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Window Dressing in Spanish Equity Funds

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PhD Dissertation

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Abbreviations

AFI	*Analistas Financieros Internacionales*
ARCH	Autoregressive Conditional Heteroscedastic model
BME	Stock Exchange and Markets of Spain (*Bolsas y Mercados Españoles*)
CAR	Cumulative Abnormal Return
CM	Continuous Market (*Mercado Continuo Español*)
CNMV	Spanish Securities Exchange Commission (*Comisión Nacional del Mercado de Valores*)
EFAMA	European Fund and Asset Management Association
EU	European Union
FI	Mutual Fund (*Fondo de Inversión*)
FII	Real estate investment fund (*Fondo de Inversión Inmobiliario*)
FTTD	First 10 trading days of the next quarter
GARCH	Generalized ARCH model
GDP	Gross Domestic Product (*Producto Interno Bruto*)
GED	Generalized Error Distribution
IBEX-35	Main benchmark of the Spanish stock market
ICI	Investment Company Institute
IGBMT	Total Madrid Stock Exchange General Index (*Índice General de la Bolsa de Madrid Total*)
IIC	Collective Investment Schemes (*Instituciones de Inversión Colectiva*)
INE	Spanish National Statistical Office (*Instituto Nacional de Estadística*)
INVERCO	Spanish Collective Investment and Pension Funds Association (*Asociación de Instituciones de Inversión Colectiva y Fondos de Pensiones*)
ISIN	International Securities Identification Numbering
LATIBEX	Market in Latin America Securities (*Mercado de Valores Latinoamericanos en Euros*)
LTTD	Last 10 trading days of a quarter
MAB	Alternative Stock Market (*Mercado Alternativo Bursátil*)
NAV	Net Asset Values

NYSE	New York Stock Exchange
OLS	Linear regression models
OM	Other months: those which do not correspond to quarters
Qs	Set of months that coincide with quarterly mandatory fund reports
RD	Return difference between the return of the fund portfolio holdings and the observed fund return
RY	Rest of the year
SIBE	Spanish Stock Market Interconnection System (*Sistema de Interconexión Bursátil Español*)
SICAV	Investment company (*Sociedad de Inversión de Capital Variable*)
SII	Real estate investment company (*Sociedad de Inversión Inmobiliaria*)
UCITS	Undertakings for Collective Investment in Transferable Securities
UK	United Kingdom
US	United States
WFE	World Federation of Exchanges

Motivation

Mutual funds are becoming more important in the economies of developed countries due to an increase in the use of these investment instruments with respect to personal finances, which has a significant impact on the savings patterns of these countries. The need to analyse the accuracy of the information supplied by fund managers to shareholders has instigated a recent line of research in financial literature that studies the investment behaviour of fund managers around portfolio disclosure dates. Despite its possible social and economical implications, this phenomenon has not been sufficiently studied, especially in the European market. Therefore, this thesis aims to fill the gap in empirical knowledge of portfolio manipulation practices by mutual funds in Spain, one of the most relevant European economies. One of the main goals of this thesis is to determine whether Spanish investors can trust quarterly information that is publicly reported by mutual funds. In this sense, we want to examine whether fund managers have disguised investment strategies around portfolio disclosures or, in contrast, they follow the usual management strategy. We expect that the development of this study will allow us to offer new insights about issues that had not been studied before in the European market and to better understand the trading behaviour of Spanish mutual funds.

The mutual fund industry in Spain has experienced extraordinary growth in the last few decades, with wide participation of the population in this sector. This participation highlights the importance of having a legislative framework that guarantees the rights of investors because any failure in the management of mutual funds can affect the finances of a large part of the population. In this sense, the Spanish legislation, under the principle of investor protection, has always taken measures to ensure that mutual funds provide transparent information to fund unit-holders. Fund managers have the obligation to submit quarterly reports to clients that contain, among other information, the fund portfolio holdings. Making the portfolio holdings public can some sometimes encourage the use of window-dressing practices to show more attractive portfolios and to attract large money inflows.

Several studies have analysed the different incentives and consequences of window dressing on return patterns around reporting dates, with a special interest in the role of this institutional practice in some well-known market anomalies such as the January effect. However, few studies have been conducted to detect window-dressing practices in mutual funds in a straightforward manner rather than analysing their potential consequences on market prices. The scarcity of studies on this subject may be due to the high quality of information needed to obtain accurate conclusions.

This thesis aims to contribute to the study of window-dressing practices in two main ways. First, we expect to contribute methodologically by proposing a new approach that complements the traditional measures of trading activity. The intention is to propose a measure that captures the general effect of trading activities on the final portfolio weights

that funds actually report to investors and therefore determine a portfolio's image. In addition, we want to apply another statistical test in the detection of portfolio manipulation based on the analysis of fund return patterns to correct possible variance problems in the return data, such as heteroscedasticity and autocorrelation. Second, our study on window dressing benefits from the use of a unique database of the monthly portfolio holdings of a large sample of Spanish domestic equity funds. This information, provided by the official regulator, overcomes the reporting selection bias and the problem of low information frequency that occurred in previous studies on this subject. Moreover, the information on monthly portfolio holdings will allow us to appropriately compare mutual fund behaviour in months with mandatory reports and in other months.

The present dissertation consists of two parts. The first part includes Chapters 1 and 2. Chapter 1 provides a brief overview of the importance of mutual funds in Spanish society and the evolution of the stock market in the country. This chapter summarizes the specific characteristics of these financial markets as compared to other international markets, specifically for readers who are not familiar with the Spanish market. Chapter 2 verifies the existence of the January effect in the Spanish stock market, and covers a detailed study of quarterly stock return patterns to identify the possible influence on this market of portfolio reports disclosed by equity funds.

The second part of the thesis includes Chapters 3 and 4. It examines the window-dressing practice as a possible management strategy employed by funds when they have to make such reports public to improve their images. This examination aims to analyse the accuracy of information supplied by fund managers to investors and to determine whether this institutional trading behaviour is related to the January effect. In Chapter 3, the window dressing by mutual funds is tested through the comparison of portfolio holdings and the analysis of trading activity around disclosure dates. Finally, Chapter 4 aims to extend the previous analysis by examining mutual fund returns and portfolio holdings as an alternative approach to detect the existence of intentional portfolio manipulation around portfolio disclosures.

Chapter 1

A first look at the Mutual Fund Industry and Stock Market in Spain

The extraordinary worldwide growth of stock markets and collective investment in recent decades deserves to be analysed in some depth. For this reason, this chapter aims to provide a brief overview of the importance of mutual funds for Spanish society and the evolution of the stock market in the country. A description of their main figures in Spain is presented as well as a discussion on how the Spanish market is facing the future compared with other countries, through a description of the two major powers in the worldwide mutual fund industry: the United States (US) and Europe. Taking into account that the purpose of this thesis is to analyse the behaviour of Spanish mutual funds around the publication of their portfolios, the contents of this chapter allow contextualisation in the national and international environments in which these portfolios have been developed.

1.1 Introduction

Until recently, investment in stock markets was a privilege for big capital. However, over time, the opportunities for small investors have expanded. Today, almost anyone can invest in this market, either through intermediaries or through collective investment institutions, the latter being one of the fastest growing sectors in the financial services industry.

Collective investment schemes (IICs: *Instituciones de Inversión Colectiva*) collect money from different investors and then set up a portfolio, which is managed by professional managers. Usually, investments are financial assets, although it depends on the type of scheme.

In collective investment, individual investors have found advantages, such as increased investment alternatives, reduced risk by diversification, reduced dealing costs, and professional management. These advantages have caused collective investment to grow faster in the US and major developed countries since the 1980s. Since the popularisation of this sector, collective investment has become an important alternative for households to traditional financial investment. Therefore, it is now one of the most relevant financial instruments, with important economic and social functions (Thompson and Choi, 2001), such as the following:

- A natural channel for the participation of households in the capital markets
- An instrument for developing a savings culture

- A factor that contributes to financial market efficiency and promotes competition in the financial market
- A formula for company financing

Spain is a clear example of the success of such institutions in Europe. In this country, the growth of collective investment has been accompanied by the development of regulations of the sector. In 1984, with Law 46/1984 of December 26 and with Royal Decree 1393/1990 of November 2, the first regulatory framework for collective investments was established. The main objective was to facilitate the full development of collective investments in Spain. This objective was reached because during its validity, the sector had a spectacular growth. However, the sector's dynamism, the maturity reached in the early 2000s, and the need to harmonise national law to European Union regulations, facilitated the creation of a new law. On November 4, 2003, Law 35/2003 repealed Law 46/1984 and its successive modifications and established the current IIC regulation framework.[1]

Under Law 35/2003, IIC can adopt two main legal forms, a fund or a society, and they can be classified as financial or non-financial schemes, depending on the investment object.

- Financial IIC include the following:
  - Mutual fund (FI: *Fondo de Inversión*)
  - Investment company (SICAV:*Sociedad de Inversión de Capital Variable*)
- Non-financial IIC include the following:
  - Real estate investment fund (FII: *Fondo de Inversión Inmobiliario*)
  - Real estate investment company (SII: *Sociedad de Inversión Inmobiliaria*)
  - Non-financial, non-typified IIC

In the current IIC regulation framework, financial IICs have more freedom to define their investment policies than under previous regulation, although it maintains certain requirements of liquidity and risk diversification. Moreover, to satisfy the principle of transparency, the Law 35/2003 establishes that IICs must define their investment vocation according to the categories provided by the Spanish Securities Exchange Commission (CNMV) and that investors should know the exact IIC category. Recently, the classification that had been used since 2002 was replaced by the CNMV Circular 1/2009 of February 4. New categories of IIC are defined according to their investment profiles, with the aim to reduce the number of existing categories and provide clear and concise information to investors.

According to the annual report 2009 on collective investment elaborated by the CNMV, the most successful IIC is the mutual fund, with a total of assets under management that amounts to 83% over total assets invested in domestic financial IICs. The faster growth of the mutual funds sector is especially remarkable because it has passed from having 166 listed

[1]Law 35/2003 has been amended several times in recent years. Specifically, it has been amended by the following: Law 25/2005 of November 24, Law 43/2007 of December 13, Royal Decree 215/2008 of February 15, Second Final Provision of Law 5/2009 of June 29, Fifth Final Provision of Law 11/2009 of October 26, and Law 10/2010 of April 28.

funds that manage €5.29 billion[2] of a half million investors in 1989 to having 2,510 listed funds that manage €163.24 billion of 5.6 million investors in 2009.[3]

In view of the fact that the mutual fund sector has developed both in terms of supply and demand, the social impact that this sector has in the Spanish economy is evident. Any failure in the management of these funds can affect the finances of a large proportion of the population because almost 80% of assets managed by Spanish mutual funds in 2009 belonged to individual investors. This indicates the clear importance of having a legislative framework that guarantees the rights of investors and fund managers and that provides an incentive for the efficient development of the sector. Therefore, in this chapter, we also provide a general description of IIC legislative framework, especially the regulation of information that such institutions must regularly submit to its shareholders and to the general public.

Another market that deserves to be analysed is the stock market, as it supports a significant number of mutual fund operations. Similar to the IIC market, the Spanish stock market has experienced a significant development in recent years. This change has been motivated by current demands of investors, brokers, and companies for having more products and services within a framework of security, transparency, and competitiveness. In the last few decades, the stock market has experienced impressive growth, with a market capitalization that increased from €81 billion in 1989 to €1,107 billion in 2009,[4] although the latter figure is influenced by the international financial crisis that has affected most of the stock markets.

Given that mutual funds and the stock market in Spain have experienced significant growth in recent years, and considering that they play a relevant role in economic growth and country development, we want to provide further details to complete the panorama. The rest of this chapter is organized as follows: Section 2 presents some topics about the legislative framework for IICs. Section 3 shows the evolution of Spanish mutual funds. Section 4 presents the situation of Spanish mutual funds in an international context. Section 5 consists of the evolution of the Spanish stock market, and a final section concludes this chapter.

1.2 Legislative framework of collective investment in Spain

1.2.1 Legislative development

The first attempts to regulate collective investment in Spain date back to 1952, with the Law of July 15 on the Legal and Fiscal System of Investment Societies. Although the main objective of this law was to encourage domestic saving and to promote interest in collective investment, the results would take more than ten years to be observable. The approval of Decree-Law 7/1964 of April 30 led to the launch of the first two mutual funds in 1966 because, for the first time, mutual funds were recognized as legal entities. Despite the efforts of the State to develop a collective investment industry in line with the existing ones in developed countries, Spanish households did not respond to this type of investment at that time.[5]

[2]One billion euro is equivalent to 10^9.

[3]Source: INVERCO (Spanish Collective Investment and Pension Funds Association).

[4]Source: BME (Stock Exchange and Markets of Spain).

[5]The main sources of this section were the Spanish legislation of IIC on the CNMV Web site, and the legislative evolution presented in Ferruz and Vicente (2004) and Fundación Inverco (2007).

After successive legislative attempts, Law 46/1984 of December 26, on Collective Investment Schemes, and their subsequent Royal Decree 1393/1990 of November 2, established a basis for the definitive introduction of collective investment in the Spanish financial system. Despite the legislative framework was established in 1984, it was not until the 1990s that the collective investment sector began to grow. It was stimulated, in part, by tax system reform in Law 18/1991 of June 6, on the Personal Income Taxes, as this law recognized a favourable regime in terms of capital gains. Therefore, in this decade, some of the savings that had previously been channelled through bank deposits shifted to these more sophisticated forms of investment, as had occurred in other countries.

The first two years of the new millennium were accompanied by a deep financial crisis that affected financial markets worldwide and by the influence of Law 40/1998, of December 9, on Personal Income Taxation. This law restricts the freedom to realize capital losses at the end of the fiscal year to reduce taxes, which may have affected the trading activity of individual investors. Consequently, the extraordinary expansion experienced by the Spanish collective investment industry in previous years was interrupted for this crisis. Therefore, as an answer to the need to overcome the difficulties of those years and to adapt the legislation to new industry requests, the Royal Decree 1393/1990 was partially modified by the Royal Decree 91/2001 of February 2. This new regulation had two main objectives: (1) to make more flexible the launch and management of the institutions to improve their competition, and (2) to open the market to new collective investment figures that were already present in the current economic environment.

Once the financial crisis passed and the legislative basics were established, in 2002, a new phase in legislative development began, which was characterized by the harmonisation between national law and European regulations.

The 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), was the first European Union (EU) legislation on collective investment. As well as the law harmonisation among European countries, Directive 85/611/EEC also aimed to establish common basic rules that ensure more effective and uniform protection for unit-holders and to facilitate UCITS circulation in the EU.

Directive 85/611/EEC has been amended several times, among others, by the Directive 2001/107/EC and the Directive 2001/108/EC of the European Parliament and of the Council of 21 January 2002. These Directives promote the free competition and marketing of UCITS in all European countries through the "European Passport", extend the scope of the activity of management companies, and introduce a new simplified prospectus for UCITS. Summarizing, they complement the introduction of collective investment in the European capital market.

The need to adopt the European Directives into the Spanish legal framework encouraged the development of the current Law 35/2003 of November 4. This new law tries to simplify the previous IIC regulation (Law 46/1984 and its successive modifications) and to adapt the legislation to the mature phase of the Spanish collective investment industry. This phase was characterized by investors that searched for diversification with certain price and quality demands, and by more and more competitive European and international financial markets. Thus, the adaptation to this new reality is based on three basic principles: liberalization of IIC investment policy, reinforcement of protection of retail investors, and improvement of the administrative intervention system.

Law 35/2003 marked an important milestone in the collective investment sector in Spain, by repealing the Law 46/1984 after almost 20 years of operation and establishing a new legal framework for the 21st century. However, this law required detailed regulations that would allow concrete application of the principles to the market. It did not happen until year 2005, when the Royal Decree 1309/2005 came into force to develop and give full effect to the objectives of the law. Some of the most relevant measures are the regulation of hedge funds, the creation of exchange-traded funds, the introduction of compartments in either investment funds or investment societies, the need for foreign IIC to be approved by CNMV to be commercialized, and the requirements of internal, management and risk controls and internal rules of conduct code, among others.

As previously mentioned, Law 35/2003 has been amended several times in recent years, and the IIC legislation is in constant development, as detailed in the Appendix 1.1. However, we consider that it is worth noting the more relevant changes that have occurred recently, such as the regulation of hedge funds and fund of hedge funds through the Order EHA/1199/2006 of April 25, the CNMV Circular 1/2006 of May 3, and the Royal Decree 362/2007 of March 16. Moreover, the Law 35/2006 of November 28, on Personal Income Taxation, has had a direct impact on the collective investment industry, as this law suppresses incentives on long-term return investments. It eliminated the reduction on taxation for investments held longer than two years and increased the base tax rate from 15% to 18%.

The previous description of the legislative framework for collective investment in Spain and its evolution shows that legislation has been developed to adapt the important growth achieved by these institutions, the new tendencies in this sector, and the legislation from the European Union.

1.2.2 Regulation about IIC public information

The evolution of the collective investment sector in Spain has had a close relationship with the dynamism and modernization of the legislative framework as well as with economic developments and the significant savings generation. These factors, together with the investors' confidence have provided the degree of maturity and consolidation that the industry has today.

The wide participation of population in this sector has been supported by the principle of investor protection, which has been present since 1952. Under this principle, legislation has always taken measures to ensure that IICs provide transparent and necessary information to investors.

Law 46/1984 established that IICs must publish three basic documents, a prospectus, an annual report, and quarterly reports on the progress of the entity. In addition, they must submit the information to participants at the time of subscription. Moreover, IIC should disclose, as relevant facts, those events that affect or may significantly affect the value of the IIC shares.

Under this law, IICs had the obligation to submit each quarter a report with the information necessary to update the annual report. The requirements of these quarterly reports were regulated in CNMV Circular 1/1991, of January 23, which also established that these reports should be sent free of charge to investors during the month following the conclusion of each quarter. For the case of investment funds, these reports must contain the following: fund identification, economic information that includes general information and portfolio

composition, a management report, and important facts. On the other hand, prospectus regulation was enacted through CNMV Circular 1/2001, of April 18, which established the format and content of the IIC prospectus, both full and simplified versions.

The coming into force of Law 35/2003 and subsequent Royal Decree 1309/2005 introduced important changes in the IIC legislative framework, which affected the information that such institutions must regularly submit to its shareholders, stakeholders and general public, among other things. According to current legislation, IIC must submit a full prospectus, a simplified prospectus, an annual report, a half-yearly report, and two quarterly reports, as follows:

- Prospectus.[6] Both the full and simplified prospectuses must include the information necessary for investors to be able to make an informed judgement of the investment proposed to them and of their risks. In general, the IIC prospectus must contain the following information: IIC identification and general information, investment society statutes or mutual fund regulations, a description of investment policy, special investment plans offered to investors with the respective investor profile, commercial information, information about expenses, commissions and profitability, and historical evolution of the IIC. The simplified prospectus is a summary of the most important information of the full one, and its contents must be readily understandable by the average investor.

- Annual report.[7] This must include annual accounts, a management report, account audit conclusions, and other information reporting the development of the activities of the IIC and its results. Furthermore, this report must contain the following: a statement of assets and liabilities, a portfolio composition, results generated by IIC assets in the period, IIC expenses, the number of shareholders, and important facts, among others.

- Quarterly and half-yearly reports.[8] These reports must include the following: general and economic information, a statement of assets and liabilities, the number of outstanding shares or units, portfolio composition, asset movements in the institution, comparative table on the last three exercises, and important facts, among others. However, CNMV Circular 4/2008, of September 11, which came into effect in 31 March 2009, states the possibility of disclosing a simplified quarterly report that includes aggregated portfolio holdings, although investors can ask for the full quarterly reports with the detailed portfolio holdings.

All documents cited above, simultaneously with its public dissemination, must be sent to CNMV, which must maintain a register of prospectuses, annual, half-yearly, and quarterly IIC reports that will be freely available to the public.

Although the current IIC legislative framework is adapted to European legislation, it is important to note that obligations concerning information to be supplied to investors are stronger in Spain. This is because Spanish IICs must publish two quarterly reports in

[6]The current model of prospectus is developed in CNMV Circular 3/2006, of October 26, on prospectuses of Collective Investment Schemes.

[7]The current model of this report is developed in CNMV Circular 4/2008, of September 11, on the contents of annual, half-yearly, and quarterly IIC reports.

[8]The requirements of these reports also are regulated in CNMV Circular 4/2008 (see footnote 7).

addition to information requirements contained in Directive 2001/107/EC. This represents an additional advantage for Spanish investors, as they have available information more regularly.

1.2.3 Conduct regulation in IIC

As previously mentioned, the IIC legislative framework in Spain rests on two pillars: the efficient allocation of savings and protection of investors. In relation to the latter, current regulation requires that management companies, custodians, traders, and investment societies comply with a set of conduct rules. These rules are comparable to the regime established in the Stock Market Law to adapt their activity to good performance practices and to prevent conflicts of interests. Therefore, investment institutions must develop an Internal Code of Conduct inspired by the principles cited in article 65 of Law 35/2003, in the general code of conduct of the stock market, and in their development rules.

This code must regulate the actions of managers, employees, and representatives. Also, the code must have objective and predetermined criteria for distribution operations that affect several IICs or clients, to ensure equity among them. Law 35/2003 also establishes that IIC must conduct their transactions on goods, rights, securities or instruments at market prices and on market conditions, except when operations are conducted under conditions more favourable to the IIC.

Currently, the legislative framework in this matter has been reinforced by the CNMV Circular 6/2009, of December 9, on internal control of management companies and investment companies. This Circular is important because it develops the internal control obligations for all activities of these companies and establishes the need to adopt policies and procedures in relation to the following: valuation of assets, calculation of net asset value, system of remuneration and fixing incentives, risks associated with delegation of functions, use of mutual fund assets, the customer care department, information security, and exercise of rights inherent in securities making up the portfolios of mutual funds, among others.

In general, these regulations on IIC conduct attempt to ensure that entities that provide investment services must act with diligence and transparency in the interest of their clients, taking care of those interests as their own.

1.3 Evolution of Spanish mutual fund industry

In the last decade, mutual funds have made a transformation in the personal finances of millions of Spanish people and in the financial management of institutional investors. To understand this great change in saving habits and investment, it is necessary to analyse the evolution of these instruments in recent years. Thus, this section provides a closer look at the evolution of magnitudes related to the three most important figures in this industry: assets under management, number of shareholders, and number of funds.[9] The evaluation of the first two figures will reflect the demand for these products, while the third is representative of supply of this financial industry.

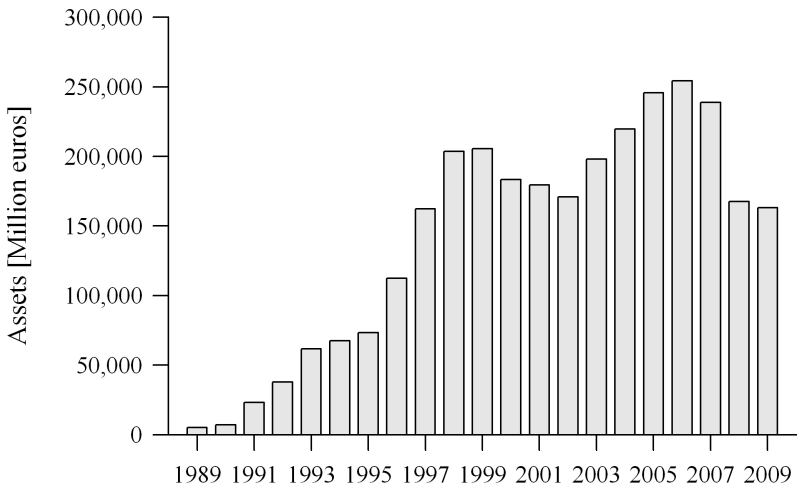
In terms of assets under management, the growth in the last two decades has been

[9]Figures in this section contain data obtained from INVERCO, updated to December 2009, unless otherwise indicated.

spectacular. The industry of mutual funds in Spain amounted to €5 billion in December 1989, while in December 2009, this amount was 31 times higher, reaching a total of €163 billion.

However, this growth has not been gradual during this period, as shown in Figure 1.1. The significant growth of this industry has occurred since 1995, reaching a peak in 1999, followed by a recession in the period from 2000 to 2002. The recession is explained by the deep financial crisis that affected worldwide financial markets, which caused a decrease in assets under management of 16.8% during this three-year period. The end of this crisis marked a new era in the mutual fund industry, characterized by intense growth. In just one year, mutual funds recovered all of the ground that had been lost in the previous stage, and in 2006, an all-time record was reached of €254 billion of assets under management.

Figure 1.1: Assets under management by Spanish mutual funds (EUR million)

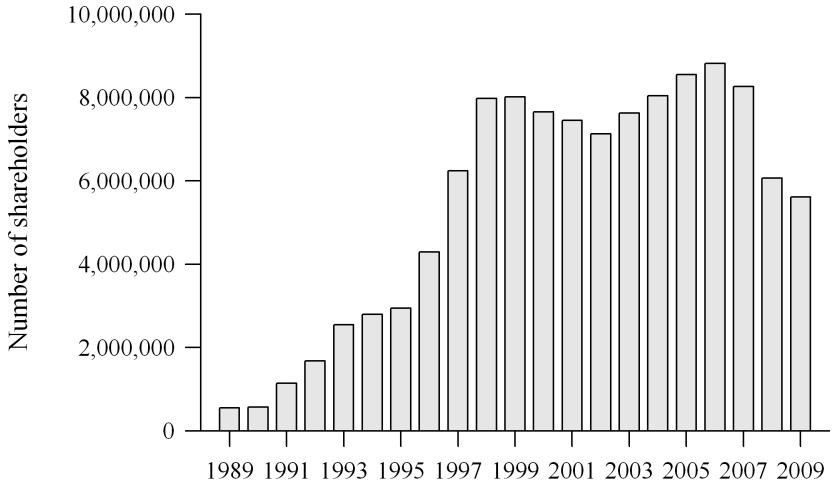


Source: INVERCO

Nevertheless, in recent years, the international financial crisis has again caused a significant decline in this industry. In particular, assets managed by mutual funds from 2006 to 2009 decreased about 35%. This decrease may have been a result of the downwards trend in prices, the sharp increase in refund claims, and the drop in subscriptions. The latter can be explained by the increase in risk perception and the attractiveness of safer assets, such as bank deposits.

In terms of the number of shareholders of mutual funds, Figure 1.2 presents an evolution similar to the previous magnitude. In the early 1990s, the number of investors hardly exceeded one million, whereas by 2009, the number had reached 5.6 million, about 95% of whom were individual investors. Despite this increase, it is important to note that this industry had almost 9 million investors in 2006. The drop in the number of investors between 2006 and 2008 is a consequence, as mentioned above, of the unfavourable evolution of returns and increasing risk perception regarding collective investment products. However, these magnitudes allow us to understand the great social impact that this industry has had in Spain, as the management efficiency of these investment institutions affects the savings of a large part of the Spanish population.

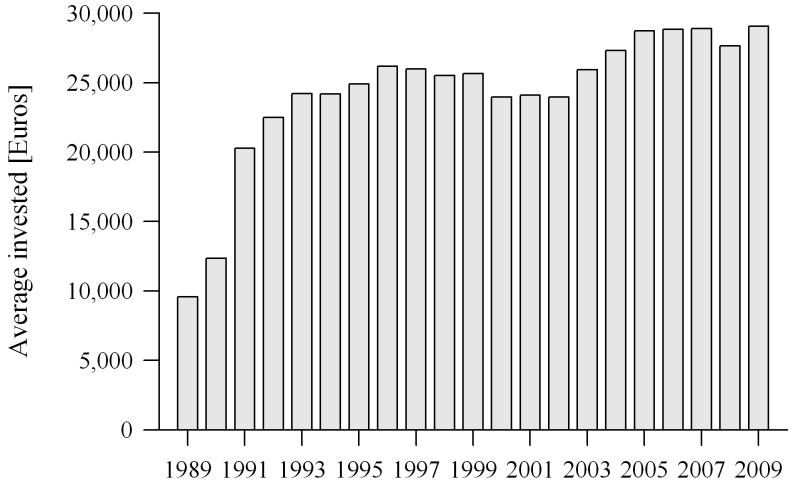
Figure 1.2: Number of shareholders in the Spanish mutual fund industry



Source: INVERCO

In Figure 1.3, we present the evolution of the average investment per shareholder. In the 1990s, the number of individual investments ranged, on average, from €20,000 to €25,000, while in the new millennium, this number exceeds €25,000 and nearly reaches €30,000. In general, this figure shows very stable behaviour in the size of this participation.

Figure 1.3: Average investment per shareholder (Euros)

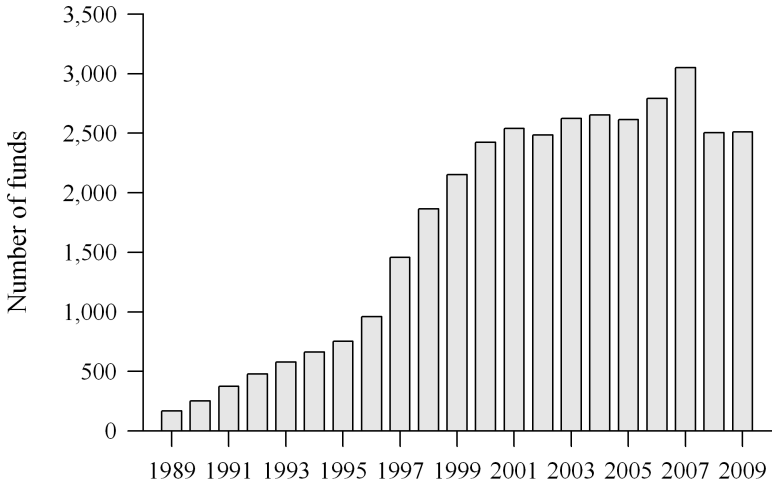


Source: Made with data from INVERCO

The previous description about assets managed by mutual funds and number of shareholders give us an idea about the growth of demand for these investment institutions. Similarly, the evolution of listed funds allows us to know the industry supply. Figure 1.4 shows the extraordinary growth in the number of funds domiciled in Spain, as it has passed from 166 listed funds in 1989 to 2,510 in 2009.

According to the CNMV, the drop in the number of funds in the last two years has mainly been the result of the restructuring of management companies' products by merging funds, motivated by the changes in legislation regarding fund profiles. Therefore, the majority of mutual funds that dropped out were absorbed by another mutual fund.

Figure 1.4: Number of funds domiciled in Spain



Source: INVERCO

At this point, it is important to remember that mutual funds in Spain are ranked by categories according to investment policy or vocation. In Table 1.1, we present the share of assets under management of the different types of funds for some years because development has not been the same in all categories. This comparison permits an analysis of what kinds of funds were the driving force behind the industry's growth period.

Table 1.1: Market share according to the type of mutual fund

	1995	**2000**	**2005**	**2009**
Money Market	57%	18%	22%	8%
Bond (Short-term)	13%	10%	18%	33%
Bond (Long-term)	17%	6%	4%	5%
Balanced/Mixed	6%	14%	6%	5%
Equity	1%	4%	4%	2%
Guaranteed	2%	23%	25%	28%
International	4%	25%	12%	10%
Others	0%	1%	9%	9%

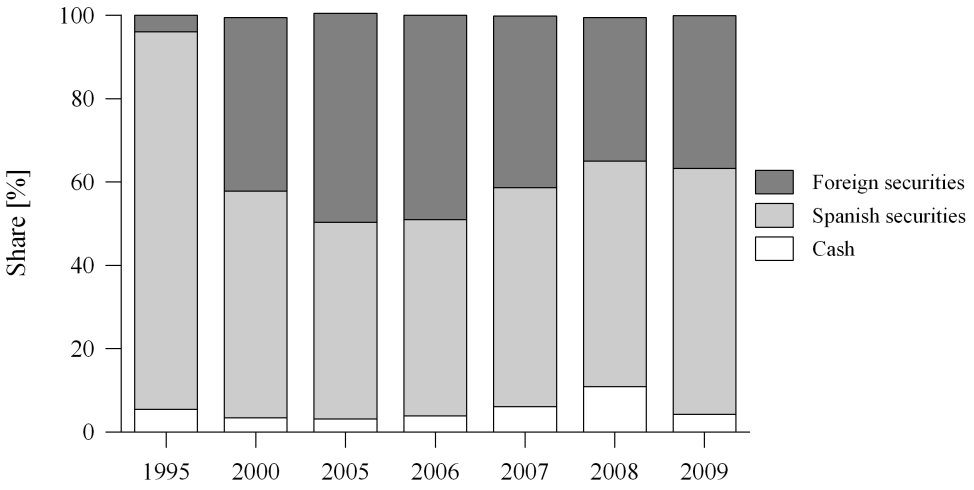
Source: INVERCO

This table offers comprehensive information about changes that occurred in the Spanish mutual fund industry from 1995 to 2009. In this sense, the share of money market funds has suffered a considerable decrease, which has caused a dramatic increase in guaranteed funds. Furthermore, Table 1.1 shows that preferences for investment in bond funds have changed over time, as long-term bond funds have decreased in advantage of short-term ones. The current dominance of lower risk funds in the market shows the essentially conservative profile that Spanish investors have.

On the other hand, the growing phenomenon of globalization that has occurred in the economy has also affected the geographical destination of these collective portfolios, which is generating greater international diversification of investments. This globalization has affected collective investment in Spain, which, belonging to the European Union, has experienced increasing investment in securities issued by other countries, especially from the

European Monetary Union. This change in investment behaviour is evident in Figure 1.5, as investments in Spanish securities have decreased to the advantage of foreign securities. In 1995, mutual funds invested mainly in Spanish securities, and only 4% was invested in foreign securities. However, the current pattern of investment is quite different, as investments in foreign securities have almost 40% of mutual fund portfolios.

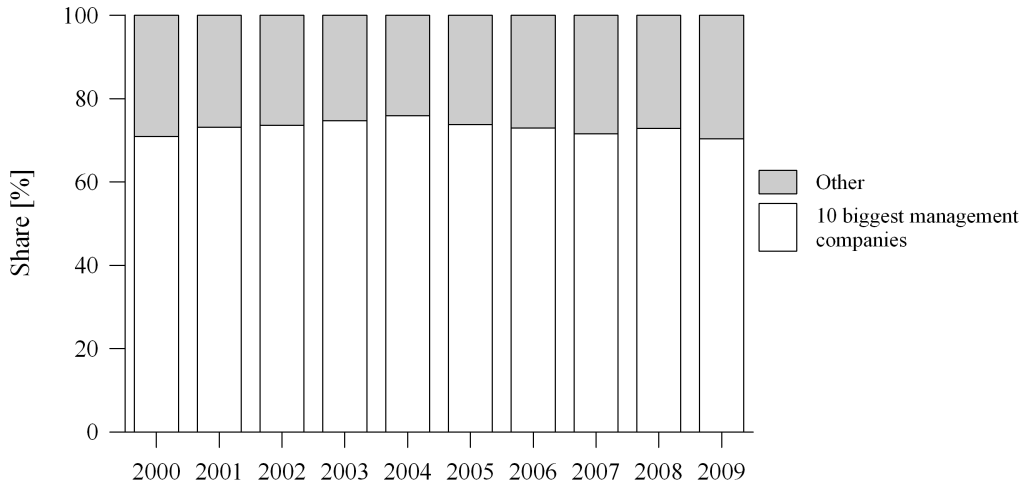
Figure 1.5: Portfolio allocation of Spanish mutual funds



Source: CNMV

Although the evolution and growth of the mutual fund industry in Spain is evident, it is important to note that the widespread use of these financial products has not been uniform among the different management companies. Therefore, the Spanish mutual fund industry has a high degree of concentration that might distort the competition. To illustrate this situation, it is sufficient to observe Figure 1.6, where it is clear that the 10 biggest management companies manage more than 70% of the total assets invested in this industry. In contrast with this, the remaining assets are managed by the other companies, which amounted to 92 in December 2009.

Figure 1.6: Mutual funds' market share of the 10 biggest management companies

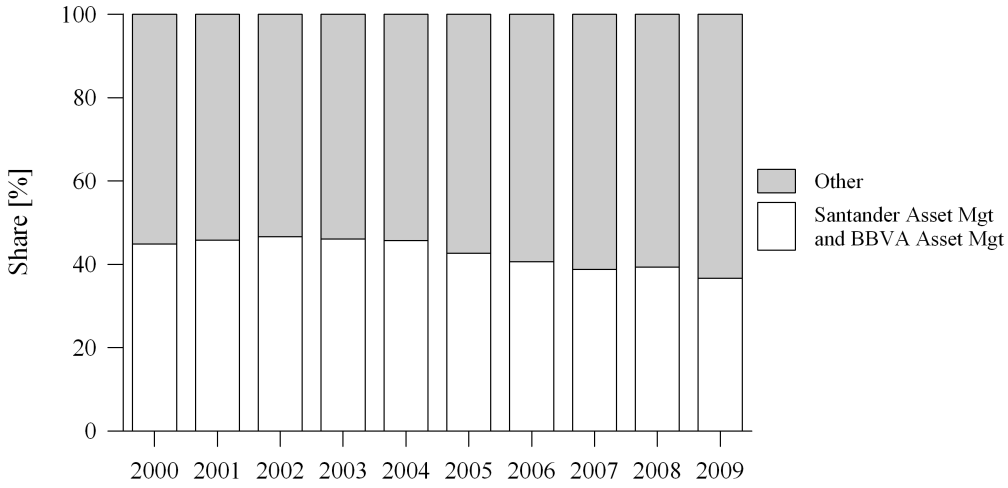


Source: Made with data from INVERCO

Despite the previous figure clearly presenting the market concentration, Figure 1.7 is even more dramatic. It shows that the two main management companies, Santander Asset

Management and BBVA Asset Management, have managed approximately 45% of the total assets invested in mutual funds. Although these data are worrying to the sector's efficiency, it is noteworthy that in recent years the percentage managed by these two companies has fallen sharply, reaching 36% in December 2009.

