REPUBLIC OF CHILE
Ministry of Finance

PENSION RESERVE FUND

First Quarter, 2008

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PREFACE

The Pension Reserve Fund (PRF) was created under the Fiscal Responsibility Law[1] for the purpose of "complementing financing of fiscal liabilities arising from the state guarantee to basic old-age, disability and survivorship pensions."[2]

The PRF was launched on 28 December 2006 with an initial contribution of **US$604.5 million**, equivalent to 0.5% of GDP in 2005. Until March 28, 2007, this was held as a term deposit with the Central Bank of Chile (CBC).

Since its inception, the PRF's assets have been managed by the CBC[3] in accordance with investment guidelines defined under Decree Nº 1,382 issued by the Finance Ministry in 2006 and complementary instructions. These guidelines stipulated the hiring of a global custodian bank which is also responsible for providing information for the evaluation of the fund's performance and for preparing reports relating to its management. At present, JP Morgan Worldwide Securities Services holds this contract.

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[1] Law N° 20,128, published in the Official Gazette on September 30 , 2006.

[2] Regulated by Decree Law N° 3,500 (1980), which was subsequently modified by Law N° 20,255 (2008).

[3] The CBC manages the fund as Fiscal Agent under the terms of the Finance Ministry's Decree Nº 1,383 (2006), known as the Agency Decree.

I. INTRODUCTION

The value of the PRF on March 31, 2008 amounted to US$1,574.30 million. During the first quarter, the fund reported capital gains and interest income of US$107.95 million. This was equivalent to an Internal Rate of Return (IRR)[4] in US dollars[5] of 7.36% for the period.[6]

One of the factors explaining the portfolio's high total return in dollars during the first quarter was its currency allocation which comprises 50% in dollars, 40% in euros and 10% in yens. Over the past year, the euro and the yen have appreciated by 19% and 18%, respectively. For this reason, and in order to show the return on the fund's assets excluding the effect of movements of its investment currencies, this is also calculated in a local currency. The IRR for the same period, measured in this way, was 2.72%.

In the first quarter of 2008, interest rates maintained their downward trend, reflecting the impact of the subprime crisis. The US Federal Reserve's Federal Open Market Committee (FOMC) reduced its monetary-policy rate by 200 basis points while the European Central Bank (ECB) maintained its policy rate.[7] This weakened the dollar which lost 7.7% against the euro and 10.9% against the yen. These factors had a positive impact on the value of the PRF.

The present report is divided into two parts. The first section provides information about the PRF's value and performance during the first quarter and the composition of its portfolio by currency and type of risk while the second part contains an explanation, prepared by the Fiscal Agent, of the behavior of the markets that affected the PRF's investments during the period.

The appendices included with the report set out the PRF's current investment policy and methodological aspects of the calculation of its benchmark and the results contained in this report as well as a glossary of the main terms used.

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[4] See methodological appendix.

[5] Henceforth, referred to simply as dollars.

[6] Unless otherwise indicated, the rate given is the non-annualized rate for the period in question.

[7] The ECB's refinancing rate.

II. MARKET VALUE AND PERFORMANCE OF THE PRF

The Pension Reserve Fund (PRF) was established on December 28, 2006 and its management entrusted on March 28, 2007 to the Central Bank of Chile (CBC) which acts as Fiscal Agent. However, formal monitoring of its performance did not begin until April 1, 2007, after the implementation of its investment policy. The starting date for all comparisons with the benchmark is, therefore, March 31, 2007.

II.1.   Market Value of the PRF

As of March 31, the PRF held assets worth US$1,574.30 million. The variations in its market value are set out in the table below:

Table 1: Market Value of PRF

Market value (US$ million)	Q1 2008			Total
	January	February	March	
Starting value	1,466.35	1,506.30	1,536.97	
Contributions	-	-	-	-
Change in value	39.95	30.67	37.33	107.95
Final value	1,506.30	1,536.97	1,574.30	

Source: JP Morgan

During the first quarter of 2008, the PRF's market value increased by US$107.95 million, representing an IRR for the period of 7.36%.

Since its inception, the value of the PRF at market prices has shown a net increase in capital and interest income of US$233.41 million, equivalent to an annualized IRR in dollars of 17.04%.

The table below shows the fund's quarterly IRR in dollars and in local currency.[8]

Table 2: Quarterly IRR in Dollars and Local Currency

Period	Capital gains & income	Final value	IRR (period)		IRR (annualized)	
	US$ million		Dollars	Local currency	Dollars	Local currency
Q1 2007	8.94	613.48	1.46%	1.46%	5.73%	5.73%
Q2 2007	0.29	1,350.12	0.03%	-0.10%	0.13%	-0.38%
Q3 2007	68.74	1,418.86	5.09%	2.19%	20.20%	8.68%
Q4 2007	47.49	1,466.35	3.35%	1.88%	13.28%	7.47%
2007	**125.46**		**12.10%**	**6.29%**	**12.00%**	**6.24%**
Q1 2008	107.95	1,574.30	7.36%	2.72%	29.53%	10.92%
Accumulated	233.41		21.43%	9.45%	17.04%	7.52%

Source: Dipres based on data provided by JP Morgan and Bloomberg

Analysis of the historic performance of the benchmark portfolio shows that the return in dollars during the first quarter of 2008 is similar to those seen between 2001 and mid-2004 during the US Federal Reserve's last expansive monetary-policy cycle. As shown in Figure 1, the benchmark registered higher annual returns - measured in dollars - for almost two years as from mid-2002 before entering a two-year cycle of decreasing returns.

