Do investment determinants and effects vary across sovereign wealth fund categories? A firm-level analysis

Francesco Gangi*, Antonio Meles, Mario Mustilli, Domenico Graziano, Nicola Varrone

Department of Economics, Università degli studi della Campania Luigi Vanvitelli, Corso Gran Priorato di Malta, Capua, CE, 81043, Italy

ABSTRACT

This paper investigates whether determinants and effects of sovereign wealth funds (SWFs) investment vary across types of funds. To address this issue, we classify SWFs based on their scope and the origin of wealth. We find that saving and reserve funds and non-commodity funds pick better-performing firms. Furthermore, effects vary among SWF categories. In fact, saving and reserve funds assume a passive role in managing investments, unlike multi-objective and development funds which have detrimental effects on the target companies. As a whole, these findings confirm that heterogeneity of SWFs in terms of how they target firms and activism matters.

1. Introduction

Over the past few years, the weight of sovereign wealth funds (SWFs) within the global financial system has increased sufficiently to attract the interest of academics and policymakers. According to recent statistics, the value of worldwide SWF investments in industrial and financial companies has reached US $7.46 trillion (Sovereign Wealth Funds Ranking, February 2018). To convey a sense of the size, hedge funds managed approximately US $3.22 trillion in 2016 (Preqin, 2018), whereas the assets under management of private equity firms approached US $3 trillion in 2017 (Consultancy, UK, 2018).

In addition to the relevant dimension of this phenomenon, a second reason for the growing interest in SWFs is the opacity or lack of information that generally characterizes the manner in which they invest (Chhaochharia and Laeven, 2008). Despite the increase in studies concerning and information provided by SWFs, a gap in knowledge about the firm-level characteristics of their operations remains.

This lack of knowledge is partly due to the ownership structure of SWFs and the fact that they have lower information disclosure obligations than more conventional investors. Consistent with this view, there has been significant demand for regulation of SWFs in target countries and requests for greater transparency of SWFs (Alhashel, 2015).

Moreover, the debate on the economic role of SWFs has been developed through the comparison between state capitalism and market capitalism (Bruton et al., 2015; Aguilera et al., 2016). In the first case, SWF policy objectives should coincide with the economic growth of the country of origin. In the second case, SWF objectives should coincide with the maximization of the value of investee companies. The potential dichotomy between these two objectives and the latent agency conflicts between private and

* Corresponding author.
E-mail addresses: francesco.gangi@unicampania.it (F. Gangi), antonio.meles@unicampania.it (A. Meles),
mario.mustilli@unicampania.it (M. Mustilli), domenico.graziano@unicampania.it (D. Graziano), nicola.varrone@unicampania.it (N. Varrone).

political interests are additional factors contributing to the increased attention towards SWFs (e.g. Aguilera et al., 2016).

The recent financial crisis further attracted interest in the operational logic of SWFs, as they have invested in equity of important financial companies in the Western world, such as Merrill Lynch (about 11%), Citicorp (about 8%) and Unicredit (about 10%). These investments contributed to enriching the debate on their liquidity functions and their effects in terms of financial market stabilization (Betbèze, 2009; Baker and Boatright, 2010).

Among the different lines of research in the growing literature on SWFs, the present study aims to investigate the determinants and effects of SWF investments mainly by focusing on different SWF categories.

Indeed, both of the issues mentioned above have been already analysed in previous research, but the demand for knowledge is still great (Alhashel, 2015). Several studies have focused on the determinants of SWF investments (e.g. Gupta and Yu, 2007; Chhaochharia and Laeven, 2008; Cohen, 2009; Caner et al., 2011; Candelon et al., 2011; Kotter and Lel, 2011; Knill et al., 2012a; Ciarlone and Miceli, 2016). Others have focused on the financial market performance of target companies (e.g. Chhaochharia and Laeven, 2008; Jory et al., 2010; Dewenter et al., 2010; Knill et al., 2012b; Bortolotti et al., 2015) and target companies´ competitors (Boubakri et al., 2017). The empirical evidence has yielded a broad spectrum of results that do not always converge.

While several papers (e.g. Knill et al., 2012a) argue that the investments of SWFs may be driven by political motives, other studies find that SWFs are more likely to make investments for achieving economic and financial goals (e.g. Bortolotti et al., 2015; and Boubakri et al., 2016a). At same time existing literature provides evidence that SWFs are generally passive shareholders with limited impact on investee firms (e.g., Kotter and Lel, 2011), while other studies find a positive relationship (e.g. Dewenter et al., 2010; Fernandes, 2014) between SWF investments and the performance of target firms. There are also papers (e.g. Bortolotti et al., 2015; Aguilera et al., 2016) that support an agency conflict hypothesis according to which SWFs investments may be detrimental for firms' performance by encouraging firm managers to achieve purposes that are not value-maximizing.

One shortcoming in the literature is that most of the previous studies fail to consider whether and how differences among SWFs, mainly in terms of objectives, source of funding and investment strategies, influence their preferences and how they manage and monitor target firms. This drawback is well emphasized by Alhashel (2015), who argues that one possible reason for such mixed results is the significant heterogeneity among SWFs.

Therefore, in this paper we go beyond the existing literature, not just considering SWFs as a homogeneous group, but also trying to understand if different types of SWFs select and affect their target firms in different manners.

To do this, we first construct a large sample of companies (i.e. 386 unique firms) targeted by SWFs over the period 2000 to 2016 and for which we have accounting data starting from five years before until five years after the investment.

Second, we classify these firms in various subgroups based on the type of SWF that has made the investment. Specifically, we distinguish four categories of SWFs (i.e. saving funds, reserve funds, multi-objective funds and development funds) according to their objectives (e.g. Kunzel et al., 2011; Al-Hassan et al., 2013) and two categories (i.e. commodity funds and non-commodity funds) according to the origin of their wealth (e.g. Kotter and Lel, 2011; and Boubakri et al., 2017).

Finally, we construct a sample of non-target firms by selecting worldwide listed firms. Consistent with Kotter and Lel (2011), we use the entire Worldscope database as a proxy of the universe of companies in which SWFs could invest.

The econometric models include multinomial regression analysis to investigate the determinants of investments by different SWFs categories. In a second phase, the study performs a difference-in-difference (DD) regression analysis, correcting for serial correlation, in order to investigate the effects that different categories of SWFs have on profitability of target firms during the years following the investment. In both phases, our estimates include several controls for firm-specific characteristics of targets. Findings confirm that determinants and effects vary across different SWF categories.

Hence, we contribute to the literature on SWFs in several aspects. First, we match determinants and effects of SWFs investment with firm-level characteristics of SWFs. The latter are not a homogeneous investor category, so our study is among the first that tests the relationship between firm-specific drivers of investment decision-making and different firm-level characteristics of SWF categories. Second, we test the relationship between the changes in the operating performance of target firms and the theoretical differences in investment style that exist among SWF categories. Third, we provide a comprehensive framework that spreads from a political agenda to economic motives, on the side of the investment, and from a passive to an active role of SWFs, on the side of the stake management approach. In the last case, our framework incudes both a negative and a positive impact on target firm performance following investment. Conflict of interests and efficient monitoring are the theoretical constructs that support the opposing scenarios. Finally, due to the dynamism of investment approach over time, the current study adopts more recent data relative to prior analyses (e.g. Kotter and Lel, 2011; Fernandes, 2014; Bortolotti et al., 2015; Boubakri et al., 2016a). As a whole, the originality of the current study is intended to shed light on the conflicting evidence regarding determinants and effects of SWFs.

The remainder of the work is organized as follows. Section 2 includes the theoretical background. Section 3 formalizes the research questions of the study. Section 4 describes the methodology. Section 5 presents the empirical results of our statistical analysis. Section 6 discusses the main implications of the study. Finally, section 7 provides concluding remarks.

2. Theoretical background

In this study, we examine the firm-specific determinants of SWFs' investment and performance of SWFs' target companies. In contrast with prior investigations (e.g. Dyck and Morse, 2011; Kotter and Lel, 2011; Bernstein et al., 2013; Fernandes, 2014; Bertoni and Lugo, 2014; Bortolotti et al., 2015; Megginson and Fotak, 2015; Boubakri et al., 2016a), we do not limit our analysis on SWFs as a whole, since we distinguish SWFs by different categories. Indeed, the present study is a first attempt to connect the literature on determinants and impact to several categories of SWFs that prior analyses (e.g. Hammer et al., 2008; Dyck and Morse, 2011; Kunzel
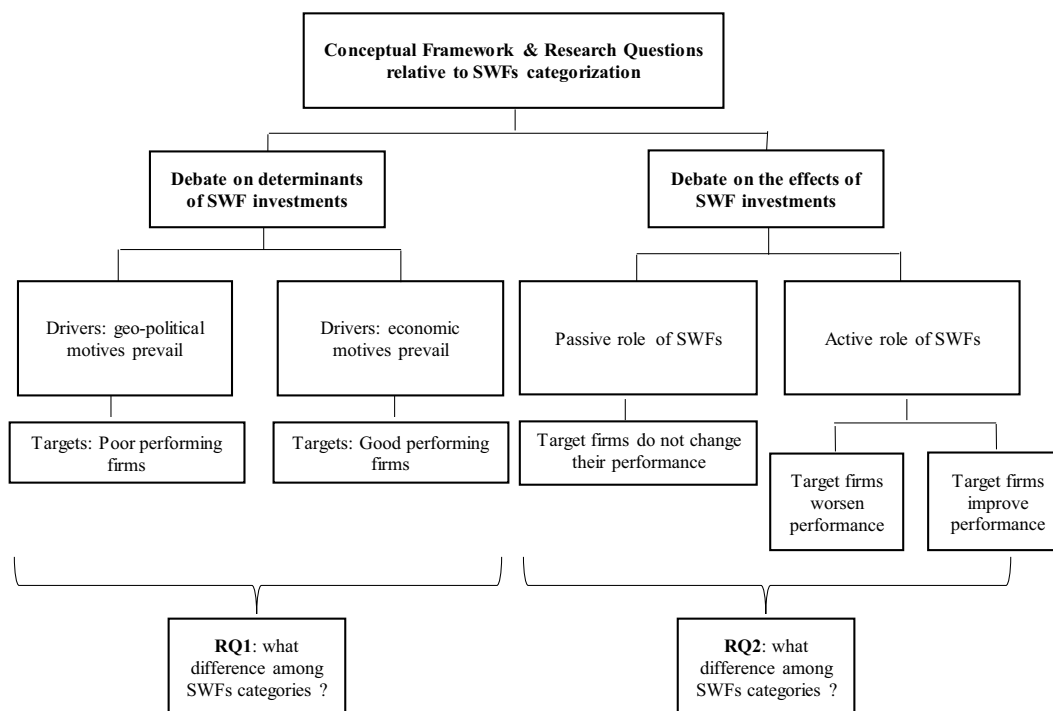
Fig. 1. Conceptual framework.

et al., 2011; Al-Hassan et al., 2013) identified on the basis of different theoretical criteria relative to objectives and investment approach.

There is not a universally accepted definition of SWFs. According to Alhashel (2015, p. 2), SWFs "are state-owned investment vehicles that invest globally in various types of assets ranging from financial to real alternative assets". Kotter and Lel (2011, p. 362) specify that SWFs are "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".

