

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO
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PERFORMANCE ANALYSIS OF PGBL AND VGBL RETIREMENT FUNDS

RIO DE JANEIRO
2019

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Master's dissertation presented to the Instituto
Coppead de Administração, Universidade Fed-
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ter in Business Administration (M.Sc.).

Supervisor: Carlos Heitor Campani, Ph.D.

RIO DE JANEIRO

2019

CIP - Catalogação na Publicação

C676p Clem Soares, William
PERFORMANCE ANALYSIS OF PGBL AND VGBL RETIREMENT
FUNDS / William Clem Soares. -- Rio de Janeiro,
2019.
46 f.

Orientador: Carlos Heitor Campani.
Dissertação (mestrado) - Universidade Federal do
Rio de Janeiro, Instituto COPPEAD de Administração,
Programa de Pós-Graduação em Administração, 2019.

1. Investment Performance. 2. PGBL/VGBL Funds.
3. Insurance Companies. 4. Brazilian Financial
Market. I. Heitor Campani, Carlos, orient. II.
Título.

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RIO DE JANEIRO
2019

Resumo

Analizamos o desempenho dos fundos de aposentadoria no mercado brasileiro. Neste segmento, o Plano Gerador de Benefícios Livres (PGBL) e a Geração de Vida Livre (VGBL) são os produtos mais notáveis, representando mais de 90% deste mercado. Nós esclarecemos o desempenho dos fundos PBGL / VGBL controlados por empresas puramente seguradoras, em oposição aos fundos PBGL / VGBL controlados por empresas diretamente ligadas a grandes bancos de varejo. Nossos resultados sugerem um melhor desempenho para seguradoras puras, tanto para fundos conservadores quanto agressivos, em termos de maiores retornos médios. Nós também comparamos o desempenho de fundos com base na análise do Alfa de Jensen: os resultados para a maioria dos desempenhos analisados foram abaixo do mercado. Além disso, também foi avaliado a influência da taxa de administração cobrada e do tamanho do fundo sobre os retornos líquidos e sobre o risco. Altas taxas de administração mostraram não valer a pena, já que o impacto negativo foi duplo: menor retorno com maior risco. Por outro lado, maiores fundos apresentaram maiores retornos líquidos com nenhuma evidência de maior risco. Finalmente, a análise confirmou o maior retorno líquido de fundos controlados por companhias puramente seguradoras também após o controle da taxa de administração e do tamanho do fundo: estes fundos mostraram, com evidências estatísticas, fornecer de 0,8% a 1% de retorno a mais por ano.

Palavras-chave: Performance de Investimentos, Fundos PGBL/VGBL, Seguradoras, Mercado Financeiro Brasileiro

Abstract

We analyze the performance of retirement funds in the Brazilian market. In this segment, the Free Benefit Generating Plan (PGBL) and the Free Benefit Generating Life (VGBL) represent the most notable products, accounting for more than 90% of the market share. We shed light on the performance of PBGL/VGBL funds controlled by pure insurance companies as opposed to PBGL/VGBL funds controlled by companies directly linked to large retail banks. Our results suggest a better performance for pure insurance companies, for both conservative and aggressive funds, in terms of higher average returns. We also compare performances of funds based on the Jensen's alpha analysis: Results for most of the funds analyzed were poor, underperforming the market. In addition, it was also assessed the influence of the administrative fee charged and fund's size on net returns and risk. Higher administrative fees showed not to payoff since the negative impact was twofold: lower net returns with higher risk. On the other hand, larger funds presented higher net returns with no evidence of higher risk attached. Finally, the analysis confirmed the higher net returns of funds controlled by pure insurance companies also after controlling for administrative fee and size of the fund: These funds showed, with statistical evidence, to provide from 0.8% to 1% more per year.

Keywords: Investment Performance, PGBL/VGBL Funds, Insurance Companies, Brazilian Financial Market

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1 Introduction

One of the hot topics in the Brazilian economy is the pension and social security system. Many researchers argue that the primary structure (public) for pensions is financially unsustainable and, as a consequence, risky for future retirees. In April 2017, the Organization for Economic Cooperation and Development (OCDE) released a memo based on a study made by Gragnolati et al. (2011), claiming that the Brazilian pension expenses and population aging have significantly increased and, as such, if the current pension system did not change, the pensions' budget would contribute to a future financial collapse.

A good alternative to protect the future incomes from any modification made in the primary system is in the complementary (private) pension system. Simply put, in Brazil we can differentiate two kinds of vehicles in the private pension system: Pension Funds and Specially Constituted Investment Funds (FIE). The Pension Funds term is used to describe funds managed by non-profit institutions which do not provide open access to the general public, but only for employees from certain companies. On its turn, the term FIE is used to describe the legal vehicle used by for-profit open-access pension institutions: the participation is available to every Brazilian citizen, according to his own decision. FIE are the ones linked to plans like PGBL and VGBL, which are the focus of this article.

In Brazil, the private pension system is divided between two types of institutions: pure insurance companies and insurance companies linked to retail banks. The difference between them is the fact that, for pure insurers, pension products are the main source of income, while retail banks have credit as their primary source of income. According to data kindly provided by Quantum Finance, in December 2017, 91% of total PGBL and VGBL net worth were controlled by five companies linked to a large retail bank (Bradesco, BrasilPrev, Caixa Econômica Federal, Itaú and Santander). Retail banks overwhelmingly dominate the sector. As a consequence, it can be hypothesized that pure insurance companies will have to differentiate themselves with more significant performance and lower administrative fees.

The purpose of this paper is to compare the performance of PGBL/VGBL retirement funds, differentiating pure insurance companies from companies linked to large retail banks. No other previous work has performed such analysis. We do hope the article helps with the development of this market segment in Brazil.

The following section presents a brief theoretical framework and reviews the literature that

supports this research. Subsequently, we introduce the methodology, as well as the data used, and then we present the results and analyses.

2 The Environment in Brazil

The Brazilian social security system is divided into two main categories: the primary (public) and the complementary (private) pension system. The primary pension plan is mandatory and every worker has to contribute. However, workers from private and public sectors are treated differently by current law. The workers from the public sector have a special social security regime called RPPS protected by the 40th article of the Federal Constitution. On the other hand, workers from the private sector are destined to the general social security regime (RGPS). More details can be found in Amaral (2013).

The complementary pension system can also be divided into two categories. The complementary pension plans can be closed-access, available only for individuals working on specific departments in the public sector or specific companies from the private sector: these plans are managed by the so called EFPC (Closed Entities of Complementary Pension). And there are the open-access pension plans, available to every person, which are managed by the so called EAPC (Open Entities of Complementary Pension). Figure 1 illustrates this division.

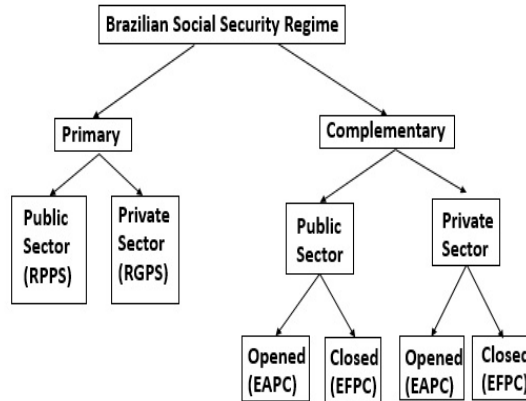


Figure 1: Social Security Scheme.
Source: Elaborated by the authors.

In Brazil, closed funds (managed by EFPC) are simply known by the term Pension Funds. These funds were created just to manage the resources of a specific group or entity in the private or public sector. On its turn, open-access funds managed by EAPC have also a specific vehicle: the Specially Constituted Investment Funds (FIE). While EFPC are not for-profit organizations,

EAPCs are for-profit institutions.

According to Fenaprevi, which is a non-profit Brazilian institution that represents the EAPC, there are three plans that one can choose if they decide to invest in a given EAPC. These plans are: Free Benefit Generating Plan (PGBL), Free Benefit Generating Life (VGBL) and Traditional Plans (which are old-fashioned nowadays and difficult to find). PGBL and VGBL plans have become very popular, and they currently account for more than 90% of the sector, as according to Campani & Brito (2018). Moreover, FenaPrevi (2017) indicated that almost all the new contracts issued are about just PGBL and VGBL products (99.4% in October 2017). Therefore, because of their relevance, we will focus in these two categories.

The main difference between these two plans is basically the additional tax benefit for the PGBL products. Apart from that, they are exactly the same for practical matters. In PGBL products, one can deduce up to 12% of his annual income for tax purposes. For a detailed discussion on PGBL and VGBL plans, see Campani & da Costa (2018) and Schossler & Conto (2001).

According to FenaPrevi (2017), the provision destined to FIE has boosted incredibly: it went from R\$ 615 billions in January 2017 to more than R\$ 735 billions in October 2017. It has confirmed a trajectory of increasing demand for PGBL and VGBL products well-known by the market: this trend seems to become even stronger in the future.

The data provided by Quantum Finance also added more information about this market. According to them, the size of this market in net worth was of 771 billion in December 2017, with 13491 of active plans and 1280 of active funds. The informations also confirmed the particular characteristic of the sector, which is considered as an oligopoly. Five insurance companies linked to a retail bank (BrasilPrev, Caixa Econômica Federal, Santander, Itaú and Bradesco) control the most significant part of the market share: 91% of the total net worth (702.7 billion), 63% of the total FIE (806) and 63% (8474) of all active plans available of this market.

Conversely, the only four pure insurance companies with portfolios that surpass ten years of existence (Porto Seguro, Sulamérica, Mapfre and Icatu Seguros) hold all together: 1.5% of the total net worth (11.5 billion), 6% of the total FIE (81) and 13% (1744) of all active plans available in this market. We conclude that this sector is highly concentrated at the hands of large retail banks.

3 Literature Review

The importance of pension products to the Brazilian economy has significantly increased in the past few years, as commented by Silva (2016) and Silva et al. (2015). This is supported by the strong and increasing demand by the population for complementary pension products. Costa & Soares (2017) studied this growing demand, providing interesting insights: For example, this demand seems not to have reached the lower layers of the Brazilian society or those with low schooling levels.

Campani & da Costa (2018) made a deep research encompassing the four largest PGBL and VGBL providers in Brazil. They had concluded that, despite the higher fees usually charged by FIE, in the long run they are still very competitive when compared to standard investment funds, due to exclusive tax benefits guaranteed by law. They also have pointed out that these fees, although still at high levels, have been showing a decreasing pattern, which allows them to conjecture that in the long run, with the development of this market, fees tend to equalize with the ones charged by standard investment funds.

Higher fees are charged under the assumption of active management and potential superior performance. In order to check whether or not PBGL and VGBL funds are active managed, Campani & Brito (2018) performed a dynamic style analysis to find out that this was not the case with such funds: in other words, high fees were not justifiable. The passivity presented by the funds analyzed (all of them managed by institutions linked to a retail bank) was shown to be such that, with a very simple strategy, anyone could obtain, at least, the same performance but with lower fees.

Another important point is why the market share is so heavily dominated by retail banks once pension or insurance products are not their primary service. Many authors tried to address this topic. Vanzetta (2013) aimed to analyze the role of the distribution of insurance and pension products by banks (bancassurance) in the Brazilian insurance market. According to him, the union of the two markets occurred after 1967, when the entire collection related to insurances started to be done through the banking network, thereby providing a rich fund-raising system for the institution's main activity: lending. Since then, convergence movement between the two businesses only grew through mergers and acquisitions of banks and insurance companies, with major historical milestones, such as the 1988 constitution that established the linkage of the insurance industry to the Brazilian financial system. Currently, the attractiveness of

selling insurance for banks remains very high and easy, since their clients are already there. Backed by the capillarity of the banking network, the bancassurance had a relevant role in the popularization of insurance and pension products among the population. In a nutshell, still according to Vanzetta (2013), the decision by the financial institutions to start selling insurance and pension products goes through the strategy of diversifying product portfolio, in order to cover its costs through products and services that are complementary to the financial intermediation.

Aligned with this argumentation, Pagnussatt (2010) claimed that the consolidation of the banking and insurance industry in Brazil, the increasing competition among players, the regulatory changes and the increasing importance of revenues from insurance subsidiaries to banking conglomerates have encouraged the review of strategies by banks and by pure insurance companies. Within this perspective, strategic alliances with insurance companies emerged as an important mean to achieve competitive advantage. The results show the dominance of the Brazilian insurance market by insurance companies controlled by banking conglomerates, especially in segments with higher affinity for the financial services: retirement savings, “capitalization” (combines lottery-based drawings with an incentive savings product) and life insurance.

On the other hand, Bottino (2012) believes that the concentration of insurance and pension services by retail banks may be dangerous to society. According to him, the market share concentration among a few players creates an oligopoly extremely harmful for investors who are offered old-fashioned products at exorbitant fees. His proposal is twofold: political changes and promotion of the competition among players in order to create a more efficient market.

Some other authors focused on how insurance companies allocate their resources. Mette (2009), for instance, studied whether the insurance companies in Brazil are optimizing their asset allocation, using data from 2001 to 2007. The results have shown that most of these institutions allocated their assets efficiently, at least as according to Markowitz theory. On the other hand, Amaral (2013) compared the performance of FIE and standard investment funds, with data from 2005 to 2011: The results showed that FIE (i.e., funds linked to PGBL and VGBL plans) performed below the standard funds. Similar results were found by Medeiros (2015).

Lima (2006) studied the performance of PGBL funds in the period of 2003 and 2004, concluding that they did not beat the CDI rate, which is commonly used as the riskless rate in Brazil. Cardoso (2006) had the objective to study the existence of performance persistence in PGBL, VGBL and FAPI (Fund of Individual Scheduled Retirement - perhaps the most relevant example of a tradition plan) funds from January 2001 to December 2004: His conclusion was

that it was not possible to ascertain that a given fund will repeat in the future the performance obtained in the past.

So far, we are not aware of any other work that has compared the performance of funds managed by retail banks and pure insurance companies in the PGBL and VGBL industry. The importance of this comparison is claimed by the fact that, as Bottino (2012) has argued, the retail banks may be inefficient due to the lack of competition and, as a consequence, they may deliver poor performance attached to high fees. We believe that savvy investors will find relevant the analysis carried out below, as well as regulators and competitors of this market segment.

4 Methodology and Data

PGBL and VGBL funds are usually classified in three categories: conservative, moderate and aggressive, as according to Campani & Brito (2018). Conservative funds only invest in fixed income instruments; moderate funds are allowed to invest 15-30% (depending on the institution) in stocks; and aggressive funds can invest up to 40-49% in stocks. To our objectives, conservative and aggressive funds suffice.

There are many ways to measure funds performance. According to Varga (2001), the simplest performance indicator is the average return. Nonetheless, the average return does not account for the risk taken to achieve that return. As a consequence, we will also use other measures which do consider risk.

Initially, it will be calculated the annualized geometric mean of each FIE. Subsequently, for conservative funds, the returns will be compared with the annualized geometric mean of CDI returns (used as a benchmark). Next, for aggressive funds, it will be used a daily weighted average of CDI and IBRX-100 (60% of CDI and 40% of IBRX-100). The acronym CDI represents the average rate at which the Brazilian banks are willing to borrow/lend to each other for one day and it is quite often considered as the riskless rate in the Brazilian financial market. On its turn, the Brazil Index of Shares IBRX-100 is a total return index referring to a theoretical portfolio composed of the 100 most traded shares on the Brazilian exchange.

