

The Brazilian Pension System from an innovative perspective

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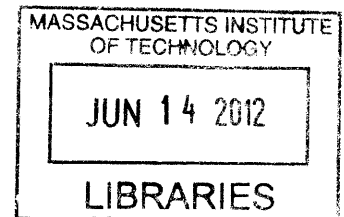
SUBMITTED TO THE MIT SLOAN SCHOOL OF MANAGEMENT IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

JUNE 2012

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Submitted to the MIT Sloan School of Management on May 11,
2012 in partial fulfillment of the requirements for the degree of
Master of Business Administration

ABSTRACT

The demographic changes and the growth in expenses of the social security make the current pension system in Brazil unsustainable, creating opportunities for the complementary fund industry.

This work discusses the current and future state of the Brazilian Pension Fund System and points out the opportunities for the private pension fund industry. Additionally, this paper proposes an innovative model for the new generation of retirement products based on the Goal-Based Approach, adapted to the Brazilian market.

This paper is the result of intense research based on the most significant bibliography in this area, as well as interviews with pension funds experts from the private, academic and public sectors.

The thesis demonstrates that the creation of the complementary fund for federal employers was a significant initiative, but it is far from solving the pension system deficit problem. Additionally, the paper criticizes the high market share concentration among only six players, which creates an “oligopoly” extremely harmful for investors, who are offered old-fashioned products at exorbitant fees. It also presents an adaptation of the Goal-Based Approach that is expected to become the new standard for the next generation retirement products.

Finally, apart from the political changes that should be pursued to guarantee the stability and future of the national budget, competition must increase. Innovative products and distribution channels proposed in this thesis will better serve customers, who will be offered tailor-made and integrated solutions at reasonable costs.

Thesis Supervisor: Robert Merton

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Acknowledgments

The author would like to thank the distinguished and knowledgeable people, who accepted being interviewed and contributed to the paper. Below is a brief list of the people who I had the honor to speak to during my research:

- Ariane Di Orio Andrade – Former President at Instituto de Previdência do Município do Rio
- Eric Rosenfeld - Senior Lecturer of Finance at MIT Sloan School of Management
- Fabio Giambiagi – Chief Risk Officer at BNDES and author of many books about the Brazilian Pension System
- Felipe Vilhena Antunes Amaral BNDES – Risk Management at BNDES
- John Watson – Lecturer at Stanford GSB and Financial Engines Fellow
- Jose Cechin – Executive Director of FenaSaúde and Former Social Security Minister
- Jose Manoel Pereira Pinto – Managing Investment Director at Fundacao Atlantico (Oi Telecom Pension Fund)
- Kati Almeida Braga – President of Icatu Seguros
- Nilton Molina – Chairman of the Board of Mongeral/Aegon Seguros, former President of Icatu Seguros and founder of Bradesco Seguros
- Paulo Tafner – Deputy Secretary of the Rio de Janeiro State Treasury
- Peter Diamond - MIT Institute Professor and Nobel Prize winner
- Ricardo Weiss – Former Managing Investment Director at FAPES (BNDES Pension Fund)
- Thomás Tosta de Sá – President of the Brazilian Institute of Capital Markets – IBMEC former president of the Comissão de Valores Mobiliários(CVM, the Brazilian SEC)
- Wilson Risolia - Rio de Janeiro Education Secretary, Former President of RioPrevidencia (Rio de Janeiro Pension Fund) and MD at Caixa Economica Federal
- Zvi Bodie – Norman and Adele Barron Professor of Management at Boston University

The information and views set out in this publication are those of the author and do not necessarily reflect the official opinion of any of the contributors.

A special thanks to my advisor Professor Robert Merton, who always inspired me to challenge the status quo and to look for innovative solutions for the problems.

I would also like to thank Mrs. Thalia Rubio, from the MIT Writing Center, for the innumerable reviews and insights.

Last but not least, I extend my thanks to my family and my fiancé Celina Beatriz Mendes de Almeida for their patience and loving support.

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Contents

Introduction.....	10
1. The Brazilian Pension System Analysis.....	12
a. Brief historical description.....	12
b. Recent Reforms:.....	15
c. Current Policies (Eligibility and expenses).....	17
d. The role of each of the three social security pillars (Government, Employers and Savings) in Brazil.....	20
General Social Welfare Policy (RGPS).....	20
Special Welfare Policy (RPPS).....	22
Complementary Welfare Policy (RC).....	24
e. Description of the informal sector.....	25
f. Demographic changes analysis.....	27
g. Analysis of possible levers of change to better distribute the weight across the three pillars.....	30
2. Private Market and Investment Strategies.....	33
The Brazilian Private Pension Fund Market.....	33
a. What is the size of the complementary pension funds industry in Brazil?.....	36
Closed Entities.....	36
Open Entities.....	40
3. The design of attractive pension funds for the new era.....	46
a. Goal-based investment.....	48
Define the needs and wants (Goals).....	49
Sources of income.....	50
Risks associated with income, needs and wants (Integration).....	52
Assessing your Risk Capacity.....	54
Personal risk profile.....	55
Data update.....	56
b. Investment Myths and Pitfalls.....	57
In the long-term stocks are not risky.....	57
Target-date funds are the best retirement solution.....	58
The impact of investment funds fees on final returns are negligible.....	59
Illiquid investments are always a good source of diversification.....	60

If you find an alpha generator, you do not need diversification.....	61
Hedge Funds managers consistently outperform the market	62
c. Distribution Channels	63
Retail banks	63
Financial “Supermarkets”	64
Financial advisors	65
Alternative distribution channels.....	65
d. The next generation of retirement solutions.....	66
Financial Engines	67
Dimensional Fund Advisors (DFA) – Retirement Solution.....	68
4. A vision for the future	71
a. The future of the RPPS system	71
Should individual investors invest in the Funpresp?.....	72
Opportunity for innovative products and services	74
b. The future of the RGPS system	77
c. The future of the Complementary System	79
Closed Entities:	79
Open Entities:	80
5. Conclusion	86
References.....	88

Figures

Figure 1: 2010 efforts among the social security pillars (RGPS)	21
Figure 2: 2010 efforts among the social security pillars (RPPS)	23
Figure 3: RPPS – Actuarial Deficit (BRL million) October 2011.....	24
Figure 4: Informal Sector Evolution (%)	26
Figure 5: Informal Sector % in Urban Areas	27
Figure 6: Population age pyramids from the Brazilian 2008 IBGE's Census (Revised in 2010).....	28
Figure 7: Closed Entities Asset Allocation	38
Figure 8: Actuarial Target Rate of DB Plans.....	39
Figure 9: Brazilian Real Interest Rate Evolution	39
Figure 10: Open Entities AUM evolution.....	41
Figure 11: AUM by product	42
Figure 12: Annual AUM growth by product	42
Figure 13: INSS Cap / Minimum Wage Ratio.....	44
Figure 14. Bovespa Index Sector % Breakdown (February 2012)	54
Figure 15: Super-Efficient Portfoliot.....	61
Figure 16: DFA's estimates of the level of income in retirement plotted against the frequency of obtaining each level	70
Figure 17: Measuring Risk: Deferred Annuities Monthly Returns	70

Tables

Table 1: Funpresp Basic Characteristics	17
Table 2: Pension System Deficit	18
Table 3: Comparison between RGPS and RPPS general rules	18
Table 4: Average growth rate.....	28
Table 5: % of Total population	29
Table 6: Women and men life expectancy difference	30
Table 7: Projections of public expenditure on pensions, 2007-60.....	31
Table 8: Coverage of private pension schemes by type of plan, 2009.....	36
Table 9: Assets in pension funds and public pension reserve funds in OECD countries, 2009.....	37
Table 10: Market Share Distribution	43
Table 11: Economically Active Population by Number of Minimum Wage	43
Table 12: Net pension replacement rates by earnings	45
Table 13: Social Class Definition according to FGV in 2011	45
Table 14 Management Fees charged by the banks to retail investors	48
Table 15: NTN-B current yields	53
Table 16: Difference between investing in the Funpresp and in the Private Sector	73

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Introduction

The results of the 2008 IBGE's census, which were broadly ignored by the Brazilian media and government, shows that the Brazilian demographic profile is changing much faster than anyone have expected. The Brazilian aging rate is the second in the world, only behind Japan. The impact of this change will make the current pension system in Brazil unsustainable; making this issue a priority for the stability and future of the national budget.

The objective of this thesis is to discuss the current and future state of the Brazilian Pension Fund System and point out the opportunities for the private pension industry in the country. The other aim of the study is to present ways to design and manage attractive Defined Contribution plans (DC).

The thesis is divided in four main sections:

1 The Brazilian Pension System: In the first section, the work describes the current design of the Brazilian Pension system and estimates its cost to each of the three pillars of the social security (government, companies and individuals). One sub-section is dedicated to the analysis of the informal sector and another to the analysis of the country's demographic changes, which are very relevant to understanding the system deviations. As a final point of the first section, the study reviews some of the government and academic proposals to mitigate the problem.

2. Private Market and Investment Strategies: This section describes and analyses the Brazilian private pension market from different perspectives. Furthermore, the paper estimates the current size of the private market and the potential opportunities for innovation in the sector.

3. The design of attractive pension funds for the new era: First, the third section details the theory and implementation strategies of the Goal-Based Approach, which is considered by the author as the best way to design attractive funds for the new era. Additionally, there are sub-sections dedicated to the discussion of some of the financial industry common wisdom and the development of alternative distribution channels in Brazil.

4. A vision for the future: After all the research and analysis detailed in the thesis, the section presents the author's opinions about the future of the Brazilian Pension System. A particular focus is devoted to the Complementary System, where the author foresees the best opportunities for the private sector.

1. The Brazilian Pension System Analysis

This first section of the thesis has the objective to give a detailed description of the Brazilian Pension system. The text explains how the country evolved from a single pension institution in 1835, covering only the employees of the Ministry of Economics, to a system that currently covers more than 91% of the population.

But the pension system has become a source of concern to the country since the government expenses are now extremely high. Even though the country has made substantial progress in the reduction of the informal sector (sub-section 1.d), the number of public employees retiring soon and the sharp decline in the population's birth rate urge a quick reaction by the government. As a result, the study dedicates one sub-section to analyze in depth the dramatic demographic changes of the country, which are very relevant to understanding the magnitude of the problem.

Next, the paper describes the current design of the system and estimates the cost to each of the three pillars of the social security (government, companies and workers). Finally, the work discusses some of the government and academic proposals to mitigate the problem.

a. Brief historical description¹

Initially, the Brazilian social welfare was a private organization that slowly migrated to be under governmental supervision after a series of political interventions. The objective of this section is to describe and discuss the milestones of this transition.

¹ This section was based on Kertzman, I. (2010), *Curso Pratico de Direito Previdenciario*. Salvador, Bahia: Editora JusPODIVM, *see also* Brazilian Social Welfare Ministry (2009) "Overview of Brazilian Social Welfare" available at: http://www.previdencia.gov.br/arquivos/office/3_091113-150152-707.pdf

Montepio Geral dos Servidores do Estado (MONGERAL) was launched in 1835 and was the first private pension institution in the country. Only employees of the Ministry of Economics were eligible to receive MONGERAL benefits that were very similar to life insurance, since the pension could only be accessed after the employee death. Furthermore, employees provided the funds necessary to run the company.

In 1888, for the first time the Constitution legislated retirement rights. Hence, this point marks the beginning of the transition to the government responsibility. Initially, only employees of the Brazilian Post Office were covered and the conditions to receive the pensions were: 30 years of contribution, 60 years old or demonstrated incapability to continue to perform the work. Further, the pension value was equivalent to the average salary of the last three years of employment.

However, the ultimate milestone of this transition and development of the Brazilian Social Security occurred in 1923 with the approval of the The Elói Chaves Law, which foresaw the creation of a Retirement and Pension Fund for each railroad company. From the time this Law went into effect, social protection in Brazil was able to count on an institution that offered pension, retirement, medical assistance and pharmaceutical aid. The law is considered a milestone because it established a precedent for the creation of Retirement and Pension Funds for other classes of workers, which caused a substantial increase in the percentage of workers covered by the system. In the 1920's many companies expanded the Pension and Retirement model, creating around 200 Retirement and Pension "Packets" (CAPs).

Therefore in the 30's, the Social Welfare system restructured itself, keeping the corporative bases, in order to face the political-economic dynamism of the initial stages of the Brazilian industrialization process. The CAPs merged to form the Retirement and Pension Institutes (IAPs). The IAPs were categorized by profession, for example Seafarers, Traders, Bankers and others. The institutes, though, had a striking feature: inequality, as each one had a specific benefit and contribution

structure, which created a significant disparity between the qualitative and quantitative levels of social protection.

Heavily influenced by the 1919 German constitution, the 1934 Constitution formalized the Brazilian welfare system. Hence, the constitution introduced the tripod contribution system, where Government, Employers and Employees are required to contribute to funding for retirement, maternity leaves, accidents or deaths. Furthermore, the constitution also details the public employees' pensions' rights. According to the 1934 text, the public employees' retirement conditions were: 68 years, 30 years of contribution or demonstrated disability to continue to work. Thus, this constitution may be considered the root of some of the Brazilian government deficit problems we are dealing now.

Since the beginning, the problem of corporate governance and investment strategy of the pension funds has been an issue. An example that illustrates this fact very well was the construction between 1956 and 1960 of Brasilia, the new Capital of the Republic, funded with the IAP's resources. There are still criticisms regarding the use of Social Welfare resources in this task, without the evaluation of the risk return of the transaction.

In 1967, the IAPs legislations were unified and consolidated into the National Institute of Social Welfare (INPS) and in 1971 the rural workers finally obtained their retirement rights with the creation of the Assistance to the Rural Worker Program (FUNRURAL), which was funded by rural employees who were charged a fee according to the amount of their production. This was another important step in the Brazilian pension system since the rural workers represented a large percentage of the population.

On the whole, the evolution to the current model started in 1988 with the creation of the National Social Welfare and Assistance System (SINPAS) to integrate the following functions: concession and maintenance of benefits; rendering services and funding activities and programs, as well as Social

Welfare and Assistance's administrative and capital management. In order to complete the mission, a number of institutes were created². Later, most of the institutes were shut down or merged to create a more centralized and efficient structure. The exception is the DATAPREV institute that continues to serve the Social Security and the Finance Ministries.

Finally in 1990 the INSS, which is the base of the current system, was created as a result of the merger of the INPS and IAPS. The INSS is responsible for the payment of benefits to the insured members across all the territory. The welfare tax revenue was incorporated into the system of tributary collection looking for higher efficiency and a bigger scale in 2007.³

b. Recent Reforms:

Even though the expenses and deficit of the pension system are known by most of the politicians, the changes and reforms in the system are made very slowly. Governments are not encouraged to make the reforms since changes do not affect the government cash flows immediately but only in the years ahead. In addition, since the population is not well educated about the problem, the reforms impact the popularity of the government very negatively⁴. To summarize, the paper lists the reforms made or envisioned by the last three presidents⁵:

- President Fernando Henrique Cardoso "FHC" (1995-2002): FHC made two major changes in the Brazilian retirement system:
 - Public Sector Workers : The reform set a minimum retirement age for both active employees (53 men and 48 women) and new entrants (60 for men and 55 for women)

² Institutes created: National Institute of Medical Assistance of Social Welfare (INAMPS), National Institute of Social Welfare (INPS), Institute of Financial Administration of Social Welfare and Assistance (IAPAS), Center for Medication (CEME), Social Welfare Data Processing Company (DATAPREV), Foundation of Minors' Welfare (FUNABEM) and Brazilian Legion of Assistance (LBA).

³ Brazilian Social Welfare Ministry (2009) "Overview of Brazilian Social Welfare" available at: http://www.previdencia.gov.br/arquivos/office/3_091113-150152-707.pdf

⁴ OECD (2011) "Economic Surveys: Brazil." (<http://www.oecd.org/dataoecd/12/37/48930900.pdf>)

⁵ Giambiagi, F., & Tafner, P. (2010). Demografia a ameaça invisível: O dilema previdenciário que o Brasil se recusa a encarar, Rio de Janeiro : Elsevier

- Private Sector Workers: Introduction of the Social Security Factor⁶ (Fator Previdenciario, “FP”). Since the reform, pension benefits have been calculated by multiplying the average of 80% of the highest earnings throughout the working life by a parameter that depends on the retirement age, number of years of contribution and life expectancy at retirement. The objective of this change was to penalize early retirement. Before the installation of the FP, more than 82% of employees retired before age 55.
- President Luiz Inacio “Lula” da Silva (2003-2010):
 - Public Sector Employees: Defined the employee’s contribution requirements at a minimum rate of 11% on earnings exceeding the INSS ceiling for civil servants of all levels of government. Also set a minimum retirement age of 60 years for men and 55 years for women, with a reduction of 5% in the value of pensions for each year of early retirement.
- President Dilma Rousseff (2011 - Present):
 - Public Sector Employees: President Dilma got the approval of the Public Employees Complementary Welfare Policy, a bill that has remained in limbo for eight years. The new fund, to be named Funpresp, will be managed by the government and is expected to quickly become the largest pension fund in Latin America. Under the reform, new government employees will no longer be entitled to a pension equal to their last salary and will have a ceiling benefit equal to the INSS Cap. New federal employees will contribute 11% of their salaries up to the INSS cap, while the government will contribute 22%. Above that amount, the government will match employees’ contributions up to 8.5%. Table 1 describes the basic characteristics of the Funpresp.

⁶Formula of the Social Security Factor also known as Welfare Factor (F):

$$F = \frac{Tc \times a}{Es} \times \left[1 + \frac{Id + (Tc \times a)}{100} \right]$$

Key:
 F = welfare factor
 Es = life expectancy after retirement
 Tc = Contribution time at the moment of retirement
 Id = Age at the time of retirement
 a = contribution share corresponding to 0.31

Table 1: Funpresp Basic Characteristics

	Funpresp-Exe	Funpresp-Leg	Funpresp-Jud
Beneficiaries	Executive	Legislative and Brazilian Court of Audit (TCU)	Judiciary
Number of Board of Directors Seats		6	
Number of Audit Committee Seats		4	
Number of Executive Directors Seats		4 (Max)	
Board of Directors Nominations	President	President of the Supreme Court	Lower House and Senate
Audit Committee Nominations		Beneficiaries	
Executive Directors Nominations	2 by the beneficiaries / 2 by the Board of Directors of the Closed Complementary Pension Entity		
Government advance contribution in 1Y	R\$ 50 mi	R\$ 25 mi	R\$ 25 mi

Source: Brazilian Lower House website, <http://www.camara.gov.br>

c. Current Policies (Eligibility and expenses)

The Brazilian social security can be divided in three main systems⁷:

1. **General Social Welfare Policy (RGPS):** The RGPS covers paid urban, autonomous, domestic and rural workers. In other words, the system covers workers from private initiatives and public servants under the CLT (Consolidation of Labor Laws). Currently, there are about 24 million beneficiaries.
2. **Special Welfare Policy (RPPS):** The RPPS comprises civil and military government employees at the federal, state and municipal levels. It is administered by the respective governments. According to Fitch, the RPPS currently covers the public servants from 26 states, the federal district and over 30% of the totality of 5,563 municipalities. Municipalities that do not have Special Welfare Policies follow the RGPS rules.
3. **Complementary Welfare Policy (RC):** There are basically two main types of Complementary Welfare Policies in Brazil: Private Complementary Welfare and Public Employees Complementary Welfare. The Private Complementary Welfare is completely optional and is based in the constitution of reserves that guarantee the future benefits. The Public Employees Complementary Welfare is still to be approved by the government as we have discussed in the previous chapter.

