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ORIGINAL ARTICLE

Performance of retirement funds: An analysis focused on pure insurance companies*, **

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ABSTRACT

This paper analyzes the performance of Free Benefit Generating Plans (*Plano Gerador de Benefício Livre* – PGBL) and Free Benefit Generating Life (*Vida Gerador de Benefícios Livres* – VGBL) funds in the Brazilian market. This paper is unique when it comes to segregate funds managed by pure insurance companies (PICs) from those managed by large retail banks. We also discuss the impact of characteristics such as administration fee and fund size in the fund performance. The academic literature does not consider the differentiation between funds characteristics neither the type of institution that manages them. Furthermore, the available studies on this market are usually simple and, for example, do not use multifactor models to measure risk adjusted performances. The PGBL and VGBL funds performances are object of great interest since their market grows sustainably and quickly. Funds underperforming the market should improve their strategies and decrease administration costs to deliver better net performances. This work aims at improving the market competition, such that retirement products remain attractive to investors. We develop two multifactor models representing the risk sources for each class of funds analyzed (conservative and aggressive funds). The performance is thus measured by Jensen's alpha, although we also analyze realized returns and volatilities. We also develop a multifactor model based on administrative fee and fund's size to capture the PIC effect. Our results suggest that PGBL and VGBL funds managed by PICs perform better in terms of higher average returns with no extra volatility, when compared to similar funds managed by companies linked to large retain banks. We found that higher administrative fees do not payout and it might even destroy value in the case of funds that invest in stocks. Larger funds presented higher net returns with no extra volatility. Finally, the analysis confirmed, with statistical evidence, the higher net returns of funds controlled by PICs in two situations: (i) after controlling for administrative fee and size of the fund – from 0.8 to 1% more per year; and (ii) after controlling for market risk sources – from 0.64 to 1.18% more per year.

Keywords: investment performance, retirement funds, 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, consequently, risky for future retirees. In April 2017, the Organisation for Economic Co-operation and Development (OCDE) released a memo based on a study made by Gragnolati, Jorgensen, Rocha, and Fruttero (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 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 (*fundo de investimento especialmente constituído* – 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 Free Benefit Generating Plan (*Plano Gerador de Benefício Livre* – PGBL) and Free Benefit Generating Life (*Vida Gerador de Benefícios Livres* – VGBL), which are the focus of this article.

In Brazil, the private open-access pension system is divided between two types of institutions: pure insurance companies (PICs) and insurance companies linked to retail banks. The difference between them is the fact that, for PICs, pension and insurance products are the main source of income, while retail banks have credit as their primary source of income. According to data 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. Consequently, it can be hypothesized that PICs will have to differentiate themselves, with more prominent performances and lower administrative fees.

The purpose of this paper is to compare the performance of PGBL/VGBL retirement funds, differentiating PICs from companies linked to large retail banks. Campani and Brito (2018) evaluated the performance of PGBL/VGBL retirement funds from the largest five institutions, but all of them linked to large retail banks. On their turns, Amaral (2013) and Medeiros (2015) compared performances of PGBL/VGBL funds with standard investment funds, not differentiating funds managed by PICs and focusing on returns and volatilities. These are the closest related papers in the literature. We do hope this 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 must 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 *Regime Próprio de Previdência Social* (RPPS) protected by the 40th article of the Brazilian Constitution. On the other hand, workers from the private sector are destined to the General Social Security Regime (*Regime Geral de Previdência Social* – 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 Closed Entities of Complementary Pension (*Entidades Fechadas de Previdência Complementar* – EFPCs). In addition, there are the open-access pension plans, available to every person, which are managed by the so-called Open Entities of Complementary Pension (*Entidades Abertas de Previdência Complementar* – EAPCs). Figure 1 illustrates this division.

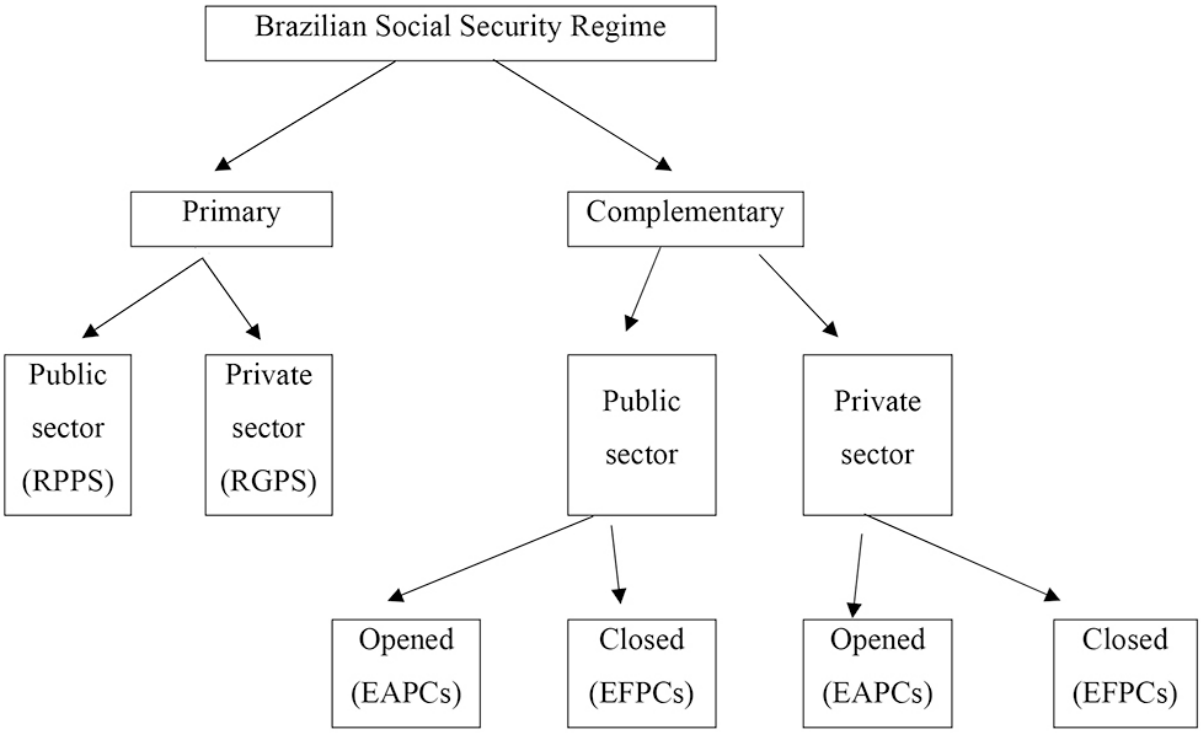

Figure 1 *Social security in Brazil*

EAPCs = Open Entities of Complementary Pension (Entidades Abertas de Previdência Complementar); EFPCs = Closed Entities of Complementary Pension (Entidades Fechadas de Previdência Complementar); RGPS = General Social Security Regime (Regime Geral de Previdência Social); RPPS = Regime Próprio de Previdência Social.

Source: *Elaborated by the authors.*

In Brazil, closed funds (managed by EFPCs) 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 EAPCs have also a specific vehicle: the FIE. While EFPCs are not for-profit organizations, EAPCs are for-profit institutions.

According to the Federação Nacional de Previdência Privada e Vida (FenaPrevi) (2017a), which is a non-profit Brazilian institution that represents the EAPCs, there are tree plans that one can choose if they decide to invest in a given EAPC. These plans are PBGL, VGBL, and the 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 and Brito (2018). Moreover, FenaPrevi (2017b) 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 bene t for the PGBL products. Apart from that, they are the same for practical matters. In PGBL products, one can deduct up to 12% of his annual income for tax purposes. For a detailed discussion on PGBL and VGBL plans, see Conto and Schossler (2001) and Campani and Costa (2018).

According to FenaPrevi (2017a), the provision destined to FIE has boosted incredibly; it went from R$ 615 billion in January 2017 to more than R$ 735 billion 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 R$ 771 billion in December 2017, with 13,491 of active plans and 1,280 of active funds. The information also confirmed the 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 (R$ 702.7 billion), 63% of the total FIE (806), and 63% (8,474) of all active plans available of this market.

Conversely, the only four PICs with portfolios that surpass 10 years of existence (Porto Seguro, SulAmérica, Mapfre, and Icatu Seguros) hold all together: 1.5% of the total net worth (R$ 11.5 billion), 6% of the total FIE (81), and 13% (1,744) 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 Mette (2009) and Silva (2016)do Regime Geral de Previdência Social (RGPS. This is supported by the strong and increasing demand by the population for complementary pension products. Costa and 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 and 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 and 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 the author, 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 bank assurance had a relevant role in the popularization of insurance and pension products among the population. Concisely, 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 PICs. 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.