The weights that compose the benchmark for aggressive funds were determined based on the work of Campani & Brito (2018). The paper demonstrates that, although aggressive funds were allowed to invest up to 49% in variable income products, on average, the investments were closer to 40%: in such way, fund managers can better control their allocation in order not to stay out

of regulation.

In addition, to detect any superior performance of pure insurance companies, it will be calculated a simple regression analysis. The dependent variable will be the mean (total or net) annualized returns and the independent variable will be a dummy variable representing the “pure insurance company” effect to be investigated. Equation (1) represents the simple regression analysis.

$$R_{i,M} = \beta_0 + \beta_1 * \text{dummy}_{PIC,i} \quad (1)$$

where β_1 is the marginal return due to the “pure insurance company” effect, while the intercept (β_0) is the average of the mean returns for companies linked to retail banks. $R_{i,M}$ is the mean (total or net) annualized return for fund i .

Secondly, it will be calculated the Sharpe ratio in order to consider the risk and return trade-off. The Sharpe ratio is widely used in studies of performance analysis with investment funds and assets in general. However, it loses meaning when the portfolio return is lower than the risk-free rate, given by the CDI returns. To overcome this caveat, Israelsen (2005) presents an adjusted definition, which will be used by this study, as according to equation (2):

$$SR_i = \frac{R_{i,M} - R_{f,M}}{\sigma_i^{\frac{R_{i,M} - R_{f,M}}{\text{abs}(R_{i,M} - R_{f,M})}}} \quad (2)$$

where SR_i represents the Sharpe ratio for fund i , $R_{i,M}$ is the mean (total or net) annualized return for fund i , $R_{f,M}$ represents the mean annualized return for the risk-free rate, σ_i is the annualized standard deviation for fund i , and the function **abs** returns the absolute value of $(R_{i,M} - R_{f,M})$. This adjusted formula correctly orders the performances even when the portfolio return is lower than the risk-free rate.

After the ranking, the Mann-Whitney test will be performed to assess difference between the two medians on the ranking. This test is a non-parametric method appropriate for examining the difference in medians for two independent populations. The null hypothesis considers that there is no difference between the two medians. The alternative hypothesis considers the opposite. It In addition, a simple regression analysis will be performed to evaluate whether there is any direct correlation between the Sharpe ratio and pure insurance companies. As before, funds controlled by pure insurance companies are labeled as one, while funds belonging to companies

linked to a large retail bank are labeled as zero. The equation is the following (3):

$$SR_i = \beta_2 + \beta_3 * \text{dummy}_{PIC,i} \quad (3)$$

where β_3 is the marginal Sharpe ratio due to the “pure insurance company” effect, while the intercept (β_2) is the average of the Sharpe ratios for companies linked to retail banks. SR_i is the Sharpe ratio for fund i .

Third, the analysis of Jensen’s alpha will be performed to determine which funds deliver positive alphas. This important performance indicator is originated from the CAPM model. The measurement is risk-adjusted and, originally, it represents the average return on a portfolio above (if positive) or below (if negative) that one predicted by the CAPM. A positive value for Jensen’s alpha means that the funds’ managers have "outperformed the market" with their cherry-picking skills. However, the CAPM is not adequate to our analysis, and we therefore adopt alternative models for conservative and aggressive funds.

For conservative funds, the Jensen’s alpha will be evaluated based on a two-factor model, in which the factors represent relevant instruments in the Brazilian fixed income market: IMA-B (basket of government bonds indexed by IPCA, the official Brazilian inflation rate), and IRF-M (basket of government bonds with pre-fixed rates). These indices translate into two major risk sources: inflation and pre-fixed rates. The equation used to calculate the alphas is thus the following:

$$R_{i,t} - CDI_t = \alpha_{0,i} + \alpha_{1,i} * (IMA_t - CDI_t) + \alpha_{2,i} * (IRF_t - CDI_t) \quad (4)$$

where $\alpha_{1,i}$ and $\alpha_{2,i}$ are the fund’s exposures to the IMA-B and IRF-M factors. The $\alpha_{0,i}$ is the Jensen’s alpha for fund i .

A similar approach was used to evaluate the Jensen’s alpha for aggressive funds. As aggressive funds are a blend of fixed income and variable income products, a six-factor model was proposed to calculate the alphas. It was used the same two factors from the multiple regression for conservative funds and added four more factors based on the Carhart (1997) model.

The Carhart (1997) model is an important contribution for portfolio’s analysis. It is an extension of the Fama–French three-factor model that includes a momentum factor. According to Fama & French (1993), the average returns on stocks are related to firm characteristics like size, earnings/price, cash flow/price, book-to-market equity, past sales growth and past returns. As a consequence, the authors have presented a model that includes two additional risk

factors: (i) the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks (SMB — small minus big), and (ii) the difference between the return on a portfolio of high book-to-market ratio stocks and the return on a portfolio of low book-to-market stocks (HML — high minus low). In the Carhart (1997) model, momentum in a given stock is described as the tendency for the stock price to continue rising if it is performing well or to continue declining if it is performing negatively. The monthly momentum can be calculated by subtracting the equal weighted average of the lowest performing firms from the equal weighed average of the highest performing firms, both lagged one month, according to Carhart (1997). Similar to the three factor model from Fama & French (1993), momentum factor is defined by the acronym WML, which means winners minus losers.

Therefore, the model used to assess the Jensen's alphas of aggressive funds will be as follows:

$$R_{i,t} - CDI_t = \alpha_{3,i} + \alpha_{4,i} * (R_{m,t} - CDI_t) + \alpha_{5,i} * SMB_t + \alpha_{6,i} * HML_t + \alpha_{7,i} * WML_t + \alpha_{8,i} * (IMA_t - CDI_t) + \alpha_{9,i} * (IRF_t - CDI_t) \quad (5)$$

where $\alpha_{4,i}$, $\alpha_{5,i}$, $\alpha_{6,i}$, $\alpha_{7,i}$, $\alpha_{8,i}$ and $\alpha_{9,i}$ are fund's exposures to the six risk factors. The $\alpha_{3,i}$ is the Jensen's alpha for the aggressive fund i .

Finally, we developed a regression analysis in which it is investigated the influence of three variables on the annualized net returns: administrative fees, size and pure insurance company effect. It is expected that administrative fees have an impact on net returns. High fees are charged under the assumption of high performance, so it will be investigated. Likewise, the size is expected to influence the net returns. Do small funds deliver higher returns to attract more resources? This is the question to be answered with the regression. And lastly, the "pure insurance effect" will be assessed due to reasons aforementioned. The equation writes as follows:

$$R_{i,m} = \beta_4 + \beta_5 * Fee_i + \beta_6 * \ln(Size_i) + \beta_7 * dummy_{PIC,i} \quad (6)$$

where β_4 is the regression intercept, β_5 and β_6 are the slopes of the fee and size factors, and β_7 is the marginal net return due to the "pure insurance company" effect after controlling for the fee and size effects. The fund size refers to the fund net worth held in December 2017.

In addition, a similar investigation was performed but related to the risk (as measured by the standard deviation) of all funds during the period analyzed. Are high administrative fees associated with high risk? Are small funds more volatile than bigger funds? Are pure insurance companies riskier than insurance companies linked to retail banks? These are questions answered

by the regression. The equation below describes this analysis:

$$\sigma_i = \beta_8 + \beta_9 * Fee_i + \beta_{10} * \ln(Size_i) + \beta_{11} * dummy_{PIC,i} \quad (7)$$

where β_8 is the regression intercept, β_9 and β_{10} are the slopes of the fee and size factors, and β_{11} is the marginal standard deviation (risk) due to the “pure insurance company” effect after controlling for the fee and size effects. All other variables are defined just as previously.

All data concerning the funds were provided by Quantum Finance. The returns were provided on a daily basis from January 3rd, 2008, to December 28th, 2017, which sums up to a total of 2470 observations.

The selection criteria started with the mapping of all aggressive and conservative PGBL and VGBL funds available in the market. Then, we selected funds with at least 10 years of existence in December 2017. This time frame was chosen to have the longest possible period, within the restriction of having at least four pure insurance companies. It was also important that the fund received investments from solely one institution (although not common, some funds are shared by more than just one institution). In addition, only non-Master funds were chosen. These criteria were important to allow the comparison performed by this study and they refined the selected universe of PGBL and VGBL funds to 9 institutions (five retails banks and four insurance companies) and a total of 131 (PGBL and VGBL) funds. The list of funds and institutions can be seen on appendix A.

The risk factors from the Carhart (1997) four factor model were retrieved from NEFIN Center website: NEFIN is the Brazilian Center for Research in Financial Economics of the University of São Paulo. The factors were generated based on the assessment of the Brazilian stock market and more information is provided by Nefin (2017).

Both fixed income factors (IMA-B and IRF-M) as well as the benchmarks (IBRX-100 and CDI) time-series were retrieved from the Bloomberg data services platform.

5 Results

5.1 Geometric Mean Return Analysis

To preserve the identity of each fund, figures 2 and 3 do not assume any specific order. Figure 2 represents the comparison between mean annualized total returns and mean annualized net

returns of conservative funds. Net return is the total return deduced by the administrative fee charged by each institution. More information about how much is charged by each institution can be seen on Appendix B.

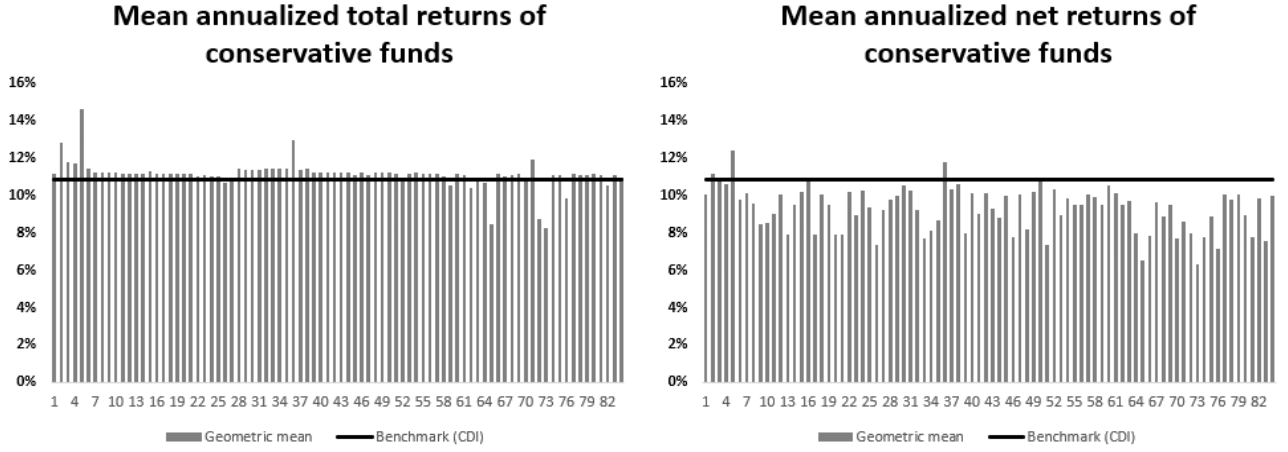


Figure 2: Annual returns of conservative funds.
Source: Elaborated by the authors.

As one can see, for total returns of conservative funds, only 9 out of 84 funds did not beat the benchmark, which is the annualized geometric mean of CDI returns (10.83%). This can be explained by the fact that these funds may invest in corporate bonds, which deliver higher returns than the benchmark. However, after the administrative fee has been charged, this behavior reverts. Only 3 out of 84 funds delivered net returns to investors higher than the CDI.

To determine whether pure insurance companies experienced better returns, a simple regression analysis was performed (equation 1). The results can be seen on table 1.

Table 1: Simple regression analysis for conservative funds with total or net returns as dependent variables and a dummy variable representing the “pure insurance company” effect.

	Total returns conservative funds			Net returns conservative funds		
	Estimate	t-value	P-value	Estimate	t-value	P-value
Intercept	11.00%	134.3	0.0%***	9.20%	68.3	0.0%***
Pure insurance company effect	0.75%	3.3	0.1%***	0.87%	2.3	2.2%**
Adjusted R2	10.9%			5.1%		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

On table 1, there is statistically significant indication that pure insurance companies deliver higher returns, on average. A premium of 0.75% per year is found on the regression to the total returns. On its turn, a premium of 0.87% per year is found on the the net returns.

Figure 3 represents the analysis to aggressive funds. For the total returns, only 19 out of 47 funds beat the benchmark (daily weighted average of CDI, 60%, and IBRX-100, 40%), that has presented a mean annualized return of 8.16% per year. When assessing the net returns, only 9

out of 47 funds beat this benchmark.

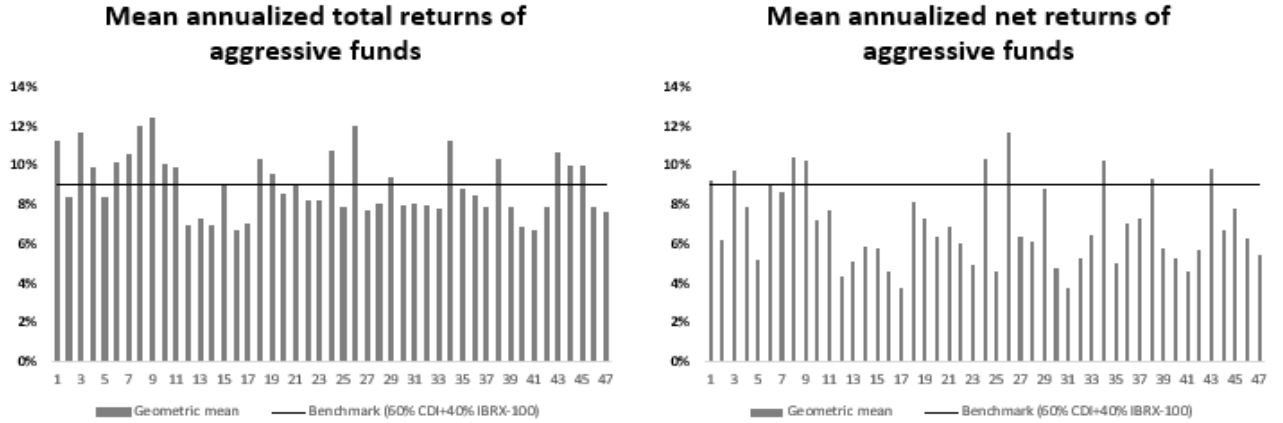


Figure 3: Annual returns of aggressive funds.
Source: Elaborated by the authors.

Another simple regression analysis was performed to compare performance between the two types of institutions, but now to aggressive funds (equation 1). The results can be seen on table 2.

Table 2: Simple regression analysis for aggressive funds with total or net returns as dependent variables and a dummy variable representing the “pure insurance company” effect.

	Total returns aggressive funds			Net returns aggressive funds		
	Estimate	t-value	P-value	Estimate	t-value	P-value
Intercept	8.66%	32.9	0.0%***	6.63%	19.1	0.0%***
Pure insurance company effect	1.04%	2.2	3.7%**	1.03%	1.6	11.4%
Adjusted R2	7.3%			3.4%		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

As table 2 indicates, to total returns, there is a premium return for funds administrated by pure insurance companies (1.04%). However, no statistical evidence was found on the regression of the net returns.