⁷ Kertzman, I. (2010), Curso Pratico de Direito Previdenciario. Salvador, Bahia: Editora JusPODIVM

From the Table 2 we can understand why President Dilma aggressively advocated for the approval of the bill creating the Funpresp. The estimate deficit of the RPPS for the Federal Government employees is around R\$ 57 billion⁸, an amount close to the total budget for Education during the same period. During the same period the RGPS deficit declined; one of the main reasons for this decline was the increase in contributions driven by the formalization of the country's labor market.

Table 2: Pension System Deficit

	RGPS	RPPS (Federal Government only)	Total
Beneficiaries	24,000,000	950,000	24,950,000
Deficit 2009	(42,900,000,000)	(47,000,000,000)	(89,900,000,000)
Deficit 2010	(42,900,000,000)	(51,000,000,000)	(93,900,000,000)
Deficit/PIB	-1.2%	-1.4%	-2.6%
Deficit 2011 (Est)	(38,500,000,000)	(57,000,000,000)	(95,500,000,000)
CAGR Deficit	-5.27%	10.13%	3.07%

Source: Estadao Newspaper, <http://www.estadao.com.br>

It is very difficult to generalize the rules for retirement in Brazil because of differences in the RPPS' policies among regions and exceptions in the RGPS' policies among specific professions.

Nevertheless, Table 3 was designed to illustrate the differences between the RPPS and RGPS policies.

Table 3: Comparison between RGPS and RPPS general rules

	RGPS	RPPS
Benefits Cap	INSS Cap (Currently R\$ 3.691)	No cap
Minimum age	No minimum age	60 Men - 55 Women
Benefit calculation	Average (Higher 80%) * Welfare factor	Average (Higher 80%)
Readjustment	Parity with INSS Cap	Inflation repositioning
Employer Contribution	20% + 1-3% of Insurance	22%
Employee Contribution	8-11%	11%
Pension	up to 100% INSS Cap	up to 100% INSS Cap + 70% of the balance

⁸ Estadao Newspaper: <http://www.estadao.com.br/> : March 10th 2011 and August 29th 2011

The benefits offered to the RGPS insured are:⁹

1. Retirement

- a. Retirement due to age: 65 years for men and 60 years for women. Rural workers have the benefit of five years earlier: 60 years for men and 55 years for women. (The minimum contribution time is 15 years but men at the age of 70 and women at the age of 65 can apply to the benefits with lower contribution time)
- b. Retirement due to Contribution time: 35 years for men and 30 years for women. Teachers from children's education to high school have their contribution time reduced by five years: 30 years for men and 25 years for women. The application of the welfare factor is mandatory, averaging the greater benefit value to greater age, contribution time and value of contribution.
- c. Special Retirement: Designed to protect insured that work conditions that are harmful to their health or physical integrity. Contribution time in those cases can vary to 15 to 25 years.
- d. Disability Retirement: This benefit is awarded to the insured who is totally or completely incapacitated for the job.

2. Pensions

- a. Pension for death: Benefit is as follows: husband/wife/companion; non-emancipated child under 21 and handicapped child of any age; father or mother; sibling under the age of 21 or handicapped of any age. The value of the pension due to death corresponds to the retirement that would have been received in case of disability and is divided in equal parts among the dependents.

3. Aids

- a. Illness Aid: When some form of physical or mental illness hinders work for more than fifteen days. The benefit is given as of the 16th day away from the job, if the

⁹ Brazilian Social Welfare Ministry. "Overview of Brazilian Social Welfare" <http://www.previdencia.gov.br>

insured is employed. The company pays the first 15 days. For workers not under the CLT rules, the benefit is given since the first day of disability.

- b. **Reclusion Aid:** Paid out to the dependents of the insured that has been taken to prison, in the same conditions as pension for death. The benefit is given only if the insured worker's last salary is equal to or less than R\$862.60, in 2011
- c. **Accident Aid:** Compensation that the insured receives when, after consolidation of the injuries resulting from accident of any kind, including work related, result in aftereffects that reduce the work capability of the insured . It corresponds to 50% of the benefit salary and is paid out until the eve of the beginning of any retirement or the date of death of the insured. There is no wait-time for the application of this benefit.
- d. **Maternity Salary:** All the women insured under the General Social Welfare Policy have the right to maternity salary during the period of 120 days.
- e. **Family Salary:** It is paid out monthly to the employee, except domestic servants, in proportion to the number of children up to the age of 14. In 2011, the value corresponded to R\$29.41 for the insured with a monthly wage lower than R\$573.58 and to R\$20.73 for the insured with a monthly wage between R\$573.58 and R\$862.11.

d. The role of each of the three social security pillars (Government, Employers and Savings) in Brazil

As described in the previous chapter the Brazilian Pension system is mainly divided into three different systems:

General Social Welfare Policy (RGPS)

- **Companies:** Generally contribute to the social security with 20% of the employee's salary per month. The company might incur an additional charge of 0 to 6% depending on the risk of the

work. The contribution may vary according to the type of industry: Financial Companies are charged 22.5%, Cooperatives 15% and Domestic Employees 12%. The tax payment for the companies is based on the total salary of the employee, regardless of the INSS ceiling value. On March 27th 2012, the Brazilian government announced tax incentives for 15 sectors of the economy, which will have their contribution to the system from 20% to 2% until December 2014.

- **Employees:** The employee contribution varies according to its salary: 8% for employees with salaries up to R\$ 1.040,22, 9% for employees with salaries between R\$ 1.040,23 and R\$ 1.733,70 and 11% for employees with salaries between R\$ 1.733,71 and R\$ 3.467,40. The employee taxes are charged only up to the INSS ceiling and any amount over this value is not charged.
- **Government:** The government acts as the guarantor of the social security system. The contribution of the government is basically the difference between the total benefits entitled and the total revenues earned.

Figure 1 illustrates the division of efforts among the three social security pillars in the RGPS.

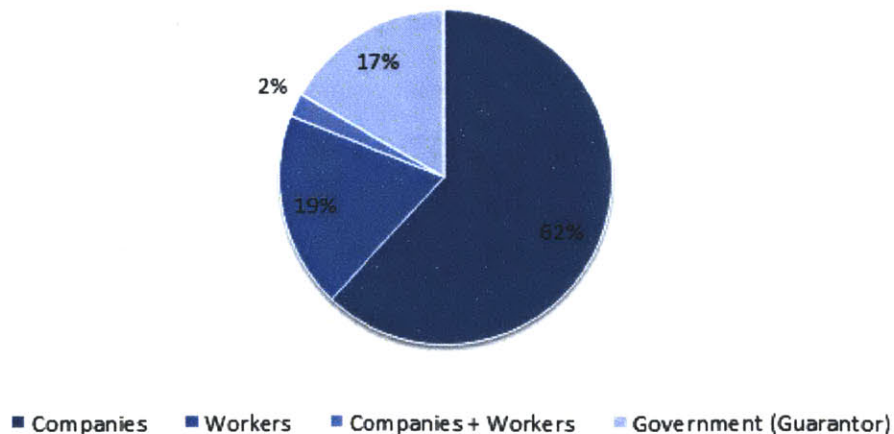


Figure 1: 2010 efforts among the social security pillars (RGPS) Source: Ministry of Social Security,

<http://www.previdenciasocial.gov.br>

In 2010, the 17% of government share participation as guarantor of the system represented R\$ 42.9 billion. But adding other costs that are not directly related to the RGPS pension calculation such as: INSS employees' salaries and other social benefits the government expenses with the system reach R\$ 73 billion.

However the chart above is expected to change between 2012 and 2014. During this period, companies from 15 sectors will have their contribution to the RGPS reduced from 20% to 2%. According to Brazilian Ministry of Finance, this measure is expected to reduce the companies contribution to the RGPS by R\$ 7,2 billion per year¹⁰, increasing the government deficit by the same amount each year.

Special Welfare Policy (RPPS)

The RPPS system was created in 1998 and already covers the public servants from 26 states, the federal district and over 30% of the totality of 5,563 municipalities. According to the legislation, the deficits of the RPPS should be covered by the states and municipalities.

There are more than 2,000 different RPPS in Brazil, so we cannot describe a general rule for all of them. We will use as example the Federal Government Special Welfare Policy (before the approval of the Funpresp), which is the largest and most relevant system under the RPPS system.

- **Companies (in this case the government):** The contribution of the Federal Government is equivalent to double its employees' contribution, totaling 22% of the salary per month. This value varies substantially across different RPPS systems but the law imposes a minimum contribution of 11%.
- **Employees:** The contribution for federal employees is 11% of their salary. Retired employees contribute with 11% of their benefits over the INSS ceiling. The value of the employee

¹⁰ Valor Econômico – April 4th, 2012:

<https://conteudoclipingmp.planejamento.gov.br/cadastrros/noticias/2012/4/5/desoneracao-agrava-deficit-da-previdencia>

contribution is normally between 10-14%, varying much less than the value of the government contribution.

- **Government:** The government acts once again as the guarantor of the social security system. The contribution of the government is basically the difference between the total benefits owned and the total revenues earned. In this case the responsibility varies across Municipalities, Cities, States and others.

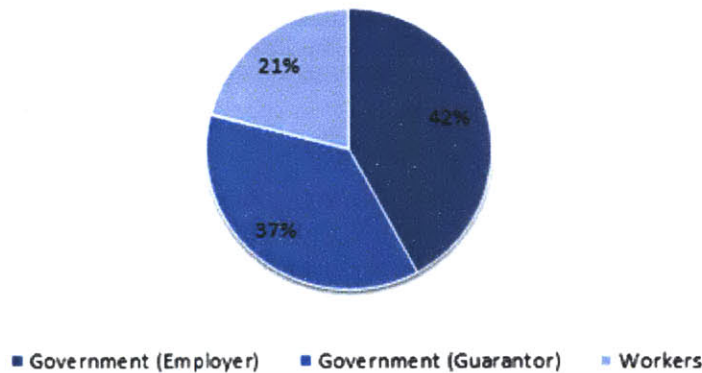


Figure 2: 2010 efforts among the social security pillars (RPPS) Source: Ministry of Social Security, <http://www.previdenciasocial.gov.br>; Chart by the author assuming government contributes with 2/3 of the RPPS revenues

Fitch estimates that the consolidated pension-related expenditures of states doubled in the last five years corresponding to 33.2% of total expenditures and more than a third of total revenues combined.¹¹ Even though there are several requirements to regulate and control the RPPS, most of the participants do not comply with the requirements. The biggest issue with the system is the lack of transparency, which makes it extremely hard to estimate the current actuarial deficit and future implications of the system for the country's budget.

¹¹ Fugulin, Paulo ; Goncalves, Maria R, The Pension System in Brazil: Challenges to Subnationals (<http://www.fitchratings.com/>)

Recently, Rio de Janeiro among other states presented estimates about their current actuarial deficit and introduced stricter investment policies. Despite the recent progress, the number of independent RPPS systems decelerates the speed of changes.

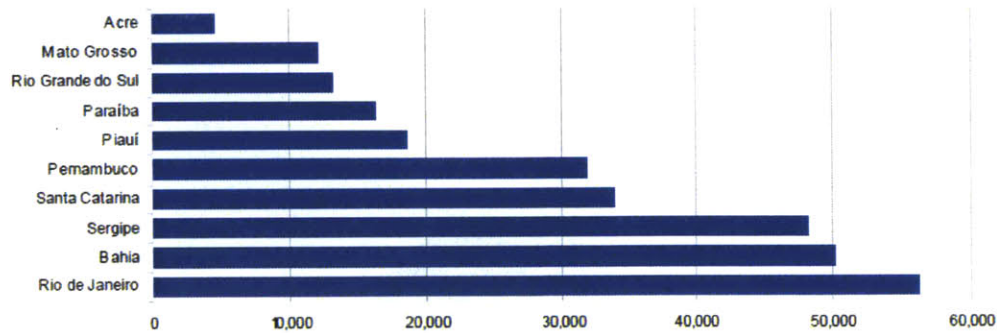


Figure 3: RPPS – Actuarial Deficit (BRL million) October 2011 Source: Fugulin, P. & Goncalves, M.R. (2012) “The Pension System in Brazil: Challenges to Subnationals.” Fitch Ratings

Complementary Welfare Policy (RC)

In the second part of this thesis, I will present in detail the discussion about the Brazilian Complementary Welfare Policy. At this point it is important to understand the RC in relation to the balance of the three pension pillars.

- Companies:** Larger companies have their own Pension Funds but most of them have different plans to manage. Historically, companies offered Defined Benefit plans (DB), which proved to be the wrong model and are not offered anymore. Now most companies offer employees Defined Contribution Plans that are managed by the company’s pension fund managers or third party banks. The inheritance of the DB still represents a significant burden to many companies, especially with the decline of interest rates that are requiring fund managers to take more risk to achieve the same level of returns. Typically, companies match employee contributions up to a certain level (around 10%) and the Complementary Welfare Policy is being used as a Human Resource tool to attract and keep employees in the company. The trend in the industry is that

companies will offer more and more DC managed by banks to avoid the strict regulation and high costs of having their own pension fund management teams.

- **Employees:** The Complementary Welfare Policy is optional for the employees. To encourage employees to save and invest in Complementary Welfare Systems the government offers a number of fiscal benefits that we will detail in the next section of the thesis. The change from DB to DC policy makes the employee bear all the risk of the investment so the contribution and asset management of the companies are now very relevant in the recruiting process.
- **Government:** The Sao Paulo Government launched the first public complementary fund in 2011¹² and recently the federal government created Federal Employees Complementary Welfare Fund (Funpresp). The Funpresp will be a DC plan with the employees bearing all the risks of future performance. The government will match employees' contribution up to 8.5% of the difference between the employee's salary and the INSS Cap.

e. Description of the informal sector

The continued growth of the Brazilian economy, which recently surpassed Britain's to become the world's sixth largest economy in the world, directly impacted the country's informal sector.

According to the most recent Labor Market Report produced by the Institute for Applied Economic Research (IPEA) from 2008 to September 2011, the percentage of informal workers dropped from 40% to nearly 35% of the total working population.¹³

The drastic reduction in only three years is very encouraging and can be explained from different perspectives:

- According to Rafael Mello and Professor Daniel Santos¹⁴ from IBMEC, the increase in formal the labor force is related to the entrance in the market of a more qualified and educated generation;

¹² Valor Economico : <http://www.valor.com.br/politica/1137234/sp-e-o-1>

¹³ Mercado de Trabalho: Conjuntura e Analise (2012), IPEA, Ano 17, Fevereiro 2012

¹⁴ Mello, R. & Santos, D. (2009) "Aceleracao Educacional e a Queda Recente da Informalidade." Mercado de Trabalho Conjuntura e Análise -IPEA, Volume 39, Pages 27-35

- Entrepreneurs/Employees are also moving to the formal sector to have access to the growing and attractive credit market;
- FGV's Professor Fernando de Holanda Barbosa Filho attributes the drop in the informal sector to the modernization of the economy. He mentions that a friendly business environment with less bureaucracy and easy tax reports stimulates the formalization of the economy.¹⁵

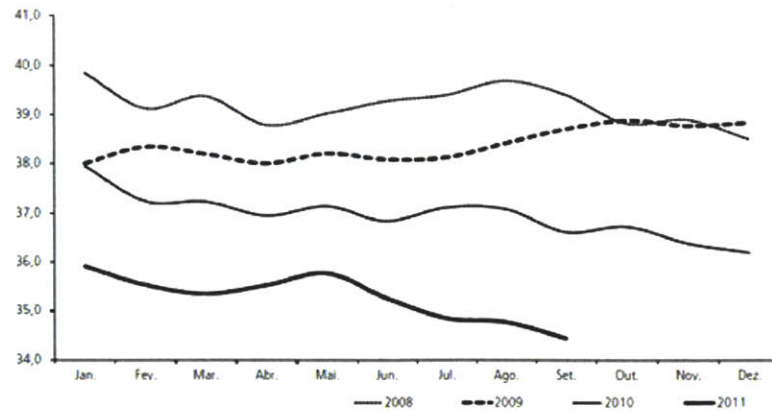


Figure 4: Informal Sector Evolution (%) Source: IPEA – Brazilian Labor Market Report, Nov 2011

Recent studies from FGV University and ETCO Institute point out that the informal sector represented 17.2% (R\$ 653,417 Bi) of the Brazilian GDP in 2011, very encouraging since in 2003 it corresponded to 21% of the Brazilian GDP.

In the 2010 Census, IBGE analyzed the evolution of Brazilian informal market from 2000 to 2010 in terms of the numbers of workers. The number of employees covered by the social security grew from 63,3% of the employee population to 71,5% of the employee population, which includes employees covered by RGPS and RPPS systems.¹⁶

In 2011, the informal sector percentage of the Brazilian GDP dropped only 0.5% compared to the 2010 number. The decrease in the speed of the formalization is probably caused by the impact of the global crisis on the Brazilian economy.

¹⁵ Veja Magazine: <http://veja.abril.com.br/noticia/economia/economia-informal-representa-18-3-do-pib-do-brasil>

¹⁶ O Globo Newspaper Articles : <http://oglobo.globo.com/economia/crise-global-diminui-ritmo-de-reducao-de-informalidade-no-brasil-3360269> and <http://oglobo.globo.com/economia/a-decada-do-emprego-formal-4761313>

However, the informal sector in Brazil is still very large. The average of developed economies informal sector is approximately 10% of the GDP. Moreover, the value of the informal sector economy in Brazil is equal to the Argentinian GDP and twice the Chilean GDP.

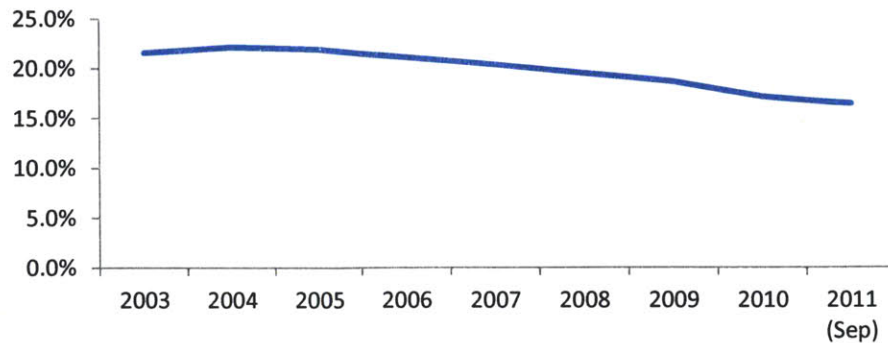


Figure 5: Informal Sector % in Urban Areas Source: IPEA – Brazilian Labor Market Report, Aug 2011

f. Demographic changes analysis^{17 18 19}

For many years Brazil and most of the emerging markets were considered young countries because of their demographic profile. The reduction in the global fertility rate and increase in life expectancy are rapidly changing the demographic profile of some of the largest emerging market countries, including China and Brazil.

The population age pyramids from the Brazilian 2008 IBGE’s Census (Revised in 2010) below indicate that the Brazilian population is aging faster than predicted, forcing the government to review all Social Security Policies to adapt them to the new demographic reality of the country.