The above definitions indicate that SWFs are peculiar categories of institutional investors that may pursue different investment logics that are not necessarily strictly financial. Not by chance, authors (e.g. Fotak et al., 2013; Aguilera et al., 2016) consider SWFs a new form of state capitalism that is blurring the relationships between finance and politics. This aspect has fuelled the debate over the objectives and the investment approach of SWFs towards the target companies. Topics of the debate are what drives SWF investment and whether SWFs contribute to increasing the value of the investee companies. Both are questions mainly addressed in the past through treatment of SWFs as homogenous group. This is a gap that we try to fill. Therefore, consistent with these topical themes, in the following subsections, we first trace drivers and effects that prior studies have identified regarding SWFs. Then, we specialize the analysis based on several firm-level characteristics of SWFs and theoretical investment consequences. Accordingly, we pose the research questions of our empirical study (see Fig. 1).

2.1. The political agenda of SWF investments

The debate regarding the manner in which SWFs choose target companies has been broad. Considering the origins of SWFs, several studies have mainly focused on macroeconomic and geo-political determinants (Candelon et al., 2011; Caner et al., 2011; Ciarlone and Miceli, 2016).

Some researchers have pointed out that bilateral political relationships might play an important role in investment decisions. In particular, according to Knill et al. (2012a), SWFs prefer to invest in nations with weaker relationships with their countries of origin. Other authors have pointed out that the SWFs are oriented towards contexts with more-developed financial markets and greater economic and institutional stability (Gupta and Yu, 2007; Ciarlone and Miceli, 2016). For Chhaochharia and Laeven (2008) (hereafter CL), SWFs follow investment schemes not entirely driven by profit-maximization goals. In this sense, SWFs could be driven by diversification goals to the extent that they invest in industries that are not located in their countries of origin.

Other studies have argued that SWFs prefer to invest in host countries with cultures similar to those of their home countries (Chhaochharia and Laeven, 2008) or in countries more affected by financial crises (Ciarlone and Miceli, 2016). Johan et al. (2013) reported that SWFs are moving towards countries in which investor protection is lower, in contrast to the findings of other studies (Fernandes, 2014; Ciarlone and Miceli, 2016) showing that investor protection in the host country is a positive determinant of SWF investments.

For Kotter and Lel (2011), the foreign government ownership of SWFs suggests that they might have additional objectives beyond financial performance, such as political and social goals, which would be reflected in their investment activities. This suggestion was confirmed by Bernstein et al. (2013), who discussed the social goals of SWFs in their countries at the expense of financial returns. Milhaupt and Zheng (2014) argue that SWFs may act as new vehicle for governments to exercise control in non-state companies through financing. This aim could predict divergent objectives from strictly economic ones or political interferences through the power of financial capital.

In summary, the characteristics of the host country and the geo-political relations should be components of the investment strategies of SWFs.

However, despite the increasing literature, the debate over whether SWFs are driven by economic motives or political ones and whether they invest to maximize their financial returns remains open (Alhashel, 2015). The prevalence of reasons that are not strictly economic but rather are linked to interference in geo-political interests (Kotter and Lel, 2011) could predict that SWFs do not choose target companies on the basis of their profitability or financial solidity at the time of the deal. SWFs operate with a different mandate than conventional funds. The selection of target firms may be a function of criteria other than strictly financial returns.

Furthermore, being fully financed by the government's surplus, SWFs may have different interests than institutional investors. For example, they may not be strictly interested in additional financial resources deriving from the dividends of the target companies (Kotter and Lel, 2011; Fernandes, 2014; Boubakri et al., 2016a). Moreover, for geo-political reasons, SWFs could be incentivized to invest in companies belonging to strategic sectors but facing financial difficulties or cash constraints, especially during downturn periods (Fernandes, 2014). In addition, managers of SWFs may have less interest in financial track records than fund managers who must undertake external funding campaigns. The specific governance structure and financing sources can postpone the objective of profitability of the target companies at closing. Therefore, the differences in organization design of SWFs and the origin of financial capital may reflect different propensities among political or economic agendas of this peculiar type of investor.

2.2. Financial goals of SWF investments

Previous analyses consider that extra-financial reasons may prevail among the more strictly financial screening criteria of SWFs. At the same time, the mission of SWFs includes preserving wealth derived from non-renewable natural resources. Therefore, SWFs are called on to capitalize on the surplus deriving from these resources. For example, the Nigerian Sovereign Investment Authority specifies that its objective is to provide future generations of Nigerians a solid savings base in preparation for when the hydrocarbon reserves of Nigeria are exhausted (www.nsia.com). The Sovereign Wealth Fund Institute (SWFI), regarding investment strategies, emphasizes that SWFs tend to prefer returns over liquidity. SWFs' strategies may not be totally divorced from optimization of the risk/return trade-off. These aspects contrast with the perspective of a mainly or exclusively political agenda. That is, political motivations might not necessarily prevent SWFs from selecting profitable companies.

This point of view finds confirmation in Bortolotti et al. (2015) and Boubakri et al. (2016a), who find that more profitable companies are more likely to be targeted by SWFs. The same position we find in the contribution of Balding (2011), who argues that SWFs act as rational economic agents in terms of both their asset allocation and their diversification across assets and geographies. Consistent with Ferreira and Matos (2008), SWFs can be interested in investing in more profitable firms with track records of positive financial returns. Dyck and Morse (2011) report that political motivations are not the exclusive motivations of SWFs, as these investors also tend to safeguard the economic reasons for their investments and maximize financial returns. In an opposing position, Kotter and Lel (2011) find that SWFs invest in poorly performing and financially distressed firms.

Therefore, on the basis of previous non-conclusive considerations (political agenda or financial goals?), the treatment of SWFs as homogenous category risks leaving open the questions of what actually drives their investment decision among economic and non-economic objectives.

2.3. The effects of SWF investments

A better understanding of SWFs includes a deeper analysis of the effects following their investment. This aspect has been investigated in the previous literature mainly in terms of macro-effects and abnormal returns on financial markets, again by looking at SWFs as an overall phenomenon.

First, some studies have emphasized the economic benefits of the long-term stabilizing influence on liquidity, in addition to the incentives for greater economic growth (Kotter and Lel, 2011). The most-investigated topic has been the financial markets' reactions to the announcement of SWF investments. Several authors conclude positive effects of investments (Dewenter et al., 2010; Candelon et al., 2011; Kotter and Lel, 2011; Knill et al., 2012b; Bortolotti et al., 2015; Bortolotti et al., 2015), with a market reaction very similar to the announcement effect of investments made by institutional investors for comparable event windows (Kotter and Lel, 2011). Similarly, Megginson and Fotak (2015) find support for a positive-announcement-period stock price increase. However, in this case, the abnormal return is significantly lower than that for peer-owned financial investors, thus indicating an SWF discount instead of an SWF premium.

The recognition that SWFs convey a positive signal to market participants also suggests possible convergence on the expected effects on target companies' performance after the intervention of these funds. However, as ascertained by Alhashel (2015), the question regarding the performance of target firms has yet to be answered.

According to the perspective of the current study, the persistence of inconclusive evidence could be linked to the open debate over the activism and the monitoring capability of SWFs. About the latter, two main scenarios emerge. In a first one, government

ownership and political interference could lie at the origin of a passive rather than active behaviour (Rose, 2008; Kotter and Lel, 2011). If this scenario is valid, SWFs would be entities that do not bring changes in performance of target firms (Knill et al., 2012b; Alhashel, 2015). The alternative is quite different, as it implies an active role of SWFs that can impact investee companies negatively or positively. So, in this case, we can consider two interpretative lines.

From a first perspective, which we conventionally call "non-efficient activism", the ownership structures and extra-financial reasons for investment decisions may impact the manners in which SWFs manage investee companies. In particular, SWFs could be subject to significant political constraints from both the host country and the country of origin (Kotter and Lel, 2011). The presence of state ownership might be associated with weak managerial incentives in terms of efficiency and profitability. This condition contrasts with the evidence for a positive signal conveyed to the financial markets. The potential existence of agency conflicts depending on political or extra-economic objectives might cause the fund manager to pursue objectives that are not value-maximizing (Alhashel, 2015). According to Bernstein et al. (2013), long-term performance (price/earnings) worsens when politicians are involved in SWF management, reflecting embedded agency issues in which politicians' investment interests are not always aligned with those of the SWFs (Aguilera et al., 2016). Therefore, one of the main risks with SWFs investment is excessive involvement by politicians in SWF goals and governance. This is normally associated with home bias, less reliance on external fund managers (Bernstein et al., 2013), higher interest in political rent-seeking (Pistor and Hatton, 2011) and the subsequent orientation towards short-term goals. This context of non-efficiency-seeking is particularly significant in economic downturns that exert higher pressures on politicians to impact the SWFs' mandates and use their resources to capture specific electorates (Aguilera et al., 2016). In this sense, SWFs would be seen as value-destroying entities (Bortolotti et al., 2009).

From a second perspective, the government ownership of SWFs might not necessarily be associated with a deterioration of operational and financial performance of target firms. In fact, the presence of political constraints might not restrain SWFs from efficient shareholder activism (Mehrpouya et al., 2009). In this case, the approach of an SWF motivated by financial objectives may prevail (Knill et al., 2012b). The role of the SWF can be more active within the target firms (Dewenter et al., 2010) by monitoring the investee companies and thus justifying the SWF premium on the financial markets. Positive reactions of capital markets could be associated with the expectation that due to the participation of SWFs, the target companies will improve their operating performance after the deal (Fernandes, 2014). Along the same line, Bertoni and Lugo (2014) find that target companies experience reductions in their credit risk.

The availability of large amounts of financial resources can contribute to the implementation of longer-term plans by the companies financed. Patient money can incentivize and justify greater attention to strategic objectives that generate structural effects. The participation of SWFs can stimulate greater sensitivity to monitoring processes because even if the market is not behind them, managers of sovereign wealth funds still express the opinions of the governments to which they belong. Due to these premises, SWF participation can lie at the origin of benefits for the target firms (Chhaochharia and Laeven, 2008; Alhashel, 2015).

Therefore, to better discern which scenario is more consistent in terms of effects on investee companies, the analysis cannot be independent from a categorization of SWFs. That is, the answer of what impacts we can actually expect from SWF investment may remain unresolved without in-depth investigations based on different characteristics of SWF subgroups.

2.4. SWFs categorization by objective and investment style

Alhashel (2015) argues that the mixed results regarding the determinants and effects of the SWF investment process might reflect the existence of different categories of SWFs. That is, as SWFs are not a monolithic entity (Hammer et al., 2008; Dyck and Morse, 2011; Kunzel et al., 2011; Al-Hassan et al., 2013; Bertoni and Lugo, 2014; Aguilera et al., 2016), objectives, asset allocation and management of stakes could vary across the different subgroups of SWFs. "This heterogeneity across SWFs suggests it is misleading to put all SWFs into the same category" (Dyck and Morse, 2011, p. 6). However, as pointed out by Alhashel (2015), what drives SWFs and whether they create value for target firms are topics that the prior literature has mainly addressed by considering SWFs as a homogenous group. On one hand, there is in the literature the awareness that SWFs can differ significantly in terms of their investment style (e.g. Bertoni and Lugo, 2014), but on the other hand, there is not sufficient empirical evidence regarding whether and how the differences among SWF categories are related to performance of the target companies before and following the deal. Moreover, the variety of SWFs is an even more complex feature due to the presence of funds that cannot be categorized in a single typology, being multi-purpose funds. Therefore, the relationships between category differences, decision making and effects of SWFs is a sensitive gap relative to the prior literature.

