Sovereign Wealth Funds: Analysis of the performance of the Brazilian Sovereign Wealth Fund

The aim of this study is to analyze the performance of the Brazilian sovereign Wealth Fund between 2009 and 2012 and to compare it with Sovereign Funds (SFs) from other countries. Our approach is quantitative, with exploratory and descriptive goals. This is a longitudinal study, and its strategies are bibliographic sources and document analysis. Our secondary data were collected from reports available on official websites. Our results indicate that the accumulated gross performance of the Brazilian Sovereign Wealth Fund was low (7%) over four years, with decisions focused on risky assets. In the last years, there was a change in the investment strategy, with small portfolio diversification in comparison with other SFs. Comparisons between the FSB and the returns from other assets indicated a negative performance, including falling short of the Brazilian long term interest rate (TJLP) and stock market index (Ibovespa) targets.

1 INTRODUCTION

The Sovereign Wealth Funds Institute (2013) defines Sovereign Fund or Sovereign Wealth Fund as a type of governmental investment made by countries for financial and strategic purposes. It consists in a financial instrument through which countries use part of their international reserves or part of their tax revenue to finance strategic enterprises of interest to the State, as well as to acquire equity in banks, and national and foreign companies. According to researchers (TRUMAN, 2008), these are investments that involve higher risks and higher returns, and several countries have implemented these as a strategy for State investments.

Among the countries with the largest sovereign funds in the world, according to a ranking by the Institute Sovereign Wealth Funds (2013), the following are noteworthy: United Arab
Emirates (Abu Dhabi), Norway, Singapore, Saudi Arabia, Kuwait, China, Russia, Canada, Australia, Qatar, United States, Libya, Brunei, South Korea and Malaysia. More industrialized countries, such as Germany, Canada, United States, France, Great Britain, Italy and Japan support the implementation of rules to regulate the operation of these funds to ensure more transparency and predictability for these instruments.

In view of the scenario of new players in the capital market and new strategies for the creation of sovereign wealth funds being employed across the rest of the world, Brazil, having accumulated international reserves under the Central Bank's management, began debating the creation of its own sovereign fund. This was preceded by long discussions and studies on the internal and external environments. Hence, in 2008, the Brazilian government, through law no 11,887/2008, instated the Brazilian Sovereign Fund (FSB).

Despite reducing the likelihood of a foreign exchange crisis, the accumulation of international reserves has high opportunity costs. A Sovereign Fund is usually created when international reserves reach a certain level that exceeds the "optimal" level (TRUMAN, 2008), i.e. the level required to ensure foreign exchange stability and security during periods of international crises. Hence, the relevant issue from a political and managerial perspective is to determine the threshold from which to begin seeking alternative investments for accumulated income in foreign currency.

As there are important benefits (and costs) from accumulating international reserves, particularly in terms of reducing external vulnerability, the threshold from which to seek alternative investments must be determined carefully as many aspects render the sovereign fund strategic for the economic security of any country. Therefore, the performance of these surplus reserves must be analyzed based on the returns and risks associated with the reserves.
accumulated by a country, considering variables inherent to the decisions regarding the size and ideal purpose of a sovereign fund. This is particularly important because these funds represent large sums of resources invested by countries. All of the above lead us to formulate the following research question: **How did the Brazilian Sovereign Fund perform between 2009 and 2012?**

Having contextualized our key topic and issues raised, the general goal set to answer our research question was analyzing the performance of the Brazilian Sovereign Fund between 2009 and 2012. As a means to achieve our general goal, we outlined the following specific goals - (a) describing asset acquisitions by the Brazilian Sovereign fund from 2009 to 2012, (b) describing how the composition of the Brazilian Sovereign Fund's investment portfolio evolved from 2009 to 2012, (c) comparing the Brazilian Sovereign Fund's performance with that of other sovereign funds, (d) analyzing how the Brazilian Sovereign Fund's asset portfolio evolved in relation to the Long Term Interest Rate (TJLP in Portuguese) and the Ibovespa index.

The rationale for this study is as follows: as Sovereign Wealth Funds (SWFs) are a global phenomenon, they are State-owned financial mechanisms for investments in domestic and international markets; they function as macroeconomics policy instruments, legally structured as public funds (unincorporated) or institutions without corporate status (such as publicly held corporations). They are objects of State intervention in the economic order, which support the financial, foreign exchange, monetary or foreign trade policy acting as if they were private agents, and that operate through several media or activities (financial market, foreign exchange market and others).

