Leverage, this means firms prefer to reinvest first their own cash before accessing the debt market. This is consistent with the Pecking Order theory. ROA correlates positively with log market value thus evidencing that larger firm in the dataset are also the more profitable. Intangible Assets ratio correlates positively with Leverage meaning that knowledge based firms are also the most leveraged.

# 9. Methodology

## 9.1 Logit Model on firms already targeted by SWFs

The econometric estimator that I propose to test the first hypothesis is a maximum likelihood estimator, the density function used is the logit function, therefore, the estimator is a logit regression. I propose this estimator because it is a very intuitive and common model in the existing literature. Moreover, it allows ESG score to have a non-linear effect on the investment decisions of SWFs and I do not need to worry about predicting negative value for the ownership percentage. The logit model will have as dependent variable a SWFs ownership indicator variable and, as major independent variable, firms' CSR performances. To obtain a feasible dependent variable for my logit model I create a new variable which is equal to 1 if SWFs own 1% or more of the firm share and equal to 0 otherwise. This is done in order to discern whether the SWFs ownership in the firm is consistent and relevant or not. With 1 percent or more of SWFs ownership, I can argue that the firm has attracted the attention and consistent investment from SWFs and therefore it is appropriate to consider such firm as a SWFs target. The control group of my analysis will be therefore the observation for which the SWFs ownership does not reach the threshold of 1% share exogenously imposed by me. I chose the threshold of 1% of ownership share because of the characteristics of the SWFs ownership variable, as shown in the descriptive statistics below SWFs ownership of firms have a median of 0.76%. Choosing a threshold close to the median but above it allows me to create a meaningful control group which is large enough to be effective and leave the median level of investment of SWFs inside the control group while identifies a treated group composed by observation above the median and therefore composed by firms which have obtained a relatively large amount of investment.

**TABLE VI**

**Summary statistics on SWF % variable**

| | N | Mean | St.Dev | Median | min | max |
|---|---|---|---|---|---|---|
| SWF % Ownership | 75063 | 1.356 | 2.083 | .76 | .001 | 13.877 |

It can appear more suitable to use as a control group, i.e. firms which are not treated, firms which have not received investment at all from SWFs. However, the

methodology of analyzing directly the portfolio of SWFs allows me to avoid to build a meaningful control group of firms that have not received any investment from SWFs. Since the literature has shown that the determinants of SWFs are various and they depend on very specific SWFs objectives such as state planner objectives (Dick and Morse (2011)) or steal know-how objectives (Martin (2010)) and it is not possible for me to control for such variables that needs to be present in a regression in which the control group is composed by firms that do not have received any investment. Considering this I chose the approach of analyzing an already formed portfolio of firms targeted by SWFs because I do not need to collect such data and I do not need to use a propensity score technique to match the observation of the control group with the observation of the treated group. The focus of this thesis is, therefore, to study if SWFs invest more in high CSR firms given a set of firms in which SWFs are interested. After collecting data on the firms that are already been targeted by SWFs I will analyze how firm characteristics, and especially ESG score, correlate with different definitions of SWFs ownership.

An alternative approach to test the relation between CSR score and SWFs investment decision would be to regress the CSR score of firms against bias in the investment decisions of SWFs. The bias, as described in paragraph 2.3, can be obtained by subtracting to the benchmark weights the actual weights of the SWFs portfolio. Then it would be necessary to regress such bias on the CSR score and finally to observe the coefficient on CSR score in order to check if it is positive and significant. This however is unfeasible because many SWFs decide not to disclose all their holdings and even if SWFs disclose all their holding it would be still difficult to obtain a benchmark neutral with respect to CSR. It is not possible to obtain such weights using the market capitalization because we do not know if CSR score influence the market capitalization of firms and it is not possible to use mutual fund weights because I could not know if they pursue a CSR investing strategy or not.

One more different approach, already partially discussed above, to test the hypothesis would be to use a control group which is composed by firms who have not received investments by SWFs instead of using firms which are already being targeted by SWFs, as done in this research. This could be a possible way to handle the research question but still there would be two main issue. The first is that to select a meaningful

control group should be used a propensity score technique to match each observation of the treated group with one observation of the control group in terms of likelihood of receiving investment from SWFs. Such likelihood would be constructed using a maximum likelihood logit model using explanatory variables different from the ESG score and then, after the matching between the control group and treated group, it would be necessary to add the ESG score in the logit model and check the significance of its coefficient using the new matched sample. Alternatively I could run a particular linear regression, with dependent variable the logit-transformed percentage of SWFs ownership in a firm and with explanatory variables the drivers of SWFs investment and the transformed ESG score, in which, in order to compute the coefficients on the explanatory variable, I minimize the weighted sum of squared errors using as weigh the inverse of the probability of being targeted for treated observation and the inverse of one minus the probability of being targeted for control observation using the technique suggested by the literature (Freedman and Berk (2008)). If one of the propensity score matching proposed above is not implemented some hardwired difference among the control and the treated groups that covariate with the ESG score would make the coefficient on the ESG score to suffer of endogeneity. However, I would have to add to the maximum likelihood logit model control for investment drivers that makes the SWFs invest in a firm in the first place, which are difficult to observe and consequently difficult to insert in the logit regression which aim to create a propensity score for the firms in the sample. Indeed, when checking for the probability of receiving a SWFs investment one needs to control for drivers such as: the home bias, the emerging industry tilt, the state planner objectives, the hidden agenda objectives and many other drivers that may influence SWFs to invest in a firm rather than in another. Analyzing instead an already formed portfolio of SWFs investment I can narrow the control variables to the firm's balance sheet characteristics because such firms have already been chosen by SWFs and I can therefore shift the focus to what characteristics make SWFs invest more in a firm.

To avoid that my exogenously imposed thresholds drive the results I will run a linear regression of transformed variables using an inverse logit transformation to move the variables of interest (SWFs Ownership and ESG score) from their bounded field of existence to R. I will use in such set of regression the same control variables used in the

specification above and I will gradually add fixed effect to check if one of them may cause a loss of significance of the ESG coefficient.