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[8] See appendix

Figure 1: Moving Annual Return on the Benchmark in Dollars and in Local Currency
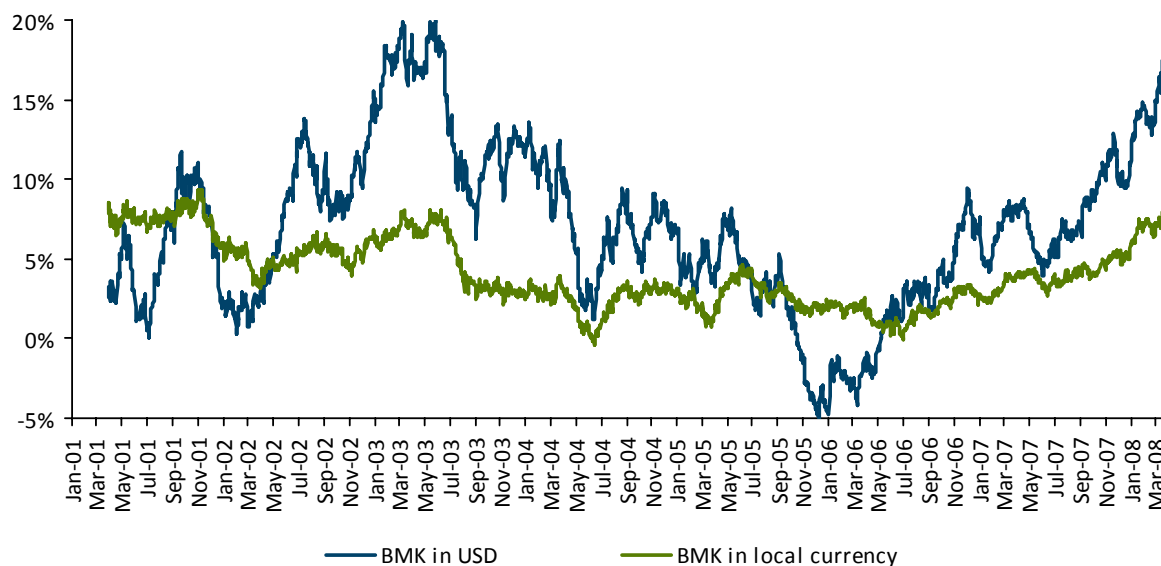
Source: Dipres based on data provided by JP Morgan and Bloomberg

In the first quarter, the composition of the PRF by type of risk and currency, expressed in dollars,[9] was as follows:

Table 3: Composition of the PRF by Asset Class and Currency

Assets	Original currency	1st quarter 2008 (US$ million)		
		January	**February**	**March**
Sovereign	USD	474.58	496.33	572.09
	EUR	441.74	438.54	461.48
	JPY	107.38	107.38	115.93
Agencies	USD	46.95	47.06	-
	EUR	-	-	-
	JPY	-	-	-
Bank	USD	224.43	224.04	207.44
	EUR	166.50	175.81	170.32
	JPY	44.72	47.82	47.05
Total		**1,506.30**	**1,536.97**	**1,574.30**

Source: JP Morgan

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[9] According to JP Morgan, the exchange rates used at the close of the month were:
January 31   : 1.4806 USD/EUR and 106.325 JPY/USD
February 29   : 1.5181 USD/EUR and 104.105 JPY/USD
March 31   : 1.5845 USD/EUR and 99.535 JPY/USD

Table 4 shows the currency composition and the duration of the portfolio during the quarter.

Table 4: Composition of the PRF by Currency and Duration

Original currency	January		February		March	
	Amount (US$ million)	Duration (years)	Amount (US$ million)	Duration (years)	Amount (US$ million)	Duration (years)
USD	745.96	2.38	767.43	2.48	779.52	2.60
EUR	608.24	2.19	614.35	2.15	631.80	2.51
JPY	152.10	2.68	155.20	2.75	162.98	2.67
Total	1,506.30	2.38	1,536.97	2.53	1,574.30	2.57

Source: JP Morgan

II.2. PRF's market price evolution

II.2.1 Contributions and withdrawals

Since its inception, the PRF has received the following contributions:

Table 5: PRF's contributions

Date	Amount (US$)
December 28, 2006	604,539,841.16
May 24, 2007	736,353,172.49
Total	1,340,893,013.65

Source: Dipres

In compliance with Decree Nº 1,272 (2006) and Decree Nº 495 (2007), both issued by the Finance Ministry, the contributions[10] were equivalent to 0.5% of the previous year's GDP, converted into foreign currency at the observed exchange rate as reported by the CBC on the day of making the contribution.

II.2.2 Performance of Financial Investments

Figure 2 sets out the performance of the PRF measured using an index[11] that shows daily variations in the market value of its portfolio expressed in dollars. The base value is 100 as of March 31, 2007.

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[10] Contributions rules are defined in the Fiscal Responsibility Law N°20,128 (2006) and in the Pension Reform Law N°20,255 (2008).

[11] Unlike the IRR, this indicator excludes the effect of net cash flows (contributions minus withdrawals) on the fund's return.

