Portfolios in disguise? Window dressing in bond fund holdings

Updated version

Cristina Ortiz	cortiz@unizar.es	Universidad de Zaragoza (Spain)
José Luis Sarto	jlsarto@unizar.es	Universidad de Zaragoza (Spain)
Luis Vicente	lavicent@unizar.es	Universidad de Zaragoza (Spain)

Abstract

   This paper enlarges the current research on window dressing practice on strategic allocations. The existence of window dressing is of special interest for investors in order to know whether portfolio holdings vary across months with public portfolio disclosures. The monthly bias free sample of bond funds contributes to the scarce works on this phenomenon in the literature. The monthly frequency provides a more comprehensive analysis than the quarterly perspective traditionally applied in previous research. A comparison between disclosed and undisclosed portfolios is followed by the test of the window dressing practice on public debt allocations. We carry out complementary analyses such as the seasonality of this practice or the significance of some fund characteristics (size, fees, age and past returns). Empirical evidence also shows that some funds significantly modify portfolios prior to disclosure decreasing the public debt allocation, but it is not a general behaviour in the sector.

EFM classification Codes: 340; 370

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1. Introduction

National regulatory agencies for the investment industry usually require mutual fund managers to disclose their portfolios periodically to show in detail the investing strategy tracked by the funds. In the European Union (EU), EU Council Directives impose obligations concerning information to be supplied to fund unit holders. This includes reporting on portfolio holdings at least twice a year.[1]

This requirement provides additional information to know better the source of fund performance. However, this informative requisite is not useful whether fund managers plan their investing decisions considering the disclosure dates. Bond fund managers may temporarily modify asset weights to reveal different portfolios from those actually held. Thus, the data available for investors is not representative of the investing strategy between disclosures, providing misleading information to investors as well as additional transaction costs derived from portfolio rebalancing.

This abusive practice, known as "window dressing", is motivated by managers' perception that portfolio disclosures have a significant influence on the investors' opinion of their professional skills. Agency problems arise from this institutional practice due to well-known asymmetry in the performance-flow relationship (e.g. Sirri and Tufano, 1998). Managers are tempted to improve the disclosed image to attract larger net money flows than those that could be obtained by actual portfolio holdings. Loser and riskier securities are replaced briefly with winner and safer assets before reporting of the portfolios, leading investors to infer that the fund has held top performing securities between disclosures. Investors, on the other hand,

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[1] Directive 2001/107/EC of the European Parliament and of the Council of 21 January 2002 partially amends Council Directive 85/611/EEC of 20 December 1985 on the coordination of laws, regulations and administrative provisions relating to Undertakings for Collective Investment in Transferable Securities (UCITS). Section VI of this Directive imposes an obligation concerning information to be supplied to unit holders that includes the requirement to provide a simplified prospectus, a full prospectus, an annual report for each financial year and a half-year report covering the first six months of the financial year. These periodic reports must include the portfolio holdings of the fund (see Chapter IV of Schedule B annexed to this Directive).

would like reliable information on the fund holdings to allocate more appropriately their money.

Window dressing is still a compelling matter in the field of financial research. Most studies on this cosmetic practice examine its influence on well-known return anomalies, but little attention has been paid to its existence and underlying motivations. The scarce literature on this topic finds important limitations to test window dressing, which may bias the conclusions found in most of the literature. A major concern is the unavailability of higher frequency data that would allow a direct comparison between disclosed and undisclosed information. We add to the literature a straightforward approach of analysing monthly portfolios to obtain more accurate conclusions on these institutional trading activities.

As far as we know, this paper is the first study on the window dressing practice of bond managers in a relevant Euro market. We analyse a bias-free sample of Spanish bond funds, thereby contributing to the practically non-existent background on this cosmetic practice in bond funds. The monthly comparison among disclosed and non-disclosed portfolios enables us to provide more precise evidence on this management behaviour instead of circumstantial conclusions.

Our work examines window dressing in an aggregate perspective besides each bond fund separately, thus showing the individual significance of this phenomenon in one of the main fund industries in Europe. In addition, we focus on differences in the magnitude of this cosmetic practice according to institutional features of our fund database, such as size, fees, age, portfolio duration and recent performance. Our further analysis provides helpful results to understand the main factors that drive the motivations for this management behaviour in a relevant European fund industry, making this study a unique contribution.

The paper is organised as follows. The next section describes the main background on window dressing and the particular specifications of this work. Section 3 describes the

database and the procedure to classify monthly portfolio holdings. Section 4 includes the design and the results of the empirical tests. Section 5 provides an individual perspective of this phenomenon along with an analysis of the contribution of various fund characteristics to window dressing practice. Section 6 summarises the main conclusions.

2. Background and Literature

The interaction between fund managers' decisions and the disclosure schedule is not a new issue in finance. Nevertheless, since Haugen and Lakonishok (1988) point to window dressing as the main factor to explain high returns of small and recent loser stocks after the year end, most of the papers on this management practice focus on the influence of this institutional practice on stock prices. Ackert and Athanassakos (2000), O'Neal (2001), Ng and Wang (2004), He et al. (2004) and Sias (2006), among others, provide evidence that supports the aforementioned role of institutional trading to drive the January effect in stock portfolios. Musto (1997) also finds results consistent with this management behaviour to explain the January effect in money markets.

Despite these conclusions, the literature casts some doubt on the role of the window dressing hypothesis in price patterns. There is extensive evidence which supports individuals' tax-motivated behaviour as the most plausible explanation for stock return anomalies at the year end (e.g. Ritter, 1988; Dyl and Maberly, 1992; Poterba and Weisbenner, 2001; D'Mello et al., 2003; Starks et al., 2006). There are also studies that question the role of institutional window dressing in explaining return patterns in bond markets (e.g. Maxwell, 1998; Fridson, 2000).

These conflicting results reflect the need for further examination of the existence of window dressing beyond its influence on turn-of-the-year returns. That is, the potential existence of this institutional behaviour cannot be completely inferred from price movements around disclosure dates because other trading activities could also be playing an important

role in these price patterns. Lee et al. (1998) report that performance hedging is more relevant to explaining the January effect than window dressing practice. Brown et al. (1996), Chevalier and Elison (1997), Taylor (2000) and Busse (2001) examine managers' incentives for risk shifting during the last part of the year in an attempt to maximize short-term return and to benefit, therefore, from the performance-flow relationship. Carhart et al. (2002) also find that equity fund managers inflate quarter-end portfolio prices with last-minute trading of stocks already included in their portfolios to obtain larger money net flows.

Much of the scarce evidence on the existence of window dressing comes from empirical studies based on the analysis of disclosed information. Lakonishok et al. (1991) test the buying/selling intensity of recent winner/loser securities by examining the quarterly disclosed portfolios reported by US equity pension fund managers. These authors find that both purchases and sales of loser securities are higher in the fourth quarter. However, they do not find higher purchases of winner securities for the same period, providing weak evidence of window dressing practice in the last quarter of the year.

Ng and Wang (2004) follow the methodology of Lakonishok et al. (1991) to test the relation between quarterly changes in portfolio holdings and contemporaneous stock returns. They find that institutional investors tend to sell more extreme-loser small stocks in the last quarter and to buy more small cap stocks—both winners and losers—in the first quarter, providing evidence that this practice contributes significantly to the turn-of-the-year effect on these stocks. He et al. (2004) extend this analysis, finding mixed results for different types of financial and non-financial institutions.