¹⁷ IBGE - Brazilian Institute for Geography and Statistics, <http://www.ibge.gov.br/english/>

¹⁸ Giambiagi, F., & Tafner, P. (2010). Demografia a ameaça invisível: O dilema previdenciário que o Brasil se recusa a encarar, Rio de Janeiro : Elsevier

¹⁹ da Silva, V.C. (2009) “Brazilian population ageing: household conditions and family support.” Universidade Federal de Minas Gerais available at: <http://iussp2009.princeton.edu/download.aspx?submissionId=91615>

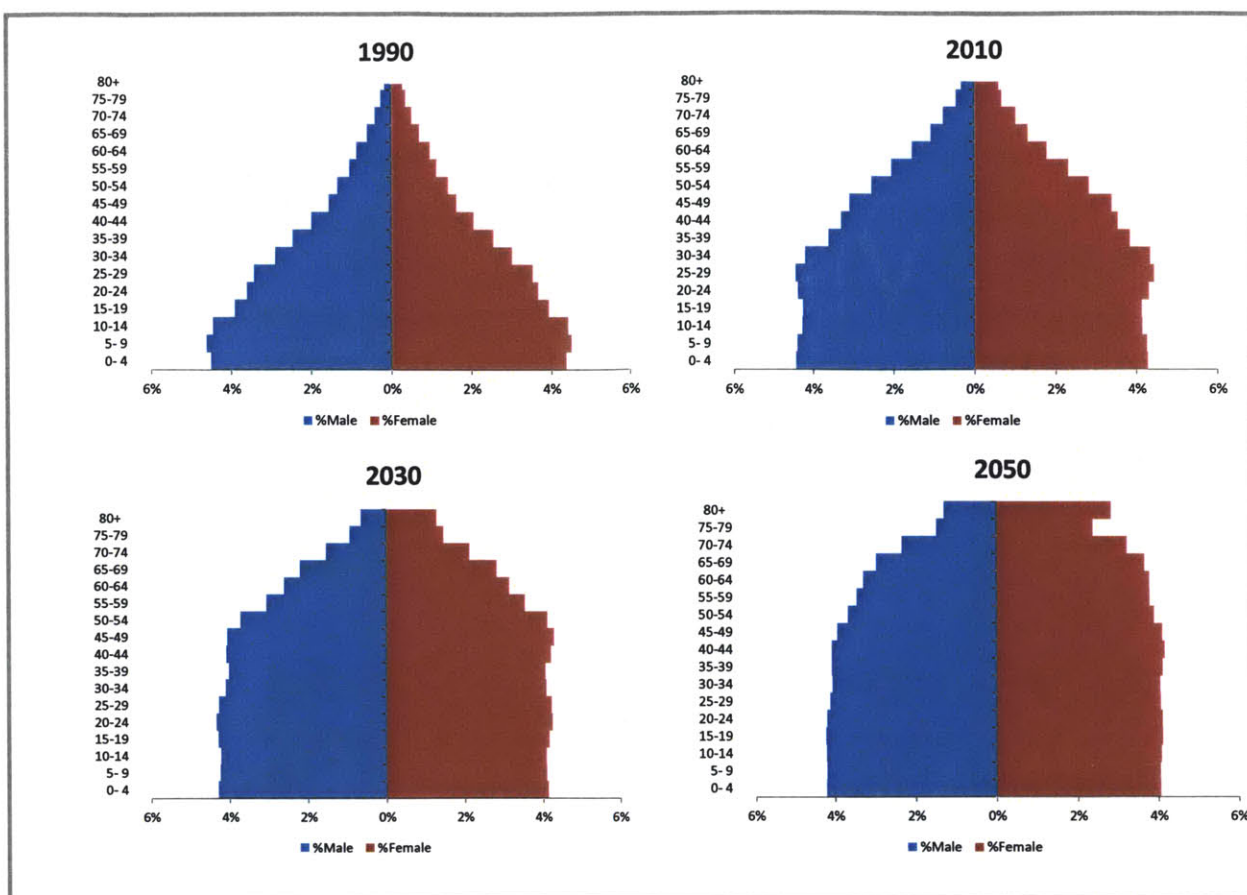


Figure 6: Population age pyramids from the Brazilian 2008 IBGE's Census (Revised in 2010) Source:

IBGE - Brazilian Institute for Geography and Statistics, <http://www.ibge.gov.br/english/>

According to IBGE Census' projections, the young population (0-14Y) is expected to decrease at a rate of 0.10% yoy from 2010 to 2050; during the same period the elder population (+60Y) is expected to grow at a rate of 2.67% yoy.

Table 4: Average growth rate

Period	0-14Y	15-59Y	60Y+	Total Population
2000-2010	0.04%	1.44%	3.39%	1.22%
2010-2020	-0.10%	0.78%	3.75%	0.88%
2020-2030	-0.18%	0.37%	3.13%	0.63%
2030-2040	0.00%	0.02%	2.30%	0.42%
2040-2050	-0.11%	-0.10%	1.51%	0.23%
2010-2050	-0.10%	0.27%	2.67%	0.54%

Source: IBGE - Brazilian Institute for Geography and Statistics, <http://www.ibge.gov.br/english/>

The same Census indicates that the elderly population in Brazil reached 18.2 million people or 9.5% of the population in 2010. By 2050 the elderly population is expected to nearly triple, reaching 52.2 million people or 22% of the population.

Table 5: % of Total population

Year	60Y+	65Y+	80Y+
2010	9%	6%	1%
2020	13%	9%	1%
2030	16%	13%	2%
2040	19%	16%	2%
2050	22%	20%	3%

Source: IBGE - Brazilian Institute for Geography and Statistics, <http://www.ibge.gov.br/english/>

A relevant data piece of to understand the consequences of the demographic changes to the Social Security System is the ratio of Retired Population (+65Y) / Active Population (15-59Y). One must remember that in the current system the active population is responsible for funding the benefits of retirees with the government and private sector. The ratio is expected to change from 9.1% in 2010 to 25.5% in 2050, putting a lot of pressure on the government to secure the sustainability of the social security under the current model.

As we mentioned in the previous chapter, in Brazil women preserve the right to retire five years before men. At the same time, women life expectancy is higher than men. The IBGE's Census revealed that the difference in life expectancy between women and men increased during the last ten years, adding a layer of pressure to the current Social Security System. The table below summarizes the increase in life expectancy difference between women and men from 2000 to 2010. Additionally, the 2010 IBGE's Census revealed that in the last ten years women's income increased three times more than men's income. Currently, women's wages are on average 73,8% of men's wage.²⁰

²⁰ O Globo newspaper article: <http://oglobo.globo.com/economia/renda-das-mulheres-cresce-tres-vezes-mais-que-dos-homens-4761290>

Table 6: Women and men life expectancy difference

Year	0Y	20Y	40Y	60Y	70Y
2000	7.7	6.8	4.7	2.9	1.9
2001	7.7	6.8	4.8	2.9	1.9
2002	7.6	6.8	4.8	2.9	2
2003	7.6	6.8	4.9	3	1.9
2004	7.6	6.8	4.9	3.1	2
2005	7.6	6.8	4.9	3.1	2
2006	7.6	6.7	5	3.1	2.1
2007	7.6	6.8	5	3.2	2.1
2008	7.6	6.8	5	3.2	2.2
2009	7.6	6.7	5	3.3	2.2
2010	7.6	6.7	5.1	3.4	2.3

Source: IBGE - Brazilian Institute for Geography and Statistics, <http://www.ibge.gov.br/english/>

g. Analysis of possible levers of change to better distribute the weight across the three pillars

Table 7, prepared by OECD, exposes all the worries concerning the Brazilian public expenditures with pension funds given the dramatic demographic changes the country is expected to face in the years ahead. Brazil, which is still a young country, spends much more on pension funds than more mature and aged countries. Currently the spending is around 8.5% but this number is expected to double by 2050.

Table 7: Projections of public expenditure on pensions, 2007-60

	2007	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
OECD countries												
Australia	3.6	3.6	3.6	3.7		4.3		4.7		4.9		
Austria	12.8	12.7	12.8	13.0	13.4	13.8	13.9	13.9	14.0	14.0	13.9	13.6
Belgium	10.0	10.3	10.9	11.8	13.0	13.9	14.4	14.6	14.7	14.7	14.8	14.7
Canada	4.6	5.0	5.4	5.8	6.3	6.6	6.6	6.5	6.4	6.3	6.3	6.2
Chile												
Czech Republic	7.8	7.1	6.9	6.9	7.0	7.1	7.6	8.4	9.4	10.2	10.8	11.0
Denmark	9.1	9.4	10.2	10.6	10.5	10.6	10.5	10.4	10.0	9.6	9.3	9.2
Estonia	5.6	6.4	6.2	5.9	5.8	5.6	5.4	5.4	5.3	5.3	5.2	4.9
Finland	10.0	10.7	11.8	12.6	13.4	13.9	13.9	13.6	13.4	13.3	13.3	13.4
France	13.0	13.5	13.5	13.6	13.9	14.2	14.5	14.4	14.3	14.2	14.1	14.0
Germany	10.4	10.2	10.1	10.5	11.0	11.5	11.9	12.1	12.2	12.3	12.5	12.8
Greece	11.7	11.6	12.2	13.2	14.8	17.1	19.4	21.4	23.0	24.0	24.3	24.1
Hungary	10.9	11.3	10.9	11.0	10.9	11.0	11.4	12.2	12.7	13.2	13.7	13.8
Iceland		4.0								6.9		
Ireland	4.0	4.1	4.3	4.6	5.0	5.4	5.8	6.4	7.1	8.0	8.4	8.6
Israel												
Italy	14.0	14.0	14.0	14.1	14.3	14.8	15.2	15.6	15.4	14.7	14.2	13.6
Japan												
Korea	0.6	0.9	1.1	1.4	2.0	2.5	3.1	3.9	4.8	5.5	6.0	6.5
Luxembourg	8.7	8.6	8.9	9.9	12.1	14.2	16.6	18.4	20.7	22.1	23.7	23.9
Mexico		2.4								3.5		
Netherlands	6.6	6.5	7.2	7.8	8.4	9.3	10.0	10.3	10.3	10.3	10.4	10.5
New Zealand	4.0	4.7	4.8	5.3	5.9	6.7	7.3	7.7	7.8	8.0		
Norway	8.9	9.6	10.8	11.5	12.0	12.7	13.2	13.4	13.4	13.3	13.5	13.6
Poland	11.6	10.8	9.6	9.7	9.7	9.4	9.3	9.2	9.1	9.1	9.0	8.8
Portugal	11.4	11.9	12.1	12.4	12.6	12.6	12.3	12.5	12.8	13.3	13.1	13.4
Slovak Republic	6.8	6.6	6.3	6.3	6.9	7.3	7.8	8.3	8.8	9.4	9.9	10.2
Slovenia	9.9	10.1	10.6	11.1	12.0	13.3	14.7	16.1	17.3	18.2	18.6	18.6
Spain	8.4	8.9	9.2	9.5	10.1	10.8	11.9	13.2	14.6	15.5	15.6	15.1
Sweden	9.5	9.6	9.5	9.4	9.4	9.5	9.5	9.4	9.1	9.0	9.2	9.4
Switzerland	6.4	6.3	6.6	6.8	7.5	8.1	8.6	8.6	8.8	8.6		
Turkey		7.3								11.4		
United Kingdom	6.6	6.7	6.8	6.9	7.2	7.6	7.8	8.0	7.9	8.1	8.6	9.3
United States	4.3	4.6	4.8	4.9	4.9	4.9	4.9	4.8	4.8	4.8	4.7	4.7
OECD28		8.4	8.6	8.9		10.0		10.8		11.4		
Other major economies												
Argentina		5.9								8.6		
Brazil		8.5								15.8		
China		2.2								2.6		
India		1.7								0.9		
Indonesia		0.9								2.1		
Russian Federation	5.2	7.9		7.3		6.4		6.1		6.0		
Saudi Arabia		2.2								7.1		
South Africa	1.1	1.3	1.7	1.8	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.4
EU27	8.9	9.1	9.2	9.6	10.0	10.6	11.1	11.6	12.1	12.5	12.8	12.9

Source: OECD (2011) "Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries." (www.oecd.org/els/social/pensions/PAG)

So the Brazilian government knows that it will need to make reforms on the pension system to avoid the budget's collapse.

- **RGPS:** There are currently no laws to be voted or discussions in the Brazilian congress about potential changes in the RGPS system to reduce to government deficit. However, academics and market practitioners are divided in two main discussion groups:
 - **Parametrical Changes:** The majority of academics argue that structural changes in the system would not have the government support and would be extremely hard to get approved. This group believes the most effective way to reduce the RGPS government deficit is promoting parametrical changes such as: increasing minimal retirement age, changing retirement system to include gender equality and reducing some of the benefits.
 - **Structural Changes:** A group of academics and market practitioners led by IBMEC (Brazilian Institute of Capital Markets) believe that the system needs structural changes to be sustainable in the long run. They propose a series of changes but the most important is the creation of a two pillar RGPS system: one similar to the current INSS but with a cap aggressively reduced to R\$ 1,245 and the other pillar, for employees earning between R\$ 1,245 and the current INSS Cap, a Defined Contribution plan supported by employers and employees.
- **RPPS:** The approval of the Funpresp and other complementary funds is expected to increase household savings and reduce the burden of the government on the system. According to the Social Security Minister, Garibaldi Alves Filho, the expectation is that the new legislation will reduce the current deficit of R\$ 57 billion to R\$ 18 billion in the next 40 years.²¹

²¹ IstoeDinheiro

(http://www.istoedinheiro.com.br/noticias/66931_GOVERNO+PODE+PEDIR+REGIME+DE+URGENCIA+PARA+FUNPRESF)

2. Private Market and Investment Strategies

The Brazilian Private Pension Fund Market

The ultimate mark of the Brazil Complementary Welfare System was fixed with the edition of Complementary Law no. 109, of May 29th, 2001. The Brazilian Complementary Welfare is held on two pillars:

1. **Open Entities:** For-profit organizations offering different kinds of retirement plans to the population. There are two basic types of pension plans:
 - **PGBL - Plano Gerador de Benefícios Livre (Free Benefit Generator Plan):** First sold in 1998, it is the first defined contribution pension plan sold in the country. PGBL plans are generally recommended for investors who have taxable income, since it allows for a deferral of up to 12% of the annual taxable income, on a pre-tax basis. The income tax is levied on the withdrawal's total value (principal plus capital gains) as determined in the applicable legislation.
 - **VGBL - Vida Gerador de Benefícios Livre (Free Benefit Generator Life Plan):** VGBL plans are recommended to exempt individuals; investors who do not incur withholding tax, or who already contribute 12% of their annual taxable income to a PGBL plan and wish to contribute more to a retirement plan. The contributions made to a VGBL are not deductible yearly but only the capital gains are taxed upon redemption.

Like the typical pension funds both consist of two phases: investment period and benefit period. There are additional incentives for investing in those plans.²²

²² Fram Capital Website, <http://www.framcapital.com/en/private-pension>

- **Estate Planning:** Selection of beneficiaries may be altered at any time and if the investor passes away or becomes disabled the resources are made available immediately to the beneficiaries.
- Investors may choose between two tax systems:
 - **Progressive:** Under the progressive system, different tax brackets apply depending on the amount withdrawn, in accordance with the applicable Monthly Progressive Income Tax Table for individual investors. Upon withdrawals, a 15% flat tax rate is levied. This amount may then be adjusted if applicable when filing for year-end taxes. Retirement benefit payments are excluded from this condition.
 - **Regressive:** Under the regressive system, the accumulation period is considered and participants are subject to decreasing rates in accordance to the table below:

<u>Accumulation Period Income</u>	<u>Tax rate</u>
Less or equal to two years	35%
2 - 4 years	30%
4 - 6 years	25%
6 - 8 years	20%
8 - 10 years	15%
More than 10 years	10%

The tax is withheld at the source and may not be compensated in the year-end tax filing. The table applies to both withdrawals and payment of benefits.

Most of the product innovation depends on the government approval, making the process very bureaucratic and slow. For example, there are three very promising products that have been pending to be approved by the government for more than four years. Those products are:

- **Micro-Insurance** targets the low income population, which are vulnerable to numerous perils, including illness, accidental death and disability, loss of property due to theft or fire, agricultural losses, and disasters of both the natural and manmade varieties. Micro-insurance could reach 100 million people according to some researchers but there are many issues to be debated. One professional of the industry argued that the processing fees for the micro-insurance would be higher than the premium in some cases. In debate for more than four years the project is expected to be approved in 2013.
 - **VGBL Health** is a hybrid of health insurance and retirement plan. Inspired by the American Health Savings Account (HAS), the project was designed to help investors to accumulate reserves to pay for the high costs of healthcare during their retirement period. Additionally, the project includes fiscal benefits for both employees and employers: companies' expenses with the fund will be tax deductible and workers' medical expenses will be tax exempt. Specialists believe the project will be approved in 2012.
 - **VGBL Education** is similar to the VGBL Health but the objective is to allow investors to accumulate reserves to pay for their dependents' studies. The project discussions are evolving very slowly so its approval is not expected in the near future.
2. **Closed Entities:** Non-profit organizations also known as Pension Funds. In general, the pension funds receive contributions from the participants and respective sponsor, being, eventually, able to receive contributions only from the latter. With the introduction of Complementary Law no.109/2001, the eventual deficits in the Defined Benefit and Variable Contribution plans must be covered in a proportional way between sponsor and participant.

a. What is the size of the complementary pension funds industry in Brazil?

In our measurement of the size of the Brazilian complementary pension fund sector we will keep separated closed and open entities. Given the difference among incentives, regulation and players among both entities we believe the separation will provide more insights about the current state and potential of the private industry in Brazil.

Table 8: Coverage of private pension schemes by type of plan, 2009

(As a % of working age population (16-64 years))

	Mandatory/ quasi- mandatory	Voluntary			Mandatory/ quasi- mandatory	Voluntary		
		Occupational	Personal	Total		Occupational	Personal	Total
OECD members								
Australia ^{1, 2, 3}	68.5	..	..	..	
Austria	n.a.	12.1	25.7	..				
Belgium ²	n.a.	38.5	..	..		
Canada ²	n.a.	33.9	35.1	52.6				
Chile	74.8	..	..	..	
Czech Republic	n.a.	n.a.	60.2	60.2				
Denmark	ATP: -70.0 QMO: -59.0	n.a.	..	..		
Estonia	65.0	n.a.	..	..		
Finland	-100.0	7.4	21.3	28.8				
France ⁴	n.a.	3.5	7.0	..				
Germany ⁵	n.a.	32.2	29.9	..				
Greece	n.a.	0.2	..	..		
Hungary	43.6	n.a.	19.2	19.2				
Iceland ³	82.5	n.a.	..	..		
Ireland	n.a.	28.6	10.5	37.6				
Israel	35.2	..	..	..	
Italy	n.a.	7.5	5.5	12.8				
Japan	n.a.	..	..	..	
Korea	n.a.	18.8	12.2	..				
Luxembourg	n.a.	3.4	..	..		
Mexico	50.2	1.5	0.1	1.6				
Netherlands	69.3	n.a.	..	..		
New Zealand	..	9.1	42.9	..				
OECD members (cont.)								
Norway	..	..	..	..			22.0	..
Poland	53.0	1.2	..	..			..	..
Portugal	n.a.	4.3	..	..			..	..
Slovak Republic	36.5	n.a.	21.8	21.8			..	..
Slovenia ⁶	n.a.	..	..	..			..	48.2
Spain	n.a.	7.0	28.1	..			..	..
Sweden ³	PPM: -76.0 QMO: -68.0	n.a.	..	..			..	..
Switzerland ²	70.1	n.a.	..	..			..	..
Turkey	..	0.5	4.2	4.7			..	..
United Kingdom ⁷	n.a.	49.1	18.1	..			..	..
United States ³	n.a.	32.8	24.7	41.1			..	..
Other major economies								
Argentina	..	n.a.	..	..			..	..
Brazil ⁸	n.a.	2.0	6.1	..			..	..
EU27	..	..	..	..			..	..
China	..	..	..	..			..	..
India	..	..	..	..			..	..
Indonesia	..	..	..	..			..	..
Russian Federation ³	..	5.4	..	..			..	..
Saudi Arabia	..	..	..	..			..	..
South Africa ⁸	n.a.	23.4	..	..			..	..