The theory proposes different categories of SWFs through the application of different criteria that provide classifications that do not totally overlap. Consistent with prior analyses (e.g. Hammer et al., 2008; Kunzel et al., 2011; Al-Hassan et al., 2013) in the current paper, we refer first to the taxonomy of the International Working Group of Sovereign Wealth Funds (2008). These principles provide several practical items of guidance regarding governance, accountability arrangements, and the conduct of investment. The classification criteria depend on the policy objectives and the consequent asset allocation by funds (Al-Hassan et al., 2013). According to this taxonomy, five categories of SWFs can be distinguished: saving funds, reserve investment corporation, pension reserve funds, development funds, and stabilization funds. The first four categories consist of funds that invest mainly in equities, whereas the last typology of SWF invests mainly in bonds and other assets. In particular, stabilization funds should have macroeconomic objectives, such as isolation from the volatility of commodity prices. Their time horizon and liquidity targets make them resemble central banks. In fact, this category of SWFs has a role in countercyclical fiscal policies to regulate the phases of growing or declining economy. Accordingly, most of their resources are invested in government bonds of foreign governments, aiming for a liquid and less-risky portfolio. The shorter-term horizon is consistent with the lower risk profile, as the investment horizon is normally considered a

critical factor for any strategic asset allocation. A long investment horizon is traditionally associated with the ability to take greater risk (Kunzel et al., 2011). In general, stabilization funds are financed by fiscal surplus, so their investment objectives can be influenced by the fiscal policies of governments. The portfolio composition is mainly characterized by debt fixed income and cash (Kunzel et al., 2011). Stabilization aims are frequently part of SWFs characterized by different purposes, such as stabilization/saving or stabilization/saving/development (Al-Hassan et al., 2013). Therefore, in addition to the single categories taken individually, some funds from particularly rich economies tend to pursue multiple objectives. In this case, it is more difficult to identify a unique form of strategic asset allocation. In the current study, we conventionally identify these subgroups as multi-objective SWFs.

The other categories of SWFs identified by the International Working Group of Sovereign Wealth Funds (2008) are equity-oriented, starting with the saving SWFs, for which high shares of their portfolios are allocated to equity (Al-Hassan et al., 2013). These funds are vehicles to transform non-renewable assets into diversified financial assets in order to transfer wealth between generations of the country of origin. In line with their mandate and their larger shares of equity, these funds should present a high risk-return profile and a longer investment horizon (Kunzel et al., 2011). Furthermore, these funds would tend to maximize their net value through active investment management (Al-Hassan et al., 2013). Therefore, in terms of objectives and risk tolerance, saving SWFs would tend to allocate their resources to more aggressive and risky assets over a long-term horizon. Through this strategy, since risk generally has a positive relationship with the expected financial return, a riskier asset class should tend on average to a higher return than investments in more liquid and secure assets over a shorter time horizon.

Reserve SWFs, instead, are distinguished between investment corporations and pension funds. The reserve investment funds are vehicles to reduce the costs of maintaining reserves or to earn higher returns from large reserves. Therefore, these funds should pursue higher financial returns by allocating their resources primarily to equities (Al-Hassan et al., 2013). Pension reserve funds, then, tend to invest in stocks and other assets to offset the pension costs. They are typically designed to address future outflows based on commitments in the state budget to pay pensions.

Finally, socio-economic aims are at the basis of development SWFs, which are vehicles designed to allocate financial resources to socio-economic projects, investing especially in infrastructure. These investments require a lot of time and a lot of planning for the exit without unduly influencing that asset's price. Hence, development funds should be characterized by a very long investment horizon, without the rush to exit these alternative assets (Kunzel et al., 2011).

Prior literature assumes that investment objectives could also be influenced by the source of funding (e.g. Kunzel et al., 2011). Therefore, consistent with other studies (e.g. Bertoni and Lugo, 2014; Aguilera et al., 2016; Boubakri et al., 2017) the further criteria for classifying SWFs that we adopt in the current study are based on the distinction between commodity-based SWFs and non-commodity-based SWFs. The main financing source of commodity-based SWFs is the financial surplus from revenues of fossil fuels sales, typically oil and gas. Instead, in the case of non-commodity-based SWFs, the main sources of financing are foreign-exchange reserves and other sources (Aguilera et al., 2016). According to the SWF rankings of the SWFs Institute (Sovereign Wealth Fund Institute, 2018), 57% of the largest SWFs by assets under management belong to the oil-based category, whereas 43% of the largest SWFs obtain financial capital from other sources. In theory, commodity-based SWFs would tend to a less risky profile having predominantly a stabilization target that takes into account the cycles and the commodity price risk. These funds would tend to choose assets that serve as natural hedging instruments for commodity prices (Kunzel et al., 2011). Therefore, given the objective of mitigating financial risks, commodity-based SWFs should be oriented towards less-aggressive assets and lower return on the investment than non-commodity-based SWFs.

Overall, the previous classifications draw a framework to better understand the firm-level characteristics of SWFs, which helps to fill a space left by the literature, which has mainly explored the macro-economic trends of SWFs (Aguilera et al., 2016) from a homogeneous point of view regarding those funds (Alhashel, 2015). The theoretical criteria for categorizing SWFs are rooted prevalently in two operating aspects, the objectives for which these funds are designed and their risk/return profile. From these aspects, then, there are potential differences in investment strategies and financial expectations. Therefore, given the alternative categories of SWFs, the further gap to fill is the verification of how these categories are associated with determinants and effects of SWF investment.

3. Research questions

From the literature review above, we derive motivations of SWFs that spread from political to economic agendas. At the same time, prior studies argued that the investment approach can vary from passive to active roles in terms of the approach for stake management. In the last case, due to the risk of agency conflicts, the impact on the performance of investee companies may be both negative or positive.

Our literature review demonstrates that SWFs are a non-monolithic entity. Rather, these funds can be distinguished consistent with different criteria, including objectives, investment styles and funding source origin. Therefore, by matching the assumptions regarding drivers and impacts with different SWFs categorizations, the research questions that the present study intends to cover are twofold:

- RQ1: do determinants of target companies differ among different SWF categories?
- RQ2: do effects on target companies differ among different SWF categories?

We try to answer these questions in the empirical section of the current study.

4. Empirical analysis

4.1. Data collection

To investigate the characteristics of SWFs' target firms, the current study adopted multiple public sources. First, through the Zephyr Bureau Van Dijk database, we identified deals involving SWFs between 2000 and 2016 (the study period).[1] Our analysis considers only those deals referring to target firms for which Zephyr reports the International Securities Identification Number (ISIN). The ISIN code is useful for collecting financial data about target firms through the Thomson Reuters database (Worldscope). After dropping observations that did not meet this criterion, 776 deals remained. As the list of deals included more than one SWF investment in the same company, we reduced the number of investment events to 617, corresponding to 483 unique target firms. After excluding banks from the list, the final sample of the current study comprised 482 investment events in 386 unique firms (main group). Table 1 provides the adopted SWF classifications and the summary statistics regarding deals executed between 2000 and 2016. For comparison with similar studies, Kotter and Lel (2011) analysed 417 deals involving 326 unique firms from 1980 to 2008. Knill et al. (2012a) adopted a sample of 130 SWF acquisitions. Bortolotti et al. (2015) assembled an event-study sample of 799 transactions from 1983 to 2012. Boubakri et al. (2016a) employed a sample of 344 deals over the period from 1991 to 2011. Therefore, the current study includes more recent years than previous investigations, and the sample size is consistent with the prior literature.

Furthermore, to deepen the firm-specific determinants and effects of SWF investments, similarly to Kotter and Lel (2011), we use the entire Worldscope database as a proxy of the universe of companies in which SWFs could invest. This database contains yearly observations of more than 81,000 companies[2].

4.2. Variables and descriptive statistics

This section describes first the variables we use in our empirical analyses, which are also summarized in Table 2, followed by descriptive statistics for our sample and the comparison sample.

Similar to previous studies (among others, Kotter and Lel, 2011; Bortolotti et al., 2015; Boubakri et al., 2016a) that investigate the determining factors of SWF investments and their impact on target companies, our primary variable is a dummy (*SWF investment*), which is set to 1 when a firm is targeted by an SWF and 0 otherwise. In addition to the existing literature, we also use two categorical variables that enable us to investigate differences among types of SWFs. The first categorical variable is *Scope,* which assumes five different values: 1 for saving funds, 2 for reserve investment funds, 3 for multi-objective funds, 4 for development funds, and 0 for the baseline category (i.e. companies that are not targeted by SWFs). We build this variable following the criterion used by the International Working Group of Sovereign Wealth Funds (2008) that classifies SWFs based on their investment goal. In particular, we matched the sampled SWFs of the current study with SWFs list by categories reported in Al-Hassan et al. (2013) and Kunzel et al. (2011). The second categorical variable is *Origin*, which differentiates SWFs based on the source of their wealth under management and that assumes three different values: 1 for non-commodity funds, 2 for commodity-based funds, and 0 for companies that are not targeted by SWFs. The sources of the classification of sampled SWFs are Boubakri et al. (2017) and Kotter and Lel (2011). Indeed, previous studies, argue that funds deriving their wealth from different sources may select dissimilar investment targets (e.g. Bertoni and Lugo, 2014).

Further, because various factors may predict the decisions of SWFs to target a firm and influence its post-investment performance, our dataset comprises several variables.

We include a number of "firm-specific" characteristics commonly used by the literature investigating SWF investments and firm outcomes (e.g. Kotter and Lel, 2011; Bortolotti et al., 2015; Boubakri et al., 2016a; Megginson et al., 2016). First, to measure a firm's performance, we use net income divided by total assets (*ROA*), operating income on invested capital (*ROI*), and net income divided by the equity book value (*ROE*). Second, to proxy for growth opportunities, we use the one-year sales growth (*Sales growth*). Third, as a proxy of financial risk, we adopt two complementary indicators: the total net debt-to-total capital ratio (*Leverage*), which is widely considered as a simple proxy of a firm's risk of financial distress and the ratio of cash assets to total assets (*Cash assets ratio*), which is a traditional indicator of a firm's cash constraints. Fourth, we consider the natural logarithm of the book value of assets (*Log assets*) as a proxy for size and information asymmetry, the dividend yield (*Dividend yield)* to control for the dividend policy and the ratio of foreign sales to total sales (*Foreign sales ratio*) as a proxy for the degree of internationalization. Fifth, we include in our analysis the ratio of intangible assets to total assets (*Intangible assets ratio*) to check for the intensity of know-how of the target firm.

Finally, because the time period and various additional factors at the industry and country levels may influence a firm's performance and the choice of an SWF to select target firms, we add several control variables. We use a variable (*Crisis*) that controls for the 2007–2009 financial crisis, a variable (*Emerging*) that is set to 1 if the firm is incorporated in a country that is included in the *MSCI* emerging market index and 0 otherwise, and a set of industry dummies.

Table 1 provides some information about our sample firms. *Panel A* presents the distribution according to the country of target firms. During the sample period, SWFs have invested in firms from 43 countries, with Vietnam attracting the most SWF investments (10.79% of the total), followed by the United States (9.54%), India (7.26%), China and Hong Kong (both with 7.05%), the United

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Table 1
Investments distribution by country and SWFs' categories.

Panel A - SWFs' investments by country.