Sias and Starks (1997) also use disclosed information, which reflects the institutional aggregate investment for each stock, showing that return patterns around the year end are not significantly influenced by institutional trading. Johnston et al. (2000) re-examine this

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evidence, questioning the role of both institutional and individual trading in turn-of-the-year returns after controlling for risk and microstructure effects.

Meier and Schaumburg (2004) analyse semi-annual disclosed portfolios to detect significant higher turnover ratios during the last days of the quarter, especially for funds with poor recent performance. This result seems to be motivated by a clear interaction between manager trading and disclosure dates.

The results of the empirical studies above should, however, be interpreted with caution because the analysis of low-frequency, quarterly or even semi-annual portfolio disclosure does not solve the ambiguity of the conclusions based on this information. That is, disclosed portfolio holdings may already be affected by window dressing practice, thereby casting doubts on the accuracy of these results. Elton et al. (2010) re-examine the effect of portfolio data frequency on well-known mutual fund hypotheses, claiming that the use of monthly information is essential to study window dressing practice when considering portfolio holdings. Sias et al. (2006) also deal with the relevant problem of low-frequency portfolios, developing a method to estimate high-frequency covariances when one variable is available at lower frequencies.

Musto (1999) contributes to this debate, stating that low-frequency disclosed information may help to understand the relationship between price variations and institutional trading, but also demands a direct comparison between disclosed and undisclosed portfolios to know in detail the institutional trading activities between disclosures in a straightforward manner.

However, to our knowledge, only three investigations use undisclosed information to test window dressing hypothesis. Musto (1997) makes some aggregate comparisons using quarterly money market holdings, explaining in a subsequent study that the quick maturity of money market assets involves lower window-dressing transaction costs in money funds than in other funds (Musto, 1999). This author uses undisclosed weekly data to show that money

fund managers allocate more in government assets around disclosures than at other weeks.[2] That is, money managers are motivated to reveal a safer portfolio image because the preservation of the principal, instead of high yields, would be the main objective of this type of fund.

Following this disclosed versus undisclosed approach, Elton et al. (2010) analyse monthly portfolios voluntarily reported by a sample of US stock funds to the private data provider Morningstar that are unavailable to fund unit holders. These authors find window dressing in the annual report, but no evidence is detected in any other quarterly disclosure. This empirical result is consistent with the hypothesis that investors pay more attention to annual reports than to complementary reports throughout the year. This dataset allows, however, for a conservative test of window dressing because a reporting selection bias may be present since the monthly holdings of those funds that are window dressed could not be reported to the private data provider.

A reporting bias is also found in Morey and O'Neal (2006), who use a quarterly survey by Morningstar to compare the credit quality between disclosed and undisclosed portfolios for a large sample of US bond funds. To the best of our knowledge, this is the only existing work on institutional window dressing on bond markets. This study provides evidence consistent with the results reported by Musto (1999) in money funds, that is, bond fund managers seem to be more concerned about disclosing safer holdings than stock managers' motivations for disclosing performance-winner assets.

Although considerable efforts have been devoted to analyse US funds, it remains unknown whether bond funds are window dressed in European markets. It is the aim of our paper to provide further insights into bond fund managers' behaviour related to the disclosure schedule in Spain, thereby contributing to the recent literature on this cosmetic practice in Europe.

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[2] The high price of this weekly government/corporate allocation data makes this information non-observable to many individual investors.

3. Data

Our sample includes 35,171 monthly portfolios of 865 Spanish bond funds from June 1999 to December 2006. The Spanish official fund listing requires that these funds invest 100% in fixed-income assets of which at least 95% are in the Euro currency. Bond funds that additionally hold significant shares in other bond fund units are excluded from our sample to avoid duplication in our portfolios. Fund managers must report monthly portfolio information to the Spanish Securities and Exchange Commission, CNMV. Thus, the eventual reporting selection bias detected in Morey and O'Neal (2006) and Elton et al. (2010) is overcome by working with monthly holdings provided by CNMV instead of analysing portfolio information voluntarily supplied by fund managers to private data providers.

The database is also free of the well-known survivorship bias because we consider the portfolio holdings of all listed bond funds in CNMV at the end of each month. Thus, a minimum of 357 bond funds per month are computed. Our study is not distorted by look-ahead bias either because this monthly reporting procedure does not depend on future events that may affect the funds included in the sample.

Consequently, we work with 12,019 portfolios publicly reported to fund unit holders at the end of each quarter, as well as the remaining 23,152 monthly undisclosed portfolios.[3] The 'undisclosed' quality refers to unit holders because CNMV controls this monthly information. This supervision involves accuracy of the data we use, but it may provide conservative evidence of window dressing in the sense that monthly reporting frequency would likely reduce incentives for window dressing due to the higher levels of portfolio turnover and transaction costs necessary for this cosmetic practice on a monthly basis. However, this is an

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[3] According to section 2 of CNMV Circular 1/91 of 21 January 1991, managers must provide a quarterly report to investors that includes an exhaustive description of the portfolio holdings of the fund. This legal requirement broadens the obligation to disclose annual and semi-annual portfolio holdings required by European Council Directive 85/611/EEC of 20 December 1985. However, CNMV Circular 4/2008 of 11 September 2008, which came into effect on 31 March 2009, states the possibility of disclosing a simplified quarterly report that includes an aggregated portfolio composition, not an exhaustive composition. However, investors can ask for full quarterly reports with the actual portfolio holdings.

open debate because recent literature questions the potential benefits/costs from increased frequency of disclosure (Wermers, 2001; Frank et al., 2004; and Ge and Zheng, 2006).

Consistent with Spanish official fund listing, our bond fund sample is divided into two groups according to management objectives: short-term funds, which present portfolio durations lower than 2 years with the preservation of the capital as the prime objective; and long-term funds which invest in assets with higher durations. The increasing difference between the median duration terms for each sample reported in Table 1 should justify the existence of higher levels of window dressing in short-term funds due to the lower transaction costs necessary for this practice.

Table 1
Descriptive statistics

	30 June 1999		31 December 2006	
	Short-term Funds	*Long-term Funds*	*Short-term Funds*	*Long-term Funds*
Number of funds	203	161	329	141
Total net assets (€million)	25,893	20,236	91,904	8,116
Median fund size (€million)	34.03 (96.88)	53.13 (125.27)	84.87 (229.37)	25.42 (51.49)
Total unit holders	993,037	668,231	2,347,189	285,693
Median unit holders per fund	722 (3,570)	1,150 (3,787)	1,262 (4,645)	490 (1,250)
Management companies	72	83	58	79
Median fees (%)	1.35 (0.74)	1.50 (0.55)	0.95 (0.59)	1.25 (0.50)
Median portfolio duration (years)	1.42 (1.48)	2.58 (1.91)	0.24 (0.29)	2.36 (1.83)
Share in Spanish fund market (%)	12.56	9.82	36.13	3.19
Mortality rate (%)	61.08	57.76	0	0
Attrition rate (%)	16.58	19.39	3.64	4.96

This Table shows some descriptive statistics of our fund database at the beginning (30 June 1999) and at the end (31 December 2006) of our initial period of study. As stated by Spanish official listings, funds are classified as short-term funds (portfolio duration lower than 2 years) and long-term funds (portfolio duration higher than 2 years). Fees include management and custodial fees expressed as a percentage of the total assets of the fund. The mortality rate for each year is obtained as one minus the number of surviving funds in December 2006 that also existed at the end of each year divided by the number of existing funds at the end of the year. The attrition rate is calculated as the number of exiting funds each year divided by the number of existing funds at the end of the year. Attrition rates for June 1999 are computed for the whole year 1999. Figures in brackets represent the interquartile range.