Figure 1.7: Mutual funds' market share of the two biggest management companies

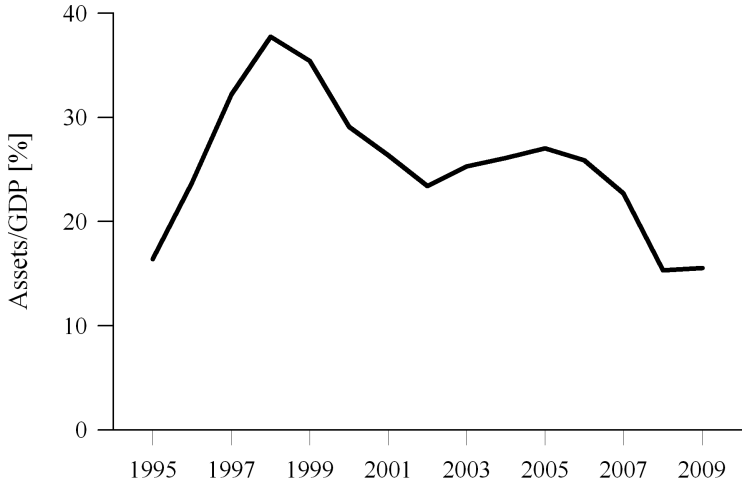


Source: Made with data from INVERCO

These signs of improvement in competition may be the result of recent legislative modifications regarding the authorisation of foreign EU management companies to market their funds in Spain, with the approval of the "European Passport" and the flexibility to move flows from one mutual fund to another without any taxation, among other incentives. Therefore, it is possible that these measures help to promote the quality of management companies, reducing the importance of brand image, and improving the competition in the sector.

To complete the analysis and determine the importance of this industry on the economy, we present the evolution of assets under management of mutual funds related to the GDP, mutual fund assets per capita, and financial savings of Spanish families.

Figure 1.8: Assets under management in the mutual fund industry as a percentage of the GDP

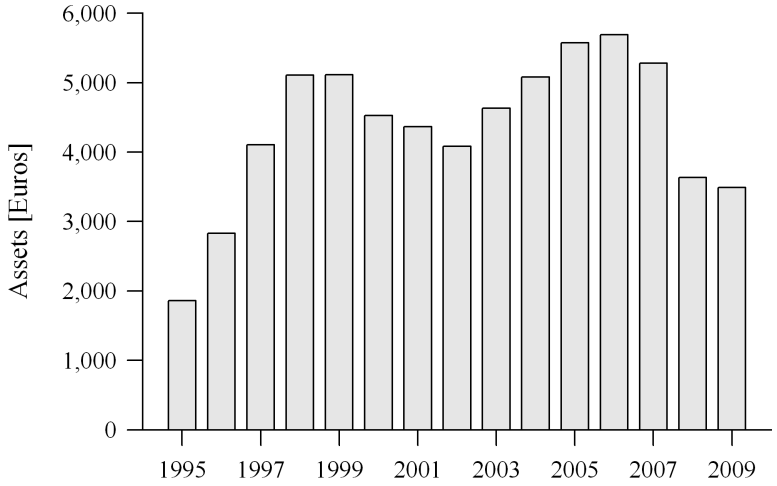


Source: Made with data from INVERCO and the Spanish National Statistical Office (*Instituto Nacional de Estadística*, INE). GDP at Current-price

The analysis of assets under management of mutual funds related to the GDP (Figure 1.8) again shows the peak reached by the industry in the late 1990s, when it reached almost 38% of the GDP. In this figure, the negative impact of international crises on the industry is also evident, given that at the beginning of the millennium and in recent years, this percentage has decreased significantly, reaching the 1995 level in 2009.

On the other hand, Figure 1.9 shows the evolution of an important indicator to identify the social relevance of the mutual funds industry. This indicator is the ratio of assets under management to the population of the country. Once again, it is obvious that the social relevance of this industry has grown in recent years, rising from €1,863 per capita in 1995 to €3,492 in 2009, although in 2006 the industry reached a maximum of €5,688 per capita.

Figure 1.9: Assets of mutual funds per capita in Spain



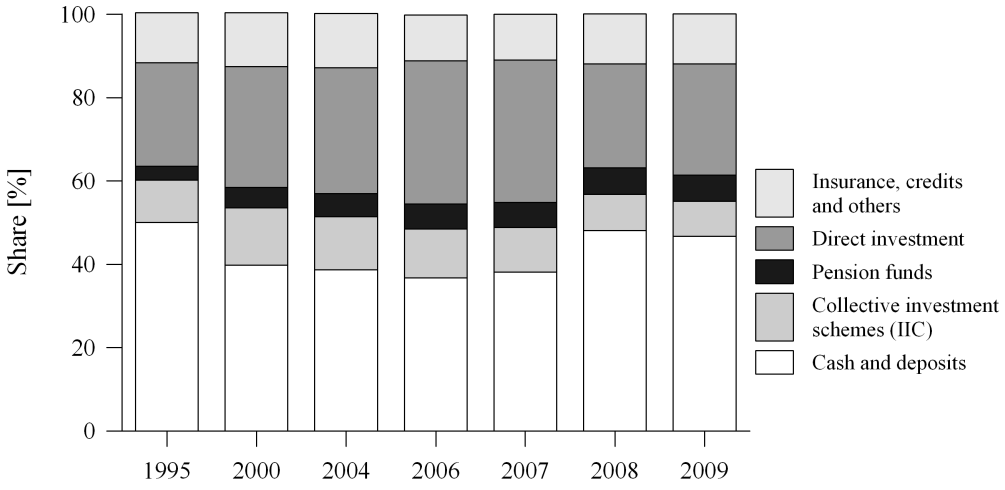
Source: Made with data from INVERCO and the INE

The additional analysis ends with the saving preferences of Spanish households. Figure 1.10 again shows the conservative profile that Spanish families have, as they usually keep about 50% of their savings in cash and deposits. However, it should be noted that, between 2000 and 2007, families extended their savings to the financial markets (fixed income and stocks). The investment in these markets was mainly through direct investment, although the percentage invested in the IIC also increased during those years.

To conclude this historical description, we note that the evolution of the collective investment sector has had a close relationship with the dynamism and modernization of the regulatory framework. In addition, the economic progress and significant generation of savings are the factors that have helped to achieve the degree of maturity and consolidation that the sector currently has in the Spanish financial system.

Despite the development level reached by the collective investment industry in the last two decades, it is important that the State continues to regulate the sector in a responsible manner, to further enhance the benefits and minimize the problems of these financial instruments. Similarly, it is also important that investors continue participating in the IIC industry because of its advantages over other types of investments and that they become more active in monitoring the management of these IICs.

Figure 1.10: Household financial savings in Spain



Source: INVERCO

1.4 Mutual funds in the international context

Over the past few decades, the mutual fund industry has flourished worldwide, becoming one of the most successful industries in the financial markets. According to the European Fund and Asset Management Association - EFAMA (2010),[10] worldwide mutual funds held assets worth €15.88 trillion at the end of 2009, distributed across 65,306 mutual funds.

The two main associations of investment management industry are the Investment Company Institute (ICI) from the US and the EFAMA. These associations provide the data presented in this section. To make comparisons among countries, it is necessary to clarify that the US definition of mutual funds is comparable to the European definition of UCITS.

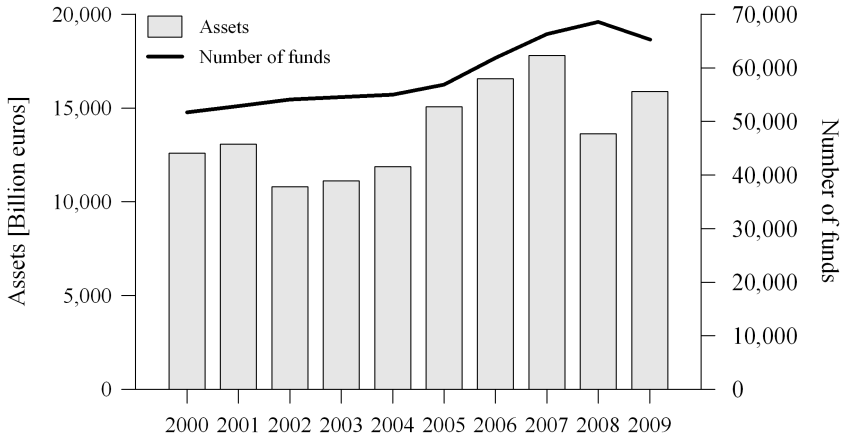
The evolution of total mutual fund assets (Figure 1.11) reflects the effect in this industry of the two main financial crises suffered in the new millennium and how the sector gradually recovered in 2009. The constant growth in the number of funds in this decade is also remarkable, a magnitude that only in the last year has shown a slight decrease (since 2000).

The distribution of mutual fund assets by region, shown in Figure 1.12, allows us to observe the preponderance of America in the worldwide mutual fund industry, as its share is always over 50%. In particular, this region managed 55% of the assets invested in this industry in 2009, with significant participation by the US. The second region in order of importance is Europe, which has gradually increased its global share. In 2009, the European countries with the highest assets under management are Luxembourg, France, Ireland, and the United Kingdom (UK), which together managed 75% of the total assets invested in the European mutual fund industry.

On the other hand, the number of funds by region (Figure 1.13) shows that Europe is the region with the largest fraction, around 50%, while the remaining 50% is divided almost equally between the America and Asia and Pacific.

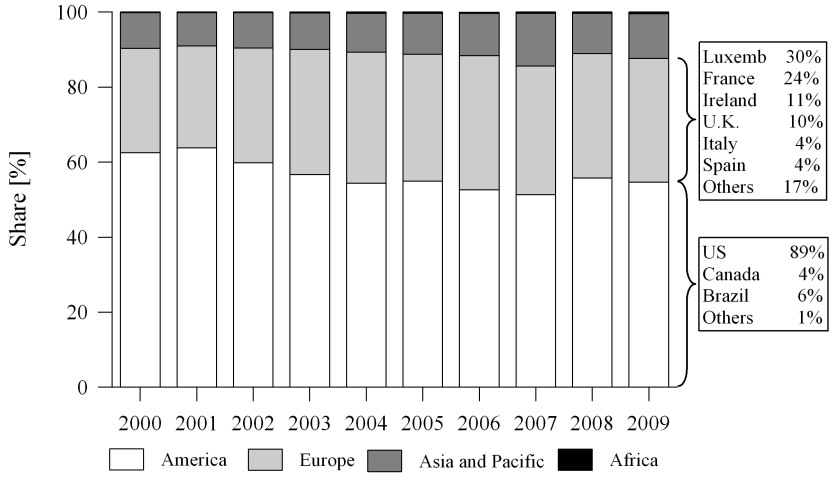
[10]EFAMA is the representative association for the European investment management industry that is composed of 26 national member associations and 42 corporate members. Currently, the EFAMA national members are the following: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and the UK.

Figure 1.11: Worldwide total net assets and number of mutual funds



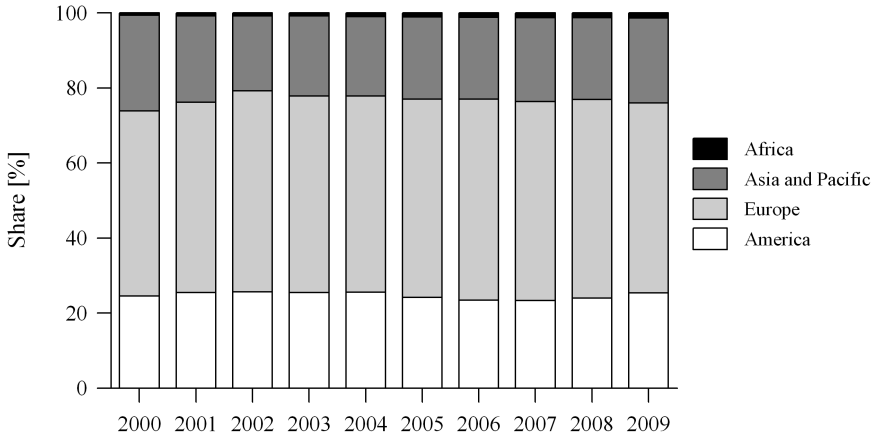
Source: EFAMA

Figure 1.12: Breakdown of assets by region



Source: Made with data from EFAMA

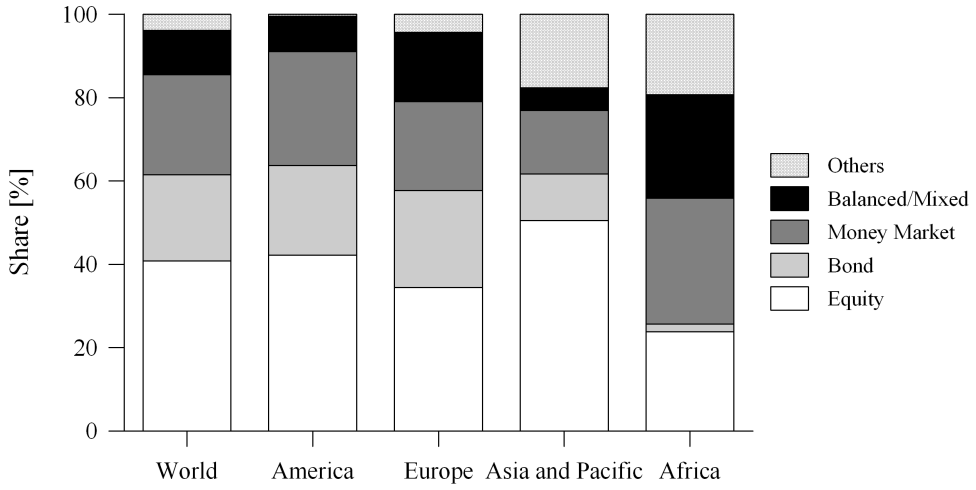
Figure 1.13: Breakdown of number of funds by region



Source: EFAMA

To finish with the international context of the mutual fund industry, the composition of mutual fund assets by fund categories is shown in Figure 1.14. This breakdown corresponds to the fourth quarter of 2009 and is presented both globally and by region. The main categories defined in statistics of EFAMA are the following: equity, bond (fixed income), money market, balanced/mixed, and others.

Figure 1.14: Breakdown of mutual fund assets by category (4^{th} quarter 2009)



Source: EFAMA

At the end of 2009, 41% of worldwide mutual fund assets were held by equity funds and 24% by money market funds, while the asset share of bond funds was 21% and the asset share of balanced/mixed was 11%.

In Figure 1.14 the great similarity between the composition of the world's and America's asset is remarkable, which again shows the importance and prevalence of this region in the worldwide mutual fund industry. By contrast, there is a marked difference in the number of assets managed by categories in other regions, stressing the high popularity of equity funds in Asia and Pacific and the almost equal participation of equity, money market, and bond categories in Europe.

The previous description of the international context reveals the existence of two great powers in the management of mutual funds: the US and Europe. For this reason, more information on these regions is subsequently presented.

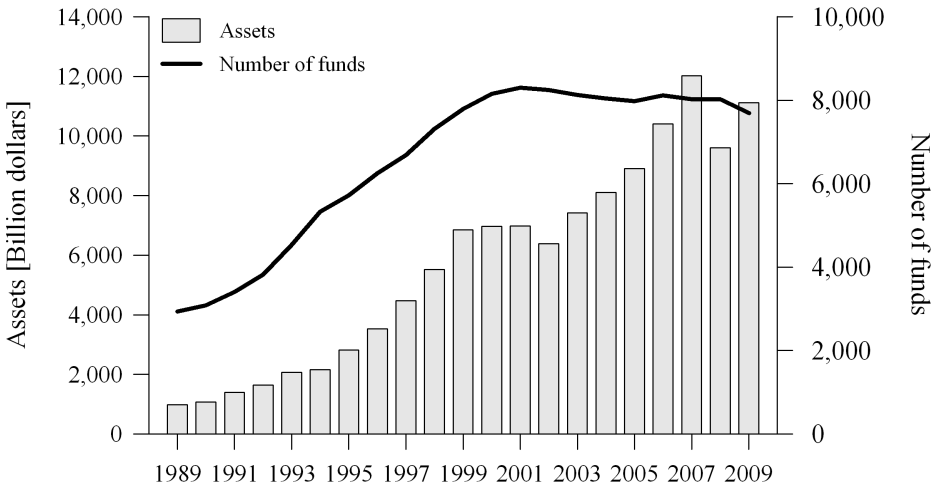
1.4.1 The mutual fund industry in the United States

It is well known that the mutual fund industry in the US has been one of the references in the great development of this market worldwide. According to the ICI (2010), at the end of 2009, US mutual fund industry managed $11,120 billion (€7,720 billion) of assets with 7,691 funds.

Despite the early development of the US mutual fund industry, it experienced impressive growth in the last two decades, as Figure 1.15 shows. As occurred in other countries, this market has also suffered from the financial crises at the beginning of the new millennium and in recent years. This situation is reflected especially in the reduction of assets under management, a figure that dropped 20% between the years 2007 and 2008 but that showed important signs of recovery in 2009.

The evolution of the number of funds in the US (Figure 1.15) shows an impressive increase because it has passed from almost 3,000 funds in 1989 to 7,691 in 2009.

Figure 1.15: US total net assets and number of mutual funds

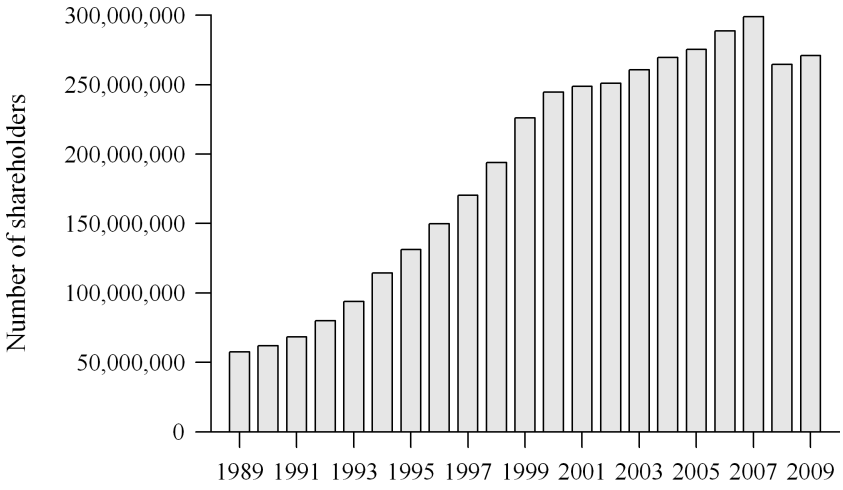


Source: ICI

It is important to note that while the size of the industry in the US is 41 times bigger than in Spain, the number of funds is only three times bigger, which may be a sign of a potential oversupply of funds in Spain. Therefore, the average size of funds in the US is significantly higher than in Spain.

Concerning the number of shareholders in this industry, Figure 1.16 shows a constant increase since 1989, although it has fell more than 10% in the last few years. Despite this decrease, the social relevance of the mutual fund industry continues to be extraordinary, which is evident when relating the 271 million shareholders accounts in 2009 with the 307 million residents in the US in the same year (U.S.Census-Bureau, 2010).

Figure 1.16: Number of shareholder accounts in the US

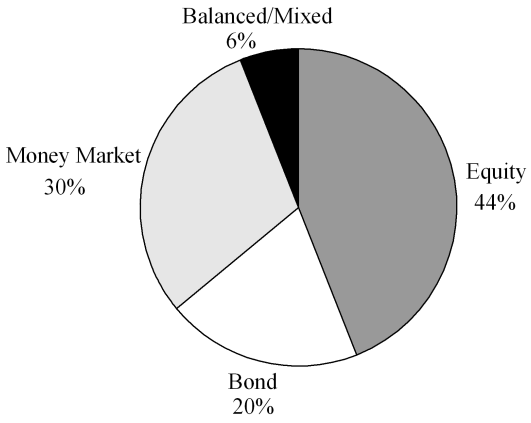


Source: ICI

Finally, Figure 1.17 shows the mutual fund assets by categories at the end of 2009. According to the EFAMA, equity and money market funds are the most popular in the US, with 44% and 30% of total assets managed, respectively (EFAMA, 2010). Important

differences are found in the comparison of these data with the assets by categories in Spain, as Spanish investors show preferences towards lower-risk funds, such as bond and guaranteed funds.

Figure 1.17: Breakdown of US mutual fund assets by category (4^{th} quarter 2009)



Source: ICI

From the information available in this section, it is possible to extract some important features of the Spanish mutual fund industry compared with the US industry. In addition to the obvious difference in the size of both industries, there is a difference in strategies because while, in Spain, there are many small funds, in the US, there are fewer funds with a higher volume of assets under management. Additionally, the differences in investor preferences of both countries are evident: Spanish investors are more conservative, with preferences towards bond and guaranteed funds, while US investors show preferences towards equity and money market funds.

1.4.2 The mutual fund industry in Europe

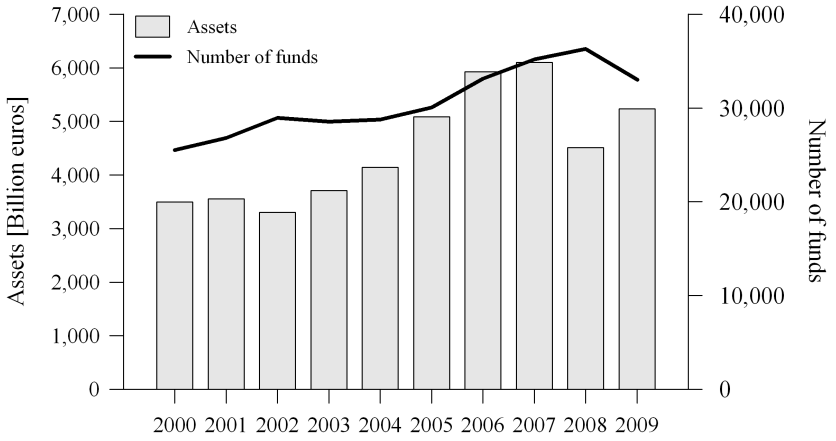
The European mutual fund industry, as others worldwide, has experienced a significant development in recent decades. The potential for growth of most of the countries has facilitated the promotion of this financial product not only to institutional but also to retail investors. According to EFAMA, at the end of 2009, the number of mutual funds stood at 33,054, which manage €5,237 billion (EFAMA, 2010).

The analysis of the total net assets managed by European industry (Figure 1.18) shows the same effect of the financial crises detected previously in other industries and the gradual recuperation in 2009. Furthermore, the number of funds also has been affected by crises, although to a lesser extent.

The European mutual fund industry has been dominated by a few countries that manage nearly 80% of total net assets. In 2009, more than 45% of total net assets were managed by the countries of major economic relevance in Europe (the UK, France, Germany, Italy, and Spain) and more than 40% by Luxembourg and Ireland. The high share of Luxembourg and Ireland is probably due to favourable tax and regulatory environments. Specifically, Luxembourg has benefited from its stringent bank secrecy laws, and Ireland has benefited from its favourable tax treatment of fund management companies (Khorana *et al.*, 2005). Moreover, both countries have engaged in a successful distribution and administration of

cross-border UCITS around the world. The ranking is shown in Table 1.2, in which Spain ranks seventh.

Figure 1.18: Europe total net assets and number of mutual funds



Source: EFAMA

Table 1.2: Breakdown of European mutual fund assets by country (4^{th} quarter 2009)

	Assets (EUR mill)	Share
Luxembourg	1,592,373	30.4%
France	1,253,395	23.9%
Ireland	597,331	11.4%
United Kingdom	506,137	9.7%
Germany	220,424	4.2%
Italy	193,998	3.7%
Spain	**187,152**	**3.6%**
Sweden	118,198	2.3%
Switzerland	116,798	2.2%
Belgium	74,081	1.4%
Austria	69,157	1.3%
Netherlands	66,300	1.3%
Denmark	57,632	1.1%
Norway	49,403	0.9%
Finland	45,905	0.9%
Liechtenstein	21,053	0.4%
Poland	15,983	0.3%
Turkey	13,484	0.3%
Portugal	10,973	0.2%
Greece	8,631	0.2%
Hungary	7,672	0.1%
Czech Republic	3,774	0.1%
Slovakia	2,931	0.1%
Russia	2,209	0.0%
Slovenia	1,812	0.0%

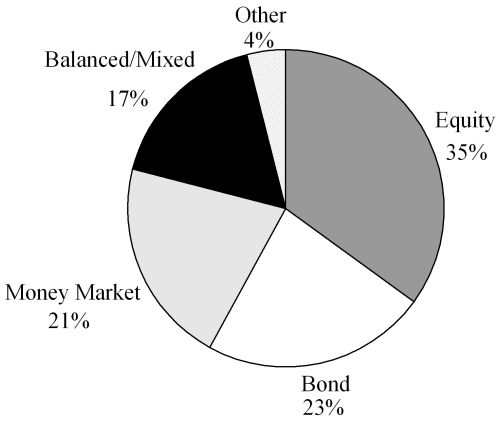
Continued on next page...

	Assets (EUR mill)	Share
Romania	787	0.0%
Bulgaria	177	0.0%
All funds	**5,237,770**	**100.0%**

Source: EFAMA

The assets distribution by type of fund (Figure 1.19) shows that equity funds, followed by money market and bond funds, are those with the greatest participation, a situation that is similar to that found in the US market. However, the comparison with assets distribution in Spain reveals an important difference in bond funds because in Spain this type of fund shares almost 40% of total assets.

Figure 1.19: Breakdown of European mutual fund assets by category (4th quarter 2009)



Source: EFAMA

In summary, the analysis of the mutual fund industry in the international context demonstrates rapid growth in the last two decades, becoming one of the most successful industries in the financial markets. The main figures show some differences in the development and characteristics of the collective investment sector among continents and countries. However, it is important to note that, anywhere, this financial instrument has a significant social and economic relevance, given the high participation of the population in this market and the extraordinary volume of assets managed.

Although it is well known that the mutual fund industry in the US has been one of the references in this market worldwide, it is significant that the European industry has had an important development, with countries where the collective investment has reached significant levels of development and with other countries with great potential for growth.

1.5 Evolution of Spanish stock market

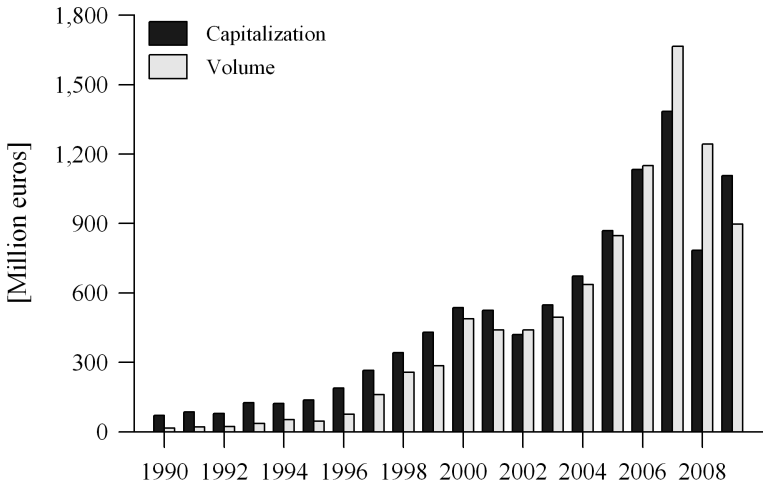
After the previous analysis of the mutual fund industry, in this section, we briefly analyse the recent evolution of the stock market in Spain, given that this market bears a close relation to collective investment. This relationship is mainly based on the fact that the stock market

supports a significant number of mutual fund operations. Therefore, what happens in the stock market affects the performance of mutual funds and the management of mutual funds also probably affects the stock market. This section serves as an introduction to the next chapter, which analyses in depth the stock market and its relationship with mutual funds.

The Spanish stock market has had an evident development process in recent years, and as a response to the new international financial setting, it has created the Stock Exchange and Markets of Spain (BME: *Bolsas y Mercados Españoles*), which is the operator of all stock markets and financial systems in Spain. Therefore, the stock exchanges of Barcelona, Bilbao, Madrid, and Valencia belong to the BME Group.

According to BME statistics, the capitalization of the Spanish stock market[11] has experienced significant growth in the last two decades, as we can see in Figure 1.20. Since 1990, this magnitude has been affected only by the two recent international financial crises, although, in 2007, it reached the maximum level with €1,384 billion, followed by a decrease of 43% in 2008 and an important recovery in 2009, the year in which it amounted to €1,107 billion. The decline in 2008 has been widespread in all of the world's exchanges, where the value of traded shares fell considerably in this bad year.

Figure 1.20: Capitalization and value traded on the Spanish stock market (EUR billion)



Source: BME

Figure 1.20 also shows the evolution of value traded on the SIBE[12] electronic market. Although past behaviour is similar to capitalization, the impact of the recent crisis has been less in 2008 because it only decreased by 26%. However, this magnitude continued a decreasing trend in 2009.

As Table 1.3 shows, capitalization increases in 2009 were important in almost all sectors, although these were especially significant in sectors such as consumer services, financial services, and foreign shares.

[11]Market capitalization data available in BME statistics include all markets: continuous market (CM), open outcry for four stock exchanges, alternative stock market (MAB), and market in Latin America securities (LATIBEX).

[12]SIBE (Spanish Stock Market Interconnection System) is the technical trading platform of the Spanish stock exchange market where the order book is located.

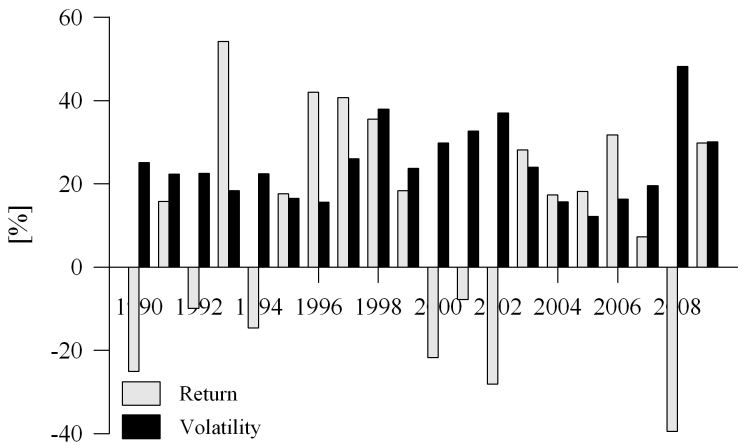
Table 1.3: Breakdown of capitalization by sector (2008 - 2009), (EUR Billion)

	2008	**2009**	**% change**
Petrol and power	149	130	-13%
Basic materials, industry and construction	44	55	25%
Consumer goods	34	42	25%
Consumer services	24	33	38%
Financial services and real estate	150	203	35%
Technology and telecommunications	78	95	22%
MAB	25	27	8%
Foreign Shares	282	522	85%
	785	**1,107**	**41%**

Source: BME

Another good indicator of the stock market situation is the evolution of the main market index. Therefore, in Figure 1.21 we report the annual return and the volatility[13] of Ibex-35, which is the index that brings together the 35 most liquid Spanish stocks traded. As the figure shows, 2008 was the most negative year in Ibex-35 history, characterized by extremely negative returns (-39%) and high volatilities (48%), being, according to BME, the worst performance in the 135 years that the Spanish stock exchange has had general indices (BME, 2010). However, the recovery in 2009 is notable, with lower volatility (30%) and positive returns (30%).

Figure 1.21: Annual return and volatility of Ibex-35



Source: BME

To complete the brief description of the Spanish stock market, in Table 1.4 we report the ownership of Spanish listed companies. Share losses in the financial sector are remarkable, especially for banks and savings banks, which have been offset mainly by non-resident investors, who represent 38.5% of the value of Spanish listed companies in 2008. The high participation of non-resident investors reflects the integration of the Spanish economy into the international arena and the confidence of investors in the Spanish market.

Another aspect to highlight is the significant participation of individual or household investors, who maintained their position even in times of financial crises and who now own

[13] According to BME, the annual volatility is calculated as the standard deviation of the daily return series.

20% of Spanish listed companies. On the other hand, the loss of participation of collective investment in 2008 reflects the situation that these institutions had in the crisis.

Table 1.4: Share ownership of Spanish listed companies (% as market capitalization)

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Banks and savings banks	7.3	7.9	7.1	7.7	8.7	8.6	9.3	9.4	7.6
Insurance companies	2.3	2.3	2.2	2.3	2.3	2.4	2.5	2.2	2.0
Collective investment	4.8	4.9	5.2	5.6	6.3	6.2	7.2	6.0	5.4
Public administrations	0.2	0.2	0.4	0.3	0.3	0.3	0.3	0.2	0.3
Non-Financial companies	20.3	21.7	22.0	23.0	23.1	24.7	24.4	25.4	26.0
Individuals/Households	30.5	28.0	28.3	26.0	24.1	23.6	23.8	20.1	20.2
Non-Residents	34.7	35.0	34.8	35.1	35.2	34.2	32.5	36.7	38.5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: BME

Finally, we want to contextualise the Spanish stock market in the international arena. According to the World Federation of Exchanges (WFE), in 2009, the Spanish Stock Exchange occupies the ninth position in the world by capitalization and the tenth by total value of share trading, as Table 1.5 shows.

Table 1.5: The 10 world biggest stock markets in 2009

	Stock market	**USD billion**	**Change 2009/2008**
By capitalization:			
1	NYSE Euronext (US)	11,838	29%
2	Tokyo SE Group	3,306	6%
3	NASDAQ OMX	3,239	44%
4	NYSE Euronext (Europe)	2,869	37%
5	London SE	2,796	50%
6	Shanghai SE	2,705	90%
7	Hong Kong Exchanges	2,305	73%
8	TSX Group	1,677	62%
9	**BME Spanish Exchanges**	**1,435**	**51%**
10	BM&FBOVESPA	1,337	126%
By value of share trading:			
1	NASDAQ OMX	28,951	-21%
2	NYSE Euonext (US)	17,785	-47%
3	Shanghai SE	5,062	95%
4	Tokyo SE Group	3,991	-29%
5	London SE	3,391	-46%
6	Shenzhen SE	2,774	122%
7	Deutsche Brse	2,186	-53%
8	NYSE Euronext (Europe)	1,982	-55%
9	Korea Exchange	1,559	9%
10	**BME Spanish Exchanges**	**1,511**	**-37%**

Source: WFE

1.6 Summary and conclusions

After describing the history of the industry of mutual funds in Spain, we conclude that this evolution has had a close relationship with the dynamism and modernization of the regulatory framework. Furthermore, the degree of maturity and consolidation the sector has in the Spanish financial system has been achieved due to factors such as economic progress and the significant generation of savings.

The popularity of mutual funds in the last two decades has made a real transformation in personal finances of millions of Spanish individuals and in the financial management of institutional investors. The main figures of this industry show the great social impact in this country, as the management efficiency of these investment institutions may affect the finances of a large part of the population. Therefore, it is important that the State continues to regulate the sector in a responsible manner, to further enhance the benefits and minimize the problems of these financial instruments. Similarly, it is also important that investors continue to participate in the IIC industry because of its advantages over other types of investments and that they become more active in monitoring the management of these IICs.

On the other hand, the analysis of the mutual fund industry in the international context allowed us to show that although there are some differences in the development and characteristics of the collective investment sector among continents and countries, the social and economic relevance that this financial instrument has is similar, given the high population share in this market and the extraordinary volume of assets managed.

Furthermore, international contextualisation showed the incipient force of the Spanish financial market, reflected by its seventh place ranking in the European distribution of mutual fund assets and the place occupied by the Spanish Stock Exchange, which is ranked ninth in the world by capitalization and tenth by total value of share trading.

The effect of globalization on Spanish financial markets has been evident in this chapter. Collective investment, being immersed in the European Union, has seen increasing investment in securities issued by other countries, which generates greater international diversification of investments. Moreover, the high participation of non-resident investors in the Spanish stock market reflects the integration of the Spanish economy in the international arena and the confidence of foreign investors in this market.

Finally, given the economic and social importance that mutual funds now have in Spain, we are motivated to continue the study of this market. In the next chapter, we will analyse the behaviour of Spanish market returns on dates of public disclosure of mutual funds' reports to identify the role of institutional trading in the Spanish calendar anomalies. Later, in the second part of the thesis, we will examine window dressing as a possible management strategy employed by funds when they have to make such reports public to improve their respective images. This examination will aim to analyse the truthfulness of information supplied by managers of mutual funds to investors and to determine whether this institutional trading behaviour is related to the January effect.

Appendix 1.1

Spanish Legislation of Collective Investment Schemes

This appendix gathers the regulations cited in Chapter 1 and other recent regulations that have modified some cited laws, especially Law 35/2003, of November 4. The list was updated on October 10, 2010 and it is presented in chronological order.

- Decree-Law 7/1964, of April 30, on the Investment Companies and Funds and Commerce Bourses.
- Law 46/1984, of December 26, on Collective Investment Schemes.
- Royal Decree 1393/1990, of November 2, approving the Regulation of the Law 46/1984.
- Law 18/1991, of June 6, on Personal Income Taxation.
- CNMV Circular 1/1991, of January 23, on the contents of quarterly reports of Collective Investment Schemes.
- Law 40/1998, of December 9, on Personal Income Taxation and other tax rules.
- Royal Decree 91/2001, of February 2, partially amending the Royal Decree 1393/1990 of November 2.
- CNMV Circular 1/2001, of April 18, on the prospectus of Collective Investment Schemes.
- Law 35/2003, of November 4, on Collective Investment Schemes.
- Royal Decree 1309/2005, of November 4, approving the Regulation of the Law 35/2003 and adapting the tax regime for Collective Investment Schemes.
- Law 25/2005, of November 24, on venture capital firms and their management firms.
- Order EHA/1199/2006, of April 25, which implements the provisions set forth in the Regulations of Law 35/2003, of November 4, governing Collective Investment Schemes, concerning hedge funds and funds of hedge funds and which enables the CNMV to incorporate different provisions.
- CNMV Circular 1/2006, of May 3, on hedge funds.
- CNMV Circular 2/2006, of June 27, providing information on foreign Collective Investment Schemes filed with the CNMV registers.
- CNMV Circular 3/2006, of October 26, on prospectuses of Collective Investment Schemes.
- Law 35/2006, of November 28, on the Personal Income Tax and the partial amendment of the laws on corporate income tax, non-resident income tax, and wealth tax.