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

Dominique-Ferreira (2018) also defends the expansion of insurance retail. The insurance offer extension channels vary by country and by customer profile, but the so-called bancassurance acquires importance and robustness, mainly due to the impact of retail banks in several countries (such as Brazil). In this way, the penetration of insurance services in the market increases and guarantees benefits for the sector as a whole. On the other hand, in their pioneering study, Boyd, Graham, and Hewitt (1993) looked at the issue of bankruptcy risk in non-financial institutions when they are linked or merged by banks. In the specific case of insurance firms (pension, life, and property), the bankruptcy risk of the bank and the acquired institution increase substantially. Still dealing with the risk issue, Köhler (2015) observed an increase in systemic risk for a sample of 394 countries, based on the consolidation of the insurance sector. The insertion of the banking sector in the insurance market is also observed as one of the factors responsible for the considerable increase in risk in the sector.

Some other authors focused on how insurance companies allocate their resources. Mette and Martinewski (2001), 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).

Mette (2009) studied the performance of PGBL funds in the period of 2003 and 2004, concluding that they did not beat the *certificado de depósito interbancário* (CDI) rate, which is commonly used as the risk free rate in Brazil. Cardoso (2006) had the objective to study the existence of performance persistence in PGBL, VGBL, and the Fund of Individual Scheduled Retirement [*Fundo de Aposentadoria Programada Individual* (FAPI) – perhaps the most relevant example of a tradition plan] from January 2001 to December 2004. The author concluded that it was not possible to ascertain that a given fund will repeat, in the future, the performance obtained in the past.

The literature reviewed did not present a singler work that has compared the performance of funds managed by retail banks and PICs 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 (FIE) are usually classified in three categories: conservative, moderate, and aggressive, as according to Campani and Brito (2018). Conservative funds only invest in fixed income instruments, moderate funds area allowed to invest 15-30% (depending on the institution) in stocks, and aggressive funds could invest up to 49% in stocks (in the time period analyzed by this study, because new funds launched after November 2015 were allowed to invest up to 70% in stocks). For the purpose of this study, conservative and aggressive funds suffice.

All data concerning the funds (FIE) were provided by Quantum Finance. The returns were provided on a daily basis from January 3 2008 to December 28 2017, which sums up to a total of 2,470 observations.

Initially, it is calculated the annualized geometric mean of the daily returns for each fund (FIE). Subsequently, for conservative funds, the returns will be compared with the annualized geometric mean of CDI returns (used as a benchmark) for the same time period. Next, for aggressive funds, it will be used a daily weighted average of CDI and the Brazil Index of Shares (*Índice Brasil* – 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 risk free rate in the Brazilian financial market. On its turn, the IBrX-100 is a total return index referring to a theoretical portfolio composed of the 100 most traded shares in the Brazilian exchange.

The weights that compose the benchmark for aggressive funds were determined based on the work of Campani and 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 get out of regulation.

In addition, to detect any superior performance of PICs, it will be calculated a simple regression analysis. The dependent variable will be the mean annualized return of each fund and the independent variable will be a dummy variable representing the PIC effect to be investigated (1 if a PIC and 0 if linked to a retail bank). Equation 1 represents the simple regression that will be performed for total and net returns, separating conservative and aggressive funds (i.e., four regressions will be analyzed).

$$R_{i,Mean} = \beta_0 + \beta_1 * dummy_{PIC,i} \quad (1)$$

where β_1 is the marginal return due to the PIC effect, the intercept (β_0) is the average of the mean returns for companies linked to retail banks, and $R_{i,Mean}$ is the mean (total or net) annualized return for fund *i*. All regressions performed in this study use the ordinary least squares (OLS) estimation methodology. It is also important to mention that all regressions had their errors tested for normality and homoscedasticity conditions (Jarque-Bera and White tests, respectively) to provide statistical trustworthiness.

Secondly, the analysis of Jensen's alpha will be performed to determine which funds deliver positive alphas after considering their exposures to different risk sources. This important performance indicator is originated from the capital asset pricing model (CAPM), a single risk-factor model. However, the CAPM has evolved to multifactor models, understanding that the market risk is not able to explain all risk sources at play.

The Jensen's alpha is risk-adjusted and it measures the average return above (if positive) or below (if negative) the one predicted by the multifactor risk model used. A positive value for Jensen's alpha means that the funds' managers have "outperformed the market" with their cherry-picking skills.

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: basket of government bonds indexed by IPCA, the official Brazilian inflation rate [*índice de mercado Anbima* (IMA-B)], and basket of government bonds with pre- fixed rates [*índice de renda fixa de mercado* (IRF-M)]. These indices translate into two major risk sources: inflation and pre-fixed rates. The equation used to calculate the alphas is thus the following:

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

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*, and the time-series for each fund *i*, for the risk free rate, and for both risk factors are, respectively, denoted by $R_{i,t}$, CDI_t, IMA_t, and IRF_t. As opposed to the regressions represented by equation 1, notice that equation 2 describes a time-series regression performed fund by fund (for the conservative funds).

A similar approach was used to evaluate the Jensen's alpha for aggressive funds. As these funds are a blend of fixed income and variable income products, a six-factor model is proposed. We use the same two factors as before plus four factors based on 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 and French (1993), the average returns on stocks are related to firm characteristics like size, earnings/price, cash ow/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 (small minus big – SMB); 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 (high minus low – HML). 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 and 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 is as follows:

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

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*, and $R_{m,t}$, SMB_t, HML_t, and WML_t are the time-series of returns for the market index and for the three market factors explained above. The other time-series are exactly as defined before and, as equation 2, this regression is a time-series regression performed fund by fund (for the aggressive funds).

Finally, we developed a regression analysis in which it is investigated the influence altogether of three variables on the annualized net returns: administrative fees, size, and PIC effect. It can be conjectured that administrative fees have a positive impact on net returns, since high fees might be charged under the assumption of superior performance. The impact of fund size on net returns will also be investigated: do small funds deliver higher returns because they are more agile to implement new portfolio allocations? These two variables will serve as control variables since we still want to analyze the existence of the "pure insurance effect". The equation writes as follows:

$$R_{i,Mean} = \beta_2 + \beta_3 * Fee_i + \beta_4 * Ln(Size_i) + \beta_5 * dummy_{PIC,i} \quad [4]$$

where β_2 is the regression intercept, β_3 and β_4 are the slopes of the fee and size factors, and β_5 is the marginal net return due to the PIC effect after controlling for the fee and size effects. The fund size refers to the fund net worth held in December 2017 and we use logs to get a better scaling effect. Just like the regressions represented by equation 1, this is not a time-series regression, but a cross-sectional regression (in the sense that there is a single regression performed to all set of funds analyzed).

In addition, a similar investigation was performed, but related to the risk (as measured by the standard deviation [SD]) of all funds during the period analyzed. Are high administrative fees associated with high risk? Are small funds more volatile than bigger funds? Are PICs riskier than insurance companies linked to retail banks? These are questions we investigate. The equation 5 describes this analysis:

$$\sigma_i = \beta_6 + \beta_7 * Fee_i + \beta_8 * Ln(Size_i) + \beta_9 * dummy_{PIC,I} \quad [5]$$

where β_6 is the regression intercept, β_7 and β_8 are the slopes of the fee and size factors, and β_9 is the marginal SD (risk) due to the PIC effect after controlling for the fee and size effects. All other variables are defined just as before. Notice that this regression is similar to the previous one, therefore a cross-sectional regression.

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 PICs. 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 nine 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 the Núcleo de Pesquisa em Economia Financeira (Nefin) website, Universidade de São Paulo. The factors were generated based on the assessment of the Brazilian stock market and more information is provided by Nefin (2015). 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.

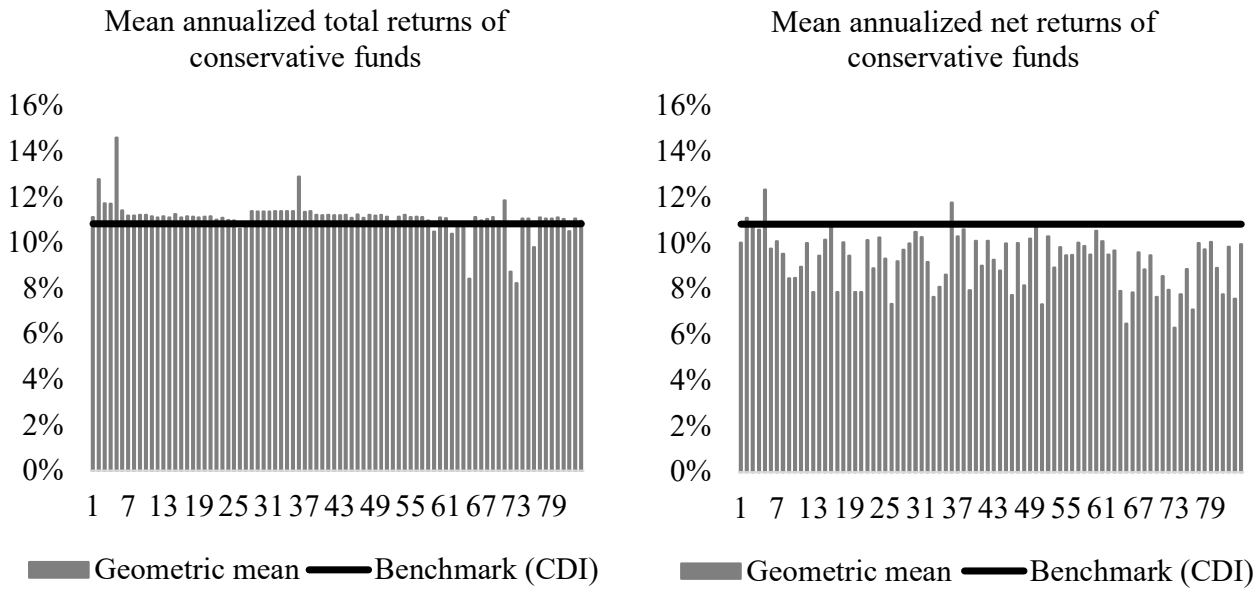

Figure 2 *Annual returns of conservative funds*
CDI = certificado de depósito interbancário.
Source: *Elaborated by the authors.*