### 9.2 Choosing relevant control variable

To decide which variables are most relevant to control for when testing SWFs investment decisions I use the published literature as a guide. In the published literature a logit regression about SWFs investment decisions is not uncommon and among such papers there is a paper from Gangi, Meles, Mustilli, Graziano, Varrone (2018) in which they use a logit regression to test hypotheses about SWFs investment behavior. In such logit regressions are included as control variable data on firms assets, ESG, sales growth, leverage, intangible assets ratio, dividend yield, cash assets ratio and foreign sales ratio; they also included indicator variables that state if the firm belong to an emerging industry and if the observation refers to a period of crisis. To obtain such variables is enough to manage the existing data set that I have at my disposal. In particular, to generate the crisis indicator variable is enough to generate in STATA an indicator variable using the date variable as a discriminator variable. To produce the intangible asset ratio variable, which is simply the percentage of total asset which are intangible, is enough to make a simple mathematical operation in stata: Intangible Assets/Total Asset. For what concerns the foreign sale assets ratio and the emerging industry indicator variable nothing can be done therefore I will not add them in the regressions. I also will add as control variables that are not included in the paper from Gangi, Meles, Mustilli, Graziano, Varrone (2018), the log of the market capitalization of firms, the Return on Asset of firms as well as their Market to book ratio. I decided to add the market capitalization because can explain what percentage of share can be bought with a given amount of money; in other words the bigger the market capitalization the more improbable is to observe stake ownership equal or bigger than 1% therefore it can result to be a significative explanatory variable. I decided to add the Market to Book Ratio to control for a possible value investing strategy of SWFs and, finally, I added the ROA to control for the SWFs appetite for profitable firms.

### 9.3 Theoretical justification of control variables

Theoretically one can argue that firms with high leverage and high sales growth as well as high dividend yield are more attractive from a SWF perspective because of different motivations. For instance firms with high leverage may have good operating

performance but may face financial constraints and therefore are cheap and this represents a good deal for liquid SWFs; firms with high Sales Growth show good growth potential and therefore are more attractive in a long term investment strategy, which is the investment horizon of SWFs; firms which prove to have good long-run operational perspectives for what concerns firms that pay high dividends. Indeed in the financial industry is commonly accepted that dividend cut is a signal of very poor operating performance of the firm that cut them: strong negative market reactions follow when firms decrease the dividend paid to shareholders. Therefore managers tend not to increase dividends if they are not reasonably confident to be able to pay them in the long run. For what concerns the Intangible Asset Ratio, SWFs may be led to invest in firms with high Intangible Asset Ratio because they are attracted by the knowledge capital of the firm that they may want to discover and transfer to firms in their home country or because the SWFs believe in the profit potential of knowledge based firms. Indeed all the coefficients of these four variables are statistically significant in the regression of Gangi, Meles, Mustilli, Graziano, Varrone (2018). The variable that control for the log of market capitalization is added for two obvious consideration, the first is that the larger the market capitalization the harder is to reach the 1% threshold to be signaled, in our analysis, as a significant investment from SWFs, the second is that SWFs may be attracted by highly capitalized firm. Therefore I will add the log of the market value variable to control for these effects. Finally the variable on the Market to Book ratio is used to control for a possible value or growth investing strategy from SWFs.

### 9.4 Additional control variable

From the literature review I also acknowledged that determinants of SWFs investment are firm's country characteristics (Candelon, Si, Arezki (2011)), for instance, countries with better developed financial market and legal protection attract more SWFs investment. Therefore it is appropriate to control also for the firm's country characteristics. Even if in the dataset such information are not present, there is information about the countries to which the firms belong to. Therefore adding country fixed effects should be a good enough substitute to control for such drivers of SWFs investment decisions. Another determinant of SWFs investment behavior is the firm sector (Dick and Morse (2011)) which is an information contained in the dataset. Therefore in the regressions framework I will also control for sector fixed effects. Finally

I will control also for time fixed effect to uncover time-trend in the data that may lead to spurious correlations.

Controlling for all these variables I assure that the coefficient on the ESG does not suffer from endogeneity. Therefore the following regression will allow us to check if high CSR performances attract a higher level SWFs investments.

### 9.5 The complete model and different specification of it

The model below is the complete model which will be used to test for the research question.

$$\text{P(SWFs 1\% Ownership=1)} = a + \beta_1\, ESG_{i,t} + \beta_2\, log\ log\ market\ value_{\ i,t} + \beta_3\, SalesGrowth_{i,t} + \beta_4\, Leverage_{i,t} + \beta_5\, Crisis\ Indicator + \beta_6\, ROA_{i,t} + \beta_7 IntangibleAssetRatio_{i,t} + \beta_8\, DividendYield_{i,t} + \beta_9 CashAssetRRatio_{i,t} + \beta_{10} MarkettobookRatio_{i,t} + \varepsilon$$

In the following lines I will present different specification of the complete model written above. In all the specifications there will be ESG as independent variable to check whether some variable or some combination of them is able to capture significance from the ESG variable which is the focus of this study and transfer it to itself. The first specification includes, as control variables, Sales Growth, Leverage, Crisis indicator variable and the log Market Value. The second specification adds to the previous explanatory variable the Intangible Asset Ratio and Dividend Yield. The third specification includes all firm characteristics with the exception of the cash asset ratio. The fourth specification includes all the firm characteristics. The remaining specifications gradually add fixed effects, first are added Sector fixed effects, then also Country fixed effects and lastly Year fixed effects to control for time trends.

For the same specifications I will also run a second set of regression in which the dependent variable is a dummy that specify if the firm is owned by more than 5% by SWFs and see if this different threshold changes the results. This will allow me to check if ESG score increases the probability of observing SWFs % ownership above the 5% threshold.

And, if this is the case, enhance the strength of the hypothesis that ESG may drive the investment decisions of SWFs.

### 9.6 Linear regression model with transformed variable

To test the same hypothesis I use also a set of specifications in which I run a linear regression of transformed variables. Specifically using an inverse-logit transformation of the variable SWFs Ownership in firms and of the variable ESG. Specifically I move such variables form their bounded field of existence to $R$. To perform the inverse logit transformation first it is needed to normalize the bounded variables between 1 and 0. In this thesis case is enough to divide the SWF Ownership stake and the ESG score by 100. Then to move them into the unbounded field of $R$ the inverse logit transformation need to be performed. To reassume in one formula, in order to obtain feasible variables to be used in the linear regression the following transformation need to be performed:

$$ESG_{transformed} = Log\left(\frac{\frac{ESG}{100}}{1-\frac{ESG}{100}}\right)$$

similarly for SWF Ownership variable.