- Royal Decree 362/2007, of March 16, amending article 59 of the Regulation of the Law 35/2003, of November 4, approved by Royal Decree 1309/2005, of November 4.
- CNMV Circular 1/2007, of July 11, on the requirements regarding statistical information of IIC, partially amending Circular 2/1998, of July 27, on the requirements regarding statistical information of IIC of the European Monetary Union.
- Law 43/2007, of December 13, on the protection of consumers in the purchase of goods with the offer of price restitution.
- CNMV Circular 5/2007, of December 27, on regulatory disclosures by Collective Investment Schemes.
- Order EHA/35/2008, of January 14, implementing the regulations governing IIC' accounting, determination of equity, and calculation of risk diversification coefficients and certain aspects of IICs whose investment policies consists of reproducing, replicating or tracking an equity or fixed-income index, and empowering the CNMV to issue detailed rules.
- Royal Decree 215/2008, of February 15, amending article 59 of the Regulation of the Law 35/2003, of November 4, approved by Royal Decree 1309/2005, of November 4.
- Royal Decree 217/2008, of February 15, on the legal regime for investment firms and other entities that provide investment services, which partially amends the Regulation of the Law 35/2003, of November 4, approved by Royal Decree 1309/2005, of November 4.
- Order EHA/596/2008, of March 5, regulating certain aspects of the legal regime concerning IIC depositories, and specifying the content of the statements of account.
- CNMV Circular 2/2008, of March 26, partially amending Circular 4/1994, of December 14, on accounting rules, reporting obligations, calculation of the net asset value, investment and operational coefficients, and actions in appraising real estate, applicable to real estate IICs.
- Order EHA/888/2008, of March 27, on the transactions by financial IICs with financial derivatives and clarifying certain terms in the Regulations of Law 35/2003, of November 4, approved by Royal Decree 1309/2005, of November 4.
- CNMV Circular 3/2008, of September 11, on accounting rules, financial statements, and confidential reports by Collective Investment Schemes.
- CNMV Circular 4/2008, of September 11, on the contents of annual, half-yearly, and quarterly reports of Collective Investment Schemes and their position statements.
- Order EHA/3064/2008, of October 28, amending the Ministry of Economy and Finance Order of 26 July 1989 which implemented Article 86 of the Securities Market Act, and Ministry of Economy and Finance Order of 24 September 1993, on the real estate investment trusts and companies, in order to empower the CNMV to make detailed rules on certain aspects of supervised entities' accounting and the calculation of coefficients and limits for Collective Investment Schemes.

- CNMV Circular 5/2008, of November 5, on the statistical reporting requirements with regard to assets and liabilities of European Union IICs.
- CNMV Circular 7/2008, of November 26, on accounting standards, annual accounts, and confidential reports by investment firms, IIC management companies and venture capital firm operators.
- CNMV Circular 11/2008, of December 30, concerning accounting regulations, annual financial statements, and confidential reporting of venture capital firms.
- CNMV Circular 1/2009 of February 4, on categories of mutual funds based on their investment profile.
- CNMV Circular 3/2009, of March 25, on the content of the half-yearly report on compliance with the oversight and supervision function of IIC depositaries.
- Second Final Provision of Law 5/2009, of June 29, amending the Securities Market Law 24/1988, of July 29, on discipline and intervention of credit institutions, and the revised text of the Law on regulation and supervision of private insurance, promulgated by Royal Legislative Decree 6/2004, of October 29, on the reform of significant shareholdings in investment services firms, credit institutions and insurance companies.
- Fifth Final Provision of Law 11/2009, of October 26, regulating Listed Real Estate Market Investment Companies.
- Royal Decree 1818/2009, of November 27, amending the Regulations of the Law 35/2003, of November 4, approved by Royal Decree 1309/2005, of November 4.
- CNMV Circular 6/2009, of December 9, on internal control of IIC management companies and investment companies.
- Law 10/2010, of April 28, on prevention of money laundering and terrorism financing.
- Royal Decree 749/2010, of June 27, amending the Regulation of the Law 35/2003, of November 4, approved by Royal Decree 1309/2005, of November 4, and other tax regulations.

Chapter 2

Quarterly return patterns in the Spanish stock market

In this chapter, we analyse the anomalies of Spanish stock returns around quarterly disclosures of equity fund portfolios. We increase the usual frequency of the analysis to identify the role of institutional investors in return patterns around disclosure dates. We extend previous studies by analysing the daily cumulative abnormal returns in the first trading days of a quarter to better understand the behaviour of stocks. Our results indicate no clear stock return anomalies during the first three-quarters of the year, which is consistent with the existing literature. Nevertheless, the results provide evidence that the turn-of-the-year effect persists, especially for loser small-cap stocks. This effect is stronger in bear market years than in bull market years. The daily return analysis for January shows that the main cumulative abnormal return is reached in the first trading days of the year and that the current personal income tax law in Spain has prolonged the duration of the January effect.

2.1 Introduction

Researchers in finance have documented a pronounced seasonality in stock returns around year-end, in which returns are much higher during January than in any other month of the year, especially in small-cap stocks. This phenomenon is commonly referred to as the "turn-of-the-year" or "January" effect. Other calendar anomalies, such as the weekend effect, day-of-the-month effect and holiday effect, have been also documented. However, the January effect is one of the most prevalent of these anomalies, because it has persisted for decades.

The search for explanations for this anomaly has motivated many investigations in the financial literature, with tax-loss selling by individual investors and window dressing by institutional investors being the most popular hypotheses. Although there is some evidence that both strategies may lead to the January effect on stock returns, the debate still continues with respect to which of these explanations contributes most. As the closing phrase of the paper by Haug and Hirschey (2006) reads: "... more than 30 years after its discovery, the January effect remains a compelling riddle."

Since the first empirical evidence of the January effect in the US, presented by Rozeff and Kinney (1976), most of the studies examining these abnormal returns have focused on this

stock market. However, one might ask why this well-known anomaly is still present in the most-developed market because under an efficient market hypothesis, these return patterns would be expected to disappear as investors attempt to exploit it.

In this sense, Haugen and Jorion (1996), Easterday *et al.* (2009), and Dzhabarov and Ziemba (2010), among others, have studied the persistence of the January effect over this long period of time. For instance, Haugen and Jorion (1996) analyse the evolution and persistence of this anomaly 17 years after it was discovered. They find that it remains strong and that no significant trend suggests its eventual disappearance, in spite of the numerous individual income tax changes during their sample period (1926-1993). Later, Mehdian and Perry (2002) and Gu (2003) find that in the post-crash period (after 1987), January returns are positive but statistically insignificant for the major US market indices, concluding that it could represent a trend toward market efficiency, probably because investors have begun taking advantage of this anomaly. However, Moller and Zilca (2008) argue that previous results are limited by the fact that monthly returns were used to test this phenomenon. To overcome this issue, they use daily data frequency to show that the duration of the January effect is shorter for recent years. Nevertheless, this result does not imply that this return anomaly is losing strength.

The first explanation given for the January effect was the tax-loss selling hypothesis. This argument indicates that the effect is produced by individual investors who, immediately prior the year-end, induce capital losses by selling securities that have experienced a decline in price. A joint selling behaviour by individuals at year-end would produce a fall in stock prices, but in January, when the selling pressure ceases, this behaviour results in rising prices and abnormally high returns. Since the pioneering investigations of the 70s and 80s (Dyl, 1977; Givoly and Ovadia, 1983; Keim, 1983; Reinganum, 1983; Lakonishok and Smidt, 1984; Rozeff, 1985; Ritter, 1988), several studies have presented empirical evidence concerning the effect of tax-loss selling of loser stocks on abnormal return patterns at the turn of the year.

Some recent empirical evidence is provided by Starks *et al.* (2006), who study the turn-of-the-year return and volume patterns for municipal bond closed-end funds, which are held almost exclusively by tax-sensitive individual investors. Their results show that the January effect for these funds can be largely explained by tax-loss selling activities.

However, some studies have pointed out that the tax-loss selling hypothesis may not be sufficient to explain the entire January effect. In this sense, Choudhry (2001) observed abnormally large returns in the UK and in the US during the pre-World War I period, when no form of tax treatment of capital gains/losses was present in these countries.

The leading alternative explanation for the January effect is the window-dressing hypothesis, which is based on the trading behaviour of institutional investors around disclosed management reports. Window dressing can be defined as a fund managers' practice that consists of modifying fund holdings to improve the disclosed portfolio image, thereby making a good impression on fund unit-holders. The most common form of window dressing consists in selling loser stocks and purchasing winner stocks, especially immediately before year-end (Haugen and Lakonishok, 1988; Lakonishok *et al.*, 1991).

Some studies have presented evidence in favour of the window-dressing practice as an explanation of the turn-of-the-year effect. One example is the work of Ng and Wang (2004), who investigate the relationship between institutional trading and the turn-of-the-year effect and find that institutional trading behaviour is directly linked to the return patterns of small-cap stocks, which is consistent with window-dressing and risk-shifting behaviours.

However, some studies have evaluated the two hypotheses together, tax-loss selling and window dressing, as complementary explanations for return anomalies in the turn of the year in an attempt to determine the importance of individual and institutional investors' behaviour in this phenomenon. Poterba and Weisbenner (2001), and Grinblatt and Moskowitz (2004) analyse the role of tax-induced trading in contributing to turn-of-the-year return anomalies, showing that tax-regime changes should only affect the incentives of individual investors around year-end, although they do not reject the role of institutional managers in the January effect.

Other papers report evidence that individual investors dominate year-end trading (Dyl and Maberly, 1992; Sias and Starks, 1997; D'Mello *et al.*, 2003), although Ackert and Athanassakos (2000), and Park and Moskalev (2010), among others, have found evidence in favour of the significant role of institutional trading. However, Sikes (2008) finds that the relationship between institutional investors trading and the January effect in the US is due to tax-loss selling rather than window dressing. In addition, Johnston *et al.* (2000), who re-examine the evidence related to both explanations of the turn-of-the-year effect in a manner similar to Sias and Starks (1997), find results that support neither of the two hypotheses.

Most of the studies about the January effect and its possible explanations have been performed mainly for the US stock market. Nevertheless, some investigations on calendar anomalies have also been documented for stock markets all around the world. In addition, some papers present multi-country studies focusing on the anomaly for both developed and emerging markets.[1]

In addition to the large body of US evidence of the January effect, studies in Canada have provided evidence of quarterly seasonal behaviour in the stock returns. Athanassakos (1992; 1997) and Athanassakos and Schnabel (1994) find that much of the turn-of-the-year seasonality can be explained by institutional trading behaviour and portfolio rebalancing.

In Australia, July is the beginning of the fiscal year and, according to the tax-loss selling hypothesis, the return in this month should be higher than most other months. However, the results originally obtained by Officer (1975) do not indicate evidence of this seasonality. Later studies, such as those presented by Brown *et al.* (1983) and, recently, by Peng (2005) show that, as well as in January, returns in July are the highest return months for the Australian stock market. The fact that the January anomaly cannot be explained by the tax-loss selling hypothesis led them to conclude that Australian evidence is inconsistent with the usual form of this hypothesis.

For the Asian stock markets, monthly seasonality has also been documented in some studies. The results presented for some countries are contradictory, but in general, little evidence in favour of the January effect has been found.[2] In this context, the results obtained by Lee (1991) are especially important, because he finds evidence of the January effect in Hong Kong, Korea, Singapore and Japan. Because none of these countries imposes taxes on capital gains for individual investors, he concludes that the tax-loss selling hypothesis cannot explain these anomalies.

In the case of Africa, there is little evidence of the presence of a January effect in these

[1]For developed markets see, for example, Gultekin and Gultekin (1983), Agrawal and Tandon (1994), Durham (2001), and Folliott (2007). For emerging markets see, for example, Ho (1990), Lee (1991), Chui and Wei (1998), Fountas and Segredakis (2002) and Lean *et al.* (2007).

[2]See, for example, Cheung and Coutts (1999) for Hong Kong; Maghayereh (2003) for Jordania; Bildik (2004) for Turkey; Joshi and K.C. (2005) for Nepal; and Zhang *et al.* (2008) for China.

stock markets. For instance, Ayadi *et al.* (1998) find a weak January effect in Ghana but not for Nigeria and Zimbabwe. Recently, Alagidede and Panagiotidis (2006) analyse the calendar anomalies in the Ghana stock market and find that January returns are not higher than returns in any other month. Instead, they find a significant and positive April effect due to the submission of company reports in late March, which causes an increase in April returns.

For European stock markets, international studies on seasonality have shown calendar anomalies in the markets of Belgium, Denmark, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and the UK.[3] Additionally, specific studies on Finland, Greece, Italy, Poland, Spain and the UK provide evidence of abnormally high returns in January.[4] For the UK equity market, evidence of an April effect also has been found, which is explained by the tax-loss selling hypothesis because the fiscal year ends in April.

For the case of the Spanish stock market, some studies present empirical evidence of calendar anomalies in the stock returns. Gultekin and Gultekin (1983) are among the first to find evidence of the January effect in Spain (from January 1959 to December 1979). Later, Santesmases (1986) analyses the period from January 1979 to December 1983, finding that the differences between the returns at the end of the year and those at the beginning of the next year are not due to only tax pressures because the January effect persists after controlling for tax effects.

Basarrate and Rubio (1994b) analyse turn-of-the-year stock market anomalies from 1976 to 1991, finding that the January effect is related to tax trading activities. They obtain a similar conclusion when studying the behaviour of trading volume in the market (Basarrate and Rubio, 1994c). Additionally, when they test the anomaly through the selling and purchasing behaviour of mutual funds, they find that funds do not follow window-dressing strategies (Basarrate and Rubio, 1994a). Therefore, they conclude that the tax-loss selling hypothesis is the main reason for the January effect in the Spanish stock market.

Recently, Miralles and Miralles (2007) found that from January 1988 to December 2002, the January effect still existed in the Spanish stock market, despite fiscal reforms that occurred in this period. The analysis of trading behaviour of investors around year-end shows that the stock return anomaly may be the result of the convergence of individual and institutional investors, who motivated by different trading reasons, produce pressure on stock prices. Particularly, these authors find tax motivation in individuals and window-dressing motivation in institutional investors.

Most of the studies conducted in Spain conclude that the anomaly is related to the tax-loss selling hypothesis at the end of the fiscal year (December 31). Nevertheless, Spanish taxation on capital gains for individual investors has changed several times in recent years, and since 1999, tax regulation has restricted the freedom to realize capital losses to reduce taxes.[5] This fiscal reform may have affected the tax-motivated trading of individuals around

[3]See, for example, Gultekin and Gultekin (1983), Agrawal and Tandon (1994), Durham (2001), and Folliott (2007).

[4]See, for example, Grinblatt and Keloharju (2004) for Finland; Mills *et al.* (2000), Coutts *et al.* (2000), and Al-Khazali *et al.* (2008) for Greece; Barone (1989) for Italy; Henke (2003) for Poland; and Reinganum and Shapiro (1987), Clare *et al.* (1995), Mills and Coutts (1995), Draper and Paudyal (1997), and Chen *et al.* (2007) for the UK.

[5]Under the Law 40/1998, of December 9, on the reform of the Personal Income Tax Law and its consequent Regulation in the R.D. 3/2004, of March 5, individuals may not reduce taxes through capital losses when the homogeneous financial asset was purchased within the two months before or after the transfer that caused

year-end. However, the impact of this reform on the January effect has not yet been demonstrated because previous studies have not analysed an extended period after this important amendment.

Spanish fund managers must disclose their portfolio holdings at the end of each quarter.[6] Thus, the incentives to window-dress are not present only in December. Therefore, to identify the role of institutional trading in the Spanish calendar anomalies, we extend the analysis to study not only year-end but also quarter-end stock returns from December 1999 to January 2007. Because this study is the first on the Spanish market in which the realization of capital losses is tax-restricted, the evidence of the persistence of the January effect would show that this return anomaly cannot be explained only by the tax hypothesis and that window dressing may be responsible for at least part of this phenomenon. In addition, we further investigate the impact of this law on the calendar anomaly by calculating the daily cumulative abnormal return (CAR) at the beginning of the year for two important market benchmarks and for an extended sample.

Our study differs from most of the previous papers for the Spanish market because it is the first investigation applying the methodology proposed by Ng and Wang (2004) to analyse the January effect. This approach is innovative because the analysis is based on daily stock returns instead of a stock index, allowing the observation of return patterns on several groups of stocks with different characteristics. For each turn of the quarter, we compare the return in the last trading days of a quarter with the return in the first trading days of the next quarter to identify return anomalies. Furthermore, this chapter presents a detailed analysis of the daily CAR, which is conducted to understand the behaviour of stock groups in the first trading days of the quarters and to identify the duration of the January effect in Spain.

Our empirical analysis shows that the first three-quarters do not present a clear return anomaly. However, results obtained in the last quarter confirm the persistence of the turn-of-the-year effect in the Spanish stock market. This effect is observed for all stocks and is stronger for the small-caps and for those with poor returns. Moreover, when the anomaly is analysed according to the market trend, the results suggest that the intensity of the January effect is stronger in bear markets than in bull markets. In addition, the daily return analysis shows that the main return increase in the January effect occurs in the first 10 trading days of the year and that Law 40/1998 seems to have prolonged the duration of the January effect in recent years.

The chapter is organized as follows. Section 2 describes the data and methodology. Section 3 tests the quarterly return anomalies. Section 4 includes the daily analysis in the first trading days of the quarters. The final section concludes.

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the negative return.

[6] According to Law 35/2003, of November 4, item 17, managers must present a quarterly report for investors that includes, among other components, the portfolio composition of the fund. This legal order broadens the obligation to disclose annual and semi-annual portfolio holdings required by European Council Directive 85/611/EEC. In addition, CNMV Circular 4/2008, of September 11, which came into effect on March 31, 2009, states the possibility of disclosing a simplified quarterly report, which includes aggregated portfolio holdings. However, investors can ask for the full quarterly reports with the detailed portfolio holdings.

2.2 Data and methodology

The database used in this study is provided by the Madrid Stock Exchange. It consists of the daily closing price of all Spanish[7] stocks that trade in the Continuous Market (CM) and in the New Market of Spain[8] from December 1999 to January 2007. The data include all dividends, stock splits and seasoned equity offerings in this period. The sample is free of survivorship bias because we also include in our analysis stocks that disappeared during the study horizon.

The Spanish stock market has experienced a significant growth during the sample horizon, which is evident in the data description presented in Table 2.1. In terms of market capitalization, it shows that the CM represents 81%, on average, of total market capitalization. Given that the database used in this study contains only stocks issued in Spain, the sample represents 89%, on average, over the CM capitalization. The remaining 11% corresponds to foreign companies listed on the Spanish markets, from four companies in 1999 to eight in 2006.

Table 2.1: Database description

This table presents the capitalization and number of listed companies for the Spanish stock market, the CM and the sample used in this study. It also presents the percentage that CM represents over the total market and the percentage that the sample represents over the total market and over the CM. The following data correspond to December.

	1999	2000	2001	2002	2003	2004	2005	2006
Capitalization *(Million euro)*								
Total Spanish markets[a]	430,653	537,047	525,839	419,451	547,762	672,235	868,760	1,134,137
CM[b]	419,815	471,123	444,603	339,634	433,971	525,695	616,684	813,764
Sample	377,664	404,017	396,253	302,646	384,341	470,959	552,372	708,001
% CM over total market	97%	88%	85%	81%	79%	78%	71%	72%
% sample over total market	88%	75%	75%	72%	70%	70%	64%	62%
% sample over CM	90%	86%	89%	89%	89%	90%	90%	87%
Number of listed companies								
Total Spanish markets[a]	1,370	1,761	2,384	2,899	3,265	3,315	3,337	3,378
CM[b]	146	149	147	140	127	128	128	139
Sample	142	143	142	134	121	122	123	131
% CM over total market	11%	8%	6%	5%	4%	4%	4%	4%
% sample over total market	10%	8%	6%	5%	4%	4%	4%	4%
% sample over CM	97%	96%	97%	96%	95%	95%	96%	94%

[a] Source: BME. All markets included: CM, open outcry for fourth stock exchanges, alternative stock market (MAB), and market in Latin America securities (LATIBEX).
[b] Source: CNMV. Includes stocks that trade in continuous and new market.

Table 2.1 shows the low participation that the CM has in terms of the number of listed companies, only 6% on average. Nevertheless, it is significant that 6% of the listed companies have 81% of the total market capitalization because this market includes the major securities

[7]The database contains only companies issued in Spain, that is, those that have their International Securities Identification Number (ISIN) beginning with ES.

[8]The Continuous Market (Spanish Stock Market Interconnection System or SIBE) is the computerized and integrated trading system, legally defined for the negotiation of the major securities listed on Spanish stock markets. The New Market was a special trading segment, in which securities of hi-tech companies or companies with future growth potential were traded from April 2000 to December 2007. After its disappearance, these stocks again became part of the CM.

listed on Spanish stock market. The percentage of our sample over the total number of companies in the CM is very high, at approximately 96%, given the low number of foreign companies that we excluded.

The daily stock return is calculated in terms of the relative variation of the stock closing price. It is expressed as a percentage, and it is adjusted by dividends, stock splits and seasoned equity offerings.[9] Overall, the return of a stock i between day t_1 and t_2, with $t_1 < t_2$, is measured as follows:

$$r_i = \frac{(P_{i,t_2} \cdot S_i) - P_{i,t_1} + D_i}{P_{i,t_1}} \pm A_i \tag{2.1}$$

where P_{i,t_1} is the price of the stock i at the end of the day t_1, P_{i,t_2} is the price of the stock i at the end of the day t_2, S_i is the split, D_i is the dividend, and A_i is the amount used to adjust the return for seasoned equity offerings.

When a stock distributes a dividend, the return for this day is adjusted by adding this amount (D_i) to the closing price. In the case of stock splits, the return is adjusted by multiplying the closing price by the number of parts in which a stock is divided (S_i) during the period from t_1 to t_2. In contrast, for seasoned equity offerings, the adjustment is different depending on t: in the capital subscription period, the daily return is calculated adding the preferential right to the closing price; however, when the capital subscription period finishes, the return of the next day is calculated taking into account the seasoned equity offerings proportion and the subscription price. For this financial operation, the corresponding adjustment (A_i) is applied.

To identify the influence of funds' mandatory quarterly portfolio disclosures on Spanish stocks returns, we start from the approach used by Ng and Wang (2004) to show the turn-of-the-year return patterns. With this methodology, we test whether the return during the last trading days of the quarter is equal to the first trading days of the next quarter and, thus, identify abnormal returns in the market.

Ng and Wang (2004) classify the stocks into five size quintiles according to the breakpoints of the market capitalization of the New York Stock Exchange (NYSE) at the end of each September. Because the Spanish stock market capitalization is 11 times smaller than that of the NYSE,[10] we classify the Spanish stocks into four groups to avoid too-small quintiles, which would limit the significance of the results. Specifically, the stocks that trade on the last day of each quarter (March, June, September and December) are initially classified into two segments, stocks belonging to the Spanish benchmark Ibex-35 (*Ibex*) and the remaining (*NoIbex*).[11] Then, within each segment, the stocks are sorted into two subgroups, *Large* and *Small*, according to the market capitalization. This size breakpoint is set up in 60% in both *Ibex* and *NoIbex*. Note that the five largest stocks of *Ibex* reach, on average, 60% of market capitalization. To summarize and clarify the size difference of the four categories, we present some descriptive statistics in Table 2.2.

[9] These adjustments follow the technical rules for composition and calculation of Ibex and IGBM benchmarks defined by the Stock Exchange and Markets of Spain (BME).

[10] According to the World Federation of Exchanges (WFE), in 2006 the NYSE Group capitalization was 15,421 USD billion, whereas the BME Spanish Exchanges capitalization was 1,323 USD billion.

[11] The Ibex-35 is the main benchmark of the Spanish stock market. It is a market capitalization-weighted index consisting of the 35 most liquid Spanish stocks traded in the SIBE. In 2006, the Ibex-35 capitalization represented approximately 70% of the total Spanish market capitalization.

Table 2.2: Descriptive statistics of stocks categories

At the end of the quarter, stocks are classified into two groups, *Ibex* and *NoIbex*. Within each group, the stocks are sorted into two subgroups, *Large* and *Small*, according to the market capitalization. Summary statistics of stock market capitalization and the average number of companies in each category are shown in this table.

	Ibex-Large	**Ibex-Small**	**NoIbex-Large**	**NoIbex-Small**
Capitalization *(Million euro)*				
Mean	42,473	5,103	3,304	385
Median	38,408	3,177	2,384	218
Minimum	14,638	259	805	1
Maximum	95,456	29,859	42,059	2,996
Standard deviation	18,073	4,741	3,339	439
Interquartile range	27,242	4,805	2,176	446
Average number of companies	5	30	12	87

Next, within each size category, the stocks are classified into four quartiles according to the cumulative return of the stocks over the past 11 months,[12] as follows: the stocks are sorted as a function of their cumulative return, and the resulting group is divided into four equal groups. The return quartiles within each category are labelled as *Winner*, *Medium-Winner*, *Medium-Loser*, and *Loser*. The *Winner* quartile contains stocks with the largest returns, and the *Loser* quartile contains the stocks with the smallest returns. According to the design of our study, these size categories and return quartiles are rebalanced each quarter.

The returns for the last 10 trading days (LTTD) of a quarter, the first 10 trading days (FTTD) of the next quarter and the difference between these returns (DIFF) are computed for each stock. Finally, the average return is calculated for each previously designed group, and a t-statistical test[13] is applied for the null hypothesis of equal means. However, when the sample has few observations, the result of the t-test is verified with the Wilcoxon Signed-Ranks non-parametric test.[14]

As an illustration, consider the change of quarter from December to January: the stock return for the LTTD of December (R_{Dec}) is calculated and that corresponding to the FTTD of January (R_{Jan}), as well as the difference between these ($R_{Jan} - R_{Dec}$). If the return is higher in January than in December, then the difference will be positive and it will indicate a possible turn-of-the-year effect. A t-statistical is used to confirm the validity of the results. The difference of means test is conducted based on the null hypothesis that $\mu_{Jan} - \mu_{Dec} = 0$. Evidence in favour of the January effect, or the quarterly effect if the analysis is for another quarter, will be obtained when both the null hypothesis is rejected with an appropriate level of significance and the sign of the test is positive.

[12]The process is also carried out with the cumulative return over the past two months because we are analysing the quarter return behaviour and we want to verify the effect of short-term performance in the anomaly. Given that the results are very similar to the past 11-month return criterion, the outcome of this analysis is presented in Appendix 2.1.

[13]The test applied is the t-test for two independent normal populations with unknown means.

[14]For more detail about the test and the results obtained, see Appendix 2.2.

2.3 Quarter return anomalies in the Spanish stock market

Prior studies on abnormal stock returns throughout the calendar year in the Spanish stock market provide evidence of the existence of the turn-of-the-year effect. However, in our study, the stock returns around the other three quarter-ends are also analysed to identify return anomalies for every quarter from December 1999 to January 2007. This extended analysis checks the possible influence of institutional trading on the stock returns around portfolio disclosures.

2.3.1 Preliminary anomalous evidence

In a first approach to detect return anomalies in the Spanish stock market around the turn-of-the-year, we compute the monthly average returns for the different stock groups.

Panel A in Table 2.3 presents the results for *Ibex* and *NoIbex* groups and shows that the average stock return in January is significantly higher than in the remaining months of the year. For both groups, January returns appear to be almost three times higher than the average monthly return computed for the rest of the year. The difference between January and the rest-of-year (RY) returns is higher in the *NoIbex* than in the *Ibex* group, although both are positive and statistically significant.

Table 2.3: Average return for January and the rest of the year: Dec 1999-Jan 2007

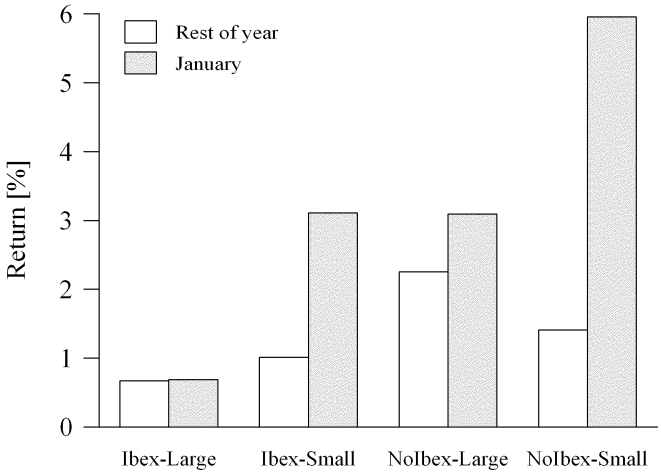
The table shows the average return for January, the average monthly return of the rest of the year (RY), and the difference between these returns (Diff (Jan,RY)). Panel A presents results for stocks classified in two main groups, *Ibex* and *NoIbex*. This classification is made for the last day of each quarter. Panel B reports results for the subgroups, which are constructed from the *Ibex* and *NoIbex* groups. Within each one, the stocks are sorted into *Large* and *Small*, according to the market capitalization. The sample period is from December 1999 to January 2007. The p-values of the t-test are in brackets.

	January	**Rest of year**	**Diff (Jan,RY)**
		Panel A: Main groups	
Ibex	2.72%	0.99%	1.73%
			(0.01)
NoIbex	3.81%	1.29%	2.52%
			(0.00)
		Panel B: Subgroups	
Ibex-Large	0.69%	0.67%	0.01%
			(0.99)
Ibex-Small	3.11%	1.01%	2.10%
			(0.00)
NoIbex-Large	3.09%	2.25%	0.84%
			(0.49)
NoIbex-Small	5.95%	1.41%	4.55%
			(0.00)

However, it would be interesting to observe what occurs in each group to identify possible

differences among stocks with high and low capitalization. In fact, according to Panel B of Table 2.3, only small subgroups (*Ibex-Small* and *NoIbex-Small*) show positive significant return differences. Similar results can be observed in Figure 2.1 that graphically displays average returns reported in Table 2.3. The January return in *NoIbex-Small* is interesting because it exceeds by almost 3.0% the return obtained by the other stock groups and because the difference in the return between January and the RY is the highest.

Figure 2.1: Graphical representation of Table 2.3



These results are consistent with those obtained in studies such as Reinganum (1983), Ng and Wang (2004), Haug and Hirschey (2006), among others, where the January effect is stronger in small-cap stocks. The explanations for this phenomenon have been based on two facts: at the end of the fiscal year, individual investors tend to sell poor performance securities in order to realize losses with tax purposes, and because their portfolio composition might be intensive in small-cap stocks, this behaviour affects the return of this type of stock. On the other hand, at the end of the year, institutional investors seek to eliminate embarrassing small-cap stocks to disclose high-quality portfolios. Therefore, anomalous trading behaviour of individual and institutional investors around year-end may explain the abnormally high return on small-cap stocks.

2.3.2 Quarterly anomalous evidence

Because an anomalous return in January was observed in the previous section, in this section, an analysis of the turn-of-the-quarter effect is carried out, with the aim of detecting significant return anomalies in quarterly changes that will subsequently allow us to explain the possible influence of window-dressing strategies by institutional investors around portfolio disclosure dates.

Table 2.4 presents the average returns for the LTTD of a quarter, the FTTD of the next quarter, and the difference between these returns for all stock groups. These results are also presented for *Winner* and *Loser* return quartiles into each group because we expect to verify if there are significant return differences between past loser and past winner stocks.

When quarters are considered in an aggregate form, Table 2.4 shows a positive and statistically significant difference between the returns of the FTTD and the LTTD for almost all stock groups, with *NoIbex-Large* being the only one with non-significant differences.

Table 2.4: Turn-of-the-quarter return patterns (aggregate)

At the end of each quarter, stocks are classified into two groups, *Ibex* and *NoIbex*. Within each group, the stocks are sorted into two subgroups, *Large* and *Small*, according to the market capitalization. Next, in each category, the stocks are classified into four return quartiles, in relation to the cumulative return of the stocks over the past 11 months. Stocks with the highest returns are contained in the *Winner* quartile, and the *Loser* quartile contains the stocks with the lowest returns. The table shows the average return for the last 10 trading days (LTTD) of a quarter, the first 10 trading days (FTTD) of the next quarter and the difference between these returns (DIFF(F,L)). This is presented for all stocks in the *Ibex* and *NoIbex* groups and for *Winner* and *Loser* return quartiles in each one. The sample period is from December 1999 to January 2007 and the p-values of the t-test are in brackets.

	All Stocks			Loser Return Quartile			Winner Return Quartile		
	LTTD	FTTD	DIFF (F,L)	LTTD	FTTD	DIFF (F,L)	LTTD	FTTD	DIFF (F,L)
Ibex-Large	-0.88%	1.89%	2.77%	-1.83%	2.10%	3.93%	-0.48%	1.66%	2.14%
			(0.00)			(0.04)			(0.19)
Ibex-Small	-0.49%	1.15%	1.63%	-0.97%	1.69%	2.66%	-0.80%	1.30%	2.10%
			(0.00)			(0.00)			(0.00)
NoIbex-Large	0.63%	0.96%	0.33%	0.79%	1.42%	0.63%	0.78%	0.39%	-0.39%
			(0.43)			(0.42)			(0.69)
NoIbex-Small	0.11%	2.13%	2.02%	-0.74%	2.91%	3.65%	0.41%	1.98%	1.56%
			(0.00)			(0.00)			(0.00)

According to the evidence presented in several papers that confirm that the January effect exists predominantly in small-cap stocks and is more pronounced in loser stocks, we expected that quarter anomalies would be especially significant for *NoIbex* stocks. However, we find that the two groups of *Ibex* stocks exhibit positive and significant differences, although it is evident that the major return differences between quarters (DIFF(F,L)) are observed in the loser return quartile.

When return differences are carefully observed, some interesting features are observed. In the first days of the quarters, an increasing pattern of the stock prices is common for all stock groups sorted in Table 2.4; this pattern is especially significant for the poor-performing small-cap stocks (*NoIbex-Small*), probably because of an over demand for them. Furthermore, in the last days of the quarters, a decreasing pattern of the stock prices is found in the Ibex groups (*Ibex-Large* and *Ibex-Small*) and in the loser return quartile of *NoIbex-Small*, which may mean that supply exceeds the demand, resulting in lower prices.

If these results are analysed according to the two main hypotheses of the January effect, then we can say that the return behaviour of *NoIbex-Small* is consistent with both window dressing and tax-loss selling because before year-end, individual and institutional investors tend to sell poor-performance and small-cap stocks. Individuals sell to reduce taxes, and institutions sell to alter their portfolios in order to demonstrate high-quality stock portfolios to their clients. However, it is prudent to study the anomalies in detail to understand what may be behind them.

In this sense, the turn-of-the-quarter return for each quarter is calculated and the results are reported in Table 2.5. Given that prior results suggest that one or more anomalies may exist in the Spanish stock market related to quarterly changes, here we try to identify the specific quarter(s) when the anomaly is significant.

Table 2.5: Turn-of-the-quarter return patterns

Each panel of this table shows the average return for the last 10 trading days (LTTD) of a quarter, the first 10 trading days (FTTD) of the next quarter and the difference between these returns (DIFF(F,L)). These values are presented for all stocks in the *Ibex* and *NoIbex* groups and for *Winner* and *Loser* retun quartiles in each one. The procedure to develop this table is similar to that described in Table 2.4. The sample period is from December 1999 to January 2007, and the p-values of the t-test are in brackets.

	All Stocks			Loser Return Quartile			Winner Return Quartile		
	LTTD	FTTD	DIFF (F,L)	LTTD	FTTD	DIFF (F,L)	LTTD	FTTD	DIFF (F,L)
	Panel A: Stock return in March and April								
Ibex-Large	-0.54%	2.39%	2.93%	-0.80%	3.11%	3.91%	-0.79%	0.88%	1.67%
			(0.02)			(0.29)			(0.32)
Ibex-Small	0.18%	1.11%	0.93%	-0.20%	1.37%	1.56%	-0.45%	0.59%	1.04%
			(0.09)			(0.25)			(0.30)
NoIbex-Large	1.29%	0.61%	-0.69%	1.19%	1.16%	-0.03%	-0.17%	-1.26%	-1.10%
			(0.38)			(0.99)			(0.33)
NoIbex-Small	1.73%	1.87%	0.14%	1.65%	1.67%	0.02%	1.43%	1.90%	0.47%
			(0.75)			(0.98)			(0.58)
	Panel B: Stock return in June and July								
Ibex-Large	-1.26%	0.02%	1.28%	-1.89%	-1.45%	0.44%	-0.22%	0.64%	0.86%
			(0.23)			(0.89)			(0.70)
Ibex-Small	-0.19%	-0.28%	-0.09%	-0.49%	-0.54%	-0.05%	0.07%	0.32%	0.26%
			(0.88)			(0.97)			(0.86)
NoIbex-Large	1.11%	0.24%	-0.88%	2.41%	1.66%	-0.75%	0.72%	-1.05%	-1.77%
			(0.20)			(0.60)			(0.19)
NoIbex-Small	-0.06%	0.17%	0.24%	-0.84%	-0.96%	-0.12%	0.18%	0.53%	0.35%
			(0.51)			(0.86)			(0.70)
	Panel C: Stock return in September and October								
Ibex-Large	-1.00%	2.50%	3.50%	-1.19%	3.79%	4.98%	-1.63%	2.23%	3.86%
			(0.06)			(0.20)			(0.47)
Ibex-Small	-0.97%	1.44%	2.41%	0.55%	2.35%	1.80%	-2.90%	1.19%	4.10%
			(0.00)			(0.38)			(0.01)
NoIbex-Large	0.28%	0.87%	0.59%	-0.62%	1.20%	1.82%	1.78%	0.22%	-1.56%
			(0.56)			(0.09)			(0.60)
NoIbex-Small	0.30%	1.38%	1.08%	-0.62%	4.20%	4.82%	1.04%	0.63%	-0.41%
			(0.38)			(0.31)			(0.64)
	Panel D: Stock return in December and January								
Ibex-Large	-0.75%	2.55%	3.30%	-3.23%	2.85%	6.07%	0.57%	2.74%	2.17%
			(0.03)			(0.25)			(0.55)
Ibex-Small	-0.90%	2.18%	3.08%	-3.36%	3.35%	6.72%	-0.05%	2.85%	2.90%
			(0.00)			(0.00)			(0.03)
NoIbex-Large	-0.13%	2.04%	2.17%	0.15%	1.62%	1.46%	0.77%	3.41%	2.64%
			(0.01)			(0.46)			(0.20)
NoIbex-Small	-1.28%	4.63%	5.91%	-2.84%	6.18%	9.02%	-0.80%	4.44%	5.24%
			(0.00)			(0.00)			(0.00)

The analysis of the first quarter change is presented in Panel A. Empirical evidence shows that most groups have differences that are not statistically significant, that is, near zero. Stocks in the *Ibex-Large* group are the only ones that exhibit a positive and significant return difference. In the loser return quartile of *Ibex-Large*, we find a large difference (3.91%) between the LTTD return in March and the FTTD in April. Nevertheless this difference is not significant.[15]

The second quarter is presented in Panel B. Because the stock returns in July and June are almost equal, the differences are near zero, and as a consequence, there is no evidence of stock return anomalies around this quarter-end.

