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Escola de Economia e Gestão

Wang Mohan

Are there "Hot Hands" in the French Bond Mutual Fund Market?

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

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Resumo

O objectivo desta dissertação é investigar o desempenho e a persistência do desempenho de fundos de obrigações franceses.. A base de dados consiste em 304 fundos franceses para o período que vai de Janeiro de 2008 a Dezembro de 2017. O desempenho dos fundos é avaliado através de um modelo multi-factor, incluindo quatro factores, nomeadamente os fatores mercado de obrigações, *default*, *option* e o fator mercado de acções. Em geral, a maioria dos fundos tem um desempenho negativoao longo o período da amostra. Para avaliar a persistência do desempenho, são usadas tabelas de contingência para períodos de 6 meses, 12 meses e 24 meses. Os resultados empíricos demonstram claramente uma forte evidência de persistência de desempenho, tanto para os fundos melhores como para os piores.

Palavras-chave: desempenho, fundo de obrigações, mercado francês, persistência de desempenho, tabelas de contingência.

Are there "Hot Hands" in the French Bond Mutual Fund Market?

Abstract

The purpose of this dissertation is to investigate the performance of French bond funds and their persistence. The dataset consists of 304 bond-oriented French funds from January 2008 to December 2017. Fund performance is evaluated through a multi-factor model including four factors, namely, bond, default, option and equity factors. In general, most funds perform poorly during the period under analysis. To assess performance persistence, we use contingency tables for 6-month, 12-month and 24-month periods. The empirical results clearly demonstrate strong evidence of performance persistence, both for winning and losing funds.

Key words: bonds fund, contingency tables, French market, performance persistence, performance.

TABLE OF CONTENTS

List of Tables

List of Appendices

1. INTRODUCTION

A relevant topic in mutual fund performance has drawn a great of attention. Known as "Hot Hands", performance persistence indicates fund managers' ability to produce returns consistently above or below their peers. The expression "hot hands" was initially applied in sports activities, generally indicating a condition of basketball players being capable of maintaining exceptional abilities to make points consistently, which is normally heard from the commentator giving praise to the outstanding players. Nowadays, this expression has been brought into many non-sports fields such as gambling theories, consumers behavior, and behavioral finance, etc. In the perspective of financial investors, "Hot hands" is a simplistic way to demonstrate who the skillful and professional asset managers are. In general, managers that can consecutively delivery superior excessive returns in comparison with the worst ones are said to have "hot hands", while the managers giving bad performance consistently are criticized as having "icy hands". Thus, the research on performance persistence is an important topic in mutual fund studies and plays a key role in the evaluation of managerial skills.

However, compared to the massive amount of research on performance persistence of equity mutual funds, studies on the performance persistence of bond funds are much fewer. The discussion on the persistence of bond mutual funds remains unclear and in need of research. In terms of their geographical focus, studies on equity funds tend to be more diverse. By contrast, researchers have not treated bond funds in much detail. In the history of the subject, the research of bond funds merely occurred in the last two decades. However, following the more and more bond funds that have been introduced in the asset management industry, their analysis has been attracting more attention.

As a country possessing the largest asset management industry in continental Europe, France plays a cardinal character in partly revealing the economic state of Europe. According to the statistics provided by The French Asset Management Association -Association Française de la Gestion financière (AFG 2017), by the end of 2017 the French asset management industry comprised 630 asset management companies with 4,000 bn € of asset under management, consisting of 1,950 bn € for French investment funds and 2,050 bn € for discretionary mandates and foreign funds managed in France. Checking the asset type breakdown in terms of categories, bond funds represent 12% of the mutual fund market, surpassing the proportions of money market and equity funds and only standing behind balanced funds. In addition, the sales of bond funds show an increase of 8.5 bn € in comparison with the previous year. Notwithstanding, up to our knowledge, there are few studies on French bond

funds. The research of bond funds is mostly focused on the US market or the whole continental Europe.[1]

The bond funds are widely recognized as a relatively safe investment vehicle. After the European debt crisis, investors tended to purchase more bond-related investment products as an alternative to equity funds, in light of the sabotaged economic state. The current amount of bond debt funds is approximately two times as before the subprime crisis, albeit the liquidity of the bond market is ascending without the signal to go back to the pre-crisis level. [2] Consequently, this draws our interest to the question: were French bond fund managers' managerial skills affected in the aftermath of the solvency problems? We believe that carrying out an investigation into the French bond fund market would shed light on this question.

The concerns expressed above motivated the topic of this dissertation: "Are there hot hands in the French bond mutual fund market?". This purpose of this study is to evaluate the performance and persistence of French bond funds and to explore whether "hot hands" exist among French bond mutual funds. In line with the duration of the European debt crisis, the sample period ranges from January 2008 to December 2017.

Our thesis is organized into six chapters, including an introductory chapter. Chapter 2 discusses the major studies related to our topic. Chapter 3 presents the methodology used to tackle the main tasks - the evaluation of performance and performance persistence. Chapter 4 is concerned with the description of data. Chapter 5 presents and analyzes our findings. Finally, chapter 6 draws upon the conclusions of the research.

[1] The data is retrieved from the *French Investment Funds Monthly Statistics* released on October, 2018 and *The French Asset Management Industry* released on April, 2018. The both are published in brochures section of Association Française de la Gestion financière site. https://www.afg.asso.fr/en/key-data-3/

[2] Sourced by *Study of Liquidity in French bond markets* issued by Autorité des marchés financiers in November 16th, 2015.

2. LITERATURE REVIEW

Research on the performance persistence of mutual funds emerged around two decades ago, while the evaluation of overall fund performance goes way back in time. The first serious analysis of fund performance was developed during the 1960s with Jensen (1968) arguing that mutual funds do not generate superior returns over the market. Although most of the subsequent studies on mutual fund performance are consistent with Jensen (1968) and thus are in line with the efficient market hypothesis (EMH), the possibility of managers exhibiting hot hands challenges this hypothesis. Hendricks et al. (1993) analyze the persistence of equity funds and put forward that investors are able to exploit the previous performance to predict the near-future ones, which is inconsistent with the EMH.

The issue of fund performance persistent is a controversial one. Several studies have revealed that the perisistence only existed during a certain time period. For instance, Malkiel (1995) found evidence of performance persistence during the 1970s, yet it ceased to exist in the 1980s. Goetzmann and Ibbotson (1994) found evidence of performance persistence in the 1976-1988 period for 728 US mutual funds. A number of authors report the association between consistency of performance and time. Furthermore, Hendricks et al. (1993) point out that performance persistence is mostly a short-term phenomenon (less than one year) while Elton et al. (1996a) document that performance persisted holds for periods longer than one year. Additionally, Carhart (1997) argues that persistence mainly exists within the poorly performing funds.

Besides the above, other studies attempt to explain the impact brought by other factors in the assessment of performance persistence. Brown et al. (1995) and Elton et al. (1996b) find that survivorship bias significantly affects the evaluation of performance persistence. Blake et al. (1993) conclude that without taking management fees into account, performance estimates would be higher. Likewise, Polwtioon and Tawatnuntachai (2006), based on global-classified U.S bond funds and domestic-classified bond funds, report that bond funds did not perform better than the market index due to the fund expense ratios, and, compared to US-domestic bond funds, the global ones provided slightly better risk-adjusted returns. Recent studies not only synthesize previous research but also provide distinct insights. Clare, et al. (2019) perform a comprehensive study of US bond funds from 1998 to 2017, featuring several distinct points, for instance, the application of self-declared benchmarks, managers' timing skills and the predictability of the performance. They find that bond funds generate good performance in the post-crisis period, but a strong performance cannot be an indicator of future performance. Also, market timing ability is observed in part of funds.

Despite the fact that the bond sector is less studied, the methodology to assess the performance persistence of bond funds is comparable in complexity to equity funds. In Kahn and Rudd (1995)'s work, unlike obtaining alpha or total returns as the measurement for performance in the past studies, the authors use the information ratio and style- adjusted returns. Then, contingency tables are used to assess the performance persistence of 300 US equity funds and all the domestic bond funds from 1983 to 1993. The performance of the fixed-income funds mainly composed of bond funds persisted during the period, but the persistence did not appear in equity fund performance. Additionally, this paper also reveals that fixed-income funds that have relatively higher fee ratios deliver stronger abnormal returns. Likewise, the authors believe survivorship bias has massive effects on the persistence analysis. By contrast, Blake et al. (1993) use a large-scale sample and conclude that although the existence of survivorship bias in bond funds would enhance performance on some samples, a large sample is relatively immune to the interference of survivorship bias. The authors also argue that survivorship bias does not affect bond funds as severely as equity funds due to fewer variables in bond fund evaluation.

Contingency tables are a widespread method for examining performance persistence for both equity funds and bond funds. An innovative method on contingency tables was undertaken by Droms and Walker (2016). The authors focus on the corporate bond funds and government bond funds in the US market from 1990 to 1999. Firstly, all the funds were classified into half "winners" and half "losers" based on their performance, whilst those funds that ceased in the subperiod were labeled as "gone". This method is an improved attempted to that of Goetzmann and Ibbotson (1994), Brown and Goetzmann (1995) and Malkiel (1995)'s methodology. The evidence of Droms and Walker (2016) shows performance persistence of corporate and government bond funds in the short term.

Another widely-used approach is cross-sectional regression. Blake et al. (1993) apply cross-sectional regressions on past performance and future performance, i.e., The predicting ability of past performance was revealed through two samples of bond funds: the sample of funds from 1979 to 1988 and a survivorship-biased sample containing all the funds that existed at the end of 1991. Other studies that use this methodology are Grinblatt and Titman (1992), Khan and Rudd (1995) and Huij and Derwall (2008).

Huji and Derwall (2008) investigate the performance persistence of 3549 US bond funds from 1990 to 2003. The authors use alternative methods for assessing performance persistence, such as the Spearman's rank correlation, the contingency tables and cross-sectional regression methods mentioned above and find some evidence of performance persistence.

In assessing performance persistence, an important issue refers to the selection between conditional and unconditional models to assess performance. Chen and Knez (1996), Christopherson et al. (1998), and Christopherson et al. (1999) argue that performance persistence is better assessed when conditional models are used. The flaws of unconditional models are related to the fact that they neglect time-varying risk and therefore they do not consider the economic conditions. Otten and Bams (2002) document the evidence of strong persistence when the conditional model is used. Silva et al. (2003) use both unconditional and conditional models to evaluate bond funds in several European countries. In posterior subsequent research, Silva et al. (2005) elucidate that neglecting time-varying alphas would result in distortion of the assessment of persistence.