Figure 2: PRF Index vs. Benchmark
(March 31, 2007 = 100)
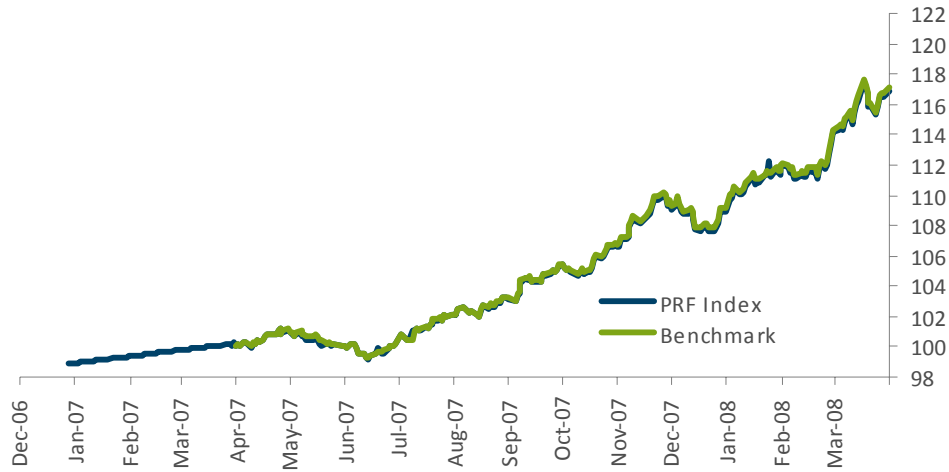
Source: Dipres based on data provided by JP Morgan, CBC and Bloomberg

In the first quarter of 2008, the index showed a return of 7.36% in comparison to 7.32% for the benchmark. As from March 31, 2007, the index registered an annualized return of 16.88% while the equivalent figure for the benchmark was 17.10%.

The table below provides a summary of the return of both the index and the benchmark in dollars and in local currency:

Table 6: Returns on the PRF
(In dollars and local currency)

Return		Q1		Accumulated since March 31, 2007	
		Period	Annualized	Period	Annualized
Dollars	PRF Index	7.36%	29.53%	16.88%	16.83%
	Benchmark	7.32%	29.34%	17.10%	17.05%
	Return differential	-0.05%	-0.19%	-0.22%	-0.22%
Local Currency	PRF Index	2.72%	10.92%	7.05%	7.03%
	Benchmark	2.68%	10.74%	7.25%	7.23%
	Return differential	-0.04%	-0.18%	-0.20%	-0.20%

Source: Dipres

III. BEHAVIOR OF RELEVANT MARKETS IN THE FIRST QUARTER

In the first quarter of 2008, the yield on sovereign bonds fell, reflecting a deepening of the mortgage crisis and poor bank results.

Figure 3: Interest Rates on 5-Year Bonds

Source: Bloomberg.
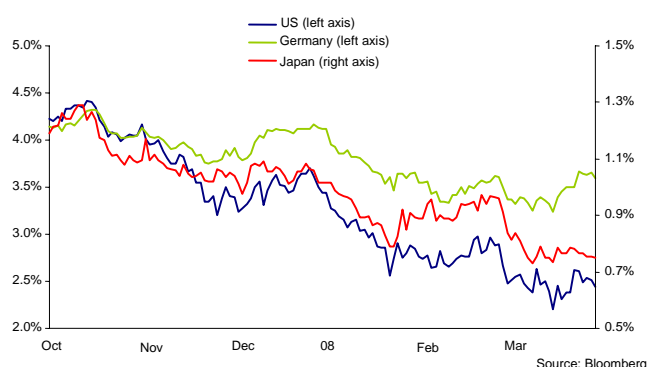
III.1. Main Economic Trends

In the **United States,** the FOMC held an extraordinary meeting at the beginning of January at which it cut the monetary-policy interest rate by 75 basis points in response to tight market liquidity and the risk that the mortgage crisis could trigger an economic recession. On the same grounds, it went on to make two further reductions in the policy rate at scheduled meetings in January (50 basis points) and March (75 basis points). Unemployment closed the quarter at 5.1%, up from 5.0% at the end of the previous quarter, and 235,000 non-agricultural jobs were lost. Inflation remained relatively high, closing at 4.0% while core inflation remained unchanged at 2.4%, its level at the end of the previous quarter. GDP growth, as reported at the end of the quarter, reached an annual rate of 2.5%, maintaining its level at the end of the previous quarter.

In the **Euro Zone,** the monetary-policy interest rate remained at 4.0%, even though the ECB injected extraordinary liquidity to mitigate the effects of the subprime crisis. The labor market continued to show a positive trend, with the unemployment rate closing the quarter at 7.1%. Inflation remained high, reaching an annual rate of 3.6% up from 3.1% at the close of the previous quarter, while core inflation closed at 2.0%, showing a small increase. GDP growth as reported at the end of the quarter reached an annual rate of 2.2%.

In the first quarter of 2008, **Japan** grew at an annual rate of 1.0%, down from the 1.7% registered at the close of 2007. The consumer price index rose by 1.2% while core inflation, at 0.1%, was positive for the first time since the end of the 1990s. The labor market continued to perform well, with the unemployment rate remaining unchanged at 3.8%. The monetary authority held its interest rate at 0.5%.

III.2. Fixed-Income Market

Due to the drop in the level of interest rates, fixed-income sovereign instruments performed positively in terms of total returns during the first quarter (Figure 4).