Panel C shows the stock returns in the LTTD of September and the FTTD of October. In general, returns in October are higher than those in September. However, most of the differences are not significant, except for stocks in the *Ibex-Small* group and in its *Winner* return quartile, whose differences are statistically different from zero at the 1% and 5% level, respectively.

In summary, results for the first three-quarters (Panels A to C) indicate that stock returns, in general, do not exhibit significant anomalies in quarterly changes. These results are in accordance with those obtained by Miralles and Miralles (2007), with a different methodology, from January 1988 to December 2002.

Finally, the analysis of the last quarter (Panel D) confirms once again that the turn-of-the-year, or the January, effect exists in the Spanish stock market for the whole sample period, mainly for small-cap stocks and for recently poor performers, that is, for the loser return quartile in *Ibex-Small* and *NoIbex-Small* groups.

NoIbex-Small stocks have high January returns and low December returns, and the difference is statistically different from zero at the 1% significance level. The average return at the turn of the year in this group is 5.91%, whereas the other groups have less than 3.30%. The *Loser* return quartile, which contains the small-cap stocks with the lowest returns in the past 11 months, is the one with the greatest difference in returns because it shifts from -2.84% of the average return in December to 6.18% in January, which averages 9.02% in only 20 trading days. The *Winner* return quartile of the *NoIbex-Small* group also exhibits a turn-of-the-year effect because the difference between January and December returns is 5.24% and is significantly different from zero at the 1% level.

In addition, differences in returns in the *Ibex-Small* group are lower than those in *NoIbex-Small*, but both exhibit the January effect because the differences are positive and statistically significant. In large-sized stocks, *Ibex-Large* and *NoIbex-Large*, the difference between January and December returns is significant when it is not controlled for past returns.[16]

In general, Table 2.5 allows the identification of different return patterns between the first three-quarters and the last quarter of the year. The absence of significant anomalies in the first three-quarters seems to indicate that there are not significant pressures on stock prices around these quarterly changes. Given that individual investors do not have tax motivations in these quarters, the results suggest that institutional trading around these portfolio disclosures does carry sufficient repercussions in the stock market. These results might be explained by the hypothesis that investors pay more attention to annual reports

[15]This result is confirmed with a non-parametric test and the conclusion is the same. For more detail, see Appendix 2.2.

[16]The t-statistical result of the *Loser* quartile for the *Ibex-Large* group is verified with a non-parametric test, and the outcome is the same. See Appendix 2.2.

than to complementary reports throughout the year, leading to the possible lack of fund motivations to window-dress the first reports of the year (Elton *et al.*, 2010).

In contrast, abnormal returns found at the turn of the year suggest that there are significant pressures on stock prices. As several papers on the January effect have shown, a joint role of individual and institutional investors may be behind this return anomaly.

The negative returns at year-end (LTTD) for the *Loser* return quartile of *Ibex-Large*, *Ibex-Small* and *NoIbex-Small* might be consistent with both the tax-loss selling and window-dressing hypotheses because individual and institutional investors tend to sell poor performing stocks before year-end. When individuals sell stocks to induce capital losses and reduce their taxes, this trading behaviour produces a fall in the prices of loser stocks. A similar effect is caused by institutional investors that window-dress their portfolios before disclosure dates because they are prone to eliminate loser stocks. Moreover, the most common form of window dressing also consists of purchasing winner stocks at the end of the quarter to disclose high-quality portfolios. This behaviour might explain the fact that the *Winner* return quartile of all stock groups reports better returns in the LTTD than in other quartiles.

On the other hand, the return at the beginning of the year (FTTD) is positive in all stock groups sorted in Table 2.5, with the return being more prominent in *NoIbex-Small* stocks, especially in its *Loser* return quartile. This increasing pattern of the stock prices might be caused by an excess of demand of these stocks during the first days of the year.

Some empirical investigations have provided evidence that, once the year ends and the losses have been realized, individuals tend to repurchase the same stocks recently sold, causing an increase in stock prices (Grinblatt and Keloharju, 2004). Nevertheless, it is important to take into account that Spanish individual investors have lost tax incentives to generate capital losses since the enactment of Law 40/1998 on Personal Income Taxes (see footnote 5). Currently, individual investors are not allowed to reduce capital losses if they buy the same stock within the two months before or after the selling order that caused the capital loss.

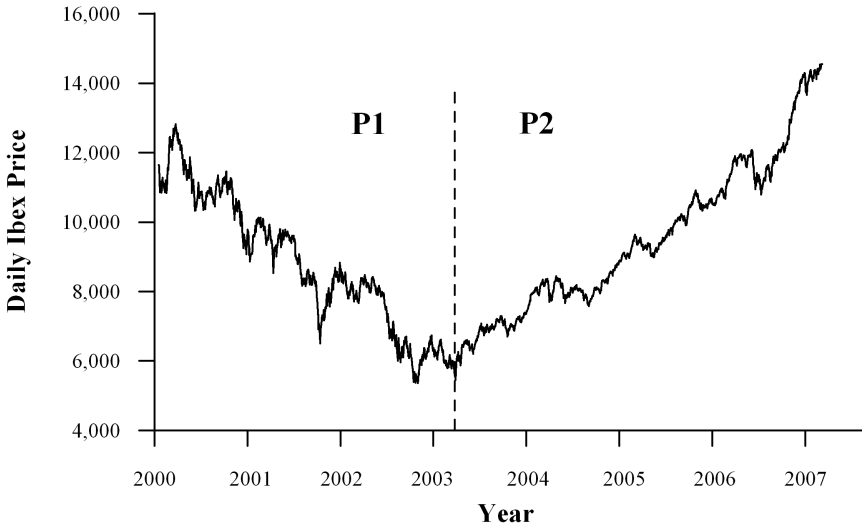
There are also papers that have analysed the trading behaviour of institutional investors at the beginning of the year, such as those presented by Ackert and Athanassakos (2000) and Ng and Wang (2004). These studies show that, once the year ends and the portfolio holdings are presented, institutional investors tend to manipulate the risk of their portfolios by purchasing smaller stocks in an attempt to outperform their benchmarks and to obtain winner results in the following year. These authors suggest that institutional managers engage in this practice, especially at the beginning of the year, because they are less concerned about including well-known stocks in their portfolios and can tolerate more risk, as they have sufficient time to take ex-post remedial actions to adjust the portfolio. In this case, an aggregate buying behaviour by institutional investors may also explain the highest return reached by stocks in the *Loser* return quartile of *NoIbex-Small*, reported in Panel D of Table 2.5.

To summarize, the lack of significance during the first quarters suggests that neither individuals nor institutions have sufficient trading motivation to affect the stock market around these quarter changes. However, the significant differences in the last quarter may be consistent with both the tax-loss selling and window-dressing hypotheses. Any of these hypotheses may explain this anomaly, but it is also possible that both aggregate trading by individual and institutional investors around year-end may have significant influence in Spanish stock returns.

2.3.3 Results by periods

In this section, we analyse two different time sub-periods to verify the robustness of the January effect observed in the Spanish stock market for the entire sample period. Because the Spanish benchmark, Ibex-35, had two clearly different trends during our study horizon (see Figure 2.2), the sample period is divided into two parts using this criterion. The first period (P1) covers December 1999 to February 2003, when the market had a downward price trend. The second period (P2) consists of a bullish market, which covers March 2003 to January 2007.[17]

Figure 2.2: Ibex-35 price evolution: December 1999 - January 2007



The analysis of stock returns around each quarter-end for bullish and bearish markets, allows us to analyse the relationship between the January effect and the annual performance of the market. The methodology applied in the previous section for the entire sample period is used for the two new sub-periods. Table 2.6 reports the average return difference around each quarter-end (DIFF(F,L)).[18]

Reviewing the results for the first three-quarters of the year, we find two distinct patterns between sub-periods: the positive return differences observed at the turn of the first quarter (Panel A) in P2, which are statistically different from zero for *Ibex-Large*, *Ibex-Small* and *NoIbex-Small*; and the positive return differences found in the third quarter (Panel C) in P1, which are significant for *Ibex-Small*, *NoIbex-Large*, *NoIbex-Small* and for their *Winner* return quartiles.

Finally, in the last turn of the quarter (Panel D), patterns between P1 and P2 are different, although both show evidence in favour of the January effect. When there is a bear market (P1), small-cap stock groups (*Ibex-Small* and *NoIbex-Small*) reach high returns during this 20-day period, being abnormally positive in their *Loser* return quartiles. On the other hand, when there is a bull market (P2), the return anomaly is present in both groups of the *NoIbex* stocks, although the January effect in the *Loser* return quartile of *NoIbex-Small*

[17]The annualized cumulative return in the first period (P1) is -20.31%, whereas in the second period (P2) it is 28.48%.

[18]The t-statistical result of extreme quartiles for *Ibex-Large* and *NoIbex-Large* groups are verified with a non-parametric test. Only the two cases marked with * in Table 2.6 are statistically significant with this test. See Appendix 2.2.

Table 2.6: Turn-of-the-quarter return patterns by periods

The table reports the average return difference around quarterly changes (DIFF(F,L)), that is, between the LTTD and the FTTD of the next quarter. This difference is presented for all stocks in the *Ibex* and *NoIbex* as well as for *Loser* and *Winner* return quartiles in each group. The results are shown by panels for each quarter. The sample is divided into two periods (1 and 2) according to the trend of the market. The procedure to develop this table is similar to that described in Table 2.4. The p-values of the t-test are in brackets, and cases marked by * are statistically significant using the Wilcoxon Signed-Ranks test (see Appendix 2.2).

	Period 1 (Bearish market) December 1999 - February 2003			**Period 2 (Bullish market)** March 2003 - January 2007		
	All Stocks	Loser Ret.Q	Winner Ret.Q	All Stocks	Loser Ret.Q	Winner Ret.Q
	Panel A: Stock return in March and April - DIFF (F,L)					
Ibex-Large	-1.13%	-0.39%	-0.48%	5.77%	7.13%	3.29%
	(0.43)	(0.87)	(0.81)	(0.00)	(0.28)	(0.23)
Ibex-Small	-1.49%	0.02%	1.08%	2.73%	2.72%	1.01%
	(0.07)	(0.99)	(0.56)	(0.00)	(0.16)	(0.36)
NoIbex-Large	-1.76%	0.73%	-1.09%	0.08%	-0.54%	-1.10%
	(0.17)	(0.72)	(0.63)	(0.93)	(0.82)	(0.40)
NoIbex-Small	-1.32%	-3.39%	0.77%	1.38%	2.89%	0.22%
	(0.06)	(0.01)	(0.51)	(0.02)	(0.01)	(0.86)
	Panel B: Stock return in June and July - DIFF (F,L)					
Ibex-Large	2.23%	-0.34%	2.94%	0.57%	1.02%	-0.70%
	(0.24)	(0.97)	(0.52)	(0.66)	(0.77)	(0.81)
Ibex-Small	0.68%	-0.86%	4.44%	-0.69%	0.61%	-3.18%
	(0.53)	(0.73)	(0.12)	(0.31)	(0.68)	(0.01)
NoIbex-Large	-0.32%	-2.18%	-3.34%	-1.25%	0.33%	-0.59%
	(0.76)	(0.36)	(0.17)	(0.16)	(0.86)	(0.71)
NoIbex-Small	1.23%	-0.45%	3.15%	-0.60%	0.16%	-2.00%
	(0.01)	(0.67)	(0.01)	(0.24)	(0.85)	(0.13)
	Panel C: Stock return in September and October - DIFF (F,L)					
Ibex-Large	5.19%	7.28%	10.29%	2.23%	3.25%	-0.97%
	(0.12)	(0.45)	(0.13)	(0.32)	(0.37)	(0.91)
Ibex-Small	5.14%	5.85%	7.28%	0.40%	-1.13%	1.79%
	(0.00)	(0.16)	(0.01)	(0.57)	(0.52)	(0.25)
NoIbex-Large	2.95%	2.93%	5.25%	-1.03%	1.08%	-6.10%
	(0.03)	(0.09)	(0.03)	(0.47)	(0.45)	(0.18)
NoIbex-Small	1.55%	2.46%	2.09%	0.67%	6.83%	-2.55%
	(0.02)	(0.10)	(0.02)	(0.76)	(0.43)	(0.08)
	Panel D: Stock return in December and January - DIFF (F,L)					
Ibex-Large	5.24%	12.62%	3.27%	1.36%	-0.48%	1.06%
	(0.07)	(0.25)	(0.67)	(0.16)	(0.76)	(0.71)
Ibex-Small	5.12%	12.83%	3.55%	1.06%	0.61%	2.25%
	(0.00)	(0.00)	(0.11)	(0.06)	(0.56)	(0.11)
NoIbex-Large	0.78%	0.59%	-0.79%	3.38%	2.19%	5.49%
	(0.60)	(0.89)	(0.82)	(0.00)	(0.14)	(0.03)
NoIbex-Small	5.25%	10.51%	2.87%	6.68%	7.33%	7.95%
	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)

is lower than in P1. As is found in the previous section and in several investigations, this return anomaly is characterized by an abnormally positive return around year-end, especially for loser small-cap stocks.

When results by period (Table 2.6) are compared with the results for the entire sample (Table 2.5), we find that the January effect in small-cap stocks remains evident regardless of the market trend, although this effect is stronger in bear markets. This behaviour agrees with results obtained by Rozeff (1985), De Bond and Thaler (1987), Dhaliwal and Trezevant (1993) and Gu (2003), who found that the turn-of-the-year effect on loser stocks was more pronounced during periods of poor performance. Dhaliwal and Trezevant (1993) offer a tax explanation: near the end of down-market years, investors tend to have a high percentage of loser stocks in their portfolios and, therefore, the selling pressure is greater than during up-market years, with the consequent reinforcement of the January effect. Although they do not contemplate the effect of institutional investors in this phenomenon, it is also possible that at the end of down-market years, these investors more actively sell poor performance stocks to show high-quality stock portfolios to their clients.

However, it is interesting that the return difference around the first quarter change has positive values only when the market trend is increasing (P2). This result may be explained through trading behaviour by institutional investors, in line with the findings of Athanassakos and Schnabel (1994). They show that Canadian pension and mutual funds invest more in the stock market in the first quarter than in the rest of the year and that this phenomenon is especially strong in bull market years because managers tend to take advantage of the increase in the value of their portfolios caused by the bull market. Nevertheless, a more accurate explanation for the Spanish case will be confirmed in the following chapters, in which trading activity in equity funds is analysed.

To summarize, the results again confirm that the Spanish stock market has a calendar anomaly at the turn of the year, which is stronger for small-cap and loser stocks when the market has a downward trend. The differences in the intensity of the January effect between two periods suggest that the behaviour of investors might be dependent on market trends. In addition, we found some significant return differences in the first quarter for bullish markets and in the third quarter for bearish markets.

2.4 A closer look at the first trading days of the quarters

In the previous sections, we confirm the existence of the January effect for the Spanish market. After this finding, we consider that it is important to extend the previous analysis by investigating the daily pattern of the effect to better understand the behaviour of stocks in the first trading days of a quarter. This approach will allow us to analyse the turn-of-the-quarter effect in detail and to determine the duration of the January effect in Spain.

Following the innovative paper of Moller and Zilca (2008), we study the daily cumulative abnormal returns during the first 65 trading days of each quarter for each size stock group.[19] We begin by calculating the average daily return for each stock group in the sample period (January 2000 to December 2006), as follows:

[19]The first 65 trading days of a quarter approximately correspond to the calendar quarter.

$$ADR_i = \frac{\sum_{y=1}^{Y} \left(\frac{\sum_{t=1}^{n_y} R_{i,t,y}}{n_y} \right)}{Y} \tag{2.2}$$

where ADR_i is the average daily return of stock group i in the sample period, $R_{i,t,y}$ is the return of group i on day t in year y, n_y is the number of trading days in year y, and Y is the number of years in the period studied.

The average abnormal return ($AR_{i,t}$) of stock group i on day t, for values of t from 1 to 65, is then calculated as:

$$AR_{i,t} = \frac{\sum_{y=1}^{Y} R_{i,t,y}}{Y} - ADR_i \tag{2.3}$$

Finally, the cumulative abnormal return ($CAR_{i,k}$) of group i from day 1 to k, is as follows:

$$CAR_{i,k} = \sum_{t=1}^{k} AR_{i,t} \tag{2.4}$$

where day 1 is the first trading day of the quarter, and k = 1, 2,..., 65.

The results of computing the cumulative abnormal returns (equation 2.4) for each stock group and for each quarter are displayed in Figure 2.3. This figure shows two different patterns: the first and the last quarters have positive and increasing CAR, whereas the second and the third quarters present a mainly negative and decreasing CAR. These results are consistent with findings presented in Section 2.3.2 (Table 2.5) because there is no evidence of return anomalies during the first two quarter changes of the year (March-April and June-July). Nevertheless, for the third-quarter change (September-October), we found weak evidence of abnormally higher October returns than those found in September, especially in Ibex groups, which is in accordance with patterns displayed Figure 2.3d. Finally, the CAR in the first quarter of the year (January-March) also provides evidence in favour of the January effect, confirming previous results in this chapter.

To statistically support the differences among stocks groups shown in Figure 2.3, we apply the t-statistical test for CAR mean differences among groups within each quarter. The results are presented in Table 2.7. Panel A shows the CAR mean differences among stock groups in the first quarter, that is, from January to March. In this case, smallest-cap stocks (*NoIbex-Small*) have the highest CAR, which is reflected in positive and significant differences among other groups. For instance, the average CAR of *NoIbex-Small* exceeds by 4.26% the CAR of *Ibex-Large*. These results again confirm that the January effect is a return anomaly especially concentrated in small-cap stocks. In contrast, the last quarter (Panel D) indicates that large stocks (*Ibex-Large* and *Ibex-Small*) present higher CAR values than small-cap stocks (*NoIbex-Large* and *NoIbex-Small*), which is reflected in negative and significant differences among these groups.

These results are consistent with the main hypothetical explanations of the January effect: tax-loss selling and window dressing. The effect of trading activity by institutional investors, who demand high-quality stocks to disclose an attractive portfolio, may be the reason for the high CAR of Ibex stocks before year-end. On the other hand, the aggregate demand of individual and institutional investors may be the reason for the high CAR of small-cap stocks after year-end.

Figure 2.3: Cumulative Abnormal Return

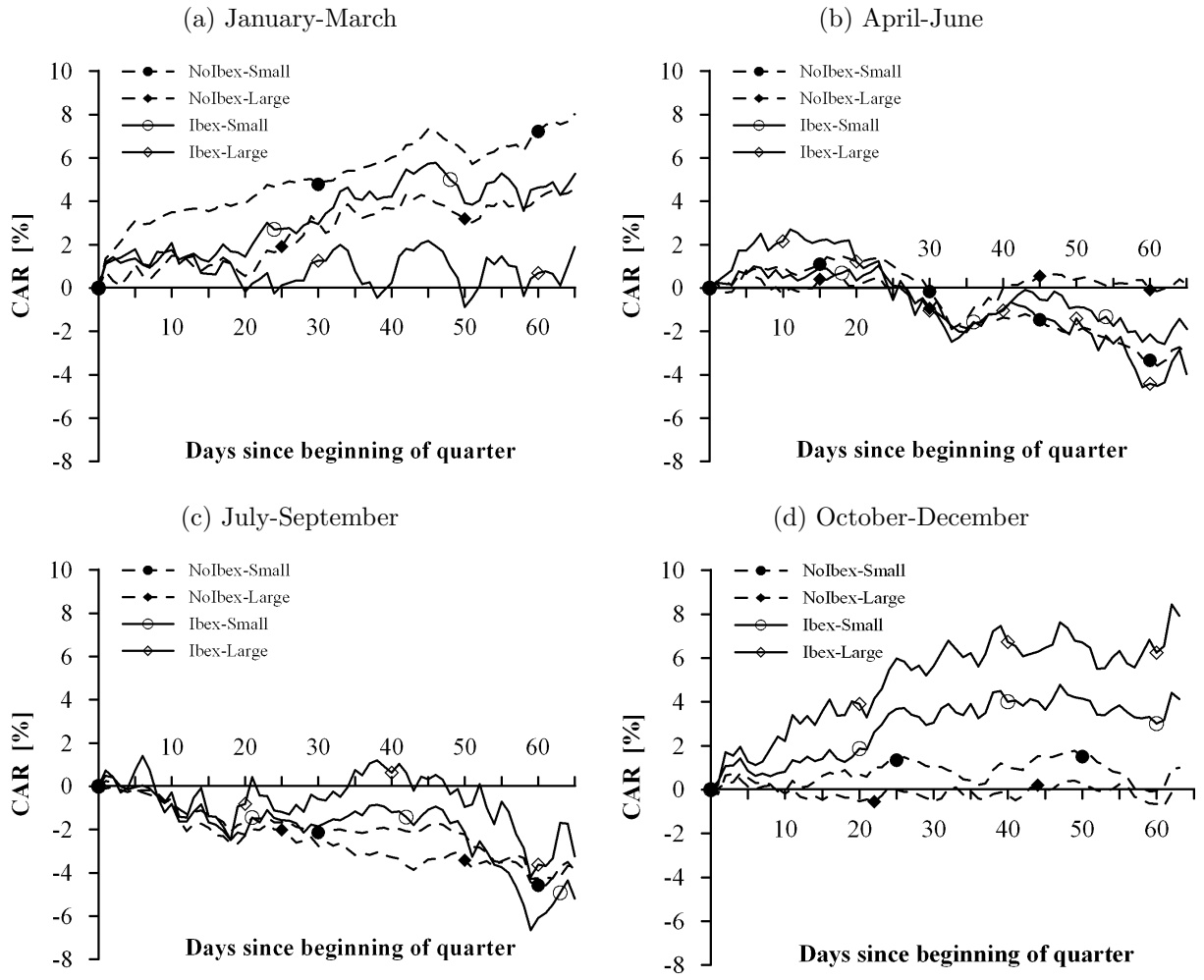


Table 2.7: CAR mean differences among groups

This table presents CAR mean differences among groups within each quarter. The statistical test is conducted based on the null hypothesis that the difference of means between two groups is equal to zero, and the alternative hypothesis is non-directional. For example, the first contrast in Panel A is made for $H_0 : \mu_{Ibex-Small} - \mu_{Ibex-Large} = 0$ and for $H_1 : \mu_{Ibex-Small} - \mu_{Ibex-Large} \neq 0$, and the result indicates that CAR in *Ibex-Small* is higher than *Ibex-Large* group, with a confidence of 99%. The p-values of the t-test are in brackets.

	Ibex-Small	NoIbex-Large	NoIbex-Small		Ibex-Small	NoIbex-Large	NoIbex-Small
	Panel A: January				**Panel B: April**		
Ibex-Large	2.44%	1.69%	4.26%	Ibex-Large	0.06%	0.58%	-0.11%
	(0.00)	(0.00)	(0.00)		0.84	(0.03)	0.73
Ibex-Small		-0.74%	1.83%	Ibex-Small		0.52%	-0.17%
		(0.00)	(0.00)			(0.00)	0.47
NoIbex-Large			2.57%	NoIbex-Large			-0.69%
			(0.00)				(0.00)
	Panel C: July				**Panel D: October**		
Ibex-Large	-1.35%	-1.89%	-1.32%	Ibex-Large	-2.18%	-5.16%	-4.26%
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
Ibex-Small		-0.54%	0.03%	Ibex-Small		-2.98%	-2.08%
		(0.03)	0.92			(0.00)	(0.00)
NoIbex-Large			0.56%	NoIbex-Large			0.90%
			(0.01)				(0.00)

Given that the most significant anomalous returns are found around the year-end, we analyse in greater detail the stock returns in the first trading days of the year. Panel A of Figure 2.3 shows that the CAR increases continuously during the first quarter for almost all of the stock groups. Moreover, Table 2.8 indicates that the maximum CAR occurs between days 45 and 65, depending on the stock group. This result reflects the fact that the duration of the January effect exceeds the first 10 trading days, which are commonly analysed, although it is evident that the main return increase occurs in early January.

Table 2.8: Maximum Cumulative Abnormal Return

This table shows the maximum Cumulative Abnormal Return (Max CAR) during the first 65 trading days, the day on which this is obtained, and the percentage of the maximum CAR reached on days 5, 10, 45 and 65. This information is presented for the size stock groups (*Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, and *NoIbex-Small*). These stock groups are constructed as described in Table 2.4

	Ibex-Large	**Ibex-Small**	**NoIbex-Large**	**NoIbex-Small**
Max CAR	2.18%	5.78%	4.58%	8.01%
Day of max CAR	45	46	65	65
% of max CAR on day 5	82%	24%	24%	39%
% of max CAR on day 10	96%	30%	32%	44%
% of max CAR on day 45	100%	99%	91%	92%
% of max CAR on day 65	-	-	100%	100%

In this sense, Table 2.8 shows clearly that in the first 10 trading days of January, stocks in the *Ibex-Large* group reach 96% of their maximum CAR, while other stock groups reach between 30% and 44%. These results suggest that stocks with higher market capitalization have a distinct behaviour in early January because they experience a demand that is more concentrated in the first trading days than the rest of the stocks. These results are consistent with evidence reported by Keim (1983), who found that almost 50% of the January effect in the US is concentrated on the first few trading days of the year.

The daily analysis of the January effect also allows us to confirm previous findings that small-cap stocks included in the *NoIbex* and *Ibex* groups have the strongest January effect because both groups present the major cumulative abnormal return, especially the smallest-cap stock group *NoIbex-Small* (8.01%).

2.4.1 Influence of the current personal income tax law on the January effect

The fact that previous analyses show that the maximum CAR occurs after day 45, has motivated an additional analysis to investigate the evolution of the January effect in the Spanish stock market. This motivation is even more clear as in the US market, Moller and Zilca (2008) find that from 1995 to 2004 the maximum CAR occurs on day 16, which is a considerably shorter duration compared with our results.

Given that our study horizon is characterized by the enactment of Law 40/1998 on the reform of the Personal Income Tax Law (see footnote 5), we calculate the CAR for Ibex-

35 and IGBMT[20] benchmarks during two sub-periods: before Law 40/1998 (1994-1998) and after (1999-2006). Therefore, this analysis will allow us to examine whether this fiscal amendment has affected the duration of the January effect, given its potential influence on individuals' trading motivations around year-end. The results of this analysis are shown in Figure 2.4 and Table 2.9.

Figure 2.4: Cumulative Abnormal Return for Spanish stock indices

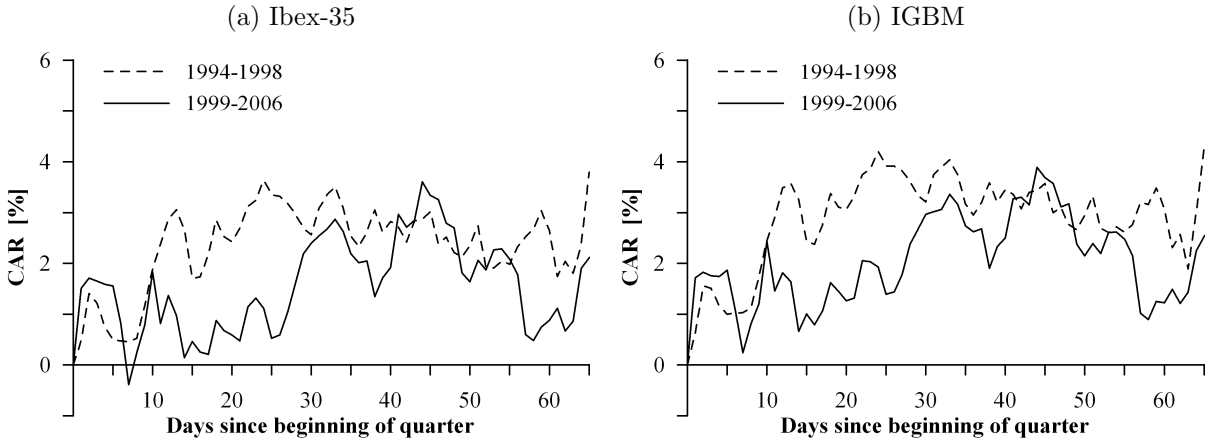


Table 2.9: Maximum Cumulative Abnormal Return for Spanish stock indices

This table shows the maximum Cumulative Abnormal Return (Max CAR) during the first 65 trading days, the day on which this is obtained, and the percentage of the maximum CAR reached on days 5, 10, 24 and 44. These values are presented for Ibex-35 and IGBMT indices.

	Ibex-35		**IGBMT**	
	1994-1998	1999-2006	1994-1998	1999-2006
Max CAR	3.63%	3.61%	4.20%	3.89%
Day of max CAR	24	44	24	44
% of max CAR on day 5	13%	43%	24%	48%
% of max CAR on day 10	52%	51%	58%	63%
% of max CAR on day 24	100%	31%	100%	50%
% of max CAR on day 44	-	100%	-	100%

The results obtained suggest that before tax reform, the January effect was much shorter than in recent years. Although the maximum CAR does not present a considerable change between sub-periods, the day in which it occurs has moved forward. Before Law 40/1998, it occurred on day 24, but in the most recent period, it occurred on day 44. This result is in the opposite direction of what Moller and Zilca (2008) found for the US stock market. In their study, the maximum CAR occurs on a much earlier day in the 1995-2004 period (day 16) than in the 1965-1994 period (day 74), suggesting that in recent years, some investors have become better informed and are less willing to purchase stocks after the January effect reaches the maximum CAR.

[20]The IGBMT is the Total Madrid Stock Exchange General Index. It is a market capitalization-weighted index that measures the performance of a select number of stocks and is adjusted by dividends and seasoned equity offerings.

The fact that after the fiscal reform, the maximum CAR in January was reached around the 45th trading day would suggest that the trading behaviour of individual investors is probably prolonging the January effect. It might be explained by the current mandate to realize capital losses if individuals purchase stocks that are similar to those sold within a period of two months.

In summary, CAR analysis among Spanish stock benchmarks again provide evidence in favour of the January effect, which has been prolonged with the enactment of Law 40/1998 but continues to concentrate more than 50% of their abnormally high returns on the first trading days of the year.

2.5 Summary and conclusions

The January effect has motivated many investigations because it is a long-lasting phenomenon, the causes of which have not yet been clearly identified. Several studies provide evidence of this effect in the Spanish stock market and of its possible relationship with the tax motivations of individual investors. However, in this chapter we extended the analysis, studying quarterly patterns of stock returns to identify the possible influence of disclosed portfolio reports of equity funds in this market.

The quarterly return anomalies are analysed comparing the return in the last 10 trading days of a quarter with the return in the first 10 trading days of the next quarter. Results show that the first three-quarters do not exhibit a significant return difference, which is consistent with the results recently obtained for the Spanish market by Miralles and Miralles (2007) for a different sample period, with a different methodology. Given that individual investors do not have tax motivations that influence stock returns in the first part of the year, results may provide evidence that trading behaviour of institutional investors around disclosure dates does not carry sufficient repercussions in the stock market.

The results obtained for the last quarter allow us to confirm that the January effect reported in early investigations still persists in the Spanish market. These return anomalies are especially relevant for small-cap stocks and poor-performing stocks. These results agree with several studies about the phenomenon, which may suggest that both tax-loss selling and window-dressing practices play an important role in the January effect. The conclusions are robust after controlling for market conditions. This complementary analysis shows that the intensity of the January effect is stronger in downward markets than in upward markets.

To examine in greater detail the behaviour of stocks in the January effect, we extend previous studies by analysing the daily pattern of the effect through the daily cumulative abnormal returns for different stock groups. The findings show that the Spanish January effect lasts approximately 45 trading days, although the main return increase occurs in the first 10 trading days, being more pronounced in large-cap stocks. Furthermore, in an attempt to examine the influence of the current personal income law on the January effect, we find that the duration of this effect has been considerably longer in recent years, which is the opposite of the conclusion provided by Moller and Zilca (2008) for the US stock market.

In conclusion, the evidence obtained in this study supports the fact that the Spanish stock market has a turn-of-the-year anomaly, which is persistent in the whole sample period. This phenomenon might be explained with tax-loss selling and window-dressing hypotheses because stock return behaviour is in line with these. Nevertheless, additional investigation is

necessary to identify the true causes of the return anomaly because it appears that individual investors do not have sufficient tax motivation under the current fiscal law. In addition, the lesser anomaly in the first three-quarters requires a confirmation that window dressing by institutional investors occurs because they present holding reports every quarter. Therefore, it would be interesting to continue the research to understand the trading behaviour of institutional investors around disclosure dates and to discover their true contribution to the January effect.

Appendix 2.1

Turn-of-the-quarter return patterns with two-month performance classification

Table 2.10. Turn-of-the-quarter return patterns with two-month performance classification

At the end of each quarter, stocks are classified into two groups, *Ibex* and *NoIbex*. Within each group, the stocks are sorted into two subgroups, *Large* and *Small*, according to the market capitalization. Next, in each category, the stocks are classified into four return quartiles in relation to the cumulative return of the stocks over the past two months. Stocks with the highest returns are contained in the *Winner* return quartile, and the *Loser* quartile contains the stocks with the lowest returns. The table shows the average return for the last 10 trading days (LTTD) of a quarter, the first 10 trading days (FTTD) of the next quarter and the difference between these returns (DIFF(F,L)). This is presented for all stocks in the *Ibex* and *NoIbex* groups and for *Winner* and *Loser* return quartiles in each one. The sample period is from December 1999 to January 2007, and the p-values of the t-test are in brackets.

	All Stocks			Low Perf. Quartile			High Perf. Quartile		
	LTTD	FTTD	DIFF(F,L)	LTTD	FTTD	DIFF(F,L)	LTTD	FTTD	DIFF(F,L)
	Panel A: Stock return in March and April								
Ibex-Large	-0.45%	2.55%	3.00%	0.80%	3.78%	2.98%	-0.57%	2.00%	2.57%
			(0.02)			(0.51)			(0.46)
Ibex-Small	0.10%	0.98%	0.88%	0.25%	0.95%	0.70%	0.48%	0.23%	-0.24%
			(0.11)			(0.62)			(0.81)
NoIbex-Large	1.47%	0.71%	-0.76%	2.18%	2.12%	-0.07%	-0.82%	0.93%	1.76%
			(0.34)			(0.98)			(0.02)
NoIbex-Small	1.74%	1.90%	0.15%	2.15%	1.27%	-0.87%	0.90%	2.17%	1.27%
			(0.73)			(0.35)			(0.25)
	Panel B: Stock return in June and July								
Ibex-Large	-1.26%	0.02%	1.28%	-1.22%	0.49%	1.71%	-1.11%	-0.05%	1.05%
			(0.23)			(0.57)			(0.63)
Ibex-Small	-0.19%	-0.28%	-0.09%	-0.86%	-0.68%	0.18%	-0.86%	0.48%	1.34%
			(0.88)			(0.90)			(0.29)
NoIbex-Large	1.04%	0.23%	-0.80%	1.21%	-0.45%	-1.66%	0.13%	0.16%	0.03%
			(0.24)			(0.30)			(0.98)
NoIbex-Small	-0.02%	0.10%	0.12%	-0.14%	-1.11%	-0.97%	-0.09%	0.65%	0.73%
			(0.74)			(0.31)			(0.38)
	Panel C: Stock return in September and October								
Ibex-Large	-1.00%	2.50%	3.50%	-1.92%	3.13%	5.06%	-2.37%	2.31%	4.68%
			(0.06)			(0.16)			(0.31)
Ibex-Small	-0.92%	1.42%	2.35%	0.09%	0.80%	0.71%	-2.01%	1.77%	3.78%
			(0.00)			(0.69)			(0.02)
NoIbex-Large	0.34%	0.72%	0.38%	-0.13%	1.39%	1.51%	0.43%	0.82%	0.39%
			(0.70)			(0.54)			(0.84)
NoIbex-Small	0.41%	1.36%	0.95%	0.54%	0.37%	-0.17%	0.16%	4.95%	4.79%
			(0.43)			(0.85)			(0.30)

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	All Stocks			Low Perf. Quartile			High Perf. Quartile		
	LTTD	FTTD	DIFF(F,L)	LTTD	FTTD	DIFF(F,L)	LTTD	FTTD	DIFF(F,L)
	Panel D: Stock return in December and January								
Ibex-Large	-0.75%	2.55%	3.30%	-1.17%	3.05%	4.22%	0.02%	2.92%	2.90%
			(0.03)			(0.40)			(0.31)
Ibex-Small	-0.93%	2.15%	3.08%	-1.15%	2.71%	3.85%	-1.14%	2.08%	3.23%
			(0.00)			(0.02)			(0.04)
NoIbex-Large	1.93%	2.16%	0.23%	0.34%	2.76%	2.42%	7.69%	3.61%	-4.08%
			(0.89)			(0.27)			(0.49)
NoIbex-Small	-1.35%	4.65%	6.00%	-1.99%	6.13%	8.12%	-2.16%	4.36%	6.52%
			(0.00)			(0.00)			(0.00)

Appendix 2.2

Wilcoxon Signed-Ranks test

The anomalies in quarterly changes are detected by the differences of the average returns in each group, which is confirmed by statistical tests. Nevertheless, when the sample is small, the t-test result is verified with the Wilcoxon Signed-Ranks non-parametric test. In this sense, we verified the results presented in Table 2.5 for *Winner* and *Loser* return quartiles of *Ibex-Large* group in each quarter and the results presented in Table 2.6 for extreme-return quartiles of *Ibex-Large* and *NoIbex-Large* groups in each period and quarter.

Following the Wilcoxon Signed-Ranks test procedure (Sheskin, 2004), absolute values of DIFF(F,L) are arranged in descending order. Then, the lowest absolute value obtains a rank of 1, and so on, until the highest rank is assigned to the highest absolute value. After that, the sign of each DIFF(F,L) is placed in front of its rank, and the sum of the ranks that have a positive sign ($\sum R+$) and the sum of the ranks that have a negative sign ($\sum R-$) are calculated.

Taking into account that the null hypothesis is that DIFF(F,L) is equal to zero and that the alternative hypothesis is non-directional, we expect $\sum R+$ and $\sum R-$ to be equivalent. To test this hypothesis, the absolute value of the smaller one is designated as the Wilcoxon T test statistic, and this T value is interpreted by employing the Table of Critical T Values for this test. To be significant, the obtained value of T must be equal or less than the tabulated critical two-tailed 0.05 T value.

Table 2.11 shows the results obtained by applying the prior procedure in the cases indicated previously. In most cases, the non-directional alternative hypothesis (DIFF(F,L)$\neq 0$) is not supported at the 0.05 level, as the T value is greater than the tabulated critical two-tailed value, which corroborates results obtained with the t-test. However, two return differences in Table 2.6 are slightly significant because their T values are equal to the tabulated critical value (*Winner* quartile of *Ibex-Large* and *Loser* quartile of *NoIbex-Large* in the third-quarter, Period 1), but these results do not significantly alter the overall performance found in this quarter.