3. METHODOLOGY

3.1 Performance measurement

The single-factor model to evaluate abnormal returns can be expressed as follows:

$$r_{p,t} = \alpha_p + \beta_p r_{m,t} + \varepsilon_{p,t} \quad (1)$$

In the above expression, $r_{p,t}$ stands for the excess returns of portfolio p relative to the risk-free rate in period t, $r_{m,t}$ represents the excess returns of the market index in period t, and $\varepsilon_{p,t}$ is the residual term. This model was initially designed to measure the performance of equity mutual funds and later applied in evaluating the performance in bond funds (Gudikunst and McCarthy, 1992; Blake et al.1993; Gallo et al., 1997; and Detzler, 1999).

The single-factor model has been widely used in the literature. However, there are certain drawbacks associated with the use of single-factor model. One of its disadvantages is that the performance of most funds is near impossible to be explained by only one risk factor. Hence, for the purpose of capturing more sources of systematic risk, we will apply a multi-factor model, as in Blake et al. (1993), and Elton et al. (1995). Our model is inspired by Elton et al. (1995), Derwall and Koedijk (2009) and Leite and Cortez (2018) and includes a bond factor, a default factor, an option factor, and an equity factor.

$$r_{p,t} = \alpha_p + \beta_{1p} Bond_t + \beta_{2p} Default_t + \beta_{3p} Option_t + \beta_{4p} Equity_t + \varepsilon_{p,t} \quad (2)$$

Where $r_{p,t}$ refers to excess returns of portfolio p in period t, $Bond_t$ stands for excess returns of a bond index , $Default_t$ refers to the spread between a high-yield index and a sovereign index, $Option_t$ corresponds the difference between a mortgage-backed and asset-backed index and the sovereign index, and $Equity_t$ is excess returns of a stock market index. Similar to the above model,

α_p is designed to measure fund performance. A statistically positive (negative) alpha indicates superior (inferior) performance.

The reason for using multi-factor models instead of single ones is straightforward. As explained previously, multi-factor models have the capability to capture additional sources of systematic risk. Besides the obvious bond factor, the default factor is used to capture the riskiness of the high-yield products and risk compensation caused by high-yield instruments (Leite and Cortez, 2018). Mortgage-backed and asset-backed funds are intended to capture option features in bond securities. The equity factor is included to consider the possibility of funds including convertible debt. Furthermore, there is the likelihood that the variance in equity returns can be responsible for explaining bond funds' performance.

As we pointed out in the literature review, in comparison with the unconditional model, the effectiveness of conditional model has been exemplified in papers such as Chen and Knez (1996), Christopherson et al. (1998), and Christopherson et al. (1999). However, considering that data collected consists of several funds with short time series and that conditional models require longer time series for the estimations, we would face practical constraints in estimating conditional models. Hence, the performance of mutual funds of this study is evaluated by the four-factor unconditional model specified in equation 2.[3]

Prior to undertaking the regressions, we construct an equally-weighted portfolio of funds to evaluate overall performance. Another major source of uncertainty is whether the sample suffers from autocorrelation and heteroskedasticity whilst the model is performed. To prevent these interferences, we apply the Newey-West estimator (1987), which is designed to correct the error terms brought by autocorrelation and heteroskedasticity. Besides, for the purpose of examining the true value of the parameter based on the sample estimate, we also conduct Wald test.

3.2 Persistence performance

3.2.1 Monthly alphas

As discussed previously, various methods have been developed and to assess performance persistence, namely cross-sectional regressions (e.g., Khan and Rudd, 1995), Spearman's rank correlation (e.g., Huji and Derwall, 2008) and contingency tables (e.g., Droms and Walker, 2006; Goetzmann and Ibbotson, 1994).

Our research primarily relies on the application of contingency tables. This methodology requires

[3] The fact that we will estimate monthly alphas with rolling windows of 36 months somewhat mitigates the main limitation of unconditional models.

the evaluation of fund performance on a monthly basis. As the performance measure, we decided to use the alpha of the four-factor model (including the bond, default, option and equity factor).[4] To estimate the monthly alphas, we followed the rolling window regression procedure inspired by Ferreira et al. (2013). Firstly, for each fund, we perform a 36-month rolling window regression based on the four-factor model. On completion of the regression, we compute the expected returns as follows:

$$r_{expected,p,t} = r_{f,t} + \hat{\beta}_{1,p,t} Default_t + \hat{\beta}_{2,p,t} Option_t + \hat{\beta}_{3,p,t} Corporate_t + \hat{\beta}_{4,p,t} Equity_t \quad (3)$$

Where $\hat{\beta}_{1,p,t}$, $\hat{\beta}_{2,p,t}$, $\hat{\beta}_{3,p,t}$ and $\hat{\beta}_{4,p,t}$ are four estimated coefficients obtained from the 36-month rolling window and $Default_t$, $Option_t$, $Corporate_t$and $Equity_t$ refer to the risk factors, The expected excess return of each fund in month t is computed as $r_{expected,p,t}$ -$r_{f,t}$ Once the expected excess returns are calculated, the monthly alphas can be easily obtained by subtracting the expected excess returns from the realized excess returns. In the follow-up procedure, the results are used to calculate the cumulative alphas in terms of the different periods used in the contingency tables.

3.2.2 Contingency Tables

Contingency tables are a broadly-used method that involves forming a matrix to represent the data frequency. Some authors point out the advantages of this method such as its 'robustness' and 'effectiveness' (Carpenter and Lynch, 1999). Furthermore, the cross-sectional regression method requires a comparatively large sample, which decreases its robustness over different samples.

The contingency tables are a two-way table, that requires the categorization of funds into Winners and Losers according to each period's median cumulative alphas. The cells in the tables include funds that are categorized as WW (winner in one period and winner the next period), WL (winner in one period and loser in the next period), LW (loser in one period and winner in the next) and LL (loser in one period and loser in the next). Under the null hypothesis of no performance persistence, the expected value in each cell would be 25%. To assess whether deviations from the expected value indicate performance persistence, we will use three statistical tests: the Odds ratio Z-statistics introduced by Brown and Goetzmann (1995), the Chi-square statistic pioneered by Kahn and Rudd (1995), and the 'repeated winner' Z-statistic proposed by Malkiel (1995).

Regarding the first test, Brown and Goetzmann (1995) compute the Odds ratio, known as the Cross-product Ratio.

[4] Several studies (e.g. Malkiel, 1995) use raw-returns as a measure of performance. We consider this approach may lead to an incorrect assessment of performance persistence, considering that what may be perceived as persistence may simply reflect the level of risk assumed by the funds.

The Odds Ratio is expressed as follows:

$$\text{Odds ratio} = \frac{\text{WW} * \text{LL}}{\text{WL} * \text{LW}} \tag{4}$$

Under the null hypothesis of no performance persistence, the value of the Odds Ratio would be equal to 1 (Brown and Goetzmann, 1995). The existence of reversals in performance is reflected in an Odds ratio lower than 1, while performance persistence implies in an Odds ratio larger than 1.

For large samples, the log of the estimated odds ratio is normally distributed with the standard error as follows (Christensen, 1990, p. 40):

$$\sigma_{\log(odds\ ratio)} = \sqrt{\frac{1}{WW} + \frac{1}{WL} + \frac{1}{LW} + \frac{1}{LL}} \tag{5}$$

The statistical significance of the Odds ratio is based on a Z-statistic that is asymptotically normally distributed:

$$\text{Z} - \text{statistic} = \frac{\ln(odds\ ratio)}{\sqrt{\frac{1}{WW} + \frac{1}{WL} + \frac{1}{LW} + \frac{1}{LL}}} \tag{6}$$

A second test used involves computing Malkiel's (1995) repeat winner ratio and the associated Z-test. Under this statistical test, the percentage of repeat winners is calculated by the expression: WW/ (WW+WL), and the percentage of repeat losers is calculated by LL/ (LW+LL). In relation to its statistical significance, the following binominal test is performed:

$$\text{Z} = \frac{(y - np)}{\sqrt{np(1-p)}} \tag{7}$$

Where y is the number of repeat winners and n is the number of repeat winners and winners-losers. If p is the probability that a winner persists, then p is expected to be 0.5. Under the consideration of both repeated winners and losers, this test can be deconstructed into two formulas given as:

$$Z_{winners} = \frac{WW - (WW+WL)*0.5}{\sqrt{(WW+WL)*0.5*(1-0.5)}} \tag{8}$$

$$Z_{losers} = \frac{LL - (LL+LW)*0.5}{\sqrt{(LL+LW)*0.5*(1-0.5)}} \tag{9}$$

Where the Z-test is normally distributed, and WW, WL, LW and LL remain the same as previously

announced. Under the Z-test, performance persistence is indicated when the percentage of repeat winners or losers is higher than 50%.

Finally, the third test is the Chi-square statistic, used by Kahn and Rudd (1995). As Carpenter and Lynch (1999) show, although the Chi-test fails to observe the existence of reversals due to the majority of performance remaining positive, the property of this test is to be able to set off the impact effect from survivorship bias. The Chi-Square test is an independence test that stems from the size of the differences between the expected values of the frequencies in each cell assuming no performance persistence and the actual frequencies. An unambiguous signal of whether there is performance persistence can be seen whether the observations on the top-left bins and bottom-right bins surpass other observations on the rest of the bins or not. The Chi-square test is defined as:

$$\chi^2 = \sum_{i,j=1}^{n} \frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}} \tag{10}$$

Where i and j represent the ordinal number of line and column of the contingency table, O_{ij} E_{ij} stand for the observed frequencies and the expected frequencies. The expected frequency can be estimated as following:

$$\text{Chi} = \frac{(WW - E1)^2}{E1} + \frac{(WL - E2)^2}{E2} + \frac{(LW - E3)^2}{E3} + \frac{(LL - E4)^2}{E4} \tag{11}$$

Where Es can be broken down into:

$$\text{E1} = \frac{(WW+WL)\times(WW+LW)}{N} \tag{12}$$

$$\text{E2} = \frac{(WW+WL)\times(WL+LL)}{N} \tag{13}$$

$$\text{E3} = \frac{(LW+LL)\times(WW+LW)}{N} \tag{14}$$

$$\text{E4} = \frac{(LW+LL)\times(WL+LL)}{N} \tag{15}$$

In this set of expressions, N refers to the number of funds.

4. DATA

Our research investigates French bond mutual funds in the period from January 2008 to December 2017. We searched for bond-related funds that are based on France but not restricted to invest only in France. Therefore, the geographical focus of the funds is France and the Eurozone. From Thomson Reuters Eikon Datastream, we not only selected the funds[5] but also collected the respective time-series of the end-of-month Total Return indexes. In our search, we found our database only contains active funds, so our study inevitably suffers from survivorship bias.