**Figure 4:** Index of Total Returns, Sovereign 1-10 Year Bonds[12]

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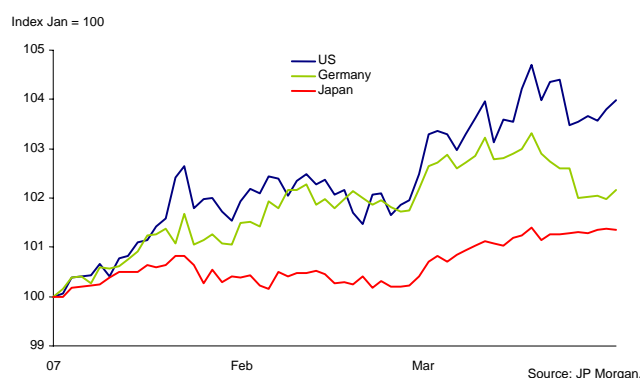
[12] Total return expressed in local currency.

III.3.   Main Spreads on Portfolio Securities

In the first quarter and, particularly, in March, the agency spread[13] for 5-year instruments again reached a new record since the start of the financial crisis (Figure 3), although it dropped back to values of close to 80 basis points towards the end of quarter. From the point of view of total returns, agency bonds performed below US Treasury bills in the first quarter of 2008.

As regards total returns, US Inflation-Linked Bonds (TIPS)[14] performed slightly below Treasury bills when comparing 5-year maturities. From the point of view of interest rate differentials, there was a small reduction in the TIPS spread[15] between the beginning and end of the quarter.

Figure 5: Agency and TIPS Spread on 5-Year Bonds

Source: Bloomberg.

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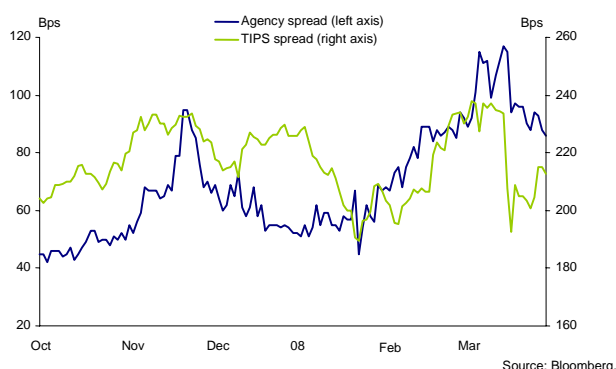
[13] Agency Spread: Yield on an agency bond minus the yield on a US Treasury bill of an equivalent maturity.

[14] TIPS: Treasury Inflation-Protected Securities.

[15] TIPS Spread: Yield on a US Treasury bill minus the yield on TIPS of an equivalent maturity.

III.4. Exchange Rates

Given the more marked drop in interest rates in the US as compared to other economies, the dollar depreciated against other major currencies in the first quarter of 2008.

The euro/dollar exchange rate dropped by 7.73% while, in the case of the yen/dollar exchange rate, the drop reached 10.90% (Figure 6). As a result, the euro weakened by 3.04% against the yen during the quarter.

Figure 6: Euro/Dollar and Yen/Dollar Exchange Rates

Source: Bloomberg.
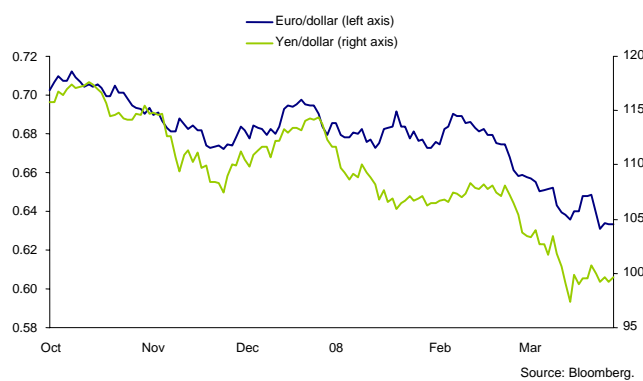
IV. APPENDIX 1: PRF'S INVESTMENT POLICY

The PRF's investment guidelines that the Fiscal Agent must follow include a reference portfolio (benchmark) for measuring the asset manager performance and some credit and allocation limits with the objective of achieving a proper diversification in the investment portfolio.

IV.1. Benchmark

The PRF's benchmark has three main components: money market, sovereign bonds and inflation-indexed sovereign bonds. The currency composition of the portfolio includes dollars (USD), euros (EUR) and yens (JPY).

Composition	USD	EUR	JPY	Total
Money Market (*)	*15.0%*	*12.0%*	*3.0%*	*30.0%*
6-month LIBID	7.5%	6.0%	1.5%	15.0%
6-month T-bill rate	7.5%	6.0%	1.5%	15.0%
Nominal Sovereign Bonds	*31.5%*	*28.0%*	*7.0%*	*66.5%*
JP Morgan GBI 1-3 years	14.2%	12.6%	3.2%	29.9%
JP Morgan GBI 3-4 years	9.5%	8.4%	2.1%	20.0%
JP Morgan GBI 5-7 years	3.9%	3.5%	0.9%	8.3%
JP Morgan GBI 7-10 years	3.9%	3.5%	0.9%	8.3%
Inflation-Indexed Sovereign Bonds	*3.5%*			*3.5%*
Barclays US Govt. Inflation-Linked Bond Index	3.5%			3.5%
TOTAL	*50.0%*	*40.0%*	*10.0%*	*100.0%*

(*) Money market's rates with a 3 months lag are used.

IV.2. Investment Limits

A. Credit Risk

The PRF's investments must fulfill the following credit-risk conditions and requirements:

The eligible issuers are:

Asset Class (Risk)	Upper Limit
Sovereigns	100%
Multilaterals	60%
Banks	50%
Agencies	30%

A.1 Sovereign Risk

The eligible countries are those, other than Chile, that over the previous 24 months have held a long-term risk classification equivalent to **A-** or higher issued at least by two of the following international credit rating agencies: Fitch, Moody's and Standard & Poor's.