Table 2.11: Results of the Wilcoxon Signed-Ranks test

Quarter	Group	Return quartile	DIFF(F,L) verified	$\sum R+$	$\sum R-$	T value	Critical value
Verifications in Table 2.5							
First	Ibex-Large	Loser	3.91%	21	7	7	2
		Winner	1.67%	20	8	8	2
Second	Ibex-Large	Loser	0.44%	18	10	10	2
		Winner	0.86%	14	14	14	2
Third	Ibex-Large	Loser	4.98%	22	6	6	2
		Winner	3.86%	19	9	9	2
Fourth	Ibex-Large	Loser	6.07%	22	14	14	3
		Winner	2.17%	22	14	14	3

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Quarter	Group	Return quartile	DIFF(F,L) verified	$\sum R+$	$\sum R-$	T value	Critical value
Verifications in Table 2.6							
First	Ibex-Large (P1)	Loser	-0.39%	3	3	3	0
		Winner	-0.48%	3	3	3	0
	NoIbex-Large (P1)	Loser	0.73%	15	21	15	3
		Winner	-1.09%	18	18	18	3
	Ibex-Large (P2)	Loser	7.13%	9	1	1	0
		Winner	3.29%	9	1	1	0
	NoIbex-Large (P2)	Loser	-0.54%	31	47	31	13
		Winner	-1.10%	29	49	29	13
Second	Ibex-Large (P1)	Loser	-0.34%	2	4	2	0
		Winner	2.94%	4	2	2	0
	NoIbex-Large (P1)	Loser	-2.18%	18	27	18	5
		Winner	-3.34%	11	34	11	5
	Ibex-Large (P2)	Loser	1.02%	5	5	5	0
		Winner	-0.70%	5	5	5	0
	NoIbex-Large (P2)	Loser	0.33%	43	35	35	13
		Winner	-0.59%	30	48	30	13
Third	Ibex-Large (P1)	Loser	7.28%	5	1	1	0
		Winner	10.29%	6	0	0	0
	NoIbex-Large (P1)	Loser	2.93%	33	3	3	3
		Winner	5.25%	32	4	4	3
	Ibex-Large (P2)	Loser	3.25%	7	3	3	0
		Winner	-0.97%	5	5	5	0
	NoIbex-Large (P2)	Loser	1.08%	48	30	30	13
		Winner	-6.10%	22	56	22	13
Fourth	Ibex-Large (P1)	Loser	12.62%	8	2	2	0
		Winner	3.27%	6	4	4	0
	NoIbex-Large (P1)	Loser	0.59%	42	13	13	8
		Winner	-0.79%	27	28	27	8
	Ibex-Large (P2)	Loser	-0.48%	3	7	3	0
		Winner	1.06%	6	4	4	0
	NoIbex-Large (P2)	Loser	2.19%	61	17	17	13
		Winner	5.49%	64	14	14	13

Chapter 3

Window dressing in Spanish equity funds: An examination of portfolio holdings

This chapter analyses a unique database of monthly portfolio holdings of a large sample of Spanish domestic equity funds to test the potential manipulation of the disclosed portfolios around mandatory reports. Both trading activity measures and a new approach based on portfolio allocations show significant differences in the investment patterns of mutual funds, depending on the trading month. The results indicate that, in the reporting months, fund managers prefer large-cap and well-known stocks (i.e., Ibex-35 stocks) with incentives to increase the disclosed portfolio share of return-winner and decrease the weight of return-loser stocks. In addition, the results show that mutual funds participate actively in the January effect through the buying of small-cap stocks at the beginning of the year. Nevertheless, mutual funds own a low percentage of the total Spanish stock market capitalization, which suggests that fund managers are taking advantage of this anomaly rather than causing it.

3.1 Introduction

The development and growth of the mutual funds industry is evident worldwide, and its importance is not only economic but also social, given the magnitude of the assets under management and household participation. In the case of the mutual fund industry in Spain, as was shown in Chapter 1, total assets have multiplied by thirty-one since 1989, while the number of shareholders has multiplied by ten. Therefore, there is an increasing need to ensure that investors receive the appropriate information to make informed decisions and that they are adequately protected against abusive mutual fund practices.

The manipulation of mutual fund portfolios at the end of performance reporting periods attracts a great deal of attention for empirical research. Several studies have analysed the different incentives and consequences of this behaviour on return patterns around reporting dates (Carhart *et al.*, 2002; Bernhardt and Davies, 2005; Gallagher *et al.*, 2009), with a special interest in the role of this institutional practice in some well-known market anomalies such as the January effect (Haugen and Lakonishok, 1988; Musto, 1997; Sias and Starks, 1997; Lee *et al.*, 1998; Ackert and Athanassakos, 2000; Ng and Wang, 2004).

As a result of this potential manipulation, the disclosed portfolios may reveal an uninformative image of the recent management of the fund, thus highlighting agency problems between fund managers and outsiders. Managers are motivated to improve the disclosed portfolio image to create the impression that the fund is performing relatively well to attract larger money inflows from investors (Lakonishok *et al.*, 1991; Musto, 1999; He *et al.*, 2004; Ng and Wang, 2004; Meier and Schaumburg, 2006; Morey and O'Neal, 2006), who mostly make investment decisions according to recent performance records (Chevalier and Ellison, 1997; Sirri and Tufano, 1998).

However, Elton *et al.* (2010) show that low portfolio data frequency (e.g., semi-annually or even quarterly data frequency) constrains the previous evidence about portfolio manipulation and provides misleading conclusions due to unobservable trades between disclosed reports (e.g., intra-period round-trip trades, that is, either a purchase followed by a sale or a sale followed by a repurchase between the reporting dates). Higher data frequency is necessary to obtain accurate conclusions about the interaction between mutual fund trading and portfolio disclosures. Our study benefits from a unique monthly portfolio database in order to appropriately address this issue in a relevant European fund industry, Spain. It should be noted that this monthly database is only available from a Spanish supervisory authority and that the access to this information is restricted.

The main contributions of this chapter are threefold. First, the chapter focuses on whether investors can rely on quarterly mandatory portfolio reports. That is, do portfolios disclosed on a quarterly basis reveal meaningful information for fund investors? Second, the chapter examines whether fund managers follow some investment strategies in disguise around these quarterly disclosures. The existence of management incentives to manipulate disclosed portfolios should result in trading patterns around the reporting schedule that are different from the usual practice of the fund in the rest of the year. The rejection of this premise would imply that the calendar time investments do not depend on the reporting schedule, as they are a consequence of the normal strategy of the fund. Finally, an empirical analysis tests in detail the institutional trading throughout the year, with special attention to the first quarter, as the highest portfolio turnover occurs during these months.

Fund managers in Spain must report to investors quarterly, which exceeds the semi-annual portfolio holdings reports required by the European Union Council Directives.[1] Indeed, our unique monthly database allows us to calculate the turnover ratio based on monthly and quarterly data, and we found that the use of quarterly data discards 38% of the trading observations with respect to monthly information. Similarly, Elton *et al.* (2010) show that with quarterly data from US stock funds, missing trades are 18.5%, whereas when using semi-annual data the loss amounts to 34.2%. These comparisons should question the informative content of low frequency portfolio reports, a bias that, as shown above, is even larger in Spain than in the US.

The analysis of monthly turnover ratios allows us to detect anomalous trading to determine either whether investors can trust public quarterly reports or whether managers follow certain cosmetic practices. This analysis reveals several atypical trading measures: the high-

[1] According to the Law 35/2003 of November 4, item 17, managers must present a quarterly report for investors that includes, among other things, the portfolio composition of the fund. This legal order broadens the obligation to disclose annual and semi-annual portfolio holdings required by the European Council Directive 85/611/EEC. In addition, CNMV Circular 4/2008 of 11 September states the possibility of disclosing a simplified quarterly report that includes aggregated portfolio holdings. However, investors can ask for the full quarterly reports with the detailed portfolio holdings.

est monthly turnover occurs in January, whereas the lowest occurs in August, and the first quarter of the year reveals the highest trading activity. The abnormally high ratio in January might initially reflect the mutual funds' participation in the turn-of-the year effect, recently documented in the Spanish stock market by Miralles and Miralles (2007) and confirmed in Chapter 2. In contrast, the low trading in August might reveal a summer-holidays effect in fund management. Still, the high trading levels in the first quarter could be consistent with risk-shifting practices because once mutual funds disclose the portfolios at year-end, managers could have incentives to temporarily increase the portfolio risk to benefit from return opportunities. Thus, this practice should result in important and observable trading activities during the first quarter.

The availability of monthly portfolio holdings allows us to draw more accurate conclusions about abnormal trading around quarter-ends and to examine whether fund managers have disguised investment strategies around portfolio disclosures or, in contrast, follow the usual management strategy. The test of this hypothesis begins with the analysis of the trading activity, in line with Ng and Wang (2004), identifying the stocks that fund managers buy and sell more intensively each month. In addition, this study then proposes a new complementary measure that identifies strategic variations in portfolio allocation to different stock groups, that is, the identification of those stocks that more intensively increase or decrease their portfolio weights. The underlying structure of this proposal provides new insight because this approach does not analyse stocks individually but as an entire portfolio. For instance, a manager could intensively sell a specific stock, but the overall strategy of the fund could make the portfolio weight of this asset increase. Considering that Spanish fund managers disclose the portfolio stock weights instead of their buying/selling activities quarterly, this complementary method captures the aforementioned effect, which Ng and Wang (2004) do not estimate.

The results of both of these measures show significant differences in the investment patterns of mutual funds depending on the trading month. In disclosure months, mutual funds tend to rebalance their portfolios to disclose well-known stocks. However, in contrast, they tend to buy and increase the portfolio weight of the smallest-cap stocks in those months when clients are not aware of the public reports.

In addition to these results, mutual funds seem to participate in the turn-of-the year effect through the intensive buying of small-cap stocks in January. Unlike in the US market, Spanish mutual funds own a low share of the stock market capitalization. In this sense, the aforementioned argument of institutional managers causing the January effect might be a weak one. The analysis of fund trading in the first quarter of the year would allow us to better understand the actual role that funds play in the January effect.

The rest of the chapter proceeds as follows: Section 2 discusses the previous research related to the window-dressing hypothesis. Section 3 describes the domestic equity fund database. Section 4 describes the analysis of turnover ratios. Section 5 shows the empirical results of the fund investment behaviour around disclosure dates. Finally, Section 6 ends the chapter with conclusions and suggestions for future research.

3.2 Literature review

Since the work of Haugen and Lakonishok (1988), extensive empirical research has focused on testing whether window dressing by institutional investors has an influence on abnormal

returns at the turn of the year. In fact, this cosmetic practice, together with the tax-loss selling hypothesis, provide the most popular explanation of the January effect. Although several studies have evaluated the contribution of both hypotheses in this return anomaly, the debate still continues with respect to which of these hypotheses contributes the most. However, few studies have been conducted to detect window-dressing practices in mutual funds in a straightforward manner instead of their potential consequences on market prices, as the following literature review shows.

The first study that analyses window dressing by institutional investors is presented by Lakonishok *et al.* (1991), who examine the trading activity of US pension fund managers using quarterly portfolio holdings. Through the comparison of the buying and selling intensity in the first three quarters with that in the fourth quarter, they find that managers tend to sell poorly performing stocks disproportionately to their holdings, especially in the fourth quarter. This result is consistent with the window-dressing hypothesis. However, the authors do not find increases in demand for winner stocks at the end of the year that would be stated by this hypothesis.

Following the methodological approach of Lakonishok *et al.* (1991) and using quarterly portfolio holdings, some empirical research provides additional evidence about this issue. Eakins and Sewell (1994) analyse changes in US institutional portfolio holdings from 1985 to 1988 to verify whether institutions improve the appearance of their portfolios at the year-end by window-dressing practices. However, they do not find evidence of this phenomenon. In the same year, Basarrate and Rubio (1994a) present the results for seven Spanish equity funds from 1986 to 1990. They test the possible influence of the window-dressing hypothesis on the January effect by means of the analysis of the trading behaviour of mutual funds. The results obtained show that mutual funds, contrary to window-dressing strategies, tend to sell winners and buy loser stocks at the year-end (i.e., mutual funds follow contrarian strategies). These authors conclude that tax-loss selling is the principal cause behind the January effect in the Spanish stock market. To our knowledge, this work is the only study that has been conducted to contrast window dressing by Spanish mutual funds with a portfolio holdings approach.

Later, Ng and Wang (2004) and He *et al.* (2004) show evidence of window dressing in the US market for several types of institutional investors.[2] Ng and Wang (2004) analyse the trading activity of institutional investors and its relationship with the turn-of-the-year effect. They find that these investors tend to sell more extreme loser small stocks in the last quarter of the year, consistent with window dressing, and buy more small stocks in the next quarter, consistent with risk-shifting. In addition, these authors provide evidence of the direct relation between institutional trading and the January effect in small stocks.

On the other hand, He *et al.* (2004) analyse whether financial institutions plan their investments according to a portfolio disclosure schedule and whether trading strategies are different depending on the institution type. They find evidence consistent with the window-dressing hypothesis because these institutions tend to sell more extreme loser stocks in the fourth quarter, behaviour that is stronger in those institutions that have performed poorly relative to the market. The authors also show that institutions that manage funds on behalf of their customers (external managers) are more inclined to window dress their portfolios than institutions that manage their own money (internal managers). These distinctive trading

[2]The data set used by these works contains equity holdings of banks, investment companies, pension funds, insurance companies, and brokerage houses.

strategies might highlight the agency problems between external managers and outsiders, thereby reflecting the interest of these managers in attracting new clients and increasing money inflows.

Musto (1997) also shows that US money market prices present an anomaly in January similar to the anomaly presented by stock markets and analyses portfolio holdings of money market funds looking for aggregate evidence of window dressing in this industry. This author finds some results consistent with this trading strategy, but the findings cannot confirm this hypothesis for individual intermediaries. In a later work, Musto (1999) again tests the window-dressing hypothesis in US money market funds, using an expensive database of weekly portfolio statistics. Although the information was collected by the newsletter *Money Fund Report*, the high subscription price makes the database non-available to retail investors. In this study, Musto (1999) directly compares between disclosed and undisclosed portfolios to determine in detail the trading activity followed by money funds in between reporting dates. The results show that money fund managers hold more government securities around disclosure dates than in the remaining weeks, showing safer and more conservative portfolios than they really have had.

In addition to the analysis of the window-dressing hypothesis based on portfolio holdings, there is another important approach that is based on the analysis of fund returns anomalies around portfolio reporting dates. O'Neal (2001), Torre-Olmo and Fernández (2002), Morey and O'Neal (2006), and Meier and Schaumburg (2006) report atypical return patterns before portfolio disclosures, which may be explained by the window-dressing practice as mutual funds have motivations to present better results to their clients. This approach will be fully explained in the next chapter.

In the financial literature, major empirical research is most commonly centred on the US market; nevertheless, there are a few studies on window dressing in other countries. For example, in Canada, Athanassakos (1992; 1997) and Athanassakos and Schnabel (1994) find that pension and mutual funds are responsible for the January effect due to the seasonal rebalancing of their portfolios. The authors also conclude that the pattern of institutional investing seems to be related to the calendar year evaluation period and issues related to conflicts of interest.

Gallagher and Pinnuck (2006) and Gallagher *et al.* (2009) find evidence that performance of Australian equity funds is higher than usual in December and is more prevalent in small and growth funds. Gallagher *et al.* (2009) examine portfolio pumping by active equity funds using a unique database of daily institutional trades. In this study, they observe price inflation in stocks that funds hold at quarter-end and year-end, which occurs in the last half-hour of trading.

There are a few papers about window dressing in European countries, such as that of Henke (2003), who studies the January effect in the Polish stock market and its possible explanations. He finds higher returns in January, although this effect is not very strong. Given that this country does not have taxes on capital gains, a tax-loss selling hypothesis cannot explain this phenomenon. However, the analysis of seasonal patterns in the trading volume of institutional investors shows a trading volume increase in December and January, suggesting that window dressing may be the force behind the January effect.

Grinblatt and Keloharju (2004) analyse the daily pattern of sales and purchases in Finland around the turn-of-the-year and its relation to the capital gains of investors. Results suggest that Finnish household investors engage in tax-loss selling practices. In contrast,

they reject the window-dressing hypothesis as an alternative explanation because institutional investors do not exhibit significant increases in their propensity to sell losing stocks in December.

Clare *et al.* (1995) analyse seasonality in the equity market in the United Kingdom, finding seasonal increases in January, April, and December and seasonal decline in September. As plausible explanations for these results, they conclude that high returns in January may be explained by the window-dressing hypothesis and that the tax-loss selling hypothesis may explain the rise of prices in April. However, they cannot identify the causes of seasonality in September and December.

Finally, the works of Basarrate and Rubio (1994a) and Torre-Olmo and Fernández (2002) have been cited here in the case of Spain, but it is important to cite other related papers, such as those of Matallín (2006) and Miralles and Miralles (2007). In the former paper, the author analyses the effect of omitting benchmarks in the study of market timing ability and seasonality in mutual funds evaluation. He finds that the positive abnormal returns at the turn-of-the-year, the beginning of July and the month-end could be explained by either herding or window-dressing strategies. On the other hand, Miralles and Miralles (2007) confirm the persistence of the January effect in small stocks during the 15 years analysed (1988-2002), despite fiscal reforms that occurred in this period. The analysis of trading behaviour of investors and their impact on profitability and assets turnover may show that the January effect is a result of the convergence of individual and institutional investors, who are motivated by different trading reasons. They particularly find a tax motivation in individual investors and a motivation for window-dressing in institutional investors.

The results obtained in the previous chapter allow us to confirm that the January effect stated in early studies still persists in the Spanish stock market. Tax-loss selling and window-dressing hypotheses are possible explanations for this phenomenon. Therefore, this chapter continues the analysis of the trading behaviour of mutual funds to understand their relationship with the return anomaly in January.

As the financial literature reveals, there is little empirical evidence of window dressing based on portfolio holdings. The scarcity of this type of analysis may be due to the difficulty of obtaining periodic reports of fund holdings and the even greater difficulty of obtaining reports in between disclosure dates. In a recent paper, Elton *et al.* (2010) re-examine some well-known hypotheses in finance using higher frequency data (monthly holdings). In window-dressing analysis, they examine mutual funds trading activity near to the quarter-end, finding evidence of this strategy only at the year-end. Furthermore, they conclude that monthly data are essential to the detection of window-dressing practices because this data frequency allows a more precise measure of trading near the quarter-end. Another important contribution toward solving this problem is made by Sias *et al.* (2006), who examine the relation between two variables with different periodicity, such as quarterly portfolio holdings and monthly fund returns. As a result, they develop a method to estimate higher frequency correlations between, for example, unobservable monthly changes in fund holdings and observable monthly returns. Therefore, the conclusions about window-dressing in previous studies may be constrained by the characteristics of the databases employed. In this sense, our study overcomes problems such as the unavailability of high frequency portfolio data and the reporting selection bias. The use of a database of monthly portfolio holdings allows us a direct comparison between disclosed and undisclosed information. In addition, our database is free of reporting selection bias because it was provided by the official regulator, the Spanish Securities Exchange Commission - CNMV, instead of by a

private provider.

In addition, it is important not to confuse window-dressing with other possible management practices followed by mutual funds, such as herding behaviour, tournaments, and momentum strategies, among others. The empirical method of this chapter and the use of monthly information should allow us to obtain more accurate results about this cosmetic practice.

Some examples of these topics are Brown *et al.* (1996), who test the tournament hypothesis in a large sample of US growth mutual funds to validate whether managers have incentives to alter the investment characteristics of their portfolios depending on the interim performance ranking. They find that relative mid-year losers increase portfolio risk more than relative mid-year winners to improve their ranking at year-end. In a related paper, Chevalier and Ellison (1997) study the risk-taking behaviour of mutual funds in relation to agency problems. They examine portfolio holdings of US mutual funds and find that funds alter the risk of their portfolios at the year-end in response to the incentives created by the flow-performance relationship.

In regard to the herding topic, Wermers (1999) studies the tendency of US mutual fund managers to "herd" in their trading activity and find high levels of herding in small stocks, with little evidence that sell-side herding is related to window-dressing strategies. In another study, Lee *et al.* (1998) analyse the US mutual fund manager behaviour around the turn-of-the-year as a cause of the January effect in small stocks, based on performance hedging and window-dressing hypotheses. The authors find that the contribution of portfolio manager behaviour toward the January effect is more likely the result of performance hedging and not of window dressing.

On the other hand, Sias (2007) investigates the possible causes of stock return momentum, finding that momentum profits are greater in stocks with high levels of institutional trading. He concludes that window dressing and tax-loss selling play a substantial role in these patterns and that institutional investors' influence on momentum profits has increased over time as their influence in the market has increased. Finally, it is worthwhile to mention the work of Carhart *et al.* (2002); they analyse the behaviour of mutual fund performance at different moments in the year, finding that fund managers manipulate the prices of stocks and that they hold, inflating fund returns at the end of quarters, especially at the end of the year.

3.3 Data

The database used in this chapter consists of monthly portfolio holdings of all Spanish domestic equity funds from December 1999 to December 2006, provided by the CNMV. These monthly reports include an exhaustive description of portfolio holdings.

The initial sample included 163 funds that have at least 12 portfolio reports during the sample period. Funds that did not meet the official investment requirements of domestic equity funds were eliminated from the sample to ensure that all portfolios analysed are appropriately classified in this category.[3] Therefore, the final database consists of 239,971

[3]The CNMV establishes in the CNMV Circular 1/2009 of February 4, that domestic equity funds are those that invest more than 75% of the portfolio in equities listed in Spanish stock exchange markets, including assets from Spanish issuers listed in other markets. The investment in stocks issued in Spain must be at

portfolio holdings collected from 7,032 monthly reports of 125 funds.

The removal of these funds does not imply a look-ahead bias in the sample because discarded funds seemed to be misclassified as not meeting the investment requirements established for domestic equity funds. This monthly information was provided to us by the official regulator, thereby overcoming the reporting selection bias, which is potentially present in the scarce research on monthly portfolios where mutual funds voluntarily supply reports to private data providers (Elton *et al.*, 2010; Liao *et al.*, 2010). The CNMV provided this information exclusively to the authors for research purposes. Therefore, the database is not available for retail and institutional investors, which means that managers could not anticipate the use of this information. Moreover, the sample is free of survivorship bias because the analysis also included funds that disappeared during the study horizon.

Despite the funds eliminated, about 80% of the total domestic equity funds reported by the Spanish Collective Investment and Pension Funds Association (INVERCO) are analysed, as is shown in Table 3.1 for December in each year . This table also reports the descriptive statistics of the total net assets of the sample through the horizon period.

Table 3.1: Descriptive statistics for the sample of Spanish domestic equity funds

This table shows the number of Spanish domestic equity funds, the number of funds included in our sample, and some descriptive statistics of total net assets of the sample. The following data correspond to December in each year.

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Number of domestic equity funds[a]	91	93	102	102	111	114	119	122
Sample	74	80	82	75	80	84	89	92
% sample over total funds	81%	86%	80%	74%	72%	74%	75%	75%
Total net assets (*Million euro*)								
Mean	80,896	69,797	59,799	47,045	59,422	79,894	92,164	93,738
Median	43,398	33,807	29,518	22,678	29,849	41,208	44,147	42,943
Minimum	2,429	940	742	1,080	1,413	329	301	474
Maximum	548,358	526,292	422,953	287,531	336,888	511,605	931,672	922,997
Standard deviation	106,686	99,979	83,220	59,903	75,569	103,611	133,807	136,382
Interquartile range	98,474	80,652	66,031	56,846	78,342	91,499	98,137	100,922

[a] Source: INVERCO.

Given that the main objective of this chapter is to verify whether domestic equity funds engage in window-dressing practices by means of the examination of portfolio holdings, all the securities held each month by funds are carefully identified by the International Securities Identification Numbering (ISIN) codes.

The portfolio characteristics of our sample are shown in Table 3.2. The domestic stock holdings of the portfolios (reported in Panel A) are classified into four size stock groups:[4] *Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, and *NoIbex-Small*. The remaining portfolio holdings

least 90% of the equity portfolio, that is, at least 67% of the total portfolio. In addition, assets must be denominated in Euros, with a 30% limit in a non-Euro currency.

[4]As in Chapter 2, Spanish stocks are classified as follows. The stocks that trade the last day of each quarter (March, June, September, and December) are initially classified into two groups: stocks belonging to the Spanish benchmark Ibex-35 (*Ibex*) and the remaining (*NoIbex*). Then, within each group, the stocks are sorted into two subgroups, *Large* and *Small*, according to the market capitalization. The *Large* subgroup represents approximately the 60% of the total group market capitalization, and the *Small* subgroup contains the remaining 40%.

contain a very wide range of foreign stocks, investment societies, and other mutual fund units, among others. The definition of domestic equity funds reduces their impact on the portfolio holdings; thus, the analysis of portfolio manipulation excludes these securities.

Note that the fund sample shows a strong preference toward large and well-known Spanish stocks, as nearly 90% of the domestic portfolio sample belongs to Ibex-35 stocks (*Ibex-Large* and *Ibex-Small*). However, the share increase in the smallest-cap stocks (*NoIbex-Small*) is also remarkable, as it tripled between December 1999 and December 2006.

Table 3.2: Portfolio characteristics of Spanish domestic equity funds

This table reports the portfolio characteristics of the fund sample. Panel A displays the portfolio composition of domestic stocks after classification into four size stock groups (*Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, and *NoIbex-Small*). Panel B shows, by size stock groups, the proportion of listed stocks that funds hold (% Held) and the fraction of the Spanish stock market capitalization that funds own (% Owned). These figures correspond to the last day of December in each year.

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
	Panel A: Portfolio composition of domestic stocks							
Ibex-Large	46.8%	51.2%	40.4%	35.0%	39.9%	35.2%	32.6%	35.6%
Ibex-Small	41.1%	41.2%	52.2%	54.0%	48.7%	48.4%	49.6%	45.5%
NoIbex-Large	5.6%	3.8%	1.8%	4.1%	2.7%	4.4%	4.8%	2.7%
NoIbex-Small	6.6%	3.9%	5.5%	7.0%	8.8%	12.0%	12.9%	16.2%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Panel B: Stock distribution							
Ibex-Large								
% Held	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Owned	1.0%	0.8%	0.6%	0.6%	0.7%	0.7%	0.8%	0.8%
Ibex-Small								
% Held	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Owned	1.9%	1.5%	1.3%	1.2%	1.2%	1.4%	1.4%	1.1%
NoIbex-Large								
% Held	91.7%	83.3%	66.7%	91.7%	91.7%	91.7%	100.0%	75.0%
% Owned	0.4%	0.2%	0.2%	0.3%	0.2%	0.6%	0.6%	0.3%
NoIbex-Small								
% Held	76.6%	76.6%	71.4%	59.8%	73.5%	80.5%	76.6%	74.7%
% Owned	1.2%	0.6%	0.7%	0.6%	1.0%	1.8%	2.1%	1.6%

According to Table 3.2 (Panel B), the aggregate fund portfolio holds every stock listed in Ibex-35 (*Ibex-Large* and *Ibex-Small* groups). These aggregate holdings also contain, on average, 90% and 75% of *NoIbex-Large* and *NoIbex-Small* stocks, respectively. However, in terms of market capitalization, the figures show the residual role of domestic equity funds in the Spanish stock market, as these funds own less than 2.0% of the total value of each stock group. When considering all Spanish mutual funds, however, they own almost 7% of the Spanish stock market capitalization by December 2006 (see Table 1.4 in Chapter 1). These results should question the crucial influence of fund management on some price anomalies, as their decisions do not affect a relevant weight of the Spanish stock market, which will be discussed later.

Despite the low percentage owned by domestic equity funds, it is important to note that this fund category is the most active participant in the Spanish stock market among all funds that invest in these domestic stocks. For December 2006, Table 3.3 shows that domestic equity funds own more than 50% of the total assets invested by mutual funds in Spanish stocks, which explains the relevance of this fund category in this market and the reason for choosing it to analyse the window dressing in Spanish mutual funds.

Table 3.3: Investment in Spanish listed companies by type of mutual fund (Dec 2006)

The table shows the proportion invested in Spanish listed companies by type of mutual fund. This is reported as a percentage of the total assets invested by all funds that invested in this market during December 2006. Spanish stocks are classified in four size stock groups: *Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, and *NoIbex-Small*.

	Ibex-Large	Ibex-Small	NoIbex-Large	NoIbex-Small
Domestic equity funds	49.5%	62.8%	55.5%	56.5%
Mixed equity funds	17.4%	13.7%	11.2%	9.4%
Euro equity funds	10.8%	5.7%	11.7%	12.0%
Mixed fixed return funds	7.9%	5.3%	5.4%	2.9%
International equity funds	7.3%	4.9%	8.1%	5.4%
Global funds	5.1%	6.4%	7.4%	10.4%
International mixed fixed return funds	1.5%	0.8%	0.5%	2.0%
International mixed equity funds	0.5%	0.3%	0.2%	1.4%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

3.4 A turnover examination

In this section, the portfolio turnover ratio is employed to analyse the intensity of the trading activity of funds during the calendar year. The turnover ratio is defined as the lesser of purchases or sales divided by the average monthly net asset value. Following the approach reported by Elton *et al.* (2010), the portfolio turnover in month j is calculated as follows:

$$C_j^+ = \sum_i (N_{ij} - N_{ij-1})\bar{P}_{ij} \text{ for all } i, \text{ where } (N_{ij} - N_{ij-1}) \geq 0 \tag{3.1}$$

$$C_j^- = \sum_i (N_{ij} - N_{ij-1})\bar{P}_{ij} \text{ for all } i, \text{ where } (N_{ij} - N_{ij-1}) < 0 \tag{3.2}$$

where N_{ij} is the number of shares of stock i held at the end of the month j, and $\bar{P}_{ij}$ is the average of the prices of stock i at the beginning and the end of month j.

For any year, the turnover is the smaller of purchases (C^+) or sales (C^-) divided by the average of the net asset value of the portfolio over the previous year, where:

$$C^+ = \sum_{j=1}^{12} C_j^+ \tag{3.3}$$

$$C^{-} = \sum_{j=1}^{12} C_j^{-} \tag{3.4}$$

The same set of equations is employed to obtain the quarterly turnover, although the estimation uses four quarterly changes in holdings instead of 12 monthly variations.

The database of monthly portfolio holdings allows us to calculate the turnover based on monthly and quarterly data for each fund and then to confirm the finding of Elton *et al.* (2010) on missing trades when quarterly information is used to examine the investment decisions of mutual fund managers. According to the results reported in Table 3.4, the average turnover using monthly data is 51%, whereas when using quarterly data, the turnover is 32%. The difference between these estimates is statistically significant at a level of 1%. These results indicate that the use of quarterly data discards 38% of trading observations with respect to monthly information, which supports the validity of the monthly data set to reduce the impact of intra-quarter round-trip trades on the conclusions of this study. This impact is even more relevant than the missing trades that Elton *et al.* (2010) report for a large sample of US stock mutual funds.

Table 3.4: Descriptive statistics of the turnover ratio

This table shows the main descriptive statistics of turnover ratios using monthly and quarterly portfolio holdings. This measure is calculated separately for each of the 125 funds in the sample.

	Monthly data	**Quarterly data**
Mean	0.51	0.32
Median	0.41	0.27
Minimum	0.00	0.00
Maximum	4.35	1.54
Standard deviation	0.44	0.23
Interquartile range	0.48	0.26

This study further analyses trading behaviour throughout the calendar year because common incentives to manipulate portfolios should result in significant trading patterns near quarterly disclosures. A preliminary approach is the following pool regression model with dummy variables to explain the monthly turnover of fund k (TO_k):

$$TO_k = \beta_{k,0} + \beta_{k,1} QEND_j + \beta_{k,2} YEND_j + \beta_{k,3} QBEG_j + \beta_{k,4} YBEG_j + \varepsilon_{k,j} \tag{3.5}$$

where $QEND_j$ takes the value of one when month j is March, June or September, and zero otherwise. $YEND_j$ takes the value of one when month j is December and zero otherwise. Similarly, $QBEG_j$ is one when month j is April, July or October; $YBEG_j$ is one when month j is January, and zero otherwise.

Before running the regression analysis, the turnover outliers in each fund were examined to decide if they should be excluded from the analysis (see Appendix 3.1). This preliminary analysis confirms that the large percentage of outliers is concentrated around the turn-of-the-quarter, which are the months of interest in the window-dressing hypothesis. Therefore,

these outliers are not discarded because they may provide information important to the analysis.

Estimates from equation 3.5 for the entire sample of funds (Table 3.5) suggest that funds tend to increase their trading activity in January and at the end of the first three quarters of the year. This is evident in the positive and significant beta estimates of *YBEG* (8.86) and *QEND* (5.31), implying that quarterly reports greatly concern fund managers. On the other hand, the *YEND* coefficient is negative and not significant, suggesting that mutual funds do not actively trade in December.

Table 3.5: Turnover pool regression

This table shows the estimation results from equation 3.5. For the entire sample of 125 funds, this table reports the pool regression coefficients and their respective p-values in brackets, as well as the R^2 value.

	Intercept	**QEND**	**YEND**	**QBEG**	**YBEG**
β	33.30	5.31	-2.49	2.27	8.86
(p-value)	(0.00)	(0.00)	(0.27)	(0.16)	(0.00)
R^2	0.004				

To better understand trading behaviour during the calendar year, Panel A in Table 3.6 reports the aggregate turnover ratios for each month, quarter, and semester. The results illustrate that the trading activity during the first half of the year is significantly higher than in the second semester ($(S1 - S2) = 6.40\%$). In fact, the most important turnover ratios detected at quarter-ends occur in the first semester (March, 41.31%; June, 39.58%). In addition, the January turnover (42.12%) is the highest for the entire year and differs from the 12-month average ratio (35.66%) at the 1% significance level. Another remarkable result is that the lowest trading occurs in August (24.09%), which may reflect the dampening effect of summer holidays in fund management. With special attention to the fiscal year-end, the findings show that the turnover in December (30.81%) is the smallest in the year with the only exception being the aforementioned summer effect.

Furthermore, due to the high concentration of the Spanish fund industry, this study also checks the robustness of these trading patterns for a subsample of those funds managed by the 10 largest fund companies. Thus, the results in Panel B of Table 3.6 reveal quite similar results in the entire sample, suggesting that there are no important differences between large and small fund companies in the trading intensity throughout the calendar year.

The significant trading activity in January might initially suggest that mutual funds participate actively in the turn-of-the-year effect in the Spanish market. Nevertheless, the low percentage held by domestic equity funds in the stock market (see Panel B of Table 3.2) questions the lead role of these institutional portfolios in this price anomaly. Therefore, it is probable that mutual funds participate in taking advantage of the anomaly rather than causing it.

Fund managers seem to engage in abnormally high trading just before reporting dates in the two first quarters. In addition, managers seem to have more incentives to trade in the first half of the year, especially in the first quarter. This strategy could be consistent with risk-shifting practices by purchasing riskier assets disproportionately at year-beginning periods (Chevalier and Ellison, 1997; Ackert and Athanassakos, 2000; Ng and Wang, 2004).

Later, the trading activity by different stock characteristics will be addressed to shed more light on this previous finding.

Table 3.6: Monthly turnover ratios

This table shows the mean turnover ratios across funds for each month (%), the standard deviation (SD), and the difference (Diff) between each month and the year average (Avg). In addition, this table reports the average turnover for the semesters (S1 and S2) and quarters (Q1, Q2, Q3, and Q4). The table also displays the difference of the average turnover between both semesters, S1-S2. Panel A presents the results for the entire sample of 125 funds and Panel B for a subsample that contains the funds that are managed by the 10 biggest management companies. * 5% significant; ** 1% significant.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
	Panel A: For the entire sample of funds												
Mean	42.12	39.62	41.31	35.00	35.99	39.58	35.78	24.09	35.07	35.97	33.68	30.81	35.66
Diff	6.46**	3.96	5.65*	-0.66	0.33	3.92*	0.12	-11.57**	-0.59	0.31	-1.98	-4.85*	
SD	53.52	51.86	66.88	58.87	50.95	46.97	44.08	43.87	44.14	48.00	45.74	49.33	
			S1						S2				S1-S2
Average			38.93						32.53				6.40**
		Q1			Q2			Q3			Q4		
Average		41.01			36.86			31.64			33.39		
	Panel B: For funds managed by the 10 biggest management companies												
Mean	42.74	35.43	33.50	25.98	26.13	33.71	34.29	20.31	26.94	29.54	28.30	27.44	30.29
Diff	12.44**	5.13*	3.21	-4.31	-4.16*	3.42	4.00	-9.99**	-3.36	-0.75	-1.99	-2.85	
SD	58.40	42.00	43.82	45.80	34.97	36.97	40.06	43.61	29.08	40.73	39.39	45.38	
			S1						S2				S1-S2
Average			32.91						27.79				5.13**
		Q1			Q2			Q3			Q4		
Average		37.22			28.63			27.16			28.39		

Although previous evidence on portfolio manipulation in the US fund market is especially relevant at year-end (Lakonishok *et al.*, 1991; He *et al.*, 2004; Ng and Wang, 2004; Elton *et al.*, 2010), the lack of evidence for significant trading in December should question portfolio manipulation by Spanish fund managers just before the fiscal year-end.

After these preliminary findings, a thorough analysis is necessary to check the institutional trading around disclosure dates to obtain accurate conclusions on potential portfolio manipulation.

3.5 Trading behaviour of mutual funds around disclosure dates

This section focuses on the characteristics of stocks that funds tend to sell, buy, and hold each month to better understand their investment activity, with special attention to those trading strategies around mandatory portfolio reports. The goal is to first examine whether investment strategies significantly differ between reporting months and the rest of the year, then to analyse investment activity in the first quarter of the year, and finally to show a trading map of mutual funds throughout the year.

To accomplish these objectives, Spanish stocks are classified into different size and performance groups to identify the characteristics of the traded securities. The first step is

therefore to sort domestic stocks by the cumulative return over the previous 11 months. This step gives four return quartiles labelled as *Winner*, *Medium-Winner*, *Medium-Loser*, and *Loser*. The *Winner* quartile contains stocks with the highest returns, and the *Loser* quartile contains the stocks with the smallest returns. These performance quartiles complement the four stock groups according to market capitalization (i.e., *Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, and *NoIbex-Small*).

