UNIVERSITY OF ECONOMICS, PRAGUE

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FOREIGN DIRECT INVESTMENT DRIVEN BY THE SOVEREIGN WEALTH FUNDS AND ITS IMPACT ON THE MARKET VALUE OF THE ACQUIRED COMPANIES

Dissertation Thesis

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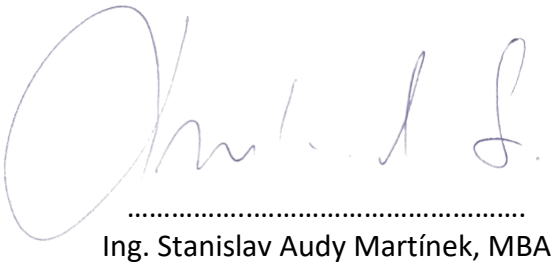
Declaration

I hereby declare that this thesis is the results of my own work and effort. Where other sources of information have been used, they have been acknowledged.

Prague, September 2019



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Ing. Stanislav Audy Martínek, MBA

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This dissertation summarizes the outcomes of the past four years of my research endeavor in international economics and finance.

From the very beginning, this journey has been guided and strongly supported by my advisor Josef Taušer to whom I would like to express my utmost gratitude for his professional supervision, expert analysis, and his patient and positive approach.

The crucial part of the research would not have been possible to be carried out without the generous financial contribution provided by the Faculty of the International Relations at the University of Economics, Prague, for which I am much thankful.

Finally, and most importantly, I would like to take this opportunity to thank my wife for her endless encouragement, expert consultancies, and an immense amount of patience.

Motto:

"Globalization has not only disturbed the balance of power between the US and the rest of the world, but it has also altered the balance of power between the public and the private sectors. One channel through which the public sector will gain influence over the financial markets is Sovereign Wealth Funds (SWF)." (Jen, 2007: p. 1).

ABSTRACT

The sheer value of the capital allocated in the Sovereign Wealth Funds (SWF), its continuous growth, and its potential to impact global financial markets with direct political and economic consequences sharply contrast with the scarce information on the funds' financial performance, investment strategies, and overall strategic intentions. This palpable knowledge gap represents the primary motivation behind the research endeavor, whose results are presented in this thesis.

Based on an originally collected dataset comprised of the SWFs cross-border investment transactions, we designed a comparative research model to investigate sovereign wealth funds' long-term impact on the market value of targeted companies. The results signal that the initial positive impact of SWFs on investee performance disappears and the investees tend to underperform the market average in the long run. Next, we employ a comparative analysis of sovereign funds' real rates of return, and the theoretical returns achievable on assets accumulated in international reserves. The results show that, from 2007 to 2017, sovereign funds' returns outperformed the theoretical returns of international reserves by almost two percentage points.

The last chapter takes the form of a case study that focuses on the influential role SWFs play in supporting national champions in strategic industries. We confirm the unique advantages provided by this model. Despite its economic and political potential, this model involves major risks, especially in times of economic recession, when a substantial government fiscal deficit can have a devastating impact on a whole industry and simultaneously lead to severe damage to the international relationships.

Keywords

Sovereign Wealth Funds; Cross-border Investment; Impact Analysis; Profitability; International Reserve; Financial Economics

ABSTRAKT

Rostoucí objem kapitálu alokovaný ve státem vlastněných investičních fondech (SIF), který v roce 2018 přesáhnul hodnotu sedmi bilionů USD a jeho potenciální dopad na globální finanční trhy ostře kontrastuje s množstvím a kvalitou dostupných informací o samotném fungování SIF, finančních výsledcích fondů a jejich dlouhodobé investiční strategii. Identifikovaná znalostní mezera představuje primární motivaci pro výzkumnou činnost, jejíž výsledky jsou prezentovány v této dizertační práci.

Stěžejní část práce tvoří originální databáze mezinárodních investičních transakcí SIF a návrh výpočtového modelu umožňujícího srovnání dlouhodobého vývoje hodnoty společností s vlastnickým podílem SIF s tržním průměrem. Výsledné výpočty naznačují, že počáteční pozitivní dopad SIF se v průběhu času vytrácí a v pětiletém horizontu se hodnota společností s podílem SIF propadá pod tržní průměr.

Druhá část práce se zabývá porovnáním míry návratnosti finančních prostředků alokovaných ve SIF s teoretickou výnosností dosažitelnou u porovnatelných finančních aktiv, která jsou součástí mezinárodních rezerv. Výsledné hodnoty ukazují, že v období mezi roky 2007-2017 výnosnost SIF překonala teoretické výnosy porovnatelných aktiv mezinárodních rezerv o téměř dva procentní body.

Závěrečnou část práce tvoří případová studie demonstrující významnou roli, kterou mohou SIF potenciálně sehrát v případě podpory vybrané státní společnosti, eventuálně celého strategického průmyslového sektoru. Navzdory identifikovaným výrazným ekonomickým i politickým benefitům tohoto modelu, práce upozorňuje na významná rizika, která jsou obzvlášť závažná v případě dlouhodobé ekonomické recese, kdy schodek státního rozpočtu může mít devastující dopad na takto podpořený průmyslový sektor a současně vést k dlouhodobému poškození mezinárodních vztahů.

Klíčová slova:

Státní investiční fondy; Přímé zahraniční investice; Mezinárodní rezerva; Finanční ekonomie

CONTENTS

INTRODUCTION – SELECTION OF RESEARCH AREA

Sovereign Wealth Funds (SWFs) are a subset of the larger group of institutional investors. The fundamental difference between SWFs and other institutional investors, such as pension funds, endowments, and hedge funds, lies in the origin of their capital. If a fund's capital is provided solely by a sovereign state, it can be considered an SWF, and specific factors not common to other institutional investors may influence the fund's operations, investment strategies, long-term priorities, and overall strategic decision-making process.

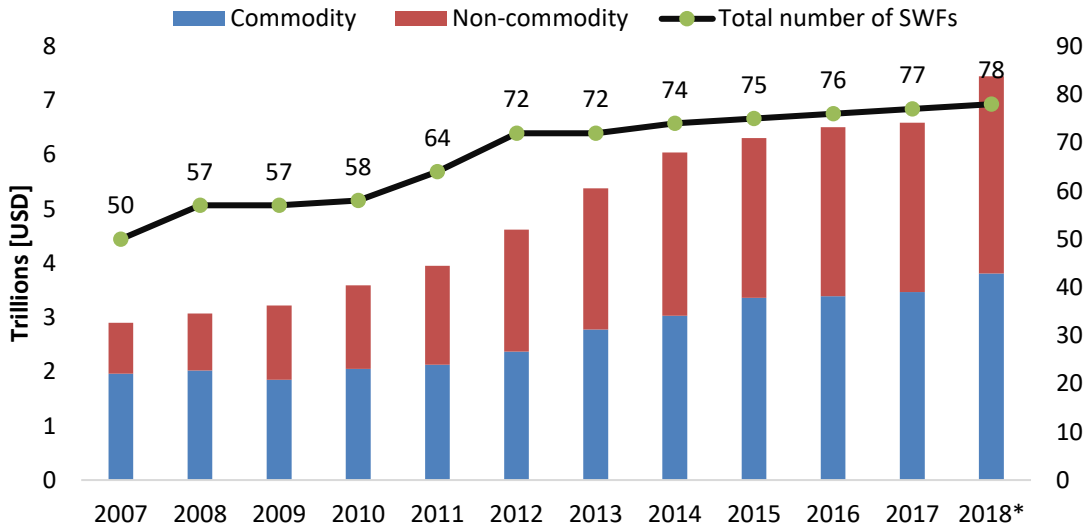

Figure 1: Sovereign Wealth Funds Assets Under Management and Number of Active Funds Worldwide

The total amount of assets under management (AUM) of SWFs has soared from $2 trillion in 2005 to $7.45 trillion in 2017, as pictured in Figure 1 (Preqin, 2018). In terms of assets, sovereign wealth funds are twice as large as the entire global hedge fund market, which was estimated to be $3.55 trillion in 2017. The AUM of SWFs is more than two and a half times that of the private equity market, which was estimated to be $2.83 trillion in 2017 (Preqin, 2018)[1].

[1] As of March, 2018.

Given the enormous amount of AUM[2] held by SWFs, and the limited transparency of these funds[3] (Aggarwal and Goodell, 2018; Al-Hassan et al., 2013; Stone and Truman, 2016, WIR, 2014[4]; Truman, 2007) it is no surprise that SWFs are attracting ongoing attention. The evident gap between the potential impact of the state-owned funds on global financial markets and the limited public information or inconsistency of research results presented by academia characterizes primary motivation for the research endeavor whose results we present in this thesis.

The area for research on sovereign wealth funds is immense, as demonstrated later in chapter one. Therefore, a careful selection of researched topics is required.

We narrowed down the plausible research area by searching for research results' inconsistencies in the rigorous theoretical, conceptual, or empirical articles. Simultaneously, we focused on "hic sunt leones" research areas not approached by academia, mostly due to a critical lack of data availability.

The meta-analysis report on state-owned investment funds resulted in defining grounds for three research sub-areas with the strongest potential for a contribution to the body of knowledge on the global phenomena of sovereign wealth funds.

(i) The net long-term impact of SWFs on firms' values and operating performances

(ii) The motivation for transferring international-reserve funds to sovereign wealth funds

(iii) SWFs' additional contributions to their national economies

In each of these three sub-areas, we identified a substantial knowledge gap. Essentially, narrowing down these gaps represents the crucial purpose of this thesis.

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[2] SWFs that invest primarily in commodity producers have experienced various strains since the pronounced fall in commodity prices from 2014 to 2016 (Al-Hassan et al., 2018). In 2018, the AUM of non-commodity-based SWFs is almost half of the global AUM of all SWFs (Preqin, 2018).

[3] The Government Pension Fund of Norway and a handful of significantly smaller (in terms of AUM) sovereign wealth funds, e.g., New Zealand's Superannuation Fund, Australia's Future Fund, and Ireland's Strategic Investment Fund, are well documented exceptions.

[4] World Investment Report, United Nation Conference on Trade and Development (UNCTAD)

Structure of the Thesis

The structure of the thesis closely follows the identified knowledge gaps.

In Chapter One a meta-analysis report provides a comprehensive insight into the current state of knowledge on the subject of sovereign wealth funds and define the theoretical grounds for the hypothesis, testable predictions and research analysis presented in the following chapters.

Chapter Two addresses the substantial inconsistencies identified in the seminal works aimed at analyzing the net long-term impact of SWFs on firms' values. We approach this issue with designing an innovative research model we then use for an empirical analysis of an original dataset comprised of SWFs' cross-border investment transactions.

Chapter Three suggests an experimental approach to comparative analysis on SWFs profitability and presents the analysis results for the selected group of SWFs representing almost 50% of assets managed by SWFs.

Chapter Four discusses the additional contributions of SWFs' to their national economies, which we did not find to be associated with SWFs in the literature. On the example of the Russian SWFs who serves as a financial guarantee authority supporting the state-owned corporation in order to subsidize the vital national industry, we present strong evidence of this SWFs' strategic role.

In the final section of the thesis, we summarize the research results presented in the previous four chapters. We discuss the results' impact on the current body of knowledge, its explanatory power, and its limitations. Finally, we provide future research suggestions and recommendations.

Development of Hypothesis

The Long-term Impact of Sovereign Wealth Funds on Firms' Value

Sovereign wealth funds, with their extensive assets and lack of explicit liabilities, are generally associated with investment strategies built on a long investment horizon and. Therefore, SWFs almost entirely fulfill the definition of a patient, long-term, focused shareholder that was envisioned in corporate-governance literature by Shleifer and Vishny (1986). Such an investor has both power and motivation to monitor portfolio-firm managers, discipline under-performers, and sustain firm value creation in the long run. Given this theoretical presumption, sovereign wealth funds should, therefore, bring higher value to investees compared to private investors who operate on presumably shorter runs.

This hypothesis is consistent with the research assumptions provided by Dewenter, Han and Malatesta (2010); Fernandes (2014); Bortolotti, Fotak and Loss (2017); or Park, Xu and In (2018).

To evaluate our research results, we established three testable predictions: (i) SWF investments in a targeted firm are expected to increase firm value. This positive effect should be even higher than provided by private investors; (ii) this impact of SWFs on investees' market value should be directly related to the extent of SWF involvement. This relationship can be measured by the size of the stake acquired; (iii) sovereign wealth funds with more transparent governance are expected to deliver proportionally higher added value to investees.

The Motivation for Transferring International Reserve Funds to Sovereign Wealth Funds

The upward trend in the asset accumulation in SWFs is adequately documented by both international financial authorities and academia. The root cause of this trend, however, has attracted limited attention compared to the other research areas which are, in many cases, derived from the previously published literature on large shareholders.

The question still untouched by academia is whether there is a research methodology allowing us to measure and evaluate the contribution of SWFs to the economy. Closest to our subject of interest is recent paper by Amar, Lecourt and Kinon (2018) who test the relationship between the emergence of SWFs and (i) excess foreign exchange reserves; (ii) the volatility of commodity prices and (iii) the appreciation of the real exchange rate.

In our research, mostly due to brevity reasons, we focus solely on SWFs profitability. Similarly to Aguilera, Capapé and Santiso (2016), Balding (2012) or Fernandes (2017) we assume that the potential financial premium delivered by SWFs to national economics represents the primary motivation for countries to establish a sovereign wealth funds Nevertheless, we did not identify any evidence, backed by an empirical research, supporting this hypothesis.

Given the recognized knowledge gap, we aim to contribute to the body of knowledge on SWFs by (i) developing a simplified model to quantify return rates on funds with potential to be transferred to SWFs, (ii) quantifying average real rates of return achieved by SWFs on their investment portfolio, and (iii) providing a comparative analysis of average SWFs real rates of return, with theoretical returns of selected assets allocated in the IR.

Sovereign Wealth Funds–Specific Role in the Economy

The political motivation behind establishing a sovereign wealth fund does not need to be driven strictly by profit maximization of available funds. Politicians can pursue a combination of objectives. Some recent studies, such as Grigoryan (2016), document examples of sovereign wealth funds that serve as a tool for maximizing political power or as a proxy for funneling public resources for private benefit. Another example can be politically driven effort to provide support to the selected industries with strong strategic potential for the national economy or acquiring access to technology or natural resources as suggested by Collier et al. (2011) and Balding (2012), or additional foreign policy and geopolitical agendas documented by Cohen (2009) or Kaminski (2017).

In the process of the literature review aimed primarily at the SWFs impact analyses, we documented a strong relationship between the Russian sovereign wealth funds and Rosatom—the Russian Federation National Nuclear Corporation. To our knowledge, there is no literature on the subject of sovereign wealth funds aimed at its role as a direct funding vehicle and financial guarantee authority supporting the state-owned corporation in order to subsidize the vital national companies or an entire industry. As we did not find sufficient data to support this hypothesis via another than Russian example, we decided to approach this SWFs sovereign wealth fund's role via case study elaborated in the last chapter of this thesis.

CHAPTER 1: SOVEREIGN WEALTH FUNDS – STATE CAPITALISM ON THE RISE

1.1 Introduction

At the beginning of the twenty-first century, the world was experiencing a continuing way of privatizations supported by market-oriented reforms. This shift from state-ownership was most evident in reducing numbers of state-owned enterprises as pointed out by Megginson (2017).

Just one decade later, we see a substantial change in the international political and economic environment. The vast amount of capital allocated in international reserves is being transferred to state-owned investment funds with limited or no transparency requirements. An upsurge in global oil prices provides additional funds to oil companies wholly owned by autocratic regimes. Moreover, this shift toward state capitalism is essentially magnified by the economic and political expansion of China and its policy build on state-owned enterprises. What drives this global geopolitical shift and how these changes impact the global financial, and political systems remain unclear.

As a direct result of this global geopolitical transformation, the total amount of assets under management (AUM) of SWFs had skyrocketed from $2 trillion in 2005 to $7.45 trillion in 2018. Simultaneously, the number of emerging SWFs has been steadily growing over the last ten years.

We believe that a better understanding of the sovereign wealth funds, their role in the national economics, long-term impact on the targeted companies and their strategic motivation allow us to comprehend why the world has changed its course towards to state capitalism and what consequences it brings to the global balance and wealth.

Due to the combination of SWFs' internal transparency policies and soft legislative requirements for data disclosure,[5] some characteristics of SWFs are challenging to

[5] Some initiatives for legislation intended to counter protectionist measures taken by States against SWFs have been developed by the Organisation for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF). (Brown and Miles, 2011)

evaluate and compare with market benchmarks, other similar institutional investments, or even with those of other SWFs (Gelb et al., 2014). This opaqueness heavily affects academic research on the motivations behind SWFs' investment strategies, financial performance, and governance, among other topics of inquiry. Limited access to SWFs verifiable performance, operational and governance data offers one explanation for the experimental and often erratic approaches to analyzing their impact that is taken by researchers to SWFs.

One of the options available to circumvent the lack of direct data obtained from SWFs is an indirect approach to research that analyzes SWFs' investment transactions and compares the performance of the companies into which they invest with a market average of firms' performance. In theory, this research approach should lead to consistent results, at least for publicly traded investees over a similar investment period, but it has not (Cumming et al., 2017; Megginson and Fotak, 2015; Alhashel, 2015). The root cause of the inconsistent research results could be found in utilizing different methodological approaches, the low quality and insufficient complexity of investee transactions data, inaccurate or inconsistent market valuation, or directly in SWFs' successful strategies for obscuring their publicly visible footprints.

The remainder of the chapter is structured as follows: Section 2 provides historical excurse in the subject of SWFs and compare the popular definition of the sovereign wealth funds. Section 3 offers a simplified classification of academic work devoted to the SWFs. Section 4 provides complex literature review focuses on research published from 2007 to 2018 on the subject of SWFs with primary focus on the academic work producing conflicting results (Aguilera et al., 2016; Megginson 2017 or Fotal et al., 2017), particularly concerning their impact on the market value of their target companies, and Section 5 concludes.

1.2 Origin, Definition, and Classification

The history of investment funds owned by sovereign states dates back to 1953 when the first sovereign wealth fund was established in Kuwait. To this date, it still exists as the Kuwait Investment Authority (KIA). Some economists might consider the Permanent School Fund established by the U.S. state of Texas in 1854 to be the ancestor of current sovereign wealth funds (Dewenter et al., 2010). Still, by 1980, there were only nine SWFs officially in operation. That number doubled by 1998 and more than quintupled by 2007. In March 2018, the total number of SWFs had reached seventy-eight.

Surprisingly, the state-owned investment funds were until 2005 viewed in the literature only as a subgroup of shareholders (Kotter and Lel, 2011, Lins, 2003; Mikkelson and Ruback, 1985 or Johanson, 2007) included in the larger group of passive institutional investors.

The financial crisis of 2007-2008 provided an opportunity for SWFs to fully utilized accumulated liquidity desperately needed by the global financial market. Additionally, the crises placed SWFs in the central focus for economists, academia, and politicians. The role of SWFs during the financial crises was studied by Beck and Fidora (2008), Gilson and Milhaupt (2009), or by Jen (2009) in his work titled "How big could sovereign wealth funds be by 2015?". In the space of only two years, SWFs become shareholders with considerable investment positions in companies as such as Merrill Lynch,[6] Bear Stearns,[7] Morgan Stanley,[8] Citigroup[9] and even the Nasdaq Stock Market, whose 19.99% ownership stake was purchased by Borse Dubai in September 2007 as pointed out by Jory et al. (2010).

In contrast, state-owned enterprises (SOEs) have been thoroughly studied by economists as an individual category of the primary economic actor since World War II (Gantt and Dutto, 1968; Davis et al., 1971). The results of these studies have significantly

[6] In 2007 a 9.4% ownership stake was acquired by Temasek Holdings, a Singapore based SWF; later in 2008 the Kuwait Investment Authority acquired an additional 6% stake in Merrill Lynch (Jen, 2009)
[7] China's CITIC Group bought a 9.9% ownership stake in Bear Stearns in 2008
[8] China's CIC fund purchased a 9.9% share in Morgen Stanley in 2008
[9] Singapore's GIC purchased a 3.6% and Kuwait's KIA a 1.6% ownership stake in Citigroup in 2008

influenced the policies implemented by the World Bank (WB) and the International Monetary Fund (IMF) (Shirley and McDonald, 1995). A substantial theoretical body of comparative analysis of private versus public ownership has been developed (Vernon, 1979; Aharoni, 1986). It later became a stepping stone for the economic research aimed at SWFs. A close connection between research on SWFs and SOEs still exists; for example, the work of Bass and Chakrabarty (2014) where the authors analyze the international competition for global resources, and Liang et al. (2015) in his work focused on the anatomy of state control of globalized state-owned enterprises.

SWFs' investment motivation, internal governance, transparency, performance, and accountability, represent major concerns for financial regulators, politicians, economists, and academics, especially concerning their foreign direct investment activities. These concerns escalated in 2008 when the IMF's International Working Group of Sovereign Wealth Funds (IWG-SWF) addressed the issues by organizing a summit attended by the official representatives of the largest SWFs. This conference resulted in a set of recommended principles of transparency and good governance for SWFs to follow (IMF, 2008)[10]. Nevertheless, the principles were never transformed into binding requirements and SWFs are, with a few exceptions, still a strong but opaque group of institutional investors (Stone and Truman, 2016; Bassan, 2015).

A detailed excursion into the origin of SWFs and their evolution is available in Kimmitt (2008) and Bassan (2015). The position of SWFs within the overall picture of state-owned corporations, public-private partnerships, and even military-industrial projects is well described by Wood and Wright (2015)

The term "sovereign wealth fund" was used for the first time only recently, by Razanov in his article "Who Holds the Wealth of Nations" (Rozanov, 2005). Rozanov defines SWFs[11] as "*sovereign-owned assets pools, which are neither traditional pension funds*

[10] International Working Group of Sovereign Wealth Funds – Sovereign Wealth Funds, Generally Accepted Principles and Practices "Santiago Principles".

[11] In another paper, "More Layers than an Onion," Capape and Guerrero (2013) provide an excellent analysis of how the definition of SWFs varies among economic research publications. Based on an SWF classification approach using eleven characteristics, Capape found full consensus on only two defining characteristics of SWFs: i) government ownership and ii) the purpose of an investment fund. Strong consensus about the definition was found about another

nor reserve assets supporting national currencies." This definition was updated by Rozanov (2008), by adding liability-based classifications aimed at the source of capital and intended use of funds by an SWF.

For this thesis, we define SWFs as follows: "…*special purpose investment funds or arrangements, owned by the general government. Created by the general government for macroeconomic purposes, SWFs hold, manage, or administer assets to achieve financial objectives, and employ a set of investment strategies which include investing in foreign financial assets*" (SWF Generally Accepted Principles and Practices, IMF 2008). This definition of an SWF was proposed by the IMF's International Working Group of Sovereign Wealth Funds (IWG) in 2008[12].

three characteristics. An SWF is considered i) an international investor; ii) without explicit liability to fund public pensions, iii) receiving public funding.

[12] Given this definition, the IMF further provides a "purpose-based" classification of SWFs comprised of only three types: i) stabilization funds, ii) saving funds, and iii) reserve investment companies.

1.3 Research Approach to Sovereign Wealth Funds

It was not until 2008 that SWFs attracted the attention of a large number of economists, financial advisors, brokers, journalists, politicians and finally, international financial regulatory authorities (Gilson and Milhaupt, 2009; Cumming et al., 2017; IMF, 2008).

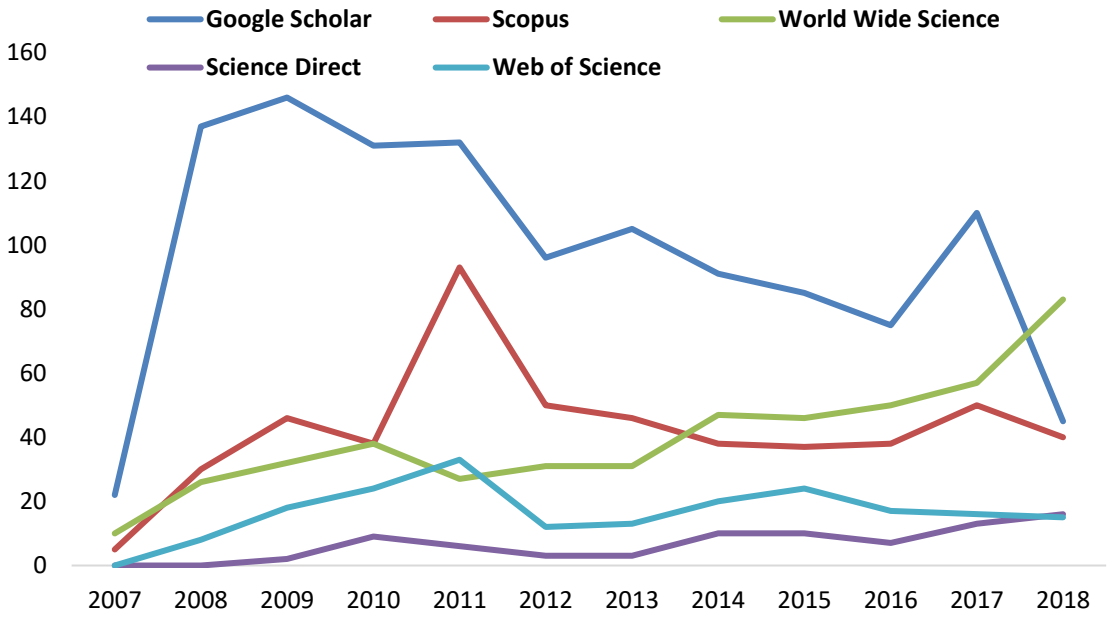

Figure 1.1: Sovereign Wealth Funds in the Academic Literature – total number of published articles and books

The general interest of the academia and economists illustrated in Figure 1.1 shows the evolution of the number of research articles published on the topic of SWFs from 2007 to 2018.[13] The initial interest of the general public and the novelty and appeal of this topic is demonstrated by the steep growth in the number of publications on SWF-related subjects, represented by the number of results provided by the Google Scholar (GS) search engine, which soared from five publications in 2006 to 146 publications in 2009.[14]

[13] The criteria for an article to be counted in this dataset were as follows: i) it includes the words "sovereign wealth fund" or an abbreviated form or modification thereof, e.g., a plural form, etc., in its title, abstract or keywords (if available), ii) it is a journal publications or book only, and iii) it provides 2018 data for the first 10 months of the year.
[14] We note that Google Scholar's advanced search options are limited. Its search results include all publications, with no filters available allowing one to assess the quality of those publications. Results also include studies published by advisory and regulatory bodies.

The trend of academic interest in SWFs is illustrated by continuous growth in the total number of publications about them, as reported in the Scopus and Web of Science (WoS) databases. In terms of the number of publications, we see it reached the maximum in 2011. Following a slowdown, the trend in the number of publications on SWFs turned positive again in 2017. Unlike the Scopus and WoS databases, World Wide Science (WWS) and Science Direct include papers published in a broad spectrum of non-English language journals. The trend illustrated by WWS indicates that from 2007, the topic of SWFs has been addressed primarily by U.S. and UK researchers and economists. Nevertheless, the subject of SWFs has become gradually attractive to the global economic research community.

1.3.1 Literature Classification

To better illustrate the various directions in which the academic research on SWFs has evolved, we suggest this literature classification:

I. **Direct**[15] - Literature on SWFs' key characteristics such as their ownership (legal structure, governance, accountability), investment strategies and investment portfolio risk-return ratios, the political, fiscal and monetary motivations behind SWFs, organizational theories, and other topics directly linked to SWFs' operational characteristics and related strategic and political-economic issues.

II. **Indirect** – Literature on the short and long-term impact on companies targeted by SWFs (investees).

III. **External**[16] – Literature on SWFs' impact on international investment law and international regulation, regional and national regulations, SWFs'

[15] The Direct category includes publications on the governance, transparency, motivations (economic, political, social) and investment strategies of SWFs, for instance, Truman (2007, 2009), Bagnall and Truman, 2013; Gilson and Milhaupt (2009), Aizenman and Glick (2009), Aguilera et al. (2016), Aggarwal and Goodell (2018), and on the impact of SWFs on the global financial markets, including Beck and Fidora (2008), Kimmitt (2008), Bertoni and Lugo (2014), Raymond (2008), Megginson and Fotak (2015) or Johan et al. (2013) and their work aimed at determinants of Sovereign Wealth Fund investment in Private Equity vs Public Equity

[16] The External category includes, for example, Cohen, (2009) Sovereign Wealth funds and National Security: The Great Tradeoff, Kern (2007), Bassan (2015), Sornarajah (2017) The International Law on Foreign Investment.

macroeconomic impact, their impact on global financial markets, and their contribution/risk to the home country's economy and its strategic export priorities.[17]

To develop a representative database of the literature on SWFs, we adopted this two-step procedure. First, our research is limited to the period from 2007 to 2018, as the vast majority of the SWF literature emerged after the global financial crisis of 2007-08.[18] An initial metadata-based search utilizing the various academic search engines and scholar databases (illustrated in Figure 1.1) resulted in approximately 2,500 relevant publications, including unpublished papers, book reviews, and editorial material. Second, a duplication check was carried out, and all publications other than journal papers and books were removed.[19] After glaring search errors were corrected, a clean dataset of 790 publications remained.

Because some of the publications included in the clean dataset can be associated with two or even all three categories, it is not possible to classify them with absolute precision. Thus, the classification was carried out as follows: first, publications with research aimed at the SWFs' impact on investees' market value (category "Indirect") were separated from the clean dataset. Second, publications that include topics in the category "External" were selected and separated from the clean dataset. The remaining publications were included in the "Direct" category. The results for the clean sample, categorized according to the proposed literature classification, are presented in Figure 1.2.

[17] Identically to SWFs impact analysis on the targeted companies, most of the studies on SWFs investment impact on legal protectionism is built on the previous research results on large institutional investors as for instance by La Porta (1999) who show that the legal protection environment for investors plays an important role in corporate governance at the country level

[18] Prior to 2005, state-owned funds were included in the larger category of institutional investors or state-owned enterprises. Between 2005 and 2006, the number of the articles on SWFs was very limited.

[19] Conference proceedings, book reviews, unpublished papers, editorial material, book series or individual book chapters and trade publications were not included in the clean sample.

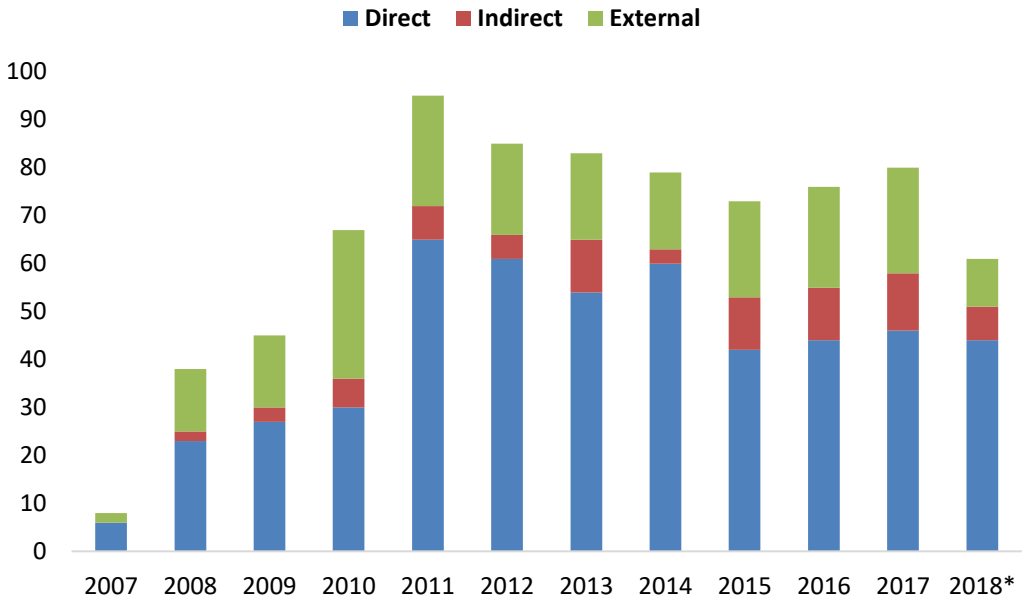

Figure 1.2: Academic Literature on Sovereign Wealth Funds from 2007 to 2018 – in total number of publications

Due to the considerable degree of heterogeneity of the SWF-related literature, following methodology review is limited only to the analysis of publications in the "Indirect" category. For a general review of the literature on SWFs, see Alhshel (2015) or Megginson and Gao (2019).