For total returns of conservative funds, only nine 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 three out of 84 funds delivered net returns to investors higher than the CDI. To determine whether PICs experienced better returns, a simple regression analysis was performed (equation 1). The results are shown in 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" (PIC) 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***
PIC	0.75	3.3	0.1***	0.87	2.3	2.2**

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

In Table 1, there is statistically significant indication that PICs deliver higher returns, on average. A premium of 0.75% per year is found in the regression to the total returns. On its turn, a premium of 0.87% per year is found in 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 nine out of 47 funds beat this benchmark.

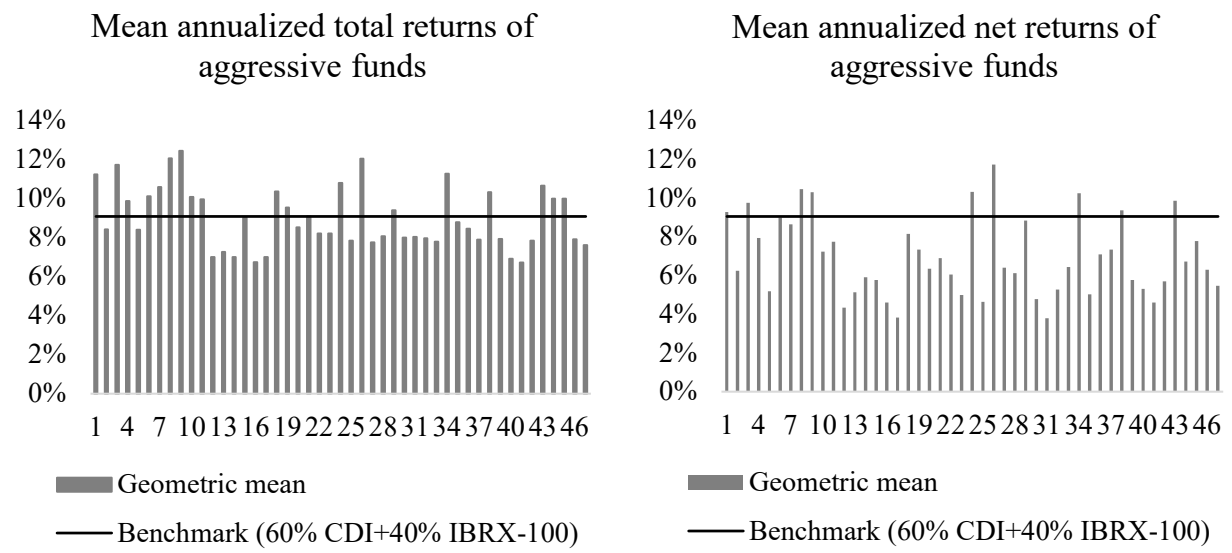

Figure 3 *Annual returns of aggressive funds*
CDI = certificado de depósito interbancário; IBrX-100 = Índice Brasil.
Source: *Elaborated by the authors.*

Another simple regression analysis was performed to compare performance between the two types of institutions, but now to aggressive funds (equation 1). The results are in 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" (PIC) effect

	Total returns Conservative funds			Net returns Conservative funds		
	Estimate (%)	t-value	p-value (%)	Estimate (%)	t-value	p-value (%)
Intercept	8.66	32.9	0.0***	6.63	19.1	0.0***
PIC effect	1.04	2.2	3.7**	1.03	1.6	11.4

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

As Table 2 indicates, in terms of total returns, there is a premium for funds administrated by PICs (1.04%), which is statistically significant at a 5% significance level. The magnitude for this premium, in terms of net returns, was very similar, although with less statistical evidence.

5.2 Jensen's Alpha Analysis

The results for Jensen's alpha can be found on Appendix C. In this assessment, an alpha of 0 means that the fund performs in line with the market, as according to its risk exposures (as given by the risk factors of the model used). A positive alpha indicates the fund is outperforming the market after controlling to its risk exposure, while a negative alpha indicates the funds fail to generate returns consistent to its risk exposures. To carry out the analysis, a two-factor model with only fixed-income factors was applied to conservative funds, as shown on equation 2. To aggressive funds, a six-factor model with a blend of fixed and variable income factors was used, as outlined on equation 3.

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 PICs, 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 R^2 were very low (1.2 and 1% 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 and Brito (2018), who used, instead, the fixed income fund of the same characteristic and from the same company as the fixed income factor for the aggressive funds model. Nonetheless, similar results can be observed to aggressive funds. Only three out of 47 regressions yielded significant positive alphas to total returns. However, to net returns, only three alphas were positive, but with no statistical significance. Many funds presented negative alphas with statistical evidence.

In summary, most 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 0 or negative. Furthermore, after the administrative fee has been charged, all the alphas diminished considerably, providing statistical evidence of under-performance. Overall, our results confirm the findings of other authors claiming that most of the retirement funds do not deliver positive alphas, as Campani and Brito (2018) point out.

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

Administrative fees are charged under the assumption of active management, as thoroughly discussed in Campani and Brito (2018). Figure 4 depicts a box plot graphic comparing administrative fees charged by PICs and companies linked to a large retail bank.

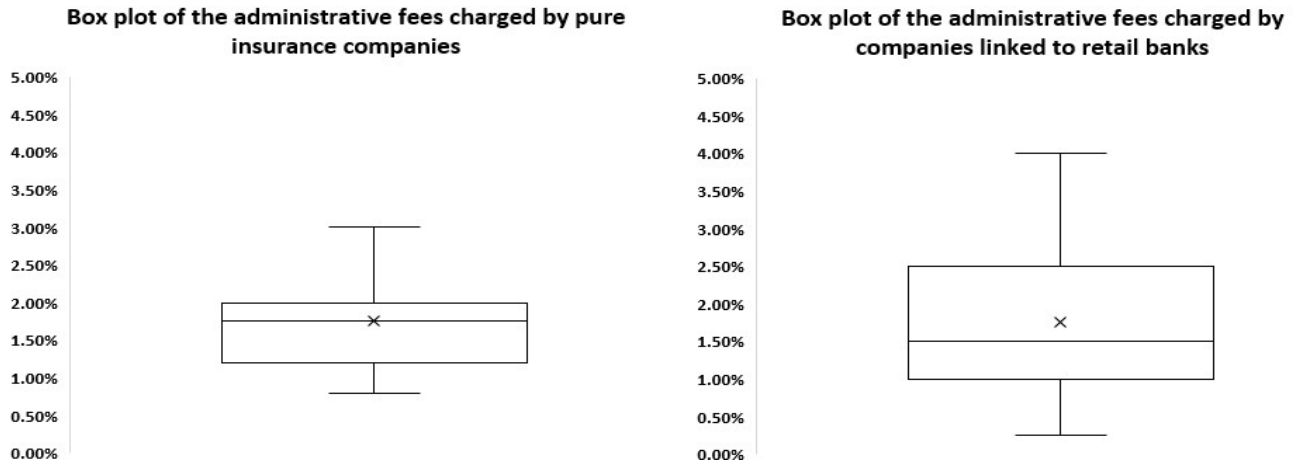

Figure 4 *Box plot of administrative fees charged by pure insurance companies and by companies linked to retail banks*
Source: *Elaborated by the authors.*

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 PICs have a more restricted range. On one hand, the PICs 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, PICs are also not able to offer very low fees as retail banks can.

Figure 5 represents the box plot graphic comparing the administrative fees charged by conservative and aggressive funds.