Source: OECD (2011) "Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries." (www.oecd.org/els/social/pensions/PAG)

Closed Entities

According to ABRAPP²³ (Brazilian Association of Closed Pension Funds), the Brazilian Closed Entities currently manages R\$ 545 billion and there are approximately 2.15 million active contributors and 664,500 beneficiaries. Even though the Brazilian pension fund industry is among the top 10 in the world in terms of assets under management, the current number represents approximately 15% of the country's GDP. The table below extracted from OECD's

²³ ABRAPP (2011), Boletim Estatístico Mar-2011 available at <http://www.abrapp.org.br>

Pensions at a Glance 2011²⁴ report allows us to compare the percentage of GDP of Brazil and other countries. In the Netherlands for example the rate of pension fund assets to GDP is 129.8%, demonstrating the potential of the Brazilian industry in the long run, if well managed.

Table 9: Assets in pension funds and public pension reserve funds in OECD countries, 2009
(As a % of GDP in MM USD)

	Pension funds		Public pension reserve funds			Pension funds		Public pension reserve funds	
	% of GDP	USD	% of GDP	USD		% of GDP	USD	% of GDP	USD
OECD members					OECD members (cont.)				
Australia	82.3	808 224	5.9	51 629	Norway ⁷	7.3	27 852	5.0	18 963
Austria	4.9	18 987	n.a.	n.a.	Poland	13.5	58 143	0.5	2 343
Belgium ¹	3.3	16 677	5.0	23 480	Portugal	13.4	30 441	5.7	13 068
Canada	62.9	806 350	8.5	108 627	Slovak Republic ¹	4.7	4 640	n.a.	n.a.
Chile	65.1	106 596	2.1	3 420.8	Slovenia	2.6	1 266	n.a.	n.a.
Czech Republic	6.0	11 332	n.a.	n.a.	Spain	8.1	118 056	5.7	83 387
Denmark ²	43.3	133 980	n.a.	n.a.	Sweden ^{1, 8}	7.4	35 307	27.2	108 785
Estonia	6.9	1 371	n.a.	n.a.	Switzerland ¹	101.2	496 957	n.a.	n.a.
Finland	76.8	182 286	n.a.	n.a.	Turkey	2.3	14 017	n.a.	n.a.
France ^{1, 3}	0.8	21 930	4.3	118 669	United Kingdom ⁹	73.0	1 589 409	n.a.	n.a.
Germany ⁴	5.2	173 810	n.a.	n.a.	United States	67.6	9 583 968	17.9	2 540 348
Greece	0.0	63	n.a.	n.a.	OECD34	67.6	16 777 792	19.6	4 642 111
Hungary	13.1	16 886	n.a.	n.a.	Other major economies				
Iceland	118.3	14 351	n.a.	n.a.	Argentina ¹⁰	11.5	30 105	n.a.	n.a.
Ireland	44.1	100 278	13.7	31 049	Brazil¹⁰	17.1	224 218	n.a.	n.a.
Israel	46.9	95 257	n.a.	n.a.	EU27	..	..	n.a.	n.a.
Italy	4.1	86 818	n.a.	n.a.	China ¹⁰	0.6	19 980	n.a.	n.a.
Japan ⁵	25.2	1 042 770	25.8	1 308 704	India	5.4	61 971	n.a.	n.a.
Korea	2.2	29 632	26.1	217 768	Indonesia	2.2	9 614	n.a.	n.a.
Luxembourg	2.2	1 171	n.a.	n.a.	Russian Federation ¹¹	1.5	14 987	n.a.	n.a.
Mexico	7.5	107 135	0.3	3 605	Saudi Arabia	..	..	n.a.	n.a.
Netherlands	129.8	1 028 077	n.a.	n.a.	South Africa ¹⁰	58.4	165 630	n.a.	n.a.
New Zealand ⁶	11.8	13 755	7.1	8 265					

Source: OECD (2011) "Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries." (www.oecd.org/els/social/pensions/PAG)

ABRAPP also provides an interesting insight about the evolution of the portfolio asset allocation of Brazilian Closed Entities, exposed in the Figure 7.

²⁴ OECD (2011) "Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries." (www.oecd.org/els/social/pensions/PAG)

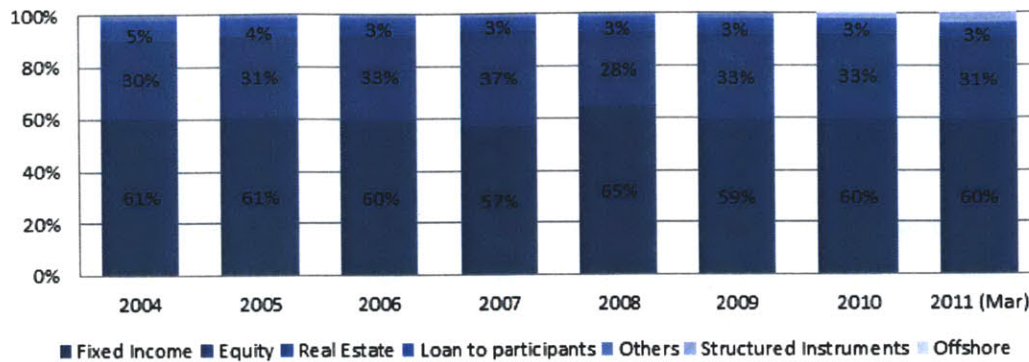


Figure 7: Closed Entities Asset Allocation Source: ABRAPP (2011), Boletim Estatístico Mar 2011 available at <http://www.abrapp.org.br>

The allocation is very stable across the years with a major concentration in fixed income instruments. Nonetheless, the equity allocation is very substantial (around 30%) but discussing the subject with pension fund managers, they think the equity percentage is overvalued.

They explained that the closed entities market is very concentrated with the top 4 institutions concentrating nearly 50% of the assets. The larger pension funds hold big stakes of ordinary equity of some companies, which in the managers' opinion makes the chart misleading.

Even though the assets under management of the Closed Entities grew from R\$ 256 billion in 2004 to R\$ 545 billion in March 2011 the prospects of the industry are not very appealing.

There are some reasons for that:

- Regulation Costs:** The requirements of the PREVIC (commission that regulates the closed entities) increased a lot. To comply with all the requirements, closed entities were forced to nearly double the workforce. Consequently the costs of managing the pension funds increased at the same pace. Managers mentioned the necessity of creating an internal auto-regulation area to avoid fines and delays in the documentation required by the regulator. Some believe that the PREVIC went too far in its requirements and expect a better balance for the future to stimulate the industry.

- New risk environment:** Most of the Defined Benefits funds have an actuarial target rate of 6% + inflation. As many managers mentioned, the 6% have been the Brazilian “magic” number for DB plans for a long time. The data from ABRAPP confirms our empirical analysis, since more than 61% of the DB plans holds the 6% actuarial target. This reality is challenged by the current and predicted decline in Brazilian real interest rates. Before, the target was easily achieved by buying government bonds but with the real interest rate declining, the pension funds using 6% of actuarial target rate will have two options: take more risk or adjust the rate to the new environment and be rescued by the sponsors and beneficiaries.

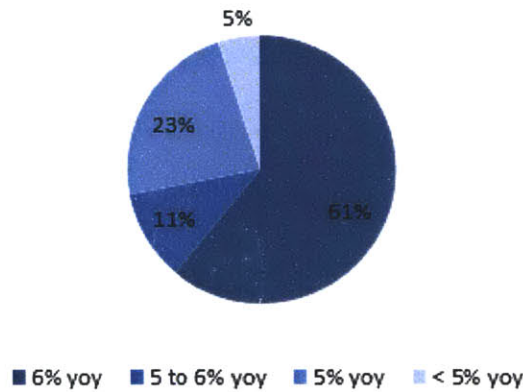


Figure 8: Actuarial Target Rate of DB Plans Source: ABRAPP (2011), Boletim Estatístico Mar 2011

available at <http://www.abrapp.org.br>

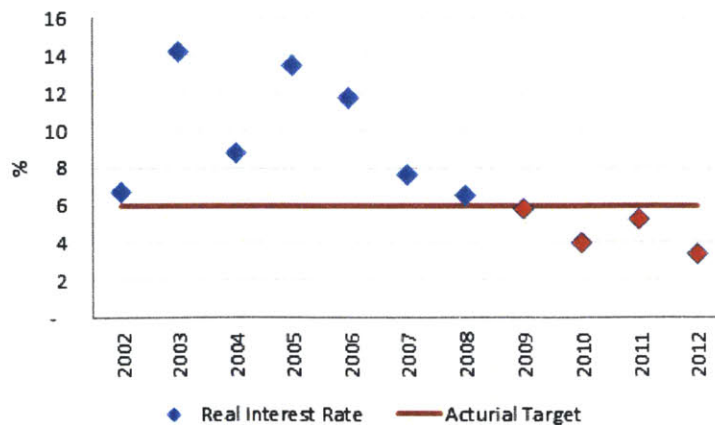


Figure 9: Brazilian Real Interest Rate Evolution Source: IPEADATA, <http://ipeadata.gov.br>

- **Liabilities:** Historically the Brazilian justice has been tilted towards the workers in most trials. Judicial losses accumulated by the companies generate a series of problems in the management of the fund and the possible future liabilities. So the provisions for this type of loss should be increased in many cases.

Currently there are some trends in the industry:

- Companies are not opening their own closed pension funds anymore. They are now offering employees' open private pension funds, managed by banks and insurance companies.
- Some of the largest pension funds such as Petros are now offering their own service to other companies. This multi-sponsored pension plan has the advantage to lever the existent and required structure of a large pension fund, adding value and reducing costs for both firms. Even though this has seemed to be a trend, there are very few players in this market and we believe the vast majority will move to the open pension fund entities.

Open Entities

Renato Russo (VP of FenaPrevi) in a recent interview with the Cobertura Magazine ²⁵ mentioned that according to a 2009 report by Kantar Worldpanel only 4% of the Brazilian households invest in the Brazilian open pension plans. The breakdown of this number by income is not surprising: 10% of the households earning more than 10 minimum wages (Class A and B) invest, 4% of the households earning between 4-10 minimum wages invest and only 1% of the households earning between 1-4 minimum wages invest. Brazil changed a lot during the last three years but those numbers are important to give a sense of the low penetration and potential of the industry.

Even though the Open Entities Plans still have a very low penetration in the Brazilian population, the growth of the sector has been very solid. For example, according to the same article the

²⁵ Revista Cobertura
(http://www.revistacobertura.com.br/lermais_materias.php?cd_materias=86543&friurl=-Previdencia-privada-pode-custear-despesa-medica-na-aposentadoria-em-2012-:)

Closed Entities assets under management grew 135% from R\$ 240 billion in 2003 to R\$ 566 billion in March 2011. During the same period the Open Entities assets under management were multiplied by four, from R\$ 48 billion to R\$ 233 billion.

Below are important statistics provided by FenaPrevi²⁶ that summarizes the current state of the Open Entities Industry:

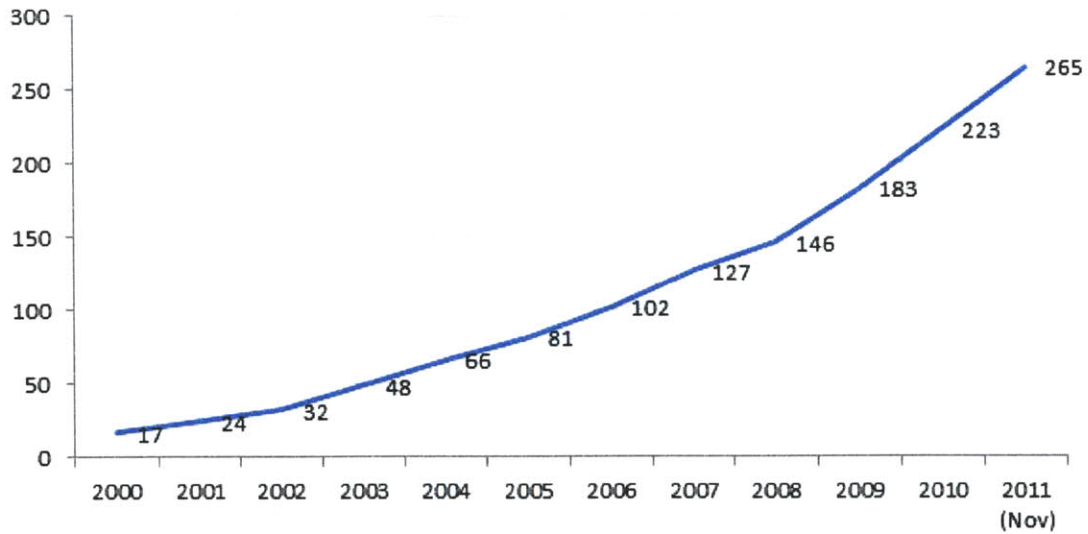


Figure 10: Open Entities AUM evolution Source: FenaPrevi (2011), Dados estatísticos – Nov 2011 available at <http://www.fenaprevi.org.br>

Figure 11 shows the breakdown of the industry by product reflecting a dominance of the VGBL products, with nearly 60% of the market share. The traditional plan reduction was already expected given that the new products offer more tax incentives to the investors and less liability to the sponsor.

²⁶ FenaPrevi (<http://www.fenaprevi.gov.br>)

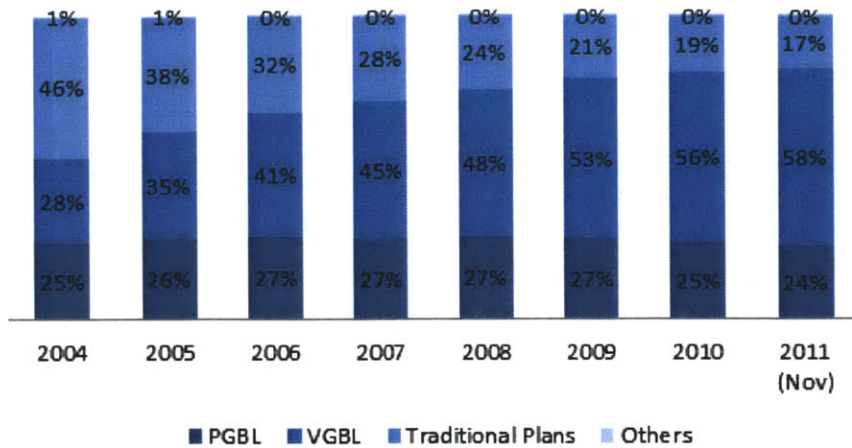


Figure 11: AUM by product Source: FenaPrevi (2011), Dados estatísticos Nov 2011 available at <http://www.fenaprevi.org.br>

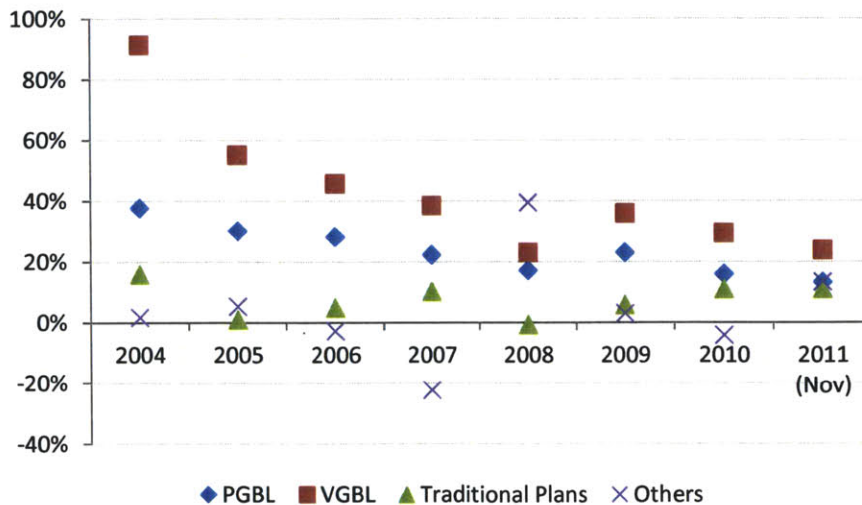


Figure 12: Annual AUM growth by product Source: FenaPrevi (2011), Dados estatísticos Nov 2011 available at <http://www.fenaprevi.org.br>

Table 10 shows the concentration of the industry; the top 6 players (all banks) hold 92.29% of market share. The only reason for this concentration is the massive distribution network of those banks, which makes the work for the independent insurance companies really hard.

The private pension fund products as we explained before are complex and require more sophisticated sales representatives to make sure the correct message and benefits are assimilated by the clients. In reality this is not what happens in the enormous institutions, where account managers, who are not always well prepared, offer products to clients with abusive fees and lack of explanation.

Table 10: Market Share Distribution

#	Institution	Mkt Share	Cumalitive Mkt Share
1	Bradesco	33.83%	33.83%
2	Itau	23.54%	57.37%
3	Banco do Brasil	18.04%	75.41%
4	Santander	7.55%	82.96%
5	Caixa	6.01%	88.97%
6	HSBC	3.32%	92.29%
7	Icatu	1.79%	94.08%
8	Sul America	1.41%	95.49%
9	Safra	0.87%	96.36%
10	Portoseguro	0.78%	97.14%
11	Outros	2.85%	100.00%

Source: FenaPrevi (2011), Dados estatísticos Nov 2011 available at <http://www.fenaprevi.org.br>

Combining the data of the IBGE 2010's Census and current market data, we can estimate the potential of the private pension market in Brazil.

Table 11: Economically Active Population by Number of Minimum Wage

Minimum Wage	Economically Active Population	% Economically Active Pop.	Cum
0	7,484,393	9%	9%
Up to 1	26,955,504	31%	40%
Between 1-2	27,578,607	32%	72%
Between 2-3	8,985,694	10%	83%
Between 3-5	6,991,107	8%	91%
Between 5-10	5,182,997	6%	97%
Between 10-20	1,811,010	2%	99%
Between 20+	741,497	1%	100%

Source: IBGE (2010), 2010 Census available at <http://www.ibge.gov.br>

To calculate Table 11 the IBGE used a minimum wage of R\$ 510,00 but since then the minimum wage was readjusted to R\$ 622,00. Figure 11 is used to give a better sense of the RGPS coverage and shows that currently the RGPS guarantees nearly full coverage for workers earning up to 6.30 minimum wages. This corresponds to more than 91% of the Brazilian economically active population, making the potential of the private pension industry limited to a number around 4-9% of the economically active population.

Figure 13 is a very good indicator of the potential growth of the private sector because the portion of the population that receives benefits up to the INSS is fully covered by the RGPS. The chart indicates a sharp decline in the INSS CAP / Minimum wage ratio from 8.9x in 2005 to 6.3x in 2012.

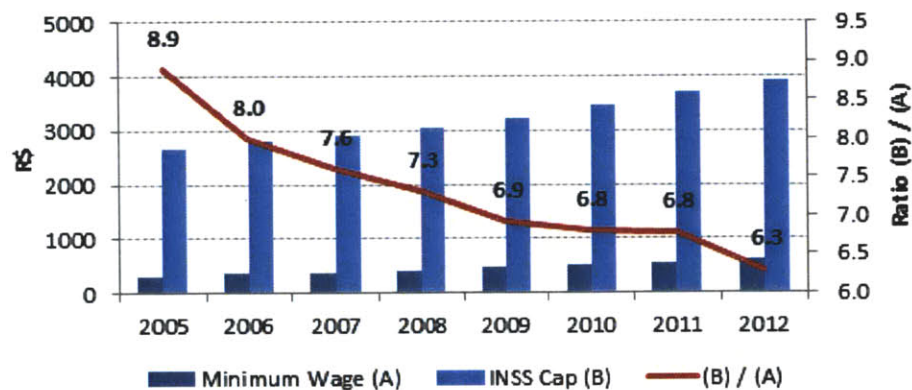


Figure 13: INSS Cap / Minimum Wage Ratio Source: Ministry of Social Welfare, <http://www.previdenciasocial.gov.br> and Portal Brasil, <http://www.portalbrasil.net>

According to OECD's Pension at a Glance 2011 report, compared to other countries, Brazil has one of the highest average net pension replacement rates²⁷ in the world.