To evaluate the potential interaction between size and recent performance, the next stage consists of obtaining 11-month return quartiles within each size group, totalling 16 performance subgroups in all. However, this chapter only analyses the top and bottom performance subgroups (i.e., *Ibex-LargeW*, *Ibex-LargeL*, *Ibex-SmallW*, *Ibex-SmallL*, *NoIbex-LargeW*, *NoIbex-LargeL*, *NoIbex-SmallW*, and *NoIbex-SmallL*) because stocks with extreme performance are the most susceptible to portfolio manipulation. The size and performance groups are rebalanced each quarter as part of the procedure.

After these identification and classification processes, two types of measures are calculated to understand the trading activity of our fund sample. These measures are complementary. The first set is based on the trading activity of funds, while the other set is based on changes in the portfolio holdings.

Measures of trading activity

This study follows the approach of Ng and Wang (2004) to identify which type of stocks managers buy and sell more intensively each month. This approach consists of computing the value of monthly holdings, sales, and purchases of each stock group for each mutual fund.

The sell ratio measures the selling activity by fund k in stock group i in month j:

$$Sell\ ratio = \frac{SELL(i,j,k)/HOLD(i,j-1,k)}{\sum_i SELL(i,j,k)/\sum_i HOLD(i,j-1,k)} \tag{3.6}$$

where $SELL(i,j,k)$ is the value of sales by fund k in month j and in stock group i, and $HOLD(i,j-1,k)$ is the value of holdings at the end of the previous month of the same stocks belonging to group i in month j. Values of $SELL$ and $HOLD$ use the average stock prices between the beginning and end of month j. The numerator of equation 3.6 is the ratio of the sales in a stock group to holdings of the same stocks at the end of the previous month, while the denominator is the ratio of total sales in month j to holdings at the end of the previous month. That is, the sell ratio measures the selling activity of a fund in a given stock group relative to the overall selling activity. For instance, suppose a manager sells 60% of the *Ibex-Large* group held in the fund portfolio but only sells 40% of the total stock holdings. Then, according to equation 3.6, the sell ratio for the *Ibex-Large* group is 1.5, which means that this fund sells 50% more of *Ibex-Large* than other types of stock.

Similarly, the buy ratio measures the buying activity by fund k in stock group i in month j:

$$Buy\ ratio = \frac{BUY(i,j,k)/HOLD(i,j,k)}{\sum_i BUY(i,j,k)/\sum_i HOLD(i,j,k)} \tag{3.7}$$

where $BUY(i,j,k)$ is the value of purchases by fund k in month j and in stock group i, and $HOLD(i,j,k)$ is the value of holdings by fund k in month j and in stock group i. Again, both variables are computed using the average of the stock prices at the beginning and end

of month j. The numerator of equation 3.7 is the ratio of the purchases of a stock group to holdings of the same stock group at the end of the month j. The denominator is the ratio of total purchases to total holdings at the end of the month j. Therefore, the buy ratio shows the proportion of purchases of stock group i during the month j relative to the proportion of the total purchases across all stock groups. As an illustration, suppose a fund buys 30% of the *Ibex-Large* group held in the fund portfolio but only buys 40% of its total stock holdings. Then, according to equation 3.7, the buy ratio for *Ibex-Large* group is 0.75, which means that this fund buys 25% less of *Ibex-Large* stocks than other types of stock.

Measures of changes in portfolio weights

To complement the aforementioned measures of trading intensity, a new complementary approach is proposed to allow the identification of the intensity in changes in the portfolio allocations to the different stock groups. The importance of this method lies in the additional information reported because this approach examines the trading patterns of the different stock groups with respect to the entire portfolio. Whereas measures of trading intensity show the purchase/sale activity of funds, measures of portfolio allocation show the final results that funds actually report to unit-holders. This new insight captures the general effect on the stock weights, which mainly determine the portfolio image. Therefore, those managers with incentives to manipulate this portfolio image should be concerned with this overall effect.

The portfolio share decrease/increase ratios by fund k in stock group i during month j are given as follows:

$$Share\ decrease = \frac{[SHARE(i,j,k) - SHARE(i,j-1,k)]^-}{AVERAGE_i[SHARE(i,j,k) - SHARE(i,j-1,k)]^-} \tag{3.8}$$

$$Share\ increase = \frac{[SHARE(i,j,k) - SHARE(i,j-1,k)]^+}{AVERAGE_i[SHARE(i,j,k) - SHARE(i,j-1,k)]^+} \tag{3.9}$$

where $SHARE(i,j,k)$ is the portfolio percentage invested by fund k in the stock group i in month j. Equation 3.8 is valid when there is a monthly decrease in the portfolio share (i.e., $[SHARE(i,j,k) - SHARE(i,j-1,k)] < 0$). Similarly, equation 3.9 applies when the difference $[SHARE(i,j,k) - SHARE(i,j-1,k)]$ is positive.

For share increases, the numerator of equation 3.9 shows the increase of the portfolio share of stock group i in month j over that share in the previous month. The denominator is the average of increases in all stock groups during month j. Therefore, this ratio indicates the increase intensity of stock group i during the month j with respect to the total increments in the portfolio allocations of fund k. Suppose a fund that has 20% of its assets invested in stocks belonging to the loser performance quartile (*Loser*) in month $j-1$ and 50% in month j, which is a positive difference of 30%. The average of the increments in all performance quartiles during month j is 15%. Therefore, the share increase ratio is 2.0, which means that this fund increased portfolio allocations to *Loser* stocks at twice the average. The same works for the share decrease ratio as well.

From the monthly equally weighted averages of all the ratios for each stock group across funds, several analyses are carried out to understand the trading behaviour of mutual funds around disclosure dates.

3.5.1 Differences among disclosure and non-disclosure months

First, this section tests whether fund managers follow some investment strategies in disguise around disclosure dates. The existence of portfolio manipulation should result in trading patterns around the reporting dates that differ from the standard practice of the fund in the rest of the year. Therefore, this study examines whether fund trading differs between disclosure months (March, June, September, and December), denoted hereafter as *Qs*, and the other eight months, denoted hereafter as *OM*. Table 3.7 reports the difference of the equally weighted averages of the ratios in *Qs* minus *OM*.

Table 3.7: Differences of measures among disclosure dates and other months

At the end of each quarter, domestic stocks are classified using two independent criteria: size and performance. The size classification consists of sorting stocks into two groups: Ibex-35 (*Ibex*) and No-Ibex (*NoIbex*). Then, the procedure divides each size group into large-cap stocks (*Large*) and small-cap stocks (*Small*), where the large subgroup contains the stocks that represent approximately 60% of the total group market capitalization and the small subgroup the remaining 40% (*Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, and *NoIbex-Small*). Finally, the procedure obtains top (*Winner*) and bottom (*Loser*) 11-month return quartiles for these four size subgroups. Additionally, four performance quartiles in relation to the previous 11-month cumulative returns are obtained: *Winner*, *Medium-Winner*, *Medium-Loser*, and *Loser*. Panel A shows the equally weighted average across funds of the different trading activity ratios (equations 3.6 and 3.7) for disclosure months (*Qs*) and other months (*OM*). Panel B reports the same structure for portfolio allocation measures (equations 3.8 and 3.9). This table also shows the difference (*Diff*) between *Qs* and *OM* for each measure. * 5% significant; ** 1% significant.

	Panel A: Measures of trading activity						**Panel B:** Measures of portfolio allocation					
	Sell ratio			Buy ratio			Share decrease ratio			Share increase ratio		
	Qs	OM	Diff	Qs	OM	Diff	Qs	OM	Diff	Qs	OM	Diff
Ibex-Large	0.80	0.80	0.00	0.76	0.82	-0.06*	2.04	2.04	0.00	2.02	2.09	-0.07
Ibex-LargeW	1.52	1.31	0.21	1.37	1.49	-0.12	2.02	2.21	-0.19*	2.12	1.96	0.16*
Ibex-LargeL	1.75	1.67	0.08	1.63	2.18	-0.55**	2.29	1.93	0.36**	2.22	2.46	-0.24**
Ibex-Small	1.30	1.30	0.00	1.26	1.23	0.03	0.91	0.90	0.01	0.95	0.90	0.05**
Ibex-SmallW	1.51	1.68	-0.17*	1.46	1.50	-0.04	0.94	0.98	-0.04	0.97	0.90	0.07**
Ibex-SmallL	1.51	1.43	0.08	1.58	1.47	0.11	0.82	0.79	0.03	0.78	0.88	-0.10**
NoIbex-Large	3.84	3.96	-0.12	4.03	4.33	-0.30	0.95	0.95	0.00	0.92	0.87	0.05
NoIbex-LargeW	4.74	4.80	-0.06	4.38	6.02	-1.64**	1.05	1.21	-0.16	0.95	0.98	-0.03
NoIbex-LargeL	4.03	3.99	0.04	5.18	5.71	-0.53	0.85	0.70	0.15**	0.90	0.91	-0.01
NoIbex-Small	3.11	3.02	0.09	2.78	2.92	-0.14	0.60	0.61	-0.01	0.56	0.62	-0.06*
NoIbex-SmallW	4.69	3.69	1.00	3.10	3.59	-0.49	0.74	0.79	-0.05	0.63	0.71	-0.08*
NoIbex-SmallL	4.13	3.64	0.49	2.88	3.33	-0.45	0.53	0.52	0.01	0.48	0.58	-0.10**
Winner	1.42	1.50	-0.08	1.32	1.42	-0.10*	0.98	1.05	-0.07**	0.94	0.94	0.00
Medium-Winner	1.06	1.04	0.02	0.96	1.03	-0.07**	0.99	1.00	-0.01	1.01	1.01	0.00
Medium-Loser	1.07	1.04	0.03	1.03	1.02	0.01	0.99	0.97	0.02	1.06	0.96	0.10**
Loser	1.18	1.11	0.07	1.29	1.14	0.15**	0.94	0.92	0.02	0.93	1.02	-0.09**

Comparing the results in Panels A and B, the buy/sell ratios and share increase/decrease ratios are mostly consistent in the sign of the difference, that is, in general terms, the trading activity of funds is also reflected in the final portfolio allocation. However, the proposed measures of share increase/decrease might have more useful information for the objectives of this empirical section because these ratios consider the final portfolio weights that funds report to investors.

Regarding size groups, results show that for *Ibex-Small*, funds tend to more intensively increase their portfolio weights during disclosure months than during the rest of the year.

In contrast, funds increase their allocations to *NoIbex-Small* less during disclosure months than during the remaining periods.

However, the results are much more interesting when combining size and recent performance because some results for the size groups are a combination of opposite patterns among interim performance subgroups. For instance, we find contrary and significant results in the *Winner* and *Loser* performance subgroups of *Ibex-Large* stocks. These results illustrate that funds tend to increase the portfolio share of return-winner large stocks (*Ibex-LargeW*) in reporting periods more than in other months. On the contrary, funds tend to decrease the share of these stocks during other periods more than in disclosures. However, the opposite occurs with return-loser large stocks (*Ibex-LargeL*), with higher share increase ratios in non-reporting months and higher share decrease ratios in disclosure months, both with statistically significant differences (*Diff*) at the 1% level. Furthermore, the finding for *Ibex-LargeL* stocks is the most robust result in Table 3.7 because funds also show a clear intention to buy these stocks more actively in those non-reporting months (see the buy ratio in Panel A). This fact seems to suggest that funds avoid well-known and large-cap stocks with poor past return records in their mandatory reports.

The results for the *Ibex-Small* group are in line with those in the *Ibex-Large* group. Funds show different behaviour between the extreme return-winners and losers: managers tend to increase the share of high-performance stocks (*Ibex-SmallW*) in reporting months more than during the rest of the year, while they show the opposite behaviour for return-loser stocks (*Ibex-SmallL*).

Previous findings on investment strategies for Ibex-35 stocks suggest that funds have quarter-end image strategies that differ from those undisclosed portfolios held in the remaining months. This conclusion is especially relevant due to the leading role of these blue-chip stocks in the portfolios of the sample (see Table 3.2). These results seem to indicate that during the reporting months, fund managers prefer large-cap and well-known stocks (i.e., Ibex-35 stocks), with incentives to increase the disclosed portfolio share of return-winners and decrease the weight of return-loser stocks, especially for those Ibex-35 stocks with the largest capitalization. These results might be consistent with the window-dressing hypothesis, that is, managers intend to improve the portfolio image by increasing the disclosed weight of well-known and return-winner stocks and decreasing the portfolio share of those stocks with poor return records.

The observations for *NoIbex* stocks suggest that funds tend to increase the portfolio share of the smallest-cap stocks (*NoIbex-Small*) more actively in those months when clients are not aware of public reports, especially in loser stocks. Although this study does not find a clear tendency towards selling and decreasing the portfolio share of these stocks in disclosure months, the results could loosely be in accordance with the window-dressing hypothesis. Nevertheless, the effect of this behaviour on the entire portfolio holdings is not important, given the low portfolio weights of these smallest-cap stocks in our sample.

Regarding performance quartiles, Table 3.7 shows varied results. Considering only extreme performance records, the results (Panel A) suggest that funds buy *Winner* stocks less intensively in those months with an obligation to disclose portfolios, and they buy more *Loser* stocks in the reporting periods than in the rest of the year. This evidence is not consistent with the window-dressing hypothesis.

Other potential explanations behind investment decisions based on recent return records could be momentum strategies. According to momentum, buy ratios should be higher than

sell ratios in the *Winner* return quartile. Furthermore, selling activity should also be more intense than buying activity in the *Loser* quartile. However, Table 3.7 rejects this hypothesis. Additionally, momentum strategy as a standard practice of the fund should be present during the entire calendar year and not only be concentrated around quarterly disclosure dates.

In general, Table 3.7 displays different behaviours based on size and performance criteria. Although the investment on Ibex-35 stocks seems initially to follow window-dressing patterns, the results are doubtful for this hypothesis when only considering return records. Specifically, managers seem to be more concerned about disclosing well-known stocks than return-winners in portfolio reports.

3.5.2 Detailed analysis of the first quarter of the year

This section details fund management during the first quarter of the year to examine those trading patterns behind the high portfolio turnover seen in these months (see Table 3.6). Specifically, the January analysis might allow us to better understand the influence of fund trading on the widely documented January effect of the Spanish stock market. As the analysis is based on trading activities, Table 3.8 only reports sell and buy ratios (equations 3.6 and 3.7).

Table 3.8: Investment activity in the first quarter

The table reports the trading activity of funds during the first quarter of the year for the different stock groups, that is, the equally weighted average of the buy and sell ratios across funds (equations 3.6 and 3.7). The t-test is for the test of equality of means between trading measures (*Diff (B, S)*). * 5% significant; ** 1% significant.

	January			**February**			**March**		
	Buy	Sell	Diff (B,S)	Buy	Sell	Diff (B,S)	Buy	Sell	Diff (B,S)
Ibex-Large	0.83	0.81	0.02	0.86	0.76	0.10	0.79	0.88	-0.09
Ibex-LargeW	1.94	1.62	0.31	1.03	1.38	-0.35*	1.35	1.66	-0.31
Ibex-LargeL	1.31	1.72	-0.41	1.34	1.26	0.08	1.57	1.55	0.03
Ibex-Small	1.14	1.27	-0.12**	1.26	1.31	-0.05	1.22	1.30	-0.08
Ibex-SmallW	1.41	1.61	-0.20	1.16	2.04	-0.88**	1.40	1.82	-0.42**
Ibex-SmallL	1.53	1.28	0.25	1.54	1.61	-0.07	1.47	1.67	-0.20
NoIbex-Large	6.28	3.43	2.85**	2.14	5.88	-3.74**	2.41	3.17	-0.76
NoIbex-LargeW	7.32	4.06	3.26*	3.46	9.71	-6.25**	3.93	4.43	-0.50
NoIbex-LargeL	9.35	3.48	5.87**	3.04	4.97	-1.94	4.29	3.27	1.02
NoIbex-Small	4.76	2.55	2.21*	3.27	2.52	0.76	2.38	2.94	-0.56
NoIbex-SmallW	5.62	2.54	3.08*	3.48	3.28	0.20	2.55	4.76	-2.20
NoIbex-SmallL	3.70	3.43	0.27	3.64	3.33	0.32	3.25	3.12	0.12
Winner	1.49	1.66	-0.18	1.07	1.71	-0.64**	1.24	1.39	-0.15
Medium-Winner	1.33	1.24	0.09	1.04	0.99	0.05	1.04	1.03	0.01
Medium-Loser	0.83	0.96	-0.13*	1.28	0.94	0.34**	1.14	0.99	0.15*
Loser	1.01	0.99	0.02	1.17	1.11	0.06	1.22	1.42	-0.20

In January, funds focus their trading activity on *NoIbex* stocks (*NoIbex-Large* and *NoIbex-Small*) with a clear purchase intention. The buy ratio is significantly higher than the sell ratio in these stock groups and in their extreme return subgroups. These differences are significant at the 1% and 5% levels, except for *NoIbex-SmallL*. This finding might be related

to the January effect in small-cap stocks that Miralles and Miralles (2007) recently report in the Spanish stock market and that we confirmed in the previous chapter. Nevertheless, it is suitable to consider that funds actively trade this type of stock in January to take advantage of the anomaly and its subsequent rise in prices. Our study, therefore, could not suggest that their trading is enough to cause any relevant price pressure in the market due to the low percentage of the total Spanish stock market capitalization owned by domestic equity funds, less than 2% for each stock group (see Panel B of Table 3.2).

A risk-shifting strategy could be another possible explanation for the fact that mutual funds buy disproportionately more *NoIbex* stocks relative to the proportion of the total purchases across all stock groups. Regarding this strategy, Ackert and Athanassakos (2000) and Ng and Wang (2004), among others, find that once managers disclose the portfolio holdings at year-end, they tend to rebalance and manipulate the risk of their portfolios by purchasing smaller stocks. These authors suggest that institutional managers especially engage in this practice at the beginning of the year because they are less concerned with including well-known stocks in their portfolios and can tolerate more risk, as they have enough time to adjust their portfolios if needed. However, the trading behaviour in February suggests that funds quickly reverse their positions in risky stocks because they actively sell the small stocks that they bought in January, particularly *NoIbex-Large* stocks. This behaviour could indicate that after the abnormally large January returns in small stocks, funds again modify their portfolios to reduce risks. Finally, high buy and sell ratios of *NoIbex* stocks could explain the high turnover in March, although the differences are not significant.

In summary, fund trades in *NoIbex* stocks primarily cause the high turnover in the first quarter. Funds exploit the January effect through purchases of small stocks and then reverse their positions in February. Risk-shifting strategies could also explain these trading patterns, but an appropriate test of this hypothesis requires further information.

3.5.3 Monthly management map of Spanish domestic equity funds

To finish the empirical analysis, this section shows the trading activities followed by mutual funds throughout the year. As a complement to previous analyses in this chapter, Table 3.9 shows, for the first time in the Spanish fund industry, a map that reveals the management behaviour of mutual funds every month. This map shows a large amount of information, such as the type of stocks that mutual funds prefer or avoid each month, main trading activities, and asset allocation changes experienced by fund portfolios, among others. Nevertheless, it is important to note that this information is presented in an aggregate form, which may hide specific management patterns in some funds or some years. The most remarkable patterns are summarized in this section.

The analysis of the trading activity on *NoIbex* stocks (especially *NoIbex-Large*) during the year reveals some interesting results. In January, April, and July, the buying activity on *NoIbex-Large* stocks is disproportionately higher than the selling activity, with a consequent positive difference between these ratios. Moreover, this behaviour is supported, in many cases, by a positive difference between share increase and decrease ratios. These results seem to indicate that mutual funds are inclined to buy and increase the allocations on these small-cap stocks immediately after the mandatory reports. However, the purchasing trend is reversed in the next month, particularly in February and August, when mutual funds clearly tend to sell and decrease the portfolio share of *NoIbex-Large* stocks. These behaviours could suggest that mutual funds actively trade on small stocks in those months when clients are

not aware of public reports.

In August, the differences between measures do not show any significant trend, except the selling activity on *NoIbex-Large* stocks. This result is supported by the prior summer effect found in the monthly turnover analysis, where the August turnover appears as the lower turnover of the year (see Table 3.6). These findings may indicate that, during the summer holidays, mutual funds are interested in getting rid of small stocks and maintaining their positions in large-cap stocks, probably to avoid excessive risks.

When the differences among disclosure and non-disclosure months are analysed (Section 3.5.1), the results indicate that in mandatory reports, mutual funds prefer Ibex-35 stocks, with incentives to increase the portfolio allocation of return-winners and decrease the weight of return-loser stocks. However, Table 3.9 reveals that this pattern occurs mainly in June and September. In those months, consistent with the window-dressing hypothesis, mutual funds are inclined to buy and/or increase the share of high-performance stocks (*Ibex-LargeW* and *Ibex-SmallW*), whereas they tend to sell and/or decrease their allocations in return-loser stocks (*Ibex-LargeL* and *Ibex-SmallL*). In addition, the portfolio manipulation in June and September is accompanied by a tendency to increase the selling activity of small-cap stocks (*NoIbex-Large* and *NoIbex-Small*).

Several studies of window dressing in the US fund market have found that this practice is mainly evident at year-end (Lakonishok *et al.*, 1991; He *et al.*, 2004; Ng and Wang, 2004; Elton *et al.*, 2010). Nevertheless, Table 3.9 shows varied results of Spanish mutual fund behaviour in December. Consistent with the window-dressing hypothesis, mutual funds tend to decrease the share of *NoIbex-SmallL* stocks before this reporting date. However, consistent with contrarian strategies, mutual funds are inclined to buy low-performance stocks (*Ibex-LargeL* and *Ibex-SmallL*) and sell and decrease the share of some high-performance stocks (*Ibex-LargeW*, *Ibex-SmallW*, and *NoIbex-LargeW*). Although the finding of these two contradictory strategies is unexpected, it is important to mention that Lakonishok *et al.* (1991) also found the same strategies at year-end in a sample of US pension funds. These results show a weak evidence of window-dressing practices by Spanish domestic equity funds at year-end.

Finally, when stocks are classified by past performance, the results in Table 3.9 indicate that mutual funds do not base their investment management in momentum strategies. However, these results show that mutual funds seem to follow contrarian strategies, especially in mandatory reports of March, June, and December. In those months, mutual funds tend to sell and decrease the share of winner stocks (*Winner* and *Medium-Winner*) and to buy and increase their portfolio share of loser stocks (*Medium-Loser* and *Loser*). This result confirms the finding of Basarrate and Rubio (1994a) on contrarian investment strategies by Spanish mutual funds.

In general terms, the analysis of the annual management behaviour suggests that mutual funds follow different trading strategies that depend on the month. In non-disclosure months, they seem to have a trade preference for small-cap stocks. In mandatory reporting dates, especially in June and September, they seem to prefer large-cap and winner stocks. On the other hand, the trading behaviour observed when stocks are divided into past performance quartiles suggests that mutual funds seem to follow contrarian strategies. However, further research is necessary to check these issues in depth because Table 3.9 only shows aggregate results of the mutual fund trading map, which are not detailed enough to provide accurate conclusions about some specific management practices.

Table 3.9: Management map of Spanish domestic equity funds

The table reports the trading activity of funds throughout the year. For each stock group, this table shows the difference between the buy and sell ratios (*Diff (B, S)*) and between the share increase and decrease ratios (*Diff (I, D)*). The t-test is for the test of equality of means between measures. * 5% significant; ** 1% significant.

	January		February		March		April		May		June	
	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)
Ibex-Large	0.02	0.22**	0.10	0.05	-0.09	0.31**	0.01	0.13	0.16**	0.09	0.00	-0.04
Ibex-LargeW	0.31	-1.02**	-0.35*	-0.64**	-0.31	0.20	0.46**	-0.22	0.13	0.07	0.03	0.47**
Ibex-LargeL	-0.41	0.49*	0.08	0.53**	0.03	0.14	0.01	-0.06	1.12**	1.11**	-0.20	0.38
Ibex-Small	-0.12**	0.05	-0.05	0.05*	-0.08	0.03	-0.12**	-0.05	-0.47	-0.01	-0.15	0.00
Ibex-SmallW	-0.20	0.15**	-0.88**	-0.13*	-0.42**	-0.14**	-0.31*	-0.27**	-0.56	-0.26**	0.34**	0.06
Ibex-SmallL	0.25	0.12*	-0.07	0.23**	-0.20	0.04	0.05	-0.03	-0.15	0.03	0.13	-0.10*
NoIbex-Large	2.85**	0.37**	-3.74**	-0.51**	-0.76	-0.03	2.47**	0.13	0.37	-0.17*	0.89	0.24**
NoIbex-LargeW	3.26*	0.30*	-6.25**	-1.17**	-0.50	0.00	4.54**	0.36**	5.10**	0.08	-0.86	-0.19
NoIbex-LargeL	5.87**	0.78**	-1.94	-0.26	1.02	0.13	-1.00	0.05	1.73	0.40**	1.57	0.13
NoIbex-Small	2.21*	0.04	0.76	0.12**	-0.56	0.00	0.06	-0.03	0.57	0.09*	-0.73	-0.11*
NoIbex-SmallW	3.08*	0.08	0.20	-0.06	-2.20	-0.22**	0.63	-0.09	-0.41	-0.23**	-1.32	-0.17
NoIbex-SmallL	0.27	-0.05	0.32	0.11	0.12	0.03	-0.79	-0.04	0.65	0.16**	-1.57*	0.02
Winner	-0.18	0.13**	-0.64**	-0.38**	-0.15	-0.14**	-0.11	-0.18**	-0.14	-0.26**	0.05	0.08
Medium-Winner	0.09	0.11	0.05	-0.16**	0.01	0.08*	0.14*	0.17**	-0.05	0.05	-0.26**	0.01
Medium-Loser	-0.13*	-0.17**	0.34**	0.21**	0.15*	0.11**	-0.18	-0.02	0.09	0.21**	-0.50**	-0.10**
Loser	0.02	0.00	0.06	0.27**	-0.20	0.05	-0.09	-0.03	-0.20**	-0.07	0.52**	0.08*

Continued on next page...

	July		August		September		October		November		December	
	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)	Diff (B,S)	Diff (I,D)
Ibex-Large	-0.13	-0.10	-0.02	0.02	-0.04	-0.33**	-0.01	0.15	0.05	-0.12	-0.03	0.00
Ibex-LargeW	0.13	0.05	0.64	-0.20	0.14	0.43*	0.27	-0.02	-0.08	0.12	-0.46*	-0.41*
Ibex-LargeL	0.66	0.87**	0.60	-0.36	-0.79	-0.63**	1.18**	1.67**	0.80*	0.26	0.42*	-0.27
Ibex-Small	-0.07	0.02	0.04	0.00	-0.06	0.09**	0.18**	-0.10**	0.05	0.04	0.11**	0.04
Ibex-SmallW	0.52**	0.18**	0.15	-0.11	0.13	0.18**	0.30*	-0.12*	-0.41**	-0.14**	-0.25*	0.01
Ibex-SmallL	-0.23	0.13**	0.17	0.03	-0.29*	-0.09*	-0.05	0.01	0.34*	0.20**	0.57**	-0.02
NoIbex-Large	2.90**	0.16	-2.26*	-0.49**	-1.38	-0.24*	-0.57	-0.25**	-0.16	0.00	1.53	-0.12
NoIbex-LargeW	6.51**	0.29	-3.64**	-1.31**	2.37	0.26	-1.20	-0.18	0.44	-0.23	-2.18	-0.47**
NoIbex-LargeL	4.71**	0.43**	0.20	0.10	-2.73**	-0.18	0.20	-0.17	0.51	-0.01	3.71	0.00
NoIbex-Small	0.59	-0.03	-1.42	-0.01	-1.01	0.06	-1.11*	0.00	-2.43**	-0.08	0.83	-0.07
NoIbex-SmallW	0.33	0.00	-0.27	0.08	0.41	0.00	-2.52**	-0.15	-2.19	-0.31**	-3.15	-0.05
NoIbex-SmallL	0.20	-0.10	0.72	0.29*	-3.23	-0.06	-0.96	0.15*	-2.54	0.01	-0.62	-0.16**
Winner	0.67**	0.16**	-0.03	-0.27**	0.20	0.11**	-0.02	-0.13**	-0.19	-0.03	-0.44**	-0.20**
Medium-Winner	-0.24**	-0.17**	-0.04	0.03	0.07	0.15**	-0.04	-0.01	0.01	0.08*	-0.22**	-0.13**
Medium-Loser	-0.28**	-0.19**	-0.03	0.00	-0.03	0.01	0.16*	0.02	-0.16**	-0.21**	0.19**	0.23**
Loser	0.02	0.20**	0.22*	0.15**	-0.21*	-0.11**	-0.09	0.07	0.34**	0.23**	0.30	-0.04

3.6 Summary and conclusions

Several studies analyse the trading behaviour of mutual funds near mandatory portfolio report periods to verify the truthfulness of these disclosed reports. However, few of them use a holdings data frequency higher than quarterly, which could severely bias their conclusions. A reporting bias could also be present in the findings of these previous studies. This chapter, therefore, examines an extensive and official fund database of monthly portfolio holdings to determine mutual fund trading around disclosure dates. The empirical section examines whether Spanish domestic equity funds manipulate their portfolios to improve their disclosed image.

The evidence of a relevant percentage of missing trades using quarterly information strengthens the use of monthly information for an appropriate comparison between disclosed and undisclosed portfolio holdings. Preliminary tests on the turnover ratios during the calendar year seem to indicate higher levels of trading activity in reporting periods, which may be in accordance with the portfolio manipulation hypothesis.

Trading activity measures and a new portfolio allocation approach provide several interesting investment patterns around quarter transitions that depend on size and recent performance records of the stocks. The new approach of this work with respect to the entire portfolio captures the general effect of trading activities on the stock weights, which mainly determine a portfolio's image.

The results for the large-cap and well-known Ibex-35 stocks suggest that funds tend to rebalance their portfolios to increase the share of return-winner stocks and to decrease the share of poor-return stocks in disclosure months, especially June and September. Interestingly, non-disclosure months show the opposite trend. These results are especially relevant due to the leading role of these blue-chip stocks in the fund portfolio holdings. On the other hand, the results for *NoIbex* stocks suggest that funds tend to increase their share of these small-cap stocks more actively in non-disclosure months. Thus, funds might manipulate their portfolios to show well-known stocks in their quarterly reports, a behaviour that is consistent with the window-dressing hypothesis.

The first-ever monthly management map of Spanish domestic equity funds reveals interesting information about the trading activities followed by mutual funds throughout the year. Moreover, the detailed analysis of the first quarter of the year shows that the trading behaviour of funds is mainly concentrated in *NoIbex* stocks. The results indicate that funds actively participate in the January effect, especially through the purchase of small-cap stocks. However, domestic equity funds own a low capitalization percentage of Spanish listed companies which suggests that funds participate in the January effect more in the sense of taking advantage of the anomaly rather than being a causative factor. This argument thus states that a window-dressing practice could not play a leading role in explaining the well-known January effect in the Spanish market, as earlier studies hypothesize.

Finally, the findings also reject that calendar patterns might be simply the result of standard fund management practices such as momentum strategies. In addition, the test of the risk-shifting hypothesis constitutes an interesting topic for further research because evidence in favour of this strategy might explain high trading figures in small stocks detected in the first quarter of the year. Future research with additional information will be necessary to appropriately verify these hypotheses.

Appendix 3.1

Analysis of turnover outliers

The detection of turnover outliers is carried out through the standardization of the monthly turnover for each mutual fund[5] and then by applying the well-known rule that an outlier is the value that is three standard deviations below or above the mean; that is, $|z| \geq 3$.

Table 3.10 reports the number of outliers found in the sample and the month in which they occur. Panel A shows that two of the months with the largest percentage of outliers belong to the first quarter, which has 37% of the total. The highest concentration of outliers occurs in January and December, which are precisely more interesting months for the window-dressing analysis. In addition, one of the purposes of this chapter is to analyse the relationship between the trading activity of funds and the January effect in the Spanish stock market. The concentration of these outliers is also evident in Panel B, with a high percentage of outliers in turn-of-the-quarter months, which are the variables included in the regression model of equation 3.5. Therefore, these results allow us to decide not to discard turnover outliers because they might provide important information to the analysis.

Table 3.10: Turnover outliers

Panel A: Outliers by month

Month	**Number of outliers**	**Percentage**
January	21	20%
February	7	7%
March	11	10%
April	6	6%
May	2	2%
June	10	9%
July	7	7%
August	4	4%
September	8	7%
October	9	8%
November	9	8%
December	13	12%
Total	**107**	**100%**

Panel B: Outliers by type of month

Type of month	**Number of outliers**	**Percentage**
QEND	29	27%
YEND	13	12%
QBEG	22	21%
YBEG	21	20%
Other	22	21%
Total	**107**	**100%**

[5]The standardization of each monthly turnover for each mutual fund consists in applying the expression $z = (x_i - \bar{x}/s)$, where z is the standardized value, x_i is the turnover observation in month i, $\bar{x}$ is the mean, and s is the standard deviation.

Chapter 4

Assessment of window dressing using fund returns and portfolio holdings

This chapter presents the analysis of the monthly portfolio holdings and daily returns of a large sample of Spanish domestic equity funds to test the potential manipulation of portfolios in mandatory reports. The comparison between the return of the fund portfolio holdings and the observed fund return reveals that only a low percentage of filings may be classified as window-dressed portfolios. These portfolios are dispersed across funds and fund managers, but they are clustered over three specific quarters that coincide with bear market months. The results seem to indicate that although window dressing is not a widespread practice in the Spanish market, there is evidence to suggest that mutual funds employ this trading strategy as a response to poor past performance.

4.1 Introduction

According to current legislation of collective investment in Spain, mutual fund managers must reveal their portfolio holdings to shareholders each quarter. Despite these disclosure requirements to ensure that investors receive fitting information, fund managers might have incentives to use trading strategies to alter their reports. In this case, the disclosed information is not useful for investor decisions because the information is simply a snapshot of the securities portfolio at a particular date; it does not necessarily provide information about the securities held throughout the quarter. Unfortunately, this practice of portfolio manipulation is difficult for mutual fund authorities to detect, and even more difficult for individual investors, given the high quality information needed to carry out comprehensive analyses on this matter.

In an attempt to find evidence of window dressing in mutual funds, several studies have employed the traditional approach of analysing the trading activity of mutual funds through the comparison of portfolio holdings (Lakonishok *et al.*, 1991; Basarrate and Rubio, 1994a; Eakins and Sewell, 1994; Musto, 1997, 1999; He *et al.*, 2004; Ng and Wang, 2004). However, this approach presents major limitations to capturing interim trades and detecting the dates when securities were bought or sold. Using this approach, the previous chapter analysed the monthly portfolio holdings of a large sample of Spanish mutual funds to test the window-dressing practice through trading activity measures. However, the high frequency of portfolio data in our database allowed us to more appropriately address the window-dressing study,

draw more accurate conclusions, and overcome the problem of low information frequency faced by the studies cited above.

A large amount literature has discussed the performance of mutual funds, but few studies have analysed anomalies in fund returns as a mechanism to identify portfolio manipulation. For instance, O'Neal (2001) examines daily returns of US equity funds to find changes in the return-generating process around portfolio reporting dates. The conclusions of this study are based on a residual analysis from market models estimated for each mutual fund. The market model regresses the daily fund returns against the daily returns of a specific Russell style index, selected according to the fund style. He finds that residuals are higher around fiscal year-end than on other days of the year. Therefore, these atypical return patterns suggest that mutual funds window dress their portfolios around fiscal year-ends.

Torre-Olmo and Fernández (2002) analyse return patterns in a sample of Spanish equity funds. They compare fund returns around quarter-ends with returns on other days of the year using the estimation of a regression model with dummy variables. The results show that mutual funds obtain higher returns around quarterly disclosure dates than during the rest of the year. Although this result is explained by window-dressing practices, the authors do not directly prove this hypothesis.

Some years later, Morey and O'Neal (2006) evaluate window dressing in a large sample of US bond mutual funds. Examining changes in quarterly portfolio holdings, they find that, consistent with window-dressing strategies, funds clearly tend to hold more government bonds and increase the quality of holdings at disclosure than at non-disclosure dates. The authors then perform a return analysis using daily data of net asset values (NAV) and find atypical return patterns around reporting dates that allow them to confirm the first result.

Meier and Schaumburg (2006) contribute to the study of window-dressing practices by proposing a methodology to identify window-dressed portfolios that combines the use of portfolio holdings and mutual fund returns. These authors compare the realized daily fund return with the daily return on the hypothetical buy-and-hold strategy around reporting dates. The study focuses on the difference between these returns given that it captures possible portfolio manipulation by fund managers prior to disclosure.

The observed fund return is calculated from the daily net asset values (NAV), while the return of the fund portfolio holdings is the hypothetical return that the fund would have earned if it had held the disclosed portfolio around the reporting date. In the case that a fund manager plans his investment decisions according to the reporting schedule, the disclosed portfolios could be significantly different to those holdings that are representative of the actual management strategy. If a fund manager buys recently winner stocks and sells loser stocks just before disclosing the portfolio, the hypothetical returns on the portfolio outperform the realized fund returns, and this divergence is detected by the test.

This chapter aims to extend the analysis of Chapter 3 by examining mutual fund returns and portfolio holdings as an alternative approach to detect the existence of intentional portfolio manipulation around portfolio disclosures. Following the approach of Meier and Schaumburg (2006) and providing an additional test, we then look for evidence of window dressing in our sample of Spanish equity funds. The test applied to detect window-dressed portfolios differs slightly from that used by these authors, which will be further developed in the methodology section. Our approach has the advantage of correcting possible variance problems in return data, such as heteroscedasticity and autocorrelation.

To our knowledge, this study is the first that examines fund returns to analyse the

window-dressing hypothesis in the Spanish fund industry. Moreover, our monthly portfolio database allows further analyses around disclosure and non-disclosure months, while Meier and Schaumburg (2006) were able to analyse only semi-annual reports. Although this approach cannot directly capture interim fund trades, the daily analysis of the return differences tries to overcome this problem to better understand fund management behaviour in between reporting dates. In addition, the analyses in this chapter examine window dressing for each mutual fund separately and not from an aggregate perspective as the analyses in the previous chapter, which constitutes an additional advantage of this approach.

The daily return analysis identifies a low percentage of filings in the sample that have a positive return difference before the reporting dates and that coincide with mandatory reports, which suggest portfolio manipulation by fund managers. Moreover, our monthly database allows for the comparison of return patterns between disclosed and non-disclosed portfolios, showing that the average daily return difference is higher in portfolios reported on quarter-ends than in portfolios reported in other months, especially in June and September. These results are consistent with the window-dressing hypothesis and with the results from the previous chapter, which revealed that mutual funds tend to manipulate their mandatory reports, especially in June and September.