This way I can run a linear regression with these two variables without worrying about predicting negative value for the SWFs ownership because it will still be in their field of existence, when transformed. Most importantly this regression will allow me to check the robustness of the CSR investing behavior-SWFs relation without relying on the possible-endogenous threshold of the 1% ownership used in the logit regressions. Moreover I will not need to rearrange the coefficient after the transformation because I am just interested in the significance and in the sign of the coefficient and these features are not affected by the transformation.

$$SWFs\ \%\ Ownership\ transformed_{\ i,t} = a + \beta_1\ ESG\ transformed_{i,t} +$$
$$\beta_2\ log\ log\ market\ value_{\ i,t} + \beta_3\ SalesGrowth_{i,t} + \beta_4\ Leverage_{i,t} +$$
$$\beta_5\ Crisis\ Indicator + \beta_6\ ROA_{i,t} + \beta_7 IntangibleAssetRatio_{i,t} + \beta_8\ DividendYield_{i,t} +$$
$$\beta_9 CashAssetRRatio_{i,t} + \beta_{10} MarkettobookRatio_{i,t} + \varepsilon$$

### 9.7 Linear regression for the engagement hypothesis

A second step is to check if SWFs actively engage the firm by increasing its CSR score. This can be done in a linear regression analysis framework in which the change in

CSR performance is regressed against a same period and a lagged variable which state the percentage of firm shares owned by SWFs. I use the change is ESG score to discriminate between CSR investing behavior and the promotion of CSR in the firms SWFs have already invested in. In this regression the control variables that should be used are different from the ones used before except for the Country, Sector and year fixed effects. These fixed effects should still be used because of different reason. For the Country fixed effects different Country-level regulation may affect firm behavior and therefore ESG score. For the Sector fixed effect different type of industrial operations may lead endogenously to different CSR score. For the year fixed effect there may be a move toward higher CSR as attention towards environmental and social issues increases among manager and stakeholders. Moreover the literature has shown that CSR score is not caused by financial performance and tied instead to unobservable firm characteristics (Neilling and Webb(2009)) therefore I will not add any firms financial performance in this regression. I rather use as a control, in the regression that aim to determine the determinants of the changes in CSR score, the lagged changes in CSR plus the explanatory variables of interest which are the same period and the lagged period variables which state the percentage of the firm share owned by SWFs. I decided to use the percentage ownership instead of a dummy variable because the size of the Ownership is important in determining the power of the owner on the decisions of the management, in other words if the hypothesis of SWFs promoting CSR in firms they invest is true, a larger share ownership should lead to a greater changes in ESG score. I use as other independent variable the lagged changes in ESG score following the Granger causality test. The methodology requires that first I run a regression of the change in ESG score against its lagged values in order to check until which lag they are significant. I discover that they are significant until the seventh lag, however I will add only the first lag in the model and check if the coefficient on the variable of interest (SWF % Ownership) is significant., if it is I will proceed and add more lags otherwise I will stop and use the results.

$$\Delta ESGscore_{i,t} = \beta_1 \Delta ESGscore_{i,t-1} + \cdots + \beta_n \Delta ESGscore_{i,t-n} + \varepsilon_i$$

Then I implement the complete model that comprises these lagged values of the dependent variable and the variables of interest that are the SWFs ownership percentage of firms shares, one of the same period and one lagged. In this model I will cluster error

variance at a firm level because the change of ESG score of the same firm are probably correlated across observation and therefore also the error of this specification may be correlated across firms.

$$\Delta ESGscore_{i,t} = a + \beta_1 \Delta . ESGscore_{i,t-1} + \beta_2 SWFstake.ownership_{i,t} + \beta_3 SWFs\ stake.ownership_{i,t-1} + \varepsilon$$

*(with cluster error variance at firm level)*

# 10. Results

## *10.1 Results of the first set of specifications*

The results of the first model are presented in this paragraph and in TABLE VII. The ESG coefficient is positive and statistically significant in all specifications, even in the last model (Model 7) where I control for year, Sector and Country fixed effect. For the other coefficients, we note that, in the first specification, the coefficient on Sales Growth is negative and statistically significant. This is contrary to what the previous literature has shown, indeed the literature provide evidence that SWFs target firms with high sales growth because of their long run growth potential but this theory is not supported by this thesis results. On the contrary, the coefficients of Intangible Asset Ratio and Dividend Yield are positive and significant in all the specifications; these results are consistent with the previous literature. This study confirms that SWFs invest in knowledge based and high dividend yield established firms. The coefficients on Cash Asset Ratio is negative and significant in all the specification but in the last one where it is just negative. This indicates that the year fixed effect, present in the last specification, capture the explanatory power of Cash Asset Ratio, in other words, there was a time trend followed both by SWFs investment decisions and by the Cash Asset Ratio of firms, from this a spurious relationship emerged in the first models. Consciously I controlled for time fixed effects and

the spurious covariance was revealed. The coefficients on ROA is significant in all specification indicating that SWFs invest in more profitable firms. The crisis indicator coefficient is never significant. The Market to Book coefficient is significant in the third and in the last two specifications, in these last two specification it is also negative which means that SWFs prefer to invest in Value firms, i.e. firms with lower valuation with respect to firms with the same book value. This is consistent with the previous literature results that showed that SWFs prefer to invest in countries that are experiencing financial turmoil and therefore whose firms are cheaper and less valued by the market. The log market value is negative and significant in the first specifications and then turn positive and significant as well in the last two. The reasons for this behavior are difficult to explain. In the first specification, the negative coefficient is reasonable: the larger the market capitalization the more difficult become to acquire more than 1% of the firm shares. Then when controlling for the Country, Year and Sector fixed effects the coefficient on the log Market Value turn positive. The most obvious explanation for this result taken alone is that high market capitalized firms attract SWFs. For the change in sign, I can conjecture that the negative sign was the result of an omitted variable bias determined by the fact that there is a negative correlation between the log market value variable and some of the country and/or sector indicator variables which are relevant for the regression and have a positive coefficient. This two condition are sufficient to generate a negative omitted variable bias. Until I added the country and sector fixed effects such conditions biased the coefficient on log market value making it negative when instead it is positive. Indeed when I add countries and sector fixed effects the coefficient on log market value changes sign and become positive. In the last three models (Model 5, 6 and 7) Sales Growth, Leverage and Cash Assets Ratio lose progressively their significance. I specify again that Model 5 includes Sector fixed effects, Model 6 includes Sector and Country fixed effects and Model 7 includes Sector, Country and year fixed effects. It must have happened that such fixed effects explained the variation in SWFs ownership much better than Sales growth, Cash asset Ratio and Leverage. The crisis indicator variable is never significant.