One important caveat from tables 1 and 2 is the fact that both yielded low adjusted R2 for total and net returns. However, the models have no intention to explain that the returns are based on just one variable, in this case the variable "pure insurance company". Therefore, low adjusted R2 are irrelevant for this analysis. The same argument applies to the simple regression analyzes (tables 3 and 4) on the following section.

5.2 Sharpe Ratio Analysis

The results from the previous section were favorable to pure insurance companies. However, one can argue that they compare returns without taking into consideration the risk. Therefore,

to better assess the performance, the Sharpe ratio analysis is performed in this section. The goal is to rank the funds based on the trade-off between risk and return, which is embedded into the Sharpe ratio equation. Once again, the name of each fund will be preserved and the analysis will be made based on the comparison between the two types of institutions.

Figure 4 depicts the ranking for conservative funds. The numbers on the vertical axis indicate the position of each institution on the Sharpe ratio ranking. Therefore, the number one on this axis indicates the best performer fund. On this figure, there is a visual (slight) concentration of funds from pure insurance companies on the lower level for both total and net returns. To confirm statistically the differences between the medians, the Mann-Whitney test was performed for both total and net returns. To total returns of conservative funds, the test rejected the null hypothesis to a level of significance equal to 1%, with $W = 187$, $p\text{-value} = 0.35\%$ and a difference in the medians favoring pure insurance companies equal to 24.63%. On its turn, to net return of conservative funds, the null hypothesis was also rejected to a level of significance equal to 10%, with $W = 256$, $p\text{-value} = 5.37\%$ and a difference in the medians favoring pure insurance companies equal to 0.006%.

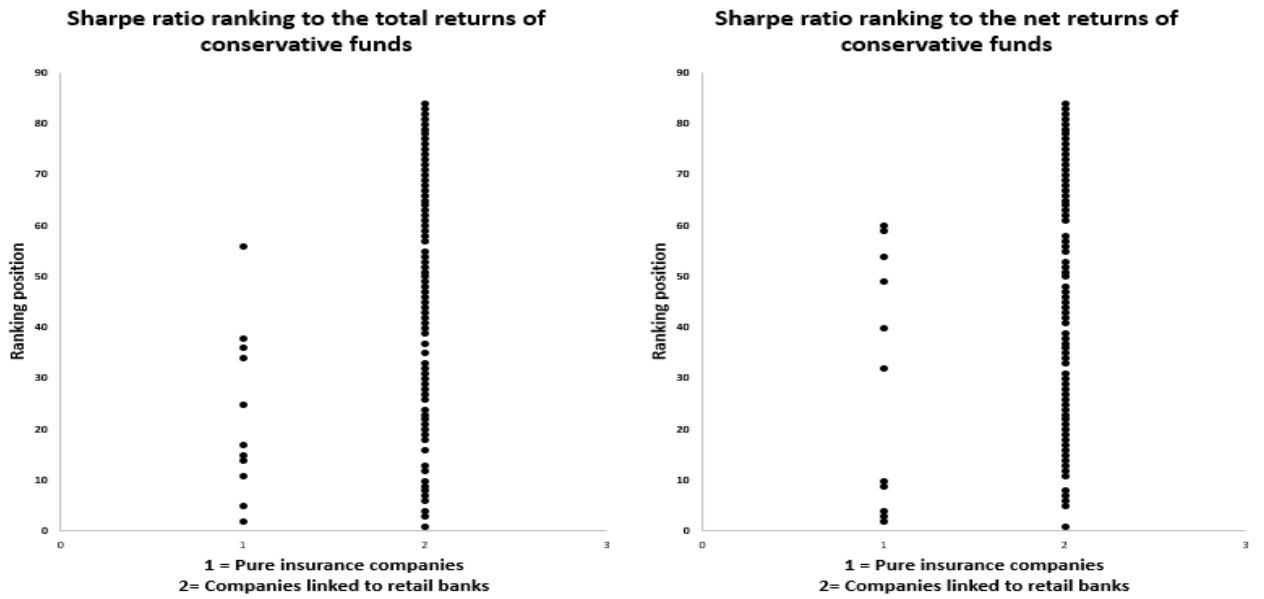


Figure 4: Sharpe ranking of conservative funds. The numbers on the vertical axis indicate the position of each institution on the Sharpe ratio ranking. The horizontal axis represents the two types of institutions.

Source: Elaborated by the authors.

To determine statistically the better performance of pure insurance companies, a simple regression analysis (equation 3) is presented below on table 3.

Table 3: Simple regression analysis for conservative funds with Sharpe ratio as dependent variable and a dummy representing the “pure insurance company” effect.

	Total returns of conservative funds			Net returns of conservative funds		
	Estimate	t-value	P-value	Estimate	t-value	P-value
Intercept	48.44%	12.9	0.0%***	1.18%	0.9	37.3%
Pure insurance company effect	26.87%	2.6	1.1%**	4.52%	1.2	22.0%
Adjusted R2	6.5%			0.6%		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

There is a superior performance of 26.87% for total returns of funds administrated by pure insurance companies. To net returns, there is no statistical evidence of superior performance.

Figure 5 represents the Sharpe ratio ranking for aggressive funds. On this figure, the ranking for pure insurance companies is more disperse in both total and net returns than it was for conservative funds. In fact, the Mann-Whitney test favored none of the returns. To total returns of aggressive funds, the null hypothesis could not be rejected, with $W = 165$ and $p\text{-value} = 12.87\%$. The same result was found to net return, with $W = 186$ and $p\text{-value} = 30.45\%$.

The results of the regression analysis for the aggressive funds are displayed on table 4.

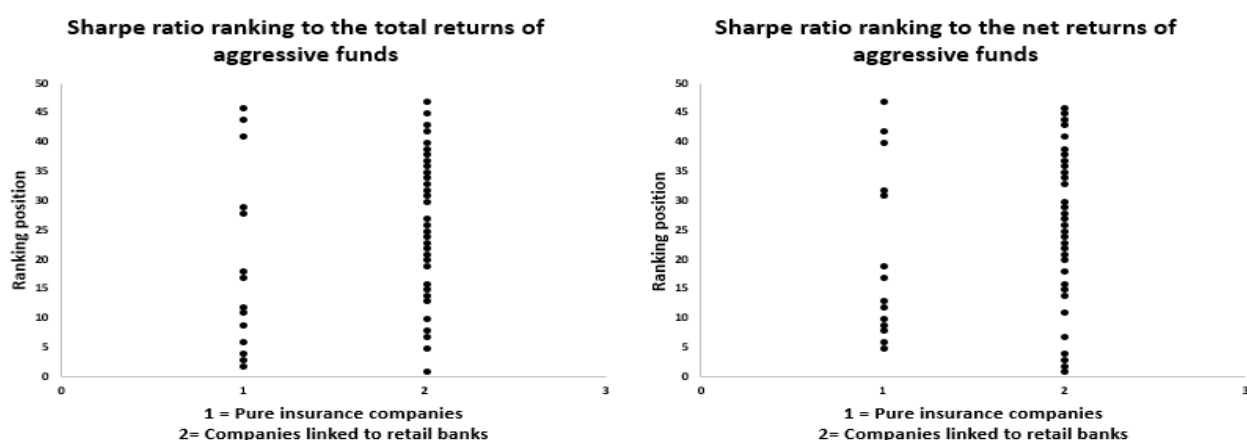


Figure 5: Sharpe ranking of aggressive funds. The numbers on the vertical axis indicate the position of each institution on the Sharpe ratio ranking. The horizontal axis represents the two types of institutions.

Source: Elaborated by the authors.

Table 4: Simple regression analysis for aggressive funds with Sharpe ratio as dependent variable and a dummy representing the “pure insurance company” effect.

	Total returns aggressive funds			Net returns aggressive funds		
	Estimate	t-value	P-value	Estimate	t-value	P-value
Intercept	2.55%	0.9	37.2%	-0.05%	-0.2	88.5%
Pure insurance company effect	7.58%	1.5	15.0%	-0.27%	-0.4	67.4%
Adjusted R2	2.4%			-1.8%		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

We can observe that both results (using total and net returns) lack statistical significance. And the biases are now opposed: while the bias still favors pure insurance companies when using total returns, this is not true when using net returns. These results, for aggressive funds, when coupled with the results of the previous section, lead us to conclude that funds administrated by pure insurance companies are, on average, more volatile than funds administrated by companies linked to retail banks: indeed, the mean annualized standard deviations are respectively 9.9% and 8.4%.

5.3 Jensen's Alpha Analysis

The results for Jensen's alpha can be found on Appendix C. In this assessment, an alpha of zero means that the fund performs in line with the market (as given by the risk factors of the model used). A positive alpha indicates the fund is outperforming the market, while a negative alpha indicates the funds fail to generate returns to the same rate as the broader sector: in other words, funds provide mean returns not compatible with their risk level. To carry out the analysis, a two-factor model with only fixed-income factors was applied to conservative funds, as demonstrated on equation 4. To aggressive funds, a six-factor model with a blend of fixed and variable income factors was used, as outlined on equation 5.

The two-factor model proved to be statistically significant to only 42 conservative funds (50% of the sample). Overall, the results show a very poor performance for the whole sample of funds. For pure insurance companies, the model was more effective than for companies linked to retail banks (only regression number 6 was rejected). However, we observe only two funds (3 and 4) yielding positive alphas to net returns, but these estimates were not statistically significant and the adjusted R2 were very low (1.2% and 1.0% respectively), which indicates lack of evidence even for these funds. All the other funds produced negative alphas to net returns. Regarding the funds managed by companies linked to retail banks, none of them delivered positive alpha for the net returns. Even those funds presenting positive alphas for gross returns were just a few statistically significant, what leads us to the conclusion that administrative fees cannot be the unique explanation for the extremely poor performance observed through the net returns.

To the analysis of aggressive funds, the six-factors model proved to be more effective statistically for most of the regressions. This might indicate that the fixed income Brazilian market is more difficult to be benchmarked. This result was also found by (Campani & Brito, 2018), who used, instead, the fixed income fund of the same characteristic and from the same company

as a benchmark for aggressive funds. Nonetheless, similar results can be observed to aggressive funds. Only 3 out of 47 regressions yielded significant positive alphas to total returns. However, to net returns, only three alphas were positive, but yet with no statistical significance. Many funds presented negative alphas with statistical evidence.

In summary, the vast majority of the alphas were not favorable to any kind of institution in particular. Predominantly, the alphas found by the models used in this work were most of the times statistically zero or negative. Furthermore, after the administrative fee has been charged, all the alphas diminished considerably, providing statistical evidence of underperformance. Overall, our results confirm the findings of other authors claiming that most of the retirement funds do not deliver positive alphas (check Campani & Brito (2018) for more details).

5.4 Robustness Check: Controlling for Administrative Fees and Size on Net Returns

Administrative fees are charged under the assumption of active management. A thorough discussion about this topic can be found in Campani & Brito (2018). The figure 6 depicts a box-plot graphic comparing administrative fees charged by pure insurance companies and companies linked to a large retail bank.

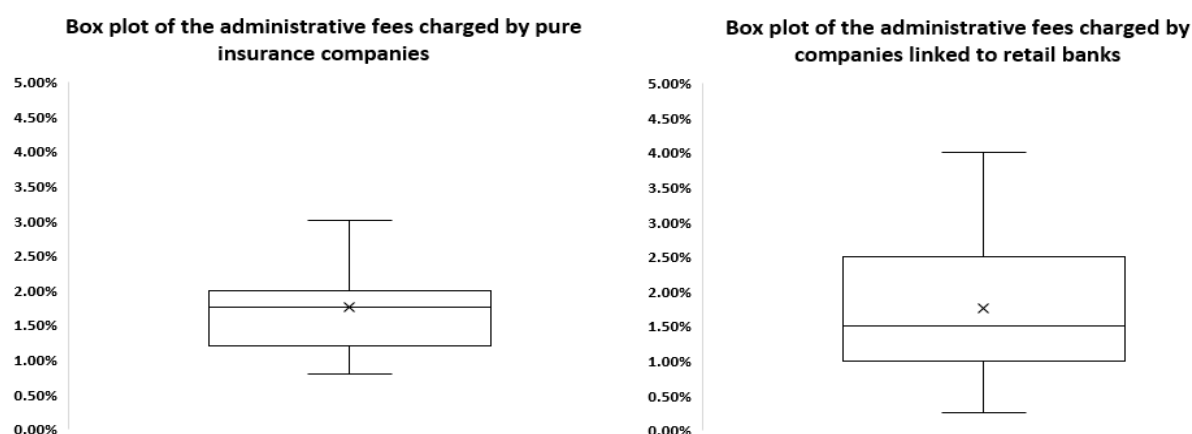


Figure 6: Box-plot of administrative fees charged by pure insurance companies and by companies linked to retail banks

Source: Elaborated by the authors.

As one can see above, the average fee of 1.75% is roughly the same for both types of institutions. However, it is clear that pure insurance companies have a more restricted range. On one hand, the pure insurance companies are not able to charge very high administration fees

because they do not have much access (as compared to retail banks) to costumers willing to pay for these higher fees. On the other hand, due to their cost structure, pure insurance companies are also not able to offer very low fees as retail banks can.

Figure 7 represents the box-plot graphic comparing the administrative fees charged by conservative and aggressive funds.

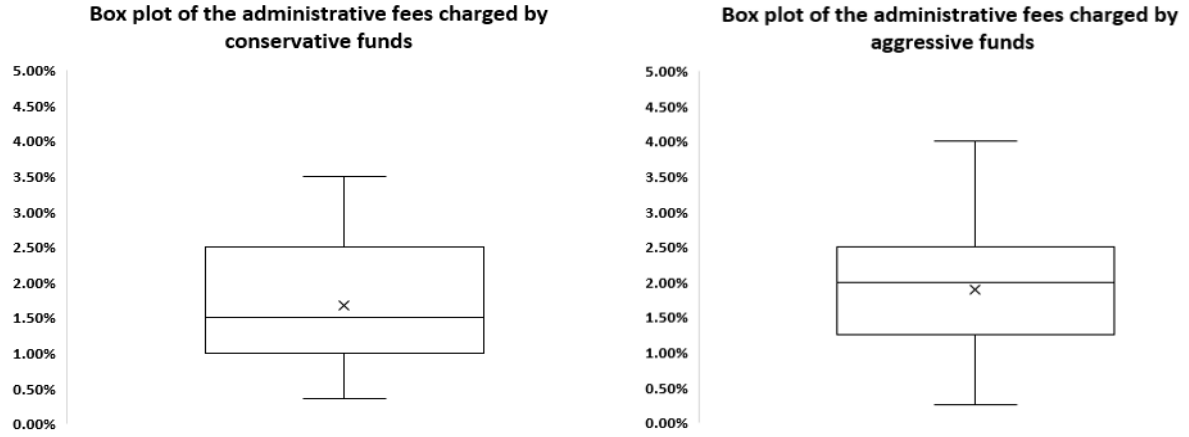


Figure 7: Box-plot of administrative fees charged by conservative and aggressive funds.

Source: Elaborated by the authors.