Country	N. of Investments	%	Country	N. of Investments	%
Australia	23	4.77%	Oman	4	0.83%
Austria	3	0.62%	Palestina	2	0.41%
Bahrain	3	0.62%	Philippines	4	0.83%
Brasil	4	0.83%	Poland	1	0.21%
Canada	9	1.87%	Portugal	4	0.83%
Cayman Islands	1	0.21%	Rep. of Korea	20	4.15%
China	34	7.05%	Russia	5	1.04%
Colombia	2	0.41%	Saudi Arabia	1	0.21%
Denmark	2	0.41%	Singapore	31	6.43%
Egypt	1	0.21%	South Africa	4	0.83%
Finland	19	3.94%	Spain	10	2.07%
France	16	3.32%	Sri Lanka	1	0.21%
Germany	6	1.24%	Sweden	3	0.62%
Hong Kong	34	7.05%	Switzerland	6	1.24%
India	35	7.26%	Taiwan	1	0.21%
Indonesia	6	1.24%	Thailand	3	0.62%
Israel	1	0.21%	Turkey	1	0.21%
Italy	11	2.28%	UK	32	6.64%
Japan	1	0.21%	United Arab Emirates	2	0.41%
Malaysia	25	5.19%	USA	46	9.54%
Netherlands	4	0.83%	Vietnam	52	10.79%
New Zealand	9	1.87%	Total	482	

Panel B - Investments by SWFs' categories.

Acquiring SWFs	Investment scope	Origin of resource	N. of Investments	%
Abu Dhabi Investment Authority	Savings	Commodity	19	3.94%
Alaska Permanent Fund Corporation	Savings	Commodity	4	0.83%
Aranda Investments (*)	Savings	Non-Commodity	13	2.70%
Bahrain Mumtalakat Holding	Multi-objective	Non-Commodity	3	0.62%
China Investment Corporation	Reserve	Non-Commodity	14	2.90%
Exchange Fund Investment Portfolio	–	Non-Commodity	30	6.22%
Government Pension Fund Of Norway	Multi-objective	Commodity	4	0.83%
Government of Singapore Investment Corp.	Multi-objective	Non-Commodity	76	15.77%
International Petroleum Investment Comp.	Development	Commodity	12	2.49%
Investment Corporation Of Dubai	–	Commodity	28	5.81%
Khazanah Nasional Berhad	Savings	Non-Commodity	23	4.77%
Korea Investment Corporation	Reserve	Non-Commodity	5	1.04%
Kuwait Investment Authority	Multi-objective	Commodity	26	5.39%
Libyan Investment Authority	Savings	Commodity	17	3.53%
Mubadala Development Company Pjsc	Development	Commodity	16	3.32%
Qatar Investment Authority	Savings	Commodity	33	6.85%
Safe Investment Company	–	Non-Commodity	22	4.56%
State General Reserve Fund	Savings	Commodity	5	1.04%
Temasek Holdings	Savings	Non-Commodity	132	27.39%
Total			482	

This table presents the distribution of the SWFs' investments by the country of target firms and by SWFs' categories. Panel A describes the number of SWF investments across the country of target firms. Panel B displays the distribution of SWFs' investments by SWFs' categories. With reference to the investment scope classification, the source of information is Al-Hassan et al. (2013), except for Aranda, considered as investment vehicle of Temasek, and for State General Reserve Fund classified according to Kunzel et al. (2011). No objective classification criterion has been found for the Exchange Fund Investment Portfolio, Investment Corporation Of Dubai, Safe Investment Company. With reference to the origin of resource classification, instead, we refer to Boubakri et al. (2017), except for the Exchange Fund Investment Portfolio and Kuwait Investment Authority, which follow the taxonomy proposed by Kotter and Lel (2011).

Kingdom (6.64%) and Singapore (6.43%). *Panel B* reports the distribution of our sample according to investing SWF. Temasek Holdings is the most active SWF, with a total of 131 investments made from 2000–2016, followed by Government of Singapore Investment, Co., with 76 investments completed. In addition, if we consider the number of investments made by the different types of funds, classified based on their scope, we discover that 51.05% of the total investments have been made by saving funds, 22.61% by multi-objective funds, 5.81% by development funds and 3.94% by reserve funds. Furthermore, when we consider the origin of funds' wealth, we find that 65.97% of the total investments are attributable to non-commodity funds and 34.03% to commodity funds.

Table 3 presents descriptive statistics and univariate tests related to firm-specific variables, including firms' performance variables, for target firms and non-target firms in the pre-investment year. Furthermore, for all variable of interest, we perform a *z-test* on

Table 2
Descriptive statistics and univariate test.

Panel A - Full sample and origin of resource classification.

	Control group		Main group		Diff. Tests	Non-Commodity		Diff. Tests	Commodity		Diff. Tests
	N	Median	N	Median	Z-Stat	N	Median	Z-Stat	N	Median	Z-Stat
Roa	19,288	5.16	437	6.09	−2.972***	286	6.32	−4.039***	151	5.50	0.522
Roi	19,257	7.46	432	8.57	−2.963***	284	9.03	−3.585***	148	7.77	−0.076
Roe	19,210	10.03	427	12.29	−3.331***	281	12.82	−3.967***	146	11.07	−0.172
Total Assets	19,296	5,028,849	448	12,312,170	−6.954***	294	12,312,170	−5.334***	154	12,307,500	−4.428***
Sales growth	19,142	6.10	433	10.75	−6.171***	285	11.45	−6.602***	148	7.50	−1.347
Leverage	19,291	26.69	448	35.75	−6.250***	294	36.87	−5.692***	154	33.82	−2.743***
Intangible assets ratio	19,290	4.97	441	2.86	5.454***	289	2.96	4.361***	152	2.79	3.229***
Dividend yield	19,296	1.28	408	1.71	−5.431***	271	1.46	−2.883***	137	2.02	−5.267***
Cash assets ratio	19,296	8.45	429	4.66	6.838***	283	4.37	5.713***	146	5.00	3.711***
Foreign sales ratio	19,208	32.56	324	20.61	1.78*	213	17.41	1.891*	111	30.73	0.421

Panel B - Investment scope classification.

	Saving		Diff. Tests	Reserve		Diff. Tests	Multi-objective		Diff. Tests	Development		Diff. Tests
	N	Median	Z-Stat	N	Median	Z-Stat	N	Median	Z-Stat	N	Median	Z-Stat
Roa	223	5.95	−2.726***	15	6.55	−0.784	98	6.28	−2.100**	27	3.21	2.802***
Roi	220	8.38	−2.377**	15	10.50	−1.637	96	9.11	−1.978**	27	4.58	3.099***
Roe	220	12.01	−2.501**	14	21.57	−2.848***	94	12.16	−1.610	26	3.18	2.734***
Total assets	231	10,900,000	−4.917***	17	21,900,000	−2.410**	99	15,000,000	−3.930***	26	9,101,450	−0.213
Sales growth	223	9.66	−3.432***	16	16.82	−3.183***	97	14.34	−4.166***	25	6.39	−0.286
Leverage	231	35.33	3.597***	16	40.10	−2.219**	100	34.06	−2.243**	26	50.89	−3.731***
Intangible assets ratio	229	2.14	5.746***	16	8.53	0.348	99	4.43	2.164**	26	4.40	0.214
Dividend yield	212	1.73	−4.135***	12	1.49	−0.511	92	1.21	−0.888	23	2.22	−1.785*
Cash assets ratio	226	4.58	5.269***	16	4.94	0.378	98	5.17	2.113**	22	2.41	3.868***
Foreign sales ratio	181	17.07	2.645***	12	24.14	0.332	68	17.59	0.354	18	27.85	0.702

Panel A reports the descriptive statistics referred to the control group and SWFs'targets considered both as a whole and according to the origin of resource classification. Panel B displays the descriptive statistics referred to SWFs' targets classified according to the SWF's investment scope. Total assets are expressed in thousands of U.S. dollars. Difference in median (Z statistics) tests compare SWFs' targets with control sample. The definitions of variables are provided in Table A1.

  * Statistically significant at 10% level.
  ** Statistically significant at 5% level.
  *** Statistically significant at 1% level.

the difference-in-median between the group of target firms and the comparison group.

It is worthwhile to note that similar to previous studies, we find remarkable differences between firms invested by SWFs and the other ones in the pre-investment year. Indeed, we find that target firms are on average larger (12.3 billion euros in total assets vs. approximately 5 billion euros), more leveraged (35.75% vs. 26.69%) and more cash-constrained (the median *cash assets ratio* is 4.66% vs. 8.45%), and they exhibit higher sales growth (10.75% vs. 6.10%), dividend yield (1.71% vs. 1.28%) and performance ratios (e.g. in terms of *ROA*, 6.09% vs. 5.16%). Furthermore, they exhibit a lower intensity of unique know-how (the median *intangible asset ratio* is 2.86% vs. 4.97%) and degree of internationalization (the median *foreign sales ratio* is 20.61% vs. 32.56%). All of these differences, except for the degree of internationalization, are significant at the 1% level.

When we split our sample of target firms based on the origin of wealth, we mainly highlight that non-commodity funds exhibit a strong preference for high-performance firms (e.g. in terms of ROA: 6.32% vs. 5.16% for the control sample), whereas commodity funds are interested in companies that are not particularly highly performing (5.50% in terms of ROA) but pay high dividends (2.02% vs. 1.28% of the comparison sample).

Also, dividing target firms based on the SWFs' investment scope, some interesting differences arise. Mainly, we find that reserve funds and development funds have very different preferences both among themselves and with respect to other funds. Specifically, reserve funds are attracted by firms that are on average very large (21.9 billion euros), with high sales growth (16.82%), profitability (e.g. 21.57% in terms of ROE) and leverage (40.1%). Development funds, instead, tend to invest in poor-performance (e.g. 3.21% in terms of ROA) and high-risk (the median *Leverage* is 50.89%, whereas the median *Cash assets ratio* is 2.4%) firms that pay high dividends (2.22%).

4.3. Specification models

According to the scope of this study, our empirical investigation consists of two related parts. The first analysis intends to

Table 3
Determinants of the likelihood of being targeted by SWFs.

	(1)	(2)	(3)
	SWF_0_1	SWF_0_1	SWF_0_1
Roa	0.010*		
	(1.74)		
Roi		0.002***	
		(2.77)	
Roe			0.001***
			(3.83)
Log assets	0.066***	0.071***	0.054**
	(2.90)	(3.17)	(2.44)
Sales growth	0.000**	0.000**	0.000**
	(2.44)	(2.18)	(2.16)
Leverage	0.006***	0.005**	0.012***
	(2.66)	(2.44)	(4.50)
Intangible assets ratio	0.547***	0.550***	0.508**
	(2.61)	(2.65)	(2.48)
Dividend yield	0.077***	0.079***	0.079***
	(4.91)	(5.05)	(5.05)
Cash assets ratio	0.251	0.241	0.400
	(0.58)	(0.56)	(0.98)
Foreign sales ratio	−0.002	−0.002	−0.002
	(−1.45)	(−1.25)	(−1.24)
Crisis	0.515***	0.511***	0.541***
	(2.89)	(2.86)	(3.06)
Emerging	0.461**	0.471***	0.461**
	(2.53)	(2.58)	(2.51)
Sector	Yes	Yes	Yes
_cons	−5.163***	−5.188***	−5.144***
	(−12.48)	(−12.68)	(−12.62)
No. of obs.	19,317	19,293	19,239
Pseudo R^2	0.127	0.127	0.128

This table shows the coefficient of estimates from the logit model explaining the determining factors of SWFs' investments. The dependent variable is a dummy variable that is set to 1 if a firm has been targeted by a SWF and 0 otherwise. T statistics are adjusted for robust standard errors and reported in round brackets. Table A1 provides the definition of variables.