**TABLE VII**

Models of SWFs investment behavior

In this table are presented the results of the first set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. SWF 1% Ownership indicator is a indicator variable that is equal to one if the firm *i* is owned at least by 1% by SWFs and equal to zero otherwise. ESG is the score of corporate social responsibility of firm *i*. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | SWFs 1% Ownership indicator | SWFs 1% Ownership indicator | SWFs 1% Ownership indicator | SWFs 1% Ownership indicator |
| ESG | 0.0142*** | 0.0125*** | 0.0124*** | 0.0113*** |
| | (19.90) | (15.61) | (15.37) | (13.95) |
| Log Market Value | -0.0300** | -0.0322** | -0.0281** | -0.0203 |
| | (-3.20) | (-3.12) | (-2.68) | (-1.92) |
| Sales Growth | -0.00196*** | -0.00236*** | -0.00226*** | -0.00178*** |
| | (-4.76) | (-4.99) | (-4.69) | (-3.57) |
| Leverage | 0.000610*** | 0.000131 | 0.000196 | -0.0000468 |
| | (5.22) | (0.87) | (1.25) | (-0.29) |
| Crisis Indicator | 0.0417 | 0.0153 | 0.0157 | -0.0186 |
| | (1.09) | (0.36) | (0.36) | (-0.43) |
| ROA | 0.0168*** | 0.0159*** | 0.0169*** | 0.0165*** |
| | (11.78) | (10.23) | (9.87) | (9.14) |
| Intangible Asset Ratio | | 0.00408*** | 0.00422*** | 0.00382*** |
| | | (12.08) | (12.42) | (11.17) |
| Dividend Yield | | 0.0426*** | 0.0415*** | 0.0364*** |
| | | (7.50) | (7.13) | (6.16) |
| Market-to-Book ratio | | | -0.0111* | -0.00408 |
| | | | (-2.46) | (-0.89) |
| Cash Assets Ratio | | | | -0.00821*** |
| | | | | (-13.73) |
| Constant | -1.413*** | -1.516*** | -1.519*** | -1.227*** |
| | (-18.24) | (-17.45) | (-17.28) | (-13.49) |
| Observations | 36030 | 29302 | 28812 | 28809 |
| *Pseudo* $R^2$ | 0.0127 | 0.0183 | 0.0186 | 0.0239 |
| Sector Fixed Effects | NO | NO | NO | NO |
| Country Fixed Effects | NO | NO | NO | NO |
| Year Fixed Effects | NO | NO | NO | NO |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

**TABLE VIII**

Models of SWFs investment behavior

In this table are presented the results of the first set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. SWF 1% Ownership indicator is a indicator variable that is equal to one if the firm *i* is owned at least by 1% by SWFs and equal to zero otherwise. ESG is the score of corporate social responsibility of firm *i*. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 5 | Model 6 | Model 7 |
|---|---|---|---|
| | SWFs 1% Ownership indicator | SWFs 1% Ownership indicator | SWFs 1% Ownership indicator |
| ESG | 0.0115*** | 0.00392*** | 0.00432*** |
| | (14.03) | (4.22) | (4.60) |
| Log Market Value | -0.0125 | 0.0557*** | 0.0511*** |
| | (-1.12) | (4.41) | (4.00) |
| Sales Growth | -0.00143** | -0.000457 | -0.000468 |
| | (-2.82) | (-0.87) | (-0.89) |
| Leverage | 0.000229 | 0.000441* | 0.000416* |
| | (1.32) | (2.38) | (2.24) |
| Intangible Asset Ratio | 0.00499*** | 0.00238*** | 0.00263*** |
| | (13.05) | (4.83) | (5.29) |
| Dividend Yield | 0.0602*** | 0.0224** | 0.0262*** |
| | (9.67) | (3.02) | (3.46) |
| Cash Assets Ratio | -0.00719*** | -0.00139 | -0.00115 |
| | (-10.96) | (-1.89) | (-1.55) |
| Market-to-Book ratio | -0.00603 | -0.0197*** | -0.0194*** |
| | (-1.24) | (-3.44) | (-3.37) |
| Crisis Indicator | -0.00712 | -0.0319 | -0.189 |
| | (-0.16) | (-0.68) | (-1.74) |
| ROA | 0.0161*** | 0.0109*** | 0.0103*** |
| | (8.81) | (5.42) | (5.10) |
| Constant | -2.343*** | -3.649*** | -3.545*** |
| | (-20.33) | (-26.39) | (-21.75) |
| Observations | 28809 | 28684 | 28684 |
| $R^2$ | 0.0381 | 0.1475 | 0.1481 |
| Sector Fixed Effects | YES | YES | YES |
| Country Fixed Effects | NO | YES | YES |
| Year Fixed Effects | NO | NO | YES |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

For what concern firm characteristics, I can therefore deduce that SWFs invest in large, well established, knowledge based and profitable firms with high dividend yield and low Market to Book ratio. From the results on the ESG coefficient we can also conclude that ESG are indeed a driver of SWFs investment. This can be easily justified by using the same motivation proposed as hypotheses in the methodology section. Namely SWFs may invest in CSR as a form of risk mitigation, as a form of self-promotion of their public image and as a result of state welfare objectives (when firm belong to the SWF home country).

The results of the models in which the dependent variable states if the firms are owned by SWFs by at least 5% of shares are presented in TABLE VIII. The results of these models reported in the tables below partly confirms the results of the previous models. Namely the ESG coefficient is still significant in all the specifications but the last two, in which country and year fixed effects are added. This results may be a signal that the previous results are driven by the exogenously imposed 1% of shares ownership threshold. Therefore I will transform the variables of ESG and SWF ownership in order to be able to conduct a different type of analysis using a linear model that will reveal which threshold is more appropriate. For now I acknowledge that ESG is not able to increase the probability of observing SWFs ownership equal or above the 5% level in the model in which Country fixed effect are added.

**Table IX**

Models of SWFs investment behavior

In this table are presented the results of the first set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. SWF 5% Ownership indicator is a indicator variable that is equal to one if the firm *i* is owned at least by 5% by SWFs and equal to zero otherwise. ESG is the score of corporate social responsibility of firm *i*. Log Market Value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 8 | Model 9 | Model 10 |
|---|---|---|---|
| | SWFs 5% Ownership indicator | SWFs 5% Ownership indicator | SWFs 5% Ownership indicator |
| ESG | 0.0192*** | 0.0160*** | 0.0140*** |
| | (10.37) | (7.29) | (6.43) |
| Log Market Value | -0.171*** | -0.170*** | -0.152*** |
| | (-6.49) | (-5.42) | (-4.75) |
| Sales Growth | 0.000988 | 0.000192 | 0.000997 |
| | (1.19) | (0.21) | (1.02) |
| Leverage | 0.000149 | -0.000462 | -0.000638 |
| | (0.51) | (-1.19) | (-1.46) |
| Crisis Indicator | -0.683*** | -0.843*** | -0.890*** |
| | (-5.41) | (-5.51) | (-5.79) |
| ROA | 0.0263*** | 0.0228*** | 0.0265*** |
| | (7.26) | (5.64) | (4.90) |
| Intangible Asset Ratio | | -0.00238** | -0.00291** |
| | | (-2.66) | (-3.21) |
| Dividend Yield | | 0.0891*** | 0.0820*** |
| | | (7.43) | (6.47) |
| Cash Assets Ratio | | | -0.0117*** |
| | | | (-7.79) |
| Market-to-Book ratio | | | -0.0104 |
| | | | (-0.82) |
| Constant | -3.025*** | -3.042*** | -2.653*** |
| | (-14.78) | (-12.20) | (-10.01) |
| Observations | 36030 | 29302 | 28809 |
| *Pseudo* $R^2$ | 0.0199 | 0.0240 | 0.0300 |
| Sector Fixed | NO | NO | NO |
| Country Fixed Effects | NO | NO | NO |
| Year Fixed Effects | NO | NO | NO |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