### 2 SOVEREIGN WEALTH FUNDS
Generally speaking, Truman (2008) asserts that sovereign funds are viewed as governmental investment tools based on foreign assets and, sometimes, managed separately from official reserves. Managers of such funds are risk tolerant and seek high returns. These funds are created as a means of reaching several macroeconomic goals of interest to the government that owns them.

According to Sias (2008), sovereign wealth funds are investment funds owned by States. With no need for immediate liquidity and vast foreign exchange reserves at their disposal, these States choose to "save" their excess reserves as financial assets other than U.S. treasury bonds, which offer low returns.

However, there is still no universal definition of sovereign funds. The U.S. Treasury, for instance, defines these funds as instruments for governmental investments based on foreign assets, which are managed separately from the financial authority's official reserves (CENTRAL BANK AND MINISTRY OF FINANCE, 2009).

The term "Sovereign Fund" was coined, in 2005, by Andrew Rozanov; he characterized Sovereign Funds as funds created for countries to specifically allocate their international reserves, in order to achieve higher diversification and higher returns in relation to traditional ways for Central Banks to manage these reserves. Nonetheless, Sovereign Funds have existed for much longer. Some studies mention the French fund Caisse dés Dépots et Consignations, created in 1816, as the first ever Sovereign Fund. However, these funds only became more popular during the post-war period.

In 1953, Kuwait created its Sovereign fund while it was still a British colony, which was initially called Kuwait Investment Board, and later became Kuwait Investment Authority, in order
to invest the returns from oil sales in long-term assets to ensure that future generations would benefit from this wealth.

Some countries created their sovereign funds seeking more profitable alternatives to invest the profits accumulated from international trade, which increased the value of corporate debt shares and bonds. Figure 1 shows the evolution of the constitution of Sovereign Funds since 1950 (TRUMAN, 2008).

[Insert Figure 1]

Truman (2008) presents three determining factors for the increasing number of Sovereign funds seen, particularly during the 2000s when these factors became more prominent: (i) increased price of commodities, particularly oil; (ii) increased international reserves; (iii) increased price of other assets, such as corporate shares and bonds.

In addition to these factors, prolonged imbalances in the global financial system also contributed to the most recent expansion of sovereign funds (ROZANOV, 2008). In this context, agricultural and mineral commodities also became more attractive. As these resources are consumable over time, the increasing demand by countries like China and India, which has been growing by 10% and 8% a year on average, respectively (IMF Outlook, 2009), in addition to the introduction of hedge funds into this market, the price of these assets has continued to appreciate steadily.

Overall, Sovereign Funds may be classified as (MENDELSON, 2008): (i) Governmental funds, (ii) Funds managed separately from Central Banks' international reserves, (iii) Funds with
high exposure to international markets; (iv) Funds that do not answer to shareholders, unlike pension funds, (v) Funds with higher risk tolerance, (vi) Funds with long-term profiles.

In regards to the classification of Sovereign funds, we can usually apply two criteria. The first, which is the most used by the US Treasury, divides Funds into two categories based on the source of their resources: commodity and non-commodity Funds.

[Insert table 1]

The International Monetary Fund (IMF), in addition to the criterion above, also proposes classification of Sovereign Funds based on their specific purpose. According to this international body, five types of funds could be identified based on this criterion, namely: stabilization funds, savings funds, investment funds, development funds and contingency pension funds.

[Insert table 2]

Since 1999, when Brazil abandoned the foreign exchange pillar supporting the Real Plan and implemented the "tripod" inflation goal, primary tax surplus, and flexible foreign exchange rate, the Brazilian economy has seen significant improvements in the performance of the Balance of Payments. This improved performance is measurable by the surpluses seen in Current Accounts during the 2000s, which is directly related to the good performance of the trade balance and the large influx of foreign resources into the country through the Balance of Payments’ Financial Account. (CAGNIN; CINTRA; FARHI, 2008).
Consequently, Brazilian international reserves increased significantly, totaling approximately USD 240 billion in December 2009. As an after effect of the foreign exchange crises of the 1990s and, in particular, of the Brazilian foreign exchange crisis of 2002, the Brazilian financial authority adopted a policy to accumulate reserves for precautionary purposes. (CAPARICA, 2010).