1.4 Impact of SWFs on Investee Market Value

The academic research aimed at sovereign wealth funds is strongly influenced by and closely follows the methodologies of the extensive research investigating large institutional investors. The literature on large shareholders represents a solid stepping stone for academic research on the subject of SWFs. The available literature on the impact of SWF investment on its targets is a good illustration of how close the two subjects of research are.

Despite the extensive academic research literature on large shareholders generally, it does not offer a unanimous opinion of the systematic effects of institutional ownership on firm value (Chhaochharia and Laeven, 2008; Karpoff, 2001; Ferreira and Matos, 2008). One of the most often-studied characteristics of large institutional shareholders is the extent to which they monitor the performance of their investees and its impact on the value of those firms. Shleifer and Vishny (1986), McConnell and Servaes (1990), and Del Guercio and Hawkins (1999) confirm that institutional investors take an active role, which leads to a positive impact on the target firm's value, compared to small shareholders who lack the means to monitor investee performance closely.[20] This research was later followed up by Chen at al. (2007), who concluded that monitoring activity is significantly higher among independent investors who focus on long-term investments. Among the large, diverse group of institutional investors, it is perhaps the hedge funds that are most like SWFs, especially in terms of their operations, degree of transparency, and investment practices. The positive impact of active monitoring of investees by hedge funds has been confirmed, for instance, by Brav et al. (2008).

At the same time, the "agency cost theory" developed by Jensen and Meckling (1976) predicts that a large shareholder will force a company to act in the best interest of that shareholder and against the interests of other investors, employees, and managers. Barclay and Holderness (1992) and Zingale (1994) empirically tested this hypothesis and confirmed that large shareholders impose agency costs on investees. Similarly, Carleton

[20] The literature refers to this tendency by small-shareholders as a free-rider problem.

et al. (1998) and Gillan and Starks (2000) find that institutional shareholders hurt their investees' performance, either because they do not have adequate monitoring skills or because their objectives conflict with maximizing the value of the investee. In their later work, Shleifer and Vishny (1997) state that the role of a dominant large shareholder is harmful because of its efforts to maximize its private benefit at the expense of minority shareholders. The negative impact of the holder of a large block of shares ("blockholder") has been thoroughly studied, for instance by Fama and Jensen (1983), Stulz (1988), and Clark and Ofek (1994), in their works on the potential costs associated with significant shareholdings by managers and other blockholders. This negative impact and even the "tunneling" of investees was borne out by a study by Johnson et al. (2000) of the behavior of large shareholders during the emerging market crisis of 1997-1998. The overall impact of large institutional shareholders can be seen as a compromise between their positive impact (mainly due to improvement in active monitoring of performance) and their negative impact as they try to maximize their profit at the expense of the investee and others. Thus, the overall impact is a nonlinear function of the size of the acquired ownership stake, where benefits increase below some critical level of ownership but decline after that as "tunneling" losses grow larger (Dewenter et al., 2010).

Ownership by sovereign wealth funds with a close relationship to a government and in many cases a rather opaque governance structure, as shown by Truman (2007) and later by Stone and Truman (2016), raises the question, what is the funds' prime motivation for its investment? Does it interfere with the maximization of investee value? Is the impact of an SWF on the investee's performance significantly different from that of other institutional investors?

Publications that focus on the impact of SWFs on target companies' market value are a minor category in the SWF literature. Our search for literature[21] found only 78 articles, representing less than 10% of the clean sample (see Figure 1.3, category "Indirect").

[21] We performed a full-text search based on a mix of keywords, abbreviations and exact phrases such as "CAR, cumulative abnormal returns, Tobin's Q, credit default spread (CDS), market-adjusted return, short-term and long-term impact, or investee market value" on our clean sample of 790 publications.

Even in this small group, less than one-third of the authors presented their empirical research based on an original dataset. The rest of the publications, either summarized previously published findings or expanded upon the discussion in previously published research (Megginson, 2017; Cumming et al., 2017; Alhshel, 2015). Some focus on secondary effects on SWF investees' market performance, similar to Boubarki et al. (2017) work evaluating impacts on the competitors to the SWFs' target firms. Therefore, the final group of publications, which reported results of the authors' original research on the impact of SWFs on investee's market value or operational performance, contained only 22 publications. Following a detailed data and research methodology "threshold of originality" check, we dropped six of the 22 articles.[22] The final list of the publications used for the methodology review on the impact of SWFs on investees is provided in Appendix I and Appendix II.

The majority of the authors of the remaining publications include both immediate market reactions and long-term impact analysis in their research papers. However, due to different methodological approaches and data collection and verification procedures used by the authors of the papers in the dataset, this chapter reviews their results for long-term and short-term impacts separately.

[22] This was mainly due to their obvious duplication of already published work, utilizing very similar or only slightly updated datasets. There was no novelty presented in terms of the SWF transaction dataset or research methodology with regard to the impact on the investee's performance or market value.

1.4.1 Short-term Impact

To assess the market reaction to and the immediate effect of an announcement of SWF investment, the majority of authors employed an event study for different event windows. This methodological approach has been successfully tested across various research fields in financial economics and has become a research standard, as pointed out by Bortolotti et al. (2017). Further detail on the event study methodology is provided by Karpoff and Malatesta (1989) and Lyon et al. (1999).

Market reaction is measured by changes in stock values or credit default swaps (Bertoni, 2014) around the time of an SWFs' announcement of its investment. This procedure is often accompanied by a market comparison study.

What differentiates the studies from the methodological perspective is:

(i) impact indicators (stock returns, credit default swaps)
(ii) construction of the control group that provides a proxy for a benchmark market return
(iii) abnormal return event windows
(iv) dataset size and transaction collection verification procedures

Research Methodology

The vast majority of authors use investees' stock returns as the critical research indicator demonstrating the market reaction to an announcement of an investment by an SWF. Bertoni and Lugo (2014) take an innovative approach, working with the evolution of credit default spreads (CDS)[23] instead of changes in share values.

When a market valuation approach is applied, the most commonly used research approach is based on the concept of cumulative abnormal returns (CARs). Authors like Fotak et al. (2008), Dewenter et al. (2010) and Bortolotti et al. (2015; 2017)[24] used CARs

[23] A credit default swap (CDS) is a financial swap agreement whereby the seller of the CDS agrees to compensate the buyer in the event of a default on a debt or other credit event. The buyer of a CDS contract pays the seller a percentage of a notional principal amount (the "notional") – the spread – since no principal actually changes hands in the transaction. The higher the credit risk associated with a firm's liabilities, the higher the CDS spread (Bertoni and Lugo, 2014)

[24] The authors discuss raw returns for purposes of testing the robustness of their research but do not present their results.

as indicators along with raw returns and market-model abnormal returns, which are computed by subtracting the expected return to the shareholder obtained from a local equity index as a market proxy. Authors calculate the abnormal returns as the difference between actual returns and those predicted by the market model. The abnormal returns are then summed to calculate cumulative abnormal returns. All the authors listed above conducted CARs-based event studies except Bertoni and Lugo (2014).

The primary variable in Bertoni's study is the adjusted decrease in CDS spreads observed at the time of an announcement of an investment by an SWF. Bertoni follows a methodology used by Hull et al. (2004), Norden and Weber (2004), and Jorion and Zhang (2007). The CDS spreads of target companies are adjusted by subtracting from them a weighted index of all CDS spreads of firms in the same rating category.[25]

CDS spreads provide certain advantages compared to stock returns and bond yields. As pointed out by Hull et al. (2004), they do not require additional adjustment for differences in risk. Also, as suggested by Blanco et al. (2005), the CDS market has been found to lead the bond market and is more responsive to changes in credit conditions Similar results confirms by Zhu (2006). However, employing CDS as an indicator of the impact of an investment by an SWF requires some caution, because CDS spreads may reflect certain factors other than the risk of default. First, as suggested by Hull and White (2001), the relationship between CDS spreads, and credit risk can be affected by counterparty risk[26] (i.e., the risk that the seller of the CDS will not be able to meet its obligations). Second, CDS spreads for corporate bonds can also be influenced by issues of liquidity and taxes (Fabozzi et al., 2007).

[25] As in Hull et al. (2004), the authors Moody's credit ratings and divide all firms in four credit categories as follow: (a) Aaa and Aa; (b) A; (c) Baa; and (d) Ba and below

[26] All else being equal (including the credit risk of the focal company), higher counterparty risk translates into a lower CDS spread.

The Control Group as a Proxy for Market Returns

The primary resources for the construction of a control group as a proxy for market return are various commercially available market indices. The most commonly used is a market capitalization-weighted index provided by Thomson Reuters Datastream[27] (Kotter and Lel, 2008; Fotak et al. 2008; Dewenter et al., 2010; Bortolotti et al., 2010; Knill et al., 2012). However, from the information available in the data and methodology description sections provided by the authors, it is not always clear what criteria have been used for matching the SWFs' target investees with relevant market indices.

For instance, Knill et al. (2012) describe the selection of his benchmark index in detail. He uses a three-criteria matching procedure based on the country, industry, and size of the target. On the other hand, Chhaochharia and Laeven, (2008) provides only information that the US-based SWF targets he studied are matched with the Center for Research In Security Prices (CRSP) value-weighted return index and his UK firms are matched with the FTSE 100 index, which would imply that national indices were used as a proxy for expected returns. Other authors evaluate the target firms in comparison to subgroups of similar companies, matched by fund type (pension funds, mutual funds). For instance, Bortolotti et al. (2015, 2017) construct his control group[28] by selecting publicly traded companies having a Standard Industry Classification (SIC) code between 6000 and 6999, and identifying financial firms with investment announcements in an interval identical to that of the SWFs' data set of target companies.

Additionally, they include only transactions in which the acquirer originates from one of the countries where the SWFs included in the impact analysis are based. Similarly, they use only transactions for which the target firm is headquartered in one of the countries where the investees in the final benchmark dataset are headquartered. A different methodology is employed by Dewenter, Han and Malatesta (2010), who regresses target firm stock returns based on the returns to two market indices: (i) returns in the domestic

[27] Recently renamed to Datastream – Refinitiv Financial Solutions.
[28] He based his control group on the publicly traded companies dataset from the Thomson Reuters SDC Platinum Mergers & Acquisitions Database (SDC).

stock market of the country where the target firm is domiciled and (ii) a market variable measuring returns in the global stock market.

Event Window

An "event window" is the period in which the SWF investment announcement occurs, during which the impact of the announcement on the investee's market value is measured. Kotter and Lel (2008) present abnormal returns at the time of an announcement of SWF investment for day intervals of (0, +1), (-1, +1), and (-2, +2). However, he also discusses results for abnormal returns for a (-10, +20) window in his paper. Fotak et al. (2008) include results only for the announcement day. In his later work (Bortolotti, Fotak and Megginson, 2015), he measures a three-day window (-1, +1) instead, as well as an eleven-day window (-5; +5) and for good measure, also for the announcement day. Dewenter et al. (2010) or Bortolotti et al. (2017) provide results for an identical three-day window (-1, +1). So does Bertoni and Lugo (2014), who uses other event windows as well, but only to test the robustness of his results. A different methodology is applied by Chhaochharia and Laeven (2008), who reports CARs for an event window of (-20, +10). Based on positive results for a (-10, -5) event window, he concludes that information about SWFs' transactions is usually known to the market before their public announcements.

The pre-event periods in which the regressions are estimated begin variously at t-288 days (Chhaochharia 2008) to t-240 days (Fotak, 2009). In the majority of the research analysis included in this review of the methodology, the pre-event window closes before the investment announcement, (t-20, t-10) days before the SWF transaction announcement. Otherwise, the measured window ends at (t, t+1) and a specific period before the announcement is excluded. For instance, Dewenter et al. (2010) uses daily returns over the period (-250, +1) but excludes the period immediately before the event (-6, -2)[29].

[29] In order to prevent possible pre-announcement news leakage from affecting the estimates

Overall, we conclude that the time interval for the analyses of abnormal market reactions following the announcement of an SWF's transaction varies only to a limited extent across the researched papers. The difference in methodology is not significant enough to have a major impact on the results of their analysis.

Data Collection and Verification Procedures

As presented in Appendix I, the number of transactions upon which researchers' calculations are based differs substantially in each study. A detailed analysis of the SWFs' transaction datasets shows that regardless of the total number of transactions the authors have collected for research purposes, which they usually state in their papers' abstract or introductory section, the real number of transactions they use for their short-term impact analysis varies enormously. For instance, Chhaochharia and Laeven (2009) state that he includes information about more than 40,000 transactions, but the clean set of the transactions he uses for evaluation of the impact of SWFs' announcements is comprised of only 86 transactions. Similarly, Karolyi (2017) initially present a dataset composed of 4,759 transactions while his clean sample for short-term analysis contains only 436 transactions.

The average number of the transactions used in work covered by this methodology review is 368 transactions. Bortolotti et al. (2017) work with the most extensive clean dataset of 796 transactions, and Soji and Wah Tham (2011) use the smallest dataset, only 66 transactions.

The procedures for collecting transaction data and the databases of commercial transactions used to identify SWF investment deals are similar across the seminal papers. The Securities Data Corporation (SDC) database is the most popular source database for identifying SWF investments (Fotak et al., 2008; Dewenter et al., 2010; Knill et al., 2012; Bortolotti et al. 2015, 2017), usually in combination with either Zephyr from Bureau van Dijk (Fotak et al., 2008; Bernstein et al., 2013, Park et al., 2018) or Factiva (Chhaochharia and Laeven, 2009; Dewenter et al., 2010; Kotter and Lel, 2010). The Sovereign Wealth Fund Institute database served as the source for the initial list of SWFs in all cases and is frequently combined with data collected from individual research.

Datastream is the most favored source of market data. Bloomberg, in combination with WorldScope, is used by the majority of the authors for firm-level accounting data. Additionally, Thomson One Banker and Zawya Limited are being mentioned as a supporting source of financial data (Bortoloti et al., 2015, 2017). In later studies, detailed online, publicly available information sources are used for data mining, for example, the Lexis-Nexis database and the archives of the Financial Times, the New York Times, GulfNews, the Associated Press, Reuters, and others.

Criteria for filtering and developing a clean data set are:

(i) Date (usually a time interval in years). A more significant number of transactions results from a longer time frame. The dataset used by Bortolotti (2015, 2017), mentioned above as having the most significant number of transactions (796), includes SWFs' investments from 1980 to 2012. Similarly, Kotter (2008) works with investments from 1982 to 2008. Some authors, such as Knill et al. (2012), provide only the information that investments are included up to a specific year. Other authors work with data from the mid-1990s to 2010, like Chhaochharia and Laeven (2008), whose dataset ranges from 1997-2007. Dewenter et al. (2010) use the spread 1996-2007 and Karolyi and Liao (2017), from 1990 to 2008.

(ii) SWF involvement - direct or indirect. The majority of the authors include both direct and indirect investments (the latter being investments by subsidiaries or special purpose vehicles that have publicly verified connections to an SWF). Results of short-run impact analyses are provided for investments of both types.

(iii) The national origin of the SWFs and their investees (i.e., domestic versus cross-border investment). Authors such as Chhaochharia end Laeven (2008) and Karolyi and Liao (2017) work only with cross-border transactions. Others usually provide information about several domestic transactions and do not exclude them from their clean datasets.

(iv) Other criteria (e.g., exclusion of initial public offerings, limitation to some particular geographical regions, and exclusion of selected industrial sectors).

Research Results

The consistency of the empirical results of the research suggests that SWFs cause positive short-term reactions in the value of the stock of their targets. The greatest average abnormal return in a three-day window around the announcement date is documented by Soji and Wah Tham (2011), who also finds that the abnormal returns for smaller event windows are significantly greater than zero but still less than those from larger windows. In his results, the average CAR is 3% for (-1, 1) and 8% for (-10, 10). Almost identically, Kotter and Lel (2011) find a positive risk-adjusted average cumulative abnormal return of 2.2% in the three-day window surrounding an announcement date. Fotak (2008) confirms a positive 0.8% mean abnormal return around the announcement date, statistically significant at the 1% level. Chhaochharia (2009) finds positive CARs during the ten trading days before the announcement of the investment, with an average CAR of 1.15% over the period (-10, -5). Dewenter et al., (2010) find that the average 3-day investment CAR is 1.5% for his full sample and 1.7% for a clean announcement subsample. The above results are supported by analysis of the impact of *divestment* by SWFs, where the average 3-day abnormal return around the date of announcement is -1.4%. Very similar results are provided by later studies. For instance, Karolyi and Liao(2017) find a median CAR of 1.2% for the 3-day window.

An important finding is that when the SWFs' investees are compared to a company targeted by private institutional investors, the results for the SWFs' targets show a significantly lower premium. This finding is supported by Bortolotti et al. (2017), who observed a three-day average CAR of +0.84% for SWFs' investees and a three-day mean CAR of + 4.82% for private investments. All CARs are significant at the 1% level.

Although Bertoni and Lugo(2014) employs a different research methodology using CDSs, he confirms the results of the other authors' analysis of stock market values. He finds a non-negligible decrease in adjusted CDS spreads around the time of an announcement. The mean 5-year average default spread (ADS) for the event window (−1, + 1) is 1.135 bps. The mean decrease in CDS spread, adjusted by an equally weighted index of all corporate CDS contracts, is significant at the 5% confidence level (or better) for each of the three maturities Bertoni considers. The magnitude of the average adjusted decrease

in spread varies across different categories of the events he studied, ranging from 1.258 bps to 2.896 bps.

Short-term Impact Conclusion

We conclude that academic research into the short-term impact of investment by SWFs on their investees provides homogeneous results. These results are similar to findings presented in the literature on the subject of large shareholders, such as that performed by Holderness (2003) and Shleifer and Vishny (1997), that investment by large shareholders is usually associated with a premium in the value of the target firms.

The positive market reaction to SWFs investment in different time windows around an investment announcement is confirmed directly, by using market value premium as an indicator, or indirectly, using risk reduction, as shown by Bertoni and Lugo (2014) in his research into changes in CDS value.

The other authors we reviewed use very similar mathematical and statistical approach that analyze cumulative abnormal returns. What significantly differentiates those studies is how the control sample is constructed to provide a proxy for average market returns.

The diversity of the applied research methodologies and the compilation of investment transactions datasets, combined with the consistency of the research results, supports a conclusion that markets perceive investment by SWFs as value-enhancing. However, the premium in value evoked by an investment by an SWF, as measured by growth in the investee's market value or by a decline in CDS spreads, is substantially less than the premium observed for a comparable group of companies targeted by private investors.

1.4.2 Long-term Impact

Sovereign wealth funds are usually regarded as long-term, passive investors. Nevertheless, SWFs do have the capability and incentives to monitor the management of their investees and potentially increase firm value by actively engaging in the governance of their target companies, as predicted by Shleifer and Vishny (1986). Enhanced access to markets and the availability of state-backed funding provides a significant advantage to SWFs' investees. On the other hand, the negative impact of investment by a government-owned entity can sometimes prevail over the benefits mentioned above. The wealth maximization typically pursued by private investors is replaced in the case of SWFs by politically motivated goals, including obtaining access to technology or natural resources and other national and geopolitical objectives (Drezner, 2009, Cohen, 2009).

Unfortunately, the empirical research into the impact of SWFs' investments over the long term,[30] does not show the same consistency of results as the studies of SWFs' short-term impact, discussed in the previous chapter.

Research Methodology

To begin, we divide empirical studies of the long-term impact of SWF investments into three groups, based on the indicators selected by authors:

(i) market value
(ii) firm performance indicators
(iii) credit default swaps

In contrast to academic research on the short-term impact of SWFs, where the most common evaluation method is based on cumulative abnormal returns (CARs), cumulative market-adjusted returns (CMAR) are more often used to evaluate long-term effects. The authors prefer to compare the change in SWFs' investees' market value with a market average instead of basing conclusions on extrapolation of investees' absolute, historical market value, or its performance indicators.

[30] By "long-term impact" is meant a one-year or longer time period from the effective date of the transaction.

The primary issue with using CMARs as an indicator is the need for a robust control sample. The quality, complexity, and robustness of the group of companies selected as proxies, or controls, have a significant impact on the reliability of the research results. We identify the authors' usual approach to the selection and verification of the control group as one of the weakest parts of ongoing research and the primary source of inconsistencies in the results of the research into SWFs' long-term impact on their investees.

Some authors, for instance, Bernstein et al. (2013), openly admit the lack of reliable data that realistically mirrors the market average. This difficulty has led them to reduce the scope of their research and prevented them from publishing their research results in full. The shortage of data is the main factor that limits the academic research into SWFs' investments into state-owned companies, although SWFs are very active investors in the private sector, as pointed out by Aguilera et al. (2016) and Megginson and Gao (2019).

Market Value

In 1980s Brown and Warner (1980, 1985) or Dyckman et al. (1984) document the empirical specification and power of test statistics designed to detect abnormal stock returns. These studies, however, documented abnormal returns in months at the most. In contrast to the previous work, Barber and Lyon (1997) and later Barber and Tsai (1999) document the empirical power and specification of test statistics designed to detect long-run abnormal stock returns in one-year, three-year, and five-year returns similar to the set up later embraced by authors aimed at abnormal stock returns of SWFs investees.

Barber and Lyon (1997) advocate the utilization of buy-and-hold abnormal return method (BHAR) This approach, however, is later questioned by Fama (1998) and Mitchell and Stafford (2000), who both suggest that this methodology may be problematic because it does not sufficiently account for possible cross-sectional dependence in returns.

Hertzel et al. (2002) mitigate the methodological weakness of BHAR by the "Calendar-time abnormal returns" identically to Mitchell and Stafford (2000). Kothari and Warner

(2007) provide a comparative analysis of BHAR a Jens-alpha approach and discusses in detail significance testing of the results and the primary issues connected to the above-described methods as the right skewness of BHAR and bias arising due to cross-correlation in returns described by Brav et al. (2000).

In the research work presented on the topic of SWFs BHAR is used often but usually in the form of proxy calculation. As the most common method, a comparative analysis based on CMAR has been used since the first studies aimed exclusively at the long-term impact of SWF investments. Examples are Fotak et al. (2008) and Dewenter et al. (2010). To this date, CMAR is still the most popular method by researchers. The latest examples include Bortolotti et al. (2017) and Park et al. (2018)[31].

CMARs are usually used in conjunction with buy-and-hold market-adjusted returns (BHARs), as described by Rosen (2006) and Bouwman et al. (2009). Some authors, as Fotak et al. (2008) and Bortolotti et al. (2015), simultaneously calculate changes in investees' raw returns for various time windows, but those results are typically used only for testing the robustness of results. On the other hand, Knill et al. (2012) use differences in raw returns for both target companies and his benchmarks without analyzing CMARs or BHARs. Dewenter et al. (2010) use both BHARs and CMARs, where we did not find any dramatic differences between presented BHAR and CMAR in terms of absolute values or significance. A combination of various performance indicators and Tobin's Q use Sojli and Wah Tham (2011) and Fotak et al. (2008) who simultaneously analyzes buy-and-hold returns, but only to measure investees' absolute performance.

Similarly, Bortolotti et al. (2017) calculates a buy-and-hold returns analysis to check the robustness of his results, but provides only the information that the results of his buy-and-hold analysis were "similar with all samples displaying positive and statistically significant abnormal returns, smaller for the SWF sample than for the benchmark sample." The literature citing statistics linked to testing of buy-and-hold returns, using

[31] Park (2018) works with the abbreviation "CAR" for his measure of SWFs' impact. However, after reviewing his methodology and comparing it to Dewenter's (2010), we believe that the authors are using cumulated market-adjusted returns (CMARs) instead of cumulative abnormal returns (CARs) as their indicators.

market returns as the reference asset, is not very specific (Barber and Lyon, 1997). Therefore, in order to confirm the robustness of their data, some authors, such as Knill et al. (2012), take Barber's suggestion to use firm returns as the benchmark reference. In order to reduce "survivorship bias" in his data set, Knill assumes that when a target firm is dropped from the sample, it has earned the benchmark return for the remainder of the sample period. Kotter and Lel (2011) examine only buy-and-hold abnormal returns. He does not use CMARs or CARs at all, arguing that BHARs are preferable to CARs because CARs can suffer from a downward distortion, as found by Kothari and Warner (1997).

A frequently used metric for large-scale assessment of firm values is Tobin's Q, which is the book value of a firm's total assets plus the market value of its shareholder equity, minus the book value of its shareholder equity divided by its total assets. For detail on the method of calculating Tobin's Q, see Gompers et al. (2003) and Gomper and Metrick (2001) or Ferreira (2008). Fernandes (2014) and Sojli and Wah Tham (2011) use Tobin's Q in their studies.

The final results of an analysis based on either CMAR or BHAR returns provide contradictory conclusions despite the comparable method with which they are calculated and the similar construction of the research models that use them. Fotak et al. (2008) find a consistent negative trend in mean abnormal buy-and-hold returns, which in his study can reach -18.3% at the end of the second year following an investment by an SWF. He found this to be true even though raw returns were positive and statistically significant at all intervals[32]. Dewenter et al. (2010) confirm a finding of negative mean and median market-adjusted returns and BHARs in the first and second years, but she also finds that in the third and fifth years, mean CMARs were positive for all of her samples and in the fifth year the estimates are significant. Bortolotti et al. (2010) finds that that mean BHAR returns are negative, but not statistically significantly

[32] Fotak et al. (2008) presents the results for six months, one-year, two-year and four-year post-investment windows. He found that the CMAR for the six month interval was -1.46% and for the four-year interval a brutal -78%. This value indicates that with significant reduction in the SWF transaction dataset, results can be significantly biased by a few extreme values (the author does not provide information about data trimming or winsorizing)

so, overall four holding periods he examined, ranging from -1.32% at one year to -4.61% at the end of three years. The median BHARs Bortolotti found were substantially more negative, ranging from -3.13% at six months to -12.75% at three years. The first BHAR returns for the earlier three holding periods were negative and statistically significant at the 1% level. Kotter and Lel (2011) show that on average, target firms do not earn any statistically significant excess returns in the first two years, but the average BHAR becomes both positive and statistically significant at the end of the third year. Sojli and Wah Tham (2011) informs us that average BHARs are positive, reaching a 16% premium in the first year. However, the author argues that BHARs are sensitive to risk and may result in overstating abnormal performance, which was also pointed out by Franks et al. (1991) and Lang and Stulz (1994). Finally, Park et al. (2018) present that based on estimates of the median BHAR, SWF target firms underperform their benchmark local markets by −4.66% in the first year. This negative result was magnified in the second year, reaching −6.32%.

Firm Performance Indicators and Credit Default Swaps

Analysis of the long-term performance indicators of firms targeted by SWFs is an alternative research approach. In one of the first long-term impact analysis on SWFs' investees' performance, Kotter and Lel (2008) use methodology similar to Karpoff (1996). In Kotter's later work, he uses both a market value approach and performance indicators. This approach was later repeated for instance, by Bortolotti et al. (2015) and other authors. Still others, like Fernandes (2014), employ a combination of firm performance indicators and Tobin's Q. The selection of performance indicators varies. The most used are (i) return on equity (ROE), (ii) return on assets (ROA) and (iii) EBITDA, which is the indicator favored by Fernandes (2014). Bortolotti et al. (2015) use total sales instead of EBITDA and book-to-market ratio. Sojli and Wah Tham (2011) uses EBITDA/assets and EBITDA/sales as measures of efficiency and profitability.

The research procedure is identical for all of the above variables. The difference between the value of each variable at the time of the SWFs investment and at selected (one to five year) periods is calculated. Most of the authors apply the same procedure to the performance variables of the control group. Finally, difference-in-difference

statistics are calculated by subtracting the change in each variable of interest for the control group from the corresponding change for the SWF sample.

Fernandes (2014) uses a propensity score-matched control group as a market proxy for his long-term impact analysis. A similar methodological approach was used by Campello et al. (2010), among others, to investigate the impact of financial constraints on companies. This technique matches events (transactions) from the research sample to the most similar events (transactions) from a control group, based on selected parameters like size, ownership, ratings, and industrial sector. The analysis and the results are based on the absolute change in selected operational indicators over the period between one year prior to the SWF's investment and one year following it. Finally, he tests the difference in the performance differences of the investee companies and the control group.

Knill et al. (2012) choose a different research approach. Similar to Brown et al. (2008), who evaluates hedge fund investments and stresses the importance of considering both return and risk, Knill is the first author who evaluates SWF investments in that way. Knill compares both the Sharpe ratio[33] and the appraisal ratio favored by Brown (2008). The Sharpe ratio measures total risk, while the appraisal ratio focuses on the investee firm's return per unit of idiosyncratic risk. Knill compares the Sharpe and appraisal ratios before and after an SWF's investment, using a difference between means test. He concludes that the results show a statistically significant negative coefficient in the Sharpe and appraisal ratios, indicating that the decline in return experienced by target firms is not compensated by a sufficient decline in risk in the one-, three-, and five-year windows.

The results based on the investee's performance indicators show inconsistencies similar to those of the studies based on the investee's market value. Kotter and Lel (2008) conclude that SWFs' investees do not experience any statistically significant change in their profitability or sales growth compared to the market control group. Despite that,

[33] as described in Sharpe (1966) and again in Sharpe (1994)

he claims that there is an apparent deterioration in the investees' performance. Fernandes (2014) finds statistically significant positive results for the group of SWF investees. He reports that in the first year following the SWF investment, they experienced an average 2.36% increase in their ROE, 1.18% in ROA, and 2.36% in their EBITDA/Assets ratio. The investees outperformed the control group performance indicators by 1.62% for ROE; 1.29% for ROA and 2.81% for EBITDA/Assets. A positive impact of SWF investment on its targets is observed by Soji (2011), who reports Tobin's Q difference-in-difference premium of 2% compared to a control group comprised of similar investments by hedge funds[34]. Opposite results are presented by Bortolotti et al. (2015) and later Bortolotti et al. (2017). In both papers negative results are observed in all measured performance indicators, and a decline in profitability is reported for all three years after SWF investment. ROA declined by 2.31 % in the first year, 1.13% over the second year, and 1.76% in the third year. The market-to-book ratio showed a similar, statistically significant decline over all time horizons.

Data Collection and Verification Procedures

The problem of the limited number of transactions used for the short-term impact analysis is even more evident in the long-term windows. Moreover, the size, structure, and verification procedures of the final transactions database differ significantly across the academic papers.

The early studies suffer from the limited number of transactions that they used for long-term impact assessment. For instance, Fotak et al. (2008) worked with datasets of 620 transactions in his short-run analysis, but for his long-term impact analysis, only 162 transactions were used for the first (second) post-investment year, 114 for the second, and only 54 for the third year. Depending on the performance indicator, Kotter and Lel (2008) use datasets containing only 44 to 51 transactions[35] in the one-year window and

[34] Sojli and Wah Tham (2011) is an exception among the selected papers because the authors cover only SWF investments in the United States. The reason for including this study in the methodology review clean sample is its interesting comparative analysis of SWFs' investees performance with a group of comparable companies targeted by hedge funds.

[35] The number of transactions varies based on the performance indicator.

a meager number of transactions for the third year (15 to 24). Dewenter et al. (2010) have datasets containing 177, 127, and 74 transactions for years one, three, and five, respectively. Also, Knill et al. (2012) work with only 157, 82, and 50 transactions for the same periods. The largest number of transactions was used by Fernandes (2014), who compiled a dataset of 880 transactions, but he provides a result only for the one-year window, which is similar to Bernstain et al. (2013) and his dataset of 796 transactions (evaluated at six months). For impact analysis over a period longer than two years, the most extensive dataset was developed by Bortolotti et al. (2017) who collected datasets of 284 to 517 transactions (depending on the performance indicator) at one year, 380 to 445 at two years and 189 to 266 at the three-year window.

Besides the limited size of the datasets, the data collection procedures, and more importantly, the number of data filters applied to the clean research sample varies substantially.

Data collection procedures were similar to short-term impact research. The primary sources for identification of SWFs were the International Forum of Sovereign Wealth Funds (IFSWF), the Sovereign Wealth Fund Institute (swfinstitute) and independent online research. General information about the existence of the various SWFs is widely available from public sources. For collecting those SWF's investment transactions, a majority of the authors relied on commercial transaction databases, the most popular of which are the Refintiv Securities Data Corporation (SDC) database and Zephyr (Bureau van Dijk), and on Form 13F-HR for U.S.-based SWFs' transactions, as used by Bortolotti et al. (2017). The source databases for the investees' financial data is most often WorldScope Banker and Zawya.