  * Statistically significant at 10% level.
  ** Statistically significant at 5% level.
  *** Statistically significant at 1% level.

investigate factors influencing the target firms' selection by SWFs for testing whether they are more likely to make investments for achieving financial goals or for political reasons. More specifically, we conduct a multivariate logit analysis with errors clustered by firm of the probability of being targeted by an SWF. We use as dependent variable a dummy (*SWF investment*) that is equal to 1 for SWFs' target firms from the investment year on and 0 otherwise. We regress this variable on one-year lagged values of firm-specific characteristics, a dummy variable that controls for the 2007–2009 financial crisis, a variable that is set to 1 for firms incorporated in emerging countries and a set of industry dummies.

Therefore, the logistic regression model is formalized as follows:

$$SWF\ investment = \beta_1\ Performance_{t-1} + \beta_2\ Log\ assets_{t-1} + \beta_3\ Sales\ growth_{t-1} + \beta_4\ Leverage_{t-1} + \beta_5\ Intangible\ assets\ ratio_{t-1} + \beta_6\ Dividend\ yield_{t-1}$$
$$+ \beta_7\ Cash\ assets\ ratio_{t-1} + \beta_8\ Foreign\ sales\ ratio_{t-1} + \beta_9\ crisis + \beta_{10}\ Emerging + \Sigma\beta_K\ Industry + \varepsilon \quad (1)$$

where *t* is the investment year and all the variables are described in Section 4.2 and also summarized in Table 2. It should be noted that we estimate the model of eq. (1) three times because we use three indicators (i.e. ROA, ROI and ROE) as proxies for the firm performance.

To test whether the determining factors of SWFs' investments vary across types of funds, we employ a multinomial logit regression by using the same independent variables as in eq. (1) and, as independent variables, two categorical variables. The first variable is *Scope*, which assumes five different values: 1 for saving funds, 2 for reserve investment corporations, 3 for multi-objective SWFs funds, 4 for development funds, and 0 for the baseline category (companies that were not targeted by SWFs). The second categorical variable is *Origin*, which differentiates SWFs based on the source of their wealth under management and assumes three different values: 1 for non-commodity funds, 2 for commodity funds, and 0 for companies that were not targeted by SWFs.

The second analysis focuses on the impact of SWFs' investment on firms' performance in the post-investment period. We are aware that one major concern with this analysis is that it should control for observable and unobservable factors that could drive both the decision of an SWF to make an investment and post-investment performance. To address the endogenous nature of the SWFs' selection

process, we use a diff-and-diff (DD) analysis of panel data, correcting for serial correlation (Bertrand et al., 2004).[3]

In particular, the specification is as follows:

$$Performance_{i,} = \beta_1 Time_{i,} + \beta_2 Treated_{i,} + \beta_3 DID_{i,} + \delta Firm characteristics + \xi industry dummies + \lambda country dummies$$
$$+ \psi year dummies + \varepsilon_i \qquad (2)$$

where *Performance* is captured by ROA, ROI and ROE, respectively. *Time* is an indicator variable that takes a value of 1 for all the years after the event date and 0 otherwise.[4] The coefficient on *Time*, β_1, reflects the change in performance for firms in the treatment group (i.e. target firms) and the comparison group. *Treated* is an indicator variable that takes a value 1 for target firms and 0 for firms in the comparison group. The coefficient on *Treated*, β_2, represents the difference between the treatment and the control group in the pre-investment years. *DID* is an interaction term between the variables *Time* and *Treated*, whose coefficient (β_3) enables us to measure the impact of SWF investment net of selection effects.

In addition, to investigate whether the impact of SWFs' investment on investee firm performance varies across SWFs, we split the sample of target firms into as many sub-samples as types of SWFs identified based on their scope and origin of wealth, respectively. Subsequently, we estimate the same specification as in Eq. (2).

5. Results

5.1. What factors drive SWFs investments, and do they vary across types of funds?

Table 3 presents the estimates of the impact that several firm-characteristics and various indicators – controlling for time, industry and country – have on the probability of being targeted by an SWF.

First, we find that firms that attract SWF investments exhibit high performance. Specifically, *column 1* indicates that the coefficient of *ROA* is positive (0.01) and statistically significant ($t = 1.74$). In terms of economic significance, we find that an increase in this variable of 1% increases the probability of being invested in by an SWF of approximately 1%. Interestingly, when we replace *ROA* with the other profitability proxies (*ROI* in *column 2* and *ROE* in *column 3*), we continue to find (at the 1% significance level) that SWFs are more interested in selecting highly profitable firms. Overall, these results seem consistent with those reported by several studies (e.g. Bortolotti et al., 2015; Boubakri et al., 2016a) but also in contrast with the findings of Kotter and Lel (2011).

Second, we observe that SWFs are more likely to select large firms that exhibit high growth and leverage. For example, in *column 1*, the coefficients of the variables *Log assets*, *Sales growth* and *Leverage* are positive and statistically significant at 5% or less. These findings are similar to those reported by previous studies on SWFs (e.g. Kotter and Lel, 2011).

Table 3 also indicates that SWFs are particularly attracted by firms that pay high dividends and that are knowledge-based. Also, they are more inclined to invest in emerging economies and during crisis periods. Indeed, the coefficients of the variables *Dividend yield, Intangible assets ratio, Emerging and Crisis* are positive and statistically significant at 5% or less. Regarding the dividend yield, our findings contrast with Fernandes (2014) and Kotter and Lel (2011), who argue that SWFs do not need additional liquidity from dividend incomes. Indeed, as these funds are entirely supported by surpluses and government receipts, SWFs are less likely to invest in high dividend-payout firms (Boubakri et al., 2016a).

After having identified the key factors that predict the likelihood of being invested in by an SWF in our sample, we try to delve more deeply into this issue by investigating whether the influence of these drivers changes across types of funds. We consider this analysis of special interest because it can help to understand if mixed results reported by previous studies may depend on the different manners in which the funds manage their portfolios and invest in companies (Alhashel, 2015).

Table 4 presents the results of multinomial logit models estimated using the variable *Scope* as the independent variable. We find evidence that among SWFs, only saving funds and reserve funds are strongly attracted by better-performing firms in terms of profitability. Regarding economic significance, we find, for example, that an increase in *ROA* of 1% increases the probability of being invested in by a saving fund of 1.4% and by a reserve fund of 2.1%. Moreover, we find that except for development funds, all SWFs are encouraged to select firms that pay high dividends. However, we also observe that in terms of economic significance, an increase in this variable of 1% is associated with a very high increase (e.g. 11.2% in *column 2*) in the probability of being targeted by a reserve fund. Interestingly, we find that all SWFs tends to invest in highly leveraged firms, but also in this case, an increase in this variable of 1% is associated with a greater increase in the likelihood of being invested in by a reserve fund (2.5% vs. 0.5% for saving and development funds and 0.4% for multi-objective funds). Although all SWFs invest in large firms (even if the magnitudes of coefficients suggest that reserve funds pay more attention to this characteristic), we find other interesting differences across SWF investment processes. Saving funds and multi-objective funds are more inclined to target firms with high growth rates (the coefficients of the variable *Sales growth* are always positive and significant at the 1% confidence level or less), but only the former appear particularly attracted by firms that exhibit high know-how intensity and cash constraints and low internationalization. Reserve funds, instead, uniquely prefer firms incorporated in non-emerging countries, whereas development funds invest in firms that, besides not being very performing and not paying high dividends, are also more leveraged compared to the control group.

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[3] We thank the anonymous referee for this suggestion.

[4] For all sampled firms we consider 5 years before the investment event. Instead, with reference to the post-investment phase, we consider 5 years following the deal, excepted for firms targeted during the 2013–2015 due to the lack of observations.

Table 4
Determinants of the likelihood of being targeted by SWFs (investment scope classification).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Savings	Reserve	Multi-objective	Development	Savings	Reserve	Multi-objective	Development	Savings	Reserve	Multi-objective	Development
Roa	0.014*** (2.77)	0.021*** (4.78)	0.005 (0.32)	−0.011 (−0.87)								
Roi					0.002*** (2.66)	0.002*** (3.80)	0.003*** (2.78)	−0.007 (−1.46)				
Roe									0.001*** (3.08)	0.002*** (3.23)	0.000 (0.64)	0.001 (1.55)
Log assets	0.054* (1.74)	0.266*** (3.13)	0.076* (1.88)	0.137* (1.76)	0.063** (2.06)	0.266*** (3.18)	0.076* (1.84)	0.139* (1.81)	0.052* (1.70)	0.199* (1.91)	0.063 (1.63)	0.100 (1.41)
Sales growth	0.000*** (2.92)	0.000 (0.93)	0.000*** (2.59)	−0.012 (−1.50)	0.000** (2.39)	0.000 (1.00)	0.000** (2.63)	−0.012 (−1.38)	0.000** (2.36)	0.000 (0.76)	0.000** (2.53)	−0.016 (−1.57)
Leverage	0.005*** (4.21)	0.025*** (8.09)	0.004** (2.07)	0.005*** (3.60)	0.004*** (3.60)	0.023*** (7.32)	0.004*** (2.75)	0.005*** (3.25)	0.010*** (3.12)	0.016*** (2.77)	0.005 (0.84)	0.019* (1.82)
Intangible assets ratio	0.397*** (3.19)	−1.368 (−0.75)	0.359 (1.57)	1.055 (0.66)	0.398*** (3.14)	−1.257 (−0.67)	0.361 (1.57)	1.061 (0.66)	0.382*** (3.13)	−1.351 (−0.73)	0.363* (1.70)	1.189 (0.72)
Dividend yield	0.001*** (2.70)	0.112*** (3.31)	0.003*** (6.96)	0.001 (1.54)	0.001*** (2.75)	0.110*** (3.45)	0.003*** (6.96)	0.001 (1.53)	0.001*** (2.71)	0.110*** (3.69)	0.003*** (6.91)	0.001 (1.52)
Cash assets ratio	−0.493*** (−2.76)	−1.017 (−0.21)	−0.383 (−1.25)	−25.451** (−1.97)	−0.495*** (−2.74)	−0.977 (−0.20)	−0.385 (−1.25)	−25.467** (−2.00)	−0.472*** (−2.78)	−1.066 (−0.22)	−0.390 (−1.36)	−24.756** (−1.97)
Foreign sales ratio	−0.004** (−2.40)	−0.000 (−0.15)	−0.000 (−0.52)	−0.001 (−0.11)	−0.004** (−2.14)	−0.000 (−0.10)	−0.000 (−0.55)	−0.001 (−0.10)	−0.004** (−2.18)	−0.000 (−0.30)	−0.000 (−0.60)	−0.001 (−0.10)
Crisis	0.167 (0.70)	0.988 (1.33)	0.902* (2.54)	2.233*** (4.42)	0.142 (0.59)	1.024 (1.41)	0.922*** (2.65)	2.234*** (4.39)	0.198 (0.83)	1.093 (1.50)	0.923*** (2.65)	2.224*** (4.53)
Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emerging	0.582*** (2.75)	−2.537*** (−3.02)	1.021*** (3.13)	−1.189 (−1.24)	0.606*** (2.87)	−2.404*** (−2.87)	1.005*** (3.02)	−1.181 (−1.24)	0.604*** (2.86)	−18.644*** (−26.54)	0.991*** (2.95)	−1.055 (−1.08)
_cons	−5.081*** (−9.87)	−12.603*** (−5.02)	−7.047*** (−8.56)	−8.364*** (−4.21)	−5.117*** (−10.23)	−12.465*** (−4.88)	−7.027*** (−8.52)	−8.389*** (−4.20)	−5.152*** (−10.14)	−10.997*** (−4.15)	−6.810*** (−8.66)	−8.404*** (−4.00)
No. of Obs.	19,317				19,293				19,239			
Pseudo R²	0.129				0.129				0.126			

This table shows the coefficient of estimates from the multinomial logit model explaining the determining factors of SWFs' investments, classified according to SWFs' investment scope The dependent variable is a categorical variable (*Scope*) that is set to 1 for saving funds, 2 for reserve investment funds, 3 for multi-objective funds, 4 for development funds, and 0 for the baseline category (companies not targeted by SWFs). T statistics are adjusted for robust standard errors and reported in round brackets. Table A1 provides the definition of variables.