Table 1 also compares descriptive statistics of these two groups at the beginning and at the end of the study horizon, highlighting the relevance of our sample. More than €100,000 million were managed at 31 December 2006, representing an asset share of 39% of the Spanish fund industry. Spain has also increased its relevance within the European fund industry. As of December 2006, it holds sixth position for total assets under management and third position for number of listed funds. Our sample represents an 8% share of assets managed by European bond funds.[4]

Descriptive figures show that the relevant growth of bond funds has been driven by short-term funds, which compensates for the decrease in long-term portfolios from 1999 to 2006. At the end of our sample, we find an increasing offer of short-term funds with larger average size, lower fees and higher number of unit holders.

However, the dispersion measures reflect significant differences in these fund statistics within the sample. Concentration in management companies of short-term funds is also evident, presenting a market map where a few huge managers compete with many smaller companies. The last part of our study tests in depth the influence of all these fund characteristics on window dressing practice.

We provide the classification process of our huge database due to its importance for the empirical analysis. A total of 1,150,710 portfolio observations are classified according to International Securities Identification Numbering (ISIN) codes to separate public debt assets from private allocations. Firstly, we identify those assets issued in Spain and other Euro countries listed in the public debt bulletins of the Bank of Spain. We then control for Spanish corporate debt listed in the bulletins of the official Spanish corporate debt market, AIAF. Finally, we also check the ISIN codes of the remaining non-classified securities in various

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[4] We consider as European bond funds those listed by European Fund and Asset Management Association (EFAMA) country members as at the end of 2006: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey and the United Kingdom. Ireland is not included because no asset breakdown for this type of fund is available. Source: EFAMA.

international security exchanges. After this exhaustive identification, we control for more than 97% of fund assets, allowing us to obtain accurate conclusions on the strategic allocation between public and private issues of fixed-income holdings.[5]

Table 2 shows that Euro public debt is the most important allocation for both long-term and short-term funds. However, we detect the limited relevance of public debt assets issued in Euro countries different from Spain, especially in short-term portfolios.[6] In addition, average allocations to public debt issues in non-Euro currencies are negligible, even much lower than the 5% limit imposed for this type of fund.

Table 2
Summary statistics of monthly allocations: June 1999-December 2006

Short-term funds

Statistic	Euro Public Debt (%)	Spanish Public Debt (%)	Non Euro Public Debt (%)	Total Public Debt (%)	Total Corporate Debt (%)
Mean	54.93	49.99	0.39	55.32	41.67
Median	54.63	49.32	0.35	55.06	41.87
Minimum	39.35	34.25	0.16	39.72	23.06
Maximum	74.60	71.31	1.09	74.86	56.93
Standard Deviation	9.81	10.41	0.25	9.76	9.43
Interquartile Range	12.84	13.42	0.26	12.75	12.55
Average life per fund (months)	30.63				
Number of funds	567				
Observations	730,501				

Long-term funds

Statistic	Euro Public Debt (%)	Spanish Public Debt (%)	Non Euro Public Debt (%)	Total Public Debt (%)	Total Corporate Debt (%)
Mean	63.31	53.60	1.24	64.55	32.40
Median	63.57	53.24	1.06	64.89	32.07
Minimum	45.55	35.14	0.63	46.78	16.02
Maximum	80.61	75.07	2.64	81.62	49.49
Standard Deviation	9.55	11.10	0.57	9.53	9.11
Interquartile Range	12.62	14.81	0.69	12.69	12.45
Average life per fund (months)	47.71				
Number of funds	298				
Observations	420,209				

For the 567 short-term funds existing at least one month from June 1999 to December 2006, summary statistics of public debt allocations are computed. Then, the average of each statistic across funds is computed and reported. The procedure is repeated for 298 long-term funds existing at least one month.

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[5] We are aware that a relevant part of the non-available information is representative of cash holdings. Less than 1% of the remaining assets represent other mutual fund units.
[6] Italy, Germany, France and the Netherlands share this scarce portfolio weight.

These statistics show that the funds included in our short-term sample, closer to money market assets than long-term funds, invest much higher percentages in public debt issues than the 7% allocated by US money funds as analysed by Musto (1999). This different management style between US and Spanish short-term managers may advance different results on window dressing in our sample. The high public debt weights of our samples provide relevance to the conclusions on window dressing in these major asset allocations.

4. Empirical Results

Several analyses are designed to test the null hypothesis of lack of significant differences between disclosed and undisclosed public debt allocations. The rejection of this premise would indicate that public debt weights depend on quarterly disclosures. The sign of this significant difference must be studied in detail to clarify the motivations for window dressing.

Significant higher public debt allocations at disclosure dates could reveal concern about preservation of capital as the main objective disclosed to investors, thereby making public higher credit quality portfolios than those actually held. On the contrary, higher corporate debt weights at disclosures are likely to show that managers want to give the impression to fund unit holders of aiming to reach higher expected returns.

Both aforementioned hypotheses are examined in detail in this section. In addition, the tests on the asymmetry and seasonality of monthly allocations around disclosure dates contribute to the literature.

4.1. Disclosed versus Undisclosed Portfolios

Initially, the original methodology of Musto (1999) is followed to validate the aforementioned hypotheses. We compare public debt weights at the end of each quarter with public debt assets held at the undisclosed monthly portfolios within the quarter.[7]

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[7] To consider the same data in all the tests designed in the empirical analysis, we only compute those funds that have portfolio statistics for all the months of quarter q, for the last month of the previous quarter, and for the first

$DISC_i(q)$ is the disclosed percentage of public debt held by fund i at the end of quarter q *(q1, March; q2, June; q3, September; q4, December). Let $UNDISC_i(q)$ be the average public debt assets allocated by fund i at the end of the two remaining months within quarter q (for q1, January and February; for q2, April and May; for q3, July and August; for q4, October and November).* We compute $DIFF_i(q)$ as the difference of $DISC_i(q)$ minus $UNDISC_i(q)$. We then test across all quarters and funds for whether $DIFF$ is significantly different from zero.

As shown in Panel A of Table 3, both fund samples disclose lower public debt allocations. The average difference for long-term funds is 0.40%, which does not reach statistical significance. Short-term funds significantly reduce public debt holdings by 1.14% at disclosures with an associated average of €2 million per quarter and fund.

This preliminary finding indicates that disclosed portfolios underestimate the undisclosed public debt allocation. The analysis of the closest trading activities around disclosures could give some additional keys to understanding this unknown evidence in recent literature. We define $UNDISC^{-1}_i(q)$ as the undisclosed public debt allocation of fund i in the month before disclosure in quarter q *(for q1, February; for q2, May; for q3, August; for q4, November).* Additionally, $UNDISC^{+1}_i(q)$ is the undisclosed allocation to public debt assets by fund i in the month following disclosure in quarter q *(for q1, April; for q2, July; for q3, October; for q4, January).* Let $DIFF^{-1}_i(q)$ be the difference of $DISC_i(q)$ minus $UNDISC^{-1}_i(q)$. We then test across all quarters and funds for whether $DIFF^{-1}$ is significantly different from zero. We repeat the same procedure for $DIFF^{+1}_i(q)$ as the difference between $DISC_i(q)$ and $UNDISC^{+1}_i(q)$.