Some authors have developed original methods to deal with the lack of information on SWFs' transactions. Bortolotti et al. (2010), for instance, uses the listing of all Norges Bank Investment Management (NBIM) equity holdings around the world, which NBIM publicly discloses quarterly. He uses these reports to track the NBIM's transactions and enlarge the investment transactions dataset he has obtained from the commercial transactions databases. This approach leads Bortolotti to a final dataset of 688 transactions, which was the most extensive sample in the literature up to the time his

study was published[36]. However, it must be stressed that of those 688 transactions, 395 (57%) were carried out by NBIM[37].

This pattern, where the majority of the transactions in the final dataset originate from just three or four SWFs, is also seen in the other studies. For instance, Dewenter et al. (2010) inform that Singapore-based SWFs represents 36% of all his transactions, which is similar to the dataset used by Park et al. (2018), where 40% of the total sample originates from Singapore SWFs alone. This situation is even more prominent in Kotter and Lel (2011), who used a dataset where 70% of the transactions are backed by Singaporean sovereign funds.

The additional criteria and data filters that the authors apply to their final datasets are similar. Concerning short-term impact analysis, these are domestic versus cross-border investment, direct versus indirect investments (i.e., those carried out by SPVs) and the exclusion of selected geographical regions or industry sectors such as real estate.

SWF Transactions Dataset—Average Stake Acquired

To our surprise, some authors paid only limited or no attention at all to the size of the stake acquired by SWFs. Despite the limited number of transactions in the dataset that Kotter and Lel (2008) used for his long-term impact analysis, he provided the following valuable information: "The median equity stake acquired by SWFs is 5 percent, with only about 5 percent of SWF investments exceeding the 50 percent threshold." Kotter also works with a "stake" variable[38] and finds a positive but statistically insignificant coefficient for the stake acquired by an SWF, suggesting that his sample does not display a high degree of SWF activism if any. Similar results were confirmed by Fotak et al. (2008). Fotak uses a cross-sectional regression, where he sets up a "percent acquired" variable and concludes that there is no evidence of a relationship between the share in the target acquired by an SWF and the target's long-term abnormal returns. Authors give no information about the median or average size of the share acquired. A similar

[36] For the time-period exceeding 12 months following the SWFs investment

[37] The authors are aware of the potential for distortion of the clean sample data and used a dummy variable to verify results for the transactions subgroup without NBIM investment deals.

[38] That is, the percentage of the target firm's equity purchased by the SWF.

research approach was used by Bortolotti et al. (2015, 2017) who worked with a clean sample comprised of transactions where the mean SWF stake acquired was 8.45%, and the median was 1.23%. Unfortunately, he did not discuss the relationship between long-term impact and size of ownership share in his work. Dewenter et al. (2010) used a clean sample with a significantly larger mean (28%) and median (20%) share acquired by SWFs than that observed by Kotter (2008). Dewenter estimates that the coefficient of a share acquired is positive. She says, "Not all of the estimates are statistically significant, but many are significant, and the estimated coefficients are fairly stable across the various specifications."

A different approach was chosen by Fernandes (2014), who uses a dummy variable in order to separate transactions where the SWF's ownership stake in a targeted company is greater than 1%. For this subsample, the average ownership stake equaled 6%. He concludes that for this "large position" subgroup of transactions, a higher long-term premium in value was recorded compared to the full sample.

The largest mean ownership share was recorded by Bernstain et al. (2013), where the mean percentage of the SWF stake in his database of transactions was 56.6%.[39] The lowest value of mean ownership share was presented by Fernandes (2014) for his full sample, which was 0.54%.

39 Bernstein's (2013) dataset is comprised of both public companies and private entities.

Long-term Impact Conclusion

This review of research methodology and data collection techniques confirms significant inconsistencies in the literature concerning the actual impact of SWF's investments on their target companies. The enhancement in the value of the target firm that would be expected based on the literature on investments by large shareholders generally is fully supported only by Fernandes (2014). His results showed that SWFs' investees substantially outperform a control group. However, it needs to be stressed that the author reports only the change in absolute operational parameters in the year prior to the SWFs investment and the year following it.

Surprisingly, even in the studies based on comparable research models, we find contradictory results. The vast majority of the authors confirm a decline in market value or performance indicators in the first two years. However, Dewenter et al. (2010) observed a statistically significant premium in market value (based on cumulative market-adjusted returns) in the third and fifth year. That positive result is contradicted by those of all the other authors who provided results for the five-year post-investment window, no matter what methodological approach they employed. For instance, Knill et al. (2012), who examined changes in both return and risk parameters, concludes that the decline in return experienced by target firms is not compensated by a sufficient corresponding risk in the five-year window. A similar negative impact is confirmed by Fotak et al. (2008) based on mean compounded abnormal returns up to the four-year window, by Bortolotti's (2017) performance-based analysis for the three-year window and by Park et al. (2018) market value-based research for the two-year window.

We did not find any methodological or statistical errors, which could explain the contradictory research results. In Fernandes (2014), we believe that his positive results might be connected to his use of a propensity score-matched control group methodology where the performance indicators of every SWF's investee in his dataset are matched with a similar firm which did not receive SWF investment. We see that Fotak et al. (2008) found, similarly to Fernandes (2014), positive raw returns in all measured windows up to four years, but when his results (using mean compounded abnormal returns) are adjusted for risk, his results are all significantly negative.

We have identified three factors as the most probable cause of the inconsistencies in the research results for the long-term impact of SWFs on targeted companies. All three factors are connected to the size, diversification, and the complexity of the authors' investment transaction datasets and their data collection, verification, and filtration procedures.

i) The limited size of the dataset (of verified SWF investment transactions), particularly in the earlier studies and in the studies that used a substantially smaller sample for the time range of more than three years following the SWF's investment

ii) The strong influence on the databases of a few investment transactions generated by one or two sovereign wealth funds

iii) Substantial differences in the authors' transactions datasets in terms of the average ownership share acquired by SWFs

Based on the results presented in this section, we conclude that the academic research on the long-term impact of SWFs' investments on the value of the companies they acquire suffers from a critical lack of adequate, comparable information on the transactions. Moreover, due to extreme differences in the datasets of SWF transactions used by researchers, in terms of transaction values, several transactions, and data verification procedures, the research results have limited explanatory power. To improve the explanatory power of future research into SWFs' long-term impact, we recommend:

i) Providing detailed information on the collection, provenance, verification, and filtration procedures for SWF transaction data. This information needs to be provided separately for short-term and long-term impact analysis because the research samples differ significantly in terms of the benchmarks they use (see Bortolotti et al. (2017))

ii) Considering either excluding investment transactions lower than 1% of ownership share from the dataset or ideally including a variable to identify

targeted investments, preferably SWF transactions exceeding a certain level (at least >1%) of investees' ownership share for long-term impact analyses

iii) Avoiding excessively large data samples at any cost. This methodology review shows that this inflation of the database adds an excessive number of transactions by one or two SWFs and increases the probability of biased research results.

1.5 Conclusion

This paper provides a structured overview of the seminal research papers published from 2007 to 2018 on the subject of the impact of investment by sovereign wealth funds on the companies into which they invest. The current academic literature does not offer a unanimous answer to the question of the nature of that impact.

First, via a metadata-based search of selected academic databases, libraries, and online academic search engines, approximately 2,500 articles discussing SWFs were identified. Next, all publications other than those in journals and books were excluded. Checks for duplication were then run, and search errors were corrected in order to provide a clean sample comprised of 790 publications. This literature database was then broken down into three categories of SWF investment that were discussed: i) Direct; ii) Indirect and iii) External.

The "Indirect" category includes only studies on SWFs' impact on targeted companies' market value or performance and is a minor category in the SWF literature. In total, only 78 articles were identified as such, representing less than 10% of the SWF-related literature database compiled for purposes of this study. Moreover, less than one-third of the authors in this subgroup presented original empirical research based on an original dataset. The rest of the publications summarized previously published findings, expanded the discussion based on previously published research results, or demonstrated secondary effects of SWF investees' market performance such as the impact of the investments on investees' competitors.

Our analysis confirms the consistency of results in the literature on market reactions closely linked in time to an SWF's announcement of an investment transaction. The short-run results vary to some extent, but a positive impact, confirmed directly by market value premium or indirectly by risk reduction, is observed by the vast majority of the publications.

No similar consistency of impact was found for long-term investment horizons.

Three factors were identified as the most probable reason for the inconsistent research results on the long-run impact of SWF investment on targeted companies. All those

factors are connected to the investment transaction datasets used. They are (i) the limited size of the SWF investment transactions datasets; (ii) the predominance of transactions generated by only one or two SWFs; and (iii) substantial variance in the SWF's average ownership share in their investees among the reviewed studies.

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CHAPTER 2: IMPACT OF THE SOVEREIGN WEALTH FUNDS ON THE MARKET VALUE OF THE ACQUIRED COMPANIES

2.1 Introduction

The principal objective of this chapter is to address a question of whether the long-term involvement of Sovereign Wealth Funds (SWFs) brings a premium or loss to foreign investees, or if its impact is possibly neutral compared to other institutional investors and the market average.

The impetus for initiating this research was provided by the inconsistent results from the economic research community and the limited attention paid to significant economic and political differences between direct and portfolio investment regarding investors' strategic intentions, and the impact investors have on the investee's long-term performance.

With the rapid growth of SWF assets under management during the last decade and the funds' cross-border investment appetite, this information has become increasingly relevant to political representatives protecting sovereign interests, to private business, to investment decision-makers, and of course to economists who have been monitoring the dynamic shift in global financial markets, especially following the global financial crisis in 2007–2008.

As thoroughly discussed in the previous chapter academic research does not offer a unanimous opinion on how SWFs impact the targeted companies' performance and market value, as pointed out by Fernandes (2017), Aguilera, Capapé and Santiso (2016) or Megginson (2017). Positive abnormal returns upon the announcement of the transaction have been unanimously confirmed by Fotak et al. (2008), Bortolotti, Fotak and Loss (2017), Chhaochharia and Laeven (2009) or Kotter and Lel (2011). However, the findings of recently published papers aimed at long-term market value (longer than one year from the effective date of the transaction), built predominately on event-study analysis, are frequently contradictory. For instance, Fernandes (2014) finds a significant premium on firm value for SWF investments (15% to 20%) and substantial improvements in operating performance and concludes that SWFs contribute to

creating long-term shareholder value. Similarly, Dewenter, Han and Malatesta (2010) finds that over 3- and 5-year periods following the acquisition announcement dates, the mean client money and asset return (CMAR) is positive for all of the samples. On the contrary, Fotak, et al. (2008) find two-year abnormal returns of SWFs average a significantly negative 14%, suggesting that deteriorating firm performance follows equity acquisitions by SWFs. This finding is further confirmed by Bortolotti et al. (2015), who finds that SWF investment targets suffer from declining return on assets and sales growth over the following three years. Park, Xu and In (2018) confirm that SWFs' investees generally underperform the overall stock market in the long run (-4.66% in the first year and -6.32% in the second year following the SWFs involvement).

Similarly, Knill, Lee, and Mauck (2012) investigate the relationship between SWF investment and long-term return-to-risk performance (up to five years). They conclude that although the risk is reduced, especially in the long-term horizon, target corporate raw returns also decline following SWF investment. This finding suggests that SWFs may not provide some of the benefits that are offered by other institutional investors.

What differentiates this study from previously conducted work is:

(i) For the market/region/sector benchmark, Thomson Reuters Value-Weighted Indices (WI) have been used. The TRWI – professional sector indices for regions comprise 99.50 % of the market capitalization of the liquid securities (covering more than 10,000 stocks in 51 countries) which are not capped at a maximum number of constituents[40]. The level of the real market performance interpretation crucial for the final credibility of the analysis results is substantially more accurate compared to previous studies aimed at the SWFs targeted companies' performance.

[40] Sector indices for countries includes 10 Economic sectors, 7 Business groups, 5 Industry groups and 5 Industries covering 51 countries and 29 regions. Sector indices will continue to be published if they have at least 3 constituents. When a sector index drops to 2 or fewer constituents, the sector index is no longer published. For detail information on the global indices please see THOMSON REUTERS GLOBAL EQUITY INDICES Index Methodology.

(ii) Its exclusive focus on SWF cross-border transactions and exclusion of all transactions bellow one percent of the investee's ownership. The reasons for excluding portfolio and domestic investment lie in:

a. The research objective of analyzing only transactions of a strategic character, where the influence and direct impact of SWFs on company leadership and strategic management can be expected;

b. The elimination of the investment funds' standard short-term portfolio-optimization activities;

c. The ability to analyze the direct impact on investee performance instead of the efficiency of the investor (SWF) portfolio management, trading or financial skills;

d. The significant reduction in the number the transactions, which allows the meticulous cross-verification of every transaction and each of investees in the full sample.

Besides other requirements, only transactions representing an ownership stock acquisition larger than 1% with simultaneous verification that the acquired stock provides the SWF with at least +1 % voting rights are included in the full sample investment transaction database, upon which all analyses and calculations presented in this paper are built. Furthermore, a subgroup comprised of SWFs transactions which meet the definition for foreigner direct investment[41] is set up, and all essential calculations are run for this subgroup of transactions as well. This set-up significantly reduces the number of transactions and SWFs included in the final dataset; however, it provides the opportunity to work only with the investment transactions where SWF ownership indicates the potential for the fund having a direct influence on the long-term strategic course of the acquired firms.

From the explanatory power perspective, the ideal option would be to use a dummy variable set for transactions over 1% and compare the results of regression analysis with

[41] As described in the 4th Edition of the OECD Benchmark Definition of FDI, 2008

the rest of the dataset, similar to Fernandes (2014), who defined a “large position” category with transactions exceeding 1% of the investees’ ownership stake. However, this approach leads to a dataset comprised of thousands of transactions with limited relevancy, and it would not allow for establishing such a meticulous verification procedure as provided in this study.

This chapter is structured as follows. The first section introduces the research subject; Section 2 introduces the methodology framework, sample data structure, and data collection procedure; Section 3 provides the empirical results and discussion on the research findings; Section 4 concludes.

2.2 Methodology Framework, Descriptive Statistics, and Sample Data

To quantify the difference in the market value for the investees with SWFs ownership and compare it with the region/sector market average, a four-step procedure was designed.

First, utilizing two transaction databases – the Eikon Datastream database (Breakingviews, I/B/E/S, StarMine) and Securities Data Company (SDC) Platinum, an online historical financial transactions database – an initial search of SWF's related transactions was initiated. An investment period set up from 2008 to 2015 resulted in a dataset comprising 1,081 investment transactions with direct or indirect SWF involvement. Indirect SWF involvement is defined as transactions performed by a company with publicly traceable SWF ownership exceeding 50%. Out of the 1,081 deals, 429 transactions were identified as representing domestic investment (the investor and investee have the same country of origin), which results in an SWF cross-border investment dataset of 652 transactions. Next, the involvement of hedge funds and private equity funds was eliminated, and only transactions with publicly announced and confirmed transaction values were kept in the working dataset. This step reduced the dataset to 319 transactions. The selected research model based on market-adjusted returns does not allow for an evaluation of investments into private equity. Therefore, only transactions into the publicly traded companies are included in the final dataset. This selection step excluded an additional 54 transactions. Finally, only transactions exceeding the 1% stock ownership threshold were included in the final database, now comprising 275 directly driven cross-border investment transactions by SWFs into the publicly traded companies with ownership shares exceeding 1%.

In order to cross-verify the investment transaction databases generated by SDC Platinum and Datastream, each selected transaction was verified individually. To include the transaction into the final dataset, the following four conditions had to be met: (1) The investee had to have the uninterrupted status of a publicly-traded company (at least 2 years following the SWF's investment); (2) The transaction was publicly confirmed on an identical date by the investor/investee and announced by an independent public

source (public media, proxy or regulator); (3) The acquiring entity (subsidiary, affiliated companies or special purpose acquisition company (SPAC)) has to have a publicly traceable connection with the SWF ownership share exceeding 50%. (4) The legal status of the investing SWF needs to be confirmed by the publicly available declaration of the sovereign state.[42]

After finalizing the transaction verification procedure and exclusion of SWFs internal asset optimization (transfer among SWF subsidiaries) and multiple trades, another 78 SWFs transactions had to be removed from the clean dataset. The most frequent reason for investment deal exclusion from the clean dataset was the lack of publicly available information (from investee, investor or credible public source) necessary to confirm the investment deal credibility and essential transaction details and SWFs multiple trades.

The final dataset comprises 197 investment events with an average value of a transaction $856.59 million (in total over $118 billion) and average investee share acquired close to 34%. For the final clean dataset, see Table 2.1 and Table 2.2.[43]In terms of the total investment transactions number and total investment value, the majority of the SWFs transactions targeted companies are from the EMEA region (42% respective 47% in value). For additional information on investors and investees' region split, see Figure 2.1.

Finally, a dummy variable for the transactions in compliance with the foreigner direct investment definition was set up. This subgroup comprises 121 transactions of the average value of $783 million, and the average % of shares acquired reaches 46%.

[42]This rule eliminates transactions similar to the bankrupt Corporate Commercial Bank AD in Bulgaria, a $128.81 million, 30% share transaction from 2009 officially run by the Luxembourg-based Bulgarian Acquisition Company II S.a.r.L and allegedly backed by a sovereign fund of Oman.

[43]The number of investment events varies in the 3rd 4th and 5th years due to transactions with dates effective 2014 and later, for which return data are not available yet.

Table 2.1: List of Sovereign Wealth Funds - Investors

This table presents nineteen sovereign wealth funds whose investment transactions are included in the final clean sample used for calculations in this chapter. For each fund following information is included: country of origin; number of fund's investment transactions included in the clean sample; average value of all fund's transactions; sum of the transactions carried out by each fund; average percentage of share acquired and finally number of transactions fulfilling the definition of the foreign direct investment transaction.

Fund name	Country	# of deals	Average deal value [mil USD]	Total deal value [mil USD]	Avg. % shares Acq.	# of FDI deals
Abu Dhabi Investment Authority (ADIA)	Saudi Arabia	6	2,223.50	6,670.50	15.42	2
Abu Dhabi Investment Council (ADIC)	Saudi Arabia	2	33.50	66.99	85.00	2
Dubai Holding	Saudi Arabia	3	500.00	500.00	43.94	3
Emirates Investment Authority (EIA)	Saudi Arabia	10	991.98	6,943.85	37.22	8
Future Fund	Australia	3	39.04	117.13	26.60	1
GIC Private Ltd.	Singapore	16	713.07	9,983.05	14.45	9
Government Pension Fund—Global	Norway	2			52.62	1
China Investment Corporation (CIC)	China	36	816.05	22,849.45	41.65	23
Investment Authority of Saudi Arabia*	Saudi Arabia	7	2,258.38	6,775.14	30.65	6
Khazanah Nasional Berhad	Malaysia	13	86.96	608.71	89.67	11
Korea Investment Corporation (KIC)	South Korea	1	2,000.00	2,000.00	8.47	0
Kuwait Investment Authority (KIA)	Kuwait	6	873.62	3,494.47	13.06	3
Libyan Investment Authority	Libya	2	4.29	4.29	5.46	0
Mubadala Development Company	Saudi Arabia	3	2,741.07	8,223.22	58.48	3
National Welfare and Reserve Fund	Russia	1	186.55	186.55	100.00	1
Qatar Investment Authority (QIA)	Qatar	33	2,171.34	36,912.85	18.02	12
Samruk-Kazyna JSC	Kazakhstan	4	599.89	1,799.66	26.80	4
State General Reserve Fund	Oman	7	50.56	303.34	16.85	6
Temasek Holdings	Singapore	42	283.05	9,057.65	32.98	26
Total		**197**	**856.59**	**116,496.8**	**33.83**	**121**

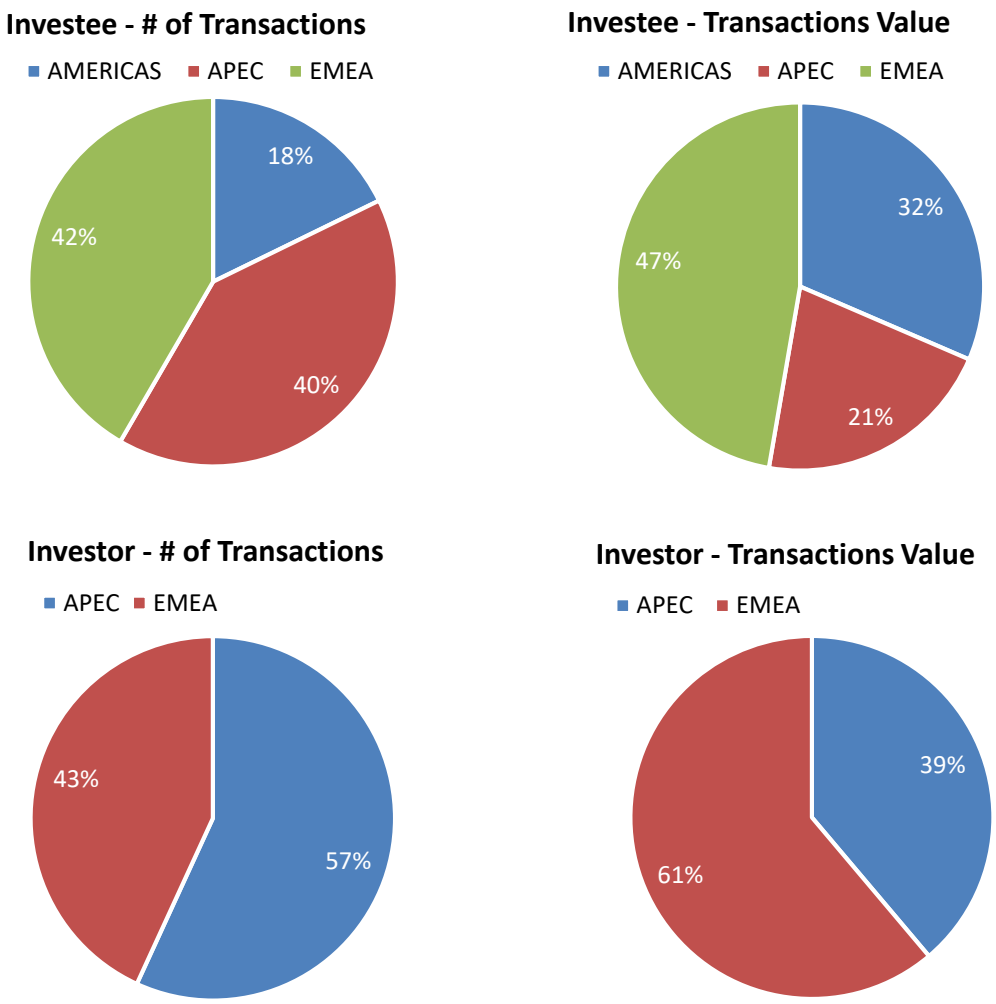

Figure 2.1*:* Investors and Investees Regional Split[44] - Full Sample

[44] (EMEA) - Europe, the Middle East and Africa including Russia; (APEC] Asia-Pacific Economic Cooperation Region

Table 2.2: Investees' Country Affiliation

This table includes forty-nine sovereign countries indicated as a country of origin of hundred and ninety-seven targeted companies (SWFs investees) included in the final clean sample used for calculations in this chapter. For each country following information is included: number of investment transactions included in the clean sample; the average value of SWFs transactions in the country; total value of the transactions; the average percentage of share acquired in investees allocated in the selected country and finally a number of transactions fulfilling the definition of the foreign direct investment transaction.

Country	Number of deals	Average deal value [mil USD]	Total deal value [mil USD]	Avg. % shares Acq.	#of FDI deals
Australia	14	129.90	1,688.74	35.12	9
Bermuda	1	1,800.00	1,800.00	9.00	0
Brazil	7	1,289.59	9,027.14	44.78	5
Bulgaria	1	128.81	128.81	30.00	1
Canada	9	1,298.55	10,388.44	45.17	5
Cayman Islands	3			100.00	3
Czech Republic	1	140.00	140.00	100.00	1
Denmark	1	2.30	2.30	100.00	1
Egypt	3	204.66	613.99	71.73	3
Finland	1	3.77	3.77	50.00	1
France	10	560.04	2,800.19	13.71	4
Germany	6	3,368.41	10,105.23	27.72	5
Greece	1				0
Hong Kong	7	425.85	2,980.92	26.20	5
China	12	319.79	3,197.86	41.83	10
India	15	174.71	2,445.92	23.54	7
Indonesia	13	368.69	2,580.86	33.45	8
Iraq	1			23.00	1
Italy	1	4.29	4.29		0
Ivory Coast	2	75.00	75.00	15.00	2
Jordan	5			15.90	4
Kazakhstan	1	939.00	939.00	11.00	1
Kuwait	1	425.14	425.14	25.80	1
Malaysia	2	1,753.12	3,506.23	19.62	2
Monaco	1			3.49	0
Morocco	2	5,729.43	11,458.85	53.00	2
Netherlands	1				0
Oman	2	69.50	139.00	23.25	2

Pakistan	3	473.57	947.14	50.06	2
Philippines	6	426.74	2,560.46	15.33	3
Poland	2			7.36	0
Portugal	2	0.91	0.91	90.00	1
Russian Fed	1	2,000.00	2,000.00	12.50	1
Saudi Arabia	1			100.00	1
Singapore	5	1,095.91	5,479.57	50.06	5
South Africa	3	49.00	98.00	5.18	0
South Korea	1	49.73	49.73	4.57	0
Spain	3	2,666.77	2,666.77	5.41	0
Sri Lanka	1	207.00	207.00	100.00	1
Switzerland	4	3,199.00	6,398.00	38.72	2
Taiwan	2			100.00	1
Tanzania	1	16.00	16.00	14.00	1
Tunisia	1			50.00	1
Turkey	3	228.50	457.00	43.74	3
Ukraine	1			39.99	1
United Kingdom	15	1,847.69	12,933.80	40.22	7
United States	14	1,670.62	15,035.59	10.50	4
Utd Arab Em	2	1,576.18	3,152.36	29.39	2
Vietnam	2	42.84	42.84	19.52	2
Total	**197**	**856.59**	**116,496.85**	**33.83**	**121**

2.2.1 Market Adjusted Return

Similar to Dewenter et al. (2010), market-adjusted returns (MARs), rather than market model abnormal returns, were calculated for every transaction from the final dataset.

The market-adjusted returns are computed as the difference between the investee return index (RI) and Thomson Reuters Value-Weighted Indices (WI). Some of the companies in the transaction database are already inactive. Therefore, both the Datastream Code and ISIN Code were used to pull the RI data from the TR databases. After pulling the ISIN code, the Thomson Reuters Business Classification (TRBC) Industry Group were identified and matched with the appropriate TR Weighted Index.

The market-adjusted return ($MAR_{i,k}$) for investee *i* on event day *k* is defined as the difference between the firm's RI on day *k* ($RI_{i,k}$) and the investee *i* matched WI on day *k*.

$$MAR_{i,k} = RI_{i,k} - WI_{i,k}$$

Return Index

RI is available for individual equities and unit trusts. RI shows the theoretical growth in value of a shareholding over a specified period, assuming that dividends are reinvested to purchase additional units of an equity or unit trust at the closing price applicable on the ex-dividend date:

$$RI_t = RI_{t-1} * \frac{P_t}{P_{t-1}}$$

except when t = ex-date of the dividend payment D_t, then:

$$RI_t = RI_t - 1 * \frac{P_t * D_t}{P_{t-1}}$$

where:

P_t = price on ex-date

P_{t-1} = price on the previous date

D_t = dividend payment associated with ex-date t

Gross dividends are used where available, and the calculation ignores tax and re-investment charges. Adjusted closing prices are used throughout to determine the price index and hence return index.

2.2.2 . Thomson Reuters Value-Weighted Indices (WI)

The TR Value-Weighted Indices cover more than 10,000 stocks in 51 countries and 29 regions. The indices are free float-adjusted, market-capitalization-weighted, and designed to serve as broad market benchmarks to track the performance of liquid equities worldwide. To model the average market performance, the Total Return variant of the WI has been used in all the calculations in this study.[45]

The index equals the aggregate market value of all index securities[46] divided by the divisor of the Index. A divisor is an arbitrary number chosen at the inception of the index to fix the starting value of the index (say, at 100). The divisor serves the purpose of scaling such aggregate value to a lower magnitude, which is more desirable for reporting purposes. In the event of any corporate action affecting the market value of the index, the divisor is adjusted to offset the change in the market value of the index so that the index value does not jump up or down drastically. All Thomson Reuters Global Equity Indices have a base value of 100 at the inception.[47]

The $WI_{i,k}$ based on the total return index is computed as follows:

$$IndexPrice_{k} = \frac{\sum_{i=1}^{n}(p_{i,k}Xq_{i,k}Xr_{i,k}) + (Div_{i,k}Xq_{i,k}Xr_{i,k})}{Divisor_{k}}$$

where:

$p_{i,t}$ = price of equity i=1,2..,n, at time k = 0,1,2, …, K

n = number of equities in the index

[45] Daily history is available from April 1999; the price return variant of WI is available for each of the indices

[46] Aggregated market value = total of number of shares of each of the index securities multiplied by each such security's closing price

[47] Detailed information about the WI construction methodology is available at THOMSON REUTERS GLOBAL EQUITY INDICES Index Methodology at https://goo.gl/ZRvJVg

$q_{i,k}$ = float-adjusted shares outstanding f or equity i at time k

$r_{i,k}$ = 1 if a country index, if regional index – exchange rate of local currency at the time (k)

2.2.3 Total Market Adjusted Return

First, the investee *i* percentage change of the Return index ($\%RI_{i,k}$) at the time *k* is defined as the difference between $RI_{i,k,}$ and $RI_{i,0}$ (time 0 is defined as the transaction *i* day effective) divided by $RI_{i,0}$.

$$\%\mathrm{RI}_{\mathrm{i,k}} = \frac{RI_{\mathrm{i,k}} - RI_{\mathrm{i,0}}}{RI_{\mathrm{i,0}}}$$

Similarly, the percentage change of the value-weighted indices ($WI_{i,k}$) matched to investee *i* at time *k* is defined as the difference between $WI_{i,k,}$ and $WI_{i,0}$ (time 0 is defined as the transaction *i* day effective) divided by $WI_{i,0}$

$$\%\mathrm{WI}_{\mathrm{i,k}} = \frac{WI_{\mathrm{i,k}} - WI_{\mathrm{i,0}}}{WI_{\mathrm{i,0}}}$$

Then the market-adjusted return percentage change ($\%MAR_{i,k}$) of investee *i* at time *k* is defined as the difference between $\%\mathrm{RI}_{\mathrm{i,k,}}$ and $\%\mathrm{WI}_{\mathrm{i,k}}$.

$$\%MAR_{\mathrm{i,k}} = \%RI_{\mathrm{i,k}} - \%WI_{\mathrm{i,k}}$$

Finally, the total market-adjusted return $TMAR_{i,k}$ [%] for all the transactions included in the transaction database is defined as the arithmetical mean of all the $\%MAR_{\mathrm{i,k}}$, where *k* defines the year (first, third and fifth) following the transaction effective date and *n* represents a number of transactions.

$$\mathrm{TMAR}_{\mathrm{i,k}} = \frac{\sum_{i=1}^{n} \%MAR_{\mathrm{i,k}}}{n}$$

Subsequently, all ratios were winsorized at the 1% and 99% levels.[48]

[48] Winsorizing procedure impacted only two transactions (overall three TMAR values) from the full sample, both with extremely positive values.

2.3 Empirical Results

2.3.1 Market Value

In the first year (250 trading days) following the effective transaction date, the negative market-adjusted return of – 0.56% (see Table 3) is observed. Based on the full sample statistics, 52% of the investees underperformed the market average (see Figure 2.2). This observation indicates a rather neutral initial impact of SWF on the Investee's performance.

In the second year (500 trading days) the total market-adjusted returns outperformed the market average by 0.8%. However, these overall positive results have been achieved by only 43% of the investees. 57% of the companies included in the full sample has underperformed the market average.