After selecting 8100 French funds, we apply several filters. First, in terms of the geographical focus of the funds, as previously mentioned, we only selected funds investing in the EuroZone and in France. Considering the Lipper Global Classification, we then selected funds that fall into the following classifications: Bond EUR, Bond EUR High Yield, Bond EUR Corporates, Bond Corporates Short Term, Bond EUR Short Term, Bond EUR Medium Term, Bond EUR Long Term, Bond EMU Government, Bond EMU Government ST, Bond EMU Government LT and Bond EMU Government MT. With respect to the Base and Start Date, we only chose funds having available data for at least 24 months, and we set the Start Date before December 2015. Once all these filters were implemented, we ended up with 448 funds. In a further procedure, we also excluded funds with different classes. Thus, we ended up with a final sample of 304 funds. The list of funds in our dataset is presented in the Appendix.

Following Leite and Cortez (2018), the 1-month maturity Euribor, collected from European Central Bank, is used as the proxy for the risk-free rate. Regarding the proxies on the four risk factors, the selection of the indexes is mainly based on the iBoxx € and BofA Merrill Lynch € Index families, both sourced from Thomson Reuters Eikon Datastream. The default factor is proxied by the spread between the BofA € Global High Yield TR Index and the iBoxx € France Sovereign TR Index. The option factor is calculated by subtracting the iBoxx € France Sovereign TR Index from the BofA € Asset-Backed & Mortgage-Backed Security (ABS&MBS) TR Index. Finally, the equity factor is proxied by the excess returns of the MSCI France Index.

In relation to the bond factor, it is proxied by the excess returns of the iBoxx € Corporate Index. It is important to mention that we first considered using two bond indexes to proxy for the bond market: a corporate bond index and a government bond index. This possibility was discussed considering that

[5] In the sample selection process, we selected the FRANCE FUND UNIVERSE (LFRAALL) which includes 8100 constituents and identifies the code of funds according to the Lipper Global classification, Asset type, Type of instruments, etc.

the sample includes funds that hold corporate and government debt. However, we ended up discarding the government factor (proxied by the excess returns of the BofA € 10+ years France Government Index) given some correlation issues that arose. In fact, as table 1 shows, the Government factor demonstrates a high correlation with the Option and the Corporate. To analyze whether this might raise multicollinearity problems, we further computed the variance inflation factors (VIF) for the five factors (including the government factor) and four factors (without the government factor). Checking on tables 3 and 4, we can observe that with the Government factor, abnormally high VIFs of the Government and Corporate factors appear (a value of 4 requires further investigation; 10 reveals severe multicollinearity). When excluding the Government factor (see Table 4), the VIF for all factors decrease to the normal state. Considering this analysis, we decided that the model should stick to the original four factors, without the Government factor. Table 2 presents the correlation matrix of the four factors and Table 5 presents the summary statistics of the four factors.

Table 1 – Correlation Matrix of coefficients of regression of 5-factor model

This table reports the correlation coefficients between the factors, where each cell indicates the correlation between two factors.

	Default	Option	Government	Corporate	Equity
Default	*1.0000*				
Option	*0.0489*	*1.0000*			
Government	*0.3375*	*0.8403*	*1.0000*		
Corporate	*-0.3881*	*-0.5803*	*-0.7986*	*1.0000*	
Equity	*-0.3618*	*0.1240*	*0.1479*	*-0.4106*	*1.0000*

Table 2 – Correlation Matrix of coefficients of regression of 4-factor model

This table reports the correlation coefficients between factors, where each cell indicates the correlation between two factors.

	Default	Option	Corporate	MSCIFR
Default	*1.0000*			
Option	*-0.4599*	*1.0000*		
Corporate	*-0.2093*	*0.2786*	*1.0000*	
Equity	*-0.4423*	*-0.0005*	*-0.4914*	*1.0000*

Table 3 – Variance Inflation Factors for five factors

This table reports the Variance Inflation factors for factors for detecting the multicollinearity in five risk factors: Government, Corporate, Option and Default and Equity. All the variables are collected from December 2007 to December 2017.

Variable	VIF	1/VIF
Government	*7.94*	*0.125947*
Corporate	*5.20*	*0.192226*
Option	*4.63*	*0.215845*
Default	*2.44*	*0.409187*
Equity	*2.34*	*0.426876*
Mean VIF	*4.51*	

Table 4 – Variance Inflation Factors without Government factor

This table reports the Variance Inflation factors for factors for detecting the multicollinearity in four risk factors: Corporate, Option and Default and Equity. All the variables are collected from December 2007 to December 2017.

Variable	VIF	1/VIF
Equity	*2.29*	*0.436423*
Default	*2.17*	*0.461788*
Corporate	*1.88*	*0.530707*
Option	*1.36*	*0.734567*
Mean VIF	*1.93*	

Besides analyzing individual fund performance, we also assess aggregate performance by constructing an equally-weighted portfolio of the funds. The summary statistics of the equally-weighted portfolio are presented in table 6.

Table 5 – Summary statistics of four factors

The table presents the summary statistics of four risk factors in which Corporate, Option and Default are primarily proxied by iBoxx € and BofA Merrill Lynch € Index family, and Equity is proxied by MSCI (Morningstar) French index. Each segment of factors consists of 120 observations. Jarque-Bera is a normality test that can determine whether the residuals of underlying variables in date set is likely to be normally distributed or not. The null hypothesis, variable being normally distributed, is rejected if P-value (JB) is lower than expected p-value (0.05 in this case).

	Default	Option	Corporate	Equity
Mean	*0.007666131*	*-5.1E-05*	*-0.00283*	*-0.00211*
Std. error	*0.005832904*	*0.000902*	*0.001768*	*0.005064*
Median	*0.008908261*	*-0.00038*	*0.002417*	*0.005774*
Std. Dev	*0.063896267*	*0.009884*	*0.019372*	*0.055476*
Variance	*0.004082733*	*9.77E-05*	*0.000375*	*0.003078*
Kurtosis	*7.54211252*	*0.379281*	*5.306091*	*1.226182*
Skewness	*-0.120045163*	*0.085786*	*-1.975*	*-0.84945*
Jarque-Bera (JB)	*284.70552*	*0.86645*	*218.7855*	*21.949*
P-value (JB)	*0*	*0.64841*	*0*	*0*
Maximum	*-0.301279623*	*-0.0256*	*-0.09421*	*-0.18887*
Minimum	*0.288423717*	*0.028709*	*0.030476*	*0.125359*
Sum	*0.919935695*	*-0.00615*	*-0.33962*	*-0.25299*
Observations	*120*	*120*	*120*	*120*

Table 6 – Summary statistics of equally-weighted portfolio

The table reports the summary statistics of monthly excess return of the equally-weighted portfolio documented from January, 2008 to December, 2017, containing 120 observations. Jarque-Bera is a normality test that can determine whether the residuals of underlying variables in date set is likely to be normally distributed or not. The null hypothesis, variable being normally distributed, is rejected if P-value (JB) is lower than expected p-value (0.05 in this case).

Equally-weighted portfolio	
Mean	*-0.003922879*
Standard Error	*0.001411461*
Median	*0.001489333*
Standard Deviation	*0.01546178*
Variance	*0.000239067*
Kurtosis	*3.075396336*
Skewness	*-1.82885483*
Jarque-Bera (JB)	*114.1845*
P-value (JB)	*0*
Maximum	*-0.056966633*
Minimum	*0.014335804*
Sum	*-0.470745426*
Observation	*120*

5. EMPIRICAL RESULTS

This chapter is divided into two parts. The first part presents the results regarding the performance of individual funds and the equally-weighted portfolio from January 2008 to December 2017. Then, we present the contingency tables results to assess fund performance persistence

5.1. Performance evaluation using the four-factor model

We start by evaluating performance both at the individual fund level and at the aggregate level, by evaluating the performance of the equally-weighted portfolio of funds. Fund performance is evaluated with the four-factor model presented in equation (2). Due to the fact that this type of time-series data it is likely affected by autocorrelation and heteroskedasticity, we use Newey-West (1987) estimators (Newey–West standard errors for coefficients estimated by OLS regression) to correct the errors.

We further use the Wald test, which tests the null hypothesis that all the coefficients of the four factors (Default, Option, Corporate, and Equity) are simultaneously equal to 0.

Table 7 presents the regression results of the four-factor model.

Table 7 – Performance evaluation using the four-factor model

This table presents estimates of performance for an equally-weighted portfolio of French bond funds using the four-factor model of equation (2). Corporate corresponds to the monthly excess returns of iBoxx € Corporate Index. Excess returns were computed using the one-month Euribor as the risk-free rate. Default is computed as the difference in returns between the BofA € Global High Yield TR Index and the iBoxx € France Sovereign TR Index. Option corresponds to the difference in return between the BofA € Asset-Backed & Mortgage-Backed Security (ABS&MBS) TR Index and the iBoxx € France Sovereign TR Index. Equity corresponds to the monthly excess returns of the MSCI France Index. Adjusted R^2 is the adjusted coefficient of determination. Wald indicates the result of the Wald test for the null hypothesis that the coefficients of the corporate, default, option, and equity factors are jointly equal to zero. The number of funds portfolio with positive (N+) and negative (N-) estimates are presented. The number of funds whose estimates are statistically significant at least at the 5% level are presented in parentheses. The asterisks are used to represent the statistically significant coefficients at the 1% (***), 5% (**) and 10% (*) significance levels, based on heteroskedasticity and autocorrelation adjusted errors (following Newey and West, 1987).

Factor		α_p	*Corporate*	*Default*	*Option*	*Equity*	Adjusted R^2	Wald
Equally-weighted portfolio		*-0.00143**** *(0.000352)*	*0.752**** *(0.0634)*	*-0.0374**** *(0.0124)*	*0.0302* *(0.0591)*	*0.0357**** *(0.00953)*	*0.9151*	*321.5****
	N+	*110 (43)*						
	N-	*194 (123)*						

With regards to fund performance at the aggregate level, the alpha of the equally weighted portfolio of funds is negative and statistically significant at the 1% level, indicating a that French bond funds underperform the benchmark. Relative to the risk factors, the coefficients of the Corporate and Equity factors are positive and statistically significant at 1% level; the coefficient of Default factor is negative and statistically significant at the 1% level: and the coefficient of the Option factor is positive but not statistically significant.

In terms of the performance of individual funds, poorly performing funds dominate. Among the 304 funds, 110 funds delivery positive alphas but only 43 out of them are statistically significant at the 5% level. In turn, 194 funds produce negative alphas, of which 123 are statistically significant at the 5% level. Funds with statistically significant positive alphas represent 14.1% of the sample compared to 40.5% of the funds with statistically significant negative alphas.