Panel A of Table 3 shows that our samples allocate lower weights to public debt issues at disclosure dates than in the previous month. However, we also find positive $DIFF^{+1}$ values,

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month of the following quarter. This condition makes the tests applicable to a shorter sample period: 3rd quarter 1999 to 3rd quarter 2006. Additionally, there are 59 short-term funds and 27 long-term funds that do not fulfil this requirement in this new sample period. However, the effect of these funds is not significant in the results of the empirical analysis. This detailed incidence is not reported for the sake of brevity. Further information is available on request.

which would contradict portfolio rebalances around disclosure dates. None of these difference values are statistically significant.

These conflicting results may be a clear consequence of the decreasing trend in public debt assets held by our sample rather than intentional management practices around quarter end. Public debt statistics reported in Table 2 are not constant from June 99 to December 2006. There is in fact a significant decreasing trend, especially for short-term funds, which coincides with the exponential growth in the trade of corporate debt issues experienced by the Spanish market during our sample period.[8]

It is necessary to consider this trend bias in well-specified tests to avoid distorted conclusions on the window dressing phenomenon. Thus, we detrend the public debt allocation series by obtaining the monthly variations of these weights. Let $\Delta DISC_i(q)$ be $DISC_i(q)$ minus $UNDISC^{-1}_i(q)$. This new variable renames the previously obtained $DIFF^{-1}_i(q)$, and represents the change in public debt allocation of fund i during the last month of quarter q. $\Delta UNDISC_i(q)$ is the average variation of the undisclosed public debt issues allocated by fund i in the two remaining months of quarter q.[9] Finally, $\Delta DIFF_i(q)$ is the difference between $\Delta DISC_i(q)$ and $\Delta UNDISC_i(q)$. We then test across all quarters and funds for whether this difference between variations in public debt holdings is significantly different from zero.

As can be seen in Panel B of Table 3, the negative values of $\Delta DISC$ and $\Delta UNDISC$ confirm the decreasing pattern in public debt weights in our portfolio samples. However, this public debt decrease is significantly more intense during disclosure months, especially for short-term funds.

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[8] Short-term (long-term) funds allocated 77.27% (74.65%) of their portfolios in public debt issues at 30 June 1999. This strategic allocation decreased sharply along our study horizon, reporting a portfolio weight of 32.25% (52.73%) at 31 December 2006. Additional information of this decreasing trend may be requested.

[9] All these first-differenced series reject the null hypothesis of a unit root in any case for a 1% MacKinnon critical value and using lags from 1 up to 12 periods.

Table 3

Tests on monthly public debt holdings: 1999, 3rd quarter ─ 2006, 3rd quarter

Panel A. Disclosed minus undisclosed public debt allocations

	Short-term funds		Long-term funds	
DISC	48.82%		63.80%	
UNDISC	49.96%		64.20%	
DIFF (p-value)	-1.14%	(0.064)	-0.40%	(0.544)
(€value)		(-2.039)		(-0.416)
UNDISC^{-1}	49.75%		64.17%	
DIFF^{-1} (p-value)	-0.93%	(0.134)	-0.37%	(0.571)
(€value)		(-1.931)		(-0.367)
UNDISC^{+1}	48.58%		63.71%	
DIFF^{+1} (p-value)	0.24%	(0.699)	0.09%	(0.881)
(€value)		(0.884)		(0.126)
Observations	5,104		4,337	

Panel B. Disclosed minus undisclosed public debt variations

	Short-term funds		Long-term funds	
ΔDISC	-0.925%		-0.369%	
ΔUNDISC	-0.510%		-0.116%	
ΔDIFF (p-value)	-0.415%	(0.002)	-0.253%	(0.022)
(€value)		(-1.378)		(-0.314)
ΔUNDISC^{+1}	-0.239%		-0.098%	
ΔDIFF^{+1} (p-value)	-0.685%	(0.000)	-0.271%	(0.042)
(€value)		(-1.046)		(-0.240)
Observations	5,104		4,337	

Panel A: For every quarter q from July 1999 to October 2006, disclosed public debt allocations DISC$_i$(q) are computed for fund i at the last month of q, and then the average of the undisclosed public debt holdings in the two remaining months within quarter q, UNDISC$_i$(q). The panel reports the means of these two-value sets across the observations and the mean difference DIFF between disclosed and undisclosed public debt holdings. This yields 5,104 sets of two values for short-term funds and 4,337 for long-term funds. We also compute the undisclosed allocations to public debt issues at the end of the month before disclosing portfolios at quarter q, UNDISC$^{-1}_i$(q), and the undisclosed allocations to public debt issues at the end of the next month after disclosing at q, UNDISC$^{+1}_i$(q). The means of these sets across the observations are also reported. We then obtain the mean difference DIFF^{-1}=DISC─UNDISC^{-1} and DIFF^{+1}=DISC─UNDISC^{+1}.

Panel B: For every quarter q from July 1999 to October 2006, variation in public debt allocation ΔDISC$_i$(q) is computed for fund i during the last month of quarter q, and then the average of the public debt variations in the two remaining months within quarter q, ΔUNDISC$_i$(q). The panel reports the means of these two-value sets across the observations and the mean difference ΔDIFF between both sets of public debt variations. This yields 5,104 sets of two values for short-term funds and 4,337 for long-term funds. We also compute the changes in the allocations to public debt issues during the next month after disclosing at q, UNDISC$^{+1}_i$(q). The mean of this set across the observations is also reported. We then calculate the mean difference ΔDIFF^{+1}=ΔDISC─ΔUNDISC^{+1}.

In brackets, the p-value is reported for the two-tailed statistic for the null hypothesis that the computed differences are not significantly different from zero. €value is proxied by averaging for all funds and quarters the product of the assets in million €of each fund i at the end of quarter q by the difference estimate computed for each test.

To provide further results on this significant behaviour, we also analyse the immediacy of portfolio rebalances around disclosure dates. We compute $\Delta UNDISC^{+1}_i(q)$ as the public debt variation of fund i in the month following quarter q. Let $\Delta DIFF^{+1}_i(q)$ be the difference of $\Delta DISC_i(q)$ minus $\Delta UNDISC^{+1}_i(q)$. Panel B of Table 3 shows negative and significant averages of this parameter, which rejects the hypothesis that changes in public debt allocations during disclosure months are similar to those variations in the month following the quarterly disclosure. This result contributes to the robustness of the evidence that Spanish bond funds do in fact reduce public debt weights significantly more during disclosure months.

This behaviour is not consistent with previous evidence in the literature of bond managers' intention to give the impression to investors that the funds are holding higher credit quality portfolios that those actually held (Morey and O'Neal, 2006). However, in our sample period, higher returns and sharply increasing issues of Spanish corporate debt coexist with stabilisation patterns experienced by public debt issues, especially for short- and medium-term debt.[10] This emerging scenario for corporate debt may explain why managers increase the allocation to corporate debt at disclosures more intensely, which allows investors to infer that the fund is riding the corporate debt wave and benefiting from the opportunity of higher returns instead of a conservative management strategy with safer portfolios but lower yields.

It is worth noting that this management preference toward disclosing return-winner portfolios attempts to attract net money flows. To examine this in more detail, we must consider a relevant amendment to the Spanish tax system since 31 December 2003. Capital gains at the withdrawal of fund units are not taxed if the money is reinvested in other mutual funds.[11] This modification involves a more competitive map without tax restrictions on

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[10] For detailed time series statistics, see Chapter 22 of the Statistics Bulletin of the Bank of Spain. http://www.bde.es/infoest/boleste.htm.

[11] Art. 95 of Law 3/2004, 5 March 2004 (BOE 60), first stated this tax modification. This amendment is currently reflected in Art. 94 of Law 35/2006, 28 November 2006 (BOE 285).

individuals' choice among the different existing funds, where return-winner portfolios should be better considered by investors.