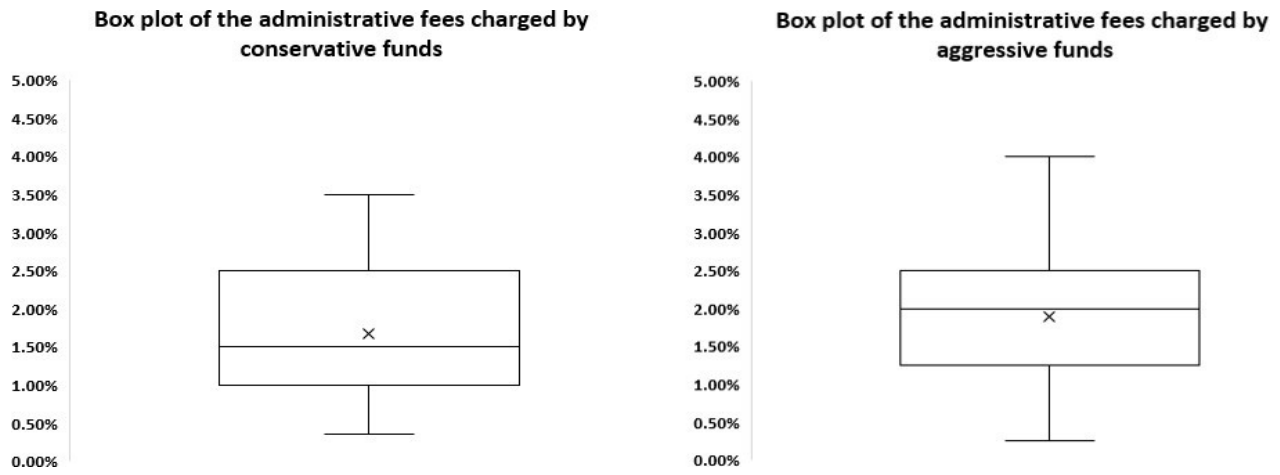

Figure 5 *Box plot of administrative fees charged by conservative and aggressive funds*
Source: *Elaborated by the authors.*

In Figure 5, 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.

In tables 3 and 4, we analyze the influence on net returns of administrative fees, size, and the PIC effect, as outlined by equation 4.

Table 3
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" (PIC) 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***
PIC	0.008	3.6	0.1***
Adjusted R^2	67.7%		
F-stat	59.0		
p-value (F-stat)	0.0%***		

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

According to the results of Table 3, there is a negative correlation between the administrative fees and net returns of conservative funds: the coefficient very close to -1 indicates that each 1% of administrative fee decreases the net return on the same basis. This means that funds with high 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, PICs 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 R^2 of 67.7% demonstrates the power of this model to explain the returns of conservative funds.

Table 4
Multiple regression analysis for net returns of aggressive funds, with administrative fee, neperian logarithm of the total net worth, and a dummy variable representing the "pure insurance company" (PIC) effect as independent variable

	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*
PIC effect	0.010	2.4	2.4**
Adjusted R^2	54.3%		
F-stat	19.2		
p-value (F-stat)	0.0%***		

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

The results displayed in Table 4 show a similar behavior as observed in Table 3. It shows that there is a negative correlation between the administrative fees and net returns of aggressive funds, but now this result is even more drastic than before; on average, for each 1% of administrative fee, investors pay 1.7% in terms of net return. The interpretation is dramatic: funds charging higher administrative fees are destroying more value for investors. Although this result might come with surprise, it is in line with the literature that shows that, on average, higher administrative fees are charged due to higher activity of fund managers. And higher activity of fund managers comes with poor performance. This result, indeed, gave rise to naïve indices like the equal weighted ones that usually present performances above the average performance of stock funds [please see Leal and Campani (2016) for a broad analysis on the topic].

Like in the case of conservative funds, there is a positive correlation between size and net returns and a premium (a bit higher) of 1% per year on top of the net return delivered by companies linked to retail banks. This result confirmed the bias found in 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 an adjusted R^2 of 54.3%.

In tables 5 and 6, we analyze the influence of administrative fees, size, and the PIC effect on the total risk assumed by the fund, as measured to its historical SD, as outlined by equation 5.

Table 5
Multiple regression analysis for conservative funds, with annualized historical standard deviation as dependent variable and administrative fee, neperian logarithm of the total net worth, and "pure insurance company" (PIC) dummy 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***
PIC effect	0.004	1.2	23.6
Adjusted R^2	7.9%		
F-stat	3.4		
p-value (F-stat)	2.3%**		

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

According to the results depicted in Table 5, 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 PIC effect. The lack of evidence may be because conservative funds tend to invest in products with similar (and low) risks. It is important to mention that the model yielded a low adjusted R^2, which is of 7.9%. This result shows that the model is poor in explaining the risk. In fact, only one variable was statistically significant.

Table 6 shows no statistically significant correlation between risk and net worth and between risk and the PIC 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. High administrative fees may be charged under the assumption of more active management: higher fees would be justified to cover higher costs due to more human capital needed to manage these funds. Nonetheless, as previously observed, it seems that these higher costs are not paying off. This result confirms the previous analysis and the literature: more active managers, on average, provide poorer performances.

Table 6

Multiple regression analysis for aggressive funds, with annualized historical standard deviation as dependent variable and administrative fee, neperian logarithm of the total net worth, and "pure insurance company" (PIC) dummy 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
PIC effect	-0.014	-1.1	26.8
Adjusted R^2	15.9%		
F-stat	3.9		
p-value (F-stat)	1.5%		

****, **, * = level of significance of 1, 5, and 10%, respectively.*

Source: *Elaborated by the authors.*

5.4 Robustness Check: Controlling for Risk Sources on Net Returns

We provide another interesting and simple analysis to investigate the robustness of our results. We form four equally weighted portfolios explained as follows: (i) all conservative funds managed by PICs; (ii) all conservative funds managed by companies linked to retail banks; (iii) all aggressive funds managed by PICs; and (iv) all aggressive funds managed by companies linked to retail banks. The daily net returns for all four portfolios are calculated from January 3 2008 to December 28 2017 – let us define these four time-series respectively denoted by $R_{Cons\_PIC,t}$, $R_{Cons\_Banks,t}$, $R_{Aggr\_PIC,t}$, and $R_{Aggr\_Banks,t}$.

We run two regressions based on the multifactor risk models stated by equations 2 and 3, respectively, to conservative and aggressive funds:

$$R_{Cons\_PIC,t} - R_{Cons\_Banks,t} = \alpha_{10,i} + \alpha_{11,i} * (IMA_t - CDI_t) + \alpha_{12,i} * (IRF_t - CDI_t) \quad (6)$$

$$R_{Aggr\_PIC,t} - R_{Aggr\_Banks,t} = \alpha_{13,i} + \alpha_{14,i} * (R_{m,t} - CDI_t) + \alpha_{15,i} * SMB_t + \alpha_{16,i} * HML_t + \alpha_{17,i} * WML_t + \alpha_{18,i} * (IMA_t - CDI_t) + \alpha_{19,i} * (IRF_t - CDI_t) \quad (7)$$

The objective of this analysis is to check whether the superior performance of funds managed by PICs remains even after controlling for the risk sources considered by this study. The results are presented in tables 7 and 8.

Table 7

Multiple regression analysis for the excessive return of the equally weighted portfolio consisted of all conservative funds managed by pure insurance companies, with respect to the equally weighted portfolio of all conservative funds managed by companies linked to retail banks

	Estimate	t-value	p-value (%)
Jensen's alpha (annualized)	0.64%	4.6	0.0***
$IMA_t - CDI_t$	0.029	12.9	0.0***
$IRF_t - CDI_t$	0.052	10.2	0.0***
Adjusted R^2	40.1%		
F-stat	826		
p-value (F-stat)	0.0%***		

Note: *the regression is given by equation 6. The variables are described in the text.*
****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

Table 8

Multiple regression analysis for the excessive return of the equally weighted portfolio consisted of all aggressive funds managed by pure insurance companies (PIC), with respect to the equally weighted portfolio of all aggressive funds managed by companies linked to retail banks

	Estimate	t-value	p-value (%)
Jensen's alpha (annualized)	1.18%	2.4	1.5**
$R_{m,t} - CDI_t$	-0.079	-64.1	0.0***
SMB_t	0.014	5.7	0.0***
HML_t	-0.021	-8.5	0.0***
WML_t	0.011	4.9	0.0***
$IMA_t - CDI_t$	0.055	7.1	0.0***
$IRF_t - CDI_t$	-0.002	-0.1	90.4
Adjusted R^2	72.2%		
F-stat	1,072		
p-value (F-stat)	0.0%***		

Note: *the regression is given by equation 7. The variables are described in the text.*
****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

We can observe from tables 7 and 8 that the portfolios of funds managed by PICs outperformed the portfolios of funds managed by companies linked to retail banks, with statistical significance. For conservative funds, the average outperformance was given by an average excess return of 0.64% per year after controlling for the two fixed income risk sources. From the positive signs of the risk factors slopes, we also conclude that funds managed by PICs are more exposed to both risk sources.