In relation to the performance of the model, as can be in Table 7, the Adjusted R-square reaches 0.9151, indicating a very good explanatory power of the model. The results of the Wald allow us to reject the null hypothesis that the coefficients of Corporate, Default, Option and Equity are jointly equal to zero.

5.2 Performance persistence

As mentioned previously, we assess performance persistence based on the four-factor alphas,

calculated through 36-month rolling regression windows. We then calculate the cumulative alphas, for alternative time periods: 6-months, 12-months and 24-months. The contingency tables based on 6-months periods comprises 14 periods and 304 funds; the 12-month contingency table comprises 7 periods and 295 funds and the 24-month contingency table covers 3 periods and 272 funds.

In the assessment of performance persistence using contingency tables, we used three statistical tests: Malkiel's (1995) Z-statistic, Brown and Goetzman's (1995) Odds ratio and Z-statistic and Kahn and Rudd's (1995) Chi-square. Under each test, the null hypothesis that past performance is unrelated to future performance. Under Malkiel's (1995) repeat winner strategy, if repeat winner or repeat loser frequencies surpass 0.5, and its Z-test is above 0, we reject the null hypothesis and claim that there is performance persistence. For Brown and Goetzman's (1995) Odds ratio, the performance persistence will be indicated when the Odds ratio and Z-statistic surpass 1, and p-value is lower than 0.05. Under Kahn and Rudd's (1995) Chi-square, the null hypothesis is rejected when Chi-square is bigger than the critical value, 3.8414 (0.05).

The following tables report the results for the 6-month, 12-month and 24-month contingency tables, respectively.

From Table 8, we observe performance persistence from 8 out of 14 periods (periods 2, 4, 5, 6, 7, 11, 12, 14) according to Malkiel's (1995) test. Moving to the Odds ratio and Z-statistic of Brown and Goetzman (1995), 9 out of 14 periods (periods 2, 4, 5, 6, 7, 11, 12, 13, 14) show evidence of performance persistence. Kahn and Rudd's (1995) Chi-square test indicates 10 out of 14 periods for which we can reject the null hypothesis. At the overall level, the results also indicate persistence of performance of winners and losers.

Table 8 – Contingency tables for 6-month periods

The table reports the test results from repeat winner strategy and Z-test (Malkiel, 1995), Odds ratio and Z-statistic (Brown and Goetzman, 1995) and Chi-square (Kahn and Rudd, 1995) based on 6-month contingency table. WL, LW, WL, and LL refer to repeat winner, loser-loser, winner-loser and repeat loser, identified by comparing the cumulative alphas of each fund with the median value from each period. Regarding Malkiel's (1995) test, REPEAT W and REPEAT L indicates the percentage of repeat winners and losers, and Z-TEST W and L their corresponding Z- test. Regarding Brown and Goetzmann's (1995) test, Z-STAT stands for the Z-statistic of the Odds ratio, and LOG indicates standard error as mentioned in chapter 3. Regarding Kahn and Rudd's (1995) test, CHI-SQ represents the Chi-square statistics. Figures in italic and bold indicate statistical significance at the 5% level.

					Malkiel					Brown and Goetzmann				Kahn and Rudd	
Period	WW	LW	WL	LL	REPEAT W	Z-TEST W	REPEAT L	Z-TEST L	p-value	ODDS RATIO	Z-STAT	(LOG)	p-value	CHI-SQ	p-value
2	76	34	35	77	***0.685***	***3.891***	***0.6937***	***4.081***	*0.000*	***4.918***	***5.492***	***0.290***	*0.000*	***31.802***	***0.000***
3	48	63	68	49	0.4138	-1.857	0.4375	-1.3229	0.063	0.5490	-2.237	0.2680	0.025	***5.298***	***0.021***
4	82	39	37	84	***0.689***	***4.125***	***0.683***	***4.057***	*0.000*	***4.773***	***5.641***	***0.277***	*0.000*	***33.537***	***0.000***
5	88	34	33	90	***0.727***	***5.000***	***0.726***	***5.029***	*0.000*	***7.059***	***6.817***	***0.287***	*0.000*	***50.331***	***0.000***
6	92	38	30	101	***0.754***	***5.613***	***0.727***	***5.344***	*0.000*	***8.151***	***7.399***	***0.284***	*0.000*	***60.977***	***0.000***
7	86	49	45	91	***0.656***	***3.582***	***0.650***	***3.550***	*0.000*	***3.549***	***4.960***	***0.255***	*0.000*	***25.723***	***0.000***
8	76	63	60	76	0.5588	1.372	0.5468	1.1026	0.170	1.528	1.748	0.243	0.081	3.124	0.0772
9	74	67	64	77	0.5362	0.851	0.5347	0.8333	0.395	1.329	1.190	0.239	0.234	1.546	0.2137
10	80	65	71	76	0.5298	0.732	0.5390	0.9264	0.464	1.317	1.174	0.235	0.240	1.726	0.1889
11	90	57	55	90	***0.620***	***2.907***	***0.612***	***2.722***	*0.000*	***2.584***	***3.943***	***0.241***	*0.000*	***15.863***	***0.000***
12	103	49	43	107	***0.705***	***4.965***	***0.686***	***4.644***	*0.000*	***5.231***	***6.607***	***0.250***	*0.000*	***46.450***	***0.000***
13	85	66	67	85	0.5592	1.460	0.5629	1.5462	0.144	***1.634***	***2.121***	***0.232***	*0.034*	***4.525***	***0.033***
14	94	57	57	94	***0.623***	***3.011***	***0.623***	***3.011***	*0.000*	***2.719***	***4.214***	***0.237***	*0.000*	***18.133***	***0.000***
TOTAL	1074	681	665	1097	***0.618***	***9.808***	***0.617***	***9.866***	*0.000*	***2.602***	***13.72***	***0.069***	*0.000*	***193.971***	***0.000***

Table 9 presents the results of the contingency table of 12-month periods. As we can observe, 4 out 7 periods (periods 3,4,6,7) show evidence of the persistence according to all the tests performed: Malkiel's (1995) repeat winner/loser test, Brown and Goetzmann (1995) Odds ratio and Z-statistic and the Chi-Square test. Considering the overall period, the results also indicate performance persistence.

Table 9 – Contingency tables for 12-month periods

The table reports the test results from repeat winner strategy and Z-test (Malkiel, 1995), Odds ratio and Z-statistic (Brown and Goetzman, 1995) and Chi-square (Kahn and Rudd, 1995) based on 6-month contingency table. WL, LW, WL, and LL refer to repeat winner, loser-loser, winner-loser and repeat loser, identified by comparing the cumulative alphas of each fund with the median value from each period. Regarding Malkiel's (1995) test, REPEAT W and REPEAT L indicates the percentage of repeat winners and losers, and Z-TEST W and L their corresponding Z- test. Regarding Brown and Goetzmann's (1995) test, Z-STAT stands for the Z-statistic of the Odds ratio, and LOG indicates standard error as mentioned in chapter 3. Regarding Kahn and Rudd's (1995) test, CHI-SQ represents the Chi-square statistics. Figures in italic and bold indicate statistical significance at the 5% level.

					Malkiel					Brown and Goetzmann				Kahn and Rudd	
Period	**WW**	**LW**	**WL**	**LL**	**REPEAT W**	**Z-TEST W**	**REPEAT L**	**Z-TEST L**	**p-value**	**ODDS RATIO**	**Z-STAT**	**(LOG)**	**p-value**	**CHI-SQ**	**p-value**
2	58	61	69	50	0.457	-0.9761	0.451	-1.0441	0.329	0.689	-1.4272	0.2610	0.154	3.1092	0.0778
3	90	33	28	95	***0.763***	***5.708***	***0.742***	***5.480***	***0.000***	***9.253***	***7.5151***	***0.2961***	***0.000***	***62.911***	***0.000***
4	82	54	40	95	***0.672***	***3.803***	***0.638***	***3.359***	***0.000***	***3.607***	***4.9840***	***0.2574***	***0.000***	***28.114***	***0.000***
5	66	74	70	75	0.485	-0.343	0.503	0.0819	0.732	0.956	-0.1914	0.2372	0.848	0.7123	0.3987
6	106	41	34	112	***0.757***	***6.085***	***0.732***	***5.740***	***0.000***	***8.517***	***7.9737***	***0.2686***	***0.000***	***70.372***	***0.000***
7	93	54	53	93	***0.637***	***3.310***	***0.633***	***3.217***	***0.001***	***3.022***	***4.5572***	***0.2427***	***0.000***	***21.307***	***0.000***
TOTAL	495	317	294	520	***0.627***	***7.156***	***0.621***	***7.017***	***0.000***	***2.7619***	***9.9146***	***0.1025***	***0.000***	***104.34***	***0.000***

Table 10 presents the contingency table results using 24-month periods. The results show evidence of performance persistence both of winners and losers under all the tests.

Table 10 – Contingency tables for 24-month periods

The table reports the test results from repeat winner strategy and Z-test (Malkiel, 1995), Odds ratio and Z-statistic (Brown and Goetzman, 1995) and Chi-square (Kahn and Rudd, 1995) based on 6-month contingency table. WL, LW, WL, and LL refer to repeat winner, loser-loser, winner-loser and repeat loser, identified by comparing the cumulative alphas of each fund with the median value from each period. Regarding Malkiel's (1995) test, REPEAT W and REPEAT L indicates the percentage of repeat winners and losers, and Z-TEST W and L their corresponding Z- test. Regarding Brown and Goetzmann's (1995) test, Z-STAT stands for the Z-statistic of the Odds ratio, and LOG indicates standard error as mentioned in chapter 3. Regarding Kahn and Rudd's (1995) test, CHI-SQ represents the Chi-square statistics. Figures in italic and bold indicate statistical significance at the 5% level.

Period	WW	LW	WL	LL	Malkiel					Brown and Goetzmann				Kahn and Rudd	
					REPEAT W	Z-TEST W	REPEAT L	Z-TEST L	p-value	ODDS RATIO	Z-STAT	(LOG)	p-value	CHI-SQ	p-value
2	79	56	39	97	***0.670***	***3.682***	***0.634***	***3.315***	*0.000*	***3.509***	***4.869***	***0.258***	*0.000*	***28.734***	***0.000***
3	92	43	43	93	***0.681***	***4.217***	***0.684***	***4.288***	*0.000*	***4.627***	***5.869***	***0.261***	*0.000*	***36.173***	***0.000***
TOTAL	171	99	82	190	***0.676***	***5.595***	***0.657***	***5.353***	*0.000*	***4.002***	***7.588***	***0.182***	*0.000*	***62.177***	***0.000***

After analyzing three contingency tables, we conclude that there is evidence of performance persistence of winners and losers at the 6-month, 12-month and 24-month periods.