Investment limits for eligible sovereign risk (between **AAA** and **A-)** are:

Risk Classification	Upper Limit
AAA	100%
AA+ AA AA-	90%
A+ A A-	30%

A.2 Supranational or Multilateral Risk

The eligible international organizations are those with a long-term risk classification equivalent to **AA-** or higher issued at least by two of the following international credit rating agencies: Fitch, Moody's and Standard & Poor's.

Investment limits for eligible multilateral risk (between **AAA** and **AA-)** are:

Risk Classification		Upper Limit (US$ million)
AAA	Aaa	800
AA+	Aa1	
AA	Aa2	600
AA-	Aa3	

A.3 Bank Risk

The methodology for selecting banking institutions and assigning limits is based on international risk classifications and the size of the institutions.

Eligible institutions are those that have a long-term risk classification of A- or higher issued at least by two of the following international credit rating agencies: Fitch,

Moody's and Standard & Poor's, and a minimum shareholders' equity equivalent to **US$1,000 million**.

Investment limits by institution are expressed in discrete intervals according to the table below:

Risk Classification	Upper Limit (US$ million)
AAA Aaa	600
AA+ Aa1 AA Aa2 AA- Aa3	400
A+ A1 A A2 A- A3	300

A.4 Agency Risk

The eligible agencies are those in the United States with a long-term risk classification equivalent to **AAA** issued at least by two of the following international credit rating agencies: Fitch, Moody's and Standard & Poor's, and a minimum shareholders' equity equivalent to **US$1,000 million**. Investment in any one agency may not exceed **US$800 million.**

B.   Eligible securities and operations

The securities and operations eligible for investment by the Fiscal Agent are the following:

B.1 Bank risk

- Current account balances.
- Overnight, tomorrow night, tomorrow next and weekend deposits (henceforth all of these will be denominated overnight).
- Time deposits and certificates of deposit.
- Commercial paper.
- Banker's acceptances.
- Bonds with maturity up to 10 years
- Foreign exchange operations (forex, forward and swaps).

B.2 Sovereign and supranational risk

- Current account balances, time deposits and overnights in Central Banks of eligible countries.
- Treasury bills, notes and bonds issued or guaranteed by governments of eligible countries or by eligible supranational institutions.
- Commercial papers, Euro commercial papers, floating rate notes, discount notes issued or guaranteed by government of eligible countries or by eligible supranational institutions.

B.3 Risk of foreign financial institution

- Bills and discount notes.
- Bonds.

B.4 Other eligible operations

- Foreign exchange swaps and forwards.

V. APPENDIX 2: METHODS OF CALCULATING ESTIMATED RETURNS

The method used to calculate the return on a portfolio depends on the nature of the fund and on whether the return to the investor or the performance of the portfolio manager is being evaluated.

In the Quarterly Report, two main methods are used: the **Time-Weighted Rate of Return (TWRR)** and the **Internal Rate of Return (IRR)**, with the latter serving as a measure of money-weighted return. While the TWRR is used to analyze the performance of the fund's management relative to the chosen benchmark, the IRR is used to determine the effective fund's return to the Republic.

A conceptual description of each of these methods is provided below, along with a discussion of their general use in the financial market and their application to Chile's sovereign wealth funds, followed by some brief final comments.

V.1.   Internal Rate of Return (IRR)

The Internal Rate of Return (IRR) on the net flows of a given period is the rate of return actually received by an investor.

The Association for Investment Management and Research (AIMR) recommends using the IRR to measure return on investments in instruments that are not publicly traded (property, private equity, etc.) since, in these cases, the portfolio manager has greater control over the amount and timing of cash flows.

The IRR is the implicit return at which the initial investment equals the present value of flows and interest or, in other words, the discount rate at which the present value of all cash flows equals zero. This is equivalent to resolving the following equation:

$$\sum_{i=0}^{i=T} \frac{CF_i}{(1+r)^i} = 0, \text{ with } CF_i = \text{net flow of day } i.$$

Rates of return calculated using the iterative IRR method are affected by the timing and size of net cash flows during the period.[16]

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[16] Alternatively, the IRR can be calculated using the Modified Dietz Method (MDM):

V.2.   Time-Weighted Rate of Return (TWRR)

This method is used by market participants to measure the performance of funds invested in publicly-traded instruments. In the case of these instruments, fund managers tend not to control investors' cash flows because they are constantly buying and selling.

The TWRR[17] is the rate of growth measured as a percentage of the change in the value of an asset over a given period without considering the effect of cash flows. In order to obtain the TWRR for the period, the daily returns are net of contributions and withdrawals, and then compounded each day.

$$TWRR_{period} = \prod_{i}^{period}(1 + r_i) - 1$$

where:

$$r_i = \frac{value\_assets_i - \text{contributions} + \text{withdrawals}}{value\_assets_{i-1}}$$

The TWRR measures the ability of a fund manager to generate value through a defined investment policy, independently of the contributions and/or withdrawals made during the period analyzed.

In the case of Chile's sovereign wealth funds, it allows their performance to be compared with the benchmark. This is achieved by converting daily returns (measured as the difference in market value from one day to another, excluding cash flows during the latter) into an index.

$$MDM\ \text{Re}\,turn = \frac{EMV - BMV - CF}{BMV + Net\ Adjusted\ Cash\ Flow}$$

where:
- *EMV* is the market value at the end of the period plus accrued interest.
- *BMV* is the market value at the beginning of the period plus accrued interest.
- *CF* is net cash flow during the period.