In this figure, the average fee for conservative funds is 1.67% and the average fee for aggressive funds is 1.89%. Aggressive funds are indeed expected to charge higher fees than conservative funds because they are allowed to invest in more assets, with higher levels of risk (i.e., stocks), which demands more from its management team. All fees charged by each fund selected by this study are presented on appendix B.

On tables 5 and 6, we analyze the influence on net returns of administrative fees, size and the “pure insurance company” effect, as outlined by equation 6.

Table 5: Multiple regression analysis for net returns of conservative funds, with administrative fee, neperian logarithm of the total net worth and a dummy variable representing the “pure insurance company” effect as independent variables.

	Estimate	t-value	P-value
Intercept	0.093	14.9	0.0%***
Administrative fee	-1.037	-12.3	0.0%***
Ln(Net worth)	0.001	2.6	1.0%***
Pure insurance company effect	0.008	3.6	0.1%***
Adjusted R2	67.7%		
F-stat	59.0		
P-value(F-stat)	0.0%***		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

According to the results of table 5, there is a negative correlation between the administrative fees and net returns of conservative funds. This result is important because it suggests that higher administrative fees are not paying off. On its turn, there is a positive correlation between net returns and size, which suggests that larger conservative funds tend to deliver higher net returns. Another important result is that, on average, pure insurance companies deliver a premium return of 0.8% per year on top of the net return delivered by a company linked to a retail bank. This result confirmed the findings of table 1, even after controlling for the administrative fee charged and the size of the fund. The Adjusted R2 of 67.7% demonstrates the power of this model to explain the returns of conservative funds.

Table 6: Multiple regression analysis for net returns of aggressive funds, with administrative fee, neparian logarithm of the total net worth and a dummy variable representing the “pure insurance company” effect as independent variables.

	Estimate	t-value	P-value
Intercept	0.057	2.7	1.0%***
Administrative fee	-1.706	-7.1	0.0%***
Ln(Net worth)	0.002	2.0	5.7%*
Pure insurance company effect	0.010	2.4	2.4%**
Adjusted R2	54.3%		
F-stat	19.2		
P-value(F-stat)	0.0%***		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

The results displayed on table 6 show a similar behavior as observed on table 5. It shows that there is a negative correlation between the administrative fees and net returns of aggressive funds, a positive correlation between size and net returns and a premium of 1% per year on top of the net return delivered by a companies linked to retail banks. This result confirmed the bias found on table 2. However, after controlling for the administrative fee charged and the size of the fund, the estimate became statistically significant. The model is also powerful in explaining the returns of aggressive funds, yielding a Adjusted R2 of 54.3%.

On tables 7 and 8, we analyze the influence of administrative fees, size and the “pure insurance company” effect on the standard deviation, as outlined by equation 7.

Table 7: Multiple regression analysis for annualized standard deviation of conservative funds, with annualized standard deviation as dependent variable and administrative fee, neperian logarithm of the total net worth and pure insurance company as independent variables.

	Estimate	t-value	P-value
Intercept	0.033	3.8	0.0%***
Administrative fee	-0.031	-0.3	79.5%
Ln(Net worth)	-0.001	-2.9	0.5%***
Pure insurance company effect	0.004	1.2	23.6%
Adjusted R2	7.9%		
F-stat	3.4		
P-value(F-stat)	2.3%**		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

According to the results depicted on table 7, there is negative correlation between net worth and risk, which suggests that larger conservative funds tend to be less volatile than smaller funds. Since small funds are more agile to take positions, this result might indicate that large funds may opt to follow more stable strategies. On the other hand, it was not found statistically significant correlation between administrative fees and pure insurance company effect. The lack of evidence may be due to the fact that conservative funds tend to invest in products with similar (and low) risks. It is important to mention that the model yielded a low Adjusted R2, which is of 7.9%. This result shows that the model is poor in explaining the risk. In fact, only one variable was significant statistically.

Table 8: Multiple regression analysis for annualized standard deviation of aggressive funds, with annualized standard deviation as dependent variable and administrative fee, neperian logarithm of the total net worth and pure insurance company as independent variables.

	Estimate	t-value	P-value
Intercept	0.001	0.0	98.5%
Administrative fee	2.015	3.0	0.5%***
Ln(Net worth)	0.003	0.9	37.0%
Pure insurance company effect	-0.014	-1.1	26.8%
Adjusted R2	15.9%		
F-stat	3.9		
P-value(F-stat)	1.5%		

Source: Elaborated by the authors. Level of significance: 1% *** 5% ** 10%*.

The table 8 shows no statistically significant correlation between risk and net worth, and between risk and the pure insurance company effect for aggressive funds. However, there is a positive correlation between administrative fee and risk, which indicates that high administrative fees tend to be attached to more volatile funds. This result is expected due to the fact that high administrative fees are charged under the assumption of more active management. In other words, higher fees would be justified to cover higher costs due to more human capital needed to manage these funds. It is important notice that the model also yielded a low Adjusted R2, which in this case is of 15.9%. As stated before, the low Adjusted R2 found means that the regression is poor in explaining the risk for aggressive funds.

The table 9 summarizes all the results that favored pure insurance companies.

Table 9: Summary of all results that favored pure insurance companies.

	Funds	Total Returns	Net Returns
Section 5.1: Analysis of net returns	Conservative	Yes	Yes
	Aggressive	Yes	No
Section 5.2: Sharpe Analysis	Conservative	Yes	No
	Aggressive	No	No
Section 5.3: Jensen's Alpha Analysis	Conservative	No	No
	Aggressive	No	No
Section 5.4: Robustness Check	Conservative	Yes*	Yes*
	Aggressive	Yes*	Yes*

* It was used both returns (total and net) in the same regression

6 Conclusion

Our findings suggest evidences that pure insurance companies deliver, in general, higher net returns. The analysis carried out grouped the funds into two classes: conservative (fixed income) and aggressive (up to 49% invested in variable income): the results in both groups favored pure insurance companies.

Another important result was that it seems that any superior performance produced by funds' management is absorbed by the administrative fee for all types of funds. To illustrate this result, the vast majority of conservative funds under-performed the CDI benchmark, when considered net returns. Even when adjusting the performance to the risk taken by the fund, as according to Jensen's alpha analysis, the results are not positive to any kind of fund on any institution. All the funds yielded alphas which were either statistically not different from zero or, what is worse, statistically lower than zero.

Our analysis also investigated the "pure insurance company" effect when controlling the fund's size and its administrative fee. For both groups of funds, it was clear the negative effect of administrative fees. Higher administrative fees indicated, on average, lower net return to investors. The size effect showed up to be positive, which means that greater funds achieved, on average, better net returns: this is known in the literature as the scale effect. Finally, the "pure insurance company" effect was statistically significant, indicating an annual premium of 0.8% for conservative funds and of 1.0% for aggressive funds. When assessing the risk through a similar analysis, results were mixed and not so evident, as well as the "pure insurance company" effect was not statistically significant to neither conservative nor aggressive funds.

Despite the superior performance of pure insurers, it is difficult to tell investors that they should decide to invest with this type of institution for at least two reasons: future uncertainties and convenience. The performance analysis carried out here looked backward. Therefore, it is difficult to ascertain whether the extra performance of these institutions will be replicated in the future. Even if this was the case, some investors may consider other retail banking offerings (such as discounted fees or other conveniences) to be worth as a package when compared to the extra returns from pure insurance companies. Especially in a scenario where all sorts of institutions lose to simple benchmarks.

We believe that this article contributes to the discussion of PGBL and VGBL (as well as others) retirement funds performances with an additional original analysis separating funds

linked to large retail banks and, as we name in this study, pure insurance companies. The results shed lights not only on the poor performance of most of the funds in comparison with standard benchmarks, but also on the even worse performance of funds linked to large retail banks. This discussion is extremely important to preserve best performances for long horizon investors as well as to guarantee that the available retirement products (e.g., PGBL and VGBL) remain attractive to everyone.

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A Institutions and Funds Selected

Table 10: Institutions selected after the filter.

Institutions selected	Type of institution
Bradesco	Insurance company linked to a retail bank
BrasilPrev (Banco do Brasil)	Insurance company linked to a retail bank
Caixa Econômica	Insurance company linked to a retail bank
Itaú	Insurance company linked to a retail bank
Santander	Insurance company linked to a retail bank
Icatu	Pure insurance company
Mapfre	Pure insurance company
Porto Seguro	Pure insurance company
Sulamérica Seguros	Pure insurance company

Source: Quantum Finance.

Table 11: Part 1 of the list of PGBL/VGBL funds, including: CNPJ of each fund, type of institution, max investment in variable income products of each fund, day where the fund was created, differentiation between feeder funds, a column showing that all fund are non-master and a column identifying the number of plans of each fund selected.

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth	Number of plans
BRASILPREV RT FIX II FIC Conservativa	03.537.407/0001-40	Brasilprev	Conservative	0	22/08/2000	no	no	R\$ 46,837,614,655.18	65
BRASILPREV RT FIX VI FIC Conservativa	07.919.956/0001-30	Brasilprev	Conservative	0	05/06/2006	no	no	R\$ 44,053,828,880.52	39
BRADESCO VGBL F10 FIC Conservativa	06.081.437/0001-54	Bradesco Asset Management	Conservative	0	06/09/2004	yes	no	R\$ 41,533,843,593.70	21
BRASILPREV RT FIX VII FIC Conservativa	06.001.785/0001-01	Brasilprev	Conservative	0	01/08/2007	no	no	R\$ 39,270,214,191.25	38
BRASILPREV RT FIX C FIC Conservativa	05.061.121/0001-67	Brasilprev	Conservative	0	12/05/2003	no	no	R\$ 23,292,868,106.16	40
ITAÚ FLEXPREV PREMIUM FIC Conservativa	04.118.652/0001-86	Itaú Unibanco	Conservative	0	19/10/2000	yes	no	R\$ 14,843,403,231.89	126
BRADESCO VGBL FIX FIC Conservativa	04.830.277/0001-00	Bradesco Asset Management	Conservative	0	08/03/2002	yes	no	R\$ 12,873,058,502.26	19
BRASILPREV RT FIX V FIC Conservativa	03.601.017/0001-92	Brasilprev	Conservative	0	12/01/2000	yes	no	R\$ 10,623,874,339.54	75
BRADESCO VGBL F15 FIC Conservativa	06.185.741/0001-70	Bradesco Asset Management	Conservative	0	19/10/2004	yes	no	R\$ 10,188,802,909.51	13
SANTANDER IV FIC Conservativa CRÉDITO PRIVADO	05.971.745/0001-11	Santander Brasil Asset Management	Conservative	0	02/02/2005	yes	no	R\$ 8,080,506,587.47	63
BRADESCO PGBL F 10 FIC Conservativa	03.256.797/0001-80	Bradesco Asset Management	Conservative	0	30/08/1999	yes	no	R\$ 7,472,920,612.64	41
BRADESCO PGBL F10 FIC PLUS FIC Conservativa	04.253.202/0001-04	Bradesco Asset Management	Conservative	0	31/07/2001	yes	no	R\$ 5,865,364,978.39	19
ITAÚ FLEXPREV INVESTORS FIC Conservativa	07.096.907/0001-45	Itaú Unibanco	Conservative	0	31/01/2006	yes	no	R\$ 5,727,311,055.42	41
CAIXA 300 FIC Conservativa PREVIDENCIÁRIO	03.926.431/0001-71	Caixa Vida e Previdência	Conservative	0	22/09/2000	yes	no	R\$ 5,719,790,379.55	30
ITAÚ FLEXPREV PLUS FIC Conservativa	02.920.280/0001-45	Itaú Unibanco	Conservative	0	07/12/1998	yes	no	R\$ 5,593,204,783.26	54
CAIXA 100 FIC Conservativa PREVIDENCIÁRIO	03.737.224/0001-79	Caixa Vida e Previdência	Conservative	0	05/06/2003	yes	no	R\$ 5,464,041,192.67	15
BRASILPREV RT FIX FIC Conservativa	03.537.379/0001-61	Brasilprev	Conservative	0	08/05/2000	no	no	R\$ 4,736,627,317.78	37
CAIXA 200 FIC Conservativa PREVIDENCIÁRIO	03.737.222/0001-80	Caixa Vida e Previdência	Conservative	0	04/07/2007	yes	no	R\$ 4,728,640,643.51	10
SANTANDER III FIC Conservativa CRÉDITO PRIVADO	04.794.586/0001-43	Santander Brasil Asset Management	Conservative	0	19/12/2001	yes	no	R\$ 4,410,229,073.40	77
SANTANDER PREV FIX EXCLUSIVO FIC Conservativa CRÉDITO PRIVADO	04.572.903/0001-06	Santander Brasil Asset Management	Conservative	0	30/11/2001	yes	no	R\$ 4,302,425,386.13	86
BRASILPREV RT FIX III FIC Conservativa	03.601.000/0001-35	Brasilprev	Conservative	0	02/07/2001	no	no	R\$ 4,207,846,594.94	40
BRADESCO PREV FÁCIL PGBL F1X FIC Conservativa	02.561.139/0001-30	Bradesco Asset Management	Conservative	0	10/05/1999	yes	no	R\$ 3,374,793,403.66	30
ITAÚ FLEXPREV CORPORATE I FIC Conservativa	04.264.940/0001-49	Itaú Unibanco	Conservative	0	06/02/2001	no	no	R\$ 2,850,121,036.69	63
ITAÚ FLEXPREV I FIC Conservativa	02.911.408/0001-40	Itaú Unibanco	Conservative	0	11/08/1999	yes	no	R\$ 2,633,827,342.13	66
SANTANDER PREV FIX EXECUTIVO FIC Conservativa CRÉDITO PRIVADO	03.534.936/0001-90	Santander Brasil Asset Management	Conservative	0	21/09/2000	yes	no	R\$ 2,352,261,647.14	97
BRASILPREV RT FIX IV FIC Conservativa	03.600.987/0001-73	Brasilprev	Conservative	0	12/01/2000	no	no	R\$ 1,889,374,181.28	41
ITAÚ FLEXPREV XII A FIC Conservativa	04.118.883/0001-90	Itaú Unibanco	Conservative	0	09/08/2001	yes	no	R\$ 1,748,450,957.93	6
BRASILPREV RENDA TOTAL CICLO DE VIDA 2020 FIC MULTIMERCADO	06.001.797/0001-28	Brasilprev	Aggressive	49	01/08/2007	no	no	R\$ 1,540,235,058.31	112
SANTANDER PREV FIX FIC Conservativa CRÉDITO PRIVADO	02.498.190/0001-44	Santander Brasil Asset Management	Conservative	0	30/03/1999	yes	no	R\$ 1,432,436,273.48	78
ITAÚ FLEXPREV SPECIAL II FIC Conservativa	02.900.304/0001-66	Itaú Unibanco	Conservative	0	17/12/1997	yes	no	R\$ 1,303,857,938.38	30
ITAÚ FLEXPREV XVI FIC Conservativa	08.543.326/0001-77	Itaú Unibanco	Conservative	0	20/06/2007	yes	no	R\$ 1,176,966,988.60	48
SANTANDER II FIC Conservativa CRÉDITO PRIVADO	04.684.467/0001-59	Santander Brasil Asset Management	Conservative	0	19/10/2001	yes	no	R\$ 1,148,953,495.02	29
SANTANDER PREV FIX SUPERIOR FIC Conservativa CRÉDITO PRIVADO	07.647.772/0001-69	Bradesco Asset Management	Conservative	0	11/09/2006	yes	no	R\$ 1,146,355,020.72	64
BRADESCO H PGBL/VGBL FUTURE FI Conservativa	01.392.021/0001-62	Bradesco Asset Management	Conservative	0	23/10/1996	no	no	R\$ 1,027,252,941.01	40
MAPFRE PREVISION PREV FIC Conservativa	07.725.529/0001-11	MAPFRE Investimentos	Conservative	0	04/05/2006	yes	no	R\$ 1,024,603,080.79	41
SANTANDER I FIC Conservativa CRÉDITO PRIVADO	07.190.289/0001-69	Santander Brasil Asset Management	Conservative	0	17/05/2005	yes	no	R\$ 1,011,413,548.76	16
MAPFRE CORPORATE PREV FI Conservativa	06.081.503/0001-15	MAPFRE Investimentos	Conservative	0	26/03/2004	no	no	R\$ 995,418,236.14	72
BRADESCO PGBL F 15 FIC Conservativa	02.998.253/0001-21	Bradesco Asset Management	Conservative	0	01/09/1999	yes	no	R\$ 980,741,789.30	24
PORTO SEGURO RUBI PREMIUM FIC Conservativa PREVIDENCIÁRIO	02.924.262/0001-78	Porto Seguro Investimentos	Conservative	0	11/09/2009	no	no	R\$ 964,257,661.32	67
SANTANDER XIII FIC Conservativa CRÉDITO PRIVADO	04.684.453/0001-35	Santander Brasil Asset Management	Conservative	0	19/10/2001	yes	no	R\$ 908,379,361.92	24
ITAÚ FLEXPREV XV A FIC Conservativa	05.592.103/0001-01	Itaú Unibanco	Conservative	0	07/02/2006	yes	no	R\$ 888,698,072.52	8
BRASILPREV FIX ANNUITY FI Conservativa	05.326.919/0001-93	Brasilprev	Conservative	0	31/10/2002	no	no	R\$ 840,199,100.74	73
SULAMÉRICA FIX 100 V FI Conservativa	03.077.322/0001-27	Sulamérica Investimentos	Conservative	0	09/08/1999	no	no	R\$ 785,564,351.66	66

Source: Quantum Finance.