²⁷ Definition of Net Pension replacement rate according to the OECD: The net replacement rate is defined as the individual net pension entitlement divided by net preretirement earnings, taking account of personal income taxes and social security contributions paid by workers and pensioners.

Table 12: Net pension replacement rates by earnings

	Individual earnings, multiple of mean for men (women where different)				Individual earnings, multiple of mean for men (women where different)				
	Median earner	0.5	1	1.5	Median earner	0.5	1	1.5	
OECD members					OECD members (cont.)				
Australia	65.9 (63.2)	82.5 (79.7)	58.9 (56.9)	47.1 (45.3)	Norway	62.3	81.7	62.2	51.4
Austria	89.9	91.3	89.9	84.6	Poland	68.2 (50.7)	68.1 (53.4)	68.2 (50.6)	68.3 (50.4)
Belgium	66.0	81.8	64.1	52.0	Portugal	65.5	73.4	69.2	70.5
Canada	61.5	88.7	57.3	39.7	Slovak Republic	72.9	68.3	74.5	76.7
Chile	66.0 (52.4)	74.4 (61.7)	64.3 (49.9)	62.7 (46.3)	Slovenia	90.2	82.5	85.4	86.2
Czech Republic	72.5	94.0	64.4	48.9	Spain	84.5	82.3	84.9	85.4
Denmark	94.5	131.9	89.8	80.8	Sweden	53.3	67.0	53.6	72.6
Estonia	63.1	73.4	58.3	51.4	Switzerland	66.4 (65.5)	78.6 (78.1)	64.1 (63.2)	46.2 (45.5)
Finland	64.8	72.0	65.2	64.4	Turkey	98.0	107.3	93.1	96.0
France	60.8	69.4	60.4	53.1	United Kingdom	48.0	67.5	41.5	30.5
Germany	58.4	55.6	57.9	57.2	United States	53.4	63.8	50.0	46.6
Greece	110.3	113.6	111.2	106.8	OECD34	72.0	82.8	68.8	63.4
Hungary	99.5	96.3	106.0	103.2	Other major economies				
Iceland	111.7	139.0	101.1	91.7	Argentina	94.7 (86.2)	106.0 (97.5)	91.3 (82.8)	87.8 (79.1)
Ireland	40.8	60.8	35.8	26.8	Brazil	96.6	96.6	96.6	98.9
Israel	92.2 (82.3)	103.0 (93.6)	78.2 (69.8)	56.7 (50.6)	China	90.6 (71.5)	106.4 (85.3)	86.8 (69.2)	80.1 (64.7)
Italy	76.2 (63)	78.2 (63.4)	75.3 (62.1)	76.7 (62.1)	India	82.3 (77.8)	108.2 (103.3)	74.1 (69.8)	63.9 (58.8)
Japan	41.4	52.7	39.7	34.9	Indonesia	14.8 (13.1)	14.7 (13)	14.9 (13.2)	14.9 (13.2)
Korea	51.8	69.8	47.5	37.3	Russian Federation	74.8 (66.6)	83.9 (75.7)	72.0 (63.8)	68.0 (59.8)
Luxembourg	96.2	103.1	94.0	90.9	Saudi Arabia	107.4 (95.1)	107.2 (94.8)	107.6 (95.2)	108.0 (95.7)
Mexico	46.9 (46.9)	58.2 (58.2)	32.2 (29.9)	33.3 (29.7)	South Africa	14.4	22.0	11.9	8.3
Netherlands	103.3	104.5	99.8	96.4	EU27	75.7 (73.6)	81.8 (79.7)	74.2 (72.1)	70.6 (68.4)
New Zealand	49.6	79.4	41.5	29.4					

Source: OECD (2011) "Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries." (www.oecd.org/els/social/pensions/PAG)

Table 13 is very relevant to the analysis of the private sector since the Brazilian Class C is expected to represent 65% of the total population in 2014 compared to only 34% in 2005. This estimate represents what many economists call the "Great Decade" or the "Formation of a Middle-class Country". The growth of the Class C in Brazil is a result of a reduction in Classes D+E population from 51% to the expected level of 19% in 2014.

Table 13: Social Class Definition according to FGV in 2011

	Minimum Income (R\$)	Maximum Income (R\$)	Min # Minimum Wages	Max # Minimum Wages
Class E	-	751	-	1.38
Class D	751	1,200	1.38	2.20
Class C	1,200	5,174	2.20	9.49
Class B	5,174	6,745	9.49	12.38
Class A	6,745		12.38	-

Source: FGV - Fundação Getulio Vargas, <http://portal.fgv.br/en>

The easiest way to immediately increase the private sector in Brazil would be by reducing the INSS, which is currently 6.3 times the minimum wage. Discussion of this possibility with several politicians and professionals²⁸, indicates that this is a remote hypothesis given the substantial political costs involved in reducing the INSS.

Since no adjustment of the INSS Cap is expected, the growth of the private sector is conditioned to the continued growth of the middle class (over the INSS Cap) and the decrease in the INSS Cap / Minimum wage ratio. Both indicators have been extremely positive in recent years, as discussed previously, which indicate a countless potential growth for the market in the long-term.

3. The design of attractive pension funds for the new era

Sections I and II cover the details about the Brazilian Pension System. This chapter explores specifics of investment strategies and products designed for the Brazilians investors. Even though, the current pension system covers most of the individuals in Brazil, the first sections demonstrates that the current design of the system is unsustainable for the long-term. Therefore, the government and companies started to transfer some of the risks to individuals. Some examples of this trend are the phasing out of the Defined Benefit plans and the probable new Complementary Fund designed for public employees.

Nobel Prize winner William Sharpe very appropriately named this “new” type of investor “Accidental Investors”²⁹ since they are now their own investment managers. The accidental investors are responsible for both growing their savings during their working lives and converting their savings into lifetime income in retirement.

²⁹ Financial Engines (2011) “Understanding the Accidental Investor 2011.” Available at http://corp.financialengines.com/employer/Accidental_Investor_April2011.pdf

Brazilian investors are used to extremely high real interest rates and comfortable retirement benefits. However, as the interest rates go down and the retirement benefits are reduced, investors will need to be educated on how to design the right retirement plan according to their needs.

Before entering into specific details about investment strategies, this chapter describes in depth the Goal-Based Approach, which defines the risk capacity of a person based on his or her sources of income, needs, wants and risks. Moreover, the objective of this section is to develop a simple framework, adapted to the Brazilian market, aiming to educate and facilitate the use of the Goal-Based Approach by individual investors.

Only after integrating all of a person's information is it possible to define the best investment strategy or product for a person. The Goal-Based Approach is underused in Brazil, where the vast majority of sales of insurance and retirement funds are designed by large retail banks' account managers not aligned with the clients' interests.

This chapter also discusses some important topics to be considered when deciding the best investment for an individual risk profile. Concurrently, the chapter explores some of the dangers investors are exposed to when dealing with unaligned financial advisors. The study presents solid arguments against the high investment fund fees charged by mutual funds and the idea that stocks are less risky investment in the long-term as well as other investment conventional wisdom.

The chapter also discusses the development of alternative distribution channels, which is the only way for the Brazilian population to have access to the appropriate retirement products and avoid the oligopoly and bad investment advice usually practiced by banks.

Finally, the chapter describes some of the financial technologies available around the world and considers their application in the Brazilian Market. The "Six banks oligopoly" dominates around 93% of the market share in Brazil, which sustains the current exorbitant fees charged to individual investors. Table 14 shows the management fee's schedule of the six largest players for retail

investors. The table does not include the subscription and withdraw fees that are also charged from clients.

Table 14 Management Fees charged by the banks to retail investors

Bank	PGBL	VGBL
Bradesco	3.00%	3.00%
Itau	3.00%	3.00%
Banco do Brasil	3.00%	3.40%
Caixa	3.00%	3.00%
Santander	3.20%	3.20%
HSBC	3.00%	3.00%

Source: Banks' websites³⁰

a. Goal-based investment

It is impossible to discuss asset allocation without knowing the client well and integrating his or her entire portfolio. The integration process includes six steps that must be taken seriously to correctly assess an individual risk profile. Those steps are:

- Define the needs and wants
- Sources of income
- Risks associated with income, needs and wants
- Definition of risk capacity
- Personal risk profile
- Data update

This sub-section initially explains each of the steps mentioned and later designs a framework adapted to the Brazilian Market.

³⁰ <http://www2.brasilprev.com.br/NossosPlanos/ParaVoce/Planos/Paginas/default.aspx>, <http://www.bradescoprevidencia.com.br>, <http://www.caixavidaeprevidencia.com.br>, <http://www.hsbc.com.br/1/2/portal/pt/para-voce/previdencia/tabela-comparativa>, <http://www.itau.com.br/previdencia/> and http://www.santander.com.br/document/wps/Lamina_Rentabilidade_Previdencia.pdf

Define the needs and wants (Goals)

In the United States, some of the schools have started teaching financial literacy to children because independent of the career they will follow, all adults face the challenge of managing resources.

Usually the first financial literacy class for children explains the difference between needs and wants. Even though this seems to be a very basic concept, many adults forget to make this distinction when defining their expenses and saving priorities.

Broadly defined, “needs” are the basic things individuals must have to survive or keep their minimum acceptable living standards. Some of the items are the same for every individual such as food, transportation, water, clothing, health care, education and housing. “Wants” are items, activities or services which individuals can live without but would be much better off having. In this category we can include all other expenses: eating out, travel, cable TV and cars, etc.

Professor Zvi Bodie³¹, uses the I.M.P.A.C.T. method³², to help individual users in to define their goals.

The I.M.P.A.C.T. abbreviation stands for:

- **“Imagine your destination:** In this step you should define all your needs and wants for now and the future. You should include every item that comes to your mind and do not forget two important items: Retirement and Emergency Funds. Retirement is something that will inevitably come to everyone, since sooner or later one’s ability to work is affected by the age. Also, it is recommended to make a clear distinction between needs and wants.
- **Monitor your progress:** Review the destination list periodically to make sure the items and estimated prices are still valid.

³¹ Zvi Bodie is the Norman and Adele Barron Professor of Management at Boston University. He holds a PhD from the Massachusetts Institute of Technology and has served on the finance faculty at the Harvard Business School and MIT's Sloan School of Management.

³² Bodie, Z. (2011) “Risk Less and Prosper: Your Guide to Safer Investing.” Hoboken, New Jersey: John Wiley & Sons Inc.

- **Prioritize your needs:** List your destination items according to their priorities. At this stage, individuals must make sure to include in their top priorities long-term goals, such as retirement, given those long-term goals might require long periods of accumulation.
- **Assign a time line:** Individuals should write their destination list in a time line, which will allow them to correctly estimate the when the expenses will need to be matched.
- **Consult with key partners:** This step is required to make sure your destination needs and wants are aligned with the expectations of your spouse or key partners.
- **Tally the costs:** Finally, the costs of the destination items can be initially listed in present value terms. The prediction of future values is extremely challenging because there are a number of factors affecting each component. One thing almost certain in all cases is that prices should be adjusted for inflation. However, inflation is not only the factor to be matched, as items such as education have risen much more than inflation in the last years, so the individual must be prudent while making this future value estimation.”

Sources of income

Following the definition of goals or the dreamed destination, the individual investor must detail the sources of income expected throughout his or her life. This step is also very important since the income will fund the individual’s goals and dreams.

This step is less straightforward than it seems to be because for a complete integration, all sources of income should be added. This includes not only the financial assets but also the human capital.

Bodie defines Human Capital as: “What economists call the value today (or the present value) of an individual’s future labor income. Human capital can be viewed from the perspective of an employer, but here we are interested in it from the point of view of the individual earner and investor.

Although human capital is intangible, and can’t be directly bought or sold, it’s a major source of each

individual's lifetime wealth.”³³ Furthermore, the individual must also think about his or her career perspectives, risks and expectations.

Brazilian individual investors have some sources of income that are usually omitted from financial planning. Some examples are:

- **Length of Service Guarantee Fund - FGTS:** Brazilian employers have to deposit every month 8% of the employee monthly benefits in a separate account managed by Caixa Economica Federal Bank. If the employee's contract is terminated without a fair reason for dismissal, the employer must deposit an amount equal to 40% of all accumulated deposits adjusted for inflation. But the money can only be withdrawn from the fund in one of the following situations: retirement, serious illness or accidents, death or for the acquisition of a home using the government housing financing plan. The fund proceeds are remunerated every month at a 3.0% annual rate and in some specific cases employees can invest up to 30% of their FGTS in Petrobras stocks.
- **RGPS/RPPS retirement plans:** This paper describes in detail the RGPS and RPPS benefits to Brazilian employees. As a reminder, the currently general rules are:
 - RGPS workers benefits are calculated as the greater of: [(Average of 80% of the highest earnings throughout their working life * Welfare factor) or INSS Cap]
 - RPPS workers benefits are calculated as the average of 80% of the highest earnings throughout their working life

Hence, individual workers should always remember to add those benefits as a source of future benefits.

- **Past Defined Benefit (DB) Plans by current or previous employers:** Most experts and academics agree that Defined Benefit Plans are being phased out. Nevertheless, since DB

³³ Bodie, Z. (2011) "Risk Less and Prosper: Your Guide to Safer Investing" Hoboken, New Jersey: John Wiley & Sons Inc.

plans represented the majority of the industry until a few years ago, the stock of those funds still represents a substantial amount both for employers and employees. Thus, individual investors should always count as future source of income the DB plans from previous or current work. Those plans are present in the company's balance sheet as liabilities and still represent risks for the sponsors. This is particularly true for Brazilian companies, whose actuarial target rate is still at 6.0% when the real interest rate is in a declining trend at 3.4%.

Risks associated with income, needs and wants (Integration)

After estimating the assets and liabilities of the individual investor, this thesis describes the best procedures to estimate the risk associated with each of those projections.

According to Professor Merton³⁴ the objective of the Goal-Based Approach is to establish a standard of living in retirement that approximates the standard of living individuals enjoyed in the latter part of their careers. In the same paper, Professor Merton emphasizes that some of the most important factors in the retiree's standard of living, such as health and housing, are not well tracked by the U.S. Consumer Price Index and should be treated as separate components in providing for an overall standard of living.

An equivalent phenomenon occurs in Brazil where services, tuitions and real estate inflation beat the traditional price indices named IPCA³⁵ and IGPM³⁶. Consequently individual investors must be very cautious when defining the risks associated with their income, needs and wants.

NTN-B is the name of the inflation-linked bonds issued by the government, which are comparable to the U.S. TIPS. NTN-Bs have semi-annual coupon of 6% and their prices are defined at auction. Below are listed the most recent NTN-Bs prices available at the Brazilian Treasury website.

³⁴ Merton, R.C. (2007) "The Future of Retirement Planning", CFA Institute available at <http://www.people.hbs.edu/rmerton/FutureofRetirementfv2007n34905.pdf>

³⁵ IPCA (National Index of Consumer Prices Wide): CPI Indicator calculated by the IBGE.

³⁶ IGP-M (General Price Index – Market) CPI indicator calculated by the Getulio Vargas Foundation (FGV).

Table 15: NTN-B current yields

Inflation Linked Bonds	Maturity	Yield (yoy)
NTNB Principal 150515	May-15	3,74%
NTNB 150515	May-15	3,71%
NTNB 150517	May-17	4,14%
NTNB 150820	Aug-20	4,34%
NTNB Principal 150824	Aug-24	4,59%
NTNB 150824	Aug-24	4,51%
NTNB 150535	May-35	4,67%
NTNB Principal 150535	May-35	4,76%
NTNB 150545	May-45	4,69%

Source: Brazilian Treasury, <http://www.stn.fazenda.gov.br> (Updated on April 30th, 2012)

One of the market myths and common mistakes of investors is that people should invest in what they know. This topic is directly related to the human capital of the investors, which is one of the major asset components of the young and middle age population. For example, a stock broker would probably be inclined to invest his or her capital in stocks, since he or she has mastered stock valuation and pricing. However, since this individual human capital risk is directly correlated with the stock market performance, he or she is far more sensitive to the stock market than an army professional. Consequently, the stock broker expert should invest less in stocks than the army professional, for example. Even though this conclusion may sound very counter-intuitive, people must look for diversification and the correct assessment of risk.

Passive investments have demonstrated to be a very efficient strategy because of their efficiency, low-costs and scalability. Launched in 1969, the Bovespa Index is the most liquid and tracked stock index of the Brazilian Market. Fundamentally the index is composed of the stocks that represent 80% of the volume of the total trades of the market and it is weighted according to the stock volume.

Hence, the index methodology creates some particularities:

- Vale and Petrobras, the most liquid stocks, represent more than 22% of the index
- For that reason the sector of basic material and oil & gas represent 40% of the index

- Consumer cyclical sector represents only 4% of the index

It is true that the Brazilian economy is still very commodity driven therefore individual investors must keep in mind that the index might not be the best benchmark associated with their goals.

Brazilian pension funds are now considering investing abroad, which is already common in countries such as Chile, Canada and others. Those examples can and should be extended to individual investors, since in many situations a better proxy for their liability risk is traded offshore. Figure 14 shows the breakdown of the Bovespa Index, which concentration in Basic Materials + Oil & Gas supports the necessity of a global diversification to better match assets and liabilities.

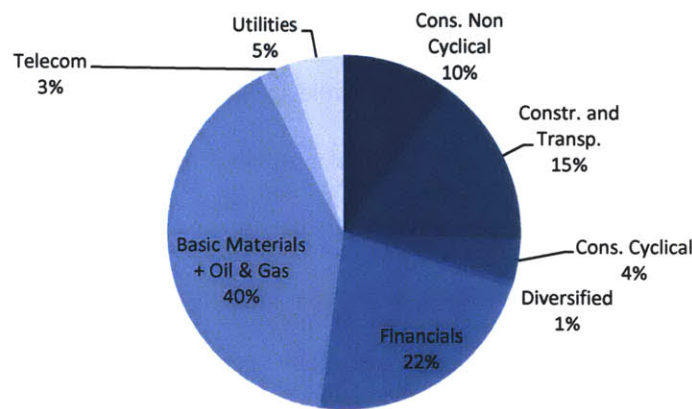


Figure 14. Bovespa Index Sector % Breakdown (February 2012) Source: BM&FBovespa, <http://www.bmfbovespa.com.br>

This chapter reinforces the importance of matching the investments to the assets and liabilities.

According to the examples mentioned in this sub-section, the risks associated may not always be hedged with the most conventional and popular assets.

Assessing your Risk Capacity

Once the future assets, liabilities and associated risks are identified, the risk capacity of each investor can be defined. Continuing with the paper comparison of the financial planning with the balance

sheet of companies, the study defines risk capacity as the equity portion on the individual balance sheet. Therefore, the basic balance sheet of the individual investor is composed of:

- Assets = Sources of Income
- Liabilities = Goals listed by priority
- Equity = Risk Capacity

Thus, according to the basic accounting rule that $\text{Equity} = \text{Assets} - \text{Liabilities}$, the Risk Capacity of individual investors is equal to their Sources of Income minus their Goals.