**TABLE X**

Models of SWFs investment behavior

In this table are presented the results of the first set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. SWF 5% Ownership indicator is a indicator variable that is equal to one if the firm *i* is owned at least by 5% by SWFs and equal to zero otherwise. ESG is the score of corporate social responsibility of firm *i*. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 11 | Model 12 | Model 13 |
|---|---|---|---|
| | SWFs 5% Ownership indicator | SWFs 5% Ownership indicator | SWFs 5% Ownership indicator |
| ESG | 0.0142*** | 0.00441 | 0.00430 |
| | (6.45) | (1.54) | (1.48) |
| Log Market Value | -0.156*** | 0.241*** | 0.245*** |
| | (-4.50) | (6.42) | (6.48) |
| Sales Growth | 0.00131 | 0.0000774 | 0.000489 |
| | (1.32) | (0.04) | (0.29) |
| Leverage | -0.000810 | 0.000540 | 0.000533 |
| | (-1.71) | (0.99) | (0.98) |
| Intangible Asset Ratio | -0.00260* | 0.000474 | 0.000357 |
| | (-2.55) | (0.32) | (0.24) |
| Dividend Yield | 0.0896*** | 0.00923 | 0.00276 |
| | (6.30) | (0.41) | (0.12) |
| Cash Assets Ratio | -0.00968*** | -0.00179 | -0.00202 |
| | (-5.78) | (-0.79) | (-0.88) |
| Market-to-Book ratio | -0.00546 | -0.0628** | -0.0623** |
| | (-0.40) | (-3.23) | (-3.20) |
| Crisis Indicator | -0.853*** | -0.160 | -0.537 |
| | (-5.50) | (-0.98) | (-1.63) |
| ROA | 0.0241*** | -0.0110 | -0.0101 |
| | (4.39) | (-1.57) | (-1.42) |
| Constant | -4.404*** | -9.299*** | -8.815*** |
| | (-10.48) | (-17.74) | (-15.30) |
| Observations | 28809 | 27147 | 27147 |
| *Pseudo* $R^2$ | 0.0677 | 0.3668 | 0.3685 |
| Sector Fixed Effects | YES | YES | YES |
| Country Fixed Effects | NO | YES | YES |
| Year Fixed Effects | NO | NO | YES |

*t* statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

### 10.3 Results of the linear model with transformed variables

The result of the linear model with transformed variables confirms the results of the first set of models in which the threshold to distinguish between control and treated group was 1%, the results are presented in TABLE XI and TABLE XII. The coefficient on the ESG score in this linear regression with the transformed variables is significant at the 0.1% level in all the different specifications, also the ones that include fixed effects. This indicates that the exogenously imposed threshold of 1% ownership of firms share used to determine the control and the treated group did not influenced the results of the first set of regressions.

**TABLE XI**

Models of SWFs investment behavior

In this table are presented the results of the second set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. SWF Ownership transformed is a variable whose field of existence is R, it is obtained using the inverse-logit transformation of the percentage of shares owned by SWFs . ESG transformed is the score of corporate social responsibility of firm *i* transformed using a inverse-logit transformation in order to move its field of existence to R. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 14 | Model 15 | Model 16 |
|---|---|---|---|
| | SWFs % Ownership transformed | SWFs % Ownership transformed | SWFs % Ownership transformed |
| ESG transformed | 0.177*** | 0.145*** | 0.136*** |
| | (14.99) | (11.13) | (10.29) |
| Log Market Value | -0.0565*** | -0.0686*** | -0.0664*** |
| | (-7.73) | (-8.37) | (-8.06) |
| Sales Growth | 0.000353 | 0.0000124 | 0.0000403 |
| | (1.05) | (0.03) | (0.10) |
| Leverage | 0.000408*** | 0.0000834 | -0.000104 |
| | (4.66) | (0.74) | (-0.87) |
| Crisis Indicator | -0.0685* | -0.0615* | -0.0709* |
| | (-2.52) | (-2.04) | (-2.32) |
| ROA | 0.0106*** | 0.0105*** | 0.00857*** |
| | (8.58) | (7.87) | (5.98) |
| Intangible Asset Ratio | | 0.00347*** | 0.00340*** |
| | | (13.82) | (13.44) |
| Dividend Yield | | 0.00732 | 0.00769 |
| | | (1.45) | (1.49) |
| Cash Assets Ratio | | | -0.00290*** |
| | | | (-6.57) |
| Market-to-Book ratio | | | 0.0133*** |
| | | | (3.79) |
| Constant | -4.719*** | -4.742*** | -4.667*** |
| | (-76.26) | (-67.53) | (-66.15) |
| Observations | 29494 | 23943 | 23567 |
| $R^2$ | 0.011 | 0.018 | 0.020 |
| Sector Fixed Effects | NO | NO | NO |
| Country Fixed Effects | NO | NO | NO |
| Year Fixed Effects | NO | NO | NO |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

**TABLE XII**

Models of SWFs investment behavior

In this table are presented the results of the second set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. SWF Ownership transformed is a variable whose field of existence is R, it is obtained using the inverse-logit transformation of the percentage of shares owned by SWFs . ESG transformed is the score of corporate social responsibility of firm *i* transformed using a inverse logit transformation in order to move its field of existence to R. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 17 | Model 18 | Model 19 |
|---|---|---|---|
| | SWFs % Ownership transformed | SWFs % Ownership transformed | SWFs % Ownership transformed |
| ESG transformed | 0.140*** | 0.0493*** | 0.0490*** |
| | (10.54) | (3.95) | (3.90) |
| Log Market Value | -0.0558*** | 0.0163* | 0.0175* |
| | (-6.67) | (2.11) | (2.25) |
| Sales Growth | 0.000179 | 0.000192 | 0.000271 |
| | (0.45) | (0.51) | (0.71) |
| Leverage | 0.0000781 | 0.000185 | 0.000180 |
| | (0.61) | (1.57) | (1.53) |
| Intangible Asset Ratio | 0.00409*** | 0.00144*** | 0.00144*** |
| | (14.45) | (4.75) | (4.71) |
| Dividend Yield | 0.0219*** | -0.0150** | -0.0158** |
| | (4.21) | (-3.01) | (-3.08) |
| Cash Assets Ratio | -0.00215*** | 0.000624 | 0.000577 |
| | (-4.53) | (1.38) | (1.27) |
| Market-to-Book ratio | 0.0114** | -0.00411 | -0.00377 |
| | (3.16) | (-1.23) | (-1.13) |
| Crisis Indicator | -0.0599* | -0.0220 | -0.0167 |
| | (-1.99) | (-0.79) | (-0.27) |
| ROA | 0.00825*** | 0.00441** | 0.00454*** |
| | (5.80) | (3.29) | (3.36) |
| Constant | -5.491*** | -6.103*** | -6.096*** |
| | (-65.29) | (-77.82) | (-66.59) |
| Observations | 23567 | 23567 | 23567 |
| $R^2$ | 0.039 | 0.228 | 0.228 |
| Sector Fixed Effects | YES | YES | YES |
| Country Fixed Effects | NO | YES | YES |
| Year Fixed Effects | NO | NO | YES |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