6. CONCLUSIONS

In the past several decades a set of studies have analyzed the performance of mutual funds. Despite the growth and relevance of bond funds, most studies focus on equity funds and the performance of bond funds is less explored. After the seminal paper of Blake *et al.* (1993), the research on bond funds gradually developed. Despite this, extant papers on bond funds primarily address bond fund performance rather than their performance persistence. In addition, previous studies favor the US market and Continental Europe instead of dealing with more specific areas.

In this paper, we assess performance persistence in the French bond mutual fund market. In particular, this dissertation examines the consistency in performance of 304 bond funds from February 2008 to December 2017. We first evaluated overall fund performance at the individual fund level and aggregate level (through the equally-weighted portfolio) based on a four-factor model that includes the bond, default, option and equity factors. To assess performance persistence, we initially conduct rolling window regressions to obtain the monthly alphas (as in Ferreira et al., 2013) Afterwards, we computed the cumulative monthly alphas for periods of 6-months, 12-months and 24-months and constructed two-way contingency tables for those periods. We used the Repeat Winner test (as in Malkiel, 1995), the Odds Ratio Z-statistic (as in Brown and Goetzmann, 1995) and the Chi-Square test (as in Khan and Rudd,

1995) to evaluate the statistical significance of performance persistence.

In terms of overall performance, the results indicate that it is apparent that few funds delivered superior performance from January 2008 to December 2017. The equally-weighted portfolio performed poorly compared to the benchmark. In terms of individual funds with statistically significant underperformance account for 40.5% of the total. Accordingly, we could claim that French bond fund did not produce overall positive performance from 2008 to 2017. We further analyzed performance persistence to check whether the best/worst funds perform consistently in subsequent periods. The results show that that performance persistence strongly holds for 6-month, 12-month and 24-month periods and both for winners and losers. Hence, we could summarize that there are "hot hands" as well as "cold hands" in French bond mutual funds from 2008 to 2017.

Several limitations to this study need to be acknowledged. First, regarding the dataset, it is not free of survivorship-bias, as only active funds are considered. For future research, the use of survivorship bias-free databases would be recommended. Secondly, the coverage of the variety of bond funds is not exhaustive: for instance, convertible bonds, global bonds, inflation-linked bonds, etc. are not included in the dataset. Thirdly, as we stated before, our conclusion relies on the use of unconditional models in evaluating performance. This choice was motivated by practical constraints in the computation of monthly alphas and probably will not lead to relevant biases since the rolling window procedure used to calculate monthly alphas somewhat accounts for time-varying risk and performance. Anyhow, we suggest that the conditional model could be used in assessing overall performance (previous to the persistence analysis). Lastly, this study has not considered management fees, as in Polwtioon and Tawatnuntachai (2006), Clare et al. (2019) and Huji and Derwall (2008).. Therefore, we suggest that future studies on this topic take this issue into account. Notwithstanding these limitations, we believe this study sheds light on the persistence of France-based bond funds, which had not been explored yet.

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APPENDIX

Appendix A – List of Funds

NAME	CODE	ASSET TYPE	BASE OR ST DATE	LIPPER GLB CLASFN.
ABN AMRO EURO SUSTAINABLE BONDS C	13293X(RI)	Bond	1998/6/25	Bond EUR
AG2R LA MONDIALE AGGREGATE EURO	89299J(RI)	Bond	2002/4/23	Bond EUR
ALCIS ALPHA OBLIGATIONS CREDIT IALCIS GESTION	88349E(RI)	Bond	2013/4/17	Bond EUR
ALCIS ALPHA OBLIGATIONS CREDIT P	41134K(RI)	Bond	2006/8/16	Bond EUR
ALCIS CAPI ALCIS GESTION	30233U(RI)	Bond	2005/1/24	Bond EUR
ALLIANZ EURO HIGH YIELD I GLOBAL INVRS.FRN.	413198(RI)	Bond	2006/10/26	Bond EUR High Yield
ALLIANZ EURO HIGH YIELD I TD	89559M(RI)	Bond	2013/7/17	Bond EUR High Yield
ALLIANZ EURO OBLIG COURT TERME ISR R C	70134J(RI)	Bond	2014/8/6	Bond EUR Short Term
ALLZ.ER.OBLIG CRT.TERME ISR GLB.INVRS.FRN.	9061Q3(RI)	Bond	2010/9/10	Bond EUR Short Term
ALM OBLIG EURO ISR IC	14363J(RI)	Bond	2001/7/10	Bond EUR
ALM SOUVERAINS EURO ISR	7076NQ(RI)	Bond	2003/3/26	Bond EMU Government
ALPHA COURT TERME PALATINE ASTMGMT.	14732N(RI)	Bond	2001/10/25	Bond EMU Government ST
AMUNDI CREDIT 1-3 EURO - P (C)	256318(RI)	Bond	2009/3/12	Bond EUR Corporates Short Term
AMUNDI CREDIT EURO - I (C)	29465K(RI)	Bond	1996/1/2	Bond EUR Corporates
AMUNDI CREDIT EURO ISR - I (C)	67077U(RI)	Bond	2004/1/22	Bond EUR Corporates
AMUNDI EURO BOND ESR - N (C)	2562JG(RI)	Bond	2006/5/2	Bond EMU Government
AMUNDI FRN.LCL OBLIG REVENU TRIM 4	31941U(RI)	Bond	2005/9/26	Bond EUR
AMUNDI FRN.LCL OBLIG REVENU TRIM 5	880501(RI)	Bond	2005/9/26	Bond EUR
AMUNDI OBLIG 1-3 EURO I (C)	67865E(RI)	Bond	1996/1/2	Bond EUR Short Term
AMUNDI OBLIG 1-3 EURO P (C)	77807U(RI)	Bond	2009/8/7	Bond EUR Short Term
AMUNDI OBLIG 5-7 EURO - I (D)	7289H5(RI)	Bond	2011/10/6	Bond EUR Long Term
AMUNDI OBLIG 5-7 EURO - I2 (C)	9387QX(RI)	Bond	1996/1/31	Bond EUR Long Term
AMUNDI OBLIG EURO - D	15345P(RI)	Bond	1996/8/23	Bond EUR
AMUNDI RESA OBLIG ETAT N C	27242U(RI)	Bond	2005/6/30	Bond EUR

ANTARIUS OBLI 1-3 ANS (C)	9331TC(RI)	Bond	2002/3/21	Bond EUR Short Term
AVIVA INVESTORS EURO AGGREGATE I	13381K(RI)	Bond	2014/11/12	Bond EUR
AVIVA INVESTORS EURO CR. BONDS 1 TO 3 FRANCE	68156U(RI)	Bond	1996/1/2	Bond EUR Short Term
AVIVA INVESTORS OBGS. VARIABLES A FRANCE	35714F(RI)	Bond	2009/10/16	Bond EUR Short Term
AVIVA INVRS.CR.EUROPE (C) GEST.D'ACTIFS	880142(RI)	Bond	2003/7/3	Bond EUR Corporates
AVIVA INVRS.OBGS. VARIABLES GEST.D'ACTIFS	880141(RI)	Bond	2006/4/13	Bond EUR Short Term
AVIVA OBLIREA AVIVA GESTION D ACTIFS	14908K(RI)	Bond	1996/7/26	Bond EMU Government
AVIVA RENDEMENT EUROPE	14076R(RI)	Bond	1996/7/26	Bond EUR
AVIVA SIGNATURES EUROPE AVIVA GESTION D ACTIFS	13310L(RI)	Bond	2001/12/28	Bond EUR Corporates
AXA EURO 7 10 D	880109(RI)	Bond	1996/1/2	Bond EUR Long Term
AXA EURO AGGEREGATE SHORT DURATION D EUR	880083(RI)	Bond	1999/7/7	Bond EUR Medium Term
AXA EURO CREDIT (D) AXA INVESTMENT PARIS	880052(RI)	Bond	1999/6/25	Bond EUR Corporates
AXA EURO OBLIGATIONS D EUR	880378(RI)	Bond	1996/7/26	Bond EUR
AXA PREMIERE CATEGORIE D INV.MANAGERS PARIS	50586K(RI)	Bond	1996/7/26	Bond EMU Government
AXA PREMIRE CATGORIE C EUR	880150(RI)	Bond	1996/7/30	Bond EMU Government
BATI CREDIT PLUS SMA GESTION	67849P(RI)	Bond	2007/5/18	Bond EUR Corporates
BATI PREMIERE (C) INVESTIMO	8696Q4(RI)	Bond	1996/7/26	Bond EMU Government
BATI TRESORERIE SMA GESTION	51520P(RI)	Bond	2009/8/4	Bond EUR
BFT CREDIT OPPORTUNITES PLUS - P (C)	9366LH(RI)	Bond	2013/12/13	Bond EUR High Yield
BFT LCR (C)	29574U(RI)	Bond	2008/1/4	Bond EMU Government ST
BFT LCR NIVEAU 2 C	87732U(RI)	Bond	2015/2/18	Bond EUR
BNP PARIBAS BOND CASH EQUIVALENT - CLASSIC (C)	29599E(RI)	Bond	2004/9/23	Bond EUR Short Term
BNP PARIBAS BOND CASH EQUIVALENT MANDAT	30117V(RI)	Bond	2012/10/10	Bond EUR Short Term
BNP PARIBAS OBLI CT CLASSIC D	9061FU(RI)	Bond	2004/9/28	Bond EUR Short Term
BNP PARIBAS OBLI CT I	299584(RI)	Bond	2005/1/11	Bond EUR Short Term
BNP PARIBAS OBLI ENTREPRISES CLASSIC	13325J(RI)	Bond	1997/6/5	Bond EUR Corporates
BNP PARIBAS OBLI ETAT CLASSIC D	29561V(RI)	Bond	2004/12/13	Bond EMU Government
BNP PARIBAS OBLI ETAT I	29599K(RI)	Bond	1996/1/2	Bond EMU Government