Again, the intuition seems very easy and logical but most of the financial planners forget to do this exercise before defining the risk capacity of their clients. At this point, if the efficient and effective use of all available assets of the employee is not sufficient to cover his or her needs and wants, there are only three ways to achieve his or her goals³⁷:

- Increase contribution rate (save more)
- Increase retirement age (work more)
- Increase risk of investments (risk more)

When confronted with this question, people (especially the young) tend to select the third option: increase the risk of the portfolio, since the general belief is that over a long enough time-horizon risky assets such as equities are much less risky. Later, the paper explains in depth why this reasoning is wrong. For now, investors should understand the importance of having a safe investing zone to cover their basic future spending needs.

Personal risk profile

After the creation of the safety zone to cover the goals, if the risk capacity (equity) is still positive, investors can invest in riskier assets. Professor Bodie describes very well this situation: "As we've

³⁷ Merton, R.C. (2010) "Observations on Individually Funded Pension System Design: Advances for the Future - Developing the Potential of the Individually Funded Pension Systems.", International Federation of Pension Fund Administrators, Santiago, pp. 61-76

seen, the chances of loss do decline over time, but this hardly means that the odds are zero, or negligible, just because the horizon is long. To evaluate risk, you need to know more than just the odds of loss. You also need to appreciate the effects of losing.”³⁸

Differing risk profile and risk capacity is an important take away from the Goal-Based Approach.

Traditionally, the first question asked by financial advisors is the risk profile of their clients.

Conversely, the paper proposes a series of steps before asking this question.

Risk profile varies substantially depending on the investor and goes much beyond the traditional breakdown of: conservative, moderate or aggressive. This paper will treat risk profile as the tradeoff between higher expected return and capital protection. Therefore, a less risk averse person is the one accepting the possible loss of capital in exchange for the possibility of obtaining gains.

Data update

The Goal-Based Approach is an ongoing process that must be updated constantly. Although the data update seems a very simple step after all the effort placed in the initial design of the plan, investors often do not dedicate the necessary efforts to this step.

For that reason, it is recommended to automate the process as much as possible. Technological advances have facilitated this procedure and much information can be updated online such as: FGTS, bank accounts and others. Regardless of the technological advances, the participation of the individual investors is essential, as only they can inform the changes in his or her goals and priorities.

In conclusion, the Goal-Based Approach requires substantial discipline and dedication from individuals and financial advisors to be successful.

³⁸ Bodie, Z. (2011) "Risk Less and Prosper: Your Guide to Safer Investing " Hoboken, New Jersey: John Wiley & Sons Inc.

b. Investment Myths and Pitfalls

The Brazilian financial market has been growing at phenomenal rates in this century. But compared to more mature financial markets, the Brazilian market is still building its foundations. As we mentioned before, the same is valid for Brazilian investors, who were for a long time used to investing in low risk government bonds and obtaining attractive returns.

But with the decrease in real interest rates, stability of the economy and development of the financial market, Brazilian investors must be prepared for this new era. This section challenges some of the popular financial wisdom that is consistently repeated and taken for granted by some investors but is not necessarily true.

In the long-term stocks are not risky

After the unparalleled market decline in 2008, investors and financial advisors revisited the stock risks in the long-term. But for academics, the myth that stocks are not risky in the long run has always been rejected.

Bodie's paper "On the risk of stocks in the long run"³⁹ demonstrates the fallacy of the statement using the option pricing theory. This direct and succinct approach to the problem perfectly summarizes the misconception of the assumption. The cost of insuring against earning less than the risk-free rate of interest increases as the length of the investment horizon increases.

This directly contradicts the conventional wisdom that young investors should invest a higher percentage in stocks and older investors a lower percentage. The theory proves that the best approach to defining the risk capacity of individual investors is not dependent on their age but can only be totally assessed through the Goal-Based Approach.

³⁹ Bodie, Z, (1995) "On the Risk of Stocks in the Long Run" Financial Analyst Journal Volume 51 Pages 18-22 Available at SSRN: <http://ssrn.com/abstract=5771>

Target-date funds are the best retirement solution

Very popular in the United States before the crisis, “Target-date funds” are structured to address some date in the future by automatically rebalancing their portfolios with time. Generally, target-date funds invest in two asset classes: fixed income (government bonds) and equities; as the fund expiration gets closer, the allocation to fixed income increases and the equities allocation is diminished.

Unfortunately, this type of fund has demonstrated to be very inefficient since it underestimates the risk of equities in the long-term. Professors Bodie, Fullmer and Treussard⁴⁰ expose the different objectives of funds in this category, which justify the difference in performance during the crisis. Some funds seek higher post-retirement accumulation than others.

This type of fund clearly ignores the Goal-Based Approach, since target-date fund does not have an objective and age is generally the unique variable used to define the asset allocation. Furthermore, usually target-date funds allocate a higher percentage to equities than the individuals’ risk capacity supports, embracing the idea that stocks in the long-term represent lower risk.

As discussed above, stock returns present a random walk, therefore, in 2008 when the S&P fell 41% many of the target-date funds (without objectives or goals) made the investors’ goals very difficult or impossible to be achieved. Many investors who were expecting to retire soon were obliged to review their retirement age and plans because of the unprecedented losses.

This problem is causing serious pain in the United States; for the Brazilian investors it is an important warning. Before investing in this category of fund, investors must understand very well the fund’s purposes and risks to confirm that the fund fits their risk capacity.

⁴⁰ Bodie, Z. & Fullmer, R. K. & Treussard, J (2010) “Unsafe at Any Speed? The Designed- In Risks of Target-Date Glide Paths” Journal of Financial Planning, March 2010, Pages 42 to 48

The impact of investment funds fees on final returns are negligible

The Brazilian investment fund industry's fees are among the highest in the world. Certainly one of the main reasons for that is the lack of alternative distribution channels, which allows the banks to charge exorbitant fees. But another relevant reason is the recent outperformance of the Brazilian stock market.

According to a Credit Suisse report⁴¹, management fees of retail fixed income funds in Brazil are among the highest in the world but institutional fixed income funds are among the lowest: Banks charge around 4% management fees on their own fixed income funds while institutional managers can pay less than 5 bps. The scenario for equity managers is very similar with many of them charging fixed management fees higher than 3% and most of the "long only" funds with the 2/20 structure of the American hedge funds.

Individual investors must understand that under the new scenario the current management fees are not sustainable. Currently the real interest rate is around 3.4 %, so a management fee of 4% on fixed income funds means that investment manager will need to take an enormous amount of risk to outperform the market.

Individual investors must understand that the management fee is the value paid to someone to manage your capital. Certainly, passive or low risk investment strategies should have lower fees, since the effort to achieve the returns is lower. Sometimes, a higher management fee make sense for more sophisticated strategies but in those cases the expected return is higher and consequently the risk of potential loss is also higher.

A simple example can clarify the issue:

- Fund Management fee(F): 3% yoy
- Inflation (I): 6% yoy

⁴¹ Credit Suisse - Detailed Analysis of Brazilian Asset Management Industry, August 2011

- Taxes (T): Assume 15% (for investments over 720 days)
- Selic (Risk free rate)(Rf): 9.75% yoy
- Fund nominal performance(Pn): 11%
- Fund real performance(Pr): $(Pn * (1-T)) - I = 3.35$
- Return to investor: $Pr - F = 0.35\%$

In this case, the management fee represents 90% of the fund real performance. The investor would have a much better investment return investing directly in NTN-Bs or in funds with low-costs.

In summary, investors must compare and understand the management and performance fees charged by investment funds. If a fund charges higher management fees it must have a good reason and the individual should make sure that the strategy fits his or her portfolio.

Illiquid investments are always a good source of diversification

In only four years, the real estate prices in Rio de Janeiro doubled in real terms. At the same time, the Private Equity industry holds approximately US\$ 10 billion to be invested in the next two years. This unprecedented boom in illiquid investments is very important to note, since in many cases, the most valuable asset of individual investors is their home. Moreover, the Private Equity industry was nearly non-existent a few years ago, so Brazilian investors need to be educated on how to measure and compare its returns.

When calculating the right amount of illiquid investment in a portfolio, it is important to make sure of the correct understanding of some financial basic principles:

- The expected returns of the portfolio can be estimated using the security characteristics line, which is defined by: $r_{a,t} = \alpha_a + \beta_a r_{m,t} + \epsilon_{a,t}$
- The definition of Beta is: $\beta_a = \frac{Cov(r_a, r_p)}{Var(r_p)}$

Therefore, the covariance calculation is directly correlated with the correct beta calculation and consequently with the correct portfolio construction. As a result, since the illiquid investments prices cannot be often obtained, the calculation of the covariance of those assets is often corrupted. The solution proposed by Professors Paul Gompers and Josh Lerner⁴², is the creation of a “Tracking Portfolio” that replicates as closely as possible the portfolio expected return and risks.

Therefore, investors must make these considerations and make sure their financial advisors are also doing so before deciding the best asset allocation for their risk capacity and risk profile.

If you find an alpha generator, you do not need diversification

Even if the stakeholder finds security with alpha, he or she will still be better off mixing the alpha generator with other components of the portfolio. In this situation, the investor will be able to create what academics call the “Super-efficient line.” Figure 13, demonstrates that the investor can achieve better returns diversifying even in the occurrence of a security generating alpha.

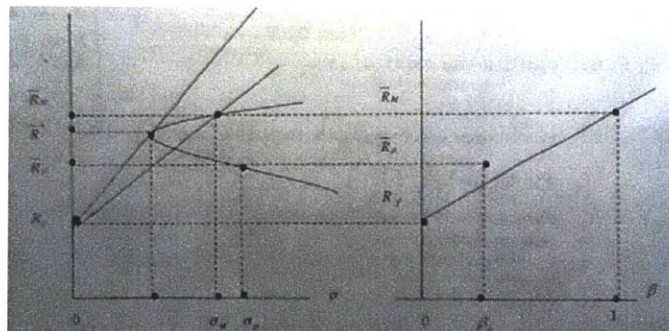


Figure 15: Super-Efficient Portfolio Source: Robert C. Merton Lecture at MIT Sloan School of Management

⁴² Gompers, P. & Lerner, J. (1997) “Risk and Reward in Private Equity Investments: The Challenge of Performance Assessment,” *The Journal of Private Equity*, Winter 1997, Volume 1, Number 2, Pages 5 to 12

Hedge Funds managers consistently outperform the market

The paper “An Index-Based Measure of Liquidity”⁴³, by George Chacko, Sanjiv Das and Rong Fan, reveals that major portion of hedge fund returns comes from taking liquidity risk. Additionally, the paper demonstrates that the liquidity mismatch is present in most of funds that take long and short positions.

From the eleven strategies⁴⁴ submitted to sensitivity to liquidity tests, nine presented negative reactions to increases in illiquidity. The only two strategies without evidence of sensitivity to liquidity were:

- **Dedicated short- bias:** Only holds short positions, so cannot have liquidity mismatch
- **Managed futures:** Generally focused in very liquid markets

To better illustrate the intuition behind the results, this study uses two basic strategies as examples:

- **Long and Short Equities:** Short positions normally come from big firms because to short small caps is very expensive and they have very low liquidity. Therefore, the funds are generally long less liquidity securities and short the most liquid ones, creating the liquidity mismatch demonstrated by the Chacko, Das and Fan’s paper.
- **Convertible Arbitrage:** Typically, the Convertible Arbitrage funds buy illiquid bonds and sell liquid stocks. In this case the liquidity mismatch is even more evident and easy to understand.

This topic is extremely important to pension and retirement funds, which often have a very long-term investments horizon. Therefore, the portfolio managers of those funds should not be buyers of liquidity but rather sellers. Once the source of alpha is identified, the portfolio managers can execute the strategy on their own or change the price they pay for hedge funds.

⁴³Chacko, G. & Sanjiv,D. & Rong , F (2012) “An Index-Based Measure of Liquidity.” Working Paper, Santa Clara University and Gifford Fong Associates

⁴⁴ Convertible Arbitrage, Dedicated Short Bias, Emerging Markets, Equity Market Neutral, Event Driven, Fixed Income Arbitrage, Global Macro, Long Short Equity, Managed Futures, Multi-Strategy and Credit Suisse/Tremont Blue Chip Index

c. Distribution Channels

The Brazilian Retirement and Insurance industry is highly dominated by the retail banks. A similar phenomenon occurs with the asset management industry, where more than 75% of the assets are managed by a few banks. This oligopoly scenario creates a situation of extremes: Brazil has one of the highest retail fund management fees and one of the lowest institutional fund management fees. On the one hand, banks can charge high fees to retail investors because of the lack of alternative distribution channels and the low average financial education of the population. On the other hand, banks charge extremely low fees to institutional investors, since they can make profits from the same clients in other areas. This situation creates a very challenging scenario for independent insurance and asset management companies. But with the interest rates' continued decline and new alternative distribution channels, the possibility of change increases.

Retail banks

As mentioned in the previous chapter, the 6 largest retail banks' market share in the insurance and retirement funds industry is around 93%. Leveraging their massive distribution channels and taking advantage of the low level degree of financial education of Brazilian investors, the banks are able to charge extremely high fees to individual investors. The opposite occurs with institutional investors; in this case, banks charge very low fees to retain the client and obtain higher margins in other business. Citibank is the only bank with open-architecture distribution to the mass market.

In addition, the massive sales in the retail market are conducted by poorly educated and unprepared sales representatives. Consequently, the individual investors hardly know the benefits and risks associated with their investment.

However, the decline in interest rates and the establishment of alternative distribution channels will certainly pressure retail banks to lower fees and better prepare their sales force.

Financial “Supermarkets”

In the United States, the financial supermarkets such as Charles Schwab and Fidelity play an important role in the distribution of retirement funds. Financial supermarkets are generally one stop shops where one can find all kind of financial products from different providers. In this model, the client has the option to build his or her own portfolio or to ask for a financial advisor assistant. But generally the financial supermarkets offer only “parts”, so the individual is responsible for assembling the parts and building its portfolio.

In Brazil, there are some companies are trying to replicate the model; the most successful one so far is XP Investments, which was recently acquired by British private-equity fund Actis and is expected to make an Initial Public Offering soon. Even though the participation of XP Investments is still reduced, its rapid growth demonstrates the demand for alternative distribution channels in Brazil. Orama⁴⁵ and Apogeo⁴⁶ are other examples of financial supermarkets that are trying to conquer the market in Brazil.

One thing all financial supermarkets have in common is the focus on financial education, since the first step towards more fair and reasonable fees is the recognition by investors that something is wrong. Recent data provided by XP Investments indicates that nearly 50% of the students that attend its financial courses became clients of the company.

Nevertheless, the main argument against financial supermarkets is their financial compensation model; because the supermarket normally earns a percentage of the management fee of the fund bought by individual investors. Critics argue that the supermarkets are more inclined to sell funds that offer higher rebate fees and consequently are not aligned with the clients’ best interests.

⁴⁵ Orama Investimentos, <https://www.orama.com.br>

⁴⁶ Apogeo Investimentos, <http://www.apogeo.com.br>

Financial advisors

Financial advisors are already very common for the Brazilian high net worth individuals. The numbers of private banks and family offices established in the recent years is impressive. According to the Brazilian Financial and Capital Markets Association– ANBIMA⁴⁷, the number of private bankers grew 20% from 2010 to 2011.

This movement was motivated by the substantial creation of wealth in Brazil as a result of the number of IPOs and good economic environment. The strong competition to attract the high net worth individuals is making family-offices and private banks reduce their minimum accounts and target investors with high income who were not offered premium services before.

It is relevant to mention the case of Dimensional Fund Advisors (DFA), a company formed in 1983 by David Booth and that currently manages more than US\$ 200 billion globally. Only registered financial advisors can sell DFA products, which has created a strong loyalty between financial advisors and the company throughout the years. The company alleges that individual investors are better served with registered financial advisors that can correctly measure investors' risks and understand DFA's products.

Investors are attracted to financial advisors to avoid the high fees charged by banks as well as obtain more unbiased and better investment recommendations. There is still plenty of space for the development of the financial advisor market, especially for those targeting the middle and upper class population.

Alternative distribution channels

The strong regulation in the insurance and retirement fund distribution market affects the innovation in the sector. This lack of innovation is supported by the large retail banks since they already have their own distribution channels.

⁴⁷ Brazilian Financial and Capital Markets Association– ANBIMA, <http://www.anbima.com.br>

According to Mr. Francisco Galiza⁴⁸, the insurance distribution channels have evolved substantially during the last fifteen years. Even though the new vehicles are not yet representative, the expectations are that innovations will continue in the sector.

Some examples of the innovative distribution channels mentioned in Mr. Galiza's paper are:

Partnership with large retail groups, internet direct sales, and call-centers. Nonetheless, there are still some regulatory issues delaying the growth of the alternative distribution channels and keeping the independent brokers and retail banking representatives as the main selling points.

Therefore, the only way independent insurance companies can expand their market share and reduce the gap against the "6 largest banks" is through innovations. Since individual investors will be the ones who most benefit from competition, they must support regulatory changes. Otherwise, it will be extremely difficult to make advances in the distribution regulatory rules since the political power of the banks is enormous.

d. The next generation of retirement solutions

As described above, the next generation of retirement solutions should have the following characteristics:

- Design scalable and low-cost investment strategies
- Offer tailor-made investment strategies based on salary, age, gender, goals and needs
- Maximize the chances of achieving the participant desired income goal
- Keep the participants informed about the probabilities of not achieving the goal
- Suggest changes if the probabilities of reaching the goal is low or can be improved

⁴⁸ Galiza, F. (2007) "Visão das Seguradoras: Uma análise da distribuição de seguros no Brasil." Rating de Seguros Consultoria, April 2007

There are a few companies already providing the next generation of retirement funds, below we will describe two very interesting cases that can be successfully implemented in the Brazilian Market:

Financial Engines and Dimensional Fund Advisors.

Financial Engines

Created on May of 1996 by Nobel Prize Winner William Sharpe, Craig Johnson and Joseph Grundfest;

Financial Engines⁴⁹ has been a pioneer in bringing the best of financial economics and institutional money management to everyday investors through independent and personalized advisory.

The company offers a highly scalable, web based and tailor-made solution that is very appealing to the Brazilian Market. When hired by a company, Financial Engines acts as financial advisor to every employee of the company through an objective web-based application. Therefore, every individual is treated differently but the system is scalable, simple and user friendly. Financial Engines realized that many investors do not want to be retirement experts, so it offers professional financial advisor assistance to design a plan according to the individuals' needs and goals. The company relies on the Monte Carlo simulation⁵⁰ to provide their customers with the probability of reaching their investments objective and risks, before or after implementation.⁵¹

One of the most important aspects of the retirement planning is the constant update of relevant information such as salaries, bonus and goals. Financial Engines system allows an automatic update from the companies about the employers' current salaries and bonuses, so they can access in real time the odds of achieving their goals and needs. The company investment strategy is detailed in the book *"The Intelligent Portfolio – Practical Wisdom on Personal Investing from Financial Engines"* written by the company's Chief Investment Officer Christopher Jones.

⁴⁹ Financial Engines, <http://corp.financialengines.com/>

⁵⁰ Monte Carlo simulation is a computerized mathematical technique that provides a range of possible outcomes and the probabilities of each occurrence.

⁵¹ Jones, C. L. (2008), *The Intelligent Portfolio – Practical Wisdom on Personal Investing from Financial Engines*. Hoboken, New Jersey: John Wiley & Sons Inc.