Thus, we compute the previously-defined parameters $\Delta DIFF_i(q)$ and $\Delta DIFF^{+1}_i(q)$ for two subperiods: 1999-2003, when withdrawals of fund units are taxable; and 2004-2006, when reinvestment of withdrawals of fund units is tax-free. We then test across all funds and disclosure events for whether these parameters are significantly different from zero.

Table 4 indicates again a more intense underweighting of public debt assets during the disclosure months. This window dressing is much more statistically significant for short- and long-term funds since 31 December 2003, which supports that competitive choices of individual investors strengthen managers' motivations to improve the disclosed portfolio image to attract larger net flows. Apparently, the tax amendment in 2004 does not benefit investors' interests of having accurate information of portfolio holdings, at least without higher levels of portfolio supervision.

Table 4
Disclosed minus undisclosed public debt variations: 1999-2003 and 2004-2006

	1999-2003		2004-2006	
Short-term Bond Funds				
ΔDISC	-0.92%		-0.93%	
ΔUNDISC	-0.65%		-0.30%	
ΔDIFF (p-value)	-0.27%	(0.120)	-0.63%	(0.002)
(€value)		(-0.889)		(-2.102)
ΔUNDISC^{+1}	-0.37%		-0.04%	
ΔDIFF^{+1} (p-value)	-0.55%	(0.006)	-0.89%	(0.000)
(€value)		(-0.993)		(-1.125)
Observations	3,046		2,058	
Long-Term Bond Funds				
ΔDISC	-0.27%		-0.54%	
ΔUNDISC	-0.11%		-0.12%	
ΔDIFF (p-value)	-0.16%	(0.231)	-0.42%	(0.036)
(€value)		(-0.235)		(-0.450)
ΔUNDISC^{+1}	-0.15%		-0.00%	
ΔDIFF^{+1} (p-value)	-0.12%	(0.449)	-0.54%	(0.029)
(€value)		(-0.250)		(-0.223)
Observations	2,753		1,584	

This Table is developed similarly to Panel B of Table 3, but clustering the estimates within two different time periods: 1999-2003 and 2004-2006. In this case, year 1999 only includes the 3rd and 4th quarter, and year 2006 does not include the 4th quarter.

4.2. Seasonality of Window Dressing Practice

In spite of the evidence provided by Elton et al. (2010) of higher turnover ratios at the year end than for the remaining quarters for a sample of US stock funds, it remains unclear whether this seasonal pattern also applies to bond funds.

We can approximate this turnover ratio approach to seasonality in window dressing and test for whether there are differences along the year for bond funds. In short, the intensity of intentional portfolio modifications around disclosure dates may vary across quarter ends.

We compute the same set of parameters designed in section 4.1, $\Delta DIFF_i(q)$ and $\Delta DIFF^{+1}_i(q)$, but cluster for each quarter. We then test across all funds within each quarter for whether these differences are significantly different from zero.[12]

For the first three quarters of the year, the negative and mostly significant values of the difference parameters reported in Table 5 indicate that short-term fund managers, in particular, reduce more public debt weights during the disclosure months. Investors would thus be given the wrong impression that funds are holding more corporate debt than actually held, thereby disclosing a management style concerned more about future returns. This motivation may be justified by the low returns obtained by this type of fund in our sample period and the more competitive choices by individuals in the Spanish fund industry, as reported in the previous section.[13]

These results show significant window dressing activity during each quarter with the exception of the year end. Managers seem to act differently at the fiscal year end, December 31, which may support that they have a different perception of investors' preferences during the year. A possible explanation may be based on individuals' tax-motivated trade around the

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[12] In spite of the significant bias caused by the decreasing trend shown in public debt allocations, this test is also developed for the set of variables $DIFF_i(q)$, $DIFF^{-1}_i(q)$ and $DIFF^{+1}_i(q)$. The findings are consistent with the conclusions provided in this section. The results are not shown for the sake of brevity. Further information is available on request.

[13] At 31 December 2006, the 10-year annualised return of Spanish short-term fixed income funds was 2.61%, 1.98% for 5 years, 1.78% for 3 years and 2.15% for 1 year. Source: Spanish Association of Investment and Pension Funds, INVERCO, Press Release December 2006.

year end.[14] Managers may seek to disclose safer portfolios at the fiscal year end than at the other quarters to improve investors' opinions on the credit quality of the management. Thus, it seems that short-term managers attempt to attract net flows from highly risk-averse investors during the first quarter of the fiscal year, and on the other hand, these managers window dress in the remaining quarters to get the attention of those investors whose preferences are more for yields than preservation of capital. This finding is contrary to tournament hypothesis and stock fund managers' incentives to increase the portfolio risk in the last part of the year to maximise short-term returns, thereby attracting net money flows.

Table 5
Seasonality of variations in public debt weights: 1999, 3rd quarter ─ 2006, 3rd quarter

	Disclosure date			
	March 31st	June 30th	September 30th	December 31st
Short-term Funds				
ΔDISC	-0.885%	-1.167%	-1.166%	-0.440%
ΔUNDISC	-0.690%	-0.520%	-0.477%	-0.361%
ΔDIFF (p-value)	-0.196% (0.487)	-0.647% (0.020)	-0.690% (0.005)	-0.080% (0.761)
(€value)	(-0.978)	(-1.798)	(-2.223)	(-0.374)
ΔUNDISC^{+1}	-0.113%	-0.101%	-0.330%	-0.400%
ΔDIFF^{+1} (p-value)	-0.772% (0.013)	-1.066% (0.001)	-0.836% (0.003)	-0.041% (0.890)
(€value)	(-0.247)	(-0.294)	(-0.299)	(-3.467)
Observations	1,222	1,238	1,418	1,226
Long-Term Funds				
ΔDISC	-0.774%	-0.584%	0.031%	-0.200%
ΔUNDISC	-0.287%	-0.036%	0.049%	-0.213%
ΔDIFF (p-value)	-0.487% (0.019)	-0.548% (0.016)	-0.019% (0.934)	0.013% (0.954)
(€value)	(-0.219)	(-0.332)	(-0.421)	(-0.270)
ΔUNDISC^{+1}	-0.138%	0.148%	-0.303%	-0.074%
ΔDIFF^{+1} (p-value)	-0.636% (0.016)	-0.732% (0.006)	0.333% (0.195)	-0.126% (0.651)
(€value)	(-0.041)	(-0.431)	(0.111)	(-0.640)
Observations	1,042	1,058	1,180	1,057

This Table is developed similarly to Panel B of Table 3, but clustering the estimates within the four disclosure quarters of each year.

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[14] At 31 December 2006, about 75% of total net assets managed by Spanish mutual funds belonged to non-institutional investors, which should support fund managers' concern about the influence of individual motivations on some key aspects of fund management.

5. A Step Further in Window Dressing Awareness

Consistent with Musto (1999), we test for whether the average estimates found in section 4 are representative of a widespread institutional behaviour that reduces public debt allocations at disclosures or, by contrast, fewer funds with specific characteristics follow this practice in such an intense manner that they may bias the aggregate conclusions.

The Spanish fund industry has institutional features that make the window dressing hypothesis potentially sensitive to certain fund characteristics. As a consequence of the universal banking model in Spain, the fund industry is a very concentrated market with more than 90% of fund assets managed by bank-owned companies. As at 31 December 2006, 102 companies managed the industry's total assets, the ten largest holding more than 72% of these assets. Nine of these companies were owned by banks and saving banks.