BNP PARIBAS OBLI FLEXIBLE CLASSIC D	28143W(RI)	Bond	2004/9/21	Bond EUR
BNP PARIBAS OBLI LONG TERME CLASSIC D	93072W(RI)	Bond	2004/9/28	Bond EUR Long Term
BNP PARIBAS OBLI RESPONSABLE CLASSIC D	13207U(RI)	Bond	2003/11/24	Bond EMU Government
BNP PARIBAS OBLI RESPONSABLE M	53756W(RI)	Bond	2011/6/15	Bond EMU Government
BSO COURT TERME C	2620PY(RI)	Bond	1996/1/5	Bond EUR Short Term
CAM GESTION EUROBLIG R	26104R(RI)	Bond	2008/8/4	Bond EUR
CAM GESTION OBLICYCLE CREDIT R	54647C(RI)	Bond	2008/12/16	Bond EUR Corporates
CAMGESTION CAPI OBLIG CARDIF GESTION D ACTIFS	25737T(RI)	Bond	2002/8/12	Bond EMU Government LT
CAMGESTION OBLICYCLE CREDIT CLASSIC	258351(RI)	Bond	2009/1/16	Bond EUR Corporates
CAPITOP REVENUS (D)	87270F(RI)	Bond	2002/6/26	Bond EUR
CARMIGNAC GESTION SECURITE FCP CAP.	77296M(RI)	Bond	1996/1/1	Bond EUR Short Term
CARMIGNAC SECURITE A EUR YDIS	15436M(RI)	Bond	2012/6/21	Bond EUR Short Term
CAVA CT I GESTION	880445(RI)	Bond	2011/6/15	Bond EUR
CIC OBLI COURT TERME (C) CIC BANQUES	69886W(RI)	Bond	2002/4/22	Bond EUR Short Term
CIC OBLIGATIONS C CIC ASSET MANAGEMENT	15470R(RI)	Bond	1996/8/2	Bond EUR
CIPEC COMPARTIMENT OBLIGATIONS	8701CZ(RI)	Bond	2010/8/2	Bond EUR
CLICHY PREMIERE (C) FORTIS INV.MAN.FRANCE	13011V(RI)	Bond	2002/4/19	Bond EUR Corporates
CM-CIC ASSOCIATIONS COURT TERME D	13315M(RI)	Bond	2000/2/22	Bond EUR Short Term
CM-CIC LCR OBLI COURT TERME C	87308R(RI)	Bond	1996/1/5	Bond EUR Short Term
CM-CIC OBLI 7-10 C	880952(RI)	Bond	1996/10/17	Bond EUR Long Term
CNP ASSUR CAPI R NATIXIS ASSET MAN.	13344M(RI)	Bond	2012/7/3	Bond EUR Medium Term
CNP ASSUR CAPI(C) CAISSE NATIONALE	27369D(RI)	Bond	1996/8/22	Bond EUR Medium Term
CNP ASSUR EURO	74094K(RI)	Bond	1996/4/30	Bond EMU Government LT
CNP ASSUR IXIS CREDIT CDC IXIS ASSET MGMENT	13344Q(RI)	Bond	2003/8/1	Bond EUR Corporates
CNP ASSUR OBLIG R E NATIXIS ASSET MAN.	32858V(RI)	Bond	2010/12/29	Bond EMU Government
CNP ASSUR OBLIG(D) CDC IXIS	258880(RI)	Bond	1996/4/30	Bond EMU Government
CNP ASSUR UBSCREDIT BNP PARIBAS SECURITIES SVS.E	51277H(RI)	Bond	2006/2/21	Bond EUR Corporates
COGEFI SHORT TERM BOND P	54307T(RI)	Bond	1996/1/5	Bond EUR Short Term

CONFIANCE SOLIDAIRE D CREDIT COOPERATIF	9812T4(RI)	Bond	2007/10/24	Bond EUR
CONFIANCE SOLIDAIRE FDA	256405(RI)	Bond	2008/10/31	Bond EUR
COPERNIC OBLIGATION	77446P(RI)	Bond	1989/7/24	Bond EUR
COVEA EURO SOUVERAIN (C) MMA FINANCE	13426L(RI)	Bond	1998/5/27	Bond EMU Government
COVEA EURO SPREAD C	13300X(RI)	Bond	2011/7/20	Bond EUR
COVEA EURO SPREAD D FINANCE	880429(RI)	Bond	1999/2/8	Bond EUR
COVEA MOYEN TERME (C)	86575M(RI)	Bond	1998/4/2	Bond EUR Short Term
COVEA OBLIGATIONS D COVEA FINANCE	13313K(RI)	Bond	1996/8/22	Bond EUR
CPR 7-10 EURO SR - S	54376M(RI)	Bond	2008/11/14	Bond EMU Government LT
CPR EURO GOV+ MT - P	75508V(RI)	Bond	1996/1/4	Bond EMU Government MT
DNCA SERENITE PLUS C CM CIC SECURITIES	74995V(RI)	Bond	2011/3/2	Bond EUR Short Term
DNCA SERENITE PLUS I	87131D(RI)	Bond	2011/2/21	Bond EUR Short Term
DOM OPPORTUNITES 1-3 C	68661C(RI)	Bond	2012/5/4	Bond EUR Short Term
ECHIQUIER CREDIT EUROPE A	9389CF(RI)	Bond	2007/7/20	Bond EUR Corporates
ECHIQUIER CRT.TERME FINC.DE L'ECHIQUIER	87901T(RI)	Bond	2010/1/14	Bond EUR Short Term
ECOFI CONTRAT COOPERATIF 2 ECOFI INVESTISSEMENTS	92761R(RI)	Bond	2012/11/28	Bond EUR
ECOFI CONTRAT SOLIDAIRE B	75570J(RI)	Bond	2011/7/26	Bond EUR Corporates
ECOFI HIY.INMS.GROUPE CREDIT COOPERATIF	68055H(RI)	Bond	2011/3/9	Bond EUR High Yield
ECOFI OPTIM 12 MOIS	289861(RI)	Bond	2009/9/24	Bond EUR Short Term
ECOFI QUANT OBLIGATIONS ECOFI INVESTISSEMENTS	77326Q(RI)	Bond	1996/1/4	Bond EMU Government LT
ECOFI TAUX VARIABLE I INVESTISSEMENTS	30978R(RI)	Bond	2011/6/27	Bond EUR Short Term
ECUREUIL OBLI MOYEN TERM (C) ECUREUIL GESTION FCP	88796K(RI)	Bond	2005/5/10	Bond EUR
EGAMO OBLIGATION COURT TERME	29342R(RI)	Bond	2013/5/24	Bond EUR Short Term
EPARCOURT D	77136H(RI)	Bond	2004/8/9	Bond EMU Government ST
EPARGNE ETHIQUE OBGS.C ECOFI INVESTISSEMENTS	880146(RI)	Bond	2011/5/13	Bond EUR Corporates
EPARGNE ETHIQUE OBLIGATIONS D	26770R(RI)	Bond	1996/7/25	Bond EUR Corporates

EPARGNE OBLIG EURO C	13387C(RI)	Bond	2003/2/3	Bond EMU Government MT
EPARGNE SOLIDAIRE(D) EFIGESTION (CCCC)	260966(RI)	Bond	1996/1/4	Bond EUR
EQUI-TRESORERIE PLUS	32990F(RI)	Bond	1999/9/15	Bond EUR Short Term
ETOILE OBLI TAUX PLUS C	13355C(RI)	Bond	2006/3/20	Bond EUR Medium Term
EURO BONDS VISION(C) GIFAO INVESTISSEMENT	13444D(RI)	Bond	1996/1/4	Bond EUR Corporates
FAIM ET DEVELOPPEMENT HORIZON ECOFI INMS.	74084Q(RI)	Bond	2001/1/18	Bond EUR
FAUVETTES MEESCHAERT ASSET MANAGEMENT	256601(RI)	Bond	2010/12/24	Bond EUR
FEDERAL OBLIGATION PREMIERE LCR	69213T(RI)	Bond	1996/1/2	Bond EUR Short Term
FEDERAL OBLIGATION VARIABLE ISR I	9466FQ(RI)	Bond	2010/4/16	Bond EUR Corporates Short Term
FINCH C	14930D(RI)	Bond	2012/8/24	Bond EUR Medium Term
FONDOBLIG (C) LCF ROTHSCHILD AM	13351X(RI)	Bond	2001/12/21	Bond EUR
FORCE OPTIMA LCR	13360F(RI)	Bond	1998/5/15	Bond EMU Government
FRANCE TRESOR CAPITAL D	30453H(RI)	Bond	1996/10/22	Bond EUR
FRUCTI OBLI EURO COURT TERME D NATIXIS ASTMGMT.	77543D(RI)	Bond	2005/3/3	Bond EMU Government ST
FUNDY	8859VJ(RI)	Bond	2011/8/12	Bond EUR
FUNDY 0 R C	8943P9(RI)	Bond	2014/1/6	Bond EUR
GALAXIE G	54413R(RI)	Bond	2008/11/6	Bond EUR
GALAXIE OBLIGATAIRE 2 C	880969(RI)	Bond	2008/11/21	Bond EUR
GAN RENDEMENT(D) GAN - GROUPAMA	26589U(RI)	Bond	1996/8/23	Bond EMU Government
GERER REGULARITE PLUS GERER CONSEIL	13371H(RI)	Bond	2002/11/21	Bond EMU Government ST
GESTION PRIVEE RENDEMENT P (C)	8741W8(RI)	Bond	1996/1/5	Bond EUR Long Term
GOUVERNANCE ETHIQUE COURT TERME A	259860(RI)	Bond	2009/4/8	Bond EUR Short Term
GPK VARIFONDS (C) GPF GESTION	256635(RI)	Bond	1996/1/5	Bond EUR Medium Term
GROUPAMA CR.ER.I CAP.EUR	67077Q(RI)	Bond	1997/10/8	Bond EUR Corporates
GROUPAMA CR.ER.M ASST. MANAGEMENT	67613W(RI)	Bond	2009/6/11	Bond EUR Corporates
GROUPAMA CR.ER.N CAP.EUR	35759M(RI)	Bond	2006/4/26	Bond EUR Corporates
GROUPAMA CREDIT EURO ISR I C	256637(RI)	Bond	2009/3/12	Bond EUR Corporates
GROUPAMA ETAT ER.CT I D ASSET MANAGEMENT	54535X(RI)	Bond	1996/1/2	Bond EMU Government ST