The creation of the Brazilian Sovereign Fund (FSB) was announced on May 12, 2008. According to the Brazilian Ministry of Finance, this instrument is intended to meet several goals, notably - (i) Supporting projects of strategic interest to Brazil, (ii) increasing the returns of financial assets held by the public sector, (iii) creating public savings, (iv) buffering economic cycle fluctuations, and (v) promoting the internationalization of Brazilian enterprises.

The Brazilian Sovereign Fund, in its capacity, created a Tax Fund for Investments and Stabilization (FFIE in Portuguese), aimed at meeting goals (iii) and (iv) above. The FFIE is a private fund operated by a federal financial institution, whose assets are not related to the Country's assets, and which is subject to its rights and obligations. Handling this particularity of the fund was an implicit objective of creating the FSB, including a new agent in the foreign exchange market in order to reduce foreign exchange appreciation. The commodity prices' boom and increased production in the oil, mining and agricultural industries, such as soy and sugar, which consequently increased exports in Brazil, is a cause for concern to Brazilian financial authorities regarding potential losses to exporting industries not indexed to commodities. (SIAS, 2008).

3 PERFORMANCE ASSESSMENT AND CAPM
The concept of performance assessment is not a universal consensus in the academic literature (BORTOLUZZI; ENSSLIN; ENSSLIN, 2010). Authors suggest that Organizational Performance Assessment has long been popular in the literature as well as in the corporate world, but little progress seems to have been made in this research field when we analyze the different definitions found for the topic in the literature.

Organizational performance assessment is the management process used to build, set and share knowledge through identifying, organizing, measuring and integrating necessary and sufficient aspects to measure and manage the performance of strategic objectives in a specific context within an organization (ENSSLIN et al., 2010).

The Capital Asset Pricing Model (CAPM), developed by Sharpe (1964), Litner (1965) and Mossin (1966), based on the conclusions of Markowitz's (1959) work, is one of the paradigms of the area of finance. On one hand, it is a logic and intuitive model, based on a sound theoretical framework; on the other hand, its underlying hypotheses are too restrictive and have been rejected over the years. Essentially, the model proposes that the only risk factor affecting the expected returns of assets is related to market risk (systemic risk), which is captured by the asset's beta.

The CAPM model, or capital asset pricing model by Markowitz was initially proposed by William Sharpe. The CAPM equation represents an investment's expected return that leads to a situation of balance. According to this model, when an asset's returns are positively correlated with market portfolios, then its expected returns exceed the risk free rate, which is not favorable to investors.

The CAPM model enables estimating the capital cost, i.e. the return rate required by the equity manager (SAMANEZ, 2002). Another aspect considered, is when one needs to determine
the investment's risk rate. According to Famá et al. (2002), the CAPM model presents the company's or portfolio's equity cost through the minimum returns expected by the investor given the level of systematic risk. This implies a relationship between a project's and the market's returns. When applying the model, Fonseca and Bruni (2003) introduce the need to estimate the following variables:

\[ R = R_f - (R_m - R_f) \times \beta \]

- Risk free \((R_f)\) returns: it means adopting the average Selic (Special System of Liquidation and Custody) rate, as it records transactions involving public bonds and determines the funding costs of the internal debt or the use of public bonds,
- Expected market return \((R_m)\): in the Brazilian market the IBOVESPA index is used, and
- Investment beta \((\beta)\): given by the regression coefficient of an investment's returns over the returns realized by market return indexes.

The line is estimated by the least squares estimator and the model's parameters are relevant, but we provide explanations only for \(\beta\) and \(R^2\). The parameter beta represents the line's angular coefficient, i.e. it determines the asset's systematic risk in relation to the market. When the regression shows \(\beta > 1\), the asset is deemed to be aggressive, because its systematic risk is higher than the market's. On the other hand, when \(\beta < 1\) the asset's systematic risk will be lower than the market's. The determination coefficient \(R^2\) is a statistical measurement that measures the adjustment of the regression line with values seen; it indicates how much asset variations are influenced by the market portfolio; in other words, it is a systematic risk measure (ASSAF, 2005).
4 METHODOLOGICAL PROCEDURES

In order to classify the research carried out in this study, the criteria proposed by Saunders, Lewis, Thornhill (2012) were adopted, in the so-called Saunders' Onion scheme. According to the aforementioned criteria, a research effort may be classified based on the following aspects: research philosophy, its rationale, approach to the problem, research objectives, research strategy, period and data collection methodology. Hence, this study has a quantitative approach, with exploratory and descriptive goals. It is a longitudinal study and the strategies employed are bibliographic sources and document analysis.