### 10.2 Results of the linear model for the engagement hypothesis

The results of the linear model, that aim to test the hypothesis that SWFs actively engage firms in order to increase their CSR score, presented in TABLE XIII, show that there is no relation between the SWFs ownership stake and subsequent changes in CSR scores. Thus, this result indicates that SWFs do not actively engage with firms to increase their CSR score. Indeed the coefficients on both the contemporaneous and lagged SWFs ownership variable are positive but not significant in such regression. Such result is supported by the fact that there is no evidence in the literature that SWFs active engage firms and is also supported by the existing literature, namely Rose (2008), which sustain that SWFs prefer a passive approach to avoid political backlash. Indeed investigation and concerns may be prompted by the acquisition of a control block of shares of a firm by a SWF. It would be seen suspiciously because it is owned by a foreign government, consequently SFWs are un-incentivized to actively invest, especially in strategic industries. Thus, the SWFs active investment theory seems to be obsolete as well as opposed by politicians in the country of the target, this makes it very unlikely for SWFs to be effective and systematic in executing an active investment strategy. Such theoretical conjecture is supported by this thesis' results.

**TABLE XIII**

Model of SWFs active engagement in CSR

In this table is presented the results of the model of SWFs active engagement in CSR. The dependent variable is Delta ESG which the absolute changes in ESG score of firm *i* in a year. The independent variables are: the lagged by one period value of the variable Delta ESG; SWFs % Ownership which is the percentage of firms shares owned by SWFs; Lag1SWFs % Ownership which is the lagged by one period value of SWFs % Ownership.

| | Model 20 |
|---|---|
| | Δ ESG |
| Lag1 Δ ESG | -0.413*** |
| | (-56.68) |
| SWFs % Ownership | 0.0461 |
| | (0.82) |
| Lag1SWFs % Ownership | -0.0121 |
| | (-0.23) |
| Constant | 1.050 |
| | (1.72) |
| Observations | 21379 |
| $R^2$ | 0.177 |
| Sector Fixed Effects | YES |
| Country Fixed Effects | YES |
| Year Fixed Effects | YES |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

# 11 Robustness check

Since in the previous analyses we used the SWFs Ownership indicator as a monolithic entity is appropriate now to test the robustness of the results taking into consideration different subset of the SWFs.

## 11.1 Excluding from the sample Norges Investment Bank

This thesis data set is dominated by the SWF named *Norges Bank Investment Management.* This particular SWF is an example of transparency and good governance practices. Descriptive statistics show that on average 80% of the SWFs ownership variable is addressable to *Norges Bank Investment Management.* The Robustness check of my results consist therefore to explore the results of the logit model without including the *Norges Investment Bank Management* in the data set. The results, presented in TABLE XIV are that the coefficient on the ESG score is still significant but at the 5% level in both Model 22 and Model 23, less significant than in the previous regressions, where it was significant at the 0.1% level. Therefore I can deduce that the CSR investing behavior is less significant without this important fund. In other words, the dominance of *Norges Investment Bank Management* influenced the results. In order to look deeper into the determinants of the results of the first set of specification (full sample), in the following paragraph I will divide the sample into four groups based on the level of transparency of the funds and check if the relation between SWFs ownership and firm CSR still holds.

**TABLE XIV**

Robustness check of Models of SWFs investment behavior

In this table are presented the results of the third set of specification that use a Logit regression to study the determinant of the investment behavior of SWFs. The dependent variable is SWF Ownership indicator restricted sample which is an indicator variable equal to 1 if the sum of the SWFs ownership of firms shares of the restricted sample is at least equal to 1% and equal to 0 otherwise . ESG is the score of corporate social responsibility of firm *i*. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 21 | Model 22 | Model 23 |
|---|---|---|---|
| | SWFs Ownership indicator restricted sample | SWFs Ownership indicator restricted sample | SWFs Ownership indicator restricted sample |
| ESG | 0.00982*** | 0.00388* | 0.00413* |
| | (6.75) | (2.17) | (2.29) |
| Log Market Value | -0.0300 | 0.305*** | 0.306*** |
| | (-1.55) | (12.86) | (12.77) |
| Sales Growth | 0.00187* | 0.00145 | 0.00144 |
| | (2.32) | (1.36) | (1.34) |
| Leverage | -0.000321 | 0.000570 | 0.000540 |
| | (-1.09) | (1.67) | (1.57) |
| Intangible Asset Ratio | -0.00308*** | 0.000828 | 0.00107 |
| | (-4.27) | (0.84) | (1.08) |
| Dividend Yield | 0.105*** | 0.0439** | 0.0419** |
| | (10.24) | (2.92) | (2.72) |
| Cash Assets Ratio | -0.00780*** | -0.00113 | -0.000931 |
| | (-6.60) | (-0.75) | (-0.61) |
| Market-to-Book ratio | 0.000730** | -0.000905*** | -0.000911*** |
| | (2.99) | (-3.37) | (-3.40) |
| Crisis Indicator | -0.344*** | 0.122 | 0.105 |
| | (-4.06) | (1.29) | (0.46) |
| ROA | 0.0110*** | -0.00317 | -0.00332 |
| | (5.93) | (-1.14) | (-1.18) |
| Constant | -4.447*** | -10.03*** | -9.961*** |
| | (-16.64) | (-26.26) | (-23.43) |
| Observations | 28809 | 27153 | 27153 |
| *Pseudo* $R^2$ | 0.0394 | 0.3161 | 0.3168 |
| Sector Fixed Effects | YES | YES | YES |
| Country Fixed Effects | NO | YES | YES |
| Year Fixed Effects | NO | NO | YES |