* Statistically significant at 10% level.

** Statistically significant at 5% level.

*** Statistically significant at 1% level.

Table 5
Determinants of the likelihood of being targeted by SWFs (origin of resource classification).

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-commodity	Commodity	Non-commodity	Commodity	Non-commodity	Commodity
Roa	0.011*	0.005				
	(1.82)	(0.63)				
Roi			0.002***	0.001		
			(2.81)	(1.30)		
Roe					0.001***	0.001*
					(4.00)	(1.81)
Log assets	0.048*	0.103***	0.055**	0.104***	0.033	0.098***
	(1.87)	(2.72)	(2.16)	(2.78)	(1.32)	(2.62)
Sales growth	0.000**	0.000	0.000*	0.000	0.000*	0.000
	(1.97)	(0.18)	(1.75)	(0.17)	(1.65)	(0.18)
Leverage	0.006***	0.005***	0.005**	0.005**	0.013***	0.010**
	(2.60)	(2.61)	(2.34)	(2.47)	(4.19)	(2.53)
Intangible assets ratio	0.493**	0.653***	0.494**	0.656***	0.451**	0.614***
	(2.17)	(3.19)	(2.19)	(3.25)	(1.98)	(3.17)
Dividend yield	0.076***	0.074***	0.079***	0.077***	0.079***	0.077***
	(4.89)	(4.78)	(5.04)	(4.93)	(5.03)	(4.92)
Cash assets ratio	0.369	0.055	0.362	0.043	0.524	0.213
	(0.85)	(0.12)	(0.83)	(0.09)	(1.25)	(0.49)
Foreign sales ratio	−0.002	−0.004**	−0.001	−0.004*	−0.001	−0.004**
	(−1.00)	(−1.98)	(−0.78)	(−1.93)	(−0.68)	(−2.08)
Crisis	0.427**	0.696**	0.412*	0.708**	0.455**	0.719***
	(1.98)	(2.48)	(1.89)	(2.55)	(2.11)	(2.59)
Sector	Yes	Yes	Yes	Yes	Yes	Yes
Emerging	0.624***	0.127	0.644***	0.108	0.613***	0.146
	(3.08)	(0.43)	(3.21)	(0.35)	(2.99)	(0.49)
_cons	−5.430***	−6.578***	−5.463***	−6.580***	−5.341***	−6.694***
	(−11.64)	(−10.07)	(−11.93)	(−10.11)	(−11.93)	(−10.01)
No. of Obs.	19,317				19,239	
Pseudo R^2	0.118				0.119	

This table shows the coefficient of estimates from the multinomial logit model explaining the determining factors of SWFs'investments, classified according to the origin of resource invested. The dependent variable is a categorical variable (Origin) that is set to 1 for non-commodity funds, 2 for commodity-based funds, and 0 for the baseline category (companies not targeted by SWFs). T statistics are adjusted for robust standard errors and reported in round brackets. Table A1 provides the definition of variables.

  * Statistically significant at 10% level.
  ** Statistically significant at 5% level.
  *** Statistically significant at 1% level.

Second, we classify target firms based on the SWFs' source of funding and report estimates of the multinomial logit model in Table 5. Interestingly, we identify similarities and differences in terms of how different categories of SWFs choose target firms. In fact, our results demonstrate that both types of funds become more active during crisis periods and target firms that exhibit high leverage, intensity of know-how and dividend yield. Moreover, whereas non-commodity funds are attracted by highly performing firms that operate in emerging countries, commodity funds search for very large firms that exhibit poor internationalization.

5.2. The impact of SWF investments on target firm performance: Are there any differences among SWFs?

In this section, we measure the impact of SWF investments on firm performance using the DD estimation. In Table 6 (from column 1 to column 3), we report the results of estimations performed on the full sample of target firms and the comparison sample.

Starting with *ROA*, as a measure of performance, the positive (0.925) and significant (*t* = 1.75) coefficient of the dummy *Treated* indicates that target firms over-perform control firms prior to the SWF investment. This result is consistent with our estimates in Table 3 and further suggests that SWFs are more attracted by high-profitability firms. The negative and significant (at the 1% confidence level) coefficients of the variables *Time* and *DID* highlight that over the post-investment period, the *ROA* of both target and control firms declines, but there are significant decreases in target firms relative to control firms. Moreover, the coefficients on the firm-specific control variables all have the expected sign, where significant. Specifically, we find that higher total assets and lower leverage are associated with better *ROA*. We also report that firms operating in emerging countries over-perform firms in other countries over the sample period.

It is worth noting that our results are robust to all the performance measures employed (namely, *ROI* and *ROE*, also), providing further evidence that firm performance decreases subsequent SWF investment. From a theoretical perspective, this evidence may 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.

To delve more deeply into this issue, we investigate whether the heterogeneity of SWFs influences the manner in which they

Table 6

Impact of SWFs investments on target firms performance (main group and origin of resource classification).

	SWFs'targets			Non-Commodity			Commodity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Roa	Roi	Roe	Roa	Roi	Roe	Roa	Roi	Roe
Time	−0.247***	−0.492***	−0.567***	−0.248***	−0.493***	−0.567***	−0.255***	−0.505***	−0.593***
	(−3.54)	(−4.89)	(−3.46)	(−3.56)	(−4.90)	(−3.45)	(−3.63)	(−4.98)	(−3.59)
Treated	0.925*	1.422*	1.608	1.644***	2.234***	3.312***	−0.440	−0.139	−1.916
	(1.75)	(1.80)	(1.32)	(3.23)	(2.74)	(2.70)	(−0.42)	(−0.10)	(−0.83)
Did	−1.083***	−1.931***	−2.972***	−1.016***	−1.609***	−3.217***	−1.498**	−2.923***	−3.310**
	(−3.30)	(−4.11)	(−3.26)	(−2.72)	(−2.96)	(−2.97)	(−2.31)	(−3.33)	(−2.07)
Intangible assets ratio	−0.000	−0.001	0.001	−0.001	−0.001	−0.001	0.395*	0.585*	1.262*
	(−0.04)	(−0.16)	(0.21)	(−0.44)	(−0.40)	(−0.12)	(1.82)	(1.83)	(1.90)
Log assets	0.429***	0.578***	1.147***	0.425***	0.574***	1.143***	0.437***	0.588***	1.173***
	(9.09)	(8.76)	(12.19)	(8.96)	(8.65)	(12.08)	(9.10)	(8.77)	(12.24)
Leverage	−0.043***	−0.068***	−0.106***	−0.044***	−0.068***	−0.105***	−0.043***	−0.068***	−0.108***
	(−6.77)	(−7.28)	(−8.87)	(−6.55)	(−7.00)	(−8.72)	(−6.57)	(−7.10)	(−8.89)
Emerging	1.667***	2.218***	1.520***	1.648***	2.174***	1.444***	1.713***	2.271***	1.598***
	(7.76)	(6.77)	(3.15)	(7.61)	(6.58)	(2.97)	(7.78)	(6.77)	(3.23)
Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	−2.408**	4.203*	−4.829*	0.993	0.081	0.095	−0.165	0.629	−6.038
	(−1.96)	(1.75)	(−1.89)	(0.51)	(0.05)	(0.02)	(−0.07)	(0.25)	(−1.56)
No. of obs.	186,564	186,223	185,856	185,253	184,925	184,585	183,984	183,657	183,313
R-squared	0.059	0.059	0.053	0.056	0.058	0.052	0.057	0.059	0.054

This table shows the coefficient of estimates from the difference-in-difference model explaining the effects of SWFs'investments, considered both as a whole and according to the origin of resource classification. The dependent variables are measures of a firm's performance (namely Roa, Roi, and Roe). Time is a dummy variable equals to 1 for all the years after the event date and 0 otherwise. Treated is a dummy variable equals to 1 for firms targeted by a SWF, and 0 otherwise. DID is an interaction variable between Time and Treated. T statistics are adjusted for robust standard errors and reported in round brackets. Table A1 provides the definition of variables.

* Statistically significant at 10% level.
** Statistically significant at 5% level.
*** Statistically significant at 1% level.

monitor target firms and participate in their management.

In doing so, we first classify target firms based on the origin of SWFs' wealth and split them in firms invested by non-commodity funds and commodity-based funds. In Table 6 (from column 4 to column 9), we provide robust evidence that both non-commodity funds and commodity funds are involved in a type of "detrimental activism". Indeed, the variable *DID* exhibits negative and highly significant coefficients regardless of the performance measure employed.

Second, we categorize target firms based on the scope of SWFs. In Table 7, we provide strong evidence that multi-objective funds are involved in a form of activism that generates negative externalities for the investee firms. Indeed, the variable *DID* exhibits a negative and highly significant coefficient in all regressions. In the case of developments funds, the coefficient of the variable *DID* maintains a negative sign, even if the statistical evidence that we provide is lower than multi-objective. Indeed, the coefficient of *DID* is significant at the 5% level only when we regress firm *ROI* and ROA. Finally, in the case of reserve funds and saving funds, we find no evidence or very weak evidence supporting the shareholder activism hypothesis.

5.3. Robustness

One potential issue with the results illustrated in previous section is that *DD* method may not lead to valid estimations if target firms are considerably different from control firms over the pre-investment period. To mitigate this concern, we combine the *DD* estimation to the propensity score matching method developed by Rosenbaum and Rubin (1983). Other studies, such as Bertrand and Zitouna (2008) and Boubakri et al. (2016b), use a similar approach to deal with analogous selection bias issues. The main strength of the propensity score matching technique is its aptitude to identify a control group without marked differences, in terms of observable characteristics, with treated firms. In our case, the propensity score is a probability that a firm will be targeted by a SWF conditional on a set of independent variables.

Specifically, the matching algorithm starts with the estimation of a logit model for the endogenous choice variable (SWF investment = 1 for target firms, 0, otherwise) with a vector of X variables. We choose as independent variables of the model: total assets and sales growth over the pre-investment period and the dummy *Emerging*. The second step consists in estimating for all sample firms the propensity score. Finally, for each target firm we select the matching firm with the closest propensity score (*nearest-neighbor matching*). However, if no untreated firms have propensity scores that lay within the specified caliper distance (i.e., 0.2 standard deviation) of the propensity score of the target firm, that target firm is dropped from the sample. This strict selection criterion leads us to exclude 129 investment events in 100 unique target firms because no matching firm is found.

Table 7
Impact of SWFs investments on target firms performance (investment scope classification).