The study was carried in two stages. The first stage analyzed the performance (return rate) of the Brazilian Sovereign Fund by year (2009 to 2012) and consolidated returns during the period. Hence, the evolution of the composition of the Brazilian sovereign Funds' investment portfolio was analyzed based on two categories: fixed income and variable income. All data were taken from the Brazilian Sovereign Fund’s administrative reports, which are available on the official website of the Brazilian National Treasury.

The aim of the second stage was to report on the performance (return rate) and composition of the investment portfolio of the Brazilian Sovereign Fund between 2009 and 2012 compared to the Sovereign Fund of the United Arab Emirates (Mubadala), the Norwegian Sovereign Fund (GPF) and the Singaporean Sovereign Fund (Temasek). These funds were chosen for being more transparent (according to the LINABURG-MADUELL TRANSPARENCY INDEX), and having their reports publicly available on their official websites and on the Sovereign Fund Institute.
The documentary sources analyzed were the Performance Reports of the Sovereign Funds of Brazil, United Arab Emirates, Norway and Singapore for the period from 2009 to 2012, as well as other statements available on official websites.

In order to compare the performance of the Ibovespa index with that of the FSB, we used the annual return rate and the Capital Asset Pricing Model (CAPM). The CAPM is used in finance to determine the appropriate theoretical return rate of a particular asset in relation to a perfectly diversified market portfolio. The model takes into account the asset's sensitivity to non-diversifiable risk (also known as systemic risk or market risk), represented by a variable known as beta index or beta coefficient (β), as well as expected market returns and the expected return of a theoretically risk-free asset (GITMAN, 2008).

5 ANALYSIS OF RESULTS

The Fund's initial funds were realized on December 30, 2008 through issuance of 10,201,373 National Treasury bonds, totaling BRL 14,243,999,592.36 at market prices, as set forth by the National Treasury Ordinance no. 736, from December 30, 2008.

In December 2008, the FSB promoted the payment of shares of the Tax Fund for Investments and Stabilization (FFIE), addressed by article no. 7 of Law no. 11,887/2008, which is managed by BB GESTÃO DE RECURSOS DTVM S.A. The FFIE is a multi-market and exclusive fund, duly registered with the Securities and Exchange Commission - SEC. The payment of FFIE shares was equal to the total value of assets received by the Brazilian Sovereign Fund.

5.1 FINANCIAL/ASSET OWNERSHIP EVOLUTION OF THE BRAZILIAN SOVEREIGN FUND
Figure 3 illustrates the financial evolution of the Brazilian Sovereign Fund during the period studied (2009-2012).

Hence, the returns accumulated during the period studied (2009-2012) was 7.09%. The returns seen in 2009 (first year of activities of the Brazilian Sovereign Fund) was 14.65%. The year of 2010 reported the highest returns of the period studied, with 14.77%. The year of 2011 saw -17.94% depreciation of the fund's liquid assets, being the worst year for the Brazilian Sovereign Fund and, finally, 2012 saw asset depreciation again by -1.98%.

5.2 COMPOSITION OF THE BRAZILIAN SOVEREIGN FUND'S INVESTMENT PORTFOLIO

The composition of the Brazilian Sovereign Fund's investment portfolio in 2009 comprised only fixed income assets. The portfolio of the Tax Fund for Investments and Stabilization (FFIE) closed the second semester of 2009 with the following composition of public bonds: 36% on fixed rate bonds (NTN-F and LTN), 36% on bonds indexed to the IPCA (NTN-B) and 28% on bonds indexed to the SELIC rate.