Net Adjusted Cash Flow is the average of each individual cash flow weighted by the length of time (as a percentage of the total period) during which the flow affected the portfolio.

[17] Fabozzi and Frank, *Investment Management*, © 1995, pgs 611-618.

V.3.   TWRR vs. IRR

The TWRR is utilized to measure the performance of a fund manager or managers against the chosen benchmark. An alternative method of measurement is to assume that the resources are permanently invested in a portfolio that generates the same daily return as the benchmark and to compare the value of this hypothetical portfolio with that of the actual portfolio. However, under this latter method, it is more difficult to build the benchmark and verify its results.

The usual practice in financial markets is, therefore, to use the TWRR to measure a fund manager's performance and to be able to compare this with a benchmark that it is easily constructed by an external party.

The IRR, on the other hand, serves to measure a fund's performance from the point of view of the investor, in this case the State of Chile.

Although the two indicators measure different aspects of an investment, both are considered necessary in order to properly evaluate performance.

V.4.   Local currency returns

The fund's return was expressed only in dollars during 2007. Nonetheless, from now on, the reports will additionally include the return in local currency, that is, the return that the investments earned in their respective currency of denomination. The purpose of reporting local currency return is to provide information about the investment behavior excluding the impact of foreign exchange movements. The methodology used is the following:

Daily return in dollars of the fund's currencies is defined by[18]:

$$r\_currencies_t = r\_EUR_t \cdot 40\% + r\_JPY_t \cdot 10\%$$

Because the exchanges rates are commonly quoted as dollars per euro and yens per dollar, the following expressions are used to compute the currencies' return:

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[18] The reference currency composition includes a 50% in dollars, however the currency return for this portion of the portfolio, measured in dollars, is obviously zero.

$$r\_EUR_t = \frac{EUR_t}{EUR_{t-1}} - 1$$

$$r\_JPY_t = \frac{1/JPY_t}{1/JPY_{t-1}} - 1$$

If the fund's daily return measured in dollars is $r\_fund_t^{USD}$, then the daily return measured in local currency can be approximated as:

$$r\_fund_t^{local} = \frac{1 + r\_fund_t^{USD}}{1 + r\_currencies_t} - 1$$

To obtain the return in local currency for a given period of time, one must simple compound the daily returns:

$$r\_fund_t^{local} = \prod_t^{period}(1 + r\_fund_t^{local}) - 1$$

VI. APPENDIX 3: CALCULATION OF PRF BENCHMARK

The reference portfolio (benchmark) has three main components:

- ✓ **Short-term money market instruments**: 6-month LIBID and 6-month T-bill rates in dollars, euros and yens are used, with a 90-day lag to simulate a portfolio of 3-month deposits.

- ✓ **Nominal bonds**: JP Morgan GBIs for sovereign bonds of 1-3 years, 3-5 years, 5-7 years and 7-10 years in the three currencies are used.

- ✓ **Inflation-linked bonds:** Barclays US Govt. Inflation-Linked Bond Index (US TIPS) is used. This index monitors sovereign bonds with a duration between 1 and 10 years.

The weight of each of these components is as follows:

Composition	USD	EUR	JPY	Total
Money Market (*)	*15.0%*	*12.0%*	*3.0%*	*30.0%*
6-month LIBID	7.5%	6.0%	1.5%	15.0%
6-month T-bill rate	7.5%	6.0%	1.5%	15.0%
Nominal Sovereign Bonds	*31.5%*	*28.0%*	*7.0%*	*66.5%*
JP Morgan GBI 1-3 years	14.2%	12.6%	3.2%	29.9%
JP Morgan GBI 3-4 years	9.5%	8.4%	2.1%	20.0%
JP Morgan GBI 5-7 years	3.9%	3.5%	0.9%	8.3%
JP Morgan GBI 7-10 years	3.9%	3.5%	0.9%	8.3%
Inflation-Indexed Sovereign Bonds	*3.5%*			*3.5%*
Barclays US Govt. Inflation-Linked Bond Index	3.5%			3.5%
TOTAL	*50.0%*	*40.0%*	*10.0%*	*100.0%*

VI.1. Calculation of LIBID and T-Bill Benchmark

Data on LIBID[19] rates is obtained from Bloomberg. Daily returns are calculated with a lag of 90 days as follows:

$$\mathrm{Re}\, t\_Libid_t^{USD} = \frac{Libid_{t-90}^{USD}}{360} \qquad \mathrm{Re}\, t\_Libid_t^{EUR} = \frac{Libid_{t-90}^{EUR}}{360} \qquad \mathrm{Re}\, t\_Libid_t^{JPY} = \frac{Libid_{t-90}^{JPY}}{360}$$

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[19] According to convention, the LIBID rate is equal to LIBOR less 1/8 o 0.125.

LIBID rates in euros and yens are adjusted by the exchange rate in order to express them in dollars. The daily return of the LIBID benchmark is:

$$\mathrm{Re}t\_Libid_t = 7.5\% \cdot \mathrm{Re}t\_Libid_t^{USD} + 6.0\% \cdot \left[\left(1 + \mathrm{Re}t\_Libid_t^{EUR}\right) \cdot \frac{EUR_t}{EUR_{t-1}} - 1 \right] + 1.5\% \cdot \left[\left(1 + \mathrm{Re}t\_Libid_t^{JPY}\right) \cdot \frac{JPY_t}{JPY_{t-1}} - 1 \right]$$

The rates are adjusted using the same day's exchange rate (without a lag).