Table 12: Part 2 of the list of PGBL/VGBL funds, including: CNPJ of each fund, type of institution, style of investment, max investment in variable income products of each fund, day where the fund was created, differentiation between feeder funds, a column showing that all fund are non-master and a column identifying the number of plans of each fund selected.

FTE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth	Number of plans
SANTANDER VI FIC Conservativa CRÉDITO PRIVADO	04.684.515/0001-09	Santander Brasil Asset Management	Conservative	0	19/10/2001	yes	no	R\$ 767,501,097.90	4
UNIBANCO PREVER I FIC 100 ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	03.207.865/0001-37	Itaú Unibanco	Conservative	0	13/03/2000	yes	no	R\$ 757,115,339.92	24
BRASILPREV DIVIDENDOS I FIC MULTIMERCADO	05.824.217/0001-30	Brasilprev	Aggressive	49	01/08/2007	yes	no	R\$ 710,282,769.25	98
BRADESCO H VGBL CONSERVADOR FI Conservativa	05.113.771/0001-09	Bradesco Asset Management	Conservative	0	11/11/2002	no	no	R\$ 667,077,593.68	16
SULAMÉRICA FIX 100 FI Conservativa	04.056.135/0001-20	SulAmérica Investimentos	Conservative	0	01/08/2001	yes	no	R\$ 624,987,599.70	59
FIAT PREVI ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	03.821.440/0001-06	Itaú Unibanco	Conservative	0	30/07/2004	yes	no	R\$ 614,936,917.78	4
ITAÚ FLEXPREV TRICOLOR FIC MULTIMERCADO CRÉDITO PRIVADO	08.389.857/0001-57	Itaú DTVM	Aggressive	49	27/12/2006	no	no	R\$ 589,638,163.34	2
BRASILPREV RENDA TOTAL CICLO DE VIDA 2040 FIC MULTIMERCADO	05.764.785/0001-92	Brasilprev	Aggressive	49	01/08/2007	no	no	R\$ 574,096,483.06	118
ICATU SEG CLASSIC FIC Conservativa	05.200.914/0001-10	Itaú Vanguardia	Conservative	0	06/02/2003	yes	no	R\$ 571,595,824.71	35
UNIBANCO PREVER IV FIC 100 ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	03.374.369/0001-52	Itaú Unibanco	Conservative	0	29/12/1999	yes	no	R\$ 551,195,560.24	41
BRASILPREV RENDA TOTAL CICLO DE VIDA 2030 FIC MULTIMERCADO	05.132.896/0001-86	Brasilprev	Aggressive	49	01/08/2007	no	no	R\$ 549,145,097.58	118
BRASILPREV FI FIX A FIC Conservativa	05.119.745/0001-98	Brasilprev	Conservative	0	02/08/2002	no	no	R\$ 422,455,845.07	18
ITAÚ FLEXPREV CORPORATE HT FIC Conservativa	02.551.024/0001-80	Itaú Unibanco	Conservative	0	25/03/1999	no	no	R\$ 390,877,247.53	20
SANTANDER V FIC Conservativa CRÉDITO PRIVADO	05.112.439/0001-20	Santander Brasil Asset Management	Conservative	0	01/08/2002	yes	no	R\$ 388,847,800.58	3
ITAÚ FLEXPREV CORPORATE PLATINUM RV 49 FIC MULTIMERCADO	04.342.594/0001-70	Itaú Unibanco	Aggressive	49	06/02/2002	no	no	R\$ 378,363,324.98	54
ITAÚ FLEXPREV CORPORATE IV FIC Conservativa	03.374.465/0001-09	Itaú Unibanco	Conservative	0	27/12/1999	yes	no	R\$ 374,133,171.53	49
SANTANDER VIII FIC Conservativa CRÉDITO PRIVADO	03.271.069/0001-54	Santander Brasil Asset Management	Conservative	0	10/02/2000	yes	no	R\$ 361,635,943.40	13
BRADESCO H PGBL CONSERVADOR FI Conservativa	02.907.508/0001-01	Bradesco Asset Management	Conservative	0	23/04/1999	no	no	R\$ 310,936,194.30	26
MAPFRE CORPORATE PREV FIC MULTIMERCADO	07.058.135/0001-57	MAPFRE Investimentos	Aggressive	49	02/05/2005	yes	no	R\$ 269,151,025.32	63
ICATU SEG DURATION FI Conservativa	04.511.256/0001-20	Itaú Vanguardia	Conservative	0	24/07/2001	no	no	R\$ 262,884,172.89	38
SULAMÉRICA FIX 100 FI FIC Conservativa	04.738.195/0001-22	SulAmérica Investimentos	Conservative	0	13/02/2003	no	no	R\$ 235,275,950.22	11
SULAMÉRICA FIX 100 FI Conservativa	03.077.330/0001-73	SulAmérica Investimentos	Conservative	0	09/08/1999	no	no	R\$ 233,647,827.54	17
ITAÚ FLEXPREV PREMIUM V40 FIC MULTIMERCADO	07.400.588/0001-10	Itaú Unibanco	Aggressive	49	30/06/2006	no	no	R\$ 203,349,066.90	76
BRASILPREV MULTISTRATÉGIA II FIC MULTIMERCADO	05.954.445/0001-24	Brasilprev	Aggressive	49	05/01/2004	no	no	R\$ 203,267,143.36	91
UNICLAS PREVER RF I ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	08.939.962/0001-12	Itaú Unibanco	Conservative	0	19/11/2007	yes	no	R\$ 194,134,622.08	6
PORTO SEGURO Aggressive FIC MULTIMERCADO PREVIDENCIÁRIO	02.924.248/0001-74	Porto Seguro Investimentos	Aggressive	49	29/10/1999	no	no	R\$ 190,524,384.18	50
BRASILPREV MULTISTRATÉGIA I FIC MULTIMERCADO	05.954.487/0001-65	Brasilprev	Aggressive	49	05/01/2004	no	no	R\$ 185,066,270.61	24
UNICLAS PREVER RF II ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	08.939.965/0001-56	Itaú Unibanco	Conservative	0	07/11/2007	yes	no	R\$ 183,360,865.63	6
TOPAZO AZUL PGBL ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	03.821.078/0001-65	Itaú Unibanco	Conservative	0	01/07/2004	no	no	R\$ 182,728,509.57	5
PIANO ACCOR DE PREVIDÊNCIA PGBL/VGBL FI Conservativa	02.710.116/0001-40	Bradesco Asset Management	Conservative	0	17/03/1999	no	no	R\$ 170,132,653.08	6
SULAMÉRICA FIX 100 VI FIC Conservativa	04.738.201/0001-41	SulAmérica Investimentos	Conservative	0	23/09/2004	no	no	R\$ 152,112,741.81	22
BRASILPREV FI FIX Z FI Conservativa	05.163.131/0001-43	Brasilprev	Conservative	0	10/12/2002	no	no	R\$ 146,559,387.98	4
SANTANDER PREV AGRESSIVO SUPERIOR FIC MULTIMERCADO CRÉDITO PRIVADO	03.334.939/0001-24	Santander Brasil Asset Management	Aggressive	49	27/10/2000	no	no	R\$ 146,477,450.18	98
ITAÚ FLEXPREV XVI PREMIUM FIC Conservativa	02.911.564/0001-01	Itaú Unibanco	Conservative	0	28/09/1999	no	no	R\$ 133,117,002.00	4
PRALEX I ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	07.644.989/0001-15	Itaú Unibanco	Conservative	0	20/11/2006	yes	no	R\$ 117,984,652.89	2
ICATU SEG MINHA APOSENTADORIA 2030 FIC MULTIMERCADO	07.190.746/0001-54	Itaú Vanguardia	Aggressive	49	29/12/2005	no	no	R\$ 104,157,709.47	27
MAPFRE CORPORATE PLUS PREV FIC MULTIMERCADO	08.933.169/0001-20	MAPFRE Investimentos	Aggressive	49	07/12/2007	yes	no	R\$ 102,338,028.65	53
ICATU SEG Aggressive 49C FIC MULTIMERCADO	02.764.418/0001-09	Itaú Seguros	Aggressive	49	15/12/1998	no	no	R\$ 98,890,190.35	39
SANTANDER PREV FIC MULTIMERCADO CRÉDITO PRIVADO	08.918.382/0001-49	Santander Brasil Asset Management	Aggressive	49	05/11/2007	yes	no	R\$ 89,924,701.78	61
CAIXA RENDA VARIÁVEL 0/49 300 FIC MULTIMERCADO PREVIDENCIÁRIO	08.070.833/0001-30	Caixa Vida e Previdência	Aggressive	49	08/11/2007	yes	no	R\$ 73,425,519.93	12
ITAÚ FLEXPREV JEQUITIBA I FIC MULTIMERCADO CRÉDITO PRIVADO	06.356.650/0001-56	Itaú DTVM	Aggressive	49	08/01/2007	no	no	R\$ 73,344,060.47	2
SULAMÉRICA MIX 49 FI MULTIMERCADO	02.811.681/0001-01	SulAmérica Investimentos	Aggressive	49	09/08/1999	no	no	R\$ 70,976,547.87	26
SANTANDER 49 I FIC MULTIMERCADO CRÉDITO PRIVADO	07.199.199/0001-78	Santander Brasil Asset Management	Aggressive	49	17/05/2005	no	no	R\$ 64,465,435.71	5
ICATU SEG MINHA APOSENTADORIA 2020 FIC MULTIMERCADO	07.199.624/0001-68	Itaú Vanguardia	Aggressive	49	02/01/2006	no	no	R\$ 59,699,256.33	25

Source: Quantum Finance.

Table 13: Part 3 of the list of PGBL/VGBL funds, including: CNPJ of each fund, type of institution, style of investment, max investment in variable income products of each fund, day where the fund was created, differentiation between feeder funds, a column showing that all fund are non-master and a column identifying the number of plans of each fund selected.