For aggressive funds, the average outperformance was given by an average excess return of 1.18% per year after controlling for all six-risk sources considered. We also observe that, on average, the risk exposition is different for PICs and companies linked to retail banks: five from the six slopes were found to be statistically significant. The results found in this analysis strengthens the overall results of this study.

6. CONCLUSION

Our findings suggest evidences that PICs deliver, in general, higher net returns. The analysis grouped the funds into two classes: conservative (100% invested in fixed income) and aggressive (up to 49% invested in variable income); the results in both groups favored PICs.

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, most conservative funds underperformed 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 of any institution. All the funds yielded alphas which were either statistically not different from 0 or, what is worse, statistically lower than 0.

Our analysis also investigated the PIC 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. If higher fees justify more active management, we found that, on average, active management might even destroy value in the case of aggressive funds. 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 PIC effect was statistically significant, indicating an annual premium of 0.8% for conservative funds and of 1% for aggressive funds. When assessing the volatility of the funds through a similar analysis, the PIC effect was not statistically significant to neither conservative nor aggressive funds. A robustness check analysis showed that, on average, funds managed by PICs provided an extra return of 0.64 and 1.18% per year (respectively, conservative and aggressive funds), as according to the Jensen's alpha for the multifactor risk models considered in this study.

We believe that this article contributes to the discussion of PGBL and VGBL fund performances with an original analysis separating funds linked to large retail banks and, as we name in this study, PICs. The results shed lights not only on the poor performance of most of the funds in comparison with market benchmarks, but also on the even worse performance of funds linked to large retail banks when compared to funds managed by PICs. We also found strong evidence that higher administrative fees did not payoff, at least in the period analyzed. Furthermore, large funds might have a competitive advantage over small funds.

As a limitation of this study, we cite the time period analyzed and the fact that our sample consisted only of funds under operation from 2008 to 2017; beyond the well-known survivorship bias, PGBL and VGBL funds were recently launched with lower administration fees and higher competition for performance even in the large retail bank segment – this analysis might provide completely different results in the near future. Another limitation is the multifactor model used to assess risk-adjusted performance; some other risk sources might be at play and a better performance might be, in fact, explained by these hidden risk exposures. These limitations provide interesting possibilities for future research.

The analysis carried out here is extremely important for long horizon investors. We hope that this study stimulates retirement funds to perform better, in order to guarantee that the available retirement products (e.g., PGBL and VGBL) remain attractive to everyone.

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APPENDIX
A. INSTITUTIONS AND FUNDS SELECTED

Table 7
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 8
Part 1 of the list of Free Benefit Generating Plan (Plano Gerador de Benefício Livre – PGBL) and Free Benefit Generating Life (Vida Gerador de Benefícios Livres – VGBL) funds

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
BrasilPrev RT FIX II FIC Conservative	03.537.407/0001-40	BrasilPrev	Conservative	0	08/22/2000	No	No	46,857,614,655.18	65
BrasilPrev RT FIX VI FIC Conservative	07.919.956/0001-30	BrasilPrev	Conservative	0	06/05/2006	No	No	44,053,828,880.52	39
Bradesco VGBL F10 FIC Conservative	06.081.457/0001-54	Bradesco Asset Management	Conservative	0	09/06/2004	Yes	No	41,533,843,595.70	21
BrasilPrev RT FIX VII FIC Conservative	06.001.785/0001-01	BrasilPrev	Conservative	0	08/01/2007	No	No	39,270,214,191.25	38
BrasilPrev RT FIX C FIC Conservative	05.061.121/0001-67	BrasilPrev	Conservative	0	05/12/2003	No	No	23,292,868,106.16	40
Itaú Flexprev Premium FIC Conservative	04.118.652/0001-86	Itaú Unibanco	Conservative	0	10/19/2000	Yes	No	14,843,403,231.89	126
Bradesco VGBL FIX FIC Conservative	04.830.277/0001-00	Bradesco Asset Management	Conservative	0	03/08/2002	Yes	No	12,873,088,502.26	19

Table 8
Cont.

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
BrasilPrev RT FIX V FIC Conservative	03.601.017/0001-92	BrasilPrev	Conservative	0	01/12/2000	No	No	10,623,874,339.54	75
Bradesco VGBL F15 FIC Conservative	06.185.741/0001-70	Bradesco Asset Management	Conservative	0	19/10/2004	Yes	No	10,188,802,909.51	13
Santander IV FIC Conservative Crédito Privado	05.971.745/0001-11	Santander Brasil Asset Management	Conservative	0	02/02/2005	Yes	No	8,080,506,587.47	63
Bradesco PGBL F 10 FIC Conservative	03.256.797/0001-80	Bradesco Asset Management	Conservative	0	30/08/1999	Yes	No	7,472,920,612.64	41
Bradesco PGBL/VGBL FIX Plus FIC Conservative	04.253.202/0001-04	Bradesco Asset Management	Conservative	0	07/31/2001	Yes	No	5,865,364,978.39	19
Itaú Flexprev Investors FIC Conservative	07.096.907/0001-45	Itaú Unibanco	Conservative	0	01/31/2006	‘Yes	No	5,727,511,055.42	41
Caixa 300 FIC Conservative Previdenciário	03.926.431/0001-71	Caixa Vida e Previdência	Conservative	0	09/22/2000	Yes	No	5,719,790,379.55	30
Itaú Flexprev Plus FIC Conservative	02.290.280/0001-45	Itaú Unibanco	Conservative	0	12/07/1998	Yes	No	5,593,204,783.26	54
Caixa 100 FIC Conservative Previdenciário	03.737.224/0001-79	Caixa Vida e Previdência	Conservative	0	06/052003	Yes	No	5,464,041,192.67	15
BrasilPrev RT FIX FIC Conservative	03.537.379/0001-61	BrasilPrev	Conservative	0	05/08/2000	No	No	4,736,627,317.78	37
Caixa 200 FIC Conservative Previdenciário	03.737.222/0001-80	Caixa Vida e Previdência	Conservative	0	07/04/2007	Yes	No	4,728,640,643.51	10
Santander III FIC Conservative Crédito Privado	04.794.886/0001-43	Santander Brasil Asset Management	Conservative	0	12/19/2001	Yes	No	4,410,229,073.40	77
Santander Prev FIX Exclusivo FIC Conservative Crédito Privado	04.572.903/0001-06	Santander Brasil Asset Management	Conservative	0	11/30/2001	Yes	No	4,302,425,386.13	86
BrasilPrev RT FIX III FIC Conservative	03.601.000/0001-35	BrasilPrev	Conservative	0	07/02/2001	No	No	4,207,846,594.94	40
Bradesco Prev Fácil PGBL FIX FIC Conservative	02.561.139/0001-30	Bradesco Asset Management	Conservative	0	05/10/1999	Yes	No	3,374,793,403.66	30
Itaú Flexprev Corporate I FIC Conservative	04.264.940/0001-49	Itaú Unibanco	Conservative	0	02/06/2001	No	No	2,850,121,036.69	63
Itaú Flexprev I FIC Conservative	02.911.408/0001-40	Itaú Unibanco	Conservative	0	08/11/1999	Yes	No	2,633,827,342.13	66
Santander Prev FIX Executivo FIC Conservative Crédito Privado	03.534.936/0001-90	Santander Brasil Asset Management	Conservative	0	09/21/2000	Yes	No	2,352,261,647.14	97
BrasilPrev RT FIX IV FIC Conservative	03.600.987/0001-73	BrasilPrev	Conservative	0	01/12/2000	No	No	1,889,374,181.28	41
Itaú Flexprev XII A FIC Conservative	04.118.883/0001-90	Itaú Unibanco	Conservative	0	08/09/2001	Yes	No	1,748,450,957.93	6

Table 8
Cont.