Therefore, the Spanish fund market presents a competition map in which a small group of large funds usually managed by experienced and large bank-owned companies coexist with a huge number of small funds often managed by recently established firms. In such a concentrated industry, there could be incentives for small and less experienced managers to improve their image through disclosures to attract net flows. Brown et al. (1996) state that smaller equity funds do need to attract new net flows to grow and survive in the competitive market, which may in fact be an incentive to window dress. In addition, investors may pay more attention to recent returns due to the shorter performance records tracked by younger funds, which may also strengthen the motivations for this cosmetic practice.

This section deals with the motivations for bond fund managers to window dress. First, we identify funds with significant public debt variations during the last month of the quarterly disclosures. For each individual fund i, $\Delta DIFF_i$ and $\Delta DIFF^{+1}_i$ are computed across quarters with existing data. The null hypothesis that these differences are not statistically different from zero is tested by a Wilcoxon's signed-rank test.

Table 6
Managers' practice around disclosures: an individual approach

	$\Delta DIFF_i$	$\Delta DIFF^{+1}_i$
Short-term Funds:		
No. of funds with positive estimates (5% significant)	138 (2)	130 (0)
No. of funds with negative estimates (5% significant)	182 (10)	188 (10)
Long-term Funds:		
No. of funds with positive estimates (5% significant)	82 (1)	96 (1)
No. of funds with negative estimates (5% significant)	133 (7)	122 (6)

For each individual fund i, $\Delta DIFF_i$ and $\Delta DIFF^{+1}_i$ are computed across quarters with existing data. This Table shows the distribution of the signs of these differences. The null hypothesis that these estimates for fund *i* are not significantly different from zero is tested by a Wilcoxon's signed-rank test. The number of funds with 5% significant differences is reported in brackets.

This analysis provides evidence of a balanced distribution of the signs of $\Delta DIFF_i$ and $\Delta DIFF^{+1}_i$ values. However, Table 6 indicates that only a few funds significantly increase the selling trend of public debt holdings during the last month of the quarterly disclosure. Thus, we find that the window dressing reported in the aggregate analyses must not be considered as an extensive practice.

5.1. Incentives to Window Dress

To check in detail the interaction between asset allocations around disclosure dates and some specific fund features, several tests are applied on different sets of observations with common characteristics. The intensity of the window dressing phenomenon in these groups allows for the identification of significant mechanisms that may drive managers' behaviour around the disclosure schedule.

We extend the agency problem-based approach of Musto (1999), testing for whether window dressing is motivated by other factors in addition to those originally considered, namely, fund size and recent performance. In fact, for each difference observation in Panel B of Table 3, we obtain the standardized values at the quarterly disclosure dates for the following characteristics of fund *i*: log of the fund size, $fs_{i,q}$; log of the management company

size, $fcs_{i,q}$; log of the fund age, $fa_{i,q}$; log of the management company age, $fca_{i,q}$; past 3-month relative returns, $r_{i,q}$; log of the management fees, $ff_{i,q}$; and portfolio duration, $fd_{i,q}$. We then recalculate the difference estimates, $\Delta DIFF_i$ and $\Delta DIFF^{+1}{}_i$, for these new partitions.

For short-term funds, Panel A of Table 7 shows that the aggregate managers' preference towards reducing more public debt holdings during disclosure months is not driven by small funds. In fact, the smallest funds aim to improve the credit quality image of the portfolios. Nevertheless, this result is not supported by long-term funds.

Bearing in mind the highly concentrated competition map, smaller management companies should be especially motivated to improve investors' attitude towards their offered funds because of the existence of too many competitors for a residual share of the total net assets of the Spanish bond fund industry. For short-term funds, Panel B of Table 7 shows portfolio manipulation controlling for management company size. The smallest companies significantly increase public debt weights in their disclosed portfolios, whereas the remaining companies support the strategy of selling public debt before mandatory disclosures.

Due to database specifications, Musto (1999) cannot test the influence of fund age on management around disclosures. We overcome this limitation by clustering the difference values into diverse fund age groups. Panel C of Table 7 indicates a significant relationship between short-term fund age and public debt variations around disclosure dates.

In general, we find that short-term funds significantly decrease more disclosed public debt holdings, whereas the youngest short-term funds reveal higher public debt weights. In fact, we find a significant and positive value of $\Delta DIFF$ for these youngest funds, supporting that less-experienced funds disclose safer portfolios to improve investors' attitude toward their shorter management records. In addition, Panel D provides similar evidence after controlling for the age of the management company.

All the aforementioned results support that motivations to window dress are significantly different for the scarce amount of small and young short-term funds managed by small and less-experienced companies. These funds intend to compete for a residual share of net flows by improving the disclosed credit quality of their portfolios, while the remaining large portion of funds usually offered by well-known banks do not need to reveal safer portfolios to gain investor confidence.

In addition, we also test for whether those funds with worse returns are tempted to window dress to attract larger net flows. We compute the compound return of the funds over the last three months ending at the disclosure date. We then obtain the quarterly standardized value of the past relative return as this compound yield minus the average of the median of the compound returns over the same period. The difference estimates for the different subsets are shown in Panel E of Table 7.

Our results contradict the evidence found by Musto (1999) of the practice of poor performers to disclose higher public debt holdings. In fact, recent returns are not a significant motive to window dress. However, we find that the top performers for both long-term and short-term samples present a more marked selling trend in their public debt holdings in their disclosures.

Finally, we also test for whether funds with higher fees, which are supposed to be more actively managed, show significant variations in their public debt allocations around disclosure dates. Panel F presents mixed results in the sign and the statistical significance of the estimates obtained after clustering the standardized values of the log of management fees. Although some significant values are reported, we cannot verify a clear pattern in the significance of the differences that could relate the magnitude of the fees to the management activity around disclosure dates. A possible explanation for this lack of significance could be

that the fees charged by Spanish bond funds do not only depend on the degree of active management.[15]

The relationship between window dressing and the previously-defined factors is not so evident for long-term funds, which shows assorted results in the sign and significance for the difference estimates reported in Table 7. This related evidence seems to reflect that agency problems may be more relevant for those bond funds with primary objectives closer to the preservation of capital such as short-term funds with lower portfolio durations than long-term funds with objectives more closely related to yields. A more detailed test according to portfolio duration could identify the role of management objectives in the sign and intensity of this cosmetic behaviour. Portfolio duration is closely related to bond fund classification. Thus, to test the influence of this factor more consistently, difference observations are clustered by the standardized values of portfolio duration over the whole bond fund sample.

Panel G confirms that window dressing is not driven by bond funds with extreme durations. Moreover, it is noteworthy that funds with the lowest durations follow a different practice than the other groups. Thus, managers with more conservative objectives decrease the selling trend of public debt holdings during disclosure months, consistent with the intention to disclose safer portfolios as found by Musto (1999). However, our evidence is not statistically significant.

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[15] To obtain further details on the statistical significance of the incentives to explain managers' behaviour around disclosure dates, we also run a simple linear regression for each difference observation of Panel B of Table 3 on past return, age and size observations. The results confirm the significant patterns previously reported in the clustering approach, thereby supporting the robustness of the findings displayed in Table 7.