[Insert Table 3]

In regards to the public offering, Provisional Measure MP no. 500 enabled the federal government to inform Petrobrás of the possibility of transferring its right of first refusal regarding the subscription of its shares to its controlled companies, namely Caixa Econômica Federal, the National Bank for Economic and Social Development – BNDES and the Tax Fund for Investments and Stabilization, as per the offering's final prospectus.
In September 2010, the public offering was registered and liquidated, such that the Tax Fund for Investments and Stabilization subscribed 266,413,905 common shares (PETR3) worth BRL 7,899,172,283.25, representing 2.04% of the equity capital and 161,596,958 preferred shares (PETR4) worth BRL 4,249,999,995.40, representing 1.24% of the equity capital. Hence, at the end of the public offering it owned 3.9% of Petrobrás' equity capital.

At the end of 2010, the portfolio was comprised of 90% variable income (PETR3, OETR4, BBAS3) and 10% fixed income (LTN - OP. Committed).

The portfolio of the Tax Fund for Investment and Stabilization closed the second half of 2011 with the following composition, based on the value of these assets in relation to the total (position on 12/31/2011) - 82.77% in shares, with 50.90% in Petrobrás' common shares (PETR3), 22.34% in preferred Petrobrás shares (PETR4), 9.53% in common shares from Banco do Brasil (BBAS3), 17.12% in committed operations and 0.11% in other assets.

On December 31, 2012, as set forth in STN Ordinance no. 770, the National Treasury bought back the federal public bonds in the FFIE portfolio for BRL 8.85 billion. The National Treasury Secretary requested the BB DTVM for redemption of 11,579,306,053.645 of FFIE shares, worth BRL 12.4 billion, and resources were transferred to the Treasury's Unique Account (CUT) benefiting the Brazilian Sovereign Fund.

The Brazilian Sovereign Fund's investment portfolio at the close of 2012 was comprised of 19% of variable income, 0.14% of fixed income and 81% of its equity value was invested in the Treasury's Unique Account.

5.3 COMPARISON OF THE PERFORMANCE OF THE FSB AGAINST OTHER SOVEREIGN FUNDS
The return of the Brazilian Sovereign fund was compared to that of the three most transparent sovereign funds, according to the INABURG-MADUELL TRANSPARENCY INDEX, namely: GPF (Norwegian Sovereign Fund), UAE Mubadala (Sovereign Fund of the United Arab Emirates) and Temasek (Singaporean Sovereign Fund).

[Insert Figure 2]

The Sovereign Fund of the United Arab Emirates (UAE Mubdala) is the most profitable, due to high oil prices and the high returns of its investment portfolio, with average returns of 17.3%. In 2011 and 2012, when the other funds saw their worst performances, Mubdala had its highest returns in 2011, i.e. 28% returns. The Norwegian Sovereign Fund (GPF) had average returns of 8.2%, with notable returns of 25.6% in 2009. The Singaporean Sovereign Fund (Temasek) had average returns during the period researched of 5.3% on its assets. The Brazilian Sovereign Fund (FSB), on the other hand, had average returns of 2.4% on its assets during the period studied.

5.4 Analysis of the Financial Evolution of the Brazilian Sovereign Fund in Relation to the TJLP and the IBOVESPA Index

The Long Term Interest Rate (TJLP) between 2009 and 2012 was the market indicator chosen to analyze the financial evolution of the Brazilian Sovereign Fund. The rationale for this is a determination in article 3 of Decree no. 7,055 from 2009, which sets forth that investments in financial assets in Brazil must have minimum returns equal to the Long Term Interest Rate - TJLP.
The figure below shows the evolution of the Sovereign Fund's accumulated earnings in relation to the accumulated returns of the TJLP.

[Insert Figure 3]

As shown in the figure above, the Brazilian Sovereign Fund had accumulated returns (10%) above the TJLP (3%) up to July 2011. After this period, the Brazilian Sovereign Fund's accumulated returns were lower than the TJLP. From January/2012 to March/2012, the returns of the Brazilian Sovereign Fund began to surpass the TJLP again. After March/2012, the FSB's accumulated returns began to fall short of the accumulated returns of the TJLP.

Up until 2010, the accumulated returns of the Brazilian Sovereign Fund exceeded the accumulated returns of the TJLP. From 2011, the scenario inverted, i.e. the accumulated returns of the TJLP became higher than the accumulated returns of the Brazilian Sovereign Fund.

The table below shows the portfolio's expected returns, according to the Capital Asset Pricing Model, compared to the effective returns of the FSB, per annum.