In the third year (750 trading days) following the SWF investment, the total market-adjusted return for the full sample continuous to be still positive and SWFs investees returns outperformed market average by 2.93%. This result implies that the involvement of SWF investments can bring a significantly positive stimulus for the investee in the three-year outlook. An interesting takeaway from the three-year post-investment period is the fact that although the overall impact on the company market return is positive, only 38% of the investees have reached market-adjusted returns higher than the market average and the median for the group of investees after the third year since the SWF investment is negative -12.54%. This finding implies that SWFs can have a significantly positive impact on the companies (stability, limited pressure on short-term financial results, insight information, political support), but overall negative performance results were observed for the majority of investees.

In the fourth year (1,000 trading days), for the first-time negative trend in the overall performance of the group of SWFs investees compare to the market average has been recorded. In the fourth year, the market value premium for the group of the SWFs investees from the first three years has been erased, and the mean of the SWFs investees' MAR returned to the market average.

In the fifth year (1,250 trading days) after the SWF investment, the results indicate underperformance in the whole SWF investee group of companies compared to the market average. The TMAR in the fifth year reached negative -2.90%. One of the possible explanations is that SWFs primarily target companies in which they foresee a unique market opportunity, which unfortunately has only a limited positive impact on investee performance and on average this premium deteriorates during the first four years following the SWF investment. Negative results for the fifth year after the SWFs involvement together with the overall observation of the negative split in terms of the companies exceeding the market average performance since the transaction date effective supports the hypothesis that from the very long-term perspective (three-plus years) SWFs impact on the company performance is negative. When the focus is put solely on the period from the third to the fifth year following the SWF investment, the observed results are even more compelling.

Table 2.3: Market Adjusted Returns

The table presents the descriptive statistics of the full sample comprised of one hundred and ninety-seven sovereign wealth funds transactions. For each of five years following the date of the SWFs investment transaction, a difference in the market-adjusted return was calculated. The table includes the total number of investment transactions in each post-investment year; minimal and maximal value in the relevant year, arithmetic mean of all transactions; the standard deviation of its sampling distribution and the value of the full sample standard deviation.

	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
0-1Y Market Adjusted Return %	197	-106.40	120.58	-0.5592	2.769	38.863
0-2Y Market Adjusted Return %	197	-145.00	385.00	0.8303	4.846	68.020
0-3Y Market Adjusted Return %	192	-173.64	581.00	2.9261	7.128	98.766
0-4Y Market Adjusted Return %	174	-165.66	545.00	-0.3858	7.435	98.081
0-5Y Market Adjusted Return %	151	-219.42	542.66	-2.9044	8.366	102.808

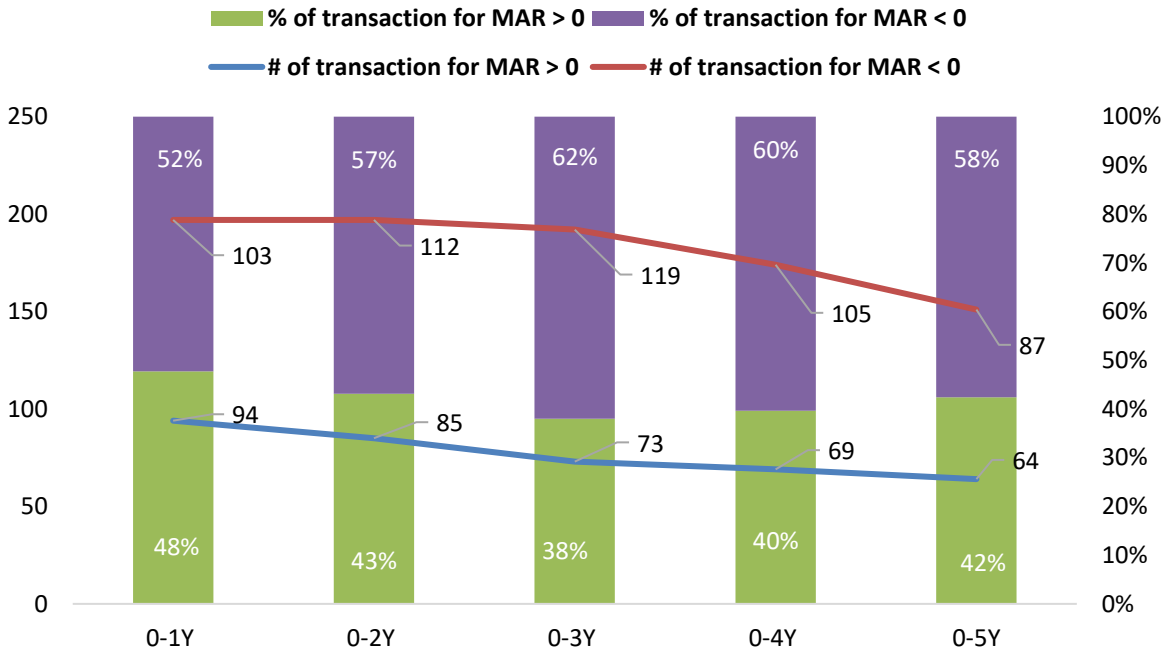

Figure 2.2: Market Adjusted Returns versus Market Performance – Full Sample

To identify statistically significant deviation of SWFs' investees returns from the market average, the SWFs investees' annual total return indexes were tested against the market average returns represented by the TR Value-Weighted Indices Table 2.4. Figure 2.3 visualizes the distribution of the investee's returns based on market performance.

Table 2.4: Investees % Change in the total RI and % Change in the TR Value-Weighted Indices

The table presents results of the linear regression analysis designed to test the relationship between the annual proportional changes in the total return indexes companies targeted by SWFs and market average simulated by annual c proportional changes in the annual value of the Value-Weighted indices.

	R	R Square	Adjusted R Square	Unstd. Coefficients		Stand. Coefficients	t	Sig.
Predictor				B	Std. Error	Beta		
			Dependent Variable: Total Return 1Y %					
1Y Global Indices Return Index Diff %	.522	.273	.269	1.065	.125	.522	8.549	.000
			Dependent Variable: Total Return 2Y %					
2Y Global Indices Return Index Diff %	.557	.310	.307	1.544	.165	.557	9.370	.000
			Dependent Variable: Total Return 3Y %					
3Y Global Indices Return Index Diff %	.215	.046	.041	.559	.184	.215	3.040	.003
			Dependent Variable: Total Return 4Y %					
4Y Global Indices Return Index Diff %	.362	.131	.126	1.011	.198	.362	5.095	.000
			Dependent Variable: Total Return 5Y %					
5Y Global Indices Return Index Diff %	.202	.041	.034	.308	.122	.202	2.512	.013

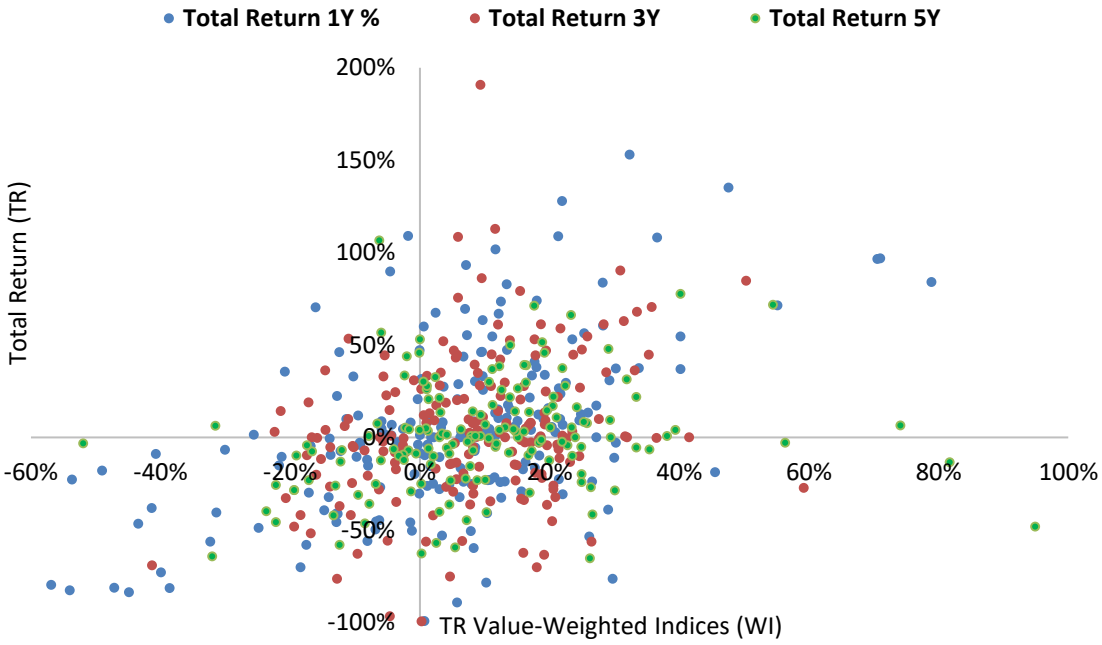

Figure 2.3: Full Sample - % Change of RI with respect to the % Change of WI

Based on the linear regression analysis results we support the hypothesis stating that there is a statistically significant linear relationship of the mean of the SWFs' investees returns on the market average returns represented by the TR Value-Weighted Indices.

The presented findings on the long-term impact of SWFs on the investees' market value are partially consistent with results provided by Dewenter et al. (2010), who concludes that over the 3-year post-investment periods, the average CMARs are positive. In contrast to this study, Dewenter confirms the SWF premium also in the 5-year post-investment period. Similarly, Fernandes (2014) confirms a premium on company value for SWF investments. On the contrary, Fotak et al. (2009) finds two-year abnormal returns of SWFs average a significantly negative 14%; identically, Knill et al. (2012), who investigated the relationship between SWF investment and the long-term return-to-risk performance (up to five years), found that although the risk is reduced especially in the long-term horizon, target company raw returns decline following the SWF investment.

Given the steep drop in market value observed in the fourth and fifth-year SWF post-investment periods, it would be interesting to investigate this negative trend further and

confirm or deny the hypothesis regarding the negative impact SWFs have on investees' market value in the five-plus-year post-investment period. This would require extending the full sample effective date interval from 2008 to ideally 1999 (the earliest data available for TR WI). Also, the Total Market Adjusted Return methodology used in this study is based on the Total Returns index and Value-Weighted Indices spot values.

Foreign Direct Investment

In the subgroup of the investment transactions fulfilling the definition of the foreigner direct investment, the involvement of Investors is expected to be even more tangible. Based on the results included in Table 2.5 and data distribution illustrated in Figure 2.4 almost identical trend as for the full sample transaction database is observed for the subgroup of FDI transactions. The initial positive impact of SWFs investor (+1.34 % in the first year and +0.58% premium in the second year) culminates in the third year following the SWFs involvement (+3.81%). Then, the initial positive effect slowly deteriorates (+0.14% in the fourth year). This negative trend continues in the fifth post-investment year and confirms negative (-1.04 %) performance results achieved by the group of investees with substantial (larger than 10% ownership stock in possession of an SWF).

Similar to full sample analysis the results of the linear regression analysis presented in Table 2.6 supports the alternative hypothesis stating that there is a statistically significant linear relationship of the mean of the SWFs' investees returns on the market average returns represented by the TR Value-Weighted Indices.

Table 2.5*:* Market Adjusted Returns – Foreigner Direct Investment Subgroup

The table includes the descriptive statistics of the subgroup comprised of the investment transactions fulfilling the definition of the foreign direct investment. For each of five years following the date of the SWFs investment transaction, a difference in the market-adjusted return was calculated. The table includes total number of investment transactions in each post-investment year; minimal and maximal value in the relevant year, arithmetic mean of all transactions; the standard deviation of its sampling distribution and the value of the full sample standard deviation.

	N	Minimum	Maximum	Mean	Std. Error	Std. Deviation
0-1Y Market Adjusted Return %	121	-106.40	120.58	1.34	3.852.11	42.37
0-2Y Market Adjusted Return %	121	-140.90	385.00	0.58	5.940.30	65.34
0-3Y Market Adjusted Return %	118	-116.31	581.00	3.81	8.323.81	90.42
0-4Y Market Adjusted Return %	106	-165.66	435.69	0.14	8.260.72	85.05
0-5Y Market Adjusted Return %	92	-219.42	376.57	-1.04	9.661.18	92.67

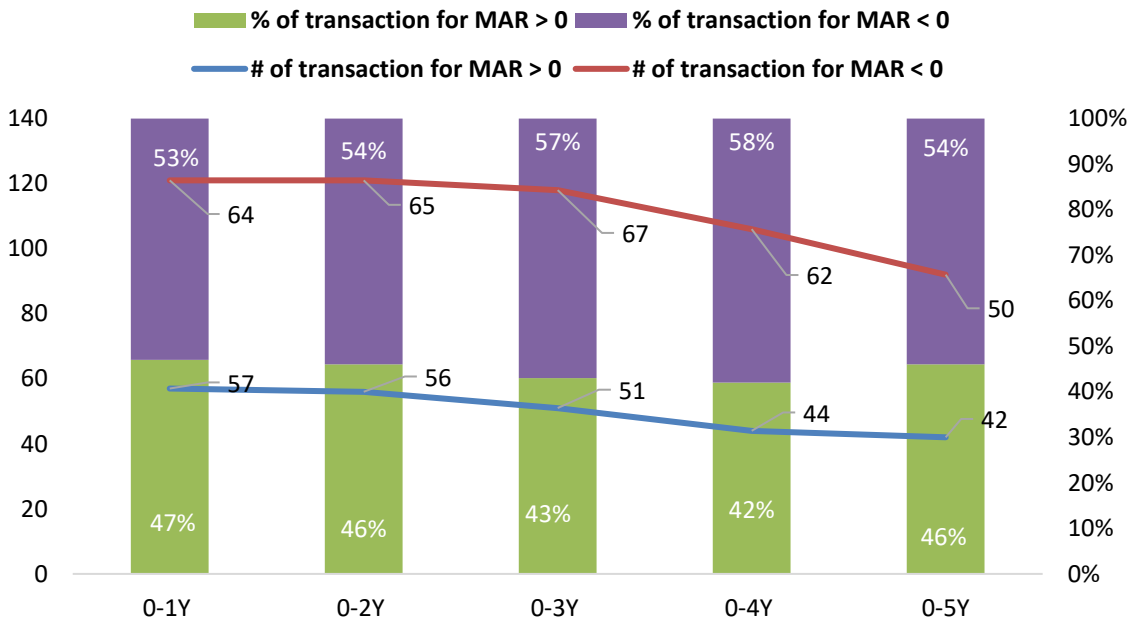

Figure 2.4: Market Adjusted Returns versus Market Performance – FDI Transactions

Table 2.6: Investees % Change in the Total RI and % Change in the TR Value-Weighted Indices - FDI Transactions Subgroup

The table includes results of the linear regression analysis designed to test the relationship between the annual proportional changes in the total return indexes companies targeted by SWFs and market average simulated by annual proportional changes in the annual value of the Value-Weighted indices. The provided results are based on the subgroup of the investment transactions fulfilling the definition of the foreign direct investment.

	R	R Square	Adjusted R Square	Unstd. Coefficients		St.Coefficients	t	Sig.
Predictor				**B**	**Std. Error**	**Beta**		
Dependent Variable: Total Return 1Y %								
1Y Global Indices Return Index Diff %	.485	.235	.229	1.073	.177	.485	6.048	.000
Dependent Variable: Total Return 2Y %								
2Y Global Indices Return Index Diff %	.536	.287	.282	1.285	.186	.536	6.929	.000
Dependent Variable: Total Return 3Y %								
3Y Global Indices Return Index Diff %	.940	.884	.883	.913	.031	.940	29.804	.000
Dependent Variable: Total Return 4Y %								
4Y Global Indices Return Index Diff %	.952	.906	.905	1.009	.032	.952	31.631	.000
Dependent Variable: Total Return 5Y %								
5Y Global Indices Return Index Diff %	.819	.671	.667	.761	.056	.819	13.538	.000

2.3.2 Transparency

To investigate the relationship between the sovereign wealth funds' level of transparency, governance standards, and impact on the long-term market value of investees, the Truman index was applied.[49]Truman analyzed sixty SWFs and nine government pension funds (GPFs). The scores are based on publicly available information, such as summaries and annual reports on the funds' websites or from their respective countries' ministries of finance. The author also drew on the self-assessment reports that most members of the IFSWF have posted on the Forum's website. The scoreboard methodology includes four sections: (1) structure, (2) governance, (3) transparency and accountability, (4) behavior. These segments are divided into 33 evaluation elements. Finally, a value (Truman Index) between 0 and 100 is attributed to each of the 60 evaluated SWFs, where 100 represents the highest level of transparency/structure/governance.[50]Table 2.7 includes all investors in the full sample with attributed SWF transparency indexes.

Table 2.7: List of All Investors Included in the Full Sample with Assigned Truman SWFs Index

This table lists sovereign wealth funds included in the full sample with assigned transparency score. For the funds' transparency evaluation, Truman 2016 Edition of SWF-scoreboard published in the Stone and Truman (2016) was put in use.

Country	Fund name	Score
Norway	Government Pension Fund—Global	98
Australia	Future Fund	87
Korea	Korea Investment Corporation	78
Singapore	Temasek Holdings	76
China	China Investment Corporation	70
Kuwait	Kuwait Investment Authority	68
United Arab Emirates	Mubadala Development Company	68
Malaysia	Khazanah Nasional Berhad	61

[49] Truman 2016 edition of SWF scoreboard included in Stone and Truman (2016)

[50] The highest Truman index in the 2016 Scoreboard edition is attributed to the Norwegian Government Pension Fund – Global (98); the lowest ranked SWF is the Equatorial Guinea Fund for Future Generations (11) If no reliable, publicly available information with regards to the operations and governance of a SWF are available Truman excludes SWFs from the index list.

Singapore	GIC Private Ltd.	61
United Arab Emirates	Dubai Holding	59
United Arab Emirates	Abu Dhabi Investment Authority	58
Oman	State General Reserve Fund	52
Russia	National Welfare and Reserve Fund	49
Kazakhstan	Samruk-Kazyna JSC	47
Qatar	Qatar Investment Authority	40
United Arab Emirates	Abu Dhabi Investment Council	33
Libya	Libyan Investment Authority	23
Saudi Arabia	Investment Authority of Saudi Arabia[51]	10
United Arab Emirates	Emirates Investment Authority (EIA)*	10

Linear regression analysis results presented in Table 2.8 indicate that no statistically significant linear dependence of the mean of the SWFs' investees MARs on SWFs level of transparency was detected. Neither, a statistically significant linear relationship was detected for the subgroup of FDI transactions. These findings contradict the Kotter Lea (2011) research results but are consistent with the Dewenter et al. (2010) long-run return regression analysis.

The final results for the full sample dataset are presented in the XY scatter chart (Figure 2.5). The data visualization does not indicate a non-linear relationship either.

[51] Investment Authority of Saudi Arabia and Emirates Investment Authority are included in the overall list of SWFs provided by Truman, however, due to critical lack of the publicly available information, no transparency index has been assigned to this two SWFs. For this research author assigned a value (10) corresponding with the lowest value of SWFs from the Truman list (Guinea Fund for Future Generations (11))

Table 2.8 – Impact of the SWFs Level of Transparency on the Investees' Performance

This table shows the results of linear regression analysis designed to test the relationship between the level of the sovereign wealth fund transparency and percentage changes in the investees annual return rates. The table includes results for both the full sample model (first half of the table) and the subgroup of the transactions fulfilling the definition of the foreign direct investment transaction (second half of the table -Model – FDI Dummy).

		0-1Y Market Adjusted Return %	0-2Y Market Adjusted Return %	0-3Y Market Adjusted Return %	0-4Y Market Adjusted Return %	0-5Y Market Adjusted Return %
				Model – Full sample		
Truman SWF Scoreboard 2016	**R**	0.053	0.015	0.041	0.002	0.046
	R Square	0.003	0.000	0.002	0.000	0.002
	Adj. R Square	-0.002	-0.005	-0.004	-0.006	-0.005
				Coefficients		
	B	-0.103	-0.052	0.202	-0.010	-0.234
	Std.Error	-0.138	0.242	0.358	0.369	0.413
	Beta	-0.053	-0.015	0.041	-0.002	-0.046
	t	-0.746	-0.215	0.565	-0.026	-0.566
	Significance	0.456	0.830	0.573	0.979	0.572
	N	197	197	192	174	151
				Model – FDI Dummy		
	R	0.04	0.023	0.027	0.059	0.154
	R Square	0.002	0.001	0.001	0.003	0.024
	Adj. R Square	-0.007	-0.008	-0.008	-0.006	0.013
				Coefficients		
	B	-0.103	0.091	0.151	-0.312	-0.852
	Std.Error	0.234	0.361	0.522	0.519	0.577
	Beta	-0.04	0.023	0.027	-0.059	-0.154
	t	-0.438	0.252	0.288	-0.601	-1.476
	Significance	0.662	0.802	0.774	0.549	0.143
	N	121	121	118	106	92

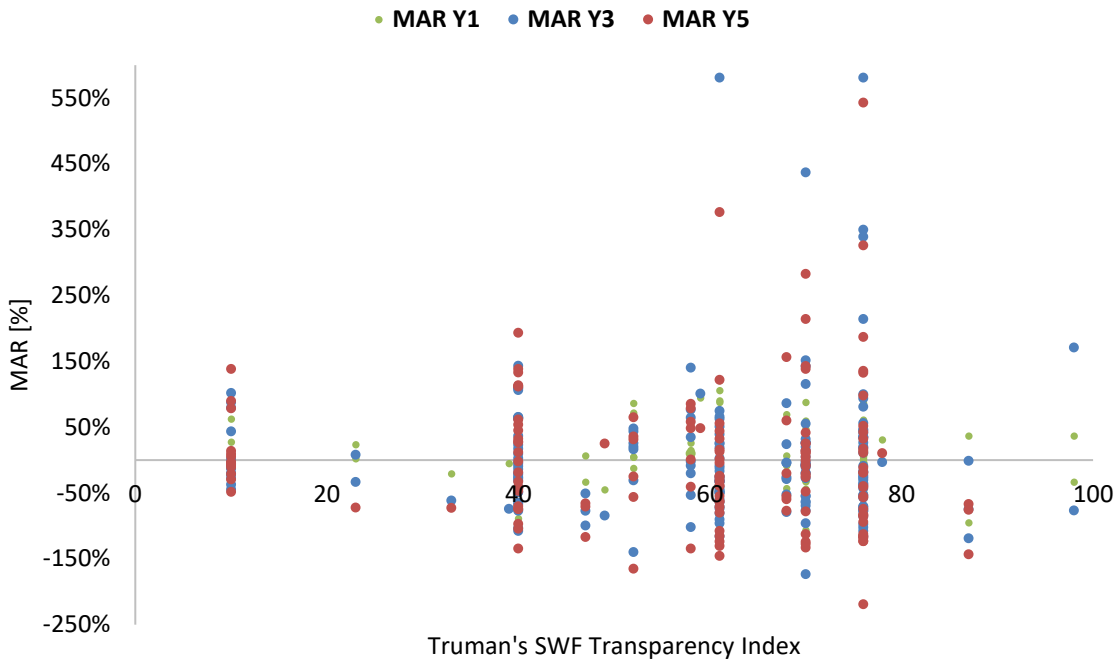

Figure 2.5: Distribution of % Δ MAR in the First, Third, and Fifth Year with Respect to the Truman SWF Transparency Index

2.3.3 Ownership Stake

Fernandes (2014), based on the regression analysis of targeted firms' value and their percentage of ownership stake owned by SWFs, concludes that there is a significant positive relationship between the companies' performance and the size of the ownership stake held by an SWF. This section presents the results of a similar analysis of the full sample dataset and FDI subcategory investigating the relationship between the SWFs' investment position and investees' market-adjusted returns.

The results of the linear regression analysis (from 1st to 5th year) for the full sample dataset and FDI subcategory are presented in Table 2.9 where investees' % of Shares Acquired is in the position of the predictor and change of MAR represents variable. The relationship between percentage change in MARs concerning SWFs ownership share in investee is visualized in the XY scatter chart (Figure 2.6).

Table 2.9: Impact of the SWFs Ownership Stake on the Investees' Performance

The table includes results of the linear regression analysis designed to test the relationship between the position of the sovereign wealth fund (ownership stake) in the targeted company and percentage changes in the investees' annual return rates. The includes results for both the full sample model (and for the subgroup of the transactions fulfilling the definition of the foreign direct investment transaction (second half of the table -Model – FDI Dummy).

		0-1Y Market Adjusted Return %	0-2Y Market Adjusted Return %	0-3Y Market Adjusted Return %	0-4Y Market Adjusted Return %	0-5Y Market Adjusted Return %
				Model – Full sample		
	R	0.109	0.126	0.079	0.115	0.1
	R Square	0.012	0.016	0.006	0.013	0.01
% of	**Adj. R**					
Shares	**Square**	0.006	0.010	0.000	0.007	0.002
Acquired				Coefficients		
	B	-0.124	-0.253	-0.231	-0.348	-0.318
	Std.Error	0.086	0.152	0.226	0.245	0.278
	Beta	-0.109	-0.126	-0.079	0.115	-0.1
	t	-1.443	-1.664	-1.022	-1.417	-1.142
	Significance	0.151	0.098	0.308	0.159	0.256
	N	174	174	170	152	131

		Model – FDI Dummy				
	R	0.159	0.156	0.095	0.141	0.104
	R Square	0.025	0.024	0.009	0.02	0.011
	Adj. R Square	0.017	0.16	0.000	0.010	0.000
				Coefficients		
	B	-.191	-.289	-.241	-.348	-.281
	Std.Error	.109	.167	.235	.240	.284
	Beta	-.159	-.156	-.095	-.141	-.104
	t	-1.759	-1.724	-1.025	-1.448	-.989
	Significance	.081	.087	.307	.151	.326
	N	121	121	118	106	92

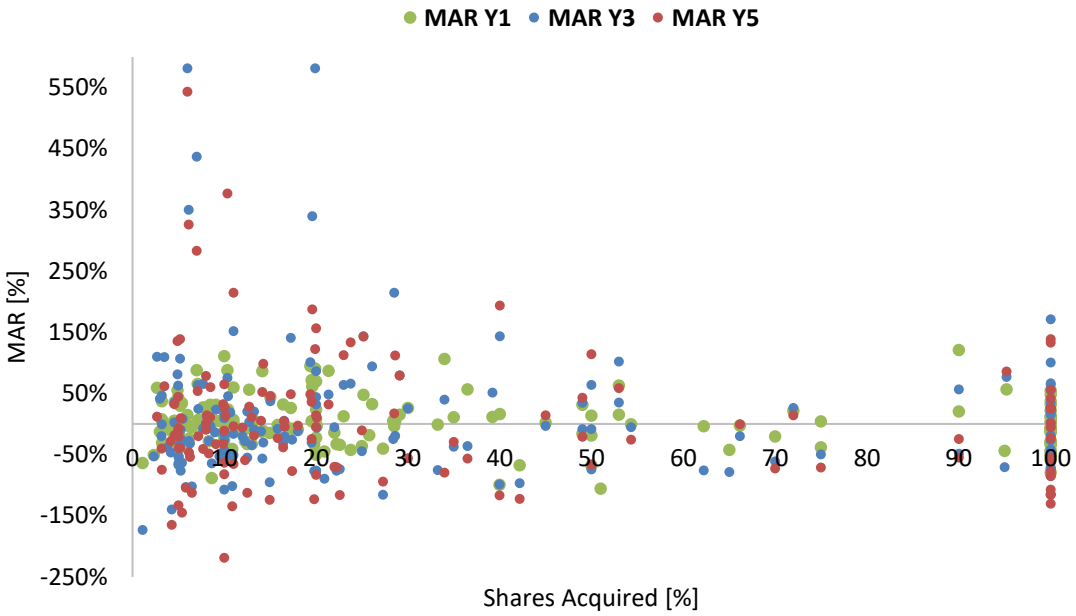

Figure 2.6: Distribution of % Δ MAR with Respect to the Size of Investee's Share Acquired by an Investor

Contrary to the findings presented by Fernandes (2014),[52] who concludes that the companies with a higher SWF ownership stake had performed better, our dataset does not provide any statistically significant evidence of such a relationship. No linear relationship of the mean of the SWFs' investees' MARs on SWFs % share acquired was detected and based on the results illustrated in Figure 2.6, a nonlinear relationship is not evident either. Therefore, we conclude that for a group of companies with SWF ownership larger than 1% and similarly for the subgroup of FDI transactions, we have no statistically significant evidence to reject the null hypothesis in this particular case that there is no linear dependence of the mean of the investees' market-adjusted returns on the size of the investor (SWF) investment position in an investee.

[52] Fernandes (2014) uses significantly different methodology for evaluating investees market value (based on the Tobins'Q) and his dataset comprises predominantly SWFs portfolio investments (with average holdings only 0.54%) which are hardly to be comparable with this full sample (with average holdings above 34% respectively 46% for the FDI subgroup)

2.4 Conclusion

The results of the empirical analysis of sovereign wealth funds' cross-border investment transactions show positive (+0.83%) market-adjusted returns in companies with SWF investment in the second post-investment year. The positive trend is evident until the third year, where the premium for the group of SWFs investees reaches its maximum (+2.92%) compared to the market average. An interesting observation from the third year following the SWF involvement is that only 38% of the investees reached market-adjusted returns higher than the market average. The median for the group of SWFs investees (in the third post-investment year) is negative (-12.54%). In the fourth year, however, the SWFs investees' returns indicate a change of the previously positive trend and start to underperform the market average (-0.35% in the 4^{th} year). This negative trend is confirmed in the fifth post-investment year (-2.90%), which indicates that the initial, gradually positive impact of sovereign wealth funds on investee performance disappears and tends to underperform the market average in a very long-term horizon.

Identical trend as for the full sample is identified for the investees included in the FDI subgroup. The results show an initially positive trend (+1.34 % in the first year and +0.58% premium in the second year). The SWFs premium reaches its maximum in the third year (+3.81%). The median for FDI subgroup in the third year, similarly to full sample returns analysis results, shows a negative value (-9.09%). Then, the initial positive effect slowly deteriorates (+0.14% in the fourth year). This negative trend continues in the fifth post-investment year and confirms negative (-1.04 %) performance results achieved in the long-term investment horizon. This finding implies that while SWFs can have a significantly positive impact on selected investees (by providing stability, limited pressure on short-term financial results, insight information or political support), the underperforming market results were observed for the majority of investees during the five years of SWFs investment involvement in targeted companies.

Second, the results of the linear regression analysis indicate that no statistically significant linear dependence of the mean of the SWFs' investees MARs on SWFs level

of transparency was detected. Neither, a statistically significant linear relationship was detected for the subgroup of FDI transactions.

Third, our dataset does not provide any statistically significant evidence of linear dependence of the mean of SWFs investees returns on SWF ownership stake.

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CHAPTER 3: MOTIVATION FOR TRANSFERRING INTERNATIONAL RESERVE FUNDS TO SOVEREIGN WEALTH FUNDS

3.1 Introduction

With the total amount of the world's foreign exchange reserves (excluding gold) reaching US$11.43 trillion in 2017 (IMF, 2018) as illustrated in the Figure 3.1, and the continuously growing reserves in the Asia and Middle East region as pointed out by Bernanke (2017) it has become incredibly tempting for governments to find a more profitable way to utilize their available funds.