Some of the lessons from the Financial Engines case are that scalability, simplicity and professional financial advisory are crucial to the implementation of the strategy. This subject is very important because the success of XP Investments, a Brazilian financial brokerage firm with focus on financial education, led many companies to believe that the best way to attract new customers is through education. Financial Engines demonstrates that this is not always true; in many cases individuals prefer to have their wealth managed by professionals instead of learning everything about the investment process.

On March 16th, 2010 the Financial Engines went public and raised about \$127.7 million. The stock initially priced above the expected target, at U\$ 12 per share, soared more than 40 percent on its first day trading day and was trading at U\$ 21.96 on April 16th 2012, showing the appetite of investors for this type of innovative and promising product.

Dimensional Fund Advisors (DFA) – Retirement Solution

DFA was founded in 1981 by David Booth and Rex Sinquefeld and had been extremely successful in applying the “Efficient Markets” theory throughout their Mutual Fund Business. But in 2010 the company incorporated Professor Merton’s SmartNest, which was an individually tailored integrated retirement-solution product developed by Nobel Laureate Robert Merton.

David Booth recently became CEO of the Retirement Division of DFA, leaving his previous position as the CEO of the Mutual Fund Division, which currently manages more than U\$ 200 billion. This act clearly demonstrates the potential of the product to compete in the multi-billion dollar industry of retirement products.

Some of the key characteristics of the DFA’s solution are:

- DFA applies the Goal-Based Approach allowing the participant to select: Retirement age, Savings rate, Minimum income and Desired Income, or setting those for the participants as a “default” in case the participants do not know what they want.

- Integrated and tailor-made products for each participant, depending on age, gender, salary and other retirement benefits
- Solution is designed to be effective for participants who are and remain completely unengaged
- The solution objective is to provide the participant the Desired Income at the age he or she is planning to retire. The likelihood of achieving this goal is available online for the participant
- If the likelihood of achieving the desired income is low, the participant has four options:
 - Increase retirement age
 - Increase the monthly contribution
 - Decrease income target
 - Increase risk of the portfolio

The distribution channel adopted by DFA to market the product is very similar to the successful strategy obtained in the Mutual Fund Division, which is relying on the long-term relationship with financial advisors.

Using options, the company exchanges the probability of achieving returns higher than expected for an increase in the probability of achieving the Desired Retirement Income. Figure 16 shows the frequency of achieving the desired scenario improves with the use of the technology.

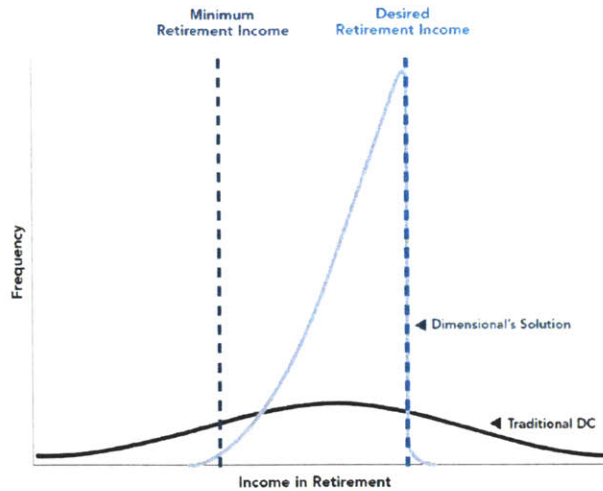


Figure 16: DFA's estimates of the level of income in retirement plotted against the frequency of obtaining each level Source: Robert C. Merton Lecture at MIT Sloan School of Management

Another unique feature of the DFA's product is the unit used to measure monthly returns. Instead of using dollars, the typical currency used to measure returns, the company uses Real Annuity Units since they are more aligned with the core objective of the program that is to deliver the Desired Retirement Income to the participant.

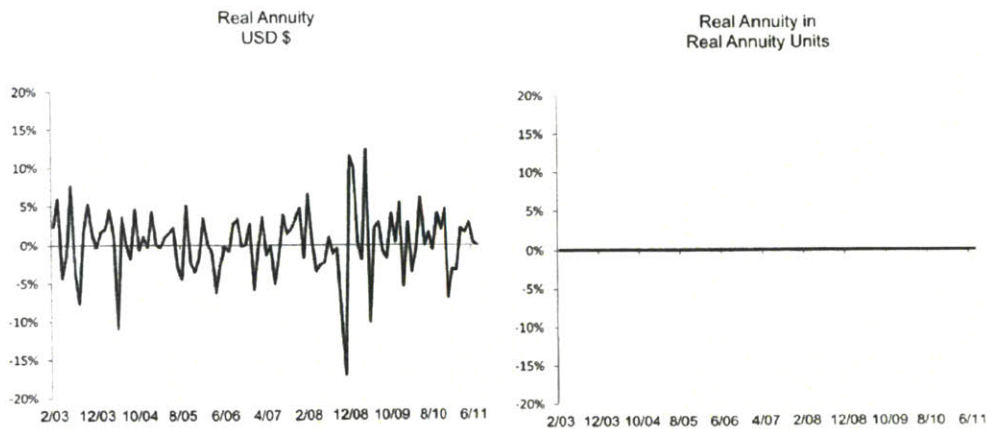


Figure 17: Measuring Risk: Deferred Annuities Monthly Returns Source: Robert C. Merton Lecture at MIT Sloan School of Management

4. A vision for the future

The previous chapters described the past and current state of the Brazilian pension industry, as well as some of the modern tools used in the design of innovative retirement products. Now, based on all presented elements, the paper explores the author's vision for the future of retirement in Brazil.

This chapter is divided in three sub-sections: RPPS, RGPS and Complementary, which are the three systems currently in place in Brazil.

a. The future of the RPPS system

As discussed in section 1.d, the RPPS is already a major source of concern to the Brazilian population. Some of the problems are the large deficits, lack of transparency and lack of corporate governance.

However, there are a number of reasons to be optimistic about the improvements of the system.

The most compelling one is the approval⁵² of the complementary fund (Funpresp⁵³), for the federal government employees, which should have implications for the RPPS system across all dimensions.

Given the reduced political costs of implementing the strategy following the federal government decision, most states and municipalities are expected to create similar structures. As discussed previously, the Complementary Fund model transfers the risk from the sponsor (the government in this case) to the beneficiaries. Consequently, in the long-term the public expenses with pensions will likely decrease with time.

In addition, the beneficiaries of the Funpresp are the employees of the Legislative, Judiciary and Executive branches, whose average education and salary are among the highest in Brazil. Therefore, it is anticipated that they will closely monitor the investment policy and corporate governance of the fund. Given the size and relevance of the Funpresp, it is expected that its policies will become the industry standard, especially to other RPPS' complementary funds. If this assumption is confirmed,

⁵² Funpresp was approved by the Senate on March 28th, 2012

⁵³ Section 1.b) for more information about the Funpresp

the concern of the lack of transparency and the lack of corporate governance norms across the various RPPS should also decline.

Currently, most of the RPPS do not comply with the obligations established by law. Since the disregard of the regulations has no negative consequences to the sponsors or managers, there are no incentives for them to follow the rules. Therefore, regulators must establish efficient control methodologies and apply severe penalties for the system participant who violates the law. As discussed in section 2.a, the funds of the private complementary closed system are extremely regulated and no rule violation is accepted. Unfortunately, the consequences of the strict regulation and control in the private sector were not positive, since the administrative costs forced smaller institutions to phase out their programs. Thus, if the RPPS regulators ensure that the rules are respected by the participants, the likelihood is that the system will have a higher degree of standardization and a reduction in corruption and bad practices.

Should individual investors invest in the Funpresp?

The Funpresp is expected to manage around R\$ 21 billion⁵⁴ in less than ten years, becoming the largest pension fund in Latin America. In Brazil, we have many examples of large pension funds of state owned companies, whose investment policy is aligned with the government needs and requirements. Given the Funpresp size, it is expected that its investment policy will also be tilted towards the benefit of the government interests. Thus, beneficiaries should not expect the fund to be managed with the objective of maximizing the returns to investors.

But with the government matching contributions up to 8.5% above the INSS Cap, even with all the conflicts of interests, it will be difficult for the beneficiaries to find a better alternative in the private sector. Table 15 compares the results of investing in the Funpresp with the government matching 100% of the contributions, and investing in a Private Fund without the government contribution, assuming a 4% annual inflation and 35 years of investment horizon.

⁵⁴ IstoE Dinheiro, http://www.istoedinheiro.com.br/noticias/79009_FUNDAO+DE+PENSAO

Table 16: Difference between investing in the Funpresp and in the Private Sector

		Funpresp Performance (yoy)					
		5%	6%	7%	8%	9%	10%
Private Fund Perf. (yoy)	5%	157	217	292	385	502	648
	6%	127	187	262	355	472	618
	7%	90	150	224	318	434	581
	8%	43	103	178	271	388	534
	9%	(15)	45	119	213	329	476
	10%	(89)	(29)	46	139	256	403

Even though it is possible to achieve better returns investing in the Private sector directly, the investor portfolio would need to take considerably more risk to achieve the same returns without the matching by the government. Moreover, since the government is responsible for the management of the fund, due to political reasons, there will be a very low probability of negative real returns to investors in the long run. Since the beneficiaries will be very influential in the government, if the fund performance is bad, we can expect the government to use every available tool to absorb a part or the total of the losses. That is why this paper suggests that the investments in the Funpresp should be classified as low risk or, as defined in section 3.a, should be allocated to fund the basic needs of the beneficiaries.

Also discussed in section 3.a, the human capital estimation is very important for an accurate application of the Goal-Based Approach. Historically, public workers have a very predictable and stable human capital, allowing the approximation of their human capital to a fixed income asset. Therefore, the beneficiaries can accurately estimate their human capital and design their Goal-Based Approach balance sheet with fewer uncertainties.

In summary, even though the Funpresp investment policy will not be aligned with the beneficiaries' objectives, the government's matching and political responsibility make the fund very attractive. Hence, the recommendation for beneficiaries of the Funpresp is to invest in the fund expecting a

return similar to an inflation protected government bond. Thus, once the recipient's goals and needs are covered, they should look for alternative sources to invest the risky portion of their portfolio.

Opportunity for innovative products and services

The establishment of the Funpresp is expected to change completely the configuration of the RPPS.

In this sub-section, the study discusses the envisioned opportunities for asset managers and insurance companies in the "new RPPS".

1. **Asset Managers:** The most obvious opportunity is the competition to manage a fraction of the capital of the Funpresp and its mirror portfolios. However, examples from the Chilean pension system show that this competition can be very predatory and increase the market concentration. Although market competition was intended to lower commissions in Chile, the private pension fund market is dominated by a handful of companies, which, according to economists Peter Diamond and Salvador Valdes-Prieto, form a "monopolistic competitive market"⁵⁵. The competition in Chile has not worked because a large fraction of the population makes bad initial decisions and rarely changes services providers, even when offered better services at lower fees. Recently, Chile implemented a successful model of "repeating" group competitive bidding for new participants of the system. This model allows the Chilean population to have access to high quality services at reasonable fees. Bolivia is another example. The Bolivian government divided the country pension system in two funds and made a competitive bidding process to select managers. The funds' management fees were set at very low levels, but the quality of the services was compromised. Given the current structure and market concentration of the Brazilian asset management and insurance industry, we have many reasons to believe that the Brazilian market will become a "monopolistic competitive market" as well. The six dominant players will probably offer services at extremely low fees (in many cases with negative margins) to avoid competition and have even more control of the market on the

⁵⁵ Diamond, P. & VALDES-PRIETO, S.(1994) "Social security reforms. In The Chilean economy: Policy lessons and challenges." Washington, D.C.: Brookings Institute.

long run. As occurs in most of the institutional pension funds, the fund selection will probably have a quantitative bias, to reduce the chances of bad practices. But the good news for the other players is that the fund will be extremely large, so innovative products will have the opportunity to attract investments.

Examples of innovative products and services that can compete with the six dominant players are:

- **Low-cost investment strategies:** The only way to compete against banks' extremely low fees will be designing innovative and profitable low-cost strategies. The case of DFA (Dimensional Fund Advisors)⁵⁶, already mentioned in section 3.c, is a good example of a strategy that can succeed in attracting funds and being profitable in very competitive markets. DFA realized that index tracking can be very costly because of the high transaction costs involved in following every movement of the index. Even though DFA's funds do not make any prediction of future value of the stocks, the company's funds are classified as active strategies since they do not track any index. This strategy combined with low distribution and trading costs enables the company to generate scalable alpha without taking idiosyncratic risk. Another successful example is the Thrift Savings Plan (TSP)⁵⁷, which is a DC plan created by the American government for civil service employees and retirees as well as for members of the uniformed services. The centralized administration of the plan, adopted by the government, reduced the funds' administrative costs, enabling managers to do everything electronically and trade the funds in a net basis. Consequently, the TSP's funds' fees are lower than 1 basis point.
- **Illiquid Funds:** Initially the fund will have a long accumulation period, so it can avoid the liquidity premium of the most traded stocks and bonds. This creates a very compelling scenario for illiquid strategies, a segment for which the larger banks do not have a competitive edge. Given the political nature of the fund, sectorial private equity funds can be very attractive candidates because they allow the government to target specific sectors and limit the managers' scope. It is

⁵⁶ Dimensional Fund Advisors, <http://www.dfaus.com>

⁵⁷ Thrift Savings Plan (TSP): <https://www.tsp.gov>

expected that the government will help investors in specific sectors, providing financing through the BNDES or issuing infrastructure debentures⁵⁸. Corporate debt strategies should also be very attractive candidates. The secondary market of corporate debt in Brazil is very illiquid and the government should take the opportunity to invest in this category, which would be very positive for the Brazilian financial market. The illiquid funds selection will certainly be less quantitative and more susceptible to bad practices, so beneficiaries should monitor very closely those investments.

Consistent alpha generators are extremely hard to find and most of the alpha generators' strategies are not scalable. Traditionally, pension fund managers in Brazil have not invested in this asset class because of the high fees, which are very hard to justify in bad years. Consequently, this class should not benefit from the new capital inflow.

2. **Pension Fund Consultants:** The government will certainly need outside help to manage so much capital. Some of the positions in the fund will be occupied by politicians, and consequently pension fund consultants will have an excellent opportunity to make good arrangements. The selection of consultants is generally very qualitative, which creates the opportunity for unfair hiring processes. To be successful in this sector, new consultants must prove with consistent data and credibility that the current management of pension funds in Brazil is not optimal and can be polished. But in this case a good relationship with the government and decision makers will be crucial to becoming a part of the team.
3. **Financial Advisors:** The Funpresp will create the first generation of "Accidental Investors" from the public sector. The estimated number of public workers in Brazil⁵⁹ is around five million but at least 50% of those workers earn salaries below the INSS cap⁶⁰. Nevertheless, the potential

⁵⁸ The infrastructure debentures were created by the government to incentive investments in infrastructure. The debentures offer fiscal benefits to individual investors similar to Real Estate Funds.

⁵⁹ Including the army, federal, states and municipalities workers

⁶⁰ "Futuro servidor federal que ganhar abaixo do teto do INSS não vai entrar em nova regra de aposentadoria", available at <http://www.func.eng.ufmg.br/?tag=funpresp>

number of new clients for financial advisor is expected to be significant in the next few years. Financial advisors should be ready to support those new clients, who have different demands than most of the private sector workers. Public workers have very stable human capital and will probably be investing in the Funpresp, so the recommended approach to financial advisors is to apply the Goal-Based Approach, allowing the investors to reach their goals and also invest their risk capacity excess. It is important to remember that nothing changes for federal workers earning less than INSS cap; consequently no opportunities are expected to be created within this large segment. Nevertheless, in the next two sections this paper discusses in more depth how financial advisors can better serve this substantial part of the Brazilian population.

If it is possible to envision a better future for the system in the long-term, in the short and mid-term the expectations are not very positive. The real interest rate decline will increase the RPPS deficit, since the majority of the funds still use Inflation + 6% as the discount rate. Furthermore, according to a leading Brazilian newspaper⁶¹, in 2015 around 40% of the 1,1 million federal workers will be able to retire. To give an idea of the impact of the massive retirement wave, in 2011 the 1,1 million beneficiaries of the federal system represented a deficit of R\$ 56 billion. The deficit should continue to grow quickly in the short mid-term before starting to decrease, which is expected to occur in 2030.

b. The future of the RGPS system

According to the Ministry of Social Welfare⁶² 67% of the economically active population (57 million⁶³) is currently covered by the INSS and 28 million receives benefits from the system. Consequently, any change in the system has implications for the majority of the voting population.

⁶¹“Renovação do funcionalismo”, O Estado de Sao Paulo, available at <https://conteudoclipingmp.planejamento.gov.br/cadastros/noticias/2012/2/26/renovacao-do-funcionalismo>

⁶² Revista Veja, <http://veja.abril.com.br/noticia/economia/previdencia-quer-cobrir-70-5-dos-trabalhadores-em-2012>

⁶³ IBGE 2010 Census, <http://www.ibge.gov.br>

Given the high political cost of changes in the retirement system, historically each government usually makes only one major change. President Dilma acted rapidly and efficiently in the creation of the complementary fund to public workers, which will have completely changed the RPPS system. It is important to emphasize that the political cost of Dilma's changes were minimized by the low number of people affected and covered by the RPPS. But Dilma started a four year mandate in January 1st 2011; if she is re-elected, it is highly probable that no major change in the system will occur before 2019. Therefore, in the short mid-term people should not expect major changes in the RGPS system.

In the long-term, given the "pay as you go" nature of the system, the government will need to modify the rules. For 2012, the projected deficit of the RGPS is R\$ 39.1 billion⁶⁴ and is not growing faster because of the growth in the revenues driven by three factors: economic growth, reduction of the informal sector and reduction of frauds and tax evasion. As described in section 1.f, the Brazilian population is aging very fast and the deficit of the government is expected to increase exponentially. As Fabio Giambiagi and Paulo Tafner define, the demographic change is an "invisible enemy"⁶⁵. People will only realize the magnitude of the problem when the deficit soars to unprecedented levels.

Since radical changes would be very difficult to explain to society, the government will probably act slowly, changing some of the parameters of the current model along the way. The minimum retirement age and minimum contribution time are two of the most important parameters to be updated. Currently there is a five year difference between women and men retirement age, 60 and 65 respectively, and contribution time, 30 and 35 respectively. The gender inequality is not compatible with the increased participation of the women in the workforce and the growing weight they have in the public deficit. Hence, this paper supports the changes proposed by Fabio

⁶⁴ Correio Braziliense, <https://conteudoclipingmp.planejamento.gov.br/cadastros/noticias/2012/3/2/deficit-do-inss-recua>

⁶⁵ Giambiagi, F., & Tafner, P. (2010). Demografia a ameaça invisível: O dilema previdenciário que o Brasil se recusa a encarar, Rio de Janeiro : Elsevier

Giambiagi⁶⁶ in the minimum retirement age of men to 67 and women to 66 and the minimum contribution time to 40 for men and 39 for women.

c. The future of the Complementary System

The perspectives for the complementary system in Brazil are very positive. The large dominance of the retail banks inhibited innovation and creativity in the sector for many years. However, the new scenario of low real interest rates, more educated investors and the phasing out of many closed entities creates a more competitive environment.

Moreover, the number of “accidental investors” is increasing at a fast pace due to strong economic growth and government incentives for the creation of funds targeting the Class “C”. An example of those new funds is the VGBL Saúde. The objective of the fund is to create savings portfolio for the worker to be able to sustain the payment of the healthcare plans at end of his life, when usually their revenues are lower and the healthcare plans are higher.

To facilitate the reading, this section will be divided in three sub-sections: closed entities, open entities and distribution channels.