FTE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth	Number of plans
ITAÚ FLEXPREV PLUS V40 FIC MULTIMERCADO	04.699.650/0001-28	Itaú Unibanco	Aggressive	49	19/12/2003	No	No	R\$ 50,085,859.42	17
ICATU SEG MINHA APOSENTADORIA 2040 FIC MULTIMERCADO	07.190.735/0001-74	Icatu Vanguardia	Aggressive	49	20/12/2005	No	No	R\$ 57,656,734.89	25
BRADESCO PGBL HIPERPREV FIC Conservativa	04.103.102/0001-03	Bradesco Asset Management	Aggressive	49	03/11/2001	Yes	No	R\$ 56,971,708.68	4
PACK FIX 100 ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	04.700.080/0001-40	Itaú Unibanco	Conservative	0	13/12/2001	Yes	No	R\$ 56,186,903.97	4
PORTO SEGURO RUBI PLUS FIC MULTIMERCADO PREVIDENCIÁRIO	08.747.758/0001-77	Porto Seguro Investimentos	Conservative	49	18/12/2007	No	No	R\$ 52,681,146.85	63
BRADESCO H PGBL/VGBL CLASSIC FIC Conservativa	07.985.878/0001-72	Bradesco Asset Management	Aggressive	49	30/11/2006	No	No	R\$ 52,235,387.13	1
SANTANDER PREV RFA FIC Conservativa CRÉDITO PRIVADO	03.565.431/0001-04	Santander Brasil Asset Management	Conservative	0	01/09/2000	Yes	No	R\$ 51,727,034.04	1
SANTANDER PREV SUPERIOR FIC MULTIMERCADO CRÉDITO PRIVADO	08.918.379/0001-25	Santander Brasil Asset Management	Aggressive	49	05/11/2007	Yes	No	R\$ 50,930,709.71	70
MAPFRE INVERSON FI MULTIMERCADO	07.187.591/0001-05	MAPFRE Investimentos	Conservative	0	09/01/2006	No	No	R\$ 46,869,747.41	2
BRASILPREV RENDA TOTAL RI FIC MULTIMERCADO	05.132.916/0001-19	Brasilprev	Aggressive	49	01/08/2007	No	No	R\$ 45,187,435.22	2
BRADESCO H PGBL/VGBL POTENCIAL FIC MULTIMERCADO	08.773.281/0001-27	Bradesco Asset Management	Aggressive	49	25/09/2007	No	No	R\$ 45,163,105.91	8
SULAMÉRICA MIX 40 I FI MULTIMERCADO	04.616.035/0001-40	SulAmérica Investimentos	Aggressive	49	26/09/2003	No	No	R\$ 42,392,354.93	64
ITAÚ FLEXPREV IV 40 FIC MULTIMERCADO	04.701.172/0001-43	Itaú Unibanco	Aggressive	49	04/09/2002	No	No	R\$ 41,677,226.49	9
ITAÚ FLEXPREV INVESTORS V 40 FIC MULTIMERCADO	08.455.270/0001-37	Itaú Unibanco	Aggressive	49	26/09/2007	No	No	R\$ 40,877,003.32	21
ICATU SEG Aggressive 49B FIC MULTIMERCADO	02.764.434/0001-43	Icatu Seguros	Aggressive	49	19/10/1999	No	No	R\$ 38,620,476.17	21
ITAÚ PRIVATE PREV V 45 FIC MULTIMERCADO	08.417.967/0001-85	Itaú DTVM	Aggressive	49	30/08/2007	No	No	R\$ 33,333,976.71	7
BRADESCO PGBL/VGBL FUTURE Aggressive III FIC MULTIMERCADO	01.392.020/0001-18	Bradesco Asset Management	Aggressive	49	30/09/1996	No	No	R\$ 31,882,136.75	37
ITAUPREV PREVSAO FIC Conservativa	04.841.814/0001-40	Itaú Unibanco	Aggressive	49	20/11/2002	Yes	No	R\$ 31,871,216.84	12
ITAUPREV ANNUITY V30 FIC MULTIMERCADO	02.668.765/0001-20	Itaú Unibanco	Aggressive	49	17/08/1998	No	No	R\$ 30,717,102.25	12
ITAÚ FLEXPREV PRIVATE V 45 FIC MULTIMERCADO	08.417.908/0001-07	Itaú DTVM	Aggressive	49	10/08/2007	No	No	R\$ 28,718,884.77	10
ITAÚ FLEXPREV XI A V40 FIC MULTIMERCADO	08.820.430/0001-61	Itaú Unibanco	Aggressive	49	17/08/2007	No	No	R\$ 26,068,201.22	2
SANTANDER X FIC Conservativa CRÉDITO PRIVADO	08.629.012/0001-91	Santander Brasil Asset Management	Conservative	0	30/10/2007	Yes	No	R\$ 23,961,047.28	10
MAPFRE CORPORATE GOVERNANCE Aggressive FIC MULTIMERCADO	07.727.352/0001-51	MAPFRE Investimentos	Aggressive	49	30/06/2006	Yes	No	R\$ 20,541,315.41	55
BRADESCO H PGBL/VGBL EMPRESARIAL CONSERVADOR FI Conservativa	03.824.229/0001-63	Bradesco Asset Management	Conservative	0	31/03/2000	No	No	R\$ 18,436,954.30	18
SANTANDER VII FIC Conservativa CRÉDITO PRIVADO	03.069.107/0001-84	Santander Brasil Asset Management	Conservative	0	21/10/1999	Yes	No	R\$ 17,109,268.90	2
SANTANDER 49 FIC MULTIMERCADO CRÉDITO PRIVADO	08.628.945/0001-64	Santander Brasil Asset Management	Aggressive	49	11/10/2007	No	No	R\$ 16,687,652.36	62
ITAÚ FLEXPREV CORPORATE PREMIUM FIC Conservativa	06.008.952/0001-38	Itaú Unibanco	Conservative	0	30/01/2004	No	No	R\$ 16,311,397.12	4
SANTANDER PREV RFB FIC Conservativa CRÉDITO PRIVADO	03.565.192/0001-71	Santander Brasil Asset Management	Conservative	0	29/09/2000	Yes	No	R\$ 15,242,963.35	1
BRADESCO H PGBL/VGBL VALOR FIC MULTIMERCADO	08.757.682/0001-93	Bradesco Asset Management	Aggressive	49	25/09/2007	No	No	R\$ 13,348,226.23	6
ITAÚ FLEXPREV DOBRADO FIC MULTIMERCADO	08.434.498/0001-42	Itaú DTVM	Aggressive	49	16/01/2007	No	No	R\$ 11,417,715.62	2
BRADESCO PRGP VRGP 30 FI Conservativa	07.058.194/0001-25	Bradesco Asset Management	Conservative	0	23/12/2004	No	No	R\$ 10,877,234.25	1
SANTANDER XIV FIC Conservativa CRÉDITO PRIVADO	04.684.499/0001-54	Santander Brasil Asset Management	Conservative	0	19/10/2001	Yes	No	R\$ 10,230,470.48	10
SADIA ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	03.431.584/0001-73	Itaú Unibanco	Conservative	0	28/04/2003	Yes	No	R\$ 5,389,606.54	2
BRADESCO PGBL CAEMI F 15 FIC Conservativa	03.958.330/0001-82	Bradesco Asset Management	Conservative	0	06/12/2000	Yes	No	R\$ 4,803,176.98	1
UNICLASS PREVER RV 49 I ESPECIALMENTE CONSTITUÍDOS FIC MULTIMERCADO	08.939.984/0001-82	Itaú Unibanco	Aggressive	49	07/11/2007	No	No	R\$ 4,221,906.57	6
ICATU SEG Aggressive I FIC MULTIMERCADO	03.644.263/0001-21	Icatu Vanguardia	Aggressive	49	30/03/2000	No	No	R\$ 3,555,707.17	4
UNIBANCO PREVER III FIX 100 ESPECIALMENTE CONSTITUÍDOS FIC Conservativa	05.535.883/0001-58	Itaú Unibanco	Conservative	0	13/06/2003	Yes	No	R\$ 3,249,903.47	2
SANTANDER FUTURE FI MULTIMERCADO	04.290.727/0001-72	Santander Brasil Asset Management	Aggressive	49	09/11/2001	No	No	R\$ 3,046,611.77	2
ITAÚ FLEXPREV VIII B FIC Conservativa	04.701.235/0001-61	Itaú Unibanco	Conservative	0	04/10/2006	Yes	No	R\$ 2,776,696.65	18
SANTANDER PREV TOP SELECT FIC MULTIMERCADO CRÉDITO PRIVADO	03.565.187/0001-69	Santander Brasil Asset Management	Aggressive	49	18/10/2000	No	No	R\$ 2,710,369.62	12
SANTANDER PREV XX FIC Conservativa CRÉDITO PRIVADO	08.629.018/0001-69	Santander Brasil Asset Management	Conservative	0	06/06/2007	Yes	No	R\$ 2,692,829.30	2
ICATU SEG MINHA APOSENTADORIA 2010 FIC MULTIMERCADO	07.190.444/0001-86	Icatu Vanguardia	Aggressive	49	29/12/2005	No	No	R\$ 2,368,022.17	5
SANTANDER XI FI Conservativa CRÉDITO PRIVADO	04.684.457/0001-13	Santander Brasil Asset Management	Conservative	0	19/10/2001	No	No	R\$ 1,687,014.16	2
UNICLASS PREVER RV 49 II ESPECIALMENTE CONSTITUÍDOS FIC MULTIMERCADO	08.939.994/0001-18	Itaú Unibanco	Aggressive	49	09/11/2007	No	No	R\$ 156,976.15	5

Source: Quantum Finance.

B Administrative Fee Charged per Fund

Table 14: Part 1 of the table containing: the name of the fund, the correspondent CNPJ and the administrative fee charged by the fund.

FIE	CNPJ	Administrative fee
UNICLASS PREVER RV 49 II ESPECIALMENTE CONSTITUÍDOS FIC MULTIMERCADO	08.939.994/0001-18	1.50%
UNICLASS PREVER RV 49 I ESPECIALMENTE CONSTITUÍDOS FIC MULTIMERCADO	08.939.984/0001-82	2.00%
UNICLASS PREVER RF II ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	08.939.965/0001-56	1.00%
UNICLASS PREVER RF I ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	08.939.962/0001-12	1.50%
UNIBANCO PREVER IV FIX 100 ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	03.374.369/0001-52	2.00%
UNIBANCO PREVER III FIX 100 ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	05.535.883/0001-58	2.50%
UNIBANCO PREVER I FIX 100 ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	03.507.865/0001-37	3.50%
TOPÁZIO AZUL PGBL ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	03.821.078/0001-65	1.00%
SULAMÉRICA MIX 49 FI MULTIMERCADO	02.811.681/0001-01	2.00%
SULAMÉRICA FIX 100 VI FI RENDA FIXA	04.738.201/0001-41	2.00%
SULAMÉRICA FIX 100 IV FI RENDA FIXA	04.056.135/0001-20	1.50%
SULAMÉRICA FIX 100 II FI RENDA FIXA	04.738.195/0001-22	2.50%
SULAMÉRICA MIX 49 I FI MULTIMERCADO	04.616.035/0001-00	1.00%
SULAMÉRICA FIX 100 V FI RENDA FIXA	03.077.322/0001-27	1.00%
SULAMÉRICA FIX 100 FI RENDA FIXA	03.077.330/0001-73	2.50%
SANTANDER XIV FIC RENDA FIXA CRÉDITO PRIVADO	04.684.499/0001-54	1.80%
SANTANDER XIII FIC RENDA FIXA CRÉDITO PRIVADO	04.684.453/0001-35	0.70%
SANTANDER XI FI RENDA FIXA CRÉDITO PRIVADO	04.684.457/0001-13	3.00%
SANTANDER X FIC RENDA FIXA CRÉDITO PRIVADO	08.629.012/0001-91	0.90%
SANTANDER VIII FIC RENDA FIXA CRÉDITO PRIVADO	03.271.099/0001-54	2.50%
SANTANDER VII FIC RENDA FIXA CRÉDITO PRIVADO	03.069.107/0001-84	3.00%
SANTANDER VI FIC RENDA FIXA CRÉDITO PRIVADO	04.684.515/0001-09	3.00%
SANTANDER V FIC RENDA FIXA CRÉDITO PRIVADO	05.112.439/0001-20	3.00%
SANTANDER PREV XX FIC RENDA FIXA CRÉDITO PRIVADO	08.629.018/0001-69	0.60%
SANTANDER PREV TOP SELECT FIC MULTIMERCADO CRÉDITO PRIVADO	03.565.187/0001-69	2.00%
SANTANDER PREV SUPERIOR FIC MULTIMERCADO CRÉDITO PRIVADO	08.918.379/0001-25	2.00%
SANTANDER PREV RFB FIC RENDA FIXA CRÉDITO PRIVADO	03.565.192/0001-71	1.25%
SANTANDER PREV RFA FIC RENDA FIXA CRÉDITO PRIVADO	03.565.131/0001-04	2.00%
SANTANDER PREV FIX SUPERIOR FIC RENDA FIXA CRÉDITO PRIVADO	07.647.772/0001-69	2.00%
SANTANDER PREV FIX FIC RENDA FIXA CRÉDITO PRIVADO	02.498.190/0001-44	3.00%
SANTANDER PREV FIX EXECUTIVO FIC RENDA FIXA CRÉDITO PRIVADO	03.534.936/0001-90	1.50%
SANTANDER PREV FIX EXCLUSIVO FIC RENDA FIXA CRÉDITO PRIVADO	04.572.903/0001-06	1.00%
SANTANDER PREV FIC MULTIMERCADO CRÉDITO PRIVADO	08.918.382/0001-49	3.00%
SANTANDER PREV AGRESSIVO SUPERIOR FIC MULTIMERCADO CRÉDITO PRIVADO	03.534.939/0001-24	2.00%
SANTANDER IV FIC RENDA FIXA CRÉDITO PRIVADO	05.971.745/0001-11	0.90%
SANTANDER III FIC RENDA FIXA CRÉDITO PRIVADO	04.794.886/0001-43	1.20%

Source: Quantum Finance.

Table 15: Part 2 of the table containing: the name of the fund, the correspondent CNPJ and the administrative fee charged by the fund.

FIE	CNPJ	Administrative fee
SANTANDER II FIC RENDA FIXA CRÉDITO PRIVADO	04.684.467/0001-59	2.00%
SANTANDER I FIC RENDA FIXA CRÉDITO PRIVADO	07.199.289/0001-69	3.20%
SANTANDER FUTURE FI MULTIMERCADO	04.299.727/0001-72	0.70%
SANTANDER 49 I FIC MULTIMERCADO CRÉDITO PRIVADO	07.199.199/0001-78	2.00%
SANTANDER 49 FIC MULTIMERCADO CRÉDITO PRIVADO	08.628.945/0001-64	1.50%
SADIA ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	05.431.584/0001-73	0.98%
PRALEX I ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	07.644.989/0001-15	0.50%
PORTO SEGURO RUBI PREMIUM FIC RENDA FIXA PREVIDENCIÁRIO	02.924.262/0001-78	1.50%
PORTO SEGURO RUBI PLUS FIC MULTIMERCADO PREVIDENCIÁRIO	08.747.753/0001-77	2.50%
PORTO SEGURO COMPOSTO FIC MULTIMERCADO PREVIDENCIÁRIO	02.924.248/0001-74	2.00%
PLANO ACCOR DE PREVIDÊNCIA PGBL/VGBL FI RENDA FIXA	02.710.116/0001-40	0.79%
PACK FIX 100 ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	04.709.080/0001-00	0.90%
MAPFRE PREVISION PREV FIC RENDA FIXA	07.725.529/0001-11	0.80%
MAPFRE INVERSION FI MULTIMERCADO	07.187.591/0001-05	2.00%
MAPFRE CORPORATE PREV FIC MULTIMERCADO	07.058.135/0001-57	1.40%
MAPFRE CORPORATE PREV FI RENDA FIXA	06.081.503/0001-15	1.00%
MAPFRE CORPORATE PLUS PREV FIC MULTIMERCADO	08.893.169/0001-20	1.90%
MAPFRE CORPORATE GOVERNANCE COMPOSTO FIC MULTIMERCADO	07.727.582/0001-51	2.60%
ITAUPREV PREVISÃO FIC RENDA FIXA	04.841.814/0001-00	0.90%
ITAUPREV ANNUITY V30 FIC MULTIMERCADO	02.668.765/0001-20	3.50%
ITAÚ PRIVATE PREV V45 FIC MULTIMERCADO	08.417.967/0001-85	1.25%
ITAÚ FLEXPREV XVI PREMIUM FIC RENDA FIXA	02.911.564/0001-01	0.90%
ITAÚ FLEXPREV XVI FIC RENDA FIXA	08.543.326/0001-77	0.90%
ITAÚ FLEXPREV XV A FIC RENDA FIXA	05.592.103/0001-01	0.38%
ITAÚ FLEXPREV XII A FIC RENDA FIXA	04.118.883/0001-90	0.98%
ITAÚ FLEXPREV XI A V40 FIC MULTIMERCADO	08.820.430/0001-61	0.50%
ITAÚ FLEXPREV VIII B FIC RENDA FIXA	04.701.235/0001-61	1.80%
ITAÚ FLEXPREV TRICOLOR FIC MULTIMERCADO CRÉDITO PRIVADO	08.389.857/0001-57	0.25%
ITAÚ FLEXPREV SPECIAL II FIC RENDA FIXA	02.290.304/0001-66	2.80%
ITAÚ FLEXPREV PRIVATE V45 FIC MULTIMERCADO	08.417.908/0001-07	1.25%
ITAÚ FLEXPREV PREMIUM V40 FIC MULTIMERCADO	07.400.588/0001-10	1.80%

Source: Quantum Finance.

Table 16: Part 3 of the table containing: the name of the fund, the correspondent CNPJ and the administrative fee charged by the fund.