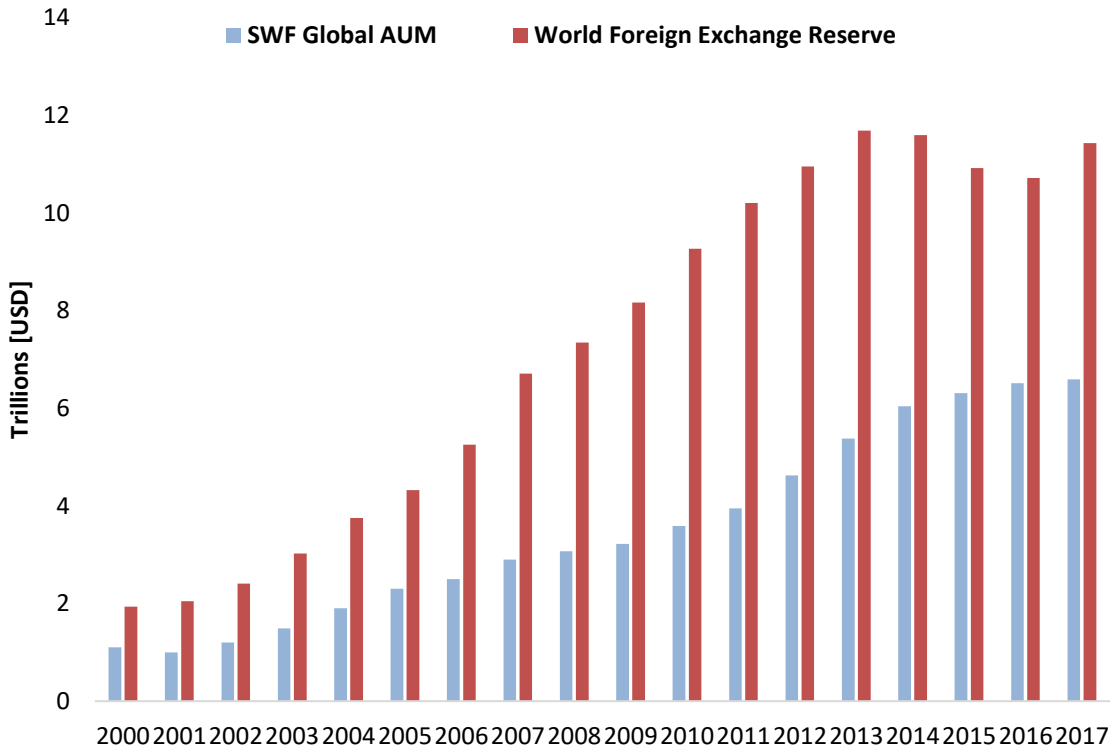

Figure 3.1: Value of Total World Foreign Exchange Reserves Excluding Gold and Sovereign Wealth Funds' Global AUM

Source: Currency Composition of Official Foreign Exchange Reserves (COFER), International Financial Statistics (IFS), Preqin (2018), and the author's calculations

A true pioneer in capitalizing on international reserve funds via a sovereign wealth authority was Singapore. In 1981 the Singaporean economy had been experiencing a continuous upsurge in the value of its international reserves (Figure 3.2).

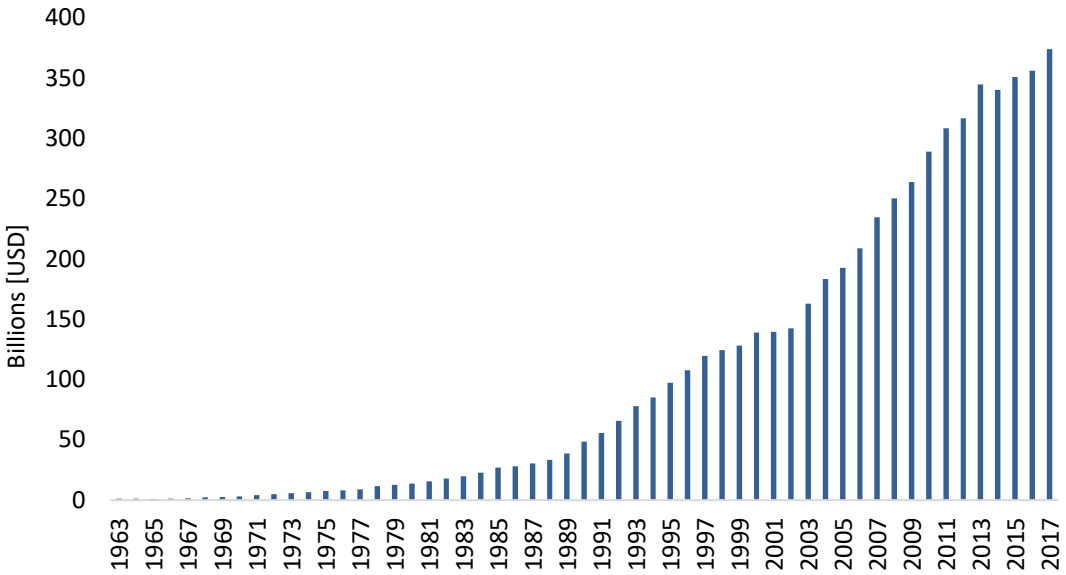

Figure 3.2: International Reserves of Singapore Including Gold

Source: IMF World Outlook, 2016 MAS – Monetary Authority of Singapore, online database

For a small economy, the reserves and its cost became a substantial burden with rather low yields and a high potential for the future higher profitability of the holdings. Following a strategic political decision, part of the international reserves was transferred to the newly established sovereign wealth fund, the Government of Singapore Investment Corporation, currently known as GIC Private Limited. GIC thus represents the first non-commodity SWF in the world. The officially proclaimed goal of the SWF is to achieve above-average yields over the long-term investment horizon[53]. The GIC remains one of the few international companies with the highest credit ratings from Standard & Poor and Moody's and based on the GIC model, which is generally

[53] From the GIC inception, the fund's strategy was to look to an investment time period of 20 years. Currently, GIC is managing a fund portfolio worth around US$350 billion (SWFI) with a 20-year annualized rate of return.

considered a benchmark for international reserve-based funds, new funds have started to emerge mostly in the East Asia region.

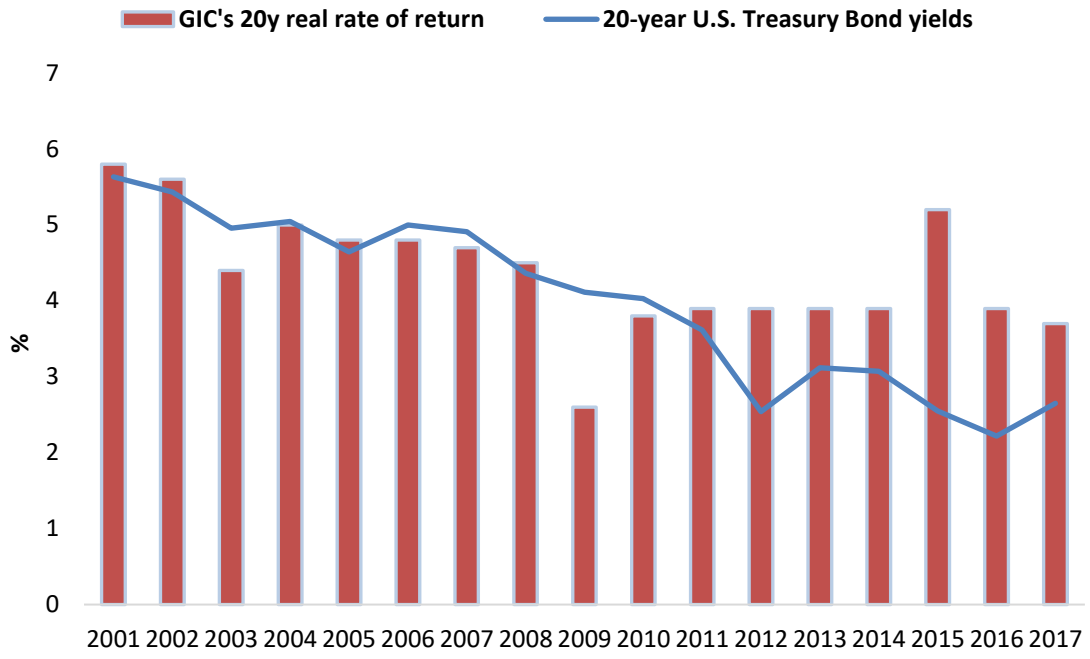

Figure 3.3: The GIC Annualized Rolling 20-Year Real Rate of Return compared with 20-year U.S. Treasury Bond Yields

Source: GIC Annual report, 2017, U.S. Department of the Treasury, online historical treasury rates archive

Assets managed by selected state-owned funds, similarly to those under GIC's management, are included in the country's international reserves. On the contrary, Temasek[54] Holding's assets are entirely excluded from the country's international reserves since these assets include higher risk equities and other illiquid assets.

Since 2007, sovereign wealth funds experienced massive growth in both AUM (Figure 3.3) and the total number of SWFs (see Table 3.1). This growth was predominantly driven by a surge in international reserves in East Asia and subsequently by the transfer of a significant portion of funds into newly established SWFs. The principal economic and political drivers behind this well-documented trend remain ambiguous.

[54] An SWF incorporated in 1974 and wholly owned by the Government of Singapore

The majority of economists consider the premium expected to be delivered by SWFs on the funds available in IR as the primary driver for the national states to establish sovereign wealth funds and transfer available funds to them, as described in Megginson et al. (2015), Aguilera (2016), Balding (2012) and Fernandes (2017). However, no tangible evidence or a research study supported by results of an empirical analysis comparing the state-owned fund's real rate of returns[55] with returns on securities managed within international reserves were identified by the author of this study.

Based on previous research and a review of the literature, the author identified two significant drivers addressed in this study: (i) maximization of the asset profitability; (ii) SWFs' limited transparency and accountability requirements together with politically motivated strategy to develop a robust financial instrument for pursuing both domestic and international political and economic goals.

To ensure reasonable article brevity, the primary attention is paid only to the profitability model description and logic behind the analysis results' explanatory power and its limitations.

[55] At least for the group of SWFs providing annual or compounded real rate returns on their investment portfolio

3.2 Literature and Theoretical Framework

3.2.1 International Reserves – Definition, History, and Purpose

The definition of international reserves varies across countries, central banks, and even regulatory authorities. Dominguez et al. (2011) stress that in the academic literature and even in official government publications, the terms "foreign reserves," "official reserves," or "international reserves" are used interchangeably.

Therefore, for this study, international reserves will be understood as defined by the International Monetary Fund (IMF 2009, paragraph 6.64): "... those external assets that are readily available to and controlled by monetary authorities for meeting the balance of payments financing needs, for intervention in exchange markets to affect the currency exchange rate, and for other related purposes (such as maintaining confidence in the currency and the economy and serving as a basis for foreign borrowing)."

In the era of the gold standard and bimetallism, foreign exchange reserves were rather exceptional (Belgium). Instead, central bank reserves were held only to back note issuance, as pointed out by Eichengreen et al. (2014). This purpose of IR changed after World War I with convertibility problems, and central banks started to develop reserves in foreign currencies. With respect to the optimal size and structure of international reserve, it is worth mentioning Keynes, especially the second volume of *A Treatise on Money* (1971), where he addressed the principles governing the optimal level of free gold reserves.[56]

The collapse of the Bretton Woods system after 1973 had a significant impact on the debate surrounding international reserves (Monnet and Puy, 2016). Subsequently, the debt crisis in the 1980s slowed the growth rate of developing countries' reserves. This trend changed in the 1990s following the acceleration in cross-border investment, and international trade, which led to a rethinking of the role of international reserves in the

[56] Keynes focuses exclusively on external drains and does not mention the influence of the internal drain on the external drain. Here, his position resembles the Guidotti-Greenspan perspective, which includes external drains and mostly ignores the role of domestic residents' financial decisions according to Obstfeld et al. (2009).

globalized economy, one in which currency crises originating in the finance sector could inflict significant reserve drains as suggested in Flood et al. (2002).

The fundamental impetus for economists to reconsider the theoretical foundations of the role of international reserves was the emerging-market currency crisis and the role of short-term external debts as its key drivers. Wijnholds et al. (2001) recount that in December 1997, after the Korean crisis erupted, the IMF board discussed a rule of thumb for reserve adequacy incorporating short-term foreign-currency debt[57]. Guidotti suggested that countries should manage their external assets and liabilities in such a way so that they are always able to live without new foreign loans for up to one year. That is, usable foreign exchange reserves should exceed scheduled amortizations of foreign currency debts (assuming there are no rollovers) during the following year.[58]

Recently, two specific reasons have brought international reserves back in the spotlight.

First, it is the rapid growth of global international reserves since 2000, as illustrated in Figure 3.1 and Figure 3.2. The upsurge was primarily driven by developing countries such as Russia and, more importantly, China, which had accumulated immense international reserves during the 2000s. In 2017, China's international reserves, including its gold reserves, reached a total value exceeding US$3.2 trillion. The second-largest reserves were those of Japan, with US$1.2 trillion (IMF, 2018).

Second, the global financial crisis of 2008, which thoroughly tested the financial strength of major economies, provided an opportunity to study and quantify the consequences of the crisis based on the size and structure of international reserves across regions and against different monetary policies.

Among the economic studies that examine international reserve policy during and after the global financial crisis, Aizenman et al. (2011) document that many emerging market countries chose not to deplete their international reserves as part of the adjustment

[57] It came to be known as the Guidotti-Greenspan rule after policymakers Pablo Guidotti and Alan Greenspan both proposed the idea in 1999

[58] This rule is readily augmented to meet the additional test that the average maturity of a country's external liabilities should exceed a certain threshold, such as three years.

mechanism. Further, they find that the primary factor distinguishing countries that did rely on reserves was their heavy trade orientation (measured by trade openness, the share of oil exports and commodity export ratios).[59]

The connection between global imbalances and global crises has been thoroughly studied by Bernanke (2015), who discusses the possible correlation between the expansion of the U.S. current account deficit and a similar current account surplus in many emerging market economies (especially East Asian economies).[60]

The latest academic focus[61]. has shifted away from chasing the equilibrium towards evaluating the other possible consequences of IR, especially from the perspective of the increasingly more globalized world economy as pointed out by Obstfeld et al. (2017).

Overall, arguments for holding international reserves remain:

(i) formal backing for the domestic currency,

(ii) a tool of exchange rate or monetary policy,

(iii) funds for servicing foreign currency liabilities and debt obligations,

(iv) servicing foreign currency liabilities and debt obligations,

(v) defense against emergencies or disaster and

(vi) IR as an investment vehicle. This possibly newest IRs role linked to the massive upsurge of IRs in the last two decades represents the critical point of interest of this study.

[59] They suggest that these countries were less wary of depleting reserves when export markets collapsed, while most other countries opted for adjustment via exchange rate depreciation rather than reserve depletion.

[60] He argues that these developments could be explained in part by the emergence of a global savings glut, driven by the transformation of many emerging-market economies – notably the rapidly growing economies of East Asia and oil-producing countries – from net borrowers into large net lenders on the international capital markets.

[61]The most discussed and elaborated questions in academia are (i) how powerful a tool international reserves represent, (ii) what IR costs are, and (iii) where the balance between IR costs and the contribution of IR to domestic currency stability and export enhancement lies.

3.2.2 Sovereign Wealth Fund as a National Investment Vehicle

Cumming et al. (2017) or Aizenman et al. (2015) confirm that the presence of sovereign wealth funds motivates developed countries to hold a lower level of IR. Truman (2008) illustrates this trend in a detailed description of China's new SWFs and lists the expected benefits for the transfer of funds from IR to SWFs. This topic is further elaborated by Megginson et al. (2015) and Fotak et al. (2016), who simultaneously confirms the continuous growth in the number of emerging SWFs and the surging value of SWF assets under management.

The majority of SWFs were historically incorporated in oil-exporting or otherwise commodity-rich countries. In some cases, the initial capital for SWFs has originated from the general budget or external surpluses that governments decided to use to invest in national investment funds. A typical example is the CIC (China Investment Corporation) incorporated in 2007 via transferring US$200 billion (at that time) of US$1.3 trillion in the Chinese International Reserves to the fund.[62] Similar to the Singapore Temasek, CIC's assets are not included in Chinese international reserves.[63]

[62] The CIC first investment was US$3 billion transaction in the Blackstone private equity group.
[63] As they were predominantly created to diversify international reserves into riskier securities, equity, real estate, and even international infrastructure projects and stakes in financial institutions and alternative assets, which would not qualify as international reserves.

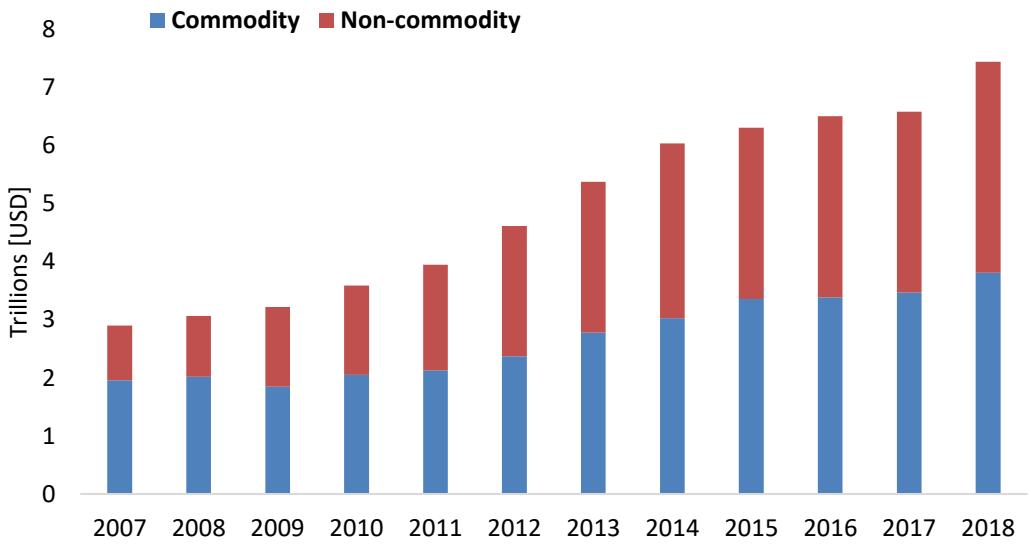

Figure 3.4: Sovereign Wealth Funds' AUM Split Based on the Origin of the Nominal Capital

Source: IMF, Preqin 2018, Sovereign Wealth Fund Institute, author's calculations

In 2018, approximately 25 active non-commodity SWFs exist worldwide with estimated total assets under management exceeding US$3.2 trillion (see Figure 3.4). Besides the largest SWFs included in Table 3.1 new non-commodity SWFs emerge, such as the Palestine Investment Fund, Senegal's FONSIS, Bolivia's FINPRO, the Turkey Wealth Fund, and more; however, there currently is not enough publicly accessible information to include these SWFs into further calculations.

Table 3.1: List of Selected Non-commodity Sovereign Wealth Funds

This table lists operating sovereign wealth funds funded coming from other than natural resources revenue. For each fund is included country of origin; estimated assets under management in 2018 and year of the funds establishing.

Sovereign Wealth Fund	Country of origin	AUM [USD billions]	Establishment
China Investment Corporation (CIC)	China	747	2007
State Administration of Foreign Exchange	China	474	1997
Hong Kong Monetary Authority Investment Portfolio	China–Hong Kong	443	1993
Government Investment Corporation of Singapore (GIC)	Singapore	350	1981
National Social Security Fund	China	295	2000
Temasek Holding	Singapore	275	1974
Investment Corporation of Dubai	UAE	210	2006
Korea Investment Corporation	Korea	122	2005
Australian Future Fund	Australia	105	2006
Samruk–Kazyna JSC	Kazakhstan	61	2008
Khazanah Nasional	Malaysia	39	1993
New Zealand Superannuation Fund		29	2003
Russian Direct Investment Fund	Russia	13	2011
Mumtalakat Holding Company	Bahrain	11	2006
Ireland Strategic Investment Fund	Ireland	9	2001
Fiscal Stabilization Fund	Peru	8	1999
Sovereign Fund of Brazil	Brazil	7	2008
China–Africa Development Fund	China	5	2007

3.3 Profitability

In order to compare SWFs' real rates of return with the theoretical yields[64] of assets accumulated in international reserves with the potential to be transferred to SWFs, an empirical comparative model was designed. The model is built on the SWFs' official real returns, and an original index comprised of a mix of government bonds with various maturities and S&P 500 annual real returns which was designed to simulate maximal hypothetical returns on the IR's assets within the framework of the risk level generally accepted by central banks monetary committees.

The major challenge for the comparative analysis is the absence of the publicly available information on the composition of reserve portfolios and its profitability provided by sovereign countries or their monetary authorities.

Central banks have considerable space to select the type of assets in which international reserves are invested. However, as noted by Ramaswamy (2008), they are rather conservative in practice, and the investment universe is dominated by fixed income securities. This approach can be demonstrated on the Bank of Brasil's asset class allocation comprised of the vast majority of sovereign bonds and to a lower extent agency bonds from several countries, while equity is extremely marginal (see Figure 3.5).[65]

The IR portfolio management and investment strategies differ substantially across the various Central Banks like Bank of Israel demonstrate in their annual report (2017) significant shift from the conservative strategy based on sovereign bonds to corporate bonds and cash and money markets (see Figure 3.6). Based on the financial results in 2017, this strategy resulted in the positive rate of return on the reserves portfolio, which was 3 percent in numeraire terms (2017). This rate of return is the highest since 2009

[64] Interest rate data on the alternative yield to reserves are unavailable – Aizenman et al. (2004), Ramaswamy (2008), Binachi (2018)

[65] The consolidated results for 2015 shows that despite the gains achieved in most of the fixed income markets individually, the exchange rate movements generated a consolidated result of -1.66% when measured in US dollars. Nonetheless, the five-year accumulated result in US dollars was 2.29%. International Reserves Management Report (2016), Banko Central do Brasil Available at https://goo.gl/c4pwdD

and more significant than the average return over the past three years of 1.7 percent. Important information is that *"the rate of return was achieved mainly as a result of a long-term process, in which the share of reserves invested in risk assets—equities and corporate bonds—was gradually increased*[66]*."*

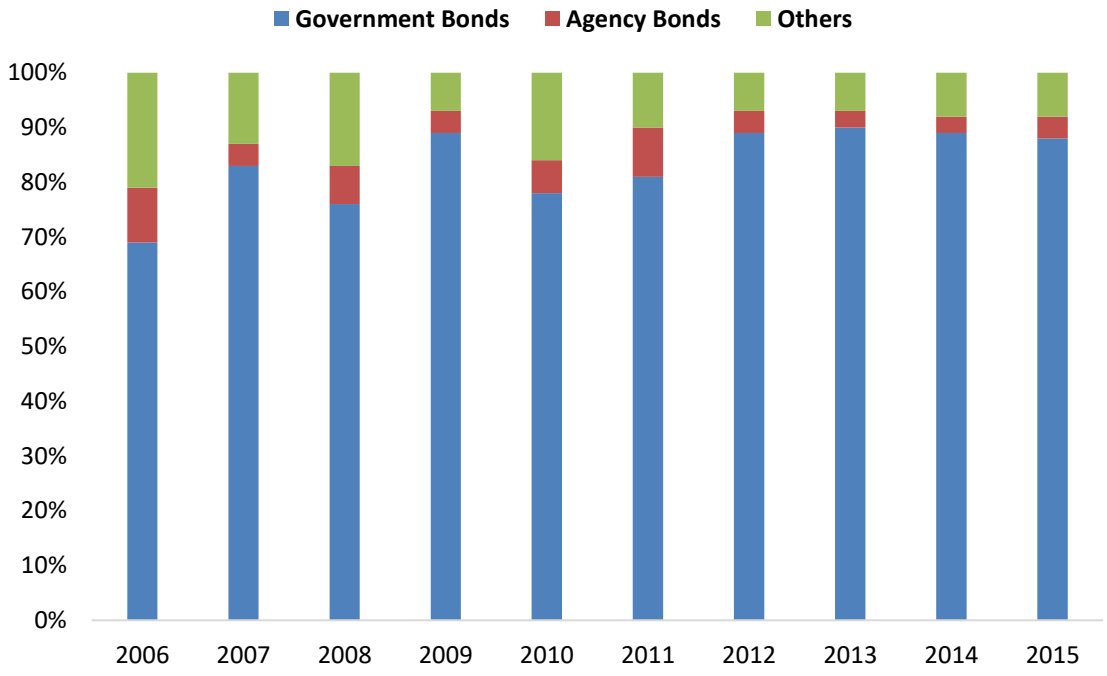

Figure 3.5: International Reserves of Brazil - Asset class allocation 2006-2015

Source: International Reserves Management Report (2016), Banko Central do Brasil

[66] This is within the framework of the risk level approved by the Monetary Committee. The rate of return was achieved in a financial environment of low yields to maturity, and even negative yields, on a considerable portion of bonds issued by major European countries, in which about one-third of the reserves are invested source: Bank of Israel, Foreign Exchange Reserves Report 2017, Available at https://goo.gl/xT1pk8

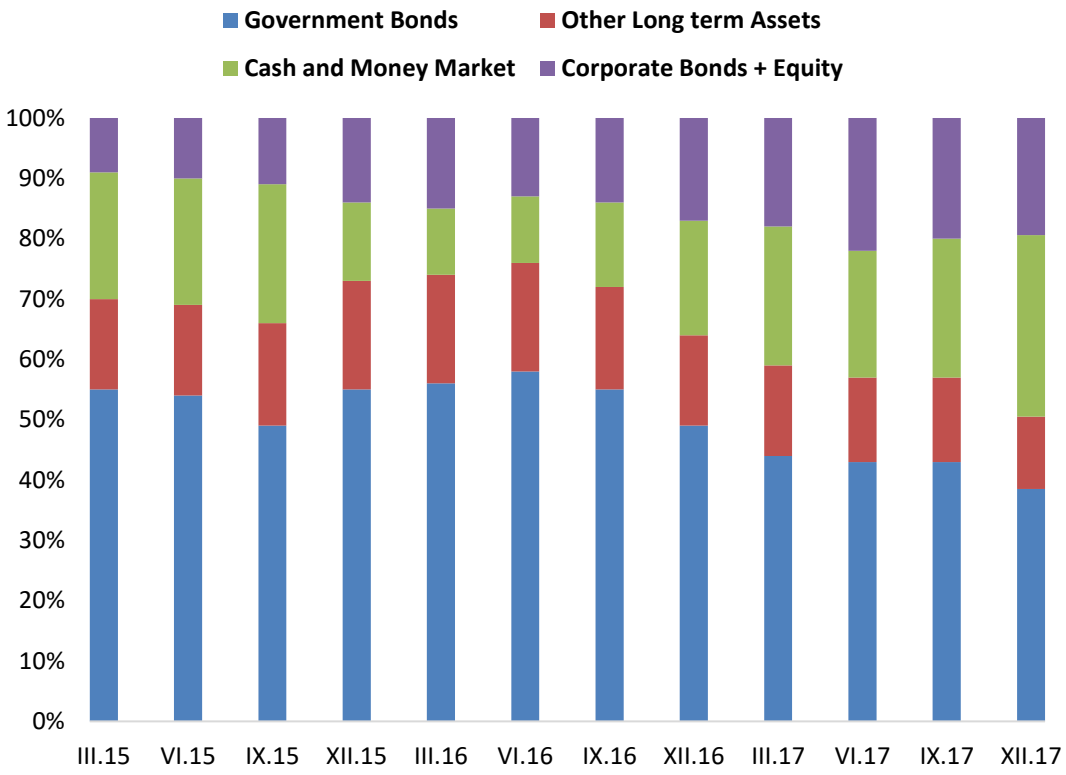

Figure 3.6: International Reserves of Israel - Asset Class Allocation 2015-2017

Source: Report on the Investment of Israel's Foreign Exchange Reserves (2017), Bank of Israel, 2018

Economists approach this lack of fundamental source data by examining notional (hypothetical) portfolios as Ramaswamy (2008) or Ferhani (2007). A similar approach was put in use in this study with one significant difference. The modeled IR asset class allocation utilized in this simulation aims to identify only maximal positive values (extremes) of the rate of returns achievable by the selected class of assets with potential to be transferred to an SWF without jeopardizing crucial IRs monetary and sovereign economic function. It is not the purpose of this model to simulate or evaluate overall consolidated rates of returns achievable by sovereign international reserves. Therefore, cash and money market asset class are entirely excluded from the model, and non-conservative asset class allocation (based on more substantial corporate bond and equity class similar to Israel international reserve) served as a role model for the simplified model structure.

The model simulates the theoretical value of IRs rate of returns is represented by the International Reserve Security Return Index (IRSRI), composed of a mix of 1-year, 10-year, and 20-year government bond yields (2/3) and S&P 500 annual real returns (1/3). The IRSRI index weights are provided in Table 3.2. The composition of government bonds included in the Government Bond Basic Index (GoBI) is provided in Table 3.3. The long-term trend of government bonds grouped by bond maturity is illustrated in Figure 3.7 for 20-year bonds, Figure 3.8 for 10-year bonds, and Figure 3.9 for 1-year bonds, and finally, the S&P 500 annual returns are pictured in Figure 3.10[67].

Table 3.2: Composition of the International Reserve Security Return Index (IRSRI)

This table lists two inputs used for calculating the International Reserve Security Return Index (IRSRI). The "Index Weight" value shows a percentage share of each title in the IRSRI.

Title	Type	Group	Index Weight
Government Bond Basic Index (GoBI)	Bond	Government	66.67 %
Standard & Poor's 500 Annual Total Returns	Stock	Market Index	33.33%

Table 3.3: Composition of the Government Bond Basic Index (GoBI)

This table includes nine treasury bond titles of three countries used for the compilation of the Government Bond Basic Index (GoBI). The "Index Weight" value shows a percentage share of each title in the GoBI.