	Saving			Reserve			Multi-objective			Development		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Roa	Roi	Roe	Roa	Roi	Roe	Roa	Roi	Roe	Roa	Roi	Roe
Time	−0.262***	−0.515***	−0.613***	−0.340***	−0.628***	−0.866***	−0.325***	−0.605***	−0.818***	−0.265***	−0.519***	−0.623***
	(−3.69)	(−5.02)	(−3.65)	(−4.60)	(−5.90)	(−5.10)	(−4.43)	(−5.72)	(−4.81)	(−3.71)	(−5.02)	(−3.65)
Treated	0.670	0.620	0.147	3.312	4.933	8.748	1.586**	2.755**	2.425	−3.814	−5.277	−8.837
	(1.06)	(0.64)	(0.10)	(1.56)	(1.58)	(1.43)	(2.26)	(2.40)	(1.41)	(−0.97)	(−1.00)	(−0.95)
Did	−0.759	−1.431**	−1.871	0.746	−0.023	0.789	−1.914***	−3.118***	−5.918***	−2.843**	−5.387**	−5.884
	(−1.47)	(−2.12)	(−1.37)	(0.38)	(−0.01)	(0.13)	(−2.93)	(−3.32)	(−3.09)	(−2.38)	(−2.51)	(−1.48)
Intangible assets ratio	0.618	0.931	2.011	3.710***	5.466***	11.802***	3.141***	4.595***	10.045***	0.749	1.102	2.320
	(1.40)	(1.44)	(1.50)	(5.20)	(5.48)	(8.06)	(4.62)	(4.76)	(6.29)	(1.34)	(1.34)	(1.32)
Log assets	0.436***	0.589***	1.174***	0.475***	0.647***	1.310***	0.467***	0.634***	1.283***	0.438***	0.592***	1.185***
	(9.03)	(8.72)	(12.10)	(9.41)	(9.16)	(13.02)	(9.34)	(9.07)	(12.80)	(8.97)	(8.65)	(11.96)
Leverage	−0.044***	−0.069***	−0.107***	−0.047***	−0.073***	−0.120***	−0.046***	−0.072***	−0.118***	−0.043***	−0.068***	−0.108***
	(−6.43)	(−6.90)	(−8.80)	(−6.32)	(−6.77)	(−9.94)	(−6.40)	(−6.86)	(−9.79)	(−6.47)	(−6.98)	(−8.78)
Emerging	1.719***	2.269***	1.618***	1.959***	2.616***	2.372***	1.910***	2.552***	2.254***	1.720***	2.263***	1.601***
	(7.77)	(6.74)	(3.23)	(8.46)	(7.47)	(4.67)	(8.37)	(7.37)	(4.43)	(7.61)	(6.58)	(3.11)
Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	−2.330*	0.285	−3.344	−0.677	−4.849	−8.311	−1.933	−1.539	−8.057	−2.654	−2.270	−6.138
	(−1.76)	(0.16)	(−1.21)	(−0.00)	(−1.01)	(−0.00)	(−1.18)	(−0.37)	(−1.37)	(−0.72)	(−0.43)	(−0.00)
No. of obs.	184,598	184,270	183,943	182,802	182,488	182,166	183,595	183,275	182,950	182,890	182,574	182,245
R-squared	0.057	0.058	0.054	0.060	0.062	0.061	0.060	0.062	0.060	0.057	0.059	0.055

This table shows the coefficient of estimates from the difference-in-difference model explaining the effects of SWFs'investments, according to the investment scope classification. The dependent variables are measures of a firm's performance (namely Roa, Roi, and Roe). Time is a dummy variable equals to 1 for all the years after the event date and 0 otherwise. T statistics are adjusted for robust standard errors and reported in round brackets. Treated is a dummy variable equals to 1 for firms targeted by a SWF, and 0 otherwise. DID is an interaction variable between Time and Treated. Table A1 provides the definition of variables.

* Statistically significant at 10% level.
** Statistically significant at 5% level.
*** Statistically significant at 1% level.

Table 8

Difference and difference regression combined to the propensity score matching method (main group and origin of resource classification).

	SWFs'targets			Non-Commodity			Commodity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Roa	Roi	Roe	Roa	Roi	Roe	Roa	Roi	Roe
Time	−0.267	−0.657	−1.247	−0.347	−0.719*	−1.321*	−0.218	−0.587	−1.061
	(−0.97)	(−1.61)	(−1.63)	(−1.29)	(−1.79)	(−1.74)	(−0.81)	(−1.46)	(−1.41)
Treated	1.863***	2.629***	3.407**	2.203***	3.200***	4.400***	1.200	1.614	1.172
	(2.76)	(2.66)	(2.25)	(3.43)	(3.28)	(2.78)	(1.04)	(0.98)	(0.49)
Did	−1.120***	−1.643**	−1.893	−0.982**	−1.356*	−2.396*	−1.339**	−2.230***	−1.092
	(−2.64)	(−2.58)	(−1.54)	(−2.02)	(−1.88)	(−1.69)	(−2.34)	(−2.67)	(−0.64)
Intangible assets ratio	0.075*	0.123**	0.274***	0.124*	0.178**	0.288*	0.069*	0.134**	0.356***
	(1.88)	(2.44)	(2.83)	(1.80)	(2.12)	(1.89)	(1.67)	(2.21)	(3.39)
Log assets	0.509***	0.664***	1.233***	0.506***	0.663***	1.226***	0.568***	0.723***	1.396***
	(3.96)	(3.80)	(5.02)	(3.57)	(3.44)	(4.77)	(3.82)	(3.60)	(5.20)
Leverage	−0.040***	−0.068***	−0.182***	−0.062***	−0.094***	−0.153***	−0.040***	−0.070***	−0.205***
	(−2.95)	(−3.81)	(−6.06)	(−5.22)	(−4.95)	(−4.99)	(−2.39)	(−3.15)	(−6.08)
Emerging	1.814***	2.873***	3.439***	1.622***	2.465***	2.712**	2.300***	3.552***	4.431***
	(3.69)	(3.88)	(3.11)	(3.17)	(3.16)	(2.32)	(3.74)	(3.88)	(3.44)
Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	−8.416*	3.972	7.398	−7.459	5.724	−19.912*	0.564	−12.870*	−26.017**
	(−1.85)	(0.86)	(1.04)	(−1.64)	(0.96)	(−1.65)	(0.15)	(−2.05)	(−2.20)
No. of Obs.	6527	6504	6476	5450	5433	5425	4415	4402	4385
R-Squared	0.123	0.135	0.105	0.131	0.135	0.104	0.143	0.155	0.130

This table shows the coefficient of estimates from the difference-in-difference model explaining the effects of SWFs'investments, considered both as a whole and according to the origin of resource classification. The dependent variables are measures of a firm's performance (namely Roa, Roi, and Roe). Time is a dummy variable equals to 1 for all the years after the event date and 0 otherwise. T statistics are adjusted for robust standard errors and reported in round brackets. Treated is a dummy variable equals to 1 for firms targeted by a SWF, and 0 otherwise. DID is an interaction variable between Time and Treated. Table A1 provides the definition of variables.

 * Statistically significant at 10% level.
 ** Statistically significant at 5% level.
 *** Statistically significant at 1% level.

In Table 8 (from column 1 to column 3) we report results of estimations performed on the sample post-propensity score matching. Overall, these findings are in line with those presented in Table 6, confirming that in average SWFs have a negative effect on target firm performance. Indeed, the coefficient of the variable *DID* continues to show a negative coefficient, maintaining its statistical significance when we regress firm *ROA* and *ROI*.

Furthermore, in Table 8 (from column 4 to column 9) we provide additional evidence that the origin of SWFs' wealth is a characteristic that does not enable us to capture marked differences on the manner in which SWFs manage investee firms. In fact, the variable *DID*, except for column 9, exhibits negative and significant coefficients for both commodity and non-commodity funds.

Finally, in Table 9, we find, once again, significant evidence that multi-scope funds are involved in a form of activism, which has negative consequences for the target firms. Indeed, the variable *DID* exhibits a negative and significant coefficient (at 5% level or less) in all regressions. Moreover, compared to results reported in Table 7 and discussed in previous section, we find weaker evidence that developments funds playing an active role in the investee firms negatively effects their performance. In effect, the coefficient of *DID* is significant at the 5% just when we regress firm *ROI*. Finally, in the case of reserve funds and saving funds we find no evidence supporting the shareholder activism hypothesis.

6. Discussion

The results of the current study provide several insights regarding the determinants and effects of investments for different SWFs categories.

Prior investigations arrive at opposing results about drivers of SWFs' investments. Some authors indicate poorly performing firms as targets of SWFs (e.g. Kotter and Lel, 2011; Fernandes, 2014), whereas others support the opposite position (e.g. Ferreira and Matos, 2008; Bortolotti et al., 2015; Boubakri et al., 2016a). This means that the empirical evidence may be divided among extra-financial reasons and financial motivations for SWFs decision-making.

The contrasting findings above may be due to SWFs' heterogeneity. In light of this, we analyse the investment determinants by splitting SWFs into categories according to theoretical objectives and the funding source.

Relative to the first categorization criteria, our findings confirm the existence of significant differences among SWFs categories. More specifically, saving SWFs and reserve investment corporations are both attracted by higher-performing firms, with a greater magnitude in the case of reserve funds. Therefore, governments seem to establish these separate entities to pursue investment policies to achieve higher returns. At the same time, the long-term objective of wealth sharing across generations supports the search for more

Table 9
Difference and difference regression combined to the propensity score matching method (investment scope classification).

	Saving			Reserve			Multi-objective			Development		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Roa	Roi	Roe	Roa	Roi	Roe	Roa	Roi	Roe	Roa	Roi	Roe
Time	−0.277	−0.658*	−1.175	−0.427	−0.816**	−1.439*	−0.293	−0.623	−1.050	−0.348	−0.708*	−1.438*
	(−1.04)	(−1.65)	(−1.54)	(−1.62)	(−2.07)	(−1.91)	(−1.12)	(−1.59)	(−1.41)	(−1.24)	(−1.71)	(−1.87)
Treated	2.033***	2.381**	2.463	3.537	5.067	8.593	2.630***	3.985***	4.864**	−3.468	−5.045	−6.186
	(2.73)	(2.20)	(1.34)	(1.64)	(1.52)	(1.22)	(3.08)	(2.99)	(2.51)	(−0.93)	(−0.99)	(−0.70)
Did	−0.629	−0.754	−0.343	1.618	2.195	5.686	−1.799**	−2.508**	−4.751**	−1.613	−3.777**	−0.644
	(−1.20)	(−0.98)	(−0.22)	(0.64)	(0.57)	(0.79)	(−2.57)	(−2.52)	(−2.27)	(−1.12)	(−2.28)	(−0.14)
Intangible assets ratio	0.061*	0.120**	0.261***	4.212	6.227*	13.495***	0.725**	0.861**	2.654***	0.875	1.880	10.428*
	(1.70)	(2.45)	(3.13)	(1.62)	(1.78)	(2.81)	(2.45)	(2.07)	(3.27)	(0.32)	(0.51)	(1.93)
Log assets	0.507***	0.663***	1.192***	0.642***	0.832***	1.564***	0.528***	0.664***	1.275***	0.601***	0.781***	1.694***
	(3.48)	(3.38)	(4.59)	(3.78)	(3.61)	(5.42)	(3.46)	(3.21)	(4.88)	(3.50)	(3.35)	(5.73)
Leverage	−0.082***	−0.127***	−0.140***	−0.103***	−0.149***	−0.181***	−0.063***	−0.093***	−0.184***	−0.035**	−0.062***	−0.202***
	(−6.67)	(−7.03)	(−4.39)	(−8.45)	(−8.30)	(−5.66)	(−4.36)	(−4.20)	(−6.00)	(−2.11)	(−3.08)	(−6.03)
Emerging	2.040***	2.805***	2.817**	2.650***	3.772**	3.538**	2.184***	3.531***	4.597***	1.693**	2.527**	3.241**
	(3.59)	(3.41)	(2.36)	(3.77)	(3.59)	(2.50)	(3.67)	(3.81)	(3.33)	(2.18)	(2.25)	(2.24)
Sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	5.735	7.124	−22.904**	−3.223	−10.551**	−26.713***	−7.975	−7.923	−19.910	−11.924**	0.476	−34.159**
	(1.17)	(1.20)	(−2.06)	(−0.86)	(−1.98)	(−3.24)	(−1.64)	(−1.17)	(−1.57)	(−2.13)	(0.06)	(−2.40)
No. of Obs.	4916	4902	4904	3434	3427	3425	4117	4105	4104	3524	3515	3509
R-Squared	0.138	0.138	0.099	0.178	0.177	0.147	0.153	0.162	0.145	0.144	0.158	0.150