FIE	CNPJ	Administrative fee
ITAÚ FLEXPREV PREMIUM FIC RENDA FIXA	04.118.652/0001-86	1.00%
ITAÚ FLEXPREV PLUS V40 FIC MULTIMERCADO	04.699.650/0001-28	3.00%
ITAÚ FLEXPREV PLUS FIC RENDA FIXA	02.290.280/0001-45	2.20%
ITAÚ FLEXPREV JEQUITIBÁ I FIC MULTIMERCADO CRÉDITO PRIVADO	08.395.650/0001-95	0.50%
ITAÚ FLEXPREV INVESTORS V40 FIC MULTIMERCADO	08.435.270/0001-37	2.50%
ITAÚ FLEXPREV INVESTORS FIC RENDA FIXA	07.096.907/0001-45	1.75%
ITAÚ FLEXPREV I V40 FIC MULTIMERCADO	04.701.172/0001-43	4.00%
ITAÚ FLEXPREV I FIC RENDA FIXA	02.911.408/0001-40	3.20%
ITAÚ FLEXPREV DOURADO FIC MULTIMERCADO	08.434.498/0001-02	0.85%
ITAÚ FLEXPREV CORPORATE PREMIUM FIC RENDA FIXA	06.008.952/0001-38	0.80%
ITAÚ FLEXPREV CORPORATE PLATINUM RV49 FIC MULTIMERCADO	04.342.594/0001-70	1.25%
ITAÚ FLEXPREV CORPORATE IV FIC RENDA FIXA	03.374.465/0001-09	1.50%
ITAÚ FLEXPREV CORPORATE II FIC RENDA FIXA	02.851.024/0001-80	1.25%
ITAÚ FLEXPREV CORPORATE I FIC RENDA FIXA	04.264.940/0001-49	1.00%
ICATU SEG MINHA APOSENTADORIA 2040 FIC MULTIMERCADO	07.190.735/0001-74	1.75%
FIAT PREVI ESPECIALMENTE CONSTITUÍDOS FIC RENDA FIXA	03.821.440/0001-06	0.50%
CAIXA RENDA VARIÁVEL 0/49 300 FIC MULTIMERCADO PREVIDENCIÁRIO	08.070.833/0001-30	3.00%
CAIXA 300 FIC RENDA FIXA PREVIDENCIÁRIO	03.926.431/0001-71	3.00%
CAIXA 200 FIC RENDA FIXA PREVIDENCIÁRIO	03.737.222/0001-80	2.00%
CAIXA 100 FIC RENDA FIXA PREVIDENCIÁRIO	03.737.224/0001-79	1.00%
BRASILPREV RT FIX Z FI RENDA FIXA	05.163.131/0001-03	0.70%
BRASILPREV RT FIX VII FIC RENDA FIXA	06.001.785/0001-01	0.80%
BRASILPREV RT FIX VI FIC RENDA FIXA	07.919.956/0001-30	1.25%
BRASILPREV RT FIX V FIC RENDA FIXA	03.601.017/0001-92	2.00%
BRASILPREV RT FIX IV FIC RENDA FIXA	03.600.987/0001-73	2.50%
BRASILPREV RT FIX III FIC RENDA FIXA	03.601.000/0001-35	3.00%
BRASILPREV RT FIX II FIC RENDA FIXA	03.537.407/0001-40	1.50%
BRASILPREV RT FIX FIC RENDA FIXA	03.537.379/0001-61	3.40%
BRASILPREV RT FIX C FIC RENDA FIXA	05.061.121/0001-67	1.00%
BRASILPREV RT FIX A FIC RENDA FIXA	05.119.745/0001-98	0.95%
BRASILPREV RENDA TOTAL RI FIC MULTIMERCADO	05.132.916/0001-19	0.40%
BRASILPREV RENDA TOTAL CICLO DE VIDA 2040 FIC MULTIMERCADO	05.764.785/0001-92	2.00%
BRASILPREV RENDA TOTAL CICLO DE VIDA 2030 FIC MULTIMERCADO	05.132.896/0001-86	2.00%
BRASILPREV RENDA TOTAL CICLO DE VIDA 2020 FIC MULTIMERCADO	06.001.797/0001-28	2.00%
BRASILPREV MULTIESTRATÉGIA II FIC MULTIMERCADO	05.954.445/0001-24	2.00%
BRASILPREV MULTIESTRATÉGIA I FIC MULTIMERCADO	05.954.487/0001-65	3.00%
BRASILPREV FIX ANNUITY FI RENDA FIXA CRÉDITO PRIVADO	05.326.919/0001-93	1.00%

Source: Quantum Finance.

Table 17: Part 4 of the table containing: the name of the fund, the correspondent CNPJ and the administrative fee charged by the fund.

FIE	CNPJ	Administrative fee
ICATU SEG MINHA APOSENTADORIA 2030 FIC MULTIMERCADO	07.190.746/0001-54	1.75%
ICATU SEG MINHA APOSENTADORIA 2020 FIC MULTIMERCADO	07.190.624/0001-68	1.75%
ICATU SEG MINHA APOSENTADORIA 2010 FIC MULTIMERCADO	07.190.444/0001-86	1.75%
ICATU SEG DURATION FI RENDA FIXA	04.511.286/0001-20	1.50%
ICATU SEG COMPOSTO I FIC MULTIMERCADO	03.644.263/0001-21	1.00%
ICATU SEG COMPOSTO 49C FIC MULTIMERCADO	02.764.418/0001-09	2.00%
ICATU SEG COMPOSTO 49B FIC MULTIMERCADO	02.764.434/0001-93	3.00%
ICATU SEG CLASSIC FIC RENDA FIXA	05.200.914/0001-10	1.00%
BRASILEPREV DIVIDENDOS I FIC MULTIMERCADO	05.824.217/0001-30	2.00%
BRADERSCO VGBL FIX FIC RENDA FIXA	04.830.277/0001-00	3.00%
BRADERSCO VGBL F15 FIC RENDA FIXA	06.185.741/0001-70	1.50%
BRADERSCO VGBL F10 FIC RENDA FIXA	06.081.457/0001-54	1.00%
BRADERSCO PRGP VRGP 30 FI RENDA FIXA	07.058.194/0001-25	3.00%
BRADERSCO PREV FÁCIL PGBL FIX FIC RENDA FIXA	02.561.139/0001-30	3.00%
BRADERSCO PGBL/VGBL FUTURE COMPOSTO III FIC MULTIMERCADO	01.392.020/0001-18	2.00%
BRADERSCO PGBL/VGBL FIX PLUS FIC RENDA FIXA	04.253.202/0001-04	0.35%
BRADERSCO PGBL HIPERPREV FIC RENDA FIXA	04.103.102/0001-93	2.00%
BRADERSCO PGBL F 15 FIC RENDA FIXA	02.998.253/0001-21	1.50%
BRADERSCO PGBL F 10 FIC RENDA FIXA	03.256.797/0001-80	1.00%
BRADERSCO PGBL CAEMI F 15 FIC RENDA FIXA	03.958.330/0001-82	1.50%
BRADERSCO H VGBL CONSERVADOR FI RENDA FIXA	05.113.771/0001-09	3.00%
BRADERSCO H PGBL/VGBL VALOR FIC MULTIMERCADO	08.757.682/0001-93	3.00%
BRADERSCO H PGBL/VGBL POTENCIAL FIC MULTIMERCADO	08.773.281/0001-27	3.00%
BRADERSCO H PGBL/VGBL FUTURE FI RENDA FIXA	01.392.021/0001-62	1.00%
BRADERSCO H PGBL/VGBL EMPRESARIAL CONSERVADOR FI RENDA FIXA	03.824.230/0001-63	1.50%
BRADERSCO H PGBL/VGBL CLASSIC FI RENDA FIXA	07.985.878/0001-72	0.68%
BRADERSCO H PGBL CONSERVADOR FI RENDA FIXA	02.907.508/0001-01	3.00%

Source: Quantum Finance.

C Jensen's Alpha Analysis for Aggressive and Conservative Funds

Table 18: Jensen's Alpha analysis for conservative funds part 1.

		Total returns of conservative funds					Net return of conservative funds				
Number	Type of institution	Alpha (annualized)	P-value (Alpha)	Adjusted R ²	F-Stat	P-value(F-Stat)	Alpha (annualized)	P-value (Alpha)	Adjusted R ²	F-Stat	P-value(F-Stat)
1	Pure insurance company	0.22%	1.8%	0.3%	4.2	1.6%	-0.77%	0.0%	0.3%	4.2	1.6%
2	Pure insurance company	-6.71%	0.0%	72.6%	3,267.1	0.0%	-8.10%	0.0%	72.6%	3,267.1	0.0%
3	Pure insurance company	1.42%	0.1%	1.2%	16.6	0.0%	0.61%	13.5%	1.2%	16.6	0.0%
4	Pure insurance company	1.23%	0.0%	1.0%	13.1	0.0%	0.23%	51.6%	1.0%	13.1	0.0%
5	Pure insurance company	-0.86%	29.1%	14.2%	206.0	0.0%	-2.83%	0.0%	14.2%	206.0	0.0%
6	Pure insurance company	0.42%	11.6%	0.1%	2.1	12.4%	-1.07%	0.0%	0.1%	2.1	12.4%
7	Pure insurance company	0.17%	42.8%	0.0%	6.1	0.2%	-0.82%	0.0%	0.4%	6.1	0.2%
8	Pure insurance company	0.20%	29.5%	0.0%	7.1	0.1%	-1.29%	0.0%	0.5%	7.1	0.1%
9	Pure insurance company	0.22%	19.7%	0.0%	8.0	0.0%	-2.26%	0.0%	0.6%	8.0	0.0%
10	Pure insurance company	0.23%	16.2%	0.0%	7.4	0.1%	-2.24%	0.0%	0.5%	7.4	0.1%
11	Pure insurance company	0.15%	38.3%	0.0%	9.4	0.0%	-1.84%	0.0%	0.7%	9.4	0.0%
12	Insurance company linked to a retail bank	0.25%	18.1%	0.1%	2.2	11.5%	-0.74%	0.0%	0.1%	2.2	11.5%
13	Insurance company linked to a retail bank	0.33%	0.0%	0.0%	1.6	20.4%	-2.63%	0.0%	0.0%	1.6	20.4%
14	Insurance company linked to a retail bank	0.26%	17.8%	0.1%	2.2	11.5%	-1.24%	0.0%	0.1%	2.2	11.5%
15	Insurance company linked to a retail bank	0.45%	3.2%	0.0%	1.2	31.0%	-0.55%	0.0%	0.0%	1.2	31.0%
16	Insurance company linked to a retail bank	0.25%	18.9%	0.1%	2.2	11.5%	-0.10%	59.0%	0.1%	2.2	11.5%
17	Insurance company linked to a retail bank	0.33%	0.0%	0.1%	1.7	18.7%	-2.63%	0.0%	0.1%	1.7	18.7%
18	Insurance company linked to a retail bank	0.27%	15.5%	0.0%	1.3	27.1%	-0.73%	0.0%	0.0%	1.3	27.1%
19	Insurance company linked to a retail bank	0.25%	18.6%	0.1%	2.2	11.5%	-1.24%	0.0%	0.1%	2.2	11.5%
20	Insurance company linked to a retail bank	0.26%	17.0%	0.0%	1.3	26.5%	-2.70%	0.0%	0.0%	1.3	26.5%
21	Insurance company linked to a retail bank	0.27%	15.4%	0.0%	1.3	27.5%	-2.69%	0.0%	0.0%	1.3	27.5%
22	Insurance company linked to a retail bank	0.15%	42.5%	0.0%	1.3	26.3%	-0.64%	0.1%	0.0%	1.3	26.3%
23	Insurance company linked to a retail bank	0.28%	0.2%	0.0%	1.6	20.4%	-1.71%	0.0%	0.0%	1.6	20.4%
24	Insurance company linked to a retail bank	0.13%	49.1%	0.0%	1.3	28.3%	-0.55%	0.4%	0.0%	1.3	28.3%
25	Insurance company linked to a retail bank	0.11%	56.4%	0.0%	1.5	21.5%	-1.38%	0.0%	0.0%	1.5	21.5%
26	Insurance company linked to a retail bank	-0.19%	0.0%	-0.1%	0.1	88.6%	-3.14%	0.0%	-0.1%	0.1	88.6%
27	Insurance company linked to a retail bank	0.03%	87.1%	0.1%	2.2	11.4%	-1.46%	0.0%	0.1%	2.2	11.4%
28	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,641.3	0.0%	-2.77%	0.0%	86.1%	7,641.3	0.0%
29	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,641.0	0.0%	-2.53%	0.0%	86.1%	7,641.0	0.0%
30	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,640.7	0.0%	-2.09%	0.0%	86.1%	7,640.7	0.0%
31	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,640.1	0.0%	-2.28%	0.0%	86.1%	7,640.0	0.0%
32	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,642.6	0.0%	-3.25%	0.0%	86.1%	7,642.5	0.0%
33	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,644.4	0.0%	-4.60%	0.0%	86.1%	7,644.2	0.0%
34	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,644.2	0.0%	-1.22%	0.0%	86.1%	7,644.1	0.0%
35	Insurance company linked to a retail bank	-1.30%	0.0%	86.1%	7,642.9	0.0%	-3.74%	0.0%	86.1%	7,642.8	0.0%
36	Insurance company linked to a retail bank	1.21%	0.0%	43.6%	953.5	0.0%	0.20%	45.8%	43.6%	953.5	0.0%
37	Insurance company linked to a retail bank	-1.32%	0.0%	86.1%	7,640.0	0.0%	-2.25%	0.0%	86.1%	7,640.0	0.0%
38	Insurance company linked to a retail bank	-1.28%	0.0%	75.5%	3,795.1	0.0%	-1.97%	0.0%	75.5%	3,795.1	0.0%
39	Insurance company linked to a retail bank	0.26%	1.6%	0.1%	2.1	12.3%	-2.61%	0.0%	0.1%	2.1	12.3%
40	Insurance company linked to a retail bank	0.34%	2.2%	0.1%	2.1	11.9%	-0.65%	0.0%	0.1%	2.1	11.9%
41	Insurance company linked to a retail bank	0.35%	2.0%	0.1%	2.1	11.8%	-1.64%	0.0%	0.1%	2.1	11.8%

Source: Elaborated by the authors. Level of significance: 1% ***1% ** 10% *

Table 19: Jensen's alpha analysis for conservative funds part 2.