Title	Stock	Type	Group	Index Weight
U.S. 20-Year Treasury Bond	BX:TMUBMUSD-20Y	Bond	Government	16.67 %
U.S. 10-Year Treasury Bond	BX:TMUBMUSD010Y	Bond	Government	16.67%
U.S. 1-Year Treasury Bond	BX:TMUBMUSD01Y	Bond	Government	16.67%
German 20-Year Treasury Bond	BX:TMBMKDE-20Y	Bond	Government	8.33%

[67] Source: Bloomberg S&P 500 Index

German 10-Year Treasury Bond	BX:TMBMKDE-10Y	Bond	Government	8.33%
German 1-Year Treasury Bond	BX:TMBMKDE-01Y	Bond	Government	8.33%
Japan 20-Year Treasury Bond	BX:TMBMKJP-20Y	Bond	Government	8.33%
Japan 10-Year Treasury Bond	BX:TMBMKJP-10Y	Bond	Government	8.33%
Japan 1-Year Treasury Bond	JP:JP01Y	Bond	Government	8.33%

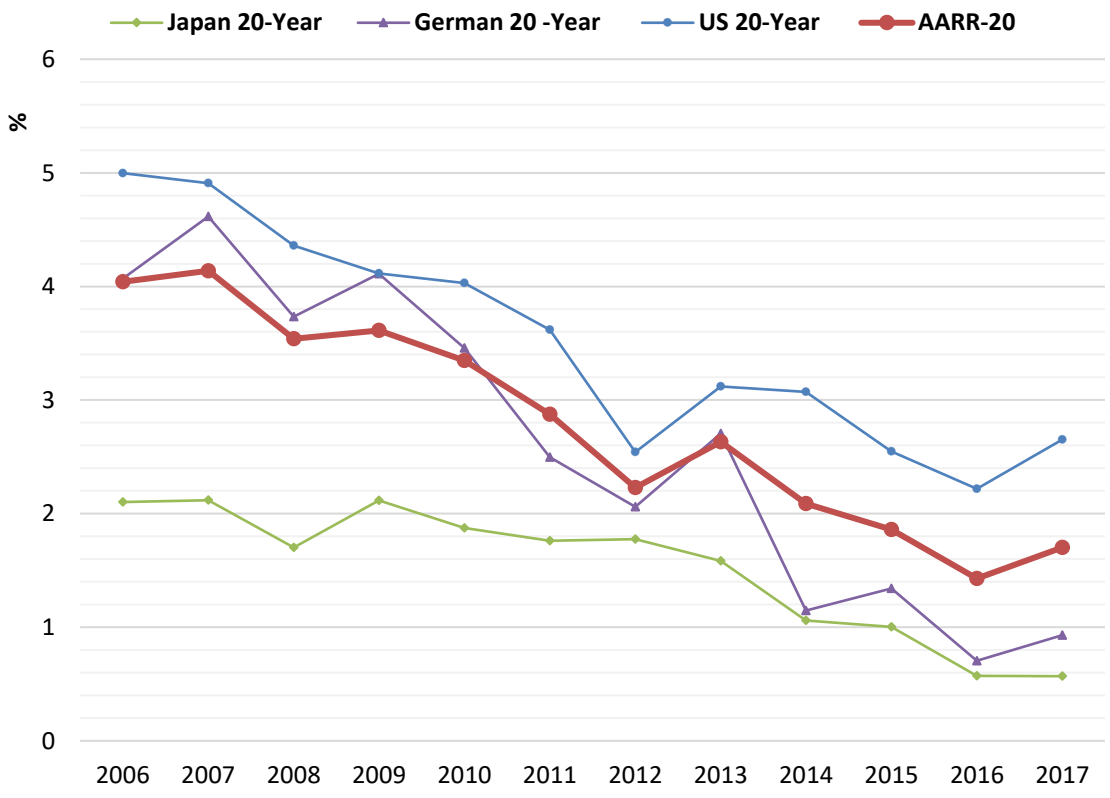

Figure 3.7: Historical Yields of 20-year Government Bonds

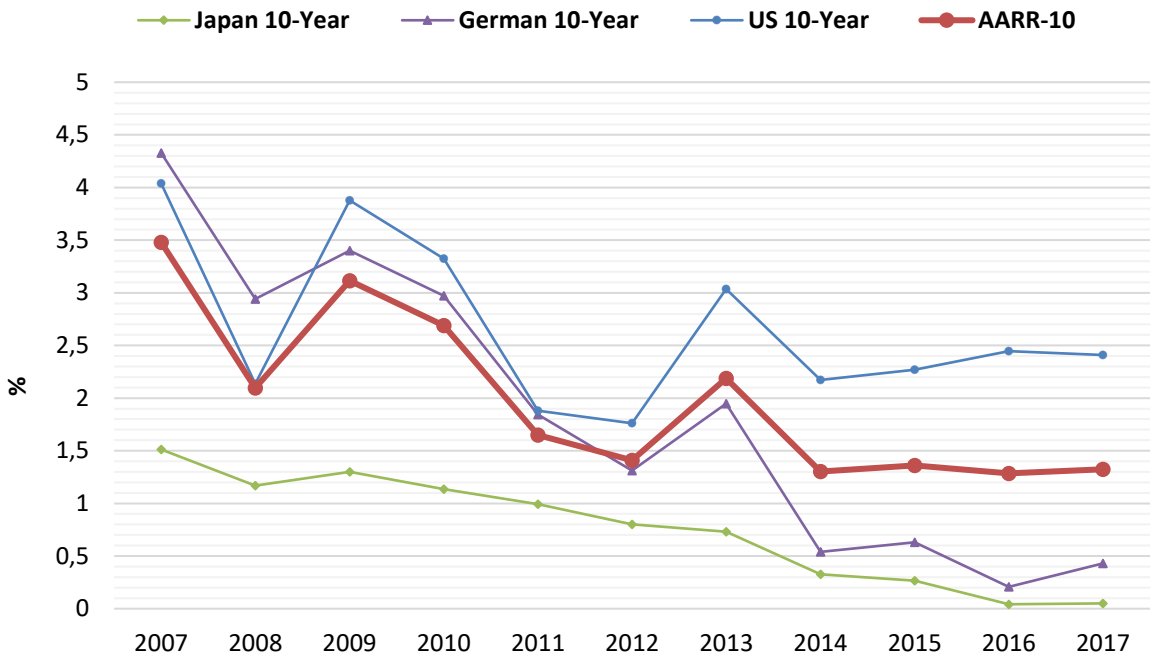

Figure 3.8: Historical Yields of 10-year Government Bonds

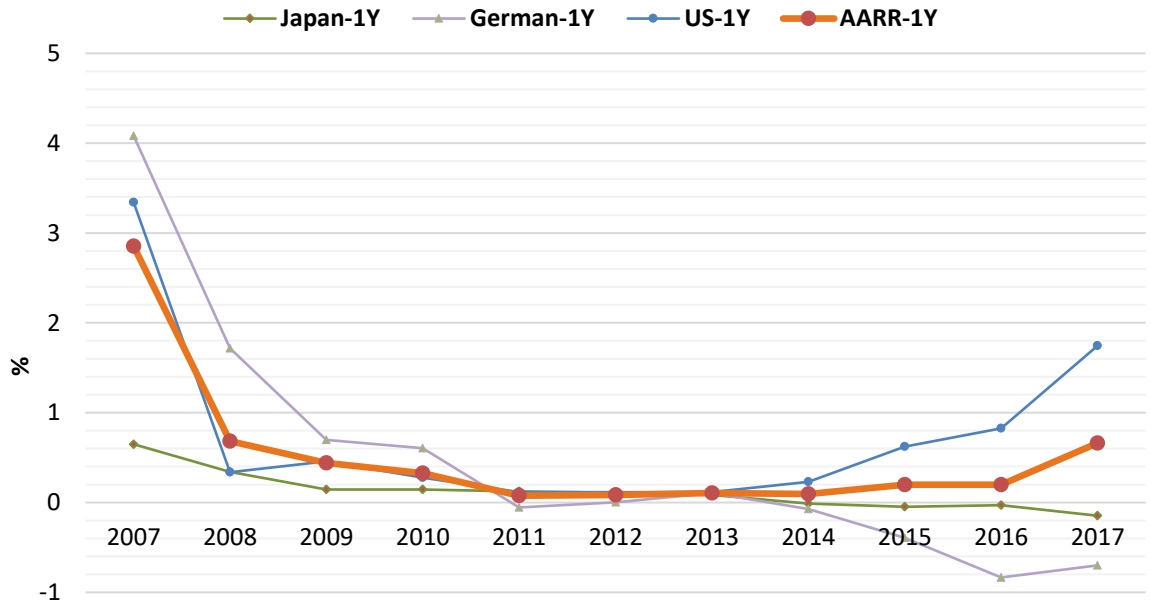

Figure 3.9: Historical Yields of 1-year Government Bonds

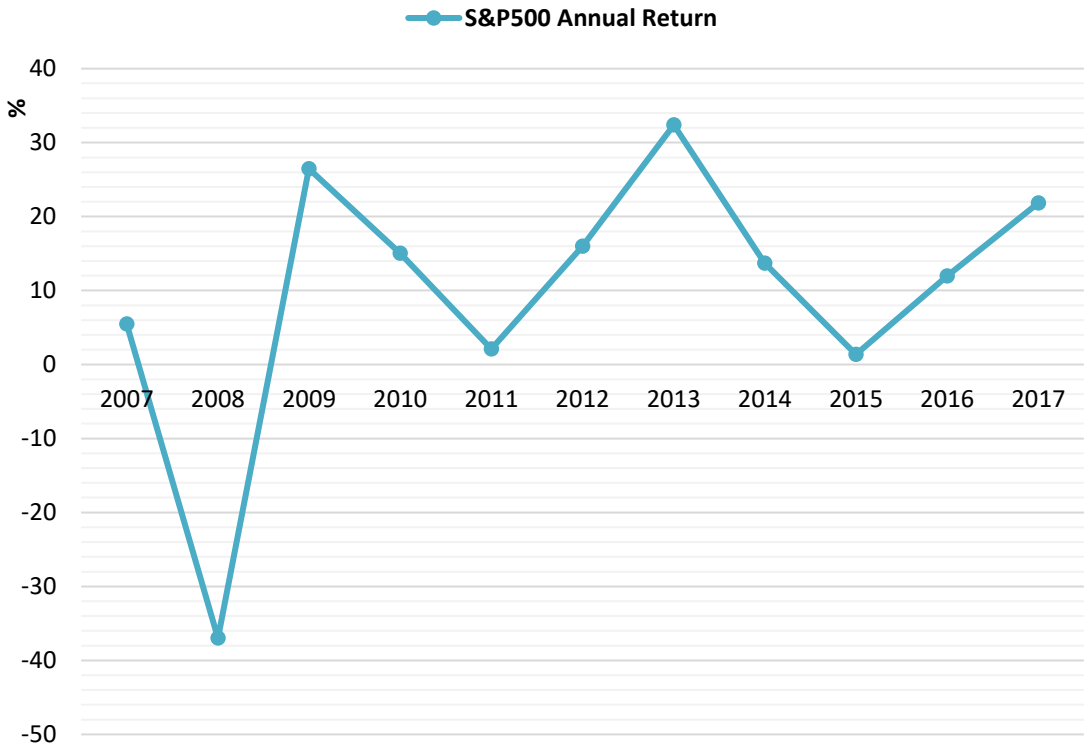

Figure 3.10: Standard & Poor's 500 Historical Annual Returns

Based on the publicly available and officially confirmed real rates of return of a group of six SWFs (see Table 3.4) with a total AUM of US$3.4 trillion, representing over 46% of total SWF AUM worldwide (Preqin, 2018), the average annual returns (AARR-1Y) and the 20-year annualized rolling real returns (AARR-20Y) were calculated.[68]

Table 3.4: Sovereign Wealth Funds with Performance Data Publicly Available

This table lists sovereign wealth funds whose annual returns are used for calculating the average annual returns (AARR-1Y) or 20-year annualized rolling real returns (AARR-20Y).

Sovereign Wealth Fund	Country of origin	AUM [US$ billions]	Establishment	Santiago Principle Self-Assessment
Government Pension Fund – Global	Norway	998	1996	No
China Investment Corporation	China	900	2007	Yes
Abu Dhabi Investment Authority	United Arab Emirates	750	1976	Yes
GIC Private Limited	Singapore	398	1981	Yes
Temasek Holdings	Singapore	275	1974	No
Korea Investment Corporation	South Korea	110	2005	Yes

The results of the comparative analysis are illustrated in two charts. Figure 3.11 shows the aggregated 1-year returns of SWFs compared with the IRSRI, and Figure 3.12 illustrates the Government Bond Index (GoBI), representing only aggregated government bond returns compared with the SWFs 20-year annualized rolling real returns.

[68] A weighted mean based on SWFs' AUM in combination with additional SWF portfolio parameters would be ideal; however, because the credibility of the available information on these SWF indicators is extremely low, a simple arithmetic mean was applied instead.

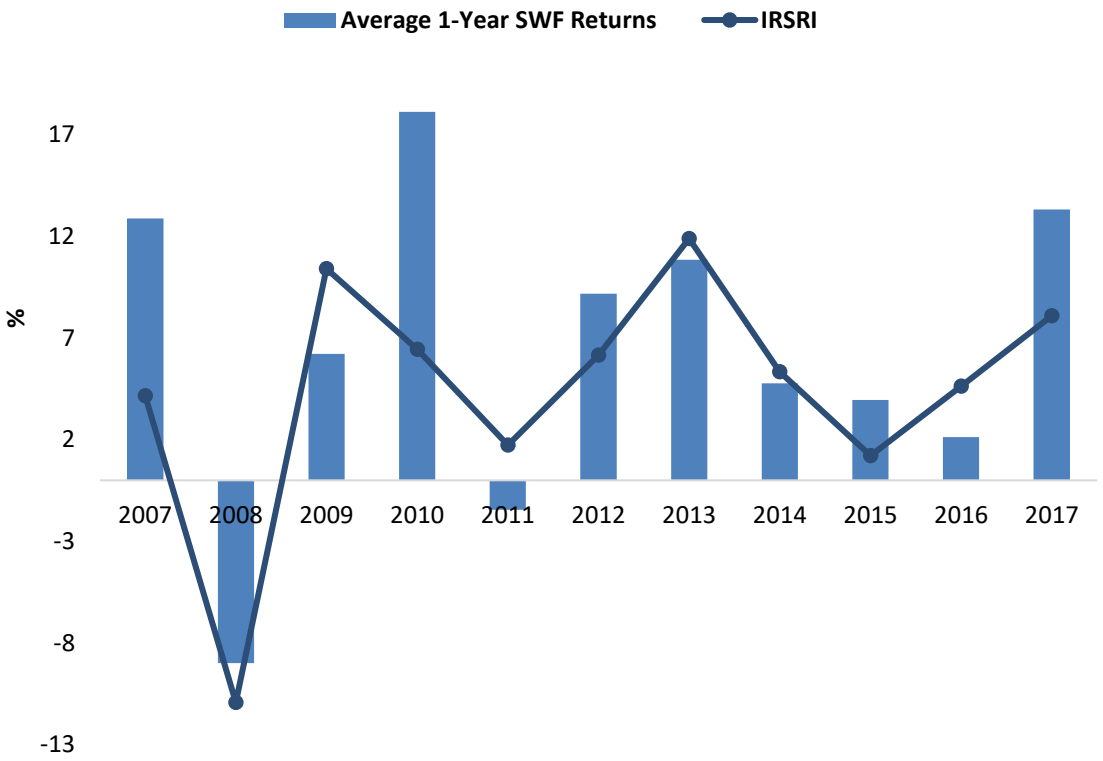

Figure 3.11: International Reserve Return Index (IRRI) Compared with 1-year Average Returns on SWF Assets

The SWFs' annual real returns (Figure 3.11) indicate substantial volatility. Returns reached a peak in 2010 (+18.12%) and the lowest value in 2007 (-8.99%). On average, from 2007 to 2017, the SWFs 1-year real return ratio equals +6.45%. The IRSRI shows a very similar trend with a negative extreme in 2010 (-10.93%) and reaching maximum value in 2013 (+11.89%). The mean value for IRSRI from 2007–2017 is 4.47%.

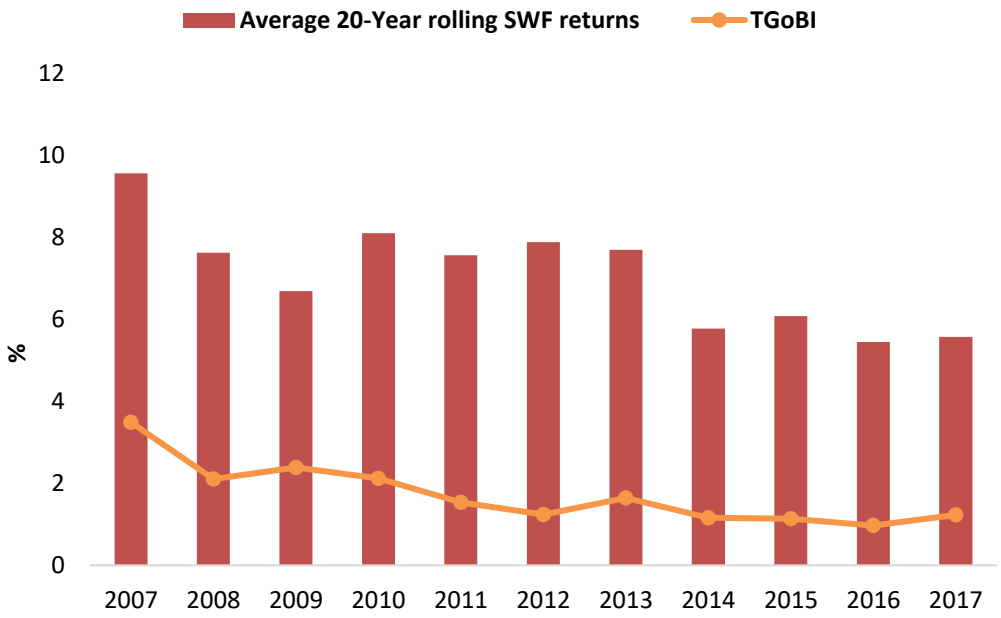

Figure 3.12: Government Bond Index Compared with SWFs' 20-year Rolling Returns

Figure 3.12 illustrates that sovereign wealth funds were capable of reaching average 20-year rolling returns from 9.57% in 2007 to the lowest value of 5.45% in 2016. On average, this ten-year period generated SWFs' average 20-year rolling returns of 7.1%. The Government Bond Basic Index (GoBI) shows a very similar trend to the SWFs' 20-year rolling returns. However, the absolute value differs significantly. The GoBI shows a maximum value in 2006 (+3.81%) and reaches the bottom value (+0.97%) in 2016. On average, the GoBI index equals only +1.90%.

As the majority of SWFs included in the sample are traditional sovereign funds with a proven track record, employing experienced managers and built on a well-designed governance structure, we can expect less competitive return values for the larger group of SWFs. However, China's CIC was established only in 2007, and despite the company's short history, the fund has been capable of generating average annual returns over 5% since the fund's inception.

To summarize the results of the above-described findings, one can see that in the last decade the group of sovereign wealth funds, which represents almost 50% of total SWF AUM, was capable to significantly outperform the returns that would be realistically

possible to reach for funds allocated in international reserves. Based on this simplified return ratio model for real annual returns, the expected premium delivered by the SWFs is 1.98 percentage points. Given the total AUM of the SWFs sub-group included in this analysis with approximately US$3.431 trillion in assets, we estimate the annual premium delivered by this group of SWFs over the possible returns delivered by funds allocated within international reserves totals the amount of US$178 billion.

Value at Risk

This model is significantly limited by the fact that the usual trade-off between the risk and return on the investment portfolio is not reflected in it. The primary sources of risk for international reserves are the risk of change in (i) exchange rates and (ii) interest rates. The exchange rate's related risk is not relevant to this analysis as cash and money market class are entirely excluded from the model simulations. The interest rates related risks are, on the other hand, relevant to the complex evaluation of the presented results. A possible solution would be the implementation of Value at Risk (VAR) in the research model, which would represent the loss of a portfolio where the probability of occurrence is defined by a confidence level for a given time horizon. Unfortunately, given the limited publicly available information on both SWFs and International reserves investment portfolio in the long-term horizon, we did not include VAR results in this paper as we concluded that at this moment the explanatory power of the VAR risk analysis is not strong enough.

3.4 Limited Transparency and Strategic Economic Influence

SWFs have no obligations towards international financial authorities to publish any information about their investment results, investment portfolio, fund governance, structure, or risk management. These concerns escalated in 2008, when the IMF, notably the International Working Group of Sovereign Wealth Funds (IWG-SWF), addressed this issue by organizing a summit attended by representatives of the significant SWFs that resulted in a set of recommended principles on transparency and governance for SWFs to follow. Nevertheless, these principles have never been transformed into binding requirements and SWFs are, with a few exceptions, still considered a powerful but somewhat opaque group of institutional investors. This statement is well confirmed by Truman research replicated in 2010, 2013 and 2015, where Truman concludes that out of the 60 SWFs included in his scoreboard-based analysis, progress in transparency and accountability during the last ten years was minimal and the majority of funds still fall in the opaque and not-transparent subcategory.

Another strong motivation for the political representation of a sovereign country to establish a state-owned fund is the creation of a powerful tool for supporting national strategic interests, critical industry, or infrastructure. Rosatom and the Russian SWFs represent one example of such a symbiotic relationship. Both Russian SWFs are commodity-based funds. However, the funds' investment strategies can clearly demonstrate the competencies and powers given to SWFs. This specific business model illustrates a unique set-up where the SWF serves as a funding and financial guarantee authority for the state-owned corporation. This relationship provides unique advantages to the entire industry, significantly strengthens Russia's international position, and simultaneously contributes substantially to increase government income. Martinek (2017) suggests that despite its economic and political advantages, this model also involves specific threats, especially in times of economic recession, when a sizeable fiscal deficit can have a devastating impact on the whole industry and simultaneously lead to severe damage in international relationships.

3.5 Conclusion

During the last decade, the value of assets managed by sovereign wealth funds more than tripled, from US$940 billion in 2007 to US$3.12 trillion in 2017. Additionally, almost 70% of currently operating non-commodity funds were established after the year 2000. These numbers strongly support the hypothesis that SWFs provide countries with positive benefits that are not achievable by managing available funds within the international reserve framework.

The comparative analysis on the group of sovereign wealth funds, representing almost 50% of assets managed by SWFs, shows that assets managed by SWFs from 2007 to 2017 outperformed theoretical returns achievable by the class of assets with potential to be transferred to an SWF without jeopardizing crucial IRs monetary and sovereign economic function, allocated in the international reserves. Based on this simplified ratio of return model, the average annual premium delivered by SWFs is 1.98 percentage points. Given the total value of assets managed by the funds included in this analysis, the estimated premium delivered by this sub-group of SWFs is US$178 billion annually. It needs to be stressed that the presented results do not reflect interest rates related to investment portfolio risks, and therefore, the results should be approached with this respect in their interpretations.

The continuous lack of generally accepted requirements for the transparency and accountability of SWFs and the minimal effort to enhance compliance with recommended transparency principles monitored in the last ten years allow funds to operate without almost any global surveillance. For some countries, this represents an additional motivation to employ state funds in their strategic political and economic initiatives.

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CHAPTER 4: SOVEREIGN WEALTH FUNDS - DRIVING GROWTH OF THE NUCLEAR POWER SECTOR – CASE STUDY

4.1 Introduction

The nuclear industry is experiencing difficult times, and one of the crucial concerns is that the lack of long-term investment capital is stymieing the construction of new power plants. Sovereign wealth funds, on the contrary, are simultaneously looking for investment opportunities with long term horizon and guaranteed a stable income.

An example of the symbiotic relationship is the one between Rosatom - the Russian Federation National Nuclear Corporation and the Russian SWFs. It demonstrates a specific business model where the SWF serves as a funding and financial guarantee authority for the state-owned corporation. This kind of relationship offers unique advantages to the entire industry, significantly strengthens Russia's international position, and contributes substantially to government revenues.

Despite its economic and political advantages, this model also involves specific threats, especially in times of economic recession when a large fiscal deficit can have a devastating impact on the whole industry and simultaneously lead to severe damage in international relationships.

The principal objective of this chapter is to demonstrate a specific role SWF can play in supporting national strategically important industries. The demonstration uses an example of a business model adopted by Rosatom[69] and Russian sovereign wealth funds (SWFs) and illustrates the various ways sovereign funds can leverage the available capital in the power sector to encourage the critical domestic industry sector as well as significantly strengthen political influence in regions of Russian interest.

This chapter starts with the description of Russia's two largest SWFs–the National Wealth Fund and the Reserve Fund and show how these two funds differ from another

[69] ROSATOM is the Russian Federation national nuclear corporation that comprises 400+ nuclear companies and R&D institutions that operate in the civilian and defense sectors. The corporation employees over 100,000 people, generating revenues of $12.9 billion (2015). Atomenergoprom is a 100% state-owned holding company that unites the country's civilian nuclear industry.

well know SWFs such as the Chinese Investment Company (CIC), TEMASEK Holding, GIC, or the Norwegian Government Pension Fund.

Next section explains the business model built upon the investment capital provided by Russia's sovereign funds, which gives a unique competitive advantage to Rosatom -- in terms of offering a turnkey solution for the delivery of the complex construction and operation of the nuclear energy infrastructure.

The specific examples of the financial and technical solutions offered by this business model are demonstrated in terms of the ongoing or proposed Rosatom international projects. A comprehensive list of projects utilizing this business pattern, including prospective customers and the expected value of future contracts, points to the market size and potential volume of future contracts.

Final subchapter summarizes the advantages and possible drawbacks of the business model and outlines future scenarios for using this pattern in other industries.

4.2 Sovereign Wealth Funds in Russia

The Russian SWFs have been studied mostly by Russian economists, such as Sukharev (2014) or Elyakova (2015). The motives and efficiency of Russian SWF, the Stabilization Fund of the Russian Federation, and other details concerning the internal mechanisms and management practices of the Russian SWFs are described in Danilina (2014).

Elyakova et al. (2015) confirm two major influencing factors for the absolute volume of the National Wealth Fund. These are the Russian currency rate to the US dollar and the global price of oil. The coefficient of correlation between the volume of the sovereign fund of Russia and the oil price is equal to 0.94. The coefficient of correlation between the volume of the sovereign fund of Russia and the dollar rate is equal to 0.97, but the efficiency of the export support provided to the Russian industry has not been a prime topic of interest.

The Russian Federation established its first sovereign fund, the Stabilization Fund, in 2004 (Elyakova, 2015). It was part of the federal budget and served as a national budget stabilization tool in case of a sudden drop of crude oil prices below the base level. On February 1, 2008, the Stabilization Fund of Russia was divided into two separate funds: The Reserve Fund (RF) whose value from 2008 to 2018 is illustrated in Figure 4.1 and the National Welfare Fund (NWF) described in Figure 4.2. NWF received initial capital of almost $88 billion. The RF's starting capital was $137 billion[70]

Currently, the RF is part of the federal budget and is intended to cover its deficit and provide prepayment of the public debt; the main difference between the RF and the Stabilization Fund is that RF income includes gas export revenues. The RF is capped at 10% of GDP, and any additional funds are transferred to the NWF[71]. For a total value of RF and NWF and its proportional value as of Russian Gross Domestic Product (GDP) see Figure 4.3.

[70] According to National Wealth Funds Statistics, Ministry of Finance of the Russian Federation [15]

[71] According to Distribution of oil and gas revenues of the federal budget, Ministry of Finance of the Russian Federation [14]

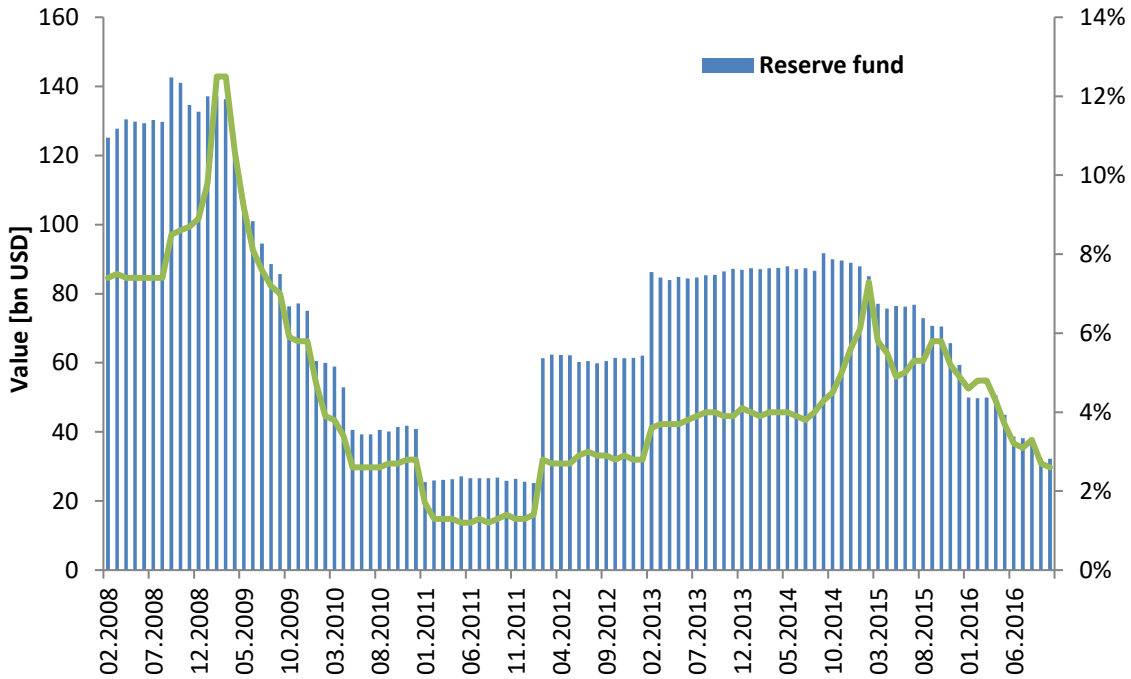

Figure 4.1: Value of the Reserve Fund

Source: National Wealth Funds Statistics, Ministry of Finance of the Russian Federation and OECD Country Statistical Profile [15;17]

The NWF is allowed to have a riskier, higher-return investment portfolio. According to the Russian Ministry of Finance, the level of risk for securities the NWF is investing in is capped at AA- or higher (Fitch or S&P). However, investments made in much riskier products such as the Ukraine Eurobonds in 2013, has given rise to some controversy. That same year, the status of the fund changed, and part of it was allocated for infrastructure projects. In 2016, the Russian Ministry of Finance declared that the portion of funds not used for projects could be used as a reserve fund (RF) to finance the budget deficit.

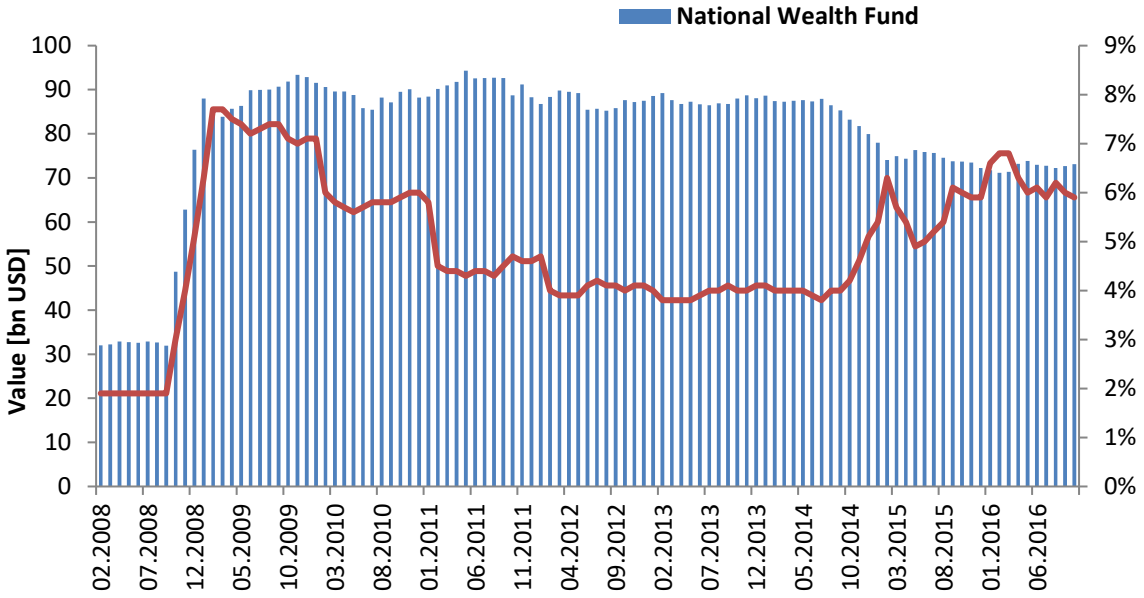

Figure 4.2: Value of the National Wealth Fund
Source: National Wealth Funds Statistics, Ministry of Finance of the Russian Federation and OECD Country Statistical Profile [15;17]

The Russian Direct Investment Fund (RDIF) was established in 2011 to facilitate and attract foreign direct investment inflows with $10 billion in reserved capital under management[72]. The initial capital was provided by the NWF. The fund seeks to invest in projects that possess a Russian operator and buy stakes in closely held Russian companies. The international/domestic investment split is 20/80. The fund's ownership stake is limited to no more than 50%; it can, however, own controlling stakes in companies in partnership with a co-investor. The fund co-invests and the co-investors must have either AUM exceeding $1 billion (for financial investors) or revenues of more than $1 billion (for strategic investors). It can co-invest with private equity and SWFs, among other strategic investors. It may use leverage while investing, with an exit time horizon of five to seven years via the public listing of the asset or a sale to strategic buyers.

[72] Source: Introduction to Russian Direct Investment Fund [27]

The RDIF Management Company LLC ("RDIF") is a limited liability company under Russian law (regulated by the Federal Law on Limited Liability Companies). The sole (100%) shareholder of RDIF is the State Corporation Bank for Development and Foreign Economic Affairs (Vnesheconombank) ("VEB") which is entirely (100%), legally, and beneficially owned by the Russian Federation. RDIF is the sole managing company for the Closed-End Unit Investment Fund of Long-Term Direct Investments or the "Russian Direct Investment Fund" (the "Fund"). The Fund is not a legal entity, and its legal nature is comparable to mutual funds in common law jurisdictions (with RDIF acting as a general partner). The RDIF is regulated under the Federal Law on Investment Funds.