GROUPAMA ETAT EURO CT N ASSET MANAGEMENT	311238(RI)	Bond	2008/12/22	Bond EMU Government ST
GROUPAMA ETAT EURO I ASSET MANAGEMENT	75570L(RI)	Bond	2005/5/18	Bond EMU Government
GROUPAMA ETAT EURO ISR ID	54626F(RI)	Bond	2011/3/10	Bond EMU Government
GROUPAMA ETAT EURO MC	54626H(RI)	Bond	2009/1/9	Bond EMU Government
GROUPAMA ETAT EURO N BANQUE FINAMA	256649(RI)	Bond	2009/1/9	Bond EMU Government
GROUPAMA OBLIG EURO I ASSET MANAGEMENT	8696PW(RI)	Bond	1997/7/4	Bond EUR
GROUPAMA OBLIG EURO M D	35759T(RI)	Bond	2013/12/13	Bond EUR
GROUPAMA OBLIG EURO N ASSET MANAGEMENT	26933M(RI)	Bond	2006/4/26	Bond EUR
GROUPAMA OBLIG LT (C) FINAMA GESTION	32677L(RI)	Bond	2003/3/31	Bond EUR Corporates
GROUPAMA PRUDENTE I ASSET MANAGEMENT	31153X(RI)	Bond	2006/1/9	Bond EMU Government
GROUPAMA TAUX LT	13049N(RI)	Bond	2005/5/26	Bond EUR Corporates
GSD PATRIMOINE GSD GEST.	13444R(RI)	Bond	1996/1/5	Bond EUR
HGA CREDIT ISR	8706EJ(RI)	Bond	1996/1/2	Bond EUR
HGA OBLIGATIONS VERTES ISR I	258372(RI)	Bond	2015/10/28	Bond EUR
HSBC ER.SHT.TM.GVT BD. FD.A C HALBIS CAP.MAN.	13354K(RI)	Bond	2002/10/11	Bond EMU Government ST
HSBC EURO GVT BOND FUND HD	53554W(RI)	Bond	1998/12/22	Bond EMU Government
HSBC EURO SHORT TERM BOND FUND AC EUR	89330X(RI)	Bond	1996/1/2	Bond EUR Short Term
HSBC EURO SHORT TERM BOND FUND IC EUR	9110GC(RI)	Bond	2008/6/12	Bond EUR Short Term
HSBC EURO SHORT TERM BOND FUND R EUR	26365F(RI)	Bond	2013/5/31	Bond EUR Short Term
HSBC EURO SHORT TERM BOND FUND S (EUR)	258357(RI)	Bond	2014/9/4	Bond EUR Short Term
HSBC FRENCH GOVERNMENT BONDS IC	93690T(RI)	Bond	1998/1/13	Bond EMU Government
HSBC FRENCH GOVERNMENT BONDS SD	868505(RI)	Bond	2007/2/27	Bond EMU Government
HSBC OBLIG EURO AD	8858Y2(RI)	Bond	1996/7/26	Bond EUR
HSBC OBLIG EURO ZC	87901J(RI)	Bond	2016/1/8	Bond EUR
HSBC SRI EURO BOND AD	50843E(RI)	Bond	2012/11/28	Bond EUR
HSBC SRI EURO BOND I	8874H0(RI)	Bond	2007/7/11	Bond EUR
HUGAU GESTION DECEMBRE I	93264W(RI)	Bond	2015/12/28	Bond EUR Short Term
HUGAU OBLI 1-3 D	67362N(RI)	Bond	2015/2/9	Bond EUR Corporates Short Term
HUGAU OBLI 3-5 C	9170WN(RI)	Bond	2009/4/3	Bond EUR

INDEP CREDIT EURO I	29702E(RI)	Bond	2006/3/28	Bond EUR Corporates
KARAKORAM EURO RENDEMENT REEL C	9321JE(RI)	Bond	2004/10/20	Bond EUR Medium Term
KEREN CORPORATE D	54647J(RI)	Bond	2015/1/29	Bond EUR Corporates
KEREN CORPORATE I KEREN FINANCE	67205Q(RI)	Bond	2009/1/15	Bond EUR Corporates
LA FRANCAISE EURO SOUVERAINS	13659D(RI)	Bond	2009/3/25	Bond EMU Government MT
LA FRANCAISE MODERATE MULTIBONDS C	13337W(RI)	Bond	2001/3/14	Bond EMU Government
LA FRANCAISE MODERATE MULTIBONDS R	68483L(RI)	Bond	2015/9/25	Bond EMU Government
LA FRANCAISE OBLIGATIONS LT I	69730N(RI)	Bond	1996/1/12	Bond EUR Long Term
LA FRANCAISE SUB DEBT C	25784N(RI)	Bond	2009/11/27	Bond EUR High Yield
LABEL EURO OBLIGATIONS I AXA INV.MANAGERS PARIS	67526D(RI)	Bond	2010/7/1	Bond EUR
LAZARD ALPHA COURT TERME D	98190X(RI)	Bond	2002/7/4	Bond EUR Corporates
LAZARD CREDIT CORPORATE	77297F(RI)	Bond	2009/5/15	Bond EUR Corporates
LAZARD LOW DELTA 12 MOIS	87077Y(RI)	Bond	2014/11/25	Bond EUR Short Term
LAZARD OBLIG CONVEX 12 MOIS	15366J(RI)	Bond	2011/6/20	Bond EUR Corporates Short Term
LBPAM 12 18 MOIS LLA BANQUE POSTALE ASST.MAN.	87689W(RI)	Bond	2013/3/13	Bond EUR Short Term
LBPAM 12-18 MOIS X	87789J(RI)	Bond	2014/10/22	Bond EUR Short Term
LBPAM OBLI CREDIT L	54150W(RI)	Bond	2013/6/21	Bond EUR Corporates
LBPAM OBLI CREDIT LBPAM	13369H(RI)	Bond	2002/3/18	Bond EUR Corporates
LBPAM OBLI ER.3 5 ANSM ASST.MAN.	880740(RI)	Bond	2012/9/26	Bond EMU Government MT
LBPAM OBLI EURO 3-5 ANS E	53650R(RI)	Bond	2012/10/30	Bond EMU Government MT
LBPAM OBLI LONG TERME D LA BQ.POSTALE ASTMGMT.	880176(RI)	Bond	2008/9/30	Bond EUR Long Term
LBPAM OBLI LONG TERME LBPAM	32595V(RI)	Bond	2000/6/15	Bond EUR Long Term
LBPAM OBLI MOYEN TERME C LBPAM	298397(RI)	Bond	1996/8/26	Bond EUR Medium Term
LBPAM OBLI MOYEN TERME E CACEIS BANK	27863P(RI)	Bond	2008/7/2	Bond EUR Medium Term
LBPAM OBLI REVENUS LBPAM	88203K(RI)	Bond	1996/7/29	Bond EUR Medium Term

LBPAM RESL.PME.LNG.TERME C LA BQ.PTLE.ASTMGMT.	9166TM(RI)	Bond	1997/4/17	Bond EMU Government LT
LBPAM RESL.PME.MOYEN TERME LA BQ.PTLE.AM	259379(RI)	Bond	2003/10/7	Bond EMU Government MT
LCL OBGS.MOYEN TERME ER. C CR.AGR.ASTMGMT.	868507(RI)	Bond	1996/7/26	Bond EUR Long Term
LCL OBGS.REVENU TRIM 3 CR.AGRICOLE ASTMGMT.	880077(RI)	Bond	1996/7/31	Bond EUR
LCL OBLIGATIONS 24 MOIS C	868335(RI)	Bond	1996/7/26	Bond EUR
LCL OBLIGATIONS CR.EURO CR.AGR.ASTMGMT.	880020(RI)	Bond	1999/11/29	Bond EUR Corporates
LCL OBLIGATIONS EURO CR.AGRICOLE ASST.MAN.	280767(RI)	Bond	1996/7/26	Bond EUR
LIBERTE OBLIGE(C) DUBLY DOUILHET	256364(RI)	Bond	1996/1/5	Bond EUR
MAM FLEXIBLE BONDS C	269623(RI)	Bond	1996/1/5	Bond EUR
MAM TAUX VARIABLES C	13363N(RI)	Bond	1996/1/5	Bond EUR
MARIGNAN TAUX CM - CIC SECURITIES	51318F(RI)	Bond	2007/11/16	Bond EUR
MARTIN MAUREL CORPORATE VARIABLE A	9934Y8(RI)	Bond	2015/9/21	Bond EUR Corporates
MARTIN MAUREL OBLIGATIONS P	13016P(RI)	Bond	1996/1/5	Bond EUR Medium Term
MCA GESTOBLIG(C) MCA FINANCE	13018F(RI)	Bond	1996/11/8	Bond EUR
MEDI COURT TERME (C)	8746DD(RI)	Bond	1993/6/2	Bond EUR Short Term
MEDI OBGS.VARIABLES BNP PARIBAS SEC.SERVICES	32999T(RI)	Bond	2006/3/22	Bond EMU Government
MENSUELCIC(D) CIC BANQUES	880744(RI)	Bond	1996/8/23	Bond EUR Short Term
METROPOLE CORPORATE BDS. METROPOLE GESTION	54563W(RI)	Bond	2008/12/24	Bond EUR Corporates
MONCEAU PERFORMANCE FORTIS INV.MAN.FRANCE	35943P(RI)	Bond	2006/5/11	Bond EMU Government
MONTSEGUR SECURITE MONTSEGUR FINANCE	51556M(RI)	Bond	2008/1/17	Bond EUR Short Term
NOVEPARGNE (C) CHOLET-DUPONT	13999X(RI)	Bond	2001/6/13	Bond EUR
NOVEPARGNE I	8865LW(RI)	Bond	2015/12/31	Bond EUR
NOVEPARGNE(D) CHOLET-DUPONT	13292P(RI)	Bond	2001/1/17	Bond EUR
OBLIG CORPORATE 1-2 1/2 Y EURO D	68156W(RI)	Bond	2009/10/16	Bond EUR High Yield
OBLIVAL C	257343(RI)	Bond	1996/1/5	Bond EUR Corporates