*t* statistics in parentheses

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

### 11.2 Dividing the sample using the transparency score as discriminator

In the following regressions I analyze if different level of transparency affect the CSR investing behavior. Indeed, the public opinion pressure theory and the self-promotion of SWFs reputation theory should apply more to more transparent SWFs. The transparency of SWFs can be used as a proxy for the reputational concern of SWFs. Therefore more transparent SWFs should be more attracted by high CSR firms because they have more to gain or to lose conducting respectively more responsible or less responsible investment decisions. To check if transparency can be a determinant factor in making SWFs pursuing a CSR investing strategy I divided my sample of SWFs in four groups based on their average score for the years 2007, 2009, 2012 and 2015 in the *Truman Transparency Index*, note that not for all the SWFs is available the score, the SWFs who do not possess the transparency score are not included in the analysis. The *Truman Transparency Index* is constructed as follows: to each SWFs are asked a "yes" or "no" questions, to each answer corresponds 1 or 0 points. Is assigned 1 point if the answer provided by SWFs means a higher level of Transparency, Governance quality and Structure soundness and 0 points are assigned if the answer instead means a lower level of Transparency, Governance quality and Structure soundness. The sum of such points is used to construct the scoreboard. Follows the list of SWFs with the respective average score on the *Truman Transparency Index* .

| Average transparency Score | SWFs |
|---|---|
| 97,25 | Norges Bank Investment Management |
| 56 | China Investment Corp. |
| 48,50 | Abu Dhabi Investment Authority |
| 63,75 | Kuwait Investment Authority |
| . | Saudi Arabian Monetary Agency |
| 66 | Hong Kong Monetary Authority |
| . | SAFE Investment Co. Ltd. |
| 56,75 | GIC Pte Ltd. |
| 69,50 | Temasek Holdings Pte Ldt. |
| 68,67 | National Council for Social Security Fund |
| 21 | Qatar Investment Authority |
| 0 | Public Investment Fund |
| . | Public Investment Corporation |
| 69 | Korea Investment Corporation |
| 84 | Future Fund Management Agency |
| 88 | Alaska Permanent Fund Corp. |
| 23,25 | Brunei Investment Agency |
| 73 | Texas Permanent School Fund |
| 54 | Khazanah Nasional Bhd. |
| 94 | Guardians of New Zealand Superannuation |
| . | State General Reserve Fund Oman |
| . | China Africa Development Fund Co., Ltd. |
| 77 | Palestine Investment Fund |
| 38,33 | State Capital Investment Corp. |

The groups of SWFs with different level of transparency are formed as follows: the first group is composed by SWFs with an average transparency score below the 25th percentile, the second is composed by SWFs with an average transparency score between the 25th and the median, the third is composed by SWFs with an average transparency score between the median and the 75th percentile and the fourth is composed by the remaining SWFs. Then I sum the ownership percentages of firms share within each group and I am ready to analyze separately these four group using the same technique as in the previous regressions. However, I change the threshold that identifies the control and the treated group accordingly with the specifics of the distributions of each of these groups which are discussed below. At this point I am ready to use such variables as dependent variables for four new logit regression. One for each group. These logit regression will comprehend all the control variable of the complete model with all the fixed effects. The outcome of such regression would determine if transparency score is a driver of SWFs

investment in firms with high CSR score. More specifically if the significance and magnitude of the coefficients on ESG score is increasing with the level of transparency of each group I can deduce that SWFs transparency is a positive driver of SWFs CSR investing behavior. If instead the results on the ESG coefficients are scattered and do not follow a clear path I could not deduce that transparency is a driver of SWFs CSR investing behavior.

In order to construct a meaningful and consistent dependent variable for these new logit regression I will study the distribution of ownership of these groups of funds and set a threshold to distinguish between the treated and the control group accordingly with the characteristics of their distributions. The following table summarize such distribution for each group

**TABLE XV**
**Summary statistics (values are in percentage points)**

| | N | Mean | St.Dev | Median | min | max |
|---|---|---|---|---|---|---|
| SWF % Ownership first quartile | 969 | 2.418 | 4.99 | .477 | .001 | 74.31 |
| SWF % Ownership second quartile | 6456 | 2.648 | 5.791 | 1.333 | .005 | 86.811 |
| SWF % Ownership third quartile | 9574 | .735 | 3.733 | .105 | .001 | 68.318 |
| SWF % Ownership fourth quartile | 7032 | .896 | .985 | .645 | .001 | 51.671 |

From the Table X I acknowledge that for all these groups the median is different from the one of the full sample. Therefore my definition of treated and control group needs to change accordingly with these different distributions. The most simple operation would be to set the threshold that defines treated and control group moving upward from the median by the same amount done in the first set of specification where the median was 0.76% and the threshold was set to 1%, for a total upward increase from the median of 0.24%. However I need to take into account also the standard deviation given that for some of these groups the same shift in the amount of firms shares owned represent different level of interest given the different standard deviations and, while in the first set of specification the standard deviation was 2.08 now the standard deviation of these distributions are much higher (except for the fourth group) therefore setting a threshold using an increase from the median of the same amount as done in the full sample group will include less observation that I would like for the first three group and more for the last group. Therefore I will scale the threshold according to both the median and the standard deviation of each distribution. In particular I will perform the same upward movement from the mean but scaled by the standard deviation: I will divide the standard

deviations of each group by the standard deviation of the full sample and then I will multiply the output by 0.24% which is the amount that I added to the median of the first group to set a meaningful threshold, with this procedure I will obtain how much I need to deviate upward from the median for each group. I use the shift upward from the median of the full sample analysis as a point of reference because is somehow validated by the linear regression of transformed variable which showed that such move upward from the mean is not endogenous. The new thresholds that I will use for the regressions are for the first, second, third and fourth group respectively 1.05%, 2%, 0.54% and 0.76%.

The results of the robustness check on transparency do not provide evidence that more transparent SWFs invest more in high CSR firms. The results are presented in TABLE XV(a) and TABLE XV(b). In the first group (low transparency score) the coefficient on ESG score is positive and significant at the 5% level; in the second group (medium-low transparency score) the coefficient on ESG is positive but insignificant; in the third group (medium-high transparency score) the coefficient on ESG score is negative and significant at the 5% level; in the fourth group (high transparency score) the coefficient on ESG score is positive and significant at the 0.1% level. These results suggest that transparency is not linearly related to CSR investing and that only funds with a high transparency score consistently invest in high CSR score firms. There is evidence that only very high or very low SWFs transparency lead to greater CSR investing behavior. Therefore my conclusions are that very transparent funds, since they are also those with the best governance practice and those who cares more about their reputation, invest in high CSR score because of their high transparency while the low transparency funds invest in high CSR score firms because of unobservable fund peculiarity. Therefore, the high CSR firms investment behavior is related to a more complex system of SWF characteristics than just the level of transparency otherwise it would be not possible to observe a positive coefficient on the ESG score also in the low transparency group regression.