[Insert Table 4]

The Capital Asset Pricing Model (CAPM) aims to determine the appropriate theoretical return rate of a particular asset in relation to a perfectly diversified market portfolio. In 2010, the FSB's performance exceeded the model by a 12.9% difference in returns. In 2011, the FSB performed lower than the model by a 4.5% difference in returns. In 2012, the FSB again performed lower than the model, with a 6.9% difference in returns, being exposed to higher risks than returns.

The picture below summarizes the returns expected by the Capital Asset Pricing Model with the FSB's effective returns by month:
We observed 30 months of FSB returns and compared these with the returns predicted by the Capital Asset Pricing Model. The absence of figures for January to June 2010 is because the FSB only acquired shares in July 2010.

Out of 30 observations, 14 observations of the FSB's return rates surpassed the returns predicted by the CAPM. In 2010, there were three observations of higher risks than returns; in July, 2010 the theoretical return rate was 11.23%, but the FSB's return rate was 3.41%. In September 2010, the theoretical return rate was 9.71% against FSB returns of 3.34%. In October, the theoretical return rate was 2.42% against -4.30% returns for the FSB, which meant exposure to higher risks than returns.

In 2011, there were 5 observations of FSB return rates exceeding the CAPM's return rate. The months of March, April, May, August, September, October and December saw theoretical return rates higher than FSB return rate, i.e. the fund was exposed to higher risks than returns during these months.

In 2012, there were 6 observations of the FSB return rates exceeding the CAPM's return rate. The months of February, March, April, June, October, November and December had theoretical return rates higher than the FSB’s return rates, resulting in higher risks than returns.

6 FINAL CONSIDERATIONS

The main goal of this study was to analyze the development of the Brazilian Sovereign Fund between 2009 and 2012. Hence, we collected data from performance reports available on the Brazilian national treasury website for the Brazilian Sovereign Fund. The data obtained for analysis were return rates and composition of the investment portfolio during the period studied.
Although Sovereign Wealth Funds are generally created through accumulation of international reserves, whether through current accounts surpluses or through a large influx of foreign capital via capital account (TRUMAN, 2008), these State-owned investment funds may be tax funded, i.e. Sovereign Wealth Funds may be funded by tax surpluses or sovereign debt. Tax surpluses are the source of funding for the Brazilian Sovereign Fund.

The initial amount available for the Brazilian Sovereign Fund was 14 billion in 2009 and, at the end of the period studied (2012) it was 15 billion, with accumulated returns of 7.09% in four years. However, the fund has already reached 19 million, in 2011. The negative performance of the Brazilian Sovereign Wealth Fund investment portfolio shows deterioration of public resources. Hence, both funding and investment strategies have proven expensive for the government. In this regard, the Brazilian Sovereign Wealth Fund seems to prioritize strategic interests that are not necessarily in line with a financial rationale.

The returns of the Brazilian Sovereign Wealth Fund in its first two years of operation (2009 and 2010) was effective against the target (TJLP), with accumulated return rate of 31.73%. However, in the following two years (2011 and 2012) the return rate varied more due to a change in investment strategy, focusing investments in Banco do Brasil and Petrobrás shares and reducing investments in fixed income. The accumulated returns of the Brazilian Sovereign Fund were 7.09% during the period researched, given that the accumulated returns for the TJLP (Brazilian Sovereign Fund's target) was 26.1%, resulting in a difference of 19% in returns. Hence, the Brazilian Sovereign Fund is operating below the accumulated returns target according to article 3 of Decree no. 7,055, from 2009, which states that capital investments in Brazil must have minimum returns equal to the Long Term Interest Rate – TJLP.
The Brazilian Sovereign Fund was instated in 2008, but began operating with public bonds (fixed income) in 2009. In its first year, its returns were 14.75% above the Singaporean Sovereign Fund (Temasek), which had returns of 4.7%. However, the Norwegian and UAE funds had returns above 25%, with a much more diverse portfolio compared to the Brazilian investment portfolio.

Resources for the Brazilian and Singaporean Sovereign Funds are non-commodities (tax surpluses), while the UAE and Norwegian funds are commodities (oil). In regards to this difference, there is also a difference in performance, funds originated from commodities perform (return) higher than funds funded by non-commodities.