In each segment, the objective is to detail the envisioned the opportunities and trends in each sub-sector.

Closed Entities:

The current state of the closed entities system was detailed in section 2.a). As mentioned previously, the increasing costs and risks of maintaining an independent structure is making many companies migrate from having their own pension fund to offering funds from insurance companies.

In addition, most of the closed entities firms still use actuarial rates of inflation + 5.5-6.0%, which are not realistic for the current investment environment in Brazil. Currently most of the portfolio of these companies’ funds is allocated to fixed income securities yielding much lower yield than the

⁶⁶ Interview with Fabio Giambiagi, Chief Risk Officer at BNDES, January 2012

actuarial rate, creating a potential problem for the future. Some of the companies will reduce the actuarial rates to more reasonable levels (closer to the real interest rate) but others will increase the risk of their portfolios to compensate for the interest rate decline, doubling the risk of future potential issues.

This is an excellent opportunity for insurance companies to take over the management of some of those large pension funds. However, to compete against the banks they will need to be very innovative and dynamic. The two solutions described in section 3.d, Financial Engines and DFA, are examples of how the insurance companies can differentiate themselves and offer the next generation of retirement products in the Brazilian Market.

Since most of the insurance companies' market target-date funds (debated in section 3.b) as the most innovative product in the area; the introduction of personalized and scalable services that help employees and employers can be very successful. The focus should be on companies and workers because retirement plans are currently an important human resource tool to keep and attract talent, so every additional service provided can be very significant.

Open Entities:

In section 2.a, the paper discussed the size and potential growth of the open entities market. The competition in the sector is very high and there is very low differentiation among products and distribution channels. One of the reasons for the massive market share accumulated by the large banks is the large number of bank's representatives across the country, offering a wide range of products to individuals.

The near term approval of the "Micro-insurance and the VGBL Saude" policies will add a significant number of potential customers to the system. The micro-insurance policy can add up to 100 million new clients to the insurance industry.⁶⁷ In addition, 33% (63 million) of the Brazilian population

⁶⁷ Valor Economico, www.valor.com.br

holds a healthcare insurance policy, making all of them candidates for investing in the VGBL Saúde funds.

Opportunities

The new products and initiatives were designed by the current market leaders, who already have established distribution channels and in many cases already offer healthcare plans. Therefore, the new regulations are not expected to stimulate the competition and reduce the concentration of the market share among the six largest players.

However, the lack of innovative products and high fees creates a very promising scenario for dynamic and innovative insurance companies. Examples from other markets show that insurance companies need to focus on two main areas: alternative distribution channels and innovative products.

Alternative Distribution Channels & Innovative Products

The decrease in the interest rates, increase of internet penetration, and development of new products create an unprecedented opportunity for alternative distribution channels. Currently the two main channels are: retail bank representatives and insurance brokers. Both methods present strong limitations, reinforcing the thesis that innovating in this sector is one of the best ways to grow.

Insurance brokers have two main problems:

- The profession is not very well regarded in Brazil, after the number of frauds by a small fraction of the group. In most of the cases, the profession is seen as a last resource for those individuals who were not able to get a better job, creating a negative selective cycle.
- Very high costs are associated with the brokers' training and the extremely low retention pressure reduces the margin of insurance companies. More than half of the brokers that are trained give up the profession before the end of the first year.

Bank representatives are not the ideal channel:

- In most of the cases they lack education and knowledge about the products, causing a disproportionate number of post-sales issues.
- The high fees charged by the banks eliminate most of the fiscal benefits offered by the retirement products to the investors.

Some of the alternative channels that can be explored by insured companies are:

1. **Internet:** According to IBOPE Nielsen Online⁶⁸, Brazil has around 80 million internet users as of December 2011, growing 10% in less than two years. Obviously, the majority of the users belong to classes A and B, the main investors of retirement funds. Unfortunately, the tight regulation of financial services in Brazil has inhibited a larger expansion of the sector in the segment. The “Orbit Brands System” created by Mr Mark S. Bonchek⁶⁹ seems to be an exceptional option to explore this vast channel. Mr. Bonchek believes that leading companies should treat customers as active participants of the product’s design and that the way they enable clients to active and constantly participate of this process is by creating brand orbits such as Apple iTunes, Google Search Engine and Nike+. As he stated in one of his articles: “Orbit brands are more like scientists building a supercollider. Their mantra is test and learn. They focus on understanding the physics of their market space (through customer behavior), create and improve their technology (on products and platforms), run experiments (for new benefits and services) and analyze the results (for customer engagement).”⁷⁰ The creation of an effective orbit by an insurance company can really make the difference. A good example of an orbit website in the United States is the Goal Gami website⁷¹, which is a free and easy way to apply the Goal-Based

⁶⁸ IBOPE Nielsen Online 2011, <http://www.ibope.com.br>

⁶⁹ Mark Bonchek, SVP of Communities and Networks at Sear Holdings

⁷⁰ Bonchek, M. (2012) “How Top Brands Pull Customers into Orbit.” Harvard Business Review Blog Network available at http://blogs.hbr.org/cs/2012/04/three_steps_to_generating_soci.html

⁷¹ GoalGami, <http://www.goalgami.com>

Approach. Another example is the popular Mint website⁷², which brings all the individual financial accounts together online, automatically categorizes transactions, allows customers to set budgets, and helps them to achieve their savings goals. This kind of innovation is what is missing in the Brazilian market, which still designs the products based on their perception of the market and believes that the internet should be used only as direct sales mechanism. After establishing this direct connection with the customers, insurance companies will be able to make indirect sales through the internet and design better products to their clients.

2. **Financial Advisors:** For many years, Brazilians citizens worried about keeping their money in the country because of the unstable political and regulatory environment. Since the stabilization of the currency and inflation, the culture changed and Brazilians decided to keep their wealth in Brazil and make profits from the high interest rates of the country. At the same time, the Brazilian financial market developed very fast, becoming one of the largest and most developed markets in the world. The creation of wealth with the number of IPOs and the strong economic growth increased the demand for financial advisors and private bankers. Currently, the size of the family-office and private bank industry is estimated to be around R\$600 billion⁷³.

Surprisingly, not many financial advisors do all the financial planning for their clients, partly because some of them only manage a portion of the total wealth of the individuals but also because of the lack of knowledge of some advisors on how to approach the issue. Moreover, many financial advisors argued that the PGBL and VGBL in Brazil are extremely expensive, eliminating the fiscal benefits offered by the product. Again, the distribution model designed by DFA⁷⁴ seems to be the most appropriate for the Brazilian market. The financial education provided by DFA to financial advisors would be important to promote the funds, and the low management fees charged by DFA would be important to align the interests of investors and managers.

⁷² Mint, <https://www.mint.com/>

⁷³ Brazilian Financial and Capital Markets Association (ANBIMA), <http://www.anbima.com.br/>

⁷⁴ Dimensional Fund Advisors, <http://www.dfaus.com>

3. **Billion Entrepreneurs Enabler (BEE)**⁷⁵: BEE is an innovative on-line platform, which can increase the distribution channels of smaller insurance firms. It gives people access to flexible jobs, enabling them to work from home or their village to earn extra revenues. It enables companies' business expansion at minimum cost and in a flexible way. BEE is a new model of mobile/on-line door to door that focuses on three segments of the population that can work at flexible times:

- **Students:** The length of studies has augmented in recent years. The job market is extremely competitive and a bachelor degree is not a guarantee of a stable and well paid job. So students need flexible jobs to fund their continued education and be better prepared for their job search.
- **Women:** Even though the participation of women in the market increased substantially, there are still a substantial number of housewives in Brazil. Additionally, many women who are currently working in formal jobs would prefer to have a flexible job to spend more time at home to take care of their children.
- **Retirees:** The increase in lifetime expectancy and higher medical expenses make a number of retirees look for flexible jobs to complement their income. Even though retirees generally have limited mobility, this is compensated for the strong network and respect they hold within their communities.

Training and preparing those people through an on-line or mobile platform can be very effective and change the outdated image of the insurance broker. The objective of the project is to redesign the figure of the insurance broker, reduce training costs, and increase the sales of the insurance companies.

⁷⁵ During the fall of 2010, a group of MIT Students (including the author of this thesis) created at the MIT Media Lab a project called Billion Entrepreneurs Enabler (BEE), which was awarded with the MIT International Development's Technology Dissemination Fellowship.

The research conducted by the team indicated a strong demand from independent insurance companies to this innovative platform. A major difference between BEE and the traditional door-to-door sales is that BEE's affiliates can represent other companies registered at the platform. This flexibility has the objective to increase the income and the retention rate of the brokers. Since Brazil is a country with enormous disparities of income, and some of the new products target the classes C, D and E, it is important to offer text message features to the affiliates that do not have access to the internet or smartphones.

The design of alternative distribution channels is directly related to the design of innovative and creative products. To be successful in the new scenario, products must have the following characteristics:

1. **Low management fees** will be a requirement in the new environment of low interest rates.

Managers must realize that the fiscal benefits of the retirement funds can be easily eliminated with high management fees, since they have a series of risk limits imposed by legislation. As mentioned before, the Brazilian market developed very fast and is each day more competitive and efficient. Therefore, insurance companies should avoid promising consistent alpha generation through the conventional strategies. Insurance companies should design economically efficient trading strategies, making profits from the liquidity that risk long-term funds can accept as well as from the reduction of distribution and administrative costs. DFA products are a good example of products that can be successful in the new environment.

2. **Tailor-made but scalable** products must be the focus of the product design. As discussed previously, each individual has its own needs and goals, so the idea that target-date funds solve all the problems is gone. Financial Engines is a very good example that it is possible to create products that are at the same time scalable but tailor-made. In this case, it will be necessary to make some investment in technology to develop a user friendly system, allowing the design of goal based strategies and the constant update of information from different providers. Once the

technology is in place, the fund selection will depend on the risk capacity and risk tolerance of the user.

- 3. Complete solution** should be emphasized. The thesis presents an affordable and simple way of offering a complete financial planning to individual investors. As mentioned before, the Goal-Based Approach is not only focused on the retirement of the individual but also concerned with the achievement of the person's goals and needs. In many situations, the thesis recommended the investment in NTN-Bs to protect the capital against the inflation. Successful insurance companies will provide solutions that analyze the total portfolio of the client (including other retirement assets) but not necessarily charging high fees for this. For example, insurance companies may charge only for the risky assets part of the individual portfolio, which is a common practice among family offices.

As described above, there is significant intersection between the design of new products and the development of alternative channels. Competition will only flourish if smaller companies combine those two initiatives. DFA and Financial Engines are examples of successful companies that innovated not only in their products development but also in their distribution channels.

5. Conclusion

In summary, the paper has described the present and the future state of the Brazilian Pension Fund System. Currently more than 92% of the economic active population is able to retire with generous replacement rates. However, the Brazilian retirement population is growing at a rate of 4% yoy and the population is expected to grow at a rate of 0.3% yoy by 2050⁷⁶. Furthermore, the growth in expenses of the % of the net revenues (excluding the money transferred to states) spent with social security grew from 35% in 1991 to 50.1% in 2009. Therefore, the demographic changes and the growth in expenses of the social security make the current pension system in Brazil unsustainable, creating opportunities for the complementary fund industry.

⁷⁶ 2008 IBGE's Census

As discussed in the previous chapters, the creation of the Funpresp is an outstanding initiative to reduce the RPPS shortage but it is far from solving the pension system deficit problem. Regardless of the political costs, the government will need to make deeper and broader changes to guarantee the stability and future of the national budget. Parametrical changes in the system, such as the increase in the minimum retirement age and the increase in the minimum contribution time to retire, should be pursued.

Additionally, the massive market share concentration on the Brazilian private retirement industry - which is estimated to be at more than 92% among the six largest players - creates an extremely damaging setting for investors, who are offered old fashioned products at exorbitant fees.

The real interest rate decline and the disappointing returns of the target-date funds during the last crisis in the United States, creates an excellent opportunity for insurance companies to increase their market share in the retirement industry. Hence, they should invest in the design of innovative products and alternative distribution channels. Competition will only flourish if smaller companies combine those two initiatives.

The new model for the next generation of retirement products should be based on the Goal-Based Approach adapted to the Brazilian Market. The success of Financial Engines and DFA, implementing the new generation of retirement products in the United States, shows the strong market demand for innovative products.

Finally, the population as a whole will benefit the most with the adoption of the recommended approach. Individuals will be better served with tailor-made and integrated solutions at reasonable costs.

References

- Black, F. (1980) "The Tax Consequences of Long-Run Pension Policy." *Journal of Applied Corporate Finance*, Volume 18, Number 1, Pages 8 to 14.
- Bodie, Z. (1995) "On the Risk of Stocks in the Long Run" *Financial Analyst Journal* Volume 51 Pages 18-22.
- Bodie, Z., & Merton, R.C., & Samuelson, W. (1992) "Labor Supply Flexibility and Portfolio Choice in a Lifecycle Model." *Journal of Economic Dynamics and Control* Volume 16, Pages 427-49.
- Bodie, Z. & Fullmer, R. K. & Treussard, J (2010) "Unsafe at Any Speed? The Designed- In Risks of Target-Date Glide Paths" *Journal of Financial Planning*, March 2010, Pages 42 to 48.
- Bodie, Z. (2011) "*Risk Less and Prosper: Your Guide to Safer Investing*" Hoboken, New Jersey: John Wiley & Sons Inc.
- Bonchek, M. (2012) "How Top Brands Pull Customers into Orbit." *Harvard Business Review Blog Network* available at http://blogs.hbr.org/cs/2012/04/three_steps_to_generating_soci.html
- Brazilian Social Welfare Ministry (2009) "Overview of Brazilian Social Welfare" available at: http://www.previdencia.gov.br/arquivos/office/3_091113-150152-707.pdf
- Brooks, S. M. (2009). *Social Protection and the Market in Latin America: The Transformation of Social Security Institutions*. Cambridge: Cambridge University Press.
- Budhraj, V. & Figueiredo, R.J.P (2005) "How Risky Are Illiquid Investments? A Practical Approach to Estimating Volatilities and Correlations of Non-traded Assets.", *The Journal of Portfolio Management*, Winter 2005, Volume 31, Number 2, Pages 83 to 93.
- Chacko, G. & Sanjiv, D. & Rong, F (2012) "An Index-Based Measure of Liquidity." Working Paper, Santa Clara University and Gifford Fong Associates.

Chen,P., & Ibbotsun,R., & Milevsky,M., & Zhu,K. (2006) "Human Capital, Asset Allocation and Life Insurance." *Financial Analysts Journal* Volume 62, Page 97-109.

Cohen, R.B. (2003) "Dimensional Fund Advisors." *HBS Case 9-203-026*.

Diamond, P. & VALDES-PRIETO, S.(1994) "Social security reforms. In The Chilean economy: Policy lessons and challenges." Washington, D.C.: Brookings Institute.

Dimensional Fund Advisors (DFA) website: <http://www.dfaus.com/>

Draghi, M. & Giavazzi, F. & Merton, R.C. (2003) "Transparency, Risk Management and International Financial Fragility." *Geneva Reports on the World Economy - International Center for Monetary and Banking Studies*, Volume 4.

Financial Engines (2011) "Understanding the Accidental Investor 2011."
http://corp.financialengines.com/employer/Accidental_Investor_April2011.pdf

Fugulin, P. & Goncalves, M.R. (2012) "The Pension System in Brazil: Challenges to Subnationals." *Fitch Ratings*.

Galiza,F. (2007) "Visão das Seguradoras: Uma análise da distribuição de seguros no Brasil." *Rating de Seguros Consultoria*, April 2007.

Giambiagi, F., & Tafner, P. (2010). *Demografia a ameaça invisível: O dilema previdenciário que o Brasil se recusa a encarar*, Rio de Janeiro : Elsevier.

Gompers,P. & Lerner,J. (1997) "Risk and Reward in Private Equity Investments: The Challenge of Performance Assessment," *The Journal of Private Equity*, Winter 1997, Volume 1, Number 2, Pages 5 to 12.

Hasanhodzic,J., & Lo, A.W. (2007) "Can Hedge-Fund Returns be Replicated?: The Linear Case" *Journal of Investment Management*, Volume 5, Number 2, pages 5 to 45.

Jin,L. & Merton, R.C. & Bodie, Z. (2006) "Do a Firm's Equity Returns Reflect the Risk of its Pension Plan?" *Journal of Financial Economics*, Volume 81, Pages 1 to 26.

Jones, C. L. (2008), *The Intelligent Portfolio – Practical Wisdom on Personal Investing from Financial Engines*. Hoboken, New Jersey: John Wiley & Sons Inc.

Kertzman, I. (2010), Curso Pratico de Direito Previdenciario. Salvador, Bahia: Editora JusPODIVM

Lo, A.W. (2011) "Adaptive Markets and the New World Order" Available at SSRN:

<http://ssrn.com/abstract=1977721>

Lo, A.W. (2001) "Risk Management for Hedge Funds: Introduction and Overview" *AIMR*.

Madrid, R. (2002) "The Politics and Economics of Pension Privatization in Latin America." *Latin American Research Review* Volume 37, Pages 159-182.

Asset Management Coursepack, Cambridge: MIT CopyTech.

Mello, R. & Santos, D. (2009) "Aceleracao Educacional e a Queda Recente da Informalidade." *Mercado de Trabalho Conjuntura e Análise -IPEA*, Volume 39, Pages 27-35.

da Silva, V.C. (2009) "Brazilian population ageing: household conditions and family support." *Universidade Federal de Minas Gerais*.

Merton, R. C. (1981) "On Market Timing and Investment Performance Part I: An Equilibrium Theory of Value for Market Forecasts." *The Journal of Business*, Volume 54, Pages 363-406.

Merton, R.C., & Henriksson, R.D. (1981) "On Market Timing and Investment Performance Part II: Statistical Procedures for Evaluating Forecasting Skills." *The Journal of Business*, Volume 54, Pages 513-533.

Merton, R.C. (2007) "Applying Modern Risk Management to Equity and Credit Analysis." *CFA Institute Conference Proceedings Quarterly*, Volume 24, Pages 14-22.

Merton, R.C. (2004) "The Real Problem with Pensions." *Harvard Business Review*, Volume 82, Number 12, Pages 21-22.

Merton, R.C. (2006) "Allocating Shareholder Capital to Pensions Plans." *Journal of Applied Corporate Finance*, Volume 18, Issue 1, Pages 15 to 24.

Merton, R.C. (2007) "The Future of Retirement Planning", *CFA Institute* available at <http://www.people.hbs.edu/rmerton/FutureofRetirementfv2007n34905.pdf>

Merton, R.C. (2010) "Observations on Individually Funded Pension System Design: Advances for the Future - Developing the Potential of the Individually Funded Pension Systems.", International Federation of Pension Fund Administrators, Santiago, pp. 61-76.

Merton, R.C. (2011), MIT Sloan School of Management Retirement Finance, Lifecycle Investing and Nation, J (2011) "Pension Math: How California's Retirement Spending is Squeezing The State Budget." *Stanford Institute for Economic Policy Research*.

OECD (2011)"Economic Surveys: Brazil." available at <http://www.oecd.org/dataoecd/12/37/48930900.pdf>

OECD (2011)"Pensions at a Glance 2011: Retirement-Income Systems in OECD and G20 Countries." available at www.oecd.org/els/social/pensions/PAG

Plano Diretor Mercados Capitais(2011), 41a Reuniao Comite Executivo.

Thrift Savings Plan (TSP): <https://www.tsp.gov>

Woodward,S.E. (2005) "Measuring and Managing Alternative Assets Risk." *Global Association of Risk Professionals Review*, Issue 24, Pages 21 to 24.