**TABLE XVI (a)**

Models used to check if transparency is a driver of CSR investing

In this table are presented the results of the models used to check if transparency is a driver of CSR investing. The estimator is a Logit regression. The dependent variable are SWF 1% Ownership indicator first and second quartile which are indicator variables equal to 1 if the sum of the of firms shares owned by the relative group of SWFs is at least equal to 1% and equal to 0 otherwise. ESG is the score of corporate social responsibility of firm *i*. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 24 | Model 25 |
|---|---|---|
| | SWF 1% Ownership first quartile | SWF 1% Ownership second quartile |
| ESG | 0.0189* | 0.00267 |
| | (2.56) | (0.71) |
| Log Market Value | 0.442*** | 0.132** |
| | (4.15) | (2.60) |
| Sales Growth | -0.0141 | 0.00396* |
| | (-1.81) | (2.28) |
| Leverage | 0.00287* | 0.000937 |
| | (2.01) | (1.31) |
| Intangible Asset Ratio | 0.0123** | 0.00599** |
| | (2.93) | (2.90) |
| Dividend Yield | 0.155** | -0.0715* |
| | (2.62) | (-2.08) |
| Cash Assets Ratio | 0.00566 | 0.00550 |
| | (0.75) | (1.77) |
| Market-to-Book ratio | -0.0179 | -0.00111 |
| | (-1.30) | (-0.43) |
| Crisis Indicator | -0.312 | -0.127 |
| | (-0.26) | (-0.25) |
| ROA | 0.00808 | -0.00533 |
| | (0.48) | (-1.58) |
| Constant | -10.77*** | -12.17*** |
| | (-6.51) | (-12.69) |
| Observations | 11674 | 25978 |
| *Pseudo* $R^2$ | 0.3115 | 0.1558 |
| Sector Fixed Effects | YES | YES |
| Country Fixed Effects | YES | YES |
| Year Fixed Effects | YES | YES |

*t* statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**TABLE XVI (b)**

Models used to check if transparency is a driver of CSR investing

In this table are presented the results of the models used to check if transparency is a driver of CSR investing. The estimator is a Logit regression. The dependent variable are SWF 1% Ownership indicator first and second quartile which are indicator variables equal to 1 if the sum of the of firms shares owned by the relative group of SWFs is at least equal to 1% and equal to 0 otherwise. ESG is the score of corporate social responsibility of firm *i*. Log Market value is the log of the market value of firm *i*. Sales Growth is the growth YoY of sales of firm *i*. Leverage is defined as Debt/Equity of firm *i*. Crisis Indicator is a variable that state if the observation belong to a Crisis period. ROA is the return on asset of firm *i*. Intangible Asset Ratio is defined as Intangible-Asset/Total-Asset of firm *i*. Dividend Yield is defined as Dividend/Stock-Price of firm *i*. Market to Book Ratio is defined as Market-Value/Book-Value of firm *i*. Cash Asset Ratio is defined as Cash/Total-Asset of firm *i*. The specification includes robust standard errors.

| | Model 26 | Model 27 |
|---|---|---|
| | SWF 1% Ownership third quartile | SWF 1% Ownership fourth quartile |
| main | | |
| ESG | -0.0142* | 0.00396*** |
| | (-2.14) | (4.48) |
| Log Market Value | -0.0822 | 0.0679*** |
| | (-0.94) | (5.71) |
| Sales Growth | 0.00179 | -0.00124* |
| | (0.77) | (-2.46) |
| Leverage | 0.000596 | 0.000186 |
| | (0.54) | (1.11) |
| Intangible Asset Ratio | -0.000215 | 0.00243*** |
| | (-0.07) | (5.32) |
| Dividend Yield | -0.152* | 0.0105 |
| | (-2.45) | (1.45) |
| Cash Assets Ratio | 0.00136 | -0.00126 |
| | (0.31) | (-1.84) |
| Market-to-Book ratio | 0.00146 | -0.000409 |
| | (0.37) | (-1.14) |
| Crisis Indicator | -0.323 | -0.127 |
| | (-0.58) | (-1.21) |
| ROA | 0.00455 | 0.00763*** |
| | (0.57) | (5.68) |
| Constant | -2.892** | -2.870*** |
| | (-3.08) | (-18.54) |
| Observations | 11770 | 28469 |
| *Pseudo* $R^2$ | 0.1425 | 0.1073 |
| Sector Fixed Effects | YES | YES |
| Country Fixed Effects | YES | YES |
| Year Fixed Effects | YES | YES |

*t* statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

# 12 Conclusion

The results of my analysis show that SWFs are only partially structurally inclined to invest in high CSR score firms. Even if the results of the first set of models (Models 1, 2, 3, 4, 5, 6, 7) show a positive and significant coefficient on the ESG score, further study reveals that the effect is not robust to changes in the framework. The changes are the exclusion from the SWFs sample one of the most transparent SWFs, namely *Norges Bank Investment Management,* and the use of a different threshold to select the control and the treated group. In particular, the exclusion of the fund *Norges Bank Investment Management* from the SWFs' sample lead to a lower significance level and a lower absolute value of the ESG coefficient (Models 21, 22, 23), while, imposing a threshold of 5% of ownership of firms shares to distinguish between control group and treated group leads the coefficient on ESG to be positive but insignificant in the last two specification (Models 12, 13), in which are present country and year fixed effects. These findings made me believe that, yes, SWFs tends to invest more in firms with high CSR scores but the tilt is not very pronounced and is determined by a system of SWFs characteristic and not just by the SWF status. In conclusion, my research indicates that, on average, SWFs prefer to invest high CSR firms but the behavior can vary widely across different SWFs. The results on the restricted sample, where I excluded the Norwegian fund made me suspect that transparency may be a driver of CSR investing. Therefore, I explored the possibility that different levels of transparency lead to different level of CSR investing. The results of the regressions provide evidence that transparency is a non-linear driver of CSR investing behavior. Indeed only the most transparent group, the group with a transparency score above the 75th percentile, shows a positive and significant coefficient at the 0.1% level in the logit regression framework (Model 27). Here I find some evidence for the theory of public opinion pressure on the fund's decisions because the presence of high level of transparency may indicate that there is a strong pressure on the fund exercised by the home-country public opinion and this may leads the fund to invest in a responsible way. Therefore I also find evidence that SWFs are not a monolithic entity and that their appetite for high CSR firms varies depending on a system of SWF's characteristics, including the fund's transparency score. Finally, there is no evidence that SWFs actively engage firms to increase firms CSR scores, even when including in the analysis the most transparent ones.

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