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
BrasilPrev Renda Total Ciclo de Vida 2020 FIC Multimercado	06.001.797/0001-28	BrasilPrev	Aggressive	49	08/01/2007	No	No	1,540,235,058.31	112
Santander Prev FIX FIC Conservative Crédito Privado	02.498.190/0001-44	Santander Brasil Asset Management	Conservative	0	03/30/1999	Yes	No	1,452,436,273.48	78
Itaú Flexprev Special II FIC Conservative	02.290.304/0001-66	Itaú Unibanco	Conservative	0	12/17/1997	Yes	No	1,303,857,938.38	30
Itaú Flexprev XVI FIC Conservative	08.543.326/0001-77	Itaú Unibanco	Conservative	0	06/20/2007	Yes	No	1,176,966,988.60	48
Santander II FIC Conservative Crédito Privado	04.684.467/0001-59	Santander Brasil Asset Management	Conservative	0	10/19/2001	Yes	No	1,148,953,495.02	29
Santander Prev FIX Superior FIC Conservative Crédito Privado	07.647.772/0001-69	Santander Brasil Asset Management	Conservative	0	09/11/2006	Yes	No	1,146,355,020.72	64
Bradesco H PGBL/VGBL Future FI Conservative	01.392.021/0001-62	Bradesco Asset Management	Conservative	0	10/23/1996	No	No	1,027,252,941.01	40
Mapfre Prevision Prev FIC Conservative	07.725.529/0001-11	Mapfre Investimentos	Conservative	0	05/04/2006	Yes	No	1,024,603,080.79	41
Santander I FIC Conservative Crédito Privado	07.199.289/0001-69	Santander Brasil Asset Management	Conservative	0	05/17/2005	Yes	No	1,011,413,548.76	16
Mapfre Corporate Prev FI Conservative	06.081.503/0001-15	Mapfre Investimentos	Conservative	0	05/26/2004	No	No	995,418,236.14	72
Bradesco PGBL F 15 FIC Conservative	02.998.253/0001-21	Bradesco Asset Management	Conservative	0	09/01/1999	Yes	No	980,741,789.30	24
Porto Seguro Rubi Premium FIC Conservative Previdenciário	02.924.262/0001-78	Porto Seguro Investimentos	Conservative	0	10/29/1999	No	No	964,257,661.32	67
Santander XIII FIC Conservative Crédito Privado	04.684.453/0001-35	Santander Brasil Asset Management	Conservative	0	10/19/2001	Yes	No	908,379,361.92	24
Itaú Flexprev XV A FIC Conservative	05.592.103/0001-01	Itaú Unibanco	Conservative	0	02/07/2006	Yes	No	888,698,072.52	8
BrasilPrev FIX Annuity FI Conservative Crédito Privado	05.326.919/0001-93	BrasilPrev	Conservative	0	10/31/2002	No	No	840,199,100.74	73
SulAmérica FIX 100 V FI Conservative	03.077.322/0001-27	SulAmérica Investimentos	Conservative	0	08/09/1999	No	No	783,564,351.66	66

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance.*

Table 9

Part 2 of the list of Free Benefit Generating Plan (Plano Gerador de Benefício Livre – PGBL) and Free Benefit Generating Life (Vida Gerador de Benefícios Livres – VGBL) funds

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
Santander VI FIC Conservative Crédito Privado	04.684.515/0001-09	Santander Brasil Asset Management	Conservative	0	10/19/2001	Yes	No	767,501,097.90	4
Unibanco Prever I FIX 100 Especialmente Constituídos FIC Conservative	03.507.865/0001-37	Itaú Unibanco	Conservative	0	03/13/2000	Yes	No	757,115,339.92	24
BrasilPrev Dividendos I FIC Multimercado	05.824.217/0001-30	BrasilPrev	Aggressive	49	08/01/2007	No	No	710,282,769.25	98
Bradesco H VGBL Conservador FI Conservative	05.113.771/0001-09	Bradesco Asset Management	Conservative	0	11/11/2002	No	No	667,077,893.68	16
SulAmérica FIX 100 IV FI Conservative	04.056.135/0001-20	SulAmérica Investimentos	Conservative	0	08/01/2001	No	No	624,987,599.70	59
Fiat Previ Especialmente Constituídos FIC Conservative	03.821.440/0001-06	Itaú Unibanco	Conservative	0	07/30/2004	Yes	No	614,936,917.78	4
Itaú Flexprev Tricolor FIC Multimercado Crédito Privado	08.389.857/0001-57	Itaú DTVM	Aggressive	49	12/27/2006	No	No	589,638,163.34	2
BrasilPrev Renda Total Ciclo de Vida 2040 FIC Multimercado	05.764.785/0001-92	BrasilPrev	Aggressive	49	08/01/2007	No	No	574,096,483.06	118
Icatu Seg Classic FIC Conservative	05.200.914/0001-10	Icatu Vanguarda	Conservative	0	02/06/2003	Yes	No	571,595,824.71	35
Unibanco Prever IV FIX 100 Especialmente Constituídos FIC Conservative	03.374.369/0001-52	Itaú Unibanco	Conservative	0	12/29/1999	Yes	No	551,195,560.24	41
BrasilPrev Renda Total Ciclo de Vida 2030 FIC Multimercado	05.132.896/0001-86	BrasilPrev	Aggressive	49	08/01/2007	No	No	549,145,097.58	118
BrasilPrev RT FIX A FIC Conservative	05.119.745/0001-98	BrasilPrev	Conservative	0	08/02/2002	No	No	422,455,845.07	18
Itaú Flexprev Corporate II FIC Conservative	02.851.024/0001-80	Itaú Unibanco	Conservative	0	03/25/1999	No	No	390,877,247.53	20
Santander V FIC Conservative Crédito Privado	05.112.439/0001-20	Santander Brasil Asset Management	Conservative	0	08/01/2002	Yes	No	388,847,800.58	3
Itaú Flexprev Corporate Platinum RV49 FIC Multimercado	04.342.594/0001-70	Itaú Unibanco	Aggressive	49	02/06/2002	No	No	378,363,324.98	54
Itaú Flexprev Corporate IV FIC Conservative	03.374.465/0001-09	Itaú Unibanco	Conservative	0	12/27/1999	Yes	No	374,133,171.53	49
Santander VIII FIC Conservative Crédito Privado	03.271.099/0001-54	Santander Brasil Asset Management	Conservative	0	02/10/2000	Yes	No	361,635,943.40	13
Bradesco H PGBL Conservador FI Conservative	02.907.508/0001-01	Bradesco Asset Management	Conservative	0	04/23/1999	No	No	310,936,194.50	26

Table 9
Cont.

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
Mapfre Corporate Prev FIC Multimercado	07.058.135/0001-57	Mapfre Investimentos	Aggressive	49	05/02/2005	Yes	No	269,151,025.32	63
Icatu Seg Duration FI Conservative	04.511.286/0001-20	Icatu Vanguarda	Conservative	0	07/24/2001	No	No	262,884,172.89	38
SulAmérica Fix 100 II FI Conservative	04.738.195/0001-22	SulAmérica Investimentos	Conservative	0	02/13/2003	No	No	235,275,950.22	11
SulAmérica Fix 100 FI Conservative	03.077.330/0001-73	SulAmérica Investimentos	Conservative	0	08/09/1999	No	No	233,647,627.54	17
Itaú Flexprev Premium V40 FIC Multimercado	07.400.588/0001-10	Itaú Unibanco	Aggressive	49	06/30/2006	No	No	209,349,066.90	76
BrasilPrev Multiestratégia II FIC Multimercado	05.954.445/0001-24	BrasilPrev	Aggressive	49	01/05/2004	No	No	203,267,143.56	91
Uniclass Prever RF I Especialmente Constituídos FIC Conservative	08.939.962/0001-12	Itaú Unibanco	Conservative	0	11/19/2007	Yes	No	194,134,622.08	6
Porto Seguro Aggressive FIC Multimercado Previdenciário	02.924.248/0001-74	Porto Seguro Investimentos	Aggressive	49	10/29/1999	No	No	190,524,384.18	50
BrasilPrev Multiestratégia I FIC Multimercado	05.954.487/0001-65	BrasilPrev	Aggressive	49	01/05/2004	No	No	185,066,270.61	24
Uniclass Prever RF II Especialmente Constituídos FIC Conservative	08.939.965/0001-56	Itaú Unibanco	Conservative	0	11/07/2007	Yes	No	183,360,865.63	6
Topázio Azul PGBL Especialmente Constituídos FIC Conservative	03.821.078/0001-65	Itaú Unibanco	Conservative	0	07/01/2004	No	No	182,728,509.57	5
Plano Accor de Previdência PGBL/ VGBL FI Conservative	02.710.116/0001-40	Bradesco Asset Management	Conservative	0	03/17/1999	No	No	170,132,653.08	6
SulAmérica FIX 100 VI FI Conservative	04.738.201/0001-41	SulAmérica Investimentos	Conservative	0	09/23/2004	No	No	152,112,741.81	22
BrasilPrev RT FIX Z FI Conservative	05.163.131/0001-03	BrasilPrev	Conservative	0	12/10/2002	No	No	146,559,387.98	4
Santander Prev Agressivo Superior FIC Multimercado Crédito Privado	03.534.939/0001-24	Santander Brasil Asset Management	Aggressive	49	10/27/2000	No	No	146,477,450.18	98
Itaú Flexprev XVI Premium FIC Conservative	02.911.564/0001-01	Itaú Unibanco	Conservative	0	09/28/1999	No	No	133,117,002.00	4
Pralex I Especialmente Constituídos FIC Conservative	07.644.989/0001-15	Itaú Unibanco	Conservative	0	11/20/2006	Yes	No	117,984,652.89	2
Icatu Seg Minha Aposentadoria 2030 FIC Multimercado	07.190.746/0001-54	Icatu Vanguarda	Aggressive	49	12/29/2005	No	No	104,157,709.47	27
Mapfre Corporate Plus Prev FIC Multimercado	08.893.169/0001-20	Mapfre Investimentos	Aggressive	49	12/07/2007	Yes	No	102,338,028.65	53

Table 9
Cont.