Table 7
Window dressing sorted by bond fund characteristics

	Panel A: Sorted by Fund Size					
Short-term Funds	$fs_{i,q}<-2$	$-2<fs_{i,q}<-1$	$-1<fs_{i,q}<0$	$0<fs_{i,q}<1$	$1<fs_{i,q}<2$	$2<fs_{i,q}$
ΔDIFF (p-value)	2.42% (0.17)	0.45% (0.22)	-0.52% (0.04)	-0.62% (0.00)	-0.87% (0.00)	-0.87% (0.16)
ΔDIFF^{+1} (p-value)	5.70% (0.08)	0.08% (0.85)	-1.29% (0.00)	-0.63% (0.01)	-0.79% (0.00)	-0.58% (0.37)
Observations	38	916	1633	1671	728	118
Long-Term Funds						
ΔDIFF (p-value)	-2.66% (0.15)	-0.17% (0.54)	0.02% (0.93)	-0.42% (0.02)	-0.43% (0.12)	-0.19% (0.77)
ΔDIFF^{+1} (p-value)	-3.63% (0.04)	-0.37% (0.34)	-0.03% (0.88)	-0.50% (0.02)	0.01% (0.98)	0.09% (0.91)
Observations	48	684	1469	1425	634	77
	Panel B: Sorted by Fund Company Size					
Short-term Funds	$fcs_{i,q}<-2$	$-2<fcs_{i,q}<-1$	$-1<fcs_{i,q}<0$	$0<fcs_{i,q}<1$	$1<fcs_{i,q}<2$	$2<fcs_{i,q}$
ΔDIFF (p-value)	2.07% (0.01)	-0.24% (0.57)	-0.64% (0.01)	-0.60% (0.00)	-0.29% (0.25)	-
ΔDIFF^{+1} (p-value)	1.71% (0.05)	-0.55% (0.28)	-0.76% (0.02)	-0.94% (0.00)	-0.60% (0.04)	-
Observations	193	649	1405	2026	831	0
Long-Term Funds						
ΔDIFF (p-value)	0.22% (0.79)	0.72% (0.06)	-0.43% (0.00)	-0.64% (0.02)	-0.09% (0.63)	-
ΔDIFF^{+1} (p-value)	-0.04% (0.96)	0.67% (0.16)	-0.49% (0.01)	-0.45% (0.15)	-0.24% (0.30)	-
Observations	96	554	1757	1054	876	0
	Panel C: Sorted by Fund Age					
Short-term Funds	$fa_{i,q}<-2$	$-2<fa_{i,q}<-1$	$-1<fa_{i,q}<0$	$0<fa_{i,q}<1$	$1<fa_{i,q}<2$	$2<fa_{i,q}$
ΔDIFF (p-value)	2.39% (0.01)	-0.58% (0.23)	-0.81% (0.00)	-0.39% (0.04)	-0.63% (0.04)	-
ΔDIFF^{+1} (p-value)	0.48% (0.64)	-1.29% (0.02)	-1.03% (0.00)	-0.41% (0.06)	-0.85% (0.01)	-
Observations	259	520	1408	2213	704	0
Long-Term Funds						
ΔDIFF (p-value)	0.00% (0.99)	-0.06% (0.89)	-0.62% (0.00)	-0.09% (0.56)	-0.31% (0.32)	-
ΔDIFF^{+1} (p-value)	0.11% (0.89)	-0.52% (0.34)	-0.37% (0.16)	-0.21% (0.23)	-0.33% (0.38)	-
Observations	234	320	1208	2101	474	0
	Panel D: Sorted by Fund Company Age					
Short-term Funds	$fca_{i,q}<-2$	$-2<fca_{i,q}<-1$	$-1<fca_{i,q}<0$	$0<fca_{i,q}<1$	$1<fca_{i,q}<2$	$2<fca_{i,q}$
ΔDIFF (p-value)	1.33% (0.08)	-2.29% (0.00)	-0.37% (0.12)	-0.47% (0.00)	-	-
ΔDIFF^{+1} (p-value)	1.13% (0.20)	-2.89% (0.00)	-0.44% (0.13)	-0.83% (0.00)	-	-
Observations	228	147	1505	3224	0	0
Long-Term Funds						
ΔDIFF (p-value)	-0.64% (0.31)	-0.74% (0.23)	0.27% (0.23)	-0.41% (0.00)	-	-
ΔDIFF^{+1} (p-value)	-1.07% (0.20)	-0.13% (0.87)	0.38% (0.17)	-0.48% (0.00)	-	-
Observations	172	151	1117	2897	0	0
	Panel E: Sorted by 3-month Past Returns					
Short-term Funds	$r_{i,q}<-2$	$-2<r_{i,q}<-1$	$-1<r_{i,q}<0$	$0<r_{i,q}<1$	$1<r_{i,q}<2$	$2<r_{i,q}$
ΔDIFF (p-value)	-0.97% (0.37)	-0.36% (0.37)	-0.37% (0.10)	-0.43% (0.05)	-0.03% (0.94)	-2.04% (0.01)
ΔDIFF^{+1} (p-value)	0.77% (0.49)	-0.44% (0.39)	-0.42% (0.10)	-0.74% (0.00)	-1.62% (0.00)	-2.92% (0.00)
Observations	115	490	1866	2072	446	115
Long-Term Funds						
ΔDIFF (p-value)	-0.75% (0.32)	1.05% (0.10)	-0.14% (0.35)	-0.23% (0.16)	-1.02% (0.02)	-4.16% (0.00)
ΔDIFF^{+1} (p-value)	-0.18% (0.84)	0.63% (0.44)	-0.14% (0.43)	-0.33% (0.09)	-0.51% (0.40)	-3.93% (0.05)
Observations	64	257	1892	1765	273	86
	Panel F: Sorted by Fund Fees					
Short-term Funds	$ff_{i,q}<-2$	$-2<ff_{i,q}<-1$	$-1<ff_{i,q}<0$	$0<ff_{i,q}<1$	$1<ff_{i,q}<2$	$2<ff_{i,q}$
ΔDIFF (p-value)	-1.34% (0.70)	-0.04% (0.90)	-0.66% (0.01)	-0.34% (0.17)	-0.32% (0.26)	-1.29% (0.04)
ΔDIFF^{+1} (p-value)	-0.22% (0.94)	-1.03% (0.01)	-0.83% (0.01)	-0.27% (0.37)	-0.74% (0.02)	-0.64% (0.32)
Observations	13	935	1699	1460	886	111
Long-Term Funds						
ΔDIFF (p-value)	0.54% (0.26)	0.00% (0.98)	-0.49% (0.04)	-0.32% (0.04)	-0.09% (0.74)	1.01% (0.24)
ΔDIFF^{+1} (p-value)	0.62% (0.29)	-0.10% (0.72)	-0.62% (0.03)	-0.36% (0.07)	0.23% (0.47)	1.86% (0.05)
Observations	202	534	1066	2046	465	24

Table 7 (continue)

Bond Funds	$fd_{i,q}<-2$	$-2<fd_{i,q}<-1$	$-1<fd_{i,q}<0$	$0<fd_{i,q}<1$	$1<fd_{,q}<2$	$2<fd_{i,q}$
		Panel G: Sorted by Portfolio Duration				
ΔDIFF (p-value)	-	0.07% (0.81)	-0.40% (0.00)	-0.56% (0.00)	-0.12% (0.51)	-0.20% (0.53)
ΔDIFF^{+1} (p-value)	-	0.16% (0.65)	-0.49% (0.00)	-0.65% (0.00)	-0.70% (0.00)	-0.82% (0.03)
Observations	0	1191	4103	2517	1215	415

We recalculate Panel B of Table 3 by partitioning the whole set of difference values into several groups based on quarterly standardized values for fund i of the following factors: log of the fund size, $fs_{i,q}$; log of the management company size, $fcs_{i,q}$; log of the fund age, $fa_{i,q}$; log of the management company age, $fca_{i,q}$; 3-month relative returns, $r_{i,q}$; log of the management and custodial fees, $ff_{i,q}$; and portfolio duration, $fd_{i,q}$

6. Summary and Conclusions

The main contribution of this paper is the direct comparison between disclosed and non-disclosed portfolios to examine in a straightforward manner the significant variations in public debt weights around disclosure dates. Our monthly data frequency of Spanish bond funds is higher than the frequency in most papers based on portfolio holdings, providing more accurate conclusions.