Comparing the evolution of the Brazilian Sovereign Wealth Fund's investment portfolio, we see that the Brazilian portfolio is very restricted in relation to the portfolio of other Sovereign Funds (Norway, Singapore and UAE), with investments in Brazilian public bonds (NTF, LTF) and stock in Brazilian companies (Banco do Brasil and Petrobrás). However, the comparator funds have much broader portfolios (areas and geographic), with higher average returns and lower risks due to their diversification in relation to the Brazilian Sovereign Fund.

The present study has theoretical, methodological and empirical limitations, because it addressed the relevant topic of sovereign funds with a restricted focus on the Brazilian performance. Therefore, it could broaden the research object with emphasis on political and economic determinants of its constitution and financial decisions, as well as on the responsibilities of managers throughout their terms. As this is still an underexploited topic in Brazil, we recommend broadening studies to shed light on these determinants, based on other theoretical frameworks and methodological applications.
7 REFERENCES


BRASIL, Lei nº 11.887 de 24 de Dezembro de 2008. Cria o Fundo Soberano do Brasil - FSB, dispõe sobre sua estrutura, fontes de recursos e aplicações e dá outras providências.


FMI, Composition of Official Foreign Exchange Reserves (COFER), dezembro de 2008


Table 1  SWF classification according to the *US Treasury*

<table>
<thead>
<tr>
<th>US Treasury classification</th>
<th>SWF examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodities funds</td>
<td>Abu Dhabi Investment Authority (ADIA); Qatar Investment Authority (QIA).</td>
</tr>
<tr>
<td>Non- commodities funds</td>
<td>Temasek – Singapore</td>
</tr>
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</table>


Table 2. SWF classification according to the *IMF*

<table>
<thead>
<tr>
<th>Classification FMI</th>
<th>SWF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stabilization funds</td>
<td>Russia and Chile</td>
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<tr>
<td>Savings fundos</td>
<td><em>Alberta (Canada)</em>&lt;br&gt;<em>Heritage Savings Trust Fund</em></td>
</tr>
<tr>
<td>Investment Funds</td>
<td><em>Government of Singapore Investment Corporation SFW</em></td>
</tr>
<tr>
<td>Development funds</td>
<td></td>
</tr>
<tr>
<td>Pension or contingency funds</td>
<td><em>National Pensions Reserve Fund (Ireland)</em></td>
</tr>
</tbody>
</table>

Source: IMF (2013)
Table 3. Brazilian SWF Investment portfolio  FSB 2009-2010

<table>
<thead>
<tr>
<th>ANO</th>
<th>NTN-F</th>
<th>NTN-B</th>
<th>LTN</th>
<th>LFT</th>
<th>OP. COMP.</th>
<th>PETR3</th>
<th>PETR4</th>
<th>BBAS3</th>
<th>CUT</th>
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<tr>
<td>2009</td>
<td>15%</td>
<td>35%</td>
<td>22%</td>
<td>28%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2010</td>
<td></td>
<td></td>
<td>10%</td>
<td></td>
<td>56%</td>
<td>24%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>17%</td>
<td></td>
<td></td>
<td></td>
<td>51%</td>
<td>22%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td>0,1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>19%</td>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Brazilian SWF Reports 2009-2012

Table 4. Capital Asset Pricing Model – annual analysis

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected return</td>
<td>1,8</td>
<td>-13,4</td>
<td>4,9</td>
</tr>
<tr>
<td>Actual return</td>
<td>14,7</td>
<td>-17,9</td>
<td>-1,98</td>
</tr>
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</table>

Source: Research data.

Table 5. Capital Asset Pricing Model – monthly analysis

<table>
<thead>
<tr>
<th>Month</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Expected return</td>
<td>Actual return</td>
<td>Expected return</td>
</tr>
<tr>
<td>Jan</td>
<td>-4,36</td>
<td>-1,56</td>
<td>8,40</td>
</tr>
<tr>
<td>Feb</td>
<td>0,96</td>
<td>6,24</td>
<td>6,49</td>
</tr>
<tr>
<td>Month</td>
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Figure 1. Amount of SWF in the world
Source: SWF Institute, 2014.

Figure 2. SWF Profitability

| Source: Research data |

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Source: Research data

Figure 3. Cumulative Brazilian SWF return x cumulative TJLP
Cumulative Brazilian SWF return x Cumulative TJLP

Source: Research data