The low proportion of portfolios identified in the extensive sample suggests that the window-dressing practice is not very common in Spanish equity funds during the period analysed. This perception is confirmed in the study of common characteristics of window-dressed portfolios because the results do not reveal signs of clustering around funds and fund management companies. However, the findings also suggest that mutual funds might use window-dressing practices to mitigate past losses. The results show that window-dressed portfolios are clustered over bear market periods and that a high percentage of the funds that have manipulated their mandatory reports have had poor past performance.

The remainder of the chapter is organized as follows: Section 2 describes the databases used in the analysis. Section 3 explains the methodology. Section 4 shows the main empirical results, and Section 5 presents the conclusions.

4.2 Data

Several data sets were employed in this study. The first set consists of the monthly portfolio holdings of 125 Spanish domestic equity funds from December 1999 to December 2006. This database was provided by the CNMV and is described in the previous chapter.[1] The second set, also provided by the CNMV, contains daily net asset values (NAV) and management fees for each fund in the sample from December 1, 1999 to January 31, 2007. As detailed in Chapter 3, these databases are free of look-ahead, reporting selection, and survivorship biases. The final sample of holdings contains 6,914 reported portfolios. The number of reported portfolios differs slightly from that used in Chapter 3 because the analysis performed in this chapter requires that all fund portfolio holdings have the corresponding daily NAV data at least during one month before and one month after the date of the report.

The holdings database includes portfolio positions in stocks, bonds and other assets and

[1]The CNMV provides this information exclusively to the authors for research purposes. Therefore, the database is not available for retail and institutional investors, and fund managers could not anticipate the use of this information.

excludes cash positions. All securities reported are carefully identified by the ISIN codes.

To achieve the goals of this chapter, the daily returns of securities reported by funds are also necessary. Therefore, the daily closing price of all Spanish stocks that trade in the Continuous Market and in the New Market of Spain (which are the main domestic stocks that are traded in this market) are obtained from the Madrid Stock Exchange. With regard to foreign stocks, the major leaders of European stocks are controlled (i.e., stocks belonging to Euro Stoxx 50 and Stoxx Europe 50 indices). Reuters DataLink provided the daily closing prices of these stocks. The returns of fixed-income securities are calculated using indices published by *Analistas Financieros Internacionales* (AFI), as follows: three-year Spanish public debt index for Spanish long-term securities; Treasury bill index (one-year) for Spanish short-term securities; and three-year Euro public debt index for European fixed-income securities. The returns on investments in other mutual fund units are obtained from the daily fund NAV database. The sample period for these returns spans from December 1, 1999 to January 31, 2007. Finally, a low percentage of fund total assets (less than 4%) are non-controlled securities, which together with cash and cash equivalents receive a zero return.

The share of the fund portfolio in each type of security is reported in Table 4.1. All funds in the sample are Spanish domestic equity funds. Therefore, as expected, the main investment is in domestic stocks. The CNMV requirements for this type of fund establish a minimum of 67% of the total portfolio invested in stocks issued in Spain, which is observable in most of the years reported in Table 4.1.

Table 4.1: Portfolio holdings of Spanish domestic equity funds

This table reports the portfolio share by type of security for our sample. The assets invested by funds are classified by categories, as follows: stocks (Spanish and European), fixed income (Spanish long-term, Spanish short-term, and European), other mutual fund units, cash and cash equivalents, and non-controlled securities. The following data correspond to December of each year.

	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Stocks:								
Spanish	70.2%	63.5%	62.4%	66.8%	66.5%	72.1%	74.0%	76.8%
European	3.0%	3.2%	2.0%	2.7%	2.4%	2.3%	2.3%	2.3%
Fixed income:								
Spanish long-term	10.9%	15.3%	19.6%	12.4%	20.4%	18.2%	15.6%	14.4%
Spanish short-term	4.5%	5.3%	3.6%	3.7%	2.4%	1.8%	2.1%	1.0%
European	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.3%	0.0%
Other mutual fund units	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Cash and cash equivalents	8.0%	8.9%	9.7%	12.2%	7.5%	5.1%	5.4%	4.9%
Non-controlled securities	3.4%	3.7%	2.7%	2.1%	0.6%	0.5%	0.4%	0.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

4.3 A methodological approach to identify window dressed portfolios

This section describes the methodology employed in this chapter to determine whether a mutual fund engages in abnormal investment strategies around quarterly disclosures. Window-dressing practices have traditionally been tested by analysing fund trading activity using portfolio holdings databases. Nevertheless, there is another approach that is based on the analysis of fund return anomalies around portfolio reporting dates. Meier and Schaumburg (2006) propose an approach that combines the use of both portfolio holdings and mutual fund returns. Taking advantage of the information that each database supplies, these authors propose a test to identify window-dressed portfolios by examining divergences between the return of the reported portfolio and the observed fund return. Interim fund trades cannot be directly captured with this approach. Nevertheless, an effort is made to solve this issue by performing a daily analysis of return differences. As a consequence, the assessment of fund management behaviour in between reporting dates can be improved. Moreover, this method has the advantage of analysing each fund portfolio holding individually and not in an aggregate form, as is performed in other approaches employed to detect window-dressing practices.

4.3.1 Return of the fund portfolio holdings

To distinguish return patterns associated with potential window-dressing practices, the approach proposed by Meier and Schaumburg (2006) requires a benchmark to compare against the realized fund return. This benchmark is the return of the buy-and-hold strategy, which represents the return that the fund would have reached if the holdings of the disclosed portfolio were maintained for the period analysed.

Given that window-dressing practices may imply higher trading activity just prior to reporting (Meier and Schaumburg, 2006; Elton *et al.*, 2010), the analysis of return patterns is concentrated around mandatory reports. Meier and Schaumburg (2006) analyse US domestic equity funds that must report each quarter, but their database only covers semi-annual portfolio holdings. These authors then calculate the return on the buy-and-hold strategy in an interval that starts 91 days before the reporting date and ends 91 days afterwards (i.e., 13 weeks before and 13 weeks after), although they concentrate the analysis on the 4 weeks before and the 4 weeks after reporting.

In the Spanish market, mutual funds must report to investors quarterly, which would require a detailed analysis on a quarterly basis. However, our database of monthly portfolio holdings allows us to analyse every month. Therefore, our study overcomes the aforementioned study because it analyses return patterns not only around disclosure portfolios (quarterly mandatory reports) but also around the non-disclosure portfolios. The return patterns associated with potential window-dressing practices are analysed in an interval that starts one month before the reporting date and ends one month afterwards. The number of trading days varies depending on the month, with a maximum of 23 trading days. The interval analysed can be defined between d_b and d_a, where d_b (d_a) is the number of trading days before (after) the reporting date.

Each reported portfolio in our database shows the assets invested the last day of the month, so taking this day as $t = 0$, the portfolio weight of each security i corresponds to

reported security positions, as follows:

$$w_{i,t} = \frac{\textit{Amount invested in security } i}{\textit{Total fund assets}} = \frac{P_{i,t} n_{i,t}}{\sum_{i=1}^{j} P_{i,t} n_{i,t}} \quad \text{for } t = 0 \tag{4.1}$$

where $P_{i,t}$ is the closing price of security i on day t, $n_{i,t}$ is the number of shares for security i on day t, and j is the total number of securities in the portfolio. As each reported portfolio shows the complete record of asset holdings and these securities are identified, the sum of all $w_{i,t}$ on day $t = 0$ is 100%.

However, the portfolio weights calculated with equation 4.1 are only valid on the reporting day ($t = 0$). Therefore, it is necessary to calculate the daily portfolio weight for the other days in the interval of interest ($t = -d_b, ..., d_a$). As this weight calculation is performed under the assumption that funds follow a buy-and-hold strategy, the following process guarantees the correct daily updating of security positions according to their appreciation.

For any day after the reporting date ($t = 1, ..., d_a$), the portfolio weight of security i ($w^c_{i,t}$) is calculated from its weight on the previous day ($w_{i,t-1}$) and the return on day t ($r_{i,t}$). The daily security returns are calculated from data sets of daily closing prices, previously described in the data section.[2] Then,

$$w^c_{i,t} = w_{i,t-1}(1 + r_{i,t}) \quad \text{for } t = 1, ..., d_a \tag{4.2}$$

Note that to calculate the portfolio weights on day $t = 1$, it is necessary to have the respective portfolio weights on day $t = 0$, previously calculated and for which the sum of all $w_{i,t=0}$ is 100%. Nevertheless, the sum of all $w^c_{i,t=1}$ is different from 100%. For that reason, the final weights on day $t = 1$ must be recalculated by a simple procedure that consists of finding the percentage that each $w^c_{i,t=1}$ represents over the sum of all $w^c_{i,t=1}$. As a result, the sum of all final portfolio weights ($w_{i,t}$) for day $t = 1$ is 100%, and they can be employed as a base to calculate the portfolio weights on day $t = 2$, and so on.

Following the above reasoning, for any day before the reporting date ($t = -d_b, ..., -1$), the portfolio weight of security i ($w^c_{i,t}$) is calculated from its weight on the next day ($w_{i,t+1}$) and the return obtained during day $t + 1$ ($r_{i,t+1}$), as:

$$w^c_{i,t} = \frac{w_{i,t+1}}{1 + r_{i,t+1}} \quad \text{for } t = -d_b, ..., -1 \tag{4.3}$$

Once again, the sum of all portfolio weights calculated for a day t ($w^c_{i,t}$) is different from 100%; therefore, they must be recalculated to obtain the final weights, which sum up to 100%. To better illustrate this procedure, Appendix 4.1 shows an example.

Thus, once all final $w_{i,t}$ are obtained, the daily return of the fund portfolio holdings ($R^P_{k,t}$) is computed for each reported portfolio by fund k and for each trading day t ($t = -d_b, ..., d_a$), as follows:

$$R^P_{k,t} = \sum_{i=1}^{j} w_{i,t-1} r_{i,t} \tag{4.4}$$

[2]Returns for Spanish stocks are adjusted by dividends, stock splits, and seasoned equity offerings, while returns for European stocks are adjusted by dividends and stock splits.

where $w_{i,t-1}$ is the weight that security i had on day $t-1$, $r_{i,t}$ is the return of security i on day t, and j is the total number of securities in the portfolio.

4.3.2 Observed fund return

From the database of daily net asset values (NAV), the daily observed fund return is calculated for each fund as the relative change in NAV. However, the NAV return cannot be compared with the return of the fund portfolio holdings. The NAV return is net of the operating expenses, while the return of fund holdings does not include the subtraction corresponding to these expenses. To solve this incompatibility, the management fees are added back to the net fund return to obtain the gross fund return, in this manner:

$$Gross\ fund\ return = \frac{1 + Net\ fund\ return}{1 - Management\ fees} - 1 \tag{4.5}$$

Daily returns are calculated for each fund over the period from December 1, 1999 through January 31, 2007. Therefore, a fund that exists throughout the sample period has 1,800 daily returns. For the entire sample of funds, a total of 177,792 daily fund returns are calculated.

4.3.3 Return difference measure

As mentioned above, the key to identifying window-dressed portfolios is to analyse possible significant divergences between the daily return of fund portfolio holdings ($R^P_{k,t}$) and the daily observed fund return ($R^F_{k,t}$). These returns are calculated for each fund and each reported portfolio for a period of time spanning from a month before to a month after the reporting date (i.e., for $t = -d_b, ..., d_a$). Following the approach of Meier and Schaumburg (2006), the return difference (RD) between these returns for fund k in day t is then calculated as:

$$RD_{k,t} = R^P_{k,t} - R^F_{k,t} \tag{4.6}$$

The analysis of the RD sign (i.e., positive or negative) is relevant to identify return patterns associated with portfolio manipulation practices.[3] A significant positive RD implies that the buy-and-hold return of the reported portfolio outperforms the observed fund return. If this pattern occurs prior to the reporting date, it could indicate that the fund manipulates the portfolio by buying recently winner stocks and eliminating loser stocks. This window-dressing strategy results in a return of reported assets that is not representative of the portfolio held by the fund during the month, with the consequent difference in returns.

The window-dressing hypothesis states that fund managers are only motivated to improve the portfolio's image when they must disclose their portfolio holdings to clients. Therefore, one would expect that this trading strategy only appears before mandatory reports, which are reported quarterly for the Spanish market. This hypothesis can be verified in this study because our monthly database of portfolio holdings allows for the comparison of return patterns between disclosed and non-disclosed portfolios. Specifically, we expect to find a

[3]Before the analysis of the RD sign, we conducted an exploratory analysis to verify significant RDs in the sample. Appendix 4.2 shows that RDs, in absolute values, are statistically different from zero for the entire sample. Although these results do not allow us to infer anything about return patterns associated with window-dressing practices, they motivate a detailed study of the RDs.

higher daily RD before the reporting dates for portfolios reported quarterly than for those in other months.

4.3.4 Model specification

To identify possible RD patterns associated with window-dressing practices, a detailed analysis of the RDs of each fund reported portfolio is conducted. Taking into account that a time series of RD is created for each reported portfolio, the RD study is based on a time series analysis of daily returns. These series elapse from d_b days before to d_a days after the reporting date.

Regarding the methodologies for a time series analysis, several financial studies employ linear regression models (OLS), assuming that the data are normally distributed, serial uncorrelated, and with constant variance. However, these assumptions are unrealistic to model some financial market variables. In particular, for financial market returns, the changes in variance over time have been widely documented.[4] Therefore, models such as the Autoregressive Conditional Heteroscedastic (ARCH), introduced by Engle (1982), and the Generalized ARCH (GARCH), introduced by Bollerslev (1986), were developed to model changes in volatility.

The specification of a GARCH(p,q) model is given by the following equations:

$$y_t = \mu + \sigma\varepsilon_t \tag{4.7}$$

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-1}^2 + \sum_{j=1}^{p} \beta_j \sigma_{t-1}^2 \tag{4.8}$$

The equation of the mean (4.7) is written as a function of exogenous variables with an error term, while the variance equation (4.8) is written as a function of a constant, an ARCH term, and a GARCH term. In the simplest form of GARCH models (i.e., the GARCH(1,1)), the variance equation is expressed as:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \tag{4.9}$$

where the ARCH term (ε_{t-1}^2) contains information about volatility observed in the previous period, while the GARCH term (σ_{t-1}^2) contains information about the forecasted variance of the previous period.

The GARCH process defined by Bollerslev (1986) assumes that the conditional distribution of the error term (ε) is normal. However, the Student's t-distribution and the Generalized Error Distribution (GED) are widely employed. Independent of the distribution assumption, the GARCH models are typically estimated by the method of maximum likelihood.

Although the aim of this chapter is to study the mean behaviour of the sample of the time series, the GARCH approach is employed to correct possible variance problems, such as heteroscedasticity and autocorrelation.

[4] See, for example, Fama (1965) and Lau *et al.* (1990).

To determine the order of the GARCH model, some p, q combinations are applied to find the most accurate model for our sample. Taking into account that most empirical applications have used lower order GARCH models (Tsay, 2010), we begin with the GARCH(2,2) estimation for each of the 6,914 time series. Table 4.2 shows, for each coefficient in the model, the percentage of reported portfolios with a significant coefficient at the 5% level. The low percentage in the second order in both terms, ARCH (α_2) and GARCH (β_2), suggests that the model could be defined with only one lag. Therefore, the GARCH(1,1) is proved, and the results show that the GARCH term (β_1) is statistically significant in more than 50% of the estimations. With regard to the ARCH term, Table 4.2 shows that it is significant for 22% of the estimated models. To finish these tests, the GARCH(1,0) model is estimated to verify if the ARCH term could be eliminated given the low percentage obtained in the GARCH(1,1) estimation. Nevertheless, the results indicate that the significance of all coefficients is lower when the ARCH term is eliminated. The results in Table 4.2 suggest that the best model is the GARCH(1,1), which is in accordance with Bollerslev *et al.* (1986), who explain that the simple GARCH(1,1) model provides a good description of the data in most empirical applications.

Table 4.2: Order specification for the GARCH model

For each reported portfolio, some GARCH(p,q) models (equations 4.7 and 4.8) are estimated to determine the most accurate model for our sample. This table reports, for each p,q combination, the percentage of reported portfolios with a significant coefficient at the 5% level.

	Mean	Variance				
	μ	α_0	α_1	α_2	β_1	β_1
GARCH(2,2)	13%	7%	12%	6%	13%	10%
GARCH(1,1)	9%	10%	22%	-	53%	-
GARCH(1,0)	5%	5%	-	-	45%	-

Once the order for the model has been specified, the most accurate conditional distribution of the error term is determined. The three most commonly used assumptions with GARCH models are the normal (Gaussian) distribution, the Student's t-distribution, and the GED distribution. For each distribution, the GARCH(1,1) model is estimated. The decision regarding the error distribution is based on the information criteria reported by Eviews (e.g., Akaike, Schwarz, and Hannan-Quinn). These criteria are often used as a guide in model selection because they provide a measure of the goodness of fit and specification of the model.

For each distribution of the error term, Table 4.3 reports the average of the information criteria obtained for the estimation of the GARCH(1,1) model for each time series. In addition, this table shows the percentage of reported portfolios with a significant coefficient at the 5% level.

The selection rule consists of selecting the model with the smallest information criterion. Therefore, the results in Table 4.3 suggest that GED distribution is the most suitable alternative to estimate the GARCH(1,1) model. This distribution has the lowest values in the Akaike and Hannan-Quinn criteria. Moreover, when the model assumes that the errors are distributed as a GED, the percentage of reported portfolios with significant coefficients increases with regard to the rest of the distributions. Another advantage of the GED assumption is that it contains the normal distribution as a special case but also allows fatter

and thinner tails than the ones in the normal distribution (Nelson, 1991).

Table 4.3: Error distribution for the GARCH(1,1) model

For each reported portfolio, the GARCH(1,1) model is estimated under different error distributions to determine the most accurate model for our sample. For each distribution (normal, t-Student, and GED), this table reports the percentage of reported portfolios with a significant coefficient at the 5% level and the average of the information criteria: Akaike, Schwarz, and Hannan-Quinn.

	Mean	Variance			Akaike	Schwarz	Hannan-Quinn
	μ	α_0	α_1	β_1			
Normal	9%	10%	22%	53%	-9.07	-8.90	-9.01
t-Student	10%	6%	13%	50%	-9.04	-8.83	-8.96
GED	17%	13%	26%	55%	-9.09	-8.89	-9.02

In summary, the time series analysis of the RDs will be performed by means of the GARCH(1,1) model, under the assumption that the errors follow a GED distribution.

4.4 Identifying significant return differences

This section focuses on the identification of filings where the reported portfolio is not informative of the actual return obtained by the fund. Once these portfolios are identified, we aim to provide evidence on two issues: first, to determine potential persistence in window-dresser funds; and second, to determine potential common characteristics in portfolios that have been manipulated. As previously mentioned, this study only focuses on the analysis of the mean to identify significant RDs and possible fund patterns. Given that the main goal is the identification of window-dressed portfolios, it is necessary to modify the mean equation (4.7) to differentiate the RD patterns before and after the reporting date because this phenomenon is mainly observed prior to reporting (Meier and Schaumburg, 2006; Elton *et al.*, 2010). Therefore, the GARCH(1,1) model is specified with the following mean and variance equations:

$$y_t = \beta_1 BEF_t + \beta_2 AFT_t + \sigma\varepsilon_t \tag{4.10}$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \tag{4.11}$$

where the equation of the mean (4.10) is written as a function of two dummy variables: BEF_t and AFT_t. BEF_t takes the value of one for days before the reporting date and zero otherwise. In contrast, AFT_t takes the value of one for days after the reporting date and zero otherwise. Note that in this equation, the t-test for β_1 (β_2) gives information about whether BEF_t (AFT_t) is significantly different from zero. Therefore, the estimation of this GARCH(1,1) model in each of the 6,914 time series allows for the identification of portfolios with significant and positive RD before the reporting date, which are denominated hereafter as "identified portfolios".

After the estimation process, 477 reported portfolios with a significantly positive BEF_t coefficient (at the 5% level) are found, which corresponds to 7% of the sample. The results are reported in Table 4.4. The average daily RD is significantly different (at the 1% level) between the entire sample and identified portfolios: -0.001% per day in the month leading up to the reporting date for the entire sample, and 0.104% for identified portfolios.

This table also shows remarkable results when splitting the sample between months in which portfolios were disclosed (quarters) and other months. This classification reveals an interesting pattern consisting in that average daily RD is higher in portfolios reported on quarter-ends than in portfolios reported in other months, with differences statistically significant at a level of 1% for both the entire sample and the set of identified portfolios. This finding suggests that the main divergence between the return of the fund portfolio holdings and the observed fund return occurs prior to mandatory reports, which supports the window-dressing hypothesis. As expected under this hypothesis, identified portfolios reported on quarter-ends exhibit the highest average daily RD (0.152%). This result means that these mutual funds would have earned, on average, 0.152% more per day if they would have held the disclosed portfolio prior to the reporting date. This RD is even larger in our study than in Meier and Schaumburg's (2006) study; these authors find that the median return difference is approximately 0.05% per day in their sample of US mutual funds.

Table 4.4: Summary results for identified portfolios

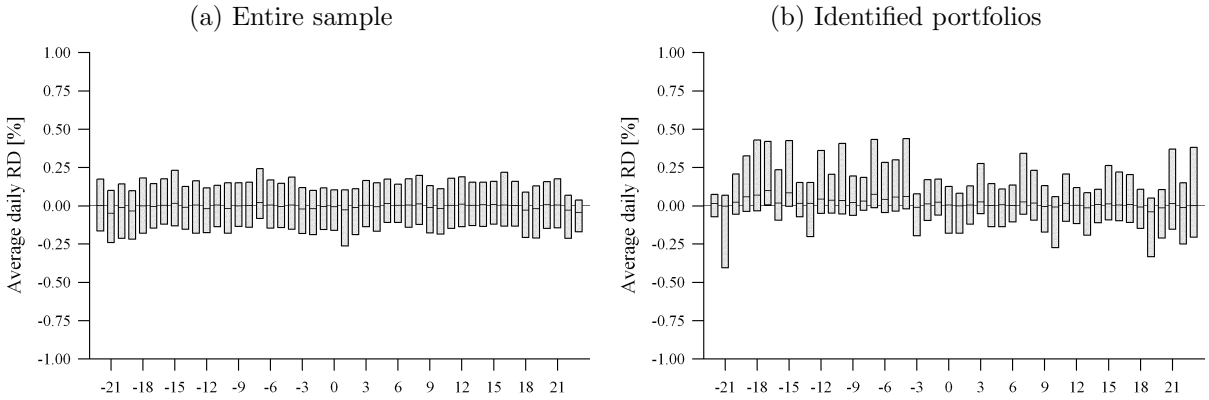
This table shows the number of portfolios and the average daily RD before the reporting date for the entire sample and the set of portfolios identified a with significant and positive BEF_t coefficient from the GARCH estimation (equations 4.10 and 4.11). This information is also presented for months that coincide with mandatory disclosure dates (quarters) and other months. Moreover, the difference of the average daily RD between quarters (Q) and other months (OM) is reported in the final column. **1% significant.

	Total	Quarters	Other months	Diff (Q,OM)
Number of portfolios:				
Entire sample	6,914	2,359	4,555	
Identified portfolios	477	213	264	
% identified	7%	9%	6%	
Average daily RD before the reporting date:				
Entire sample	-0.001%	0.021%	-0.012%	0.033%**
Identified portfolios	0.104%	0.152%	0.065%	0.087%**

Figure 4.1 uses box plots to better illustrate the RD behaviour for identified portfolios and their difference from the entire sample. For the entire sample (Panel A), the median is always near zero and the interquartile range before the reporting date ranges from -0.24% to 0.24%. The results for identified portfolios (Panel B) again show that the buy-and-hold return of the reported portfolio outperforms the observed fund return, especially prior to the reporting date, where the daily RD ranges from -0.40% to 0.44% and is in accordance with the expected portfolio manipulation pattern.

Figure 4.1: Pattern of daily RD for the entire sample and identified portfolios

For each reported portfolio, a time series of RD is created, starting d_b days before the reporting date ($t = 0$) and ending d_a days afterwards. The estimation of the GARCH(1,1) model (equations 4.10 and 4.11) allows for the identification of a set of reported portfolios with significant and positive BEF_t coefficient. This figure shows the average daily RD for the entire sample (Panel A) and identified portfolios (Panel B). The boxes represent the interquartile range (i.e., the 25^{th} and 75^{th} percentile) and the line drawn across the boxes represents the median. The sample consists of 6,914 reported portfolios in Panel A and 477 in Panel B.



4.4.1 Are portfolios with significant RDs engaged in window-dressing practices?

Portfolios that have been identified in the previous section have positive and significant RDs before the reporting dates; however, this condition is not enough to ensure that such portfolios have been manipulated with window-dressing strategies. According to the window-dressing hypothesis, fund managers are motivated to improve the portfolio's image when they must disclose their portfolio holdings to shareholders and clients. Therefore, one would expect this trading strategy to appear only near mandatory reports. The goal of this section is to analyse in detail the identified portfolios to determine whether fund managers follow certain cosmetic practices around disclosure of portfolios to investors. Table 4.5 summarizes the main results related to the identified portfolios(by month).

With regard to the number of portfolios, this table shows that June and September are the months with the highest percentage of identified portfolios with respect to the total number of reported portfolios in the sample (14% and 10% respectively). Moreover, when the average daily RD before the reporting date is analysed, Table 4.5 reveals that the highest RD also corresponds to portfolios reported in June and September. In the previous section, Table 4.4 anticipated important differences in daily RD for identified portfolios between quarter-end months and other months. Here these differences are more evident and they can be explained by the findings in June and September. These results are in accordance with expected results under the window-dressing hypothesis because those months coincide with mandatory reports. In addition, these findings also agree with the results obtained in the previous chapter, where the trading analysis revealed that in mandatory reports, especially in June and September, mutual funds prefer large-cap stocks with incentives to increase the

portfolio allocation of return-winners and decrease the weight of return-loser stocks.

Table 4.5: Average daily RD for identified portfolios

This table reports the main results of portfolios identified with significant and positive BEF_t coefficients from the GARCH estimation (equations 4.10 and 4.11). By month, this table shows the number of portfolios reported and identified as well as the percentage of identified portfolios with respect to the sample. In addition, the average daily RD for identified portfolios before the reporting date is presented.

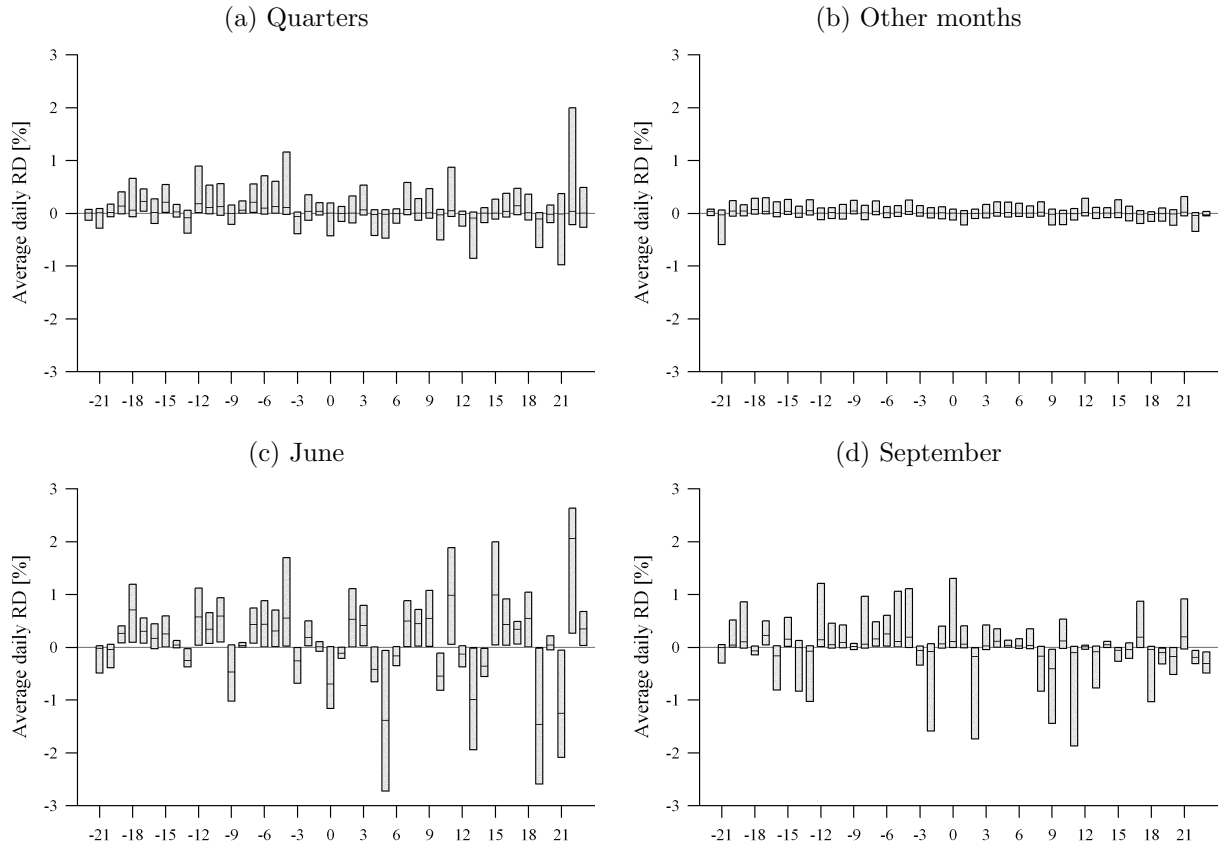
	Number of portfolios			Average daily RD for identified
	Reported	Identified	%	portfolios before the reporting date
Quarters:	**2,359**	**213**	**9%**	**0.152%**
March	563	40	7%	0.061%
June	573	79	14%	0.243%
September	576	56	10%	0.135%
December	647	38	6%	0.081%
Other months:	**4,555**	**264**	**6%**	**0.065%**
January	558	36	6%	0.057%
February	563	33	6%	0.082%
April	565	30	5%	0.094%
May	568	46	8%	0.064%
July	572	41	7%	0.057%
August	576	28	5%	0.038%
October	577	27	5%	0.068%
November	576	23	4%	0.061%
Total	**6,914**	**477**	**7%**	

This differential pattern is better illustrated in Figure 4.2. The comparison of the daily RD for portfolios that coincide with mandatory reports (Panel A) with those in other months (Panel B), reveals that something atypical occurs in quarterly reports. Before the reporting date, portfolios in Panel B exhibit a smaller dispersion and a median close to zero, while portfolios in Panel A show a positive RD, positive interquartile ranges, and a median of 0.08%. However, the RD behaviour for portfolios in June and September (Panels C and D) is even more remarkable because they display more positive interquartile ranges than the entire set of quarterly portfolios, and their median RD is approximately 0.20% and 0.06%, respectively.

Regarding RD behaviour after the reporting date for quarterly portfolios, Figure 4.2 shows that the average daily RD does not show a clear pattern; some days this difference is quite positive, while others it is very negative. This finding differs from the results obtained by Meier and Schaumburg (2006); they found no abnormal return differences after the reporting date, suggesting that the mutual funds might hold the reported portfolio over the next quarter. However, our results do not support this conclusion for Spanish mutual funds.

Figure 4.2: Pattern of daily RD for identified portfolios

For each reported portfolio, a time series of RD is created, starting d_b days before the reporting date ($t = 0$) and ending d_a days afterwards. The estimation of the GARCH(1,1) model (equations 4.10 and 4.11) allows for the identification of a set of reported portfolios with significant and positive BEF_t coefficients. This figure illustrates the average daily RD for identified portfolios corresponding to quarterly mandatory reports (Panel A) and those in other months (Panel B). Moreover, Panels C and D show RD patterns in months with the highest percentage of identified portfolios with respect to the sample, June and September. The boxes represent the interquartile range (i.e., the 25^{th} and 75^{th} percentile) and the line drawn across the boxes represents the median. The sample consists of 213 portfolios in Panel A, 264 in Panel B, 79 in Panel C, and 56 in Panel D.



4.4.2 Characteristics of window-dressed portfolios

This section looks for potential common features in the portfolios that have been identified as window-dressed portfolios. Although the analysis only focuses on 213 portfolios, one might expect certain characteristics from funds that have manipulated their portfolios. For example, one would expect some of the following patterns: funds periodically window dress their portfolios; fund management companies follow window-dressing strategies in several funds that they manage; higher levels of window dressing occur in funds with poor past performance; and some coincidences in dates, among others.

In a first review of common characteristics in the sub-sample, we find that window-dressed portfolios are quite dispersed over funds, as 95 out of 125 funds in the sample have at least one portfolio identified as window dressed. In addition, the analysis of fund management companies for those funds with a higher percentage of window-dressed portfolios also shows

a high dispersion level because a different company managed each fund.[5]

Regarding the dates of the identified portfolios, the results in Table 4.6 reveal that each of the quarters of the sample period (29 in total) has at least one window-dressed portfolio. However, it is important to note that these portfolios are clustered over time, as about 40% correspond to three quarters in 2002 (specifically, June, September, and December). This fact is more interesting when it is related with the Ibex-35 performance on those dates because these were the months of the lowest profitability during the sample period.[6] Therefore, these results might suggest that several funds found enough motivation to window dress their mandatory reports at the end of these bear market months, probably selling poor performing assets and buying recent winners to show high-quality portfolios at the end of the quarter. This finding contradicts the results of Meier and Schaumburg (2006) because they find that in a bull market, it is more likely that a fund uses window-dressing strategies.

Table 4.6: Dates of window-dressed portfolios

This table reports the dates of the 213 portfolios identified as window dressed. The dates are organized according to the number of portfolios in each quarter. This table also shows the concentration of portfolios over time, which is measured as the percentage of window-dressed portfolios in each quarter with respect to the total of 213 portfolios identified as window dressed.

Date	**Number of window dressed portfolios**	**%**
Jun-02	49	23%
Sep-02	22	10%
Dec-02	12	6%
Jun-00	10	5%
Dec-01	10	5%
Sep-03	10	5%
Mar-00	9	4%
Mar-01	9	4%
Mar-04	8	4%
Jun-05	8	4%
Sep-06	8	4%
Sep-01	7	3%
Mar-03	7	3%
Dec-00	6	3%
Jun-04	6	3%
Sep-05	6	3%
Mar-06	4	2%
Jun-01	3	1%
Dec-03	3	1%
Dec-99	2	1%
Sep-00	2	1%

Continued on next page...

[5]Tables with this information are not presented to avoid having large amounts of data without a significant contribution to the value of the analysis.

[6]The monthly returns of Ibex-35 in June, September, and December 2002 were -13.04%, -15.60%, and -9.70%, respectively.

Date	Number of window dressed portfolios	%
Mar-02	2	1%
Dec-04	2	1%
Dec-05	2	1%
Jun-06	2	1%
Jun-03	1	0%
Sep-04	1	0%
Mar-05	1	0%
Dec-06	1	0%
Total	**213**	**100%**

Finally, when funds are ranked by their past performance on the month before disclosure, the results in Table 4.7 show that 65% of the funds that manipulate their mandatory reports belong to medium-loser and loser return quartiles. Moreover, these funds have the characteristic of having a negative return of about -7.0% during the month leading up to the reporting date. This result might suggest that funds with poor past performance are more likely to manipulate their portfolios that are presented to clients.

Table 4.7: Past performance of window-dressed portfolios

Each quarter, mutual funds are classified into four quartiles according to their cumulative return over the past month: *Winner*, *Medium-Winner*, *Medium-Loser*, and *Loser*. The *Winner* quartile contains the funds with the largest returns and the *Loser* quartile contains the funds with the smallest returns. This table reports, for each quartile, the number of window-dressed portfolios and the average fund return over the past month.

Return quartile	Number of wd portfolios	%	Average fund return
Winner	33	15%	-0.3%
Medium-Winner	42	20%	-4.7%
Medium-Loser	63	30%	-6.9%
Loser	75	35%	-7.2%
Total	213	100%	

In summary, the analyses of identified portfolios that coincide with mandatory reports seem to indicate that the window-dressing practice is an isolated case within the sample of funds analysed because these portfolios are distributed over funds and fund management companies. Nevertheless, the manipulated portfolios seem to be clustered over bear market periods, probably as a response to poor past performance.

4.5 Summary and conclusions

Several studies have found evidence of the use of window dressing by mutual funds by comparing portfolio holdings and analysing their trading activity around disclosure dates.

However, there are few studies in existing literature that analyse anomalies in mutual fund returns to identify the window-dressing practice, and there is an even smaller number of studies that combine the analysis of observed fund returns with portfolio holdings information. In the latter subset, none of the studies use holdings data with a higher frequency than quarterly, which could limit their conclusions. Therefore, this chapter aims to extend the study of portfolio manipulation around mandatory reports by examining daily observed fund returns and monthly portfolio holdings in Spain, a relevant European fund industry.

The detection of window-dressed portfolios is based on the analysis of the difference between the return of the reported fund holdings and the observed fund return. The estimation of a GARCH model allows for the identification of a low percentage of filings that have positive RD before the reporting date and that coincide with mandatory reports. The monthly database used allows for the comparison between disclosed and undisclosed identified portfolios, showing that the average daily RD is higher for quarterly portfolios than for those in other months. In addition, the results show that June and September are the months with the highest percentage of portfolios identified as window dressed, with respect to the total number of reported portfolios in the sample.The results also show that these portfolios have the highest RD before the reporting date. This finding is in accordance with expected results under the window-dressing hypothesis and with the results obtained in the previous chapter. Therefore, the approaches applied in both chapters seem to capture the mutual fund behaviour during those disclosure months, providing robustness to the conclusions of this study.

The analyses of those portfolios identified as window-dressed portfolios suggest that window dressing is not a common practice in the Spanish equity funds. This conclusion is supported by the lesser proportion of filings identified in the extensive sample of portfolio holdings and the dispersion of these portfolios over funds and fund management companies. However, the results also suggest that funds with poor past performance are more likely to manipulate their portfolios and that window-dressed portfolios seem to be clustered over bear market periods, probably as a response to poor past performance.

Appendix 4.1

Calculating the return of the fund portfolio holdings

The following example illustrates the procedure describe in Section 4.3.1 to calculate the return of the fund portfolio holdings. Suppose that on June 30, a fund reports assets of €10,000. These assets are invested as follows: €5,000 in security A; €3,000 in security B; and €2,000 in security C. Taking this date as $t = 0$, Table 4.8 shows the daily return of each security as well as its respective portfolio weight for $t = -1, 0,$ and 1.