FIE	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
Icatu Seg Aggressive 49C FIC Multimercado	02.764.418/0001-09	Icatu Seguros	Aggressive	49	12/18/1998	No	No	98,890,190.35	39
Santander Prev FIC Multimercado Crédito Privado	08.918.382/0001-49	Santander Brasil Asset Management	Aggressive	49	11/05/2007	Yes	No	73,924,791.78	61
Caixa Renda Variável 0/49 300 FIC Multimercado Previdenciário	08.070.833/0001-30	Caixa Vida e Previdência	Aggressive	49	11/08/2007	Yes	No	73,425,519.93	12
Itaú Flexprev Jequitibá I FIC Multimercado Crédito Privado	08.395.650/0001-95	Itaú DTVM	Aggressive	49	01/08/2007	No	No	73,344,060.47	2
SulAmérica Mix 49 FI Multimercado	02.811.681/0001-01	SulAmérica Investimentos	Aggressive	49	08/09/1999	No	No	70,976,547.87	26
Santander 49 I FIC Multimercado Crédito Privado	07.199.199/0001-78	Santander Brasil Asset Management	Aggressive	49	05/17/2005	No	No	64,465,435.71	5
Icatu Seg Minha Aposentadoria 2020 FIC Multimercado	07.190.624/0001-68	Icatu Vanguarda	Aggressive	49	01/02/2006	No	No	59,699,256.33	25

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance*.

Table 10
Part 2 of the list of Free Benefit Generating Plan (Plano Gerador de Benefício Livre – PGBL) and Free Benefit Generating Life (Vida Gerador de Benefícios Livres – VGBL) funds

Fie	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
Itaú Flexprev Plus V40 FIC Multimercado	04.699.650/0001-28	Itaú Unibanco	Aggressive	49	12/192003	No	No	59,085,859.42	17
Icatu Seg Minha Aposentadoria 2040 FIC Multimercado	07.190.735/0001-74	Icatu Vanguarda	Aggressive	49	12/20/2005	No	No	57,656,734.89	25
Bradesco PGBL Hiperprev FIC Conservative	04.103.102/0001-93	Bradesco Asset Management	Conservative	0	11/03/2000	Yes	No	56,971,708.68	4
Pack FIX 100 Especialmente Constituídos FIC Conservative	04.709.080/0001-00	Itaú Unibanco	Conservative	0	12/13/2001	Yes	No	56,186,903.97	4
Porto Seguro Rubi Plus FIC Multimercado Previdenciário	08.747.753/0001-77	Porto Seguro Investimentos	Aggressive	49	12/18/2007	No	No	52,681,146.85	63
Bradesco H PGBL/VGBL Classic FI Conservative	07.985.878/0001-72	Bradesco Asset Management	Conservative	0	11/30/2006	No	No	52,235,487.13	1
Santander Prev RFA FIC Conservative Crédito Privado	03.565.131/0001-04	Santander Brasil Asset Management	Conservative	0	09/01/2000	Yes	No	51,727,034.04	1

Table 10
Cont.

Fie	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
Santander Prev Superior FIC Multimercado Crédito Privado	08.918.379/0001-25	Santander Brasil Asset Management	Aggressive	49	11/05/2007	Yes	No	50,930,709.71	70
Mapfre Inversion FI Multimercado	07.187.591/0001-05	Mapfre Investimentos	Conservative	0	01/09/2006	No	No	46,869,747.41	2
BrasilPrev Renda Total RI FIC Multimercado	05.132.916/0001-19	BrasilPrev	Aggressive	49	08/01/2007	No	No	45,187,435.22	2
Bradesco H PGBL/VGBL Potencial FIC Multimercado	08.773.281/0001-27	Bradesco Asset Management	Aggressive	49	09/25/2007	No	No	45,163,105.91	8
SulAmérica Mix 49 I FI Multimercado	04.616.035/0001-00	SulAmérica Investimentos	Aggressive	49	09/26/2003	No	No	42,392,354.93	64
Itaú Flexprev I V40 FIC Multimercado	04.701.172/0001-43	Itaú Unibanco	Aggressive	49	09/04/2002	No	No	41,677,226.49	9
Itaú Flexprev Investors V40 FIC Multimercado	08.435.270/0001-37	Itaú Unibanco	Aggressive	49	09/26/2007	No	No	40,877,003.32	21
Icatu Seg Aggressive 49b FIC Multimercado	02.764.434/0001-93	Icatu Seguros	Aggressive	49	10/19/1999	No	No	38,620,476.17	21
Itaú Private Prev V45 FIC Multimercado	08.417.967/0001-85	Itaú DTVM	Aggressive	49	08/30/2007	No	No	33,335,976.71	7
Bradesco PGBL/VGBL Future Aggressive III FIC Multimercado	01.392.020/0001-18	Bradesco Asset Management	Aggressive	49	09/30/1996	No	No	31,882,136.75	37
Itauprev Previsão FIC Conservative	04.841.814/0001-00	Itaú Unibanco	Aggressive	49	11/20/2002	Yes	No	31,871,216.84	2
Itauprev Annuity V30 FIC Multimercado	02.668.765/0001-20	Itaú Unibanco	Aggressive	49	08/17/1998	No	No	30,717,102.25	12
Itaú Flexprev Private V45 FIC Multimercado	08.417.908/0001-07	Itaú DTVM	Aggressive	49	08/10/2007	No	No	28,718,884.77	10
Itaú Flexprev Xi A V40 FIC Multimercado	08.820.430/0001-61	Itaú Unibanco	Aggressive	49	08/17/2007	No	No	26,068,201.22	2
Santander X FIC Conservative Crédito Privado	08.629.012/0001-91	Santander Brasil Asset Management	Conservative	0	10/30/2007	Yes	No	23,961,047.28	10
Mapfre Corporate Governance Aggressive FIC Multimercado	07.727.582/0001-51	Mapfre Investimentos	Aggressive	49	06/30/2006	Yes	No	20,541,515.41	55
Bradesco H PGBL/VGBL Empresarial Conservador FI Conservative	03.824.230/0001-63	Bradesco Asset Management	Conservative	0	05/31/2000	No	No	18,436,954.30	18
Santander VII FIC Conservative Crédito Privado	03.069.107/0001-84	Santander Brasil Asset Management	Conservative	0	10/21/1999	Yes	No	17,109,268.90	2
Santander 49 FIC Multimercado Crédito Privado	08.628.945/0001-64	Santander Brasil Asset Management	Aggressive	49	10/11/2007	No	No	16,687,652.36	62
Itaú Flexprev Corporate Premium FIC Conservative	06.008.952/0001-38	Itaú Unibanco	Conservative	0	01/30/2004	No	No	16,311,397.12	4

Table 10
Cont.

Fie	CNPJ	Institution	Style	Max investment in variable income	Date of birth	Feeder	Master	Total net worth (R$)	Number of plans
Santander Prev RFB FIC Conservative Crédito Privado	03.565.192/0001-71	Santander Brasil Asset Management	Conservative	0	09/29/2000	Yes	No	15,242,963.35	1
Bradesco H PGBL/VGBL Valor FIC Multimercado	08.757.682/0001-93	Bradesco Asset Management	Aggressive	49	09/25/2007	No	No	13,348,226.23	6
Itaú Flexprev Dourado FIC Multimercado	08.434.498/0001-02	Itaú DTVM	Aggressive	49	01/16/2007	No	No	11,417,715.62	2
Bradesco PRGP VRGP 30 FI Conservative	07.058.194/0001-25	Bradesco Asset Management	Conservative	0	12/23/2004	No	No	10,877,234.25	1
Santander XIV FIC Conservative Crédito Privado	04.684.499/0001-54	Santander Brasil Asset Management	Conservative	0	10/19/2001	Yes	No	10,230,470.48	10
Sadia Especialmente Constituídos FIC Conservative	05.431.584/0001-73	Itaú Unibanco	Conservative	0	04/28/2003	Yes	No	5,389,606.54	2
Bradesco PGBL Caemi F 15 FIC Conservative	03.958.330/0001-82	Bradesco Asset Management	Conservative	0	12/06/2000	Yes	No	4,803,176.98	1
Uniclass Prever RV 49 I Especialmente Constituídos FIC Multimercado	08.939.984/0001-82	Itaú Unibanco	Aggressive	49	11/07/2007	No	No	4,221,906.57	6
Icatu Seg Aggressive I FIC Multimercado	03.644.263/0001-21	Icatu Vanguarda	Aggressive	49	03/30/2000	No	No	3,555,707.17	4
Unibanco Prever III FIX 100 Especialmente Constituídos FIC Conservative	05.535.883/0001-58	Itaú Unibanco	Conservative	0	06/13/2003	Yes	No	3,249,903.47	2
Santander Future FI Multimercado	04.299.727/0001-72	Santander Brasil Asset Management	Aggressive	49	11/09/2001	No	No	3,046,611.77	2
Itaú Flexprev VIII B FIC Conservative	04.701.235/0001-61	Itaú Unibanco	Conservative	0	10/04/2006	Yes	No	2,776,696.65	18
Santander Prev Top Select FIC Multimercado Crédito Privado	03.565.187/0001-69	Santander Brasil Asset Management	Aggressive	49	10/18/2000	No	No	2,710,369.62	12
Santander Prev XX FIC Conservative Crédito Privado	08.629.018/0001-69	Santander Brasil Asset Management	Conservative	0	06/06/2007	Yes	No	2,692,829.30	2
Icatu Seg Minha Aposentadoria 2010 FIC Multimercado	07.190.444/0001-86	Icatu Vanguarda	Aggressive	49	12/29/2005	No	No	2,368,022.17	5
Santander XI FI Conservative Crédito Privado	04.684.457/0001-13	Santander Brasil Asset Management	Conservative	0	10/19/2001	No	No	1,687,014.16	2
Uniclass Prever RV 49 II Especialmente Constituídos FIC Multimercado	08.939.994/0001-18	Itaú Unibanco	Aggressive	49	11/09/2007	No	No	156,976.15	5

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance*.