We find evidence that bond managers hold less in public debt assets at disclosure dates. This result contradicts other previous papers that support the managers' preference for higher public debt allocations at disclosures to improve investors' opinion on portfolio risk. However, this result is affected by the decreasing trend experienced in public debt allocations during the whole sample period.

To control for this relevant trend, we designed several tests on detrended public debt allocations, that is, on monthly variation of public debt holdings. The results support that bond funds present a more significant decrease in their public debt weights during disclosures than in the other months. The tax-free switch of individuals' investment between different mutual funds has thus provoked a significant rise in the intensity of window dressing. This cosmetic practice around disclosures presents relevant seasonal patterns, thereby rejecting the statistical significance of this practice in the fourth quarter. This practice by bond fund

managers may be motivated by individuals' tax-motivated selling/buying behaviour around the end of the fiscal year.

A more detailed analysis shows that managers' decisions around disclosures are significantly explained by factors such as size and age of the fund and management company, especially for short-term funds. The largest and most experienced funds reflect a more significant decrease in public debt allocations during disclosures than in the other months. The opposite evidence is found for the smallest and youngest funds, which may support the role of agency problems in window dressing. However, recent performance, fees and portfolio duration do not have a significant influence on the intensity of this cosmetic practice.

In summary, disclosures of bond fund portfolios may provide misleading information to investors because managers' strategic allocations seem to depend on the disclosure schedule. However, individual tests suggest that this aggregate evidence around disclosure dates is driven by a small number of funds rather than a widespread behaviour for the whole sample. Other studies based on straightforward tests using disclosed and undisclosed information are necessary in the literature to complete the knowledge of window dressing in other international fund industries.

References

Ackert, L.F., and Athanassakos, G., 2000, Institutional investors, analyst following, and the January anomaly, *Journal of Business Finance & Accounting,* 27, 469–485.

Brown, K.C., Harlow, W.V., and Starks, L.T., 1996, Of tournaments and temptations: an analysis of managerial incentives in the mutual fund industry, *Journal of Finance*, 51, 85–110.

Busse, J., 2001, Another look at mutual fund tournaments, *Journal of Financial and Quantitative Analysis*, 26, 53–73.

Carhart, M., Kaniel, R., Musto, D., and Reed, A., 2002, Leaning for the tape: evidence of gaming behavior in equity mutual funds, *Journal of Finance*, 57, 661–693.

Chevalier, J., and Ellison, G., 1997, Risk taking by mutual funds as a response to incentives, *Journal of Political Economy*, 105, 1167–1200.

D'Mello, R., Ferris, S.P., and Hwang, C.Y., 2003, The tax-loss selling hypothesis, market liquidity, and price pressure around the turn-of-the-year, *Journal of Financial Markets*, 6, 73–98.

Dyl, E., and Maberly, E., 1992, Odd-lot transactions around the turn of the year and the January Effect, *Journal of Financial and Quantitative Analysis*, 27, 591–604.

Elton, E.J., Gruber, M.J., Blake, C.R., Krasny, Y., and Ozelge, S.O., 2010, The effect of holdings data frequency on conclusions about mutual fund behaviour, *Journal of Banking and Finance*, 34, 912–922.

Frank, D., Poterba, J., Shackelford, D., and Shoven, J., 2004, Copycat funds: Information disclosure regulation and the returns to active management in the mutual fund industry, *Journal of Law and Economics*, 47, 515–541.

Fridson, M.S., 2000, Semiannual seasonality in high-yield bond returns, *Journal of Portfolio Management*, 26, 102–110.

Ge, W., and Zheng, L., 2006, The frequency of mutual fund portfolio disclosure, Working paper, University of Michigan.

Haugen, R.A., and Lakonishok, J., 1988, *The incredible January effect*, Dow-Jones Irwin: Homewood, Illinois.

He, J., Ng, L., and Wang, Q., 2004, Quarterly trading patterns of financial institutions, *Journal of Business*, 77, 493–510.

Johnston, K., Cox, D.R., and Barilla, A., 2000, A reexamination of institutions and individuals at the turn of the year, *Quarterly Journal of Business and Economics*, 39, 51–59.

Lakonishok, J., Shleifer, A., Thaler, R., and Vishny, R., 1991, Window dressing by pension fund managers, *American Economic Review*, 81, 227–231.

Lee, C., Porter, D.C., and Weaver, D.G., 1998, Indirect tests of the Haugen-Lakonishok small-firm/January effect hypotheses: window dressing versus performance hedging, *Financial Review*, 33, 177–194.

Maxwell, W.F., 1998, The January effect in the corporate bond market: a systematic examination, *Financial Management*, 27, 18–30.

Meier, I., and Schaumburg, E., 2004, Do funds window dress? Evidence for US domestic equity mutual funds, Working paper, Northwestern University.

Morey, M.R., and O'Neal, E.S., 2006, Window dressing in bond mutual funds, *The Journal of Financial Research*, 29, 325–347.

Musto, D.K., 1997, Portfolio disclosures and year-end price shifts, *Journal of Finance*, 52, 1563–1588.

Musto, D.K., 1999, Investment decisions depend on portfolio disclosures, *Journal of Finance*, 54, 935–952.

Ng, L., and Wang, Q., 2004, Institutional trading and the turn-of-the-year effect, *Journal of Financial Economics*, 74, 343–366.

O'Neal, E.S., 2001, Window dressing and equity mutual funds, Working paper, Wake Forest University, Babcock Graduate School of Management.

Poterba, J. M., and Weisbenner, S.J., 2001, Capital gains tax rules, tax-loss trading, and turn-of-the-year returns, *Journal of Finance*, 56, 353–368.

Ritter, J. R., 1988, The buying and selling behavior of individual investors at the turn of the year, *Journal of Finance*, 43, 701–717.

Sias, R.W., 2006, Window dressing, tax-loss selling and momentum profit seasonality, *Financial Analysts Journal*, 62, 48–54.

Sias, R.W., and Starks, L.T., 1997, Institutions and individuals at the turn-of-the year, *Journal of Finance*, 52, 1543–1562.

Sias, R.W., Starks, L.T., and Titman, S., 2006, Changes in institutional ownership and stock returns: Assessment and methodology, *Journal of Business*, 79, 2869–2910.

Sirri, E.R., and Tufano, P., 1998, Costly search and mutual fund flows, *Journal of Finance*, 53, 1589–1622.

Starks, L. T., Yong, L., and Zheng, L., 2006, Tax-Loss selling and the January effect: evidence from municipal bond closed-end Funds, *Journal of Finance*, 61, 3049–3067.

Taylor, J., 2000, A role for the theory of tournaments in studies of mutual fund behaviour, Working paper, Massachusetts Institute of Technology, Operations Research Center, Sloan School of Management.

Wermers, R., 2001, The potential effects of more frequent portfolio disclosure on mutual fund performance, *Investment Company Institute Perspective*, 7, 1–11.