OCTO CREDIT CONVICTIONS B OCTO ASTMGMT.CSN.	86959U(RI)	Bond	2012/3/9	Bond EUR
OCTO CREDIT CONVICTIONS D ASST.MAN.	87725M(RI)	Bond	2012/10/4	Bond EUR
OCTO CREDIT COURT TERME B	87725V(RI)	Bond	2012/10/8	Bond EUR Short Term
OFI EURO HIGH YIELD ASSET MANAGEMENT	53548W(RI)	Bond	2008/6/11	Bond EUR High Yield
OFI EURO HIGH YIELD D	88517H(RI)	Bond	2013/5/3	Bond EUR High Yield
OFI GLOBAL BOND ABSOLUTE RETURN I	880105(RI)	Bond	1996/7/25	Bond EMU Government LT
OFI OBLIGATIONS ISR C	14363M(RI)	Bond	2001/7/23	Bond EUR Corporates
OFI RS EURO CREDIT SHORT TERM I	14866E(RI)	Bond	2001/12/6	Bond EUR Short Term
OPTIMUM OBLIGATIONS OPTIMUM FINANCIERE	13046J(RI)	Bond	1999/1/15	Bond EUR
OSTRUM SOUVERAINS EURO 1-3 I	54048T(RI)	Bond	1996/1/2	Bond EMU Government ST
OSTRUM SOUVERAINS EURO 1-3 MC	14000F(RI)	Bond	2008/9/29	Bond EMU Government ST
OSTRUM SOUVERAINS EURO 1-3 R	8775VN(RI)	Bond	2008/9/29	Bond EMU Government ST
OSTRUM SOUVERAINS EURO 3-5 I	99356K(RI)	Bond	2004/1/16	Bond EMU Government MT
OSTRUM SOUVERAINS EURO 5-7	13359T(RI)	Bond	1996/1/2	Bond EMU Government LT
OSTRUM SOUVERAINS EURO I	54144H(RI)	Bond	2008/9/5	Bond EMU Government
OSTRUM SOUVERAINS EURO RC	54144M(RI)	Bond	1999/1/4	Bond EMU Government
OSTRUM SOUVERAINS EURO SN	28363X(RI)	Bond	2015/12/3	Bond EMU Government
OSTRUM SOUVERAINS EURO UNICREDIT	13359V(RI)	Bond	2015/9/23	Bond EMU Government
OSTRUM SUSTAINABLE EURO SOVEREIGN 1-3	258149(RI)	Bond	1996/1/2	Bond EMU Government ST
OUDART OBLIG C OUDART GESTION	26849H(RI)	Bond	2003/2/27	Bond EUR Medium Term
OUDART OBLIG D OUDART GESTION	35911D(RI)	Bond	2006/5/4	Bond EUR Medium Term
PALATINE IMPULSIONS TAUX	67538J(RI)	Bond	2009/5/18	Bond EUR
PARIS LYON RENDEMENT C PARIS LYON GESTION	13053E(RI)	Bond	1996/1/5	Bond EUR Medium Term
PATRIMONY FUND- BONDS MARKETS C EUR	91788T(RI)	Bond	2014/10/1	Bond EUR
PORTFOLIO LCR CREDIT (C/D)	8892UD(RI)	Bond	2014/4/8	Bond EUR
PORTFOLIO LCR GOV	8935ZT(RI)	Bond	1992/1/3	Bond EUR
PORTFOLIO LCR GOV 4A (C/D)	297871(RI)	Bond	2000/1/13	Bond EUR Short Term
QUILVEST CASH EQUIVALENT P	69336K(RI)	Bond	2010/5/11	Bond EUR Short Term
R-CO CREDIT HORIZON 12 M C EUR	9600EJ(RI)	Bond	2008/12/29	Bond EUR Short Term

R-CO CREDIT HORIZON 1-3 PB EUR	54596W(RI)	Bond	2014/12/15	Bond EUR Corporates Short Term
R-CO EURO AGGREGATE C	88019R(RI)	Bond	2013/1/8	Bond EUR
R-CO EURO CREDIT C	257907(RI)	Bond	1997/3/24	Bond EUR Corporates
R-CO EURO CREDIT P EUR	8943UX(RI)	Bond	2014/7/1	Bond EUR Corporates
R-CO EURO HIGH YIELD C	8838TR(RI)	Bond	2014/3/12	Bond EUR High Yield
R-CO RISK- BASED HQLA EURO IC EUR	8807KF(RI)	Bond	2014/7/7	Bond EUR
REGARD HAUT RENDEMENT H	77809J(RI)	Bond	2011/9/21	Bond EUR High Yield
REGARD OBGS.PRIVEES ISR PRO BTP FINANCE	27459Q(RI)	Bond	2010/1/22	Bond EUR Medium Term
REGARD OBLIGATIONS COURT TERME PRO BTP FINANCE	8681CR(RI)	Bond	2003/8/28	Bond EMU Government ST
REGARD OBLIGATIONS DIVERSIFIEES	27459R(RI)	Bond	2013/11/21	Bond EUR
REGARD OBLIGATIONS LONG TERME PRO BTP FINANCE	68689R(RI)	Bond	2003/8/28	Bond EMU Government LT
REGARD OBLIGATIONS PRO BTP FINANCE	13204V(RI)	Bond	1996/1/5	Bond EMU Government MT
REGARD RENDEMENT PRO BTP FINANCE	13961V(RI)	Bond	2001/6/5	Bond EUR Long Term
RENTOBLIG PART C	54718N(RI)	Bond	2009/1/30	Bond EUR
RICHELIEU OBLIGATIONS COURT TERME I	87977R(RI)	Bond	2012/12/21	Bond EUR
RICHELIEU OBLIGATIONS EURO C	87725P(RI)	Bond	2012/10/5	Bond EUR Long Term
SCHELCHER PRINCE HAUT RE NDEMENT SCHELCHER PRINCE	26755U(RI)	Bond	2003/1/23	Bond EUR High Yield
SCHNEIDER ENERGIE SICAV SOLIDAIRE ECOFI INMS.	68661M(RI)	Bond	2010/1/15	Bond EUR
SECURI GAN (D) GAN - GROUPAMA	880027(RI)	Bond	1996/7/26	Bond EUR
SG OBLIG CORPORATE ISR C	26191J(RI)	Bond	2002/9/10	Bond EUR Corporates
SG OBLIG ETAT ER.P C SC.GL.GEST.	35671Q(RI)	Bond	2006/4/5	Bond EMU Government
SG OBLIG ETAT EURO R SOCIETE GENERALE GESTION	87302D(RI)	Bond	2012/6/28	Bond EMU Government
SG OBLIG REVENUS ANNUEL (D)	9934AD(RI)	Bond	1990/1/2	Bond EUR Medium Term
SG OBLIG REVENUS TRIM 1 (D)	9934ZR(RI)	Bond	1991/12/19	Bond EUR Medium Term

SG OBLIGATIONS C	32804K(RI)	Bond	2006/2/7	Bond EUR
SLGP CORPORATE BONDS C	67164T(RI)	Bond	2009/3/19	Bond EUR Corporates
SLGP SHORT BONDS I	8749KX(RI)	Bond	2014/2/13	Bond EUR Short Term
SOCIAL ACTIVE OBLIGS (C) CR.MUTUEL SOC DE GESTION	27301W(RI)	Bond	2003/7/18	Bond EUR
SOCIETE GENERALE OBLIG MOYEN TERME C ASTMGMT.	35671N(RI)	Bond	2006/4/5	Bond EUR Medium Term
STRAT TRIMESTRIELLE(D) LEGAL & GENERAL AM	13355P(RI)	Bond	1996/1/5	Bond EUR Medium Term
STRATEGIE OBLIG 7/10	13354V(RI)	Bond	1996/1/5	Bond EUR Long Term
SUNNY EURO STRATEGIC PLUS F	9927FE(RI)	Bond	2015/9/4	Bond EUR
SWISS LIFE FUNDS F SHT. TM.EURO ASTMGMT.FRANCE	77461V(RI)	Bond	2011/7/25	Bond EUR Short Term
SYCOMORE SELECTION CR.R SYCOMORE ASSET MAN.	87523L(RI)	Bond	2012/9/6	Bond EUR Corporates
SYCOMORE SELECTION CREDIT RUSD	9335QM(RI)	Bond	2015/11/6	Bond EUR Corporates
TA-ITA OBBLIGAZIONI	7744PT(RI)	Bond	2007/12/26	Bond EMU Government
TEA C	9466FT(RI)	Bond	2012/9/7	Bond EUR Medium Term
TIKEHAU COURT TERME A	89337L(RI)	Bond	2013/6/11	Bond EUR Short Term
TIKEHAU CP FEEDER	9145CE(RI)	Bond	2014/1/8	Bond EUR High Yield
TIKEHAU CREDIT PLUS A INVESTMENT MANAGEMENT	50846T(RI)	Bond	2007/7/4	Bond EUR High Yield
TIKEHAU CREDIT PLUS I	89336Q(RI)	Bond	2013/5/31	Bond EUR High Yield
TIKEHAU ENTRAID'EPARGNE CARAC A	7077WV(RI)	Bond	2011/7/27	Bond EUR Short Term
TIKEHAU TAUX VARIABLES A INVESTMENT MANAGEMENT	68434P(RI)	Bond	2009/11/25	Bond EUR Short Term
TIKEHAU TAUX VARIABLES K 1 INV.MAN.	87724V(RI)	Bond	2012/10/5	Bond EUR Short Term
TIKEHAU TAUX VARIABLES P INVESTMENT MAN.SAS	68535K(RI)	Bond	2009/12/9	Bond EUR Short Term
UFF OBLIGATIONS 2-3 V	9172DT(RI)	Bond	2014/10/15	Bond EUR
UNI-MT C	41228J(RI)	Bond	2006/9/21	Bond EUR
UNION CORPO 3 5 CM CIC ASSET MANAGEMENT	72492P(RI)	Bond	2010/11/5	Bond EUR Corporates

UNION OBLI COURT TERME C	35646H(RI)	Bond	2006/3/30	Bond EUR Short Term
UNION OBLI COURT TERME N CM CIC ASSET MANAGEMENT	87837R(RI)	Bond	2012/11/6	Bond EUR Short Term
UNION OBLI LONG TERME(D) CIC ASSET MANAGEMENT	258762(RI)	Bond	1997/7/25	Bond EUR Long Term
UNION OBLI MOYEN TERME BANQUES DU GROUPE CIC	258807(RI)	Bond	1996/1/31	Bond EUR Medium Term
UNION OBLI MOYEN TERME I	90607Y(RI)	Bond	2014/7/29	Bond EUR Medium Term
UNION OBLI MOYEN TERME N CM CIC ASSET MANAGEMENT	87689M(RI)	Bond	2012/9/21	Bond EUR Medium Term
UNION TAUX VARIABLE C	27289P(RI)	Bond	2003/7/15	Bond EUR
UNOFI EXPANSION (C) FINOGEST	257801(RI)	Bond	1996/1/1	Bond EUR Medium Term
UNOFI OBLIG C FINOGEST	54509D(RI)	Bond	2008/12/12	Bond EUR Long Term
UNOFI RENDEMENT 2D FINOGEST	13388C(RI)	Bond	1996/1/1	Bond EUR Medium Term
VALOROBLIGATIONS (C) CREDIT MUTUEL	259584(RI)	Bond	1996/1/4	Bond EUR
VEGA COURT TERME DYNAMIQUE R	29314V(RI)	Bond	2004/8/4	Bond EUR Short Term
VEGA EURO SPREAD I	9913Q0(RI)	Bond	2015/6/2	Bond EUR
VEGA OBLIGATIONS EURO RC	13244L(RI)	Bond	1996/1/2	Bond EMU Government