B. ADMINISTRATIVE FEE CHARGED PER FUND

Table 11
Funds analyzed with corresponding CNPJ and administrative fee charged (part 1)

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 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

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance*.

Table 12

Funds analyzed with corresponding CNPJ and administrative fee charged (part 2)

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

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance*.

Table 13

Funds analyzed with corresponding CNPJ and administrative fee charged (part 3)

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

Table 13
Cont.

FIE	CNPJ	Administrative fee (%)
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

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance*.

Table 14
Funds analyzed with corresponding CNPJ and administrative fee charged (part 4)

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

Table 14
Cont.

FIE	CNPJ	Administrative fee (%)
BrasilPrev Dividendos I FIC Multimercado	05.824.217/0001-30	2.00
Bradesco VGBL FIX FIC Renda Fixa	04.830.277/0001-00	3.00
Bradesco VGBL F15 FIC Renda Fixa	06.185.741/0001-70	1.50
Bradesco VGBL F10 FIC Renda Fixa	06.081.457/0001-54	1.00
Bradesco PRGP VRGP 30 FI Renda Fixa	07.058.194/0001-25	3.00
Bradesco Prev Fácil PGBL FIX FIC Renda Fixa	02.561.139/0001-30	3.00
Bradesco PGBL/VGBL Future Composto III FIC Multimercado	01.392.020/0001-18	2.00
Bradesco PGBL/VGBL FIX Plus FIC Renda Fixa	04.253.202/0001-04	0.35
Bradesco PGBL Hiperprev FIC Renda Fixa	04.103.102/0001-93	2.00
Bradesco PGBL F 15 FIC Renda Fixa	02.998.253/0001-21	1.50
Bradesco PGBL F 10 FIC Renda Fixa	03.256.797/0001-80	1.00
Bradesco PGBL Caemi F 15 FIC Renda Fixa	03.958.330/0001-82	1.50
Bradesco H VGBL Conservador FI Renda Fixa	05.113.771/0001-09	3.00
Bradesco H PGBL/VGBL Valor FIC Multimercado	08.757.682/0001-93	3.00
Bradesco H PGBL/VGBL Potencial FIC Multimercado	08.773.281/0001-27	3.00
Bradesco H PGBL/VGBL Future FI Renda Fixa	01.392.021/0001-62	1.00
Bradesco H PGBL/VGBl Empresarial Conservador FI Renda Fixa	03.824.230/0001-63	1.50
Bradesco H PGBL/VGBL Classic FI Renda Fixa	07.985.878/0001-72	0.68
Bradesco H PGBL Conservador FI Renda Fixa	02.907.508/0001-01	3.00

FIE = specially constituted investment funds (fundo de investimento especialmente constituído).
Source: *Quantum Finance*.

C. JENSEN'S ALPHA ANALYSIS FOR AGGRESSIVE AND CONSERVATIVE FUNDS

Table 15

Jensen's alpha analysis for conservative funds (part 1)

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) (%)
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***	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	0.4	6.1	0.2***	-0.82	0.0***	0.4	6.1	0.2***
8	Pure insurance company	0.20	29.5	0.5	7.1	0.1***	-1.29	0.0***	0.5	7.1	0.1***
9	Pure insurance company	0.22	19.7	0.6	8.0	0.0***	-2.26	0.0***	0.6	8.0	0.0***
10	Pure insurance company	0.23	16.2	0.5	7.4	0.1***	-2.24	0.0***	0.5	7.4	0.1***
11	Pure insurance company	0.15	38.3	0.7	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	0.9***	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***

Table 15
Cont.

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) (%)
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	7,644.3	0.0***
34	Insurance company linked to a retail bank	-1.30	0.0***	86.1	7,644.2	0.0***	-4.22	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	955.5	0.0***	0.20	45.8	43.6	955.5	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	0.36	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

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

Table 16
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**	-0.1	0.3	72.8	-0.78	0.0***	-0.1	31.7	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	-0.60	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	-0.05	79.0	0.0	78.8	45.5

Table 16
Cont.

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) (%)
51	Insurance company linked to a retail bank	0.23	21.2	0.0	1.5	22.7	-3.22	0.0***	0.0	148.5	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	148.2	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	28.2	-0.79	0.0***	0.0	126.6	28.2
58	Insurance company linked to a retail bank	0.11	45.6	0.0	0.7	50.2	-0.89	0.0***	0.0	68.9	50.2
59	Insurance company linked to a retail bank	-1.20	4**	10.5	145.4	0***	-2.09	0.0***	10.5	14539.0	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***	-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	20.3	-2.69	0.0***	0.0	159.5	20.3
65	Insurance company linked to a retail bank	-1.55	10.6	0.8	10.7	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***	-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	0.2	3.3	3.5**	-2.90	0.0***	0.2	334.4	3.5**
71	Insurance company linked to a retail bank	0.86	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***	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***	-0.21	88.9	4.0	5214.0	0.0***
74	Insurance company linked to a retail bank	0.17	39.8	0.2	3.2	4**	-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***	0.3	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**

Table 16
Cont.

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) (%)
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*	-0.78	0.1***	0.2	293.0	5.4*

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*

Table 17
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	-3.90	0.2 ***	83.3	2,057.1	0.0 ***	-5.57	0.0 ***	83.3	2,057.1	0.0 ***
2	Pure insurance company	-1.48	33.9	86.7	2,683.3	0.0 ***	-3.43	2.5 **	86.7	2,683.3	0.0 ***
3	Pure insurance company	-1.38	8.0 *	68.4	892.6	0.0 ***	-3.09	0.0 ***	68.4	892.6	0.0 ***
4	Pure insurance company	-4.29	0.4 ***	87.4	2,863.5	0.0 ***	-5.95	0.0 ***	87.4	2,863.5	0.0 ***
5	Pure insurance company	-1.58	30.6	86.7	2,692.2	0.0 ***	-4.49	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	-1.97	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	73.7	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	5.3	23.8	0.0 ***	-2.00	16.8	5.3	23.8	0 ***
12	Pure insurance company	-0.33	93.6	5.3	24.1	0.0 ***	-2.79	49.7	5.3	24.1	0 ***
13	Pure insurance company	-1.06	53.0	82.3	1,908.4	0.0 ***	-3.02	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	4.3	19.5	0.0 ***	-2.09	57.7	4.3	19.5	0 ***

Table 17
Cont.

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) (%)
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 ***	-4.36	0.1 ***	80.9	1,744.4	0 ***
19	Insurance company linked to a retail bank	-3.40	1.5 **	81.9	1,859.9	0.0 ***	-5.31	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 ***	-3.45	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 ***	-4.41	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 ***	-1.82	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 ***	-3.59	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 ***	-4.52	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 ***	-3.19	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 ***	-3.01	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 ***

Table 17
Cont.

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) (%)
35	Insurance company linked to a retail bank	-0.55	35.1	95.5	8,710.8	0.0 ***	-3.97	0 ***	95.5	8,710.8	0 ***
36	Insurance company linked to a retail bank	-2.98	0.3 ***	91.3	4,318.4	0.0 ***	-4.18	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	85.6	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	2,300.9	0.0 ***	-1.27	43.2	84.8	2,300.9	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 ***	-3.86	0.2 ***	87.5	2,878.4	0 ***
42	Insurance company linked to a retail bank	-1.01	44.4	87.4	2,850.9	0.0 ***	-2.97	2.3 **	87.4	2,850.9	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	5 **	40.8	284.4	0.0 ***	0.38	82.5	40.8	284.4	0 ***
45	Insurance company linked to a retail bank	3.43	5.1 *	40.8	284.5	0.0 ***	1.38	42.7	40.8	284.5	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 ***

****, **, * = level of significance of 1, 5, and 10%, respectively.*
Source: *Elaborated by the authors.*