Similarly, for T-bills, the daily return of each index is:

$$\mathrm{Re}t\_TBill_t^{USD} = \frac{TBill_{t-90}^{USD}}{360} \qquad \mathrm{Re}t\_TBill_t^{EUR} = \frac{TBill_{t-90}^{EUR}}{360} \qquad \mathrm{Re}t\_TBill_t^{JPY} = \frac{TBill_{t-90}^{JPY}}{360}$$

$$\mathrm{Re}t\_TBill_t = 7.5\% \cdot \mathrm{Re}t\_TBill_t^{USD} + 6.0\% \cdot \left[\left(1 + \mathrm{Re}t\_TBill_t^{EUR}\right) \cdot \frac{EUR_t}{EUR_{t-1}} - 1 \right] + 1.5\% \cdot \left[\left(1 + \mathrm{Re}t\_TBill_t^{JPY}\right) \cdot \frac{JPY_t}{JPY_{t-1}} - 1 \right]$$

VI.2. Calculation of Nominal Bond Benchmark

The benchmark for sovereign bonds is calculated using the different JP Morgan GBI[20] indexes, with durations of 1 to 3 years, 3 to 5 years, 5 to 7 years and 7 to 10 years for the United States (USD), Germany (EUR) and Japan (JPY). The daily return of each index in its local currency is:

$$\mathrm{Re}t\_JPM_t = \frac{Idx\_JPM_t}{Idx\_JPM_{t-1}} - 1$$

The benchmark's daily return in dollars for each country is:

$$\mathrm{Re}t\_BNom\_USD_t = \sum_{duration} \mathrm{Re}t\_Idx\_USD_t^{duration} \cdot w_{USD}^{duration}$$

$$\mathrm{Re}t\_BNom\_EUR_t = \sum_{duration} \left[(1 + \mathrm{Re}t\_Idx\_EUR_t^{duration}) \cdot \frac{EUR_t}{EUR_{t-1}} - 1 \right] \cdot w_{EUR}^{duration}$$

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[20] Government Bond Indexes.

$$\mathrm{Re}t\_BNom\_JPY_t = \sum_{duration}\left[(1+\mathrm{Re}t\_Idx\_JPY_t^{duration})\cdot\frac{JPY_t}{JPY_{t-1}}-1\right]\cdot w_{JPY}^{duration}$$

where:

$$w_{USD} = \begin{cases} \text{duration} \ 1\text{-}3 \ \text{years} = 14.1750\% \\ \text{duration} \ 3\text{-}5 \ \text{years} = 9.4500\% \\ \text{duration} \ 5\text{-}7 \ \text{years} = 3.9375\% \\ \text{duration} \ 7\text{-}10 \ \text{years} = 3.9375\% \end{cases} \quad w_{EUR} = \begin{cases} \text{duration} \ 1\text{-}3 \ \text{years} = 12.6000\% \\ \text{duration} \ 3\text{-}5 \ \text{years} = 8.4000\% \\ \text{duration} \ 5\text{-}7 \ \text{years} = 3.5000\% \\ \text{duration} \ 7\text{-}10 \ \text{years} = 3.5000\% \end{cases}$$

$$w_{JPY} = \begin{cases} \text{duration} \ 1\text{-}3 \ \text{years} = 3.1500\% \\ \text{duration} \ 3\text{-}5 \ \text{years} = 2.1000\% \\ \text{duration} \ 5\text{-}7 \ \text{years} = 0.8750\% \\ \text{duration} \ 7\text{-}10 \ \text{years} = 0.8750\% \end{cases}$$

The indexes are expressed in their local currency and adjusted by the exchange rate to obtain the return in dollars.

Finally, the benchmark for nominal bonds in USD is:

$$\mathrm{Re}t\_BNom_t = \mathrm{Re}t\_BNom\_USD_t + \mathrm{Re}t\_BNom\_EUR_t + \mathrm{Re}t\_BNom\_JPY_t$$

VI.3. Calculation of Inflation-Linked Bond Benchmark

The benchmark for inflation-linked bonds is simply:

$$\mathrm{Re}t\_TIPS_t = 3.5\%\cdot\left(\frac{Idx\_TIPS_t}{Idx\_TIPS_{t-1}}-1\right)$$

VI.4. Calculation of Benchmark for the Funds

The daily return on the benchmark for the funds is:

$$Ret\_Libid_t + Ret\_TBill_t + Ret\_BNom_t + Ret\_TIPS_t$$

VI.5. Formula for Exchange-Rate Adjustment

Exchange-rate adjustment follows from:

$$asset\_return_t^{EUR}[EUR] = \frac{asset\_price_t^{EUR}}{asset\_price_{t-1}^{EUR}} - 1 \tag{1}$$

$$EUR\_return_t = \frac{EUR_t}{EUR_{t-1}} - 1 \tag{2}$$

$$asset\_return_t^{EUR}[USD] = \frac{asset\_price_t^{EUR} \cdot EUR_t}{asset\_price_{t-1}^{EUR} \cdot EUR_{t-1}} - 1 = \frac{asset\_price_t^{EUR}}{asset\_price_{t-1}^{EUR}} \cdot \frac{EUR_t}{EUR_{t-1}} - 1 \tag{3}$$

Replacing (1) in (3):

$$asset\_return_t^{EUR}[USD] = \left(1 + asset\_return_t^{EUR}[EUR]\right) \cdot \frac{EUR_t}{EUR_{t-1}} - 1 \tag{4}$$

And, finally, replacing (2) in (4):

$$asset\_return_t^{EUR}[USD] = \left(1 + asset\_return_t^{EUR}[EUR]\right) \cdot \left(1 + EUR\_return_t\right) - 1 \tag{5}$$

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VII.   APPENDIX 4: GLOSSARY[21]

Accrued interest: Interest earned in a given period that has yet to be withdrawn or paid.