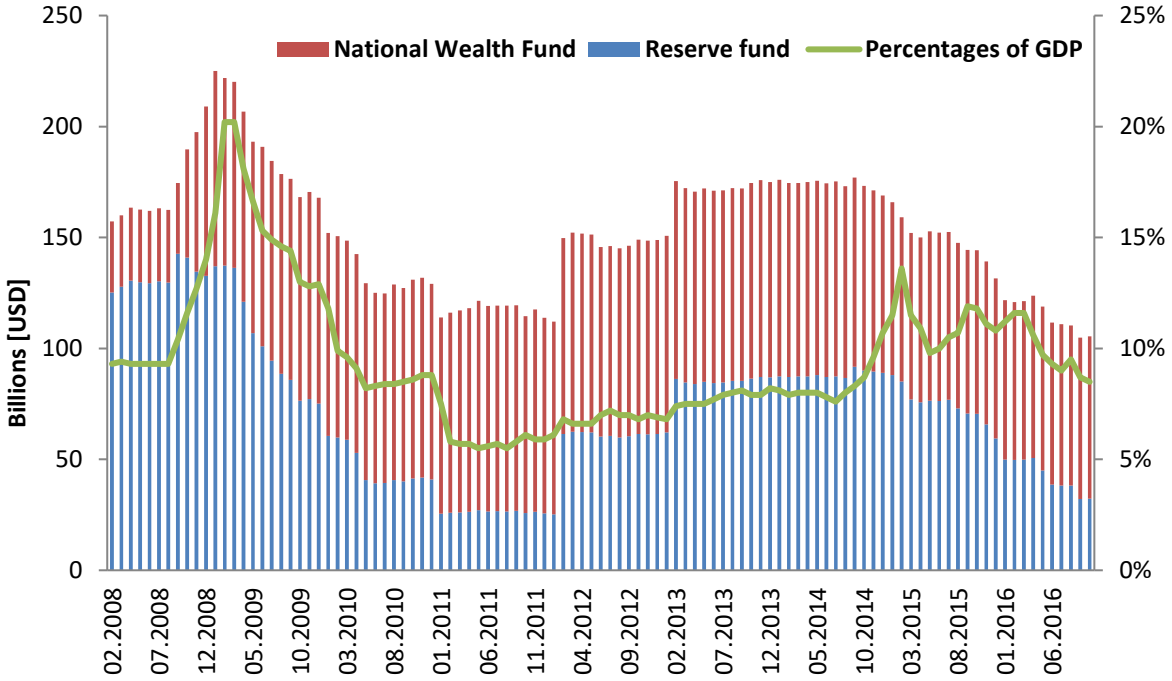

Figure 4.3: Value of Russian SWFs 2008–2016

Source: National Wealth Funds Statistics, Ministry of Finance of the Russian Federation and OECD Country Statistical Profile [15;17]

4.3 Results and Discussion

The nuclear energy sector is the last of the industrial sectors where Russia is still recognized as a world leader. In particular, with its Generation III+ VVER1200, a reactor which is considered the most powerful of its type and the most technologically advanced globally, Rosatom claims that currently the company is involved in various stages of implementation for 34 nuclear power units across Europe, Middle East, Africa, and the Asia-Pacific[73].

The Rosatom 10-year international order portfolio for construction of new NPPs is in 2016 to approximately $136 billion. The cumulative portfolio of orders, including the construction of NPPs, fuel supplies, uranium products delivery, services., will exceed $300 billion. However, it needs to be stressed that some of the projects included in the Rosatom orders portfolio raise legitimate concerns about their feasibility.

Rosatom claims it is currently the only company in the world offering the BOO (build, own, and operate) business model in the nuclear sector.[74] This model is extremely attractive to representatives of developing countries with limited resources to fund or secure external funds and guarantees for large and complex projects, such as nuclear power plants. At the same time, these countries often face a growing demand for electricity to sustain their economies and population growth and currently are also under stronger pressure to reduce CO_2 emissions. Therefore, a nuclear power plant funded by the investor may well present an unbeatable offer as pointed out by Lovering (2016).

The BOO model offers construction, testing, commissioning, and operation of a complete nuclear power plant. During the construction phase, the client pays back only relatively small payments. Most of the investment costs go back to the investor through payments for the energy generated by the NPP. The details of the payments are defined

[73] ROSATOM Public Annual Report, 2015 [24]

[74] Although other vendors have offers to fund, as for instance China General Nuclear (Hanemann and Huotari, 2016), we did not find any other ongoing project covering construction, operation, and funding of a new nuclear power plant, besides the Rosatom projects.

in a power purchase agreement (PPA) between investor and government, usually in the form of minimal electricity price per MW.

The confirmed Rosatom’s international nuclear power plant construction projects are listed in Table 4.1 The general description of the financial structure, and utilized business model is provided in the next chapter that covers ongoing projects and investment projects with signed PPA, i.e., Finland, Hungary, India, and Turkey. Based on the expected values included in Table 4.1, we see that the Rosatom's expected costs in 2017–2030 would reach USD 92.7 billion. Rosatom's expected total investment cost in 2017–2025 are USD 82 billion, and annual expected total investment cost would rise to USD 8 billion as pictured in Figure 4.4.

Table 4.1: Nuclear Power Plants Projects to be Delivered by Rosatom by 2025

This table lists nuclear power plant construction projects under the Rosatom supervision. For each project is included information on country of the investor; the official name of the nuclear powerplant (project name); type/model and power capacity of the reactor design; expected project cost; selected or expected financial model; investor's share and exected construction starting date and reactor/power plant commissioning date.

Country	Power Plant	Technology	Total cost [$billion]	Financial Model	Rosatom share [%]	Rosatom costs [$billion]	Construction	Commissioning
Hungary	Paks	2xVVER 1200	12.8	JV	80/20	10,24	2018	2024–2025
Finland	Hanhikivi	1xVVER 1200	7	JV	34/68	2,38	2017	2024
Turkey	Akkuyu	4xVVER 1200	20	BOO	100	20	2017	2023–2027
India I	Kudankulam 3&4	2x VVER 1000 (AES -92)	5.78	BOT	50+	3.2	2017	2022 2023
India II[75]	Kudankulam 5&6	2x VVER 1000 (AES -92)	8	BOT		4.2	2019	2024 2025
Bangladesh	Rooppur	2xVVER 1200	12.65	GCC[76]	90/10[77]	11,385	2017	2024–2025
Egypt	El Dabaa	4xVVER 1200	25	BOO	85/15[78]	21,25	2017	2025–2028
Jordan	Amra	2xVVER 1000 AES-92	10	BOO	49/51	4,9	2018	2024–2025
Vietnam	Ninh Thuan 1	2xVVER 1200	10	BOO	85/15[79]	8,5	2023–2024	2028–2029
South Africa	Thyspunt/ Duynefontein	2xVVER TOI	6	BOO	49/50	3	2018	2024–2025
Iran	Bushehr-2	2xVVER 1000	11	BOO	100	11	2018	2024–2025
Kazakhstan	Kurchatov	2xVBER 300	8	JV	N/A	N/A	2025	2035

75 The Kudankulam units 3 & 4 and Kudankulam units 5 & 6 are being treated by Rosatom and the Indian government as independent projects with different construction, funding, and operating conditions. [8;36]
76 General Construction Contract
77 Bangladesh NPP $12.65billion with an interest rate of Libor plus 1.75%. Bangladesh would pay off the loan within 28 years with a 10-year grace period [38]
78 The loan will be used by the Egyptian side for 13 years, between 2016 and 2028. The Egyptian side will repay loan amounts used over 22 years in 43 installments. The loan will finance 85 percent of the value of each contract for the work, services, and equipment shipping. Egypt will finance the remaining 15 percent [1].
79 The total loan value will be between $8 billion and $9 billion, depending on the cost of materials at the time construction begins. The lending period will be as long as 28 years. The proposed interest rate has not been disclosed. Rosatom has offered to fund the investment phase of the project for up to 85% of the total cost [37].

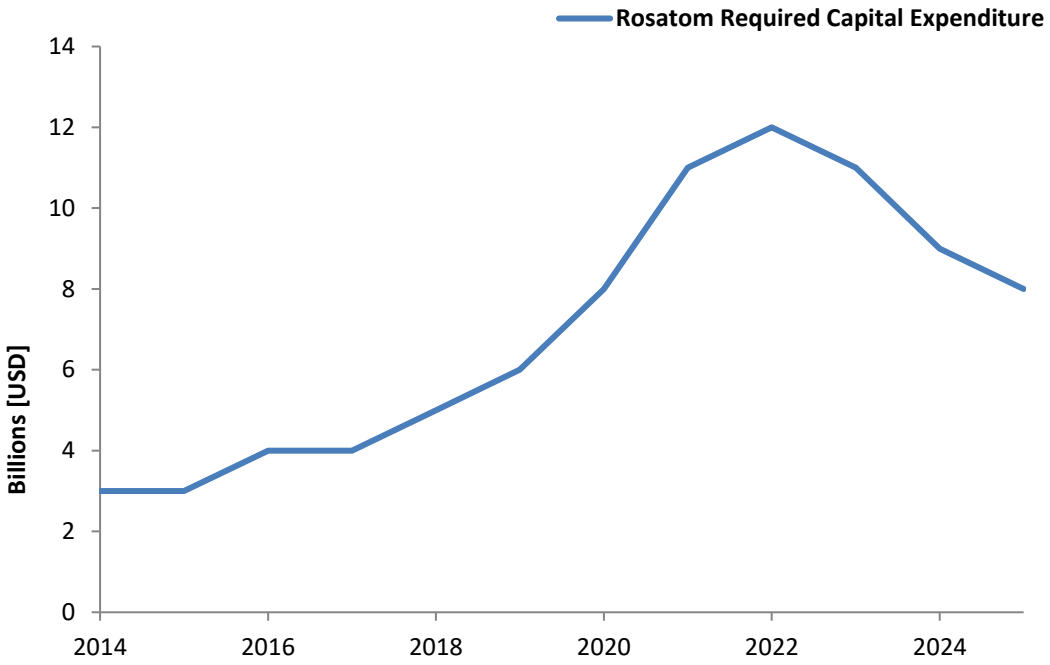

Figure 4.4: Rosatom's Future International Investment Capital Expectations

Source: Author calculations (prediction) based on the Rosatom officially announced overseas orders

4.3.1 Rosatom International Construction Projects

Finnish Example

One of the critical Finish investment projects in the energy sector is the construction of the nuclear power plant Hanhikivi 1. Rosatom has been chosen as a technology supplier and is a 34% owner of the future power plant. In 2014, Russia's Cabinet of Ministers approved up to RUB150 billion ($2.3 billion) in funding from the NWF for the Hanhikivi NPP[80].

Most of the funding will take the form of a loan guaranteed by export credit agencies, while the remainder will be “other loans.”

Hanhikivi 1 is expected to provide revenues to the Russian federal budget of RUB338 billion ($5.2 billion) during the course of the project. These revenues will be received as shares issued at par value by Atomenergoprom at an interest rate set by the Russian Central Bank to reflect future fluctuations in the value of the euro.

Hungarian Example

The Paks nuclear power plant is Hungary’s only nuclear power plant covering close to 40% of the total electricity production in the country. A series of deals, signed in late-2014, envisages the construction of the NPP’s units 5 and 6 with Russian-built VVER-1200 reactors, as well as nuclear fuel supplies and maintenance. Based on the agreement between the Russian Federation and Hungary, of the total construction cost of $12.8 billion, 20% will be covered from the Hungarian budget and 80% will be provided in the form of a loan by the Russian Federation. NWF will be probably the direct source of the $10.5 billion loans[81].

Since 2016, Russia has been granting Hungary an interest-only loan at an annual rate of 3.9%. Once construction is completed in 2026 (or, presumably, even if it is not), the principal balance will be amortized over 21 years, at an interest rate of 4.5% for the first

[80] Russia approves $2.3 Billion Funding for Hanhikivi 1 in 2015 [40]
[81] Inside Hungary's $10.8 Billion Nuclear Deal with Russia, Reuters [12]

seven years, 4.8% for the next seven, and 4.95% for the final seven-year period. Every year there will be two payment dates: March 15 and September 15.

A similar financial scheme backed by NWF funding apply to Rosatom's investment activities in Egypt, Jordan, Bangladesh, Vietnam, or Indonesia.

Turkish Example

The Akkuyu project is the world's first nuclear power plant project to use the build, operate, and own financing model (BOO). The BOO model is, in fact, an evolutionary financing approach to the build, operate, and transfer (BOT) financing model (Sarloz, 2015).

Rosatom will deliver four units of AES-2006 (VVER-1200) with a total capacity of 4,800 MW• Construction began in 2015, and the first unit is expected to be connected to the grid in 2024. Rosatom has a 100% share through the consortium of companies with the following equity structure: SC Atomstroyexport 2,267%, JSC Inter RAO 0,820%, OJSC Concern Rosenergoatom 21,948%, JSC Atomtechenergo 0,025%, JSC Atomenergoremont 0,025%, and CJSC Rusatom Overseas 74,915%. A 49 % share can be sold by Rosatom to a venture partner[82][83].

Total costs are expected to reach $20 billion, the operational lifetime has been set at 60 years, and the key document for the project feasibility is guaranteed PPA for 15 years from the date of operation of each of the four units set up, on fixed-price terms.

The project CAPEX structure is expected to be as described below:

- Equipment -- 39%
- Construction and Assembly–34%
- Miscellaneous–12 %
- Design and Engineering–7 %

[82] The Build-own-operate (BOO) Approach: Advantages and Challenges, Ministry of Energy and Natural Resources of Republic of Turkey [13]
[83] Financing Nuclear Power Plant Projects a New Paradigm? [18].

- Project management–5%
- Commissioning–3%

Based on this investment scenario, Rosatom is expected to spend roughly $20billion over the next 11 years only on this particular project with no revenue coming back to the company before 2024 according to Horst et al. (2015).

Indian Example

Rosatom supplied the country's first large nuclear power plant, comprising two VVER-1000 reactors, under a Russian-financed US$ 3 billion contract and the 1988 Russia-India agreement with a 1998 supplement. The total cost of these two units was reported as $3.3 billion by NPCIL[84] in 2016. A long-term credit facility covered about half the cost of the plant (Kumar, 2014).

Russia is supplying all the enriched fuel throughout the life of the plant, although India will reprocess it and keep the plutonium for civilian use. Unit 1 was started up in mid-July 2013, was connected to the grid in October 2013, and began commercial operations at the end of December 2014. Unit 2 commenced commercial operations at the start of April 2017. Each unit is 917 MWe net.

India's contract for the third and fourth reactors to be built at Kudankulam comes with up to $3.5 billion in export finance[85].

The total sum is supposed to finance 85% of “the value of the works, supplies, and services” provided by the Russian companies that will build the two VVER-1000 pressurized water reactors. A further credit line worth $800 million is available to cover fuel supplies. The credit lines carry interest at 4% per annum and would be repayable over 14 years and four years, respectively, one year after the start of power generation.

[84] Nuclear Power Corporation of India Limited
[85] Russia signs Deal to Expand India's Kudankulam Nuclear Plant [19]

The Indian government is expected to take up a credit offer of $3.06 billion, which is about 53% of the $5.78 billion estimated total project cost. This would be in line with the financing for the first two units.

The agreement to build reactors five and six at Kudankulam was signed in 2017. Russia signed a contract with the Indian government to build two new reactors for the Kudankulam nuclear power station in Tamil Nadu. The offer to construct the additional two units is accompanied with a Rosatom loan estimated at $4.2 billion (from 2018 for ten years) according to the World Nuclear Association[86].

Overall, Rosatom has a cumulative international order list of nuclear power plants for the next ten years, with a total value of close to $123 billion (2015)[87].

[86] Nuclear Power in India, World Nuclear Association, 2017 [36]
[87] ROSATOM Public Annual Report, 2015 [24]

4.3.2 Funding Gap

In 2015, according to Rosatom's annual financial report, the company's total revenue increased significantly by 32.8% to RUB 821.3 billion. However, given the steep rouble devaluation (see Table 4.2), total revenue in 2015 reported in USD saw a 16% drop over 2014[88]. The fact that despite the negative currency situation, the total drop in revenue has not been more significant can be attributed to the revenue structure, where foreign proceeds increased by 20.3% up to RUB 386 billion ($6.26billion), which represents 47% of total revenue (2015). Rosatom's financial results from 2015, illustrates the company's strong dependence on international orders which shield the company (and therefore the whole energy industry in Russia) from currency hikes and bolsters arguments by political leaders to support Rosatom's export activities.

Table 4.2: Financial Results–Rosatom[89]

This table includes key economic indicators as presented in the ROSATOM annual reports 2012 -2015.

Year	2012[90]	2013[91]	2014[92]	2015[93]
EBITDA [billion RUB]	140.8	155.20	200.5	211.0
EBITDA [billion USD]	4.4	5.0	5.2	3.4
Revenue (billionRUB)	474.8	529.2	618.3	821.2
Revenue (billionUSD)	14.9	17.0	16.0	13.4
Return on Sales (ROS %)	6,7	6,6	4,75	17,6
Return on Assets (ROA %)	1,4	1,3	1,11	4,46
Return on Equity (ROE %)	2,1	1,8	1,71	6,94
XR[94]	31.9	31.1	38.6	61.3

[88] Applying the currency devaluation effect on GAZPROM annual results in 2015 we see the revenue drop close to 32% and ROE decrease compare to 2013 for about 38% (from 13% to 8%) [5]. Similarly, ROSNEFT experienced almost 33% drop in the annual total revenue in 2015 when the currency effect is taken in account. [26]

[89] Rosatom financial indicators according to the International Financial Reporting Standards in nominal terms

90 ROSATOM Public Annual Report, 2011 and 2012. http://www.rosatom.ru/en/about-us/public-reporting/ [20;21]

91 ROSATOM Public Annual Report, 2013. http://www.rosatom.ru/en/about-us/public-reporting/ [22]

92 ROSATOM Public Annual Report, 2014. http://www.rosatom.ru/en/about-us/public-reporting/ [23]

93 ROSATOM Public Annual Report, 2015. http://www.rosatom.ru/en/about-us/public-reporting/ [24]

[94] XR-Exchange Rate USD/RUB – this value represents the exchange rate arithmetic mean in 2012–15, according to historical rates published by IMF at the online XR archive [9]

Table 10 The Dynamics of Rosatom's Overseas Revenue

This table provides information on the structure of Rosatoms revenue [billions USD] originated abroad and its evolution during the period from 2012 to 2015.

Year	2012	2013	2014	2015
Construction of NPPs abroad	0,332	0,708	0,948	1,565
Uranium products	2,240	2,069	2,227	2,667
Nuclear fuel assembly and other activities	2,012	2,196	2,027	2,026
Overseas Revenue	4,584	4,973	5,202	6,258

Source: Rosatom Annual Reports; authors calculations

Rosatom does not publicly provide any additional information regarding the overseas revenue structure besides a very general classification, as illustrated in Table 4.3 and Figure 4.5. Based on its list of on-going international projects over the past four years, we anticipate the vital source of revenue comes from the construction and operation of the Kudankulam NPP, Hungarian Paks[95] NPP, Finish Hanhikivi NPP, Turkish Akkuyu NPP, and Belarus Ostrovets NPP[96].

[95] Hungary has four nuclear reactors generating more than one-third of its electricity. All Hungarian nuclear reactors are Russian designed VVER – 440 / V -213 [35]

[96] Belarus' first nuclear power plant is under construction and plans are afoot to make it operational from 2019. Belarus' official cost estimate, including infrastructure, was US$ 9.4 billion, with one-third of this scheduled to be spent in 2011–15. In November 2011, it was agreed that Russia would lend up to $10 billion for 25 years to finance 90% of the contract between Atomstroyexport and the Belarus Directorate for Nuclear Power Plant Construction (now the Belarus NPP state unitary enterprise). In February 2012, Russian state-owned Vnesheconombank (VEB) and the Belarusian commercial bank Belvnesheconombank (BelVEB) signed an agreement needed to implement the Russian export credit facility. In May 2012, the parties said that the first instalment under the design contract would be $204 million, and that this would be followed by $285 million for pre-construction site works. This was confirmed with an agreement signed in May 2014 [34]

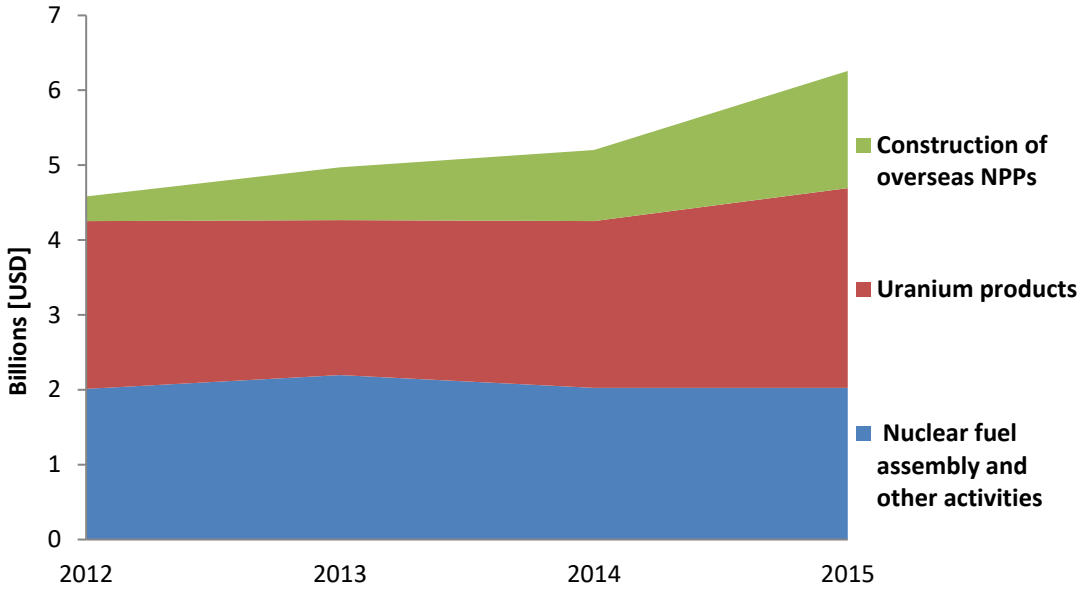

Figure 4.5: Rosatom Overseas Revenue Structure

Source: ROSATOM Public Annual Reports

The growth of internationally generated revenues (Table 4.5) implies that an export-oriented strategy brings positive results not only to Rosatom but also to the Russian Federation state budget and in times of high inflation and currency volatility, it is capable of sustaining above-average results. The business model is attractive, however, only when accompanied by access to the funds provided by Russian SWFs, especially from the National Wealth Fund.

Since 2014, the Russian Federation, as a highly oil-dependent economy, has been using the RF capital to cover the national budget deficit. In August 2016, more than 18% of the RF was used to bridge the federal budget gap ($8 billion), and the total value of the fund dropped to $32 billion**,** as shown in Figure 4.5.

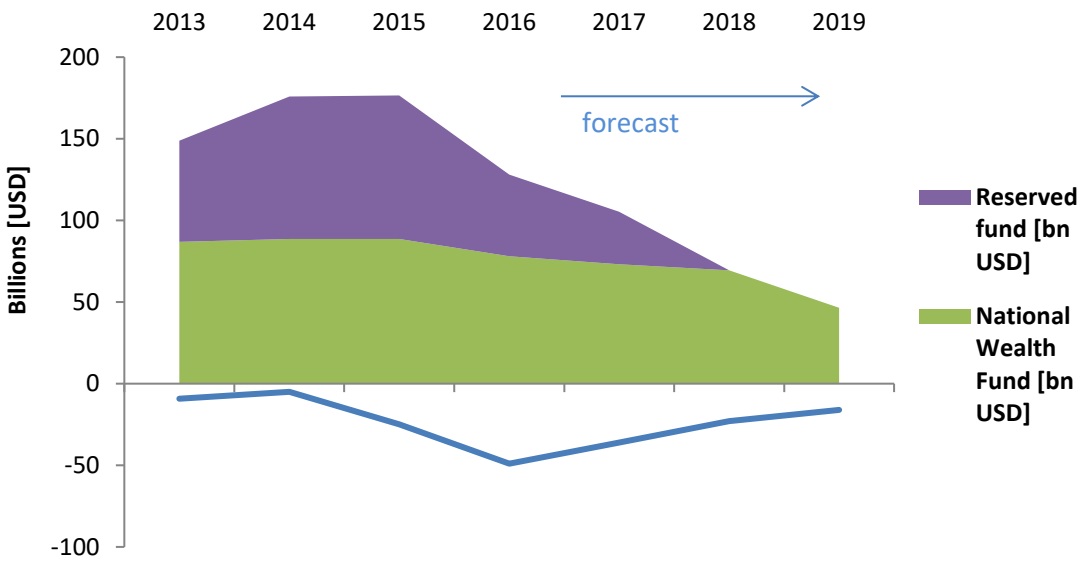

Figure 4.6: Russian Fiscal Requirements

Source: Russian Ministry of Finance and author's calculations

The Russian Ministry of Finance has expressed its concerns that with the current pace and due to the Russian Federation budget deficit (see Table 4.4), both SWFs could be depleted by the middle of 2017. Lack of funds would cause not only significant delays in ongoing projects that would have a devastating impact on the financial results of the whole company, but it could also irreversibly damage the company's reputation.

Table 4.4: Russian Federation Budget Deficit

Year	Budget deficit [billion USD]	Budget/GDP[%]	National Wealth Fund [billion USD]	Reserved fund [billion USD]
2013	−9,2	−0,5	86,79	62,08
2014	−5	−0,5	88,59	87,38
2015	−25	−2,6	88,63	87,91
2016	−49	−3,7	78	49,95
2017	−36	−2,7	73,11	32,26
2018	−23	−1,7	69,37	0
2019	−16	−1,2	46,37	0

Source: Ministry of Finance of the Russian Federation, Official Site, Section: Public Debt Statistics, 2017 [16]

Rosatom Access to International Public and Private Capital

Till now, the nuclear sector has been excluded from sanctions imposed by the EU on Russia. Rosatom has not been included in the OFAC's Sanction List or the Sectoral Sanctions Identifications (SSI) List[97]. Therefore, there is no formal obstruction in terms of securing funds from the public or private entities. However, the overall economic situation in the Russian Federation and status of a national company has a substantial impact on the international ratings of the three major rating agencies and seriously compromises the company's ability to access cheaper capital.

[97] US Department of Treasury, Sectoral Sanctions Identifications (SSI) List [31]

Table 4.5: Rosatom International Credit Rating

Rating Agency	Rating
Standard & Poor's	long-term international rating BB+ with a negative outlook; short-term international rating B;
Fitch Ratings	long-term default rating in a foreign currency BBB- with a negative outlook; long-term default rating in the national currency BBB- with a negative outlook;
Moody's Investors Service	long-term international rating Ba1;

Source: ROSATOM Credit Ratings, and Public Borrowings, 2017 [25]

The Atomenergoprom rating situation shown in Table 4.5 resonates with the real market-based cost of money which can be illustrated with the example from 2015 when the JSC Atomenergoprom[98] placed four issues of exchange-traded bonds with a total nominal value of RUB 30 billion[99] on the warrant interest rates exceeding eleven percent. Detailed information about exchange-traded bonds of JSC Atomenergoprom in circulation is given in Table 4.6.

Comparing the cost of money raised by exchange trade bonds and the terms generally offered by Rosatom to its clients, we can see that the Rosatom business model would not be feasible without backing from the Russians SWFs.

[98] Atomenergoprom is a Joint Stock Company Atomic Energy Power Corporation which unites approximately 50 enterprises of the nuclear industry. Atomenergoprom offers the full production cycle of nuclear power engineering — from uranium production to nuclear power plant construction and energy generation. AEP was established to consolidate the assets of the civilian part of the Russian nuclear industry. 100% of JSC Atomenergoprom is controlled by Rosatom)[2]

[99] one of them in nominal value of 10 RUB billion was bought back by JSC Atomenergoprom on December 25, 2015, and repaid early [25].

Table 4.6: Atomenergoprom Exchange-traded Bonds

Identification # of issue	Placement due date	Circulation period	Issuing volume [RUB billion]	Warrant interest rate. %
4B02-06-55319-E	13.07.2015	Ten years, issue terms provide for a put option for five years and a call option for two years	5	11.9
4B02-07-55319-E	25.12.2015	Ten years, issue terms provide for a put option for seven years and a call option for 4.5 years	10	11.1
4B02-08-55319-E	30.12.2015	Ten years, issue terms provide a call option for 5.5 years	5	11.1

4.3.3 The Motivation for the Sovereign State

Based on data highlighted earlier, we see that there are multiple reasons for Rosatom as well as Russian government representatives to support ongoing practice in the future despite the level of risk linked to the long-term BOO model. The main motivations are as follows:

1. **Monetary-Currency Motivation:** Since the international projects generate revenue which accounts for almost 50% of Rosatom's total revenue and shields the company from domestic currency risks[100], it is no surprise that the company aims to strengthen its global position.

2. **Demand Motivation:** Although the Russian domestic market has significantly weakened in the past three years[101] source: OECD 40, it has had a substantial impact on newly built projects as well as electricity consumption. Thus, without refocusing on overseas markets, the company would have experienced substantially larger revenue losses.

3. **Political Motivation:** The energy sector is vital for every economy in the world. For countries with minimal carbon-based fossil energy sources, the possibility of diversifying its energy mix and lowering energy dependability by constructing a nuclear power plant is undoubtedly tempting. For Russia, on the other hand, it represents an opportunity to gain significant political influence in the region.

A combination of these motivations[102] provides the reasons the Russian government to allocate such a vast quantity of funds collected in the Russian SWFs for the support of business opportunities generated by Rosatom instead subsidizing other industries such as automotive or aerospace.

The begs the question that despite these, advantages, why have governments with advanced nuclear programs not adopted this business model? The major vendors in the

[100] ROSATOM" Official Webpage, Section Credit Ratings and Public Borrowings,2017 [25]
[101] Atomenergoprom 2017. Company Profile [2]
[102] Official position of ROSATOM representatives on mitivation for state backing to nuclear plants construction projects is presented for instance here [41]

nuclear industry and governments that back them represent a very small group. According to Stulberg and Fuhrmann (2013), they include Areva (France), KEPCo/KAERI/Daewoo (South Korea), Hitachi/Toshiba/Mitsubishi/Westinghouse (Japan), AECL (Canada), and the China National Nuclear Corporation (CNNC) together with the China General Nuclear Power Group (CGN). Areva and Westinghouse are currently struggling to survive. Therefore, the main Rosatom rivals remain the Chinese consortium offering HPR1000[103] and KEPCo. The Chinese nuclear consortium has recently signed a general contract between Nucleoeléctrica Argentina SA (NASA), CNNC, and CNNC subsidiary China Zhongyuan Engineering Corporation, for the two reactors in 2016.

Another example of Chinese willingness to combine the construction of the nuclear power plants with providing the necessary funds is the Strategic Investment Agreement signed in 2016, where CGN agreed to take a 33.5% stake in the Hinkley Point C[104], as well as jointly develop new nuclear power plants at Sizewell in Suffolk and Bradwell in Essex. The Hinkley Point C and Sizewell C plants will be based on France's EPR reactor technology, while the new plant at Bradwell will feature the Hualong One design. As part of that agreement, CGN agreed to form a joint venture company with EDF Energy to seek regulatory approval for a UK version of the Hualong One design[105].

[103] The Hualong One is a fully certified 1150 MWe reactor design, with an expected 60-year design life. The first units will be Fangchenggang 3&4 (CGN) and Fuqing 5&6 (CNNC). It is also being built in Pakistan. In December 2015, CNNC and CGN formed a 50-50 joint venture company – Hualong International Nuclear Power Technology Co – to market it [32;42]

[104] Project to construct a 3,200 MW nuclear power station with two EPR reactors in Somerset, England [33;39]

[105] Hualong One Joint Venture Officially Launched, World Nuclear Association [32;39]

4.4 Conclusion

Rosatom's long-term cooperation with the Russian SWFs has allowed the company to bring to the market a competitive business- financial-political model and by doing this, as also pointed out by Pehuet (2015) changed the “financing nuclear power plant paradigm.”

We see that the Rosatom export-oriented strategy has significantly helped the company soften the impact of the ruble devaluation. We also observe gradual growth in revenues coming from the construction of overseas nuclear power plants owing to the number of ongoing projects. How important the role of the funding option during the tender process was to the clients is somewhat unclear but what is obvious, based on the presented data, is that without direct support from the Russian SWFs Rosatom would have never been able to offer the BOO model with up 100% funding. Additionally, the build, own, operate model recently contracted for the Akkuyu project in Turkey, Nuclear Power Plant Paks in Hungary, or the Indian Kudankulam goes beyond financing and purchase-price agreements, as most of the overall viability risk of the project is transferred to the vendor. This exposes the vendor, in this case, Rosatom, to significant financial risks.

If Rosatom proceeds with the major international nuclear power plant constructions, its annual expected investment cost could climb up to close to USD 4 billion. With Rosatom EBITDA near USD 3.5 billion and limited options to secure investment capital from private international financial institutions (under conditions which would allow Rosatom to keep the funding conditions competitive), such a business model is currently entirely dependent on the availability and continuous support from Russian SWFs.

This study also suggests that long-term recession in the Russian Federation could eventually consume funds in both SWFs and put Rosatom in a perilous situation not only in terms of future competitiveness but also in terms of fulfillment of the business commitments concerning ongoing projects.

Finally, the rising attractivity of the BOO model in the nuclear industry is being observed in the behavior of Rosatom’s major global competitor, the Chinese nuclear consortium.

Chines recently brought to the market their own, fully certified pressurized nuclear power reactor and as turnkey contractor offers to fund up to 85%, which put even more pressure on Rosatom.

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CONCLUDING REMARKS

This thesis, with respect to defined research scope, provides an extensive insight into the global phenomena of Sovereign wealth funds, their role in the national economies, funds' financial results, and their long-term impact on the targeted companies.