This table shows the coefficient of estimates from the difference-in-difference model explaining the effects of SWFs'investments, according to the investment scope classification. The dependent variables are measures of a firm's performance (namely Roa, Roi, and Roe). Time is a dummy variable equals to 1 for all the years after the event date and 0 otherwise. T statistics are adjusted for robust standard errors and reported in round brackets. Treated is a dummy variable equals to 1 for firms targeted by a SWF, and 0 otherwise. DID is an interaction variable between Time and Treated. Table A1 provides the definition of variables.

* Statistically significant at 10% level.
** Statistically significant at 5% level.
*** Statistically significant at 1% level.

profitable firms by saving SWFs. The latter are vehicles that transform non-renewable assets into diversified portfolios of international highly performing assets to provide for future generations. Furthermore, in terms of controls, reserve and saving SWFs are both higher risk takers, due to the positive association between the investment decision and the level of leverage of target firms.

On the opposite side, we find development and multi-objective SWFs. In these cases, in fact, the higher profitability of investee companies is not a driver, thus supporting the thesis that SWFs may choose their investment objectives on the basis of extra-financial reasons, such as strategic and geo-political issues. Development and multi-objective SWFs are able to invest independently from profitability standards of target companies at the time of entry. In exchange, they achieve diversification objectives with respect to the country of origin and acquire political weight. The latter can be obtained by funding socio-economic projects, as in the case of development SWFs. This result is consistent with the additional evidence of non-significant interest in dividend payouts of target firms. Development funds support the hypothesis that SWFs do not need additional cash, as they are fully funded by surpluses and government inputs. In turn, they are not attracted to dividend-paying firms at the time of target selection. Development SWFs probably have sufficient liquidity to be financially self-sufficient. This permits acceptance of a long-term investment perspective, such as investing in infrastructure projects. Development SWFs are likely more patient than other investors, and their financial resources can support investment programs that require more time. As development objectives are frequently associated with those of stabilization or saving funds (Al-Hassan et al., 2013), this can explain why the behaviour of multi-objective SWFs is similar to that of development funds.

In terms of the risk/return trade-off, development SWFs and multi-objective SWFs are less efficient than saving and reserve funds. In fact, whereas all these categories appear to be interested in more highly leveraged firms, only the last two categories exhibit a preference for higher profitability, consistent with a higher financial risk. Hence, the political agenda conditions the asset allocation of multi-objective and development funds from the perspective of a neutral preference for profitability of investee companies more than the targets of reserve and saving SWFs.

If we adopt a different categorization criterion that considers the origin of funding, a dichotomy emerges. That is, non-commodity SWFs prefer to invest in highly performing firms, whereas commodity SWFs are not significantly interested in the operating performance of investee companies. Commodity SWFs act as financial vehicles whose aim is to insulate the budget of their countries from volatile prices of a commodity such as oil. This main objective does not seem to coincide with the search for more profitable firms. Conversely, the risk/return trade-off appears less efficient than for non-commodity SWFs. In fact, independent of whether the origin of funding is a commodity, the level of leverage of target companies is a positive determinant of capital allocation.

Therefore, all the categories included in our analysis accept high financial risk, but only the objectives of reserve and saving funds, or non-commodity funds, seem to be consistent with a more efficient combination between higher risk and better operating performance of targets.

The overall findings allow us to answer the first research question of the current study. That is, from the standpoint of investment determinants, the analysis by categories of SWFs reveals meaningful differences in the results, thus confirming the treatment of SWFs as non-monolithic investors. In contrast with prior literature, we have adopted this innovative approach based on a firm-level perspective of investment decisions.

For controls, an additional result worthy of discussion is the size of targets. In this case, the behaviour is homogenous among SWF categories. In fact, independently from the classification, the size of investee companies is a positive determinant of selection. The finding is relevant due to the space that this target characteristic occupies within the debate about SWFs' behaviour and publicity. In particular, different from prior literature (Boubakri et al., 2016a), the analysis by categories reveals a preference for larger firms. Hence, our finding does not support the thesis that SWFs are likely to face less pressure from capital markets than other financial agents. Indeed, they certify their investments also through the size of deals. Given the organizational structure, the economy of scale related to the dimension of the investment is likely a factor in their decision making, consistent with more conventional institutional investors. Moreover, all the categories of SWFs that we have investigated certify their prestige and reputation through the sizes of the target firms, in contrast with a theoretical need for greater discretion and less media attention through investment in smaller targets.

The additional focus of the current study is the changes in operating performance after SWF investments. Here again, prior literature reports opposing findings that range from a neutral effect (e.g. Kotter and Lel, 2011) to worse (e.g. Bortolotti et al., 2015) or better (Fernandes, 2014) performance. Therefore, by splitting the sample based on several firm-level characteristics of SWFs, we aimed to obtain a more comprehensive picture of the stake management approach.

First, regardless of whether we classify SWFs based on the origin of funding, the results reveal a non-efficient form of activism. In fact, the operating performance of targets would have been better in absence of SWF investment.

Second, to better discern the effect of SWFs on targets, our analysis considers the categorization of Al-Hassan et al. (2013) and Kunzel et al. (2011) based on objectives and investment styles. In this case, the results are twofold. More specifically, in the case of targets of saving and reserve funds, the level of profitability remains substantially unchanged following the deal. This result suggests a passive role of SWFs, as they do not seem to trigger positive or negative changes in several accounting-based measures of target firm profitability. Hence, relative to the evidence of Kotter and Lel (2011), our findings indicate that the shareholder activism is not common among saving and reserve SWFs categories. Instead, regarding multi-objective funds and development SWFs, the evidence is different. In both cases, SWFs do not prevent performance deterioration of target firms after the time of the investment. Conversely, the profitability of such firms worsens during the years following the participation in equity capital. Therefore, these findings allow us to answer to the second research question of the current study by evidencing the existence of diverse effects on targets for different SWFs categories.

Summarizing, as a whole, the results of the current study confirm the usefulness of SWF categorization to bring out more precise information in terms of both the determinants and consequences of SWFs' investments, thus confirming that SWFs are not a

monolithic entity. The full sample analysis reveals results that change when we split SWFs into different classes. As a consequence, we can argue that SWF categorization matters.

7. Conclusions

SWFs have increased their financial weight in capital markets, and they are larger than other institutional investors, such as hedge funds and private equity funds. The foreign government ownership of SWFs and problems of transparency are concerns for recipient countries. Accordingly, these investors have drawn increasing interest from academics and policymakers. However, inconclusive results reported in the prior literature have solicited new approaches to understand the determinants and effects of SWFs investment.

The current study comprehensively analyses SWF screening strategies and the changes in the operating characteristics of target firms after deals by distinguishing SWFs in several categories according to firm-level characteristics. This approach is partially adopted in previous analyses (e.g. Kotter and Lel, 2011; Boubakri et al., 2017) that do not take into account differences among the objectives and investment styles of SWFs.

From the standpoint of investment decisions, our findings confirm the heterogeneity of SWFs. In fact, whereas saving and reserve funds are attracted by highly performing target firms, we cannot say the same for development and multi-objective funds. For the latter, in fact, high profitability of targets does not enhance the probability of being selected by these categories of SWFs. Hence, in the case of saving and reserve finds, economic drivers seem to prevail over what we conventionally call the political agenda. Conversely, the opposite happens in the case of development and multi-objective funds, for which the scant interest in the best-performing firms probably allows SWFs to mitigate political controversies and opposition in host countries. Furthermore, the origin of funding makes the difference in terms of preference for profitability of targets. So, by comparing the different criteria for SWF categorization, the distinction based on the objectives and investment style of SWFs and the commodity/non-commodity split lead to variation of investment determinants of SWFs.

From the standpoint of the evolution of firm-specific characteristics after deals, the SWF categorization play a role. First, if we limit the categorization to the origin of wealth, all the targets worsen their operating performance following the deal. Therefore, to better discern what makes the difference in terms of the impact on targets, categorization by objectives and investment approaches allows to verify differences among active and passive roles of SWF subgroups. That is, saving and reserve SWFs are not engaged in management of investee companies, in contrast with development and multi-objective SWFs, whose political aims probably encourage some agency conflicts and an inefficient monitoring function.

As a whole, saving and reserve SWFs pick winners without interference with the management of targets. Conversely, development and multi-objective SWFs are driven by alternative motives that impede preventing deterioration of target firms' performance following the deal.

The overall results have practical and theoretical implications. SWFs are a stand-alone and non-homogeneous category of investor. In choosing poorly performing firms, development and multi-objective funds seem similar to institutional investors. The same result holds if we examine the changes in operating performance after a deal. On the opposite side, saving SWFs and reserve investment corporations may be silent investors that support the competitiveness of the best-performing firms, thus playing a complementary role within the landscape of institutional investors. From a theoretical perspective, these different approaches to selection and management of stakes in investee companies contribute to explain the existence of mixed results in prior studies about the determinants and effects of SWFs.

Further investigations may continue to shed light on debated questions, such as activism and value creation of SWFs. Differences in the cultural contexts of holdings can provide additional explanatory motives for different impacts among SWFs categories. We believe that a future research agenda could consider these aspects in order to advance the state of knowledge about SWFs.

Declaration of interest

None.

Appendix A. Appendix

Table A1
Description of variables.

Variables	Description
SWF investiment	Dummy variable equal to 1 if the firm is targeted by a SWF and 0 otherwise.
Scope	Categorical variable equal to 1 for saving funds, 2 for reserve investment funds, 3 for multi-scopefunds, 4 for development funds
Origin	Categorical variable equal to 1 for non-commodity funds, 2 for commodity funds
Roa	Net Income divided by total assets
Roi	Net income divided by total capital
Roe	Net Income divided by common equity
Log assets	Log transformation of the total assets
Sales growth	The increase in sales over 1 year
Leverage	Total Debt divided by total capital

Table A1 (*continued*)

Variables	Description
Intangible assets ratio	Intangible assets divided by total assets
Dividend yield	The dividend per share as a percentage of the share price
Cash assets ratio	Cash assets divided by total assets
Foreign sales ratio	International Sales divided by total sales
Crisis	A dummy variable, which is set on 1 for years of financial crisis.
Emerging	A dummy variable, which is set on 1 if the firm's headquarter is in an emerging market economy

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