Number	Type of institution	Total returns of conservative funds					Net returns of conservative funds				
		Alpha (annualized)	P-value (Alpha)	Adjusted R ²	F-Stat	P-value(F-Stat)	Alpha (annualized)	P-value (Alpha)	Adjusted R ²	F-Stat	P-value(F-Stat)
42	Insurance company linked to a retail bank	0.31%	9.9%*	0.0%	0.6	55.4%	-0.69%	0.0%***	0.0%	59.1%	55.4%
43	Insurance company linked to a retail bank	0.32%	9.6%*	0.0%	0.6	55.3%	-1.43%	0.0%***	0.0%	59.3%	55.3%
44	Insurance company linked to a retail bank	0.33%	8.6%*	0.0%	0.6	55.4%	-1.86%	0.0%***	0.0%	59.0%	55.4%
45	Insurance company linked to a retail bank	0.22%	2.9%**	-0.1%	0.3	72.8%	-0.78%	0.0%***	-0.1%	31.1%	72.8%
46	Insurance company linked to a retail bank	0.34%	7.4%*	0.0%	0.6	55.8%	-2.82%	0.0%***	0.0%	58.4%	55.8%
47	Insurance company linked to a retail bank	0.23%	20.9%	0.0%	0.9	39.9%	-0.75%	0.0%***	0.0%	91.9%	39.9%
48	Insurance company linked to a retail bank	0.32%	8.8%*	0.0%	0.6	55.4%	-2.45%	0.0%***	0.0%	59.1%	55.4%
49	Insurance company linked to a retail bank	0.30%	11.2%	0.0%	0.6	55.1%	-0.69%	0.2%***	0.0%	59.6%	55.1%
50	Insurance company linked to a retail bank	0.33%	6.2%*	0.0%	0.8	45.5%	-0.65%	70.0%	0.0%	79.8%	45.5%
51	Insurance company linked to a retail bank	0.23%	21.2%	0.0%	1.5	22.7%	-0.22%	0.0%***	0.0%	149.5%	22.7%
52	Insurance company linked to a retail bank	-0.02%	88.3%	0.0%	0.7	50.7%	-0.52%	0.1%***	0.0%	68.0%	50.7%
53	Insurance company linked to a retail bank	0.22%	22.7%	0.0%	1.5	22.7%	-1.76%	0.0%***	0.0%	149.2%	22.7%
54	Insurance company linked to a retail bank	0.36%	1.2%**	-0.1%	0.1	94.8%	-0.89%	0.0%***	-0.1%	5.4%	94.8%
55	Insurance company linked to a retail bank	0.21%	31.0%	0.0%	0.6	52.9%	-1.28%	0.0%***	0.0%	63.6%	52.9%
56	Insurance company linked to a retail bank	0.21%	25.9%	0.0%	1.3	28.1%	-1.28%	0.0%***	0.0%	127.1%	28.1%
57	Insurance company linked to a retail bank	0.21%	27.1%	0.0%	1.3	29.2%	-0.79%	0.0%***	0.0%	126.6%	29.2%
58	Insurance company linked to a retail bank	0.11%	45.6%	0.0%	0.7	50.2%	-0.69%	0.0%***	0.0%	69.9%	50.2%
59	Insurance company linked to a retail bank	-1.29%	4.9%**	10.5%	145.4	0.0%***	-2.09%	0.0%***	10.5%	1433.0%	0.0%***
60	Insurance company linked to a retail bank	0.18%	33.1%	0.0%	1.3	28.4%	-0.32%	8.8%	0.0%	126.0%	28.4%
61	Insurance company linked to a retail bank	0.16%	40.3%	0.0%	1.0	36.0%	-0.74%	0.0%***	0.0%	102.3%	36.0%
62	Insurance company linked to a retail bank	-1.01%	10.4%	22.0%	350.1	0.0%***	-1.80%	0.4%***	22.0%	35006.1%	0.0%***
63	Insurance company linked to a retail bank	-0.11%	54.6%	0.0%	1.1	33.2%	-1.09%	0.0%***	0.0%	110.4%	33.2%
64	Insurance company linked to a retail bank	-0.22%	22.2%	0.0%	1.6	29.3%	-2.69%	0.0%***	0.0%	159.5%	29.3%
65	Insurance company linked to a retail bank	-1.55%	10.6%	0.8%	10.7	0.0%***	-3.31%	0.1%***	0.8%	1065.5%	0.0%***
66	Insurance company linked to a retail bank	0.19%	31.2%	0.3%	4.6	1.9%***	-2.77%	0.0%***	0.3%	456.6%	1.0%***
67	Insurance company linked to a retail bank	0.07%	71.3%	0.3%	4.3	1.4%***	-1.17%	0.0%***	0.3%	426.5%	1.4%***
68	Insurance company linked to a retail bank	0.13%	51.1%	0.3%	4.5	1.1%***	-1.86%	0.0%***	0.3%	451.3%	1.1%***
69	Insurance company linked to a retail bank	0.19%	31.8%	0.3%	4.3	1.3%***	-1.30%	0.0%***	0.3%	434.7%	1.3%***
70	Insurance company linked to a retail bank	0.06%	77.3%	0.3%	3.3	3.5%***	-2.80%	0.0%***	0.2%	334.4%	3.5%***
71	Insurance company linked to a retail bank	0.06%	61.0%	0.0%	1.4	25.3%	-2.12%	20.2%	0.0%	137.5%	25.3%
72	Insurance company linked to a retail bank	2.27%	15.2%	4.0%	51.9	0.0%***	1.56%	32.5%	4.0%	5185.1%	0.0%***
73	Insurance company linked to a retail bank	1.60%	28.7%	4.0%	52.1	0.0%***	-0.21%	88.0%	4.0%	5214.0%	0.0%***
74	Insurance company linked to a retail bank	0.17%	39.8%	0.2%	3.2	4.9%***	-2.79%	0.0%***	0.2%	321.5%	4.0%***
75	Insurance company linked to a retail bank	0.18%	37.9%	0.2%	3.1	4.4%***	-1.80%	0.0%***	0.2%	312.3%	4.4%***
76	Insurance company linked to a retail bank	-1.00%	0.0%***	0.3%	5.2	0.6%***	-3.45%	0.0%***	0.3%	518.1%	0.6%***
77	Insurance company linked to a retail bank	0.18%	32.9%	0.3%	4.3	1.4%***	-0.81%	0.0%***	0.3%	430.8%	1.4%***
78	Insurance company linked to a retail bank	0.18%	37.6%	0.2%	3.0	5.1%*	-1.02%	0.0%***	0.2%	298.0%	5.1%*
79	Insurance company linked to a retail bank	0.18%	38.4%	0.2%	3.0	4.9%***	-0.72%	0.0%***	0.2%	302.4%	4.9%***
80	Insurance company linked to a retail bank	0.18%	33.6%	0.3%	4.3	1.3%***	-1.80%	0.0%***	0.3%	431.8%	1.3%***
81	Insurance company linked to a retail bank	0.17%	41.9%	0.2%	3.1	4.5%***	-2.80%	0.0%***	0.2%	310.3%	4.5%***
82	Insurance company linked to a retail bank	-0.31%	11.8%	0.2%	3.3	3.6%***	-0.91%	0.0%***	0.2%	331.9%	3.6%***
83	Insurance company linked to a retail bank	0.19%	36.9%	0.2%	3.1	4.6%***	-2.97%	0.0%***	0.2%	307.2%	4.6%***
84	Insurance company linked to a retail bank	0.12%	60.9%	0.2%	2.9	5.4%*	-0.76%	0.1%***	0.2%	293.0%	5.4%*

Source : Elaborated by the authors. Level of significance: 1% ***1% ** 10%*

Table 20: Jensen's alpha analysis for aggressive funds.

Number	Type of institution	Total returns of aggressive funds					Net returns of aggressive funds				
		Alpha (annualized)	P-value (Alpha)	Adjusted R ²	F-Stat	P-value(F-Stat)	Alpha (annualized)	P-value (Alpha)	Adjusted R ²	F-Stat	P-value(F-Stat)
1	Pure insurance company	-2.80 %	0.2 %**	83.3 %	2,057.1	0.0 %**	-3.57 %	0.0 %**	83.3 %	2,057.1	0.0 %**
2	Pure insurance company	-1.48 %	33.9 %	86.7 %	2,683.3	0.0 %**	-2.43 %	2.5 %*	86.7 %	2,683.3	0.0 %**
3	Pure insurance company	-1.38 %	8.0 %*	68.4 %	892.6	0.0 %**	-2.09 %	0.0 %**	68.4 %	892.6	0.0 %**
4	Pure insurance company	-4.29 %	0.4 %***	87.4 %	2,663.5	0.0 %**	-5.05 %	0.0 %**	87.4 %	2,663.5	0.0 %**
5	Pure insurance company	-1.58 %	30.6 %	86.7 %	2,692.2	0.0 %**	-1.40 %	0.3 %**	86.7 %	2,692.2	0.0 %**
6	Pure insurance company	-0.18 %	57.0 %	85.3 %	2,396.5	0.0 %**	-1.17 %	0.0 %**	85.3 %	2,396.5	0.0 %**
7	Pure insurance company	-2.97 %	0.0 %***	58.9 %	590.9	0.0 %**	-3.67 %	0.0 %**	58.9 %	590.9	0.0 %**
8	Pure insurance company	1.64 %	1.6 %**	0.4 %	2.5	2.2 %**	0.23 %	79.7 %	0.4 %	2.5	2.2 %**
9	Pure insurance company	1.81 %	3.9 %**	0.0 %	0.9	47.0 %	-0.11 %	89.7 %	0.0 %	0.9	47.0 %
10	Pure insurance company	0.42 %	87.8 %	2.1 %	9.9	0.0 %**	-2.15 %	42.9 %	2.1 %	9.9	0 %**
11	Pure insurance company	-0.01 %	99.2 %	5.2 %	23.8	0.0 %**	-2.00 %	16.8 %	5.3 %	23.8	0 %**
12	Pure insurance company	-0.33 %	93.6 %	5.2 %	24.1	0.0 %**	-2.79 %	40.7 %	5.3 %	24.1	0 %**
13	Pure insurance company	-1.06 %	53.0 %	82.3 %	1,908.4	0.0 %**	-2.02 %	7.1 %*	82.3 %	1,908.4	0 %**
14	Pure insurance company	-1.27 %	45.2 %	82.3 %	1,916.8	0.0 %**	-2.25 %	18.0 %	82.3 %	1,916.8	0 %**
15	Insurance company linked to a retail bank	2.09 %	48.0 %	4.4 %	20.1	0.0 %**	-0.93 %	75.1 %	4.4 %	20.1	0 %**
16	Insurance company linked to a retail bank	-0.12 %	97.5 %	4.2 %	19.5	0.0 %**	-2.09 %	57.7 %	4.3 %	19.5	0 %**
17	Insurance company linked to a retail bank	0.06 %	98.8 %	4.1 %	18.6	0.0 %**	-2.90 %	44.2 %	4.1 %	18.6	0 %**
18	Insurance company linked to a retail bank	-2.42 %	6.1 %*	80.9 %	1,744.4	0.0 %**	-1.36 %	0.1 %***	80.9 %	1,744.4	0 %**
19	Insurance company linked to a retail bank	-3.40 %	1.2 %**	81.9 %	1,859.9	0.0 %**	-3.31 %	0 %**	81.9 %	1,859.9	0 %**
20	Insurance company linked to a retail bank	-6.47 %	0.0 %***	91.9 %	4,661.0	0.0 %**	-8.32 %	0 %**	91.9 %	4,661.0	0 %**
21	Insurance company linked to a retail bank	-5.87 %	0.0 %***	91.3 %	4,320.0	0.0 %**	-7.73 %	0 %**	91.3 %	4,320.0	0 %**
22	Insurance company linked to a retail bank	-1.50 %	19.2 %	89.1 %	3,366.0	0.0 %**	-1.45 %	0.2 %***	89.1 %	3,366.0	0 %**
23	Insurance company linked to a retail bank	-1.50 %	19.2 %	89.1 %	3,366.2	0.0 %**	-1.41 %	0 %**	89.1 %	3,366.2	0 %**
24	Insurance company linked to a retail bank	-1.42 %	0.0 %***	66.5 %	816.4	0.0 %**	-1.92 %	0 %**	66.5 %	816.4	0 %**
25	Insurance company linked to a retail bank	0.74 %	84.7 %	3.1 %	14.3	0.0 %**	-2.24 %	55.6 %	3.1 %	14.3	0 %**
26	Insurance company linked to a retail bank	-0.85 %	47.0 %	73.4 %	1,135.0	0.0 %**	-1.10 %	35.0 %	73.4 %	1,135.0	0 %**
27	Insurance company linked to a retail bank	0.58 %	71.4 %	85.5 %	2,418.0	0.0 %**	-0.67 %	67.1 %	85.5 %	2,418.0	0 %**
28	Insurance company linked to a retail bank	-0.55 %	47.1 %	95.7 %	9,071.0	0.0 %**	-2.33 %	0.2 %***	95.7 %	9,071.0	0 %**
29	Insurance company linked to a retail bank	0.14 %	85.4 %	64.0 %	732.5	0.0 %**	-0.36 %	64.0 %	64.0 %	732.5	0 %**
30	Insurance company linked to a retail bank	-0.66 %	39.5 %	95.6 %	8,918.3	0.0 %**	-1.59 %	0 %**	95.6 %	8,918.3	0 %**
31	Insurance company linked to a retail bank	-0.62 %	41.9 %	95.6 %	8,869.3	0.0 %**	-1.52 %	0 %**	95.6 %	8,869.3	0 %**
32	Insurance company linked to a retail bank	-0.74 %	33.5 %	95.6 %	9,033.5	0.0 %**	-2.19 %	0 %**	95.6 %	9,033.5	0 %**
33	Insurance company linked to a retail bank	-1.79 %	5.1 %*	94.9 %	7,716.8	0.0 %**	-2.01 %	0.1 %***	94.9 %	7,716.8	0 %**
34	Insurance company linked to a retail bank	-0.23 %	10.1 %	37.1 %	243.5	0.0 %**	-1.13 %	0 %**	37.1 %	243.5	0 %**
35	Insurance company linked to a retail bank	-0.55 %	35.1 %	95.5 %	8,710.8	0.0 %**	-2.07 %	0 %**	95.5 %	8,710.8	0 %**
36	Insurance company linked to a retail bank	-2.88 %	0.3 %***	91.3 %	4,318.4	0.0 %**	-1.18 %	0 %**	91.3 %	4,318.4	0 %**
37	Insurance company linked to a retail bank	-0.79 %	30.3 %	95.5 %	8,810.4	0.0 %**	-1.29 %	9.3 %*	95.5 %	8,810.4	0 %**
38	Insurance company linked to a retail bank	0.04 %	85.0 %	65.2 %	772.2	0.0 %**	-0.81 %	0 %**	65.2 %	772.2	0 %**
39	Insurance company linked to a retail bank	0.73 %	65.6 %	84.8 %	2,000.9	0.0 %**	-1.27 %	43.2 %	84.8 %	2,000.9	0 %**
40	Insurance company linked to a retail bank	-0.38 %	82.9 %	82.7 %	1,974.6	0.0 %**	-1.87 %	28.8 %	82.7 %	1,974.6	0 %**
41	Insurance company linked to a retail bank	-1.92 %	12.9 %	87.5 %	2,878.4	0.0 %**	-2.86 %	0.2 %***	87.5 %	2,878.4	0 %**
42	Insurance company linked to a retail bank	-1.01 %	44.4 %	87.4 %	2,550.9	0.0 %**	-2.07 %	2.3 %**	87.4 %	2,550.9	0 %**
43	Insurance company linked to a retail bank	-0.25 %	0.0 %***	2.3 %	10.8	0.0 %**	-0.94 %	0 %**	2.3 %	10.8	0 %**
44	Insurance company linked to a retail bank	3.44 %	3 %**	40.8 %	28.4	0.0 %**	0.38 %	92.5 %	40.8 %	28.4	0 %**
45	Insurance company linked to a retail bank	3.43 %	5.1 %*	40.8 %	28.45	0.0 %**	1.38 %	42.7 %	40.8 %	28.45	0 %**
46	Insurance company linked to a retail bank	-0.54 %	70.4 %	85.6 %	2,442.1	0.0 %**	-2.02 %	15.2 %	85.6 %	2,442.1	0 %**
47	Insurance company linked to a retail bank	-1.00 %	48.6 %	85.6 %	2,446.3	0.0 %**	-2.96 %	3.7 %**	85.6 %	2,446.3	0 %**

Source : Elaborated by the authors. Level of significance : 1% *** 5% ** 10% *