Initial systematic literature and methodology review on the short-term impact of SWFs on targeted companies confirms the findings presented by Alhashel (2015), Fotak, Gao and Megginson (2017), or Megginson and Gao (2019) on the consistency of research results of SWFs' short-term impact on targeted companies. The research reassembles findings in the literature on the subject of the large shareholders, as published by Holderness (2003) or Shleifer and Vishny (1997). They conclude that large shareholders are usually associated with a premium value for the shareholders of target firms, where SWFs investments are associated with the positive market reaction around the announcement period of SWFs investment, quantified by premium in the target companies' market value around this period.

The meta-analysis report on the SWFs' long-term impact provides ambiguous results. We confirm significant inconsistencies in the findings presented in the reviewed research publications. Expected value enhancement as envisioned in the context of literature on the large shareholders is fully supported only by Fernandes (2014); the results even substantially outperform the control group performance results, but it needs to be stressed that the results are built on a particularly limited time-period. Surprisingly, even in the studies built on the comparable construction of the research model, we find contradictory results. The vast majority of the authors confirm a decline in market value or performance indicators in the first two years for SWFs investees. Dewenter, Han and Malatesta (2010), find that in the third and fifth year, statistically significant premiums in market value are observed. This positive trend, however, is contradicted by the results of all other authors who provide results for the five-year post-investment window no matter the methodological approach employed. We did not find any methodological or statistical errors, which could explain such a high level of results inconsistency in the reviewed works. Instead, we identify three other factors as

the most probable cause of the contradictive research results. The proposed factors are: (i) the limited size of the dataset, and an even substantially smaller sample for a time range longer than three years following the SWFs investment; (ii) the strong dominance of investment transactions generated by one or two sovereign wealth funds; (iii) substantial differences in the authors' transactions datasets in terms of the average ownership share acquired by SWFs.

Given the conflicting theoretical predictions linked to the efficiency, management capabilities, and motivation of state-owned companies, in combination with the presented contradictory results provided by academia, we approach this issue through our designing a comparative empirical analysis built on the original SWFs transactions dataset.

For the comparative analysis, we employ standard event study techniques, supplemented by regression analysis, built on a cumulative market-adjusted return (CMAR) with a strong focus on the rigorous approach to the SWFs transactions' compilation, verification, and filtration procedure.

The results of the empirical analysis show positive (+0.83%) market-adjusted returns in companies with SWF investment in the second post-investment year. The positive trend is evident until the third year, where the premium for the group of SWFs investees reaches its maximum (+2.92%), compared to the market average. An interesting observation from the third year following the SWF involvement is that only 38% of the investees reached market-adjusted returns higher than the market average. The median for the group of SWFs investees (in the third post-investment year) is negative (-12.54%).

In the fourth year, however, the SWFs investees' returns indicate a change of the previously positive trend, as the SWFs investees start to perform below the market average (-0.35% in the 4th year). This negative trend is confirmed in the fifth post-investment year (-2.90%), which indicates that the initial, gradually-positive impact of sovereign wealth funds on investee performance disappears, as it tends to perform below the market average in a very long-term horizon. An identical trend is identified for the investees included in the FDI subgroup.

Therefore, we fail to reject the null hypothesis to "*The Long-term Impact of Sovereign Wealth Funds on Firms' Value"* alternative hypothesis envisioned in corporate-governance literature by Shleifer and Vishny (1997) that sovereign wealth funds should bring higher value to investees compared to private investors who operate on presumably shorter runs.

Additionally, the results of the linear regression analysis indicate that no statistically-significant linear dependence of the mean of the SWFs' investees MARs on the SWFs' level of transparency was detected. Neither was a statistically significant linear relationship detected for the subgroup of FDI transactions. Finally, our dataset does not provide any statistically significant evidence of linear dependence of the mean of SWFs investees returns on the size of SWF stock ownership.

In the research study aimed at establishing the motivation for transferring international reserve funds to SWFs, presented in Chapter Three, we focus on the funds' profitability. We designed a research model based on the historical financial results achieved by a group of SWFs, representing almost 50% of assets managed by SWFs. Then, we compare the average SWFs' real returns with theoretical returns achievable by the class of assets with the potential to be transferred to an SWF without jeopardizing crucial IRs monetary and sovereign economic function, allocated in the international reserves. The results show that assets managed by SWFs from 2007 to 2017 outperformed the average annual premium delivered by assets allocated in the international reserves by 1.98 percentage points.

Given the total value of assets managed by the funds included in this analysis, the estimated premium delivered by this sub-group of SWFs is US$178 billion annually. It needs to be stressed that the presented results do not reflect interest rates related to investment portfolio risks, and therefore, the results should be approached with this respect in their interpretations.

Finally, we approach the premise that the motives behind establishing sovereign wealth funds do not need to be driven strictly by profit maximization. Given the origin of the

SWFs, a various combination of political objectives can be pursued by SWFs simultaneously.

In the process of the literature review, we documented a thought-provoking relationship between the Russian sovereign wealth funds and Rosatom—the Russian Federation National Nuclear Corporation. To our knowledge, there is no literature on the subject of sovereign wealth funds approaching this specific role as a direct funding and financial guarantee authority. Therefore, we decided to document this fund's role in the form of a case study.

We see that the Rosatom export-oriented strategy has significantly helped the company soften the impact of the ruble devaluation. We also observe gradual growth in revenues coming from the construction of overseas nuclear power plants owing to the number of ongoing projects. How important the role of the funding option during the tender process was to the clients is somewhat unclear, but what is visible, based on the presented data, is that without direct support from the Russian SWFs, Rosatom would have never been able to offer the BOO model with 100% funding.

This study also suggests that long-term recession in the Russian Federation could eventually consume funds in both SWFs and put Rosatom in a perilous situation not only in terms of future competitiveness but also in terms of fulfillment of the business commitments concerning ongoing projects.

Finally, we identified the rising attractivity of the BOO model in the nuclear industry, which can be observed in the behavior of the Rosatom's major global competitor, the Chinese nuclear consortium, which has recently brought to the market their own, fully certified, pressurized nuclear power reactor as turnkey contractors offer financing options up to 85% with comparable interest rates offered by Rosatom.

Future Research Suggestions

The continuous lack of generally-accepted requirements for the transparency and accountability of SWFs and the minimal effort to enhance compliance with such rules, as monitored in the last ten years, allow funds to operate without almost any global surveillance. For some countries, this represents an additional motivation to employ state funds in their strategic political and economic initiatives.

Following the results presented in the Chapter Two, particularly the considerable drop in the market value observed in the fourth and fifth year, we see an opportunity in the further investigation of this negative trend in the even longer post-investment period. This would require extending the effective transaction date from 2008 to 1999 (the earliest data available for TR WI), in order to collect representative SWFs investment transaction samples.

We conclude that academic research on the long-term impact of SWF investments on acquired companies' values suffers from a critical lack of sufficient and comparable market information. Moreover, due to extreme differences across the SWF transaction datasets used by researchers, in terms of transaction value, several transactions and data verification procedures, the research results have limited explanatory power. To improve the explanatory power of future research on SWFs' long-term impact, we recommend to:

i) Provide detailed information on the SWF transaction data collection, provenance, verification, and filtration procedures; this information needs to be provided separately for short-term and long-term impact analysis, as the research sample differs significantly as a useful benchmark, according to Bortolotti et al. (2017).

ii) Consider either excluding portfolio investment transactions from the dataset or include a variable to identify targeted investments, preferably that of SWFs transactions exceeding a certain level (at least >1%) of investees' ownership share for long-term impact analyses.

iii) Avoid inflation of the data sample at any cost. This methodology review shows that this effort primarily leads to adding an excessive number of transactions from one or two SWFs, and increases the probability of biased research result.

APPENDIX I. Short-term impact - overview

Year	*Article*	*Authors*	*Journal*	*Long-term impact*	*Clean Sample*	*Sample Short Term*	*Research methodology*	*Control group*	*Research results*
2008	The Financial Impact of Sovereign Wealth Fund Investments in Listed Companies,	Fotak; Bortolotti; Megginson	Unpublished working paper	YES	620	212	Event study test based on the historical stock price returns adjusted for dividends and splits for targeted firms from Datastream. Only observations with data available for at least six months (120 trading days) prior to the announcement date. Results are reported for raw returns, market-adjusted abnormal returns, and market-model abnormal returns.	The expected return obtained from a market model were calculated by using the local equity index as a market proxy, from the target's return. To compute expected returns, market model using at least 120 and as much as 360 trading days ending 20 days prior to the time interval was designed	Significantly positive 0.8% mean abnormal return around the announcement date. Statistically significant at the 1% level
2008	Sovereign Wealth Funds: Their Investment Strategies and Performance	Chhaochharia; Laeven	CEPR Discussion Paper No. DP6959	NO	41472	86	An event study of abnormal equity returns around the time of the announcement based on the cumulative abnormal returns (CARs) relative to the market returns for each host country. Authors sum abnormal returns to calculate cumulative abnormal returns. For each event, the market model is estimated over the period 281 to 80 trading days prior to the event date.	For each market, the return on a commonly observed stock market index as a proxy for the market return is used (e.g., for the US the CRSP value-weighted return index is used, or for the UK -the FTSE 100 index)	SWF investments generate substantial, positive CARs during the 10 trading days prior to the announcement of the investment. The average CAR is 1.15% over the period [t-10, t-5]
2008	Friends or Foes? The Stock Price Impact of Sovereign Wealth Fund Investments and the Price of Keeping Secrets	Kotter; Lel	International Finance Discussion Paper No. 940	YES	163	163	Event study based on abnormal returns. Market model for each transaction using local currency daily returns is being used. OLS market model coefficients are estimated over a 200-day pre-event period, from the day -225 to day -26 relative to the announcement date. Coefficients from the pre-announcement model are used to calculate abnormal returns from the day -10 to day +20. Abnormal returns are then averaged across firms to form the average abnormal return.	Market capitalization weighted index for each country provided by Datastream	Average positive risk-adjusted return of 2.1 percent for target firms during two days surrounding SWF acquisition announcements. The announcement effect is both statistically and economically significant.
2010	Firm Values and Sovereign Wealth Fund Investments	Dewenter; Han; Malatesta	Journal of Financial Economics	YES	202	202	Event study based on the CARs in the three-day window (-1, +1) for each transaction by regressing target firm stock returns on the returns to two market portfolio indices from the Datastream and three event-day dummy variables. The regressions are estimated using daily returns over the period (-250, +1), excluding the period immediately before the event (-6, -2). An estimate of the announcement period abnormal return for each firm is the (CAR) over the 3-day window. The same procedure is run for the SWFs divestment.	Market portfolio indices provided by the Datastream	SWF investments are associated with positive CARs for the target firms and that divestments are associated with negative abnormal returns. The average 3-day investment CARs are 1.5% for the full sample, and 1.7% for the clean announcement subsample. The average 3-day abnormal return for SWF divestments is -1.4%
2010	Quiet Leviathans: Sovereign Wealth Fund Investment, Passivity, and the Value of the Firm	Bortolotti; Fotak; Megginson, Miracky	Working Paper	YES	802	688	Short-term event study based on market-adjusted excess returns over a three-day event window (-1 to +1) with results provided for various dataset modifications, as for instance excluding NBIM transactions.	local price indices - Datastream	The mean excess return is 1.25%. The median excess return is +0.17%. The number of positive abnormal returns exceeds the number of negative ones (368 to 320.) Both

								parametric and nonparametric test statistics are highly significant.
2011	Friends or Foes? Target Selection Decisions of Sovereign Wealth Funds and Their Consequences	Kotter; Lel	Journal of Financial Economics	YES	417	417	Event study analysis based on abnormal returns market - a model for each firm using local currency daily returns was constructed. Ordinary least squares (OLS) market model coefficients are estimated over a 160-day pre-event period, from day 180 to day 21 before the announcement date. Coefficients from the pre-announcement model are used to calculate abnormal returns from the day -10 to +20. Abnormal returns are then averaged across firms to calculate the average abnormal returns for (0, +1), (- 1, +1), and (-2, +2) windows.	The US dollar-denominated MSCI ACWI from DataStream is used as a proxy for the market return. For robustness, authors use DataStream's value-weighted national stock market indices and the manually constructed Fama and French (1998) global factors	The average cumulative abnormal return is 1.32% (t=4.60), 2.25% (t=6.79), and 2.74% (t=6.67) for the windows (0, +1), (-1, +1), and (-2, +2) around the announcement date. The significant test statistics are also highly significant for all three windows.
2011	The Impact of Foreign Government Investments: Sovereign Wealth Fund Investments in The United States	Sojli; Tham	Institutional Investors in Global Capital Markets	YES	93	66	Uses the Securities Exchange Commission (SEC) Schedule 13 filings of ownership that are larger than 5% to identify SWF targets. The cumulative abnormal returns (CARs) starting from 20 trading days before the 13D filing and ending 20 days after the filing are calculated. CARs are calculated above the expected market returns estimated for the period (-255, -20) measured using the value-weighted NYSE/Amex/NASDAQ index from CRSP	The analysis is based solely on the CAR projection.	Sixty percent of the targeted firms experience positive abnormal returns. The 25th, 50th and 75th percentile values are 8%, 7%, and 24%. The abnormal returns remain significantly different from zero for smaller event windows, but they decrease in size to 3% for (1, - 1) and 8% for (10, - 10).
2012	Sovereign Wealth Fund Investment and the Return-to-Risk Performance of Target firms	Knill; Lee; Mauck	Journal of Financial Intermediation	YES	170	159	2-day announcement returns using a (domestic) market-model event study method. The significance of market-model abnormal returns is measured using five techniques: (1) the t-test; (2) the Patell Z (Patell, 1976) test statistic, (3) the crude dependency adjustment of the t-statistic (Brown and Warner, 1985), (4) the generalized sign test; and (5) the Wilcoxon signed rank test. Both buy-and-hold and calendar time portfolio methodologies to establish abnormal returns are employed.	The return and risk of target firms are matched to those of similar firms using a pair benchmarking procedure. They are matched on three criteria of the target firm: country, industry, and size. Matching is based on the Datastream's Global Industry Classification for each firm and defines all firms within the same industry classification as the target firm. The firms are ranked by market capitalization; the firm with the closest market capitalization at the end of the month before the event is selected.	An increase of 1.37% following SWF acquisitions is seen over trading days -1 to 0. The result is significant at the 1% level using the t-statistic, Patell Z, CDA, and Wilcoxon signed rank. Positive effect in the short-term, but a negative (although generally insignificant) 1-year effect following SWF acquisitions is observed.

2014	The Effect of Sovereign Wealth Funds on the Credit Risk of Their Portfolio Companies	Bertoni; Lugo	Journal of Corporate Finance	NO	391	391	Analysis comparing the evolution of the target firm's credit default spread around the investment announcement. The main variable is the adjusted decrease in CDS spreads (ADS). The CDS spreads of target companies are adjusted by subtracting an equally weighted index of all CDS spreads of firms in the same rating category investments. The ADSs are computed for two time-intervals centered around the event, (−1, + 1) and (−3, + 1). ADSs are predominately based on 5-year maturity CDSs, but for control reasons, the calculations are also run for 1-year and 3-year CDS	Based on Moody's credit ratings, all firms are divided into four credit categories as follows: (a) Aaa and Aa; (b) A; (c) Baa; and (d) Ba and below. The implicit assumption of this procedure is that firms with similar levels of credit risk exhibit the same sensitivity to the investment.	The decrease in adjusted CDS spreads economically not negligible. The mean 5-year ADS for the event window (−1, + 1) is 1.135 bps. The mean decreases in CDS spread, adjusted by an equally weighted index of all corporate CDS contracts is significant at the 5% confidence level (or better) for each of the three maturities considered. The magnitude of the average adjusted decrease in spread varies across different specifications of the event study, ranging between 1.258 bps and 2.896 bps. The impact of SWFs on the credit risk thus seems to go in the opposite direction of that observed when the investment comes from hedge funds or private equity investors.
2015	The Sovereign Wealth Fund Discount: Evidence from Public Equity Investments	Bortolotti; Fotak; Megginson	The Review of Financial Studies	YES	1018	796	Event study based on abnormal returns. (CARs) are computed by subtracting the market-model expected return from the target firm's stock total return over various intervals (a bootstrapped, skewness-adjusted t-test corrects for the skewness of abnormal returns, and a generalized sign test for medians is employed). The expected returns are computed by estimating model parameters using daily returns over (-250, -20) window. The presented results are for three event window (day 0), three-day (-1, +1) and eleven-day (-5, +5)	Dataset built on the investments included in the Thomson Reuters SDC Platinum Mergers & Acquisitions Database (SDC), with announcement dates between 1980 and 2012 with a publicly-traded target, and with the acquirer having a SIC code between 6000 and 6999, as an identifier for financial firms. The clean benchmark sample contains 5,975 observations with a total deal value of $224 billion.	The mean 3-day CAR is positive 0.84% but lower than those of comparable private investments. All results are statistically significant at the 1% or 5% level over the 1-day and 3-day windows. For the eleven-day event window, the mean abnormal returns are insignificant at conventional levels, while the median is significant at the 5% level.
2017	Taming Leviathan: Mitigating Political Interference in Sovereign Wealth Funds' Public Equity Investments	Bortolotti; Fotak; Loss	BAFFI CAREFIN Centre Research Paper, (2017-64).	YES	1018	796	The market reaction at investment announcement using event studies based on cumulative abnormal returns (CARs). The statistical significance of mean abnormal returns is tested by using a bootstrapped, skewness-adjusted t-test to correct for the skewness of abnormal returns. For the median, a generalized sign test was used. The results are present for the event day (day 0), 3- day (-1, +1) and eleven-day (-5, +5) event windows	5,975 observations with a total deal value of $224 billion limited to Standard Industry Classification (SIC) code between 6000 and 6999	Three-day CAR is 0.84% (0.07%). For the benchmark sample, the 3-day mean and median CARs are 4.82% and 0.92%, whereas eleven-day mean and median CARs are 7.09% and 2.54%; all CARs are significant at the 1% level.
2017	State Capitalism's Global Reach: Evidence from Foreign Acquisitions by State-Owned Companies	Karolyi; Liao		NO	4759	436	Market-adjusted returns (CMARs) over three different windows around the deal announcements: 21 days (−10, +10), 11 days (−5, +5), and three days (−1, +1). The market index returns are for Datastream's capitalization-weighted national market indices.	7482 corporate acquires observations collected from the Datastream	The median CMARs are 3% for the 21-day window, 2% for the 11-day, and 1.2% for the 3-day window. These are economically smaller and statistically different from those observed for corporate-led acquisitions. CMARs of targets of corporate cross-border acquisitions are 4.0% for the 21-day window and as low as 1.5% for the 3-day window. Among the minority deals, the CMARs for the government-controlled acquirers appear smaller in magnitude again than those of the corporate acquirers.

APPENDIX II. Long-term impact - overview

Year	*Article*	*Authors*	*Journal*	*Clean Sample*	*# of tr. 1y*	*# of tr. 2y*	*# of tr. 3y*	*# of tr. 4y*	*# of tr. 5y*	*Research methodology*	*Control group*	*Research results*
2008	The Financial Impact of Sovereign Wealth Fund Investments In Listed Companies,	Fotak; Bortolotti; Megginson	Unpublished working paper	620	162	114		54		Market-adjusted returns (computed as the difference between target's returns and returns on a local equity index) and market model abnormal returns (computed as the difference between target's returns and expected returns based on a market model, with a local equity index acting as a market proxy)	Local equity index - The author includes a list of matched indices identifying the equity index used as a proxy for the market when a calculation of abnormal returns is provided.	Market-model abnormal returns are all negative; the one-year abnormal return is -8.40% and is statistically significant at the 10% level, the two-year market-model abnormal return is -14.14% and is statistically significant at the 5% level. Raw returns are positive and statistically significant at 10% for the 120 trading days following investment by the SWFs and are positive and statistically significant at the 1% level for all other time intervals
2008	Friends or Foes? The Stock Price Impact of Sovereign Wealth Fund Investments and the Price of Keeping Secrets	Kotter; Lel	International Finance Discussion Paper No. 940	163	51-44		21-15			Performance indicator-based study comparing the sample of SWFs investees and the market average over one and two-year windows. The measures of operational performance are operating profits to assets, operating profits to sales, return on assets, and sales growth	Matching the SWF target company sample with the Worldscope database concerning the country, industry, and profitability of the sample firms in the year before the SWF investment, following Barber and Lyon (1996). The industry classification is the 2-digit SIC code from WorldScope	Firms do not experience any statistically significant change in their profitability, growth, investment, and corporate governance environment following an SWF investment, compared to a matched sample of control firms. The difference in operating performance between target firms and control firms is never statistically significant, although there appears to be a deterioration of target firm performance over time.
2010	Firm Values and Sovereign Wealth Fund Investments	Dewenter; Han; Malatesta	Journal of Financial Economics	202	177		127		74	The analysis is primarily based on market-adjusted returns. The CMAR is accompanied by buy-and-hold market-adjusted returns (BHAR) These are calculated over 250, 750, and 1,250 trading days following the transaction announcement date.	Local market index returns - Datastream value-weighted global indices for the national markets	The SWF investees' mean and median adjusted returns are negative over the 1-year and 2-year window. Over 3- and 5-year periods following the SWF transaction announcement, the mean CMARs are positive for all of the samples and in the 5-year time frame the results are statistically significant.
2010	Quiet Leviathans: Sovereign Wealth Fund Investment, Passivity, and the Value of the Firm	Bortolotti; Fotak; Megginson , Miracky	Working Paper	802	576	294	128			Two different methodological approaches. First, performance-based analysis based on raw stock market returns computed as the change in the Datastream Total Return Index. Second, for each benchmark, buy-and-hold abnormal returns were computed, accompanied by cumulative abnormal returns. Results are provided for 6m, 1-year, 2-year; 3-year windows	Target firm and index returns were downloaded from Datastream. AFTSE level-3 industry classification from Datastream was used as the industry proxy. Two alternative global market indices, the MSCI World and the Datastream supplied total return indices, were used, but results were not published because they were	BHARs are insignificantly negative over all four windows, ranging from -1.32% at one year to -4.61% over three years. Medians are substantially more negative, ranging from -3.13% at 6 months to -12.75% at 3 years. The first three holding periods are significantly negative at the 1% level and the 3-year holding period result is significantly negative at the 5% level. Mean abnormal returns become increasingly negative over the four holding periods, ranging from -3.74% for 6

								almost identical to local share price indices.	months to -12.13% over 3 years. Median abnormal returns are all negative
2011	Friends or Foes? Target Selection Decisions of Sovereign Wealth Funds and Their Consequences	Kotter; Lel	Journal of Financial Economics	417	279	203	172	First, analysis is based on buy-and-hold abnormal returns (BHARs), calendar-time portfolio returns, and operational performance for event windows over a 1-year, 2-year, and 3-year periods. A second, calendar-year portfolio analysis of SWF targets using various windows is performed. Finally, an analysis of changes in operational performance is run, comparing the mean and median values of changes in the respective measures of firm performance and corporate governance between the sample and control firms over two periods:(-1,+1) and (-1,+3)	The MSCI ACWI total return indices	The target firms do not experience any robust and statistically significant change in their profitability, growth, investment, compared with a matched sample of control firms. A deterioration in the operational performance of both the target and control firms over time is identified. The average (median) ROA of the target firms falls from 5.45% (4.92%) to 5.20% (4.41%) within a year after the SWF investment. The corresponding fall in mean ROA for control firms is from 1.98% to 0.75%,
2011	The Impact of Foreign Government Investments: Sovereign Wealth Fund Investments in the United States	Sojli; Tham	Institutional Investors in Global Capital Markets	93	66	50		1. Buy-and-hold abnormal returns (BHAR) for all investments up to 12 months following the SWFs investment.2. Changes in firm performance (value, profitability, and efficiency), in the two years, prior to and after the investment, for an initial analysis of changes in firm fundamentals. The results are matched with 13G report data and hedge fund investments. Tobin's Q is used as a measure of firm value, and EBITDA/assets and EBITDA/sales as efficiency and profitability measures. All the data are taken from Compustat.	The CRSP value-weighted index is used as the benchmark for calculating BHAR, starting from 20 days before the SWF investment until the SWF investment position drops below the 5% threshold. 13G report data and hedge fund investors are used as a proxy for the performance analysis	No conclusive results for BHAR are provided. Performance analysis shows that the SWFs' target firms are significantly more profitable and more efficient than hedge fund investments. The difference in profitability, based on EBITDA/sales, decreases significantly in the post-hedge fund investment period by 19%, as does the difference in efficiency, but SWF targets still perform better than hedge fund targets on these two measures. The Tobin's Q of hedge fund targets is 37% lower than that of SWFs' targets two years after the investment, compared to 35% prior to investment.

2011	Sovereign Wealth Funds: Investment Choices and Implications Around the World	Fernandes	SSRN 1341692	42110	897-880	410-395		Based on Tobin's Q, plus indicators of operational performance (ROE, ROA, and EBITDA). Regressions of Tobin's Q on variables associated with a firm value (size; growth opportunities; leverage; cash holding and median Tobin's Q for the firm's global industry. Dummy variable for invest. >1% is included and run for all major calculations and statistical tests. The same analysis is re-run for a dataset excluding NBIM and NZSAF investments. Results reported for 1-year and 3-year windows.	Annual time-series cross-sectional regressions for Tobin's Q of a worldwide sample of firms over the 2002–2007 period. The sample is restricted to firms with a market capitalization above USD 10 million. Overall, the control sample is based on 162,000 observations for the t+1 year	Results show an increase in firm value following SWF investment, as well as significant improvements in operating performance in the first and third year following the SWF investment.
2012	Sovereign Wealth Fund Investment and the Return-to-Risk Performance of Target firms	Knill; Lee; Mauck	Journal of Financial Intermediation	170	157	82	50	Uses a difference-in-means test of raw returns for both target and benchmark-adjusted returns in 1-year, 3-year, and 5-year windows. The relationship between SWF investment and the return-to-risk performance of the target firm is measured by both the Sharpe ratio (Sharpe, 1966) and the appraisal ratio (Brown et al., 2008) The Sharpe ratio focuses on total risk, while the appraisal ratio focuses on the compensation of idiosyncratic risk. Both ratios are compared before and after SWF investment using a difference-in-the-means test. Significance is determined using a t-test. The cumulative abnormal returns, as well as the Sharpe and appraisal ratios, are winsorized at a 5% level	The return and risk of target firms are matched to those of similar firms using a pair-benchmarking procedure. They are matched on three criteria of the target firm: country, industry, and size. Matching is based on the Datastream's Global Industry Classification for each firm and finds all firms within the same industry classification as the target firm. The firms are ranked by market capitalization. The firm with the closest market capitalization at the end of the month prior to the event is selected as the benchmark.	The 1- year abnormal returns are negative, regardless of the methodology used. The raw returns for both target and benchmark-adjusted returns are lower (significant at the 1% and 5% level, respectively) in the year following SWF acquisitions. This result is stronger than the event study results, which show a negative and insignificant impact on returns in the year following SWF investment. For the 3-year window, only the raw returns remain negative and significant. At the 5-year window, both the raw and benchmark-adjusted returns are statistically insignificant. The Sharpe and appraisal ratios both slightly increase in the lead-up to SWF investment, then fall in the year after, and begin to rise again from 3 to 5 years.
2013	The Investment Strategies of Sovereign Wealth Funds	Bernstein, Lerner, Schoar	Journal of Economic Perspectives	2662	796			A methodology based on cumulative abnormal returns relative to a local market benchmark in the six-month window. Detailed results not published. Compares the results of transactions by SWFs with "Politicians" and "External managers" in executive positions.	The percentage change in the weighted (by firm value) average EBITDA/assets ratio of all publicly owned firms if the target is publicly owned, or if the target is private, all privately held firms in the corresponding three-digit SIC industry, country, and year of the target in the transaction measure for each deal.	Politician-influenced SWFs generate 16 percent lower returns in the six months after the investments. The results are weak. In the basic regressions, the politicians variable has a negative coefficient, and the external managers coefficient is positive, but neither are statistically significant.

2014	The Impact of Sovereign Wealth Funds on Corporate Value and Performance	Fernandes	Journal of Applied Corporate Finance	42110	880				Uses three different measures of operating profitability: return on assets (ROA); return on equity (ROE), and operating returns (defined as EBITDA/assets). The comparative analysis for these three measures of performance for the SWF sample and control firms over the (t–1y) and (t+1y) window. The results are provided individually for the SWF sample and control group and the difference-in-difference analysis	The benchmarking procedure is based on matching the sample of large SWF in-investments with a propensity-score-matched sample of firms. The control group is obtained by matching by country, industry, size, and Tobin's Q, as well as the relevant performance metrics (ROA, ROE, or EBITDA/Assets) in the previous year. Each SWF investee is matched to a non-invested firm with the closest propensity score within the two-digit SIC code and country.	The SWF investees group experienced significant increases in all three measured performance indicators. The results are highly significant when compared to a group of control firms with similar characteristics. The difference-in-difference premium is 1.62% for ROE, 1.29% for ROA and 2.81% for EBITDA/Assets
2015	The Sovereign Wealth Fund Discount: Evidence from Public Equity Investments	Bortolotti; Fotak; Megginson	The Review of Financial Studies	1018	631-284*	490-360*	426-190*		Operating performance analysis measuring changes in profitability (proxied by Return on Assets), growth (of sales), and valuation (Market to book) over one, two, and three years following the SWF investment. The significance of the changes is tested by using t-tests with standard errors clustered at the target firm level. The changes in operational performance variables for the matched sample are calculated as well	The set of private sector investments is identified via propensity score matching based on both target and deal characteristics.	SWF targets experience a decline in profitability, as measured by return on assets, overall time horizons. Return on assets declines by 2.31% over one year, 1.13% over two, and 1.76% over three. No statistically significant change in return on assets is confirmed for the matched sample. The difference-in-difference is statistically significant for the 2 years (at the 1% level) and 3-year period (at the 10% level). Deterioration in sales growth by 8.89 % over three years is observed. The change in sales growth is negative and highly statistically significant overall time horizons. The difference-in-difference tests are significant for the one- and three-year windows. The market to book ratio shows a statistically significant decline over all time horizons. The decline in the market to book ratio is confirmed for the matched sample over the 2- and 3-year horizon. The difference-in-difference is negative and statistically significant over the 1- and 2-year horizons, but not over the three-year horizon
2017	Taming Leviathan: Mitigating Political Interference in Sovereign Wealth Funds'	Bortolotti; Fotak; Loss	BAFFI CAREFIN Centre Research Paper, (2017-64).	1018	517/284	445/360	266/189		Investigates the impact of SWFs on a firm's profitability (proxied by its return on assets (ROA) and valuation (market-to-book ratio). For each variable, changes over one, two, and three years following investment by the SWF were calculated. The same procedure is	The set of private sector investments is identified via propensity-score-matching based on both target and deal characteristics.	SWF targets experience a decline in profitability over all time horizons: Return on assets declines by 2.31 % over one year, 1.13 over two years, and 1.76 over three years. Market-to-book ratio shows a statistically significant decline over all time horizons. Cross-border deals are also associated with stronger ROA. The analysis of operating

	Public Equity Investments					carried out over the two and three-year horizons for all other variables.			performance reveals weaker statistical significance, most probably due to a smaller data sample.
2018	The Long-term Impact of Sovereign Wealth Fund Investments	Park; Xu; In	709	554	455	First, BHARs and CARs over six months, one year, and two years are calculated. The results are provided for Fama and French (1993) three-factor and Carhart (1997) four-factor models. The results are reported for two sets of matched-firm scenario abnormal returns computed using matching firms from a benchmark sample.	The clean benchmark sample contains 6345 similar investments by non-government-owned financial firms collected from the Datastream from January 1989 to November 2015. Matches are made based on (i) target country, total asset, and book-to-market ratio and (ii) target country, target industry, and pre-event performance.	Post-event mean abnormal return estimates for both CAR and BHAR are negative and statistically significant for the 6-month, 1-year, and 2-year periods, and this pattern is also observed for the benchmark sample. The median values exhibit similar results. The group of SWFs' investees underperforms the local markets by −4.66% (CMAR) and −7.42% (BHAR) for the one year. For the two years, the performance of SWF and benchmark target firms worsens. Together they underperform local markets by −6.32% (CMAR) and −14.49% (BHAR)