Bank risk: The risk associated to an investment in bank financial instruments; refers to the different risks faced by banking institutions in the course of their activities. This normally varies in line with the institution's line of business. These risks include credit, liquidity, exchange-rate and interest-rate risk.

Basis point: One hundredth of a percentage point; the smallest unit for measuring the return on a bond or a change in interest rates.

Benchmark: A portfolio used for the purposes of comparison; permits evaluation of a fund manager's performance. For an investor in fixed-income instruments, benchmarks are, in general, optimum portfolios with clearly defined investment parameters such as the relative weight of the portfolio's components, currency allocation and credit risk.

Carry trade: A financial strategy that consists in borrowing in one currency in order to invest the resources in instruments denominated in another currency with an expected rate of return that is relatively higher than the cost of borrowing in the first currency. Under this strategy, there is no coverage against exchange-rate risk.

Commercial paper: A debt security in local or foreign currency, with a maturity of between 90 days and 1 year, issued by governments, financial institutions and large companies to cover short-term financing needs. A trade bill's yield depends on the issuer's risk rating; maturities, interest rates, repayment terms, currency and expiry vary.

Counterpart risk: The risk arising from the possibility of default on the financial obligations of the counterpart in a financial operation.

Credit risk: The risk that an issuer may not fully comply with a financial liability either at the time it falls due or at some subsequent time. In systems for the exchange of securities, this definition in general includes replacement and principal risks.

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[21] Sources: Central Bank of Chile (CBC) and Bloomberg.

Duration: A measure of exposure to interest-rate risk that measures the sensitivity of the price of a fixed-income instrument (bond) to changes in interest rates or, in other words, how much the instrument's price changes in response to a change in interest rates.

Financial agencies in the US: Mortgage lenders in the United States with explicit or implicit government backing.

Flight to quality: Investors' movement of funds to assets of better credit quality and, therefore, lower risk during periods of uncertainty or great volatility.

Inflation-linked bonds: Bonds whose value is adjusted in accordance with an inflation index; in the US, these bonds are known as TIPS.

Information ratio: A measure of the risk-adjusted return on financial securities or a portfolio; defined as the difference between the return on the security or portfolio and the benchmark divided by the TE. It can be interpreted as the ability of the manager to generate returns in excess of the benchmark for each unit of relative risk.

Internal Rate of Return (IRR): The rate of return actually perceived by an investor; corresponds to the internal rate of return on net flows during a given period.

Investment guidelines: Criteria under which investments are managed.

LIBID: London Interbank Bid Rate, the interest rate paid on interbank deposits; by definition, it is equal to LIBOR (offered rate) minus 0.00125 or 0.125%.

LIBOR: London Interbank Offered Rate, the interest rate charged on interbank borrowing.

Local Currency: Denomination currency of financial instruments.

Market risk: The risk that the value of an investment may be reduced by changes in market factors.

Money market instruments: Financial instruments with a maturity of up to a year.

Multilateral risk: The risk of default by an official multilateral issuer.

Operational risk: The risk that deficiencies in internal information systems or controls may result in unexpected losses.

Overnight deposits: Deposits with a maturity of one day.

Portfolio: A combination of investment instruments held by an individual or institutional investor.

Reference duration: Benchmark duration devised to guide and evaluate the duration of investments.

Reference structure: A reference portfolio used to guide and evaluate portfolio management.

Return differential: A measure of the performance of a portfolio compared to its benchmark.

Risk: The possibility of suffering damage or losses; the variability of the return on an investment.

Risk classification: The level of credit risk associated with a financial instrument, institution or country as defined by a risk rating agency.

Secondary market: The market in which financial assets that have already been issued are traded. Each transaction involves a sale/purchase between investors.

Sovereign risk: The risk arising from investment in sovereign instruments; generally used to refer to the risk classification of a sovereign state. This classification corresponds to the opinion issued by bodies specialized in risk evaluation as to the possibility that a state will properly comply with its financial obligations, taking into account factors that include its payment record, political stability, economic situation and willingness to repay borrowing.

Spread: The difference between yield-to-maturity on fixed-income securities; used to evaluate the relative performance of different instruments.

Subprime mortgages: Loans for house purchase granted to persons whose credit profile excludes them from access to standard financing. These mortgages are relatively more risky.

Time-Weighted Rate of Return (TWRR): Rate of growth measured as a percentage of the change in a financial instrument's value over a period of time without taking account of the effect of cash flows.

Total return: Annualized rate of growth of the economic value of an instrument or portfolio considering all the potential sources of income such as capital gains or losses, coupons and their reinvestment.

Tracking Error (TE): An indicator of the risk arising from active positions taken by a portfolio manager as compared to its benchmark.

Value at risk (VaR): An indicator of the risk of a portfolio that provides an estimate of the amount that could be lost over a given period of time with a given level of probability.

Volatility: A measure of an asset's risk, representing the variation in its price over a period of time. Values can fluctuate with market swings due to events such as variations in interest rates, unemployment and economic changes in general.

Waiver: Explicit and voluntary authorization for non-compliance during a certain period of time with certain rules, parameters and/or procedures established in specific investment guidelines.

Weekend deposits: Deposits with a maturity of a weekend.