Table 4.8: Example of the return of the fund portfolio holdings

Security	€	Daily return [%]			Calculated weight [%]			Final weight [%]		
		t = -1	t = 0	t = 1	t = -1	t = 0	t = 1	t = -1	t = 0	t = 1
A	5,000	1.0	1.0	4.0	49.50	50.00	52.00	49.39	50.00	50.72
B	3,000	0.9	-3.0	0.8	30.93	30.00	30.24	30.86	30.00	29.50
C	2,000	1.8	1.0	1.4	19.80	20.00	20.28	19.75	20.00	19.78
Total	10,000				100.23	100.00	102.52	100.00	100.00	100.00
								R^P	-0.23%	2.52%

On day $t = 0$, the portfolio weight is the proportion invested in each security. The weights are then calculated using the equation 4.1 and they are the same final weights, as follows:

$$w_{A,0} = \frac{5,000}{10,000} = 50.00\%$$

$$w_{B,0} = \frac{3,000}{10,000} = 30.00\%$$

$$w_{C,0} = \frac{2,000}{10,000} = 20.00\%$$

To calculate the portfolio weights on day $t = 1$, it is necessary to know the weights on the previous day ($w_{i,t-1}$) and the return obtained during day t ($r_{i,t}$). Applying the equation 4.2, we obtain the following results:

$$w^c_{A,1} = w_{A,0}(1 + r_{A,1}) = 0.50(1 + 0.04) = 0.5200$$

$$w^c_{B,1} = w_{B,0}(1 + r_{B,1}) = 0.30(1 + 0.008) = 0.3024$$

$$w^c_{C,1} = w_{C,0}(1 + r_{C,1}) = 0.20(1 + 0.014) = 0.2028$$

Note that the sum of these three calculated weights is not equal to 100%; it is 102.52%. Therefore, the final weights are obtained by finding the percentage that each $w^c_{i,t}$ represents over the 102.52%, in this manner:

$$w_{A,1} = \frac{0.5200}{1.0252} = 50.72\%$$

$$w_{B,1} = \frac{0.3024}{1.0252} = 29.50\%$$

$$w_{C,1} = \frac{0.2028}{1.0252} = 19.78\%$$

Now, the equation 4.3 is applied to calculate the portfolio weights on day $t = -1$:

$$w^c_{A,-1} = \frac{w_{A,0}}{(1 + r_{A,0})} = \frac{0.50}{(1 + 0.01)} = 0.4950$$

$$w^c_{B,-1} = \frac{w_{B,0}}{(1 + r_{B,0})} = \frac{0.30}{(1 - 0.03)} = 0.3093$$

$$w^c_{C,-1} = \frac{w_{C,0}}{(1 + r_{C,0})} = \frac{0.20}{(1 + 0.01)} = 0.1980$$

Once again, the sum of these three calculated weights is different from 100%; it is 100.23%. Therefore, the final weights on $t = -1$ are obtained as:

$$w_{A,-1} = \frac{0.4950}{1.0023} = 49.39\%$$

$$w_{B,-1} = \frac{0.3093}{1.0023} = 30.86\%$$

$$w_{C,-1} = \frac{0.1980}{1.0023} = 19.75\%$$

Finally, once all final $w_{i,t}$ are calculated, the daily return of the fund portfolio holdings (equation 4.4) is computed for the portfolio reported by this fund, as follows:

$$R^P_0 = \sum_{i=1}^{3} w_{i,-1} r_{i,0} = (0.4939 \times 0.01) + (0.3086 \times (-0.03)) + (0.1976 \times 0.01) = -0.23\%$$

$$R^P_1 = \sum_{i=1}^{3} w_{i,0} r_{i,1} = (0.50 \times 0.04) + (0.30 \times 0.008) + (0.20 \times 0.014) = 2.52\%$$

The results suggest that this mutual fund obtains a return of 2.52% in the first trading day of July. This return is valid under the assumption that the fund holds the same portfolio reported on June 30 (i.e., under a buy-and-hold strategy).

Appendix 4.2

A first examination of Return Differences

This appendix shows the results of an exploratory analysis to validate if significant differences exist between the return of the fund portfolio holdings and the observed fund return ($RD_{k,t} = R^P_{k,t} - R^F_{k,t}$). The purpose of this first approach is to verify that there are significant RDs on which the subsequent analysis of window-dressing strategies will focus. Therefore, we check the significance of the absolute value of RD. A simple t-statistical test is applied for the null hypothesis that the absolute value of RD equals zero. Table 4.9 shows the mean of the RD in absolute values ($|RD|$) and the p-value of the t-test for each fund.

The results for the sample of 125 funds indicate that RDs, in absolute values, are statistically different from zero for the entire sample, which means that there are significant differences between fund portfolio holding returns and observable fund returns. Although the statistical test applied does not allow us to infer return patterns associated with window-dressing practices, these results prompt a detailed study on RD.

Table 4.9: Absolute value of Return Differences

Fund	Observations	$\|RD\|$ mean	p-value	Fund	Observations	$\|RD\|$ mean	p-value	Fund	Observations	$\|RD\|$ mean	p-value
1	1,785	0.005	0.000	43	3,515	0.003	0.000	85	788	0.001	0.000
2	3,558	0.002	0.000	44	3,476	0.001	0.000	86	3,558	0.004	0.000
3	3,558	0.001	0.000	45	3,558	0.004	0.000	87	3,558	0.001	0.000
4	705	0.006	0.000	46	3,558	0.004	0.000	88	1,870	0.002	0.000
5	3,558	0.005	0.000	47	1,037	0.006	0.000	89	2,184	0.002	0.000
6	1,245	0.005	0.000	48	3,558	0.003	0.000	90	1,524	0.002	0.000
7	1,958	0.008	0.000	49	3,558	0.004	0.000	91	962	0.004	0.000
8	3,558	0.004	0.000	50	3,558	0.004	0.000	92	1,212	0.001	0.000
9	2,457	0.005	0.000	51	1,037	0.005	0.000	93	3,266	0.001	0.000
10	1,037	0.001	0.000	52	500	0.001	0.000	94	1,643	0.001	0.000
11	3,558	0.005	0.000	53	3,558	0.004	0.000	95	2,810	0.002	0.000
12	3,558	0.000	0.000	54	590	0.001	0.000	96	2,767	0.001	0.000
13	3,558	0.004	0.000	55	3,558	0.002	0.000	97	2,681	0.004	0.000
14	3,558	0.004	0.000	56	3,558	0.005	0.000	98	1,478	0.004	0.000
15	2,617	0.004	0.000	57	877	0.006	0.000	99	2,398	0.001	0.000
16	812	0.000	0.000	58	3,558	0.004	0.000	100	2,313	0.001	0.000
17	1,374	0.007	0.000	59	3,558	0.004	0.000	101	2,270	0.003	0.000
18	2,853	0.004	0.000	60	1,119	0.002	0.000	102	2,060	0.002	0.000
19	2,022	0.001	0.000	61	3,558	0.003	0.000	103	1,220	0.001	0.000
20	3,558	0.002	0.000	62	1,484	0.000	0.000	104	1,941	0.001	0.000
21	3,558	0.003	0.000	63	899	0.001	0.000	105	812	0.001	0.000
22	1,958	0.006	0.000	64	3,558	0.001	0.000	106	1,900	0.001	0.000
23	2,921	0.004	0.000	65	2,036	0.001	0.000	107	1,688	0.003	0.000
24	3,558	0.004	0.000	66	3,558	0.005	0.000	108	1,643	0.001	0.000
25	2,060	0.001	0.000	67	3,096	0.009	0.000	109	1,562	0.001	0.000
26	2,596	0.004	0.000	68	1,418	0.006	0.000	110	1,314	0.001	0.000
27	2,060	0.003	0.000	69	1,332	0.006	0.000	111	1,061	0.005	0.000
28	2,117	0.001	0.000	70	3,558	0.004	0.000	112	1,270	0.002	0.000

Continued on next page...

Fund	Observations	$\|RD\|$ mean	p-value	Fund	Observations	$\|RD\|$ mean	p-value	Fund	Observations	$\|RD\|$ mean	p-value
29	509	0.000	0.000	71	3,558	0.003	0.000	113	982	0.001	0.000
30	3,558	0.003	0.000	72	3,558	0.003	0.000	114	1,022	0.001	0.000
31	3,558	0.001	0.000	73	1,203	0.004	0.000	115	941	0.000	0.000
32	2,494	0.003	0.000	74	3,558	0.006	0.000	116	941	0.002	0.000
33	664	0.005	0.000	75	3,558	0.001	0.000	117	941	0.001	0.000
34	3,558	0.004	0.000	76	2,681	0.002	0.000	118	941	0.004	0.000
35	3,558	0.003	0.000	77	1,374	0.003	0.000	119	941	0.000	0.000
36	3,558	0.003	0.000	78	3,558	0.002	0.000	120	856	0.001	0.000
37	3,558	0.004	0.000	79	1,039	0.002	0.000	121	769	0.002	0.000
38	3,558	0.004	0.000	80	3,558	0.003	0.000	122	680	0.001	0.000
39	1,498	0.003	0.000	81	3,478	0.001	0.000	123	468	0.001	0.000
40	3,301	0.001	0.000	82	3,558	0.001	0.000	124	468	0.000	0.000
41	3,558	0.004	0.000	83	3,558	0.004	0.000	125	468	0.006	0.000
42	3,558	0.004	0.000	84	1,121	0.001	0.000				

Conclusions

To finish this dissertation, the main conclusions and contributions are summarized in this section. The main objective of the thesis was the analysis of mutual fund behaviour around mandatory portfolio reports and its relationship with calendar anomalies in the Spanish stock market. This investigation was mainly motivated by the need to analyse the accuracy of the information supplied by fund managers to shareholders and by the scarce number of studies focused on window-dressing practices in Europe.

The first part of the thesis presented a brief description of both the Spanish mutual fund industry and the Spanish stock market to provide an overview of their recent evolution and their importance to the country. The development and growth of the mutual fund industry in Spain has had a close relationship with the dynamism and modernization of the regulatory framework. This growth has also been accompanied by a high participation of Spanish families, which have begun to put their savings into the financial markets.

The contextualisation of the Spanish financial markets in the international arena showed its incipient force, which is reflected by its seventh place ranking in the European distribution of mutual fund assets. In addition, the Spanish Stock Exchange is ranked ninth in the world by capitalization and tenth by total value of share trading. The brief international analysis of the mutual fund industry confirmed that although there are some differences in the development and characteristics of the collective investment sector among continents and countries, the social and economic relevance of this financial instrument is similar given the high participation of the population and the extraordinary volume of assets managed. Therefore, there is a need to ensure that investors receive the appropriate information to make informed decisions and that they are adequately protected against abusive mutual fund practices.

Chapter 2 analysed the behaviour of stock returns around quarterly disclosures of equity fund portfolios to identify the role of institutional trading in the Spanish calendar anomalies. The results obtained indicate no clear stock return anomalies during the first three-quarters of the year, which is consistent with existing literature on the subject. Nevertheless, the results provide evidence that the January effect persists in the Spanish market, especially for loser small-cap stocks. Moreover, when the anomaly was analysed according to the market trend, the results suggest that the intensity of the January effect is stronger in bear markets than in bull markets.

The most popular explanations for the January effect are tax-loss selling by individual investors and window dressing by institutional investors. Most of the studies conducted in Spain conclude that the anomaly is related to the tax-loss selling hypothesis at the end of the fiscal year. Nevertheless, Spanish taxation on capital gains for individual investors has changed several times in recent years, and since 1999, tax regulation has restricted the freedom to realize capital losses to reduce taxes. To the best of our knowledge, this study

is the first that analyses the Spanish market for an extended period after this important amendment, which allowed us to identify the impact of this reform on the January effect. The daily return analysis revealed that the current personal income tax law has prolonged the duration of the January effect, although it continues to concentrate more than 50% of abnormally high returns on the first trading days of the year. Therefore, the persistence of this return anomaly suggests that it cannot be explained only by the tax hypothesis and that other explanations, such as the window-dressing hypothesis, might be behind this phenomenon.

The aforementioned results inspired the investigation presented in the second part of this thesis. It was interesting to identify the role of institutional behaviour in the January effect because it appears that individual investors do not have sufficient tax motivation under the current fiscal law. In Chapter 3, the potential manipulation of disclosed portfolios around the time of equity funds' mandatory reports was tested through the analysis of a unique database of monthly portfolio holdings of a large sample of Spanish domestic equity funds. This information is not available for retail or institutional investors. The CNMV provided this data set exclusively to the authors for research purposes. Therefore, fund managers could not have anticipated the disclosure of this information. Moreover, the fact that the information was provided by the official regulator overcomes the reporting selection bias, which is potentially present in the scarce research that exists on monthly portfolios where mutual funds voluntarily supply reports to private data providers.

A preliminary analysis in this chapter examined the intensity of trading activity of mutual funds during the calendar year using monthly turnover ratios. This analysis showed that the highest monthly turnover occurs in January, which might initially reflect the mutual funds' participation in the January effect. In contrast, the lowest trading activity occurs in August, which might reveal a summer-holidays effect in fund management. On the other hand, the high trading levels found in the first quarter could be consistent with risk-shifting practices.

The availability of monthly portfolio holdings allowed us to draw more accurate conclusions about abnormal trading around quarter-ends and to examine whether fund managers have disguised investment strategies around portfolio disclosures or, in contrast, follow the usual management strategy. Both trading activity measures and a new approach based on portfolio allocations revealed significant differences in the investment patterns of mutual funds, depending on the trading month. In the reporting months, especially June and September, fund managers prefer large-cap and well-known stocks (i.e., Ibex-35 stocks) with incentives to increase the share of return-winner stocks and decrease the share of return-losers. These results are especially relevant due to the leading role of these blue-chip stocks in the fund portfolio holdings. On the other hand, in non-disclosure months, fund managers tend to buy and increase the portfolio weight of the smallest-cap stocks. Therefore, these results suggest that, consistent with the window-dressing hypothesis, mutual funds might manipulate their portfolios to show well-known stocks in their quarterly reports.

Although several studies of window dressing in the US fund market have found that this practice is mainly evident at year-end, our results with respect to mutual fund behaviour in December were varied. Consistent with the window-dressing hypothesis, mutual funds tend to decrease the share of loser small-cap stocks before this reporting date. However, consistent with contrarian strategies, mutual funds are inclined to buy low-performance stocks and sell and decrease the share of some high-performance stocks. These results showed a weak evidence of window-dressing practices used by Spanish domestic equity funds at year-end.

In addition, the first-ever monthly management map of Spanish domestic equity funds revealed interesting information about the trading activities of mutual funds throughout the year. The detailed analysis of the first quarter of the year indicated that mutual funds actively participate in the January effect through the buying of small-cap stocks at the beginning of the year. However, mutual funds own a low percentage of the total Spanish stock market capitalization, which suggests that fund managers are taking advantage of this anomaly rather than causing it. This argument thus states that a window-dressing practice could not play a leading role in explaining the well-known January effect in the Spanish market, as earlier studies hypothesize. Therefore, the causes behind this anomaly are still unclear, as the tax-loss selling hypothesis has also weakened due to the current personal income law.

Finally, Chapter 4 aimed to extend the analysis of the previous chapter by examining mutual fund returns and portfolio holdings as an alternative approach to detect the existence of intentional portfolio manipulation around portfolio disclosures. The detection of window-dressed portfolios was based on the analysis of the difference between the return of the fund holdings and the observed fund return. To our knowledge, this study is the first that examines fund returns to analyse the window-dressing hypothesis in a European fund industry.

The analysis was very interesting because we examined window dressing for each mutual fund separately, rather than from an aggregate perspective as in Chapter 3. Although this approach cannot directly capture interim fund trades, it tries to overcome this problem through a daily analysis of the return differences, which allowed for a better understanding of the fund management behaviour in between reporting dates.

The daily return analysis revealed that only a low percentage of filings in the sample may be classified as window-dressed portfolios. The comparison of return patterns between disclosed and non-disclosed portfolios showed that the average daily return difference (RD) is higher in portfolios reported on quarter-ends than in portfolios reported in other months. The results also show that June and September are the months with the highest percentage of portfolios identified as window dressed, with respect to the total number of reported portfolios in the sample, and that these portfolios have the highest RD before the reporting date. This finding is in accordance with the window-dressing hypothesis because those months coincide with mandatory reports. Moreover, this finding agrees with the results of the trading analysis (Chapter 3), which revealed that mutual funds tend to manipulate their mandatory reports, especially in June and September.

The low percentage of filings identified in the extensive sample of portfolio holdings suggests that window dressing is not a widespread practice in the Spanish market during the period analysed. This perception was confirmed in the study of characteristics of window-dressed portfolios because the results do not reveal signs of clustering around funds and fund management companies. However, the findings also suggest that funds with poor past performance are more likely to manipulate their portfolios, and that window-dressed portfolios seem to be clustered over bear market periods, probably as a fund's response to poor past performance.

In summary, the detailed analysis of window-dressing strategies that was performed by applying two alternative approaches allows us to obtain robust results because both approaches seem to capture the mutual fund behaviour around portfolio disclosures, especially those results in June and September. Although the findings in Chapter 4 suggest that the window-dressing practice is not common in the Spanish equity funds industry, the trad-

ing activity followed by these funds seems to be distinctive enough to be detected by the methodology used in Chapter 3, which examines window dressing in the entire sample of funds.

This thesis contributes to existing literature in several ways. First, the detailed study of the January effect presented new insights about issues that had not been studied in the Spanish market, such as the duration of the anomaly and the consequences of the current personal income tax law. Second, the study of the trading activity of mutual funds around year-end allowed us to understand the actual role that mutual funds play in the January effect, which also constitutes a subject that had not yet been directly demonstrated in Spain. Third, the use of monthly portfolio holdings information in the window-dressing analysis allowed us to make an appropriate comparison between disclosed and undisclosed portfolio holdings, draw more accurate conclusions, and overcome the problem of low information frequency that previous studies on this subject faced. Fourth, for the first time in the Spanish fund industry, this thesis presented a map that reveals the management behaviour of mutual funds every month. Finally, this thesis has contributed methodologically to the research on window dressing by proposing a new complementary measure that identifies strategic variations in portfolio allocation and that captures the general effect on the stock weights, which primarily determine the image of a portfolio. Moreover, a statistical test was applied to detect window-dressed portfolios based on the analysis of fund return patterns, which has the advantage of correcting possible variance problems in return data, such as heteroscedasticity and autocorrelation.

Several fields for further investigation have been identified in this thesis. An appropriate test of the tax-loss selling hypothesis on a database of individual investors trading activity could be interesting to clarify the real causes of the persistent January effect in the Spanish stock market. With respect to the window-dressing hypothesis, the test of this strategy in other types of Spanish mutual funds could enrich the conclusions obtained in this thesis by extending the analysis to other financial markets. In addition, some results obtained from the analysis of the trading behaviour of mutual funds have left some management practices that could be tested further, such as momentum, risk-shifting, and contrarian strategies. Although our study found that mutual funds seem to follow contrarian strategies in some months, a direct test of this hypothesis to confirm this finding could be interesting. Similarly, our results suggest that mutual funds do not follow momentum strategies, but an appropriate test is needed to confirm this finding. Finally, testing the risk-shifting hypothesis constitutes an interesting topic because evidence in favour of this strategy might explain the high trading activity in small stocks detected in the first quarter of the year.

Resumen y Conclusiones

A continuación se presenta un resumen en español de la tesis doctoral desarrollada. Este apartado se realiza para dar cumplimiento a la normativa de tesis doctorales de la Universidad de Zaragoza, según la cual, las tesis que no estén redactadas en español, deberán incluir un resumen en dicho idioma. El objetivo de este resumen es ofrecer una visión general de la tesis, pero sin el nivel de detalle de la versión completa redactada en inglés. Por tanto, se prescinde de muchas de las referencias bibliográficas, así como de los gráficos y tablas de resultados.

La tesis está compuesta de dos partes principales. La primera está conformada por los capítulos 1 y 2. En el Capítulo 1 se realiza una descripción de los mercados de valores y de fondos de inversión en España y su comparación con otros mercados internacionales. En el Capítulo 2 se verifica empíricamente la existencia actual del efecto fin de trimestre en el mercado español de valores. Se profundiza además en las posibles causas de este fenómeno, ya que puede estar relacionado con el comportamiento de los inversores institucionales cuando tienen la obligación de publicar la composición de sus carteras.

La segunda parte comprende los capítulos 3 y 4, en los cuales se analiza exhaustivamente la estrategia del maquillaje de carteras (*window dressing*) en los fondos de inversión de renta variable españoles. En el Capítulo 3, el maquillaje de carteras es verificado a través de la comparación de la composición periódica de las carteras de los fondos y el análisis de su actividad comercial alrededor de las fechas de publicación. Por su parte, el Capítulo 4 tiene como objetivo ampliar el estudio anterior a través de una metodología alternativa que toma como punto de partida la rentabilidad del fondo y la composición de sus carteras.

Capítulo 1: Un primer acercamiento a la industria de fondos de inversión y al mercado de valores en España

En este capítulo se ofrece una visión global de la importancia que tienen los fondos de inversión para la sociedad española. Se realiza una descripción del mercado bursátil y de la industria de los fondos de inversión en España durante los últimos años y una comparación del mercado español con otros mercados internacionales.

El mercado de valores español ha vivido en los últimos años un desarrollo importante en respuesta a las exigencias actuales de los inversores, intermediarios y empresas que buscan tener cada vez más productos y servicios en un marco de seguridad, transparencia y competitividad. La evolución de cifras como la capitalización y el volumen contratado muestran un

mercado en crecimiento, aunque afectado por las crisis financieras internacionales que han sacudido a la mayoría de los mercados bursátiles de todo el mundo.

Por su parte, la inversión colectiva en España también ha tenido un fuerte crecimiento en los últimos años, llegando al punto de que una de las alternativas fundamentales de inversión para los españoles sean precisamente los fondos de inversión. Lo anterior se ha debido, en parte, a la capacidad que tiene este instrumento financiero para acercar a los inversores a cualquier mercado, tanto nacional como internacional.

Marco legislativo de la inversión colectiva en España

Teniendo en cuenta que la industria de los fondos de inversión ha evolucionado tanto por el lado de la oferta como de la demanda, se hace evidente la repercusión social que tiene esta industria en la economía española, pues cualquier fallo en la gestión de dichos fondos puede afectar notoriamente a las finanzas de una parte importante de la población. Lo anterior, pone de manifiesto la importancia de tener un marco legislativo que permita velar por los derechos de las partes (gestores e inversores) y que incentive al desarrollo eficiente de la industria.

La evolución de la inversión colectiva en España ha estado acompañada por la evolución de su marco legislativo, el cual se ha adaptado al crecimiento del sector, a las nuevas tendencias y a la normativa europea. Los primeros intentos de regulación del sector datan de 1952, pero fue en la década de los 90s cuando la inversión colectiva comenzó la senda de desarrollo y crecimiento. Una vez alcanzada la madurez del sector, la Ley 35/2003 de 4 de noviembre y su Reglamento, aprobado por el Real Decreto 1309/2005 de 4 de noviembre, buscaron simplificar el régimen anterior, adaptar la legislación española a las Directivas Europeas (2001/107/CE y 2001/108/CE), y establecer un marco normativo adecuado al estado de madurez en el que se encontraba el sector. La aprobación de esta ley supuso un gran acontecimiento para la industria de la inversión colectiva en España, pues trajo consigo la modernización normativa del sector y la flexibilización que le ha permitido a las instituciones adaptarse a los continuos cambios del mercado.

El principio de protección a los inversores ha estado siempre presente en la regulación de la inversión colectiva en España para proteger la amplia participación de la población en el sector. Bajo este principio, la legislación siempre ha tomado medidas para asegurar que las instituciones de inversión colectiva (IIC) suministren información transparente y necesaria a los inversores. En este sentido, la Ley 35/2003 establece que, además de un folleto completo, los fondos de inversión presenten un folleto simplificado con el objetivo de resumir la información que llega a los inversores. Además, dicha ley define claramente el contenido de los informes trimestrales y semestrales, los cuales deben contener, entre otros, la cartera de títulos en que tienen invertido el patrimonio.

Otro aspecto que se debe resaltar es que, aunque la legislación española está adaptada a la normativa europea, las obligaciones que tienen las IIC de presentación de información a los inversores son más fuertes en España. Específicamente, las IIC españolas deben presentar informes trimestrales, con lo cual presentan dos informes más que los requeridos por la Directiva Europea 2001/107/CE. Esto representa una ventaja adicional para los inversores españoles, ya que tienen la información disponible con mayor regularidad.

Evolución de la industria de fondos de inversión en España

A continuación se presentan las principales cifras que ponen de manifiesto la evolución y desarrollo de los fondos de inversión españoles. Para analizar tanto la demanda como la oferta de la industria, se presentan datos evolutivos del volumen patrimonial gestionado, el número de partícipes y el número de fondos de inversión existentes en el mercado.

Según datos de la Asociación de Instituciones de Inversión Colectiva y Fondos de Pensiones (INVERCO), la industria de fondos de inversión gestionaba un patrimonio de 5.285 millones de euros en diciembre de 1989, mientras que en diciembre de 2009 la cifra era 31 veces mayor, sobrepasando los 163.000 millones de euros. Aunque estas cifras demuestran un extraordinario crecimiento, se debe tener en cuenta que el crecimiento del sector no se ha producido de una forma sostenida, ya que se ha visto afectado en varias ocasiones por las crisis financieras internacionales.

La evolución del número de inversores también muestra un patrón similar al del patrimonio gestionado por los fondos. En 1989, la industria tenía casi medio millón de partícipes, mientras que en el 2009 esta cifra ascendía a 5,6 millones, de los cuales el 95% eran inversores individuales. Esta cifra refleja la gran repercusión social que la industria tiene en el país, puesto que la gestión de estas IIC afecta directamente las finanzas personales de una parte importante de la población española.

El crecimiento del número de fondos de inversión en el mercado muestra la evolución de la oferta del sector. En 1989 había 166 fondos de inversión domiciliados en España, mientras que en el 2009 esta cifra ascendía a 2.510 fondos. La oferta de fondos de inversión tiene la característica de estar muy concentrada en cuanto a las sociedades que los gestionan, puesto que las diez mayores gestoras manejan más del 70% de los activos del mercado.

La distribución de los activos gestionados por los fondos también ha cambiado durante los últimos años. La participación de los fondos monetarios ha sufrido un considerable decrecimiento desde 1995, cediendo paso a los fondos garantizados. Por otro lado, las preferencias de inversión en fondos de renta fija han cambiado en el tiempo, pues la inversión a largo plazo ha cedido participación a la inversión a corto plazo.

Del mismo modo, la composición de las carteras se ha visto afectado por diversos motivos a lo largo del tiempo, especialmente por la globalización de los mercados financieros. La cartera internacional ha pasado de representar un 4% en 1995, a representar cerca del 40% en el 2009.

Finalmente, la importancia de los fondos de inversión se manifiesta también cuando se relacionan los activos gestionados por la industria y el PIB del país. Este porcentaje ha cambiado mucho en las últimas décadas, alcanzando un máximo de 38% a finales de los 90s, aunque en la actualidad se sitúa alrededor del 15%. Del mismo modo, la evolución de la distribución de los ahorros de las familias españolas muestra que, aunque los ahorradores sigan prefiriendo los depósitos bancarios, en los últimos años se ha observado una tendencia creciente de inversión en acciones y en fondos de inversión.

Fondos de inversión en el contexto internacional

En cuanto a la situación mundial de la industria de fondos de inversión, el patrimonio global gestionado por estas instituciones ascendía a 15,88 trillones de euros a finales de 2009, distribuidos en 65.306 fondos, según datos de la *European Fund and Asset Management*

Association (EFAMA).

En cuanto a la distribución del patrimonio por países, se encuentra que América tiene un papel destacado en esta industria, pues en el 2009 gestionó el 55% del patrimonio total de la industria, con una participación significativa de Estados Unidos. Por su parte, Europa se establece como la segunda región en orden de importancia, gestionando más del 30% del patrimonio mundial. Dentro de esta región se destacan países como Luxemburgo, Francia, Irlanda, y Reino Unido, que conjuntamente gestionan el 75% del patrimonio de la industria de fondos de inversión europea. Respecto a la situación del mercado español, se tiene que a finales de 2009, este país se situó en el séptimo puesto, gestionando un 3,6% del patrimonio europeo.

Evolución del mercado de valores español

Dada la estrecha relación entre la inversión colectiva y el mercado de valores, a continuación se resumen las principales cifras que permiten ver el desarrollo que dicho mercado ha tenido en los últimos años.

Según las estadísticas presentadas por Bolsas y Mercados Españoles (BME), la capitalización del mercado español ha pasado de 71 billones de euros en 1990 a 1.107 billones en 2009. Al igual que ha ocurrido con los fondos de inversión, este crecimiento no ha sido permanente durante este periodo de tiempo, pues el mercado de valores también se ha visto afectado por las crisis financieras internacionales. Durante el año 2009 casi todos los sectores incrementaron su capitalización, siendo especialmente importante el incremento en valores extranjeros, servicios de consumo, y servicios financieros e inmobiliarios.

En cuanto a la evolución del principal índice del mercado, el Ibex-35, se destaca el comportamiento que ha tenido durante los últimos años. Durante el 2008, la rentabilidad del Ibex-35 ha sido de -39%, acompañada con una volatilidad del 49%, siendo el peor registro anual de dicho índice y el peor año en la bolsa de valores española. Sin embargo, la recuperación del mercado durante el 2009 ha sido notable, registrando una rentabilidad anual de 30% y menores niveles de volatilidad (30%).

Para conocer el perfil de los inversores se analiza la propiedad de las acciones españolas cotizadas en el mercado de valores. En la última década, los bancos y cajas han disminuido considerablemente su propiedad en el mercado de valores, la cual ha sido compensada principalmente por inversores no residentes, que en el 2008 poseían el 38,5% del valor de las acciones españolas cotizadas. Así como en el mercado de fondos de inversión, las familias españolas tienen una considerable participación en el mercado de valores, con un 20% del valor de las acciones españolas cotizadas.

Finalmente, cuando se ubica el mercado de valores español en el contexto internacional, se encuentra que en el 2009, de acuerdo a la *World Federation of Exchanges* (WFE), la bolsa española ocupaba el puesto 9 en el mundo por capitalización y el puesto 10 por volumen de negociación.

Capítulo 2: Anomalías en la rentabilidad del mercado de valores español alrededor del cambio de trimestre

En este capítulo se analiza el comportamiento de la rentabilidad del mercado español en las fechas que coinciden con la publicación de las carteras de los fondos de inversión. Lo anterior se llevará a cabo con el objetivo de verificar si existen anomalías alrededor del cambio de trimestre, fenómeno que podría verse afectado por el comportamiento irregular de los inversores institucionales en dichas fechas.

En los últimos treinta años, las explicaciones a las anomalías observadas en la rentabilidad de las acciones han motivado muchas investigaciones, especialmente en las anomalías observadas alrededor del fin de año, conocidas también como efecto enero (*January effect* o *Turn-off-the-year effect*). Como resultado de dichas investigaciones, la literatura financiera ofrece diferentes explicaciones para este fenómeno, siendo las hipótesis de las pérdidas fiscales (*tax-loss selling*) y la del maquillaje de carteras (*window dressing*) las que más atención han recibido. A pesar de que las evidencias señalen que ambas estrategias producen efectos en la rentabilidad de las acciones en enero, el debate aún continúa respecto a cuál de ellas tiene una mayor contribución.

La hipótesis de las pérdidas fiscales sostiene que el efecto enero es producido por los inversores individuales que, antes de que termine el año fiscal, tienen el incentivo de vender las acciones que han perdido valor durante el año para generar pérdidas que son consideradas como minusvalías en el pago de impuestos. Por lo tanto, un comportamiento agregado de éstos inversores al final del año produce una caída en el precio de dichas acciones, pero luego en enero, cuando la presión vendedora cesa, los precios vuelven a subir generando unos rendimientos anormales. Desde las investigaciones pioneras en las décadas del 70 y 80 (Dyl, 1977; Givoly y Ovadia, 1983; Keim, 1983; Reinganum, 1983; Lakonishok y Smidt, 1984; Ritter, 1988), muchos estudios han presentado evidencia empírica acerca de este fenómeno.

Por su parte, la hipótesis del maquillaje de carteras está basada en el comportamiento de los inversores institucionales. Puede ser definida como una estrategia que utilizan éstos inversores antes de hacer públicos los informes periódicos, con el objetivo de alterar sus carteras y hacerlas más atractivas para sus clientes. Una posible línea de acción de esta estrategia consiste en vender las acciones que han sufrido pérdidas de valor durante el año y comprar acciones ganadoras, todo ello realizado especialmente durante los últimos días del año (Haugen y Lakonishok, 1988; Lakonishok *et al.*, 1991; Ng y Wang, 2004).

En el caso del mercado de valores español, son varios los estudios que presentan evidencia empírica de la existencia de anomalías en la rentabilidad de las acciones alrededor del fin de año. En los años 80, Gultekin y Gultekin (1983) presentaron un estudio internacional sobre el efecto enero, en el cual muestran que, entre 1959 y 1979, el mercado español tenía rendimientos anormales en enero. Unos años más tarde, Santesmases (1986) encontraba la misma anomalía en el periodo comprendido entre 1979 y 1983. Además, Basarrate y Rubio (1994b) encontraron existencia del efecto enero entre 1976 y 1991; Torre-Olmo y Fernández (2002) en el periodo comprendido entre 1991 y 1998; y recientemente, Miralles y Miralles (2007) en el periodo de 1988 a 2002. En definitiva, existe evidencia de que, entre 1959 y 2004, las rentabilidades de algunas acciones en enero son anormalmente altas en el mercado de valores español.

Muchos de los estudios descritos anteriormente para el caso español concluyen que la anomalía en las rentabilidades de las acciones en enero está relacionada con la hipótesis de

pérdidas fiscales. Sin embargo, la normativa fiscal ha cambiado varias veces en los últimos años y, desde 1999, se ha restringido la libertad de generar pérdidas fiscales para reducir el pago de impuestos (Ley 40/1998, de 9 de diciembre). Por lo tanto, esta reforma fiscal puede haber afectado el comportamiento de los inversores individuales alrededor del fin de año. Sin embargo, el impacto de esta reforma sobre el efecto enero aún no se ha demostrado, ya que los estudios anteriores no han analizado un período prolongado después de esta importante modificación en la legislación.

El estudio que se lleva a cabo en este capítulo es el primero en el mercado español que analiza un periodo de tiempo en el que existen restricciones para generar pérdidas de capital con motivos fiscales. Por lo tanto, la persistencia del efecto enero en este periodo podría significar que las anomalías en la rentabilidad podrían estar explicadas no sólo por motivos fiscales de los inversores individuales, sino también por otros motivos, como el maquillaje de carteras de los fondos de inversión. Dadas estas posibles implicaciones, el análisis de anomalías en la rentabilidad se extiende más allá del típico análisis alrededor del fin de año, y por ello se analizan todos los cambios de trimestre, que coincide precisamente con las fechas de publicación de informes de los fondos de inversión.

Datos y metodología

La base de datos empleada en este capítulo consiste en los precios de cierre diarios de las acciones españolas que se negocian en el Mercado Continuo y en el Nuevo Mercado durante el periodo temporal que abarca desde diciembre de 1999 a enero de 2007. La base de datos, libre de sesgo de supervivencia, fue facilitada por la Bolsa de Madrid. Además, la base de datos contiene información de todos los dividendos, splits y ampliaciones de capital durante este periodo de tiempo, pues la rentabilidad diaria de las acciones se ajustó por dichos factores.

La metodología utilizada por Ng y Wang (2004) para mostrar el efecto enero constituye el punto de partida para contrastar el comportamiento de la rentabilidad de las acciones del mercado español alrededor del cambio de trimestre.

Para ello se comienza con la clasificación trimestral de las acciones en varios grupos, así: el último día del trimestre se clasifican las acciones en dos grupos, las que pertenecen al Ibex-35 (*Ibex*) y las demás (*NoIbex*). Luego, dentro de cada grupo, las acciones son clasificadas en dos subgrupos, grandes (*Large*) y pequeñas (*Small*), de acuerdo a la capitalización del mercado. Por lo tanto, los cuatro grupos por tamaño son: *Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, y *NoIbex-Small*.

Posteriormente, dentro de cada categoría de tamaño, las acciones son clasificadas en los siguientes cuartiles de acuerdo a la rentabilidad acumulada en los últimos 11 meses: *Winner*, *Medium-Winner*, *Medium-Loser*, y *Loser*. El cuartil *Winner* contiene las acciones con los mayores rendimientos, mientras que el *Loser* contiene las acciones con las rentabilidades más bajas. Según el diseño de nuestro estudio, los grupos por tamaño y los cuartiles se rebalancean cada trimestre.

Una vez clasificadas las acciones, se calculan para cada acción las rentabilidades de los últimos diez días de negociación del trimestre (LTTD), de los primeros días del siguiente trimestre (FTTD), y la diferencia entre ellas. Finalmente, se calcula la rentabilidad promedio para cada grupo de acciones y se realizan pruebas estadísticas (t-test) para la hipótesis nula de igualdad de medias. De esta forma es posible determinar si existe diferencia entre la rentabilidad de los últimos días del trimestre y la de los primeros días del trimestre siguiente.

Por ejemplo, cuando se considera el cambio de trimestre de diciembre a enero, se calculan la rentabilidad de los últimos días de diciembre, la rentabilidad de los primeros días de enero, y la diferencia entre ellas. Si la rentabilidad es mayor en enero, la diferencia será positiva y podría indicar que existe efecto enero. Para validar estadísticamente esa diferencia se aplican las pruebas pertinentes.

Resultados

El primer análisis que presenta el capítulo consiste en comprobar, de forma preliminar, si existen diferencias en la rentabilidad mensual de las acciones en enero y los demás meses del año. Los resultados para los grupos y subgrupos de acciones por tamaño muestran que la rentabilidad promedio en enero es superior a la rentabilidad promedio de los demás meses del año, siendo especialmente superior en las acciones pequeñas (*Ibex-Small* y *NoIbex-Small*). Estos resultados ponen de manifiesto una anomalía en enero y coincide con estudios previos que encuentran que el efecto enero es especialmente fuerte en acciones de baja capitalización bursátil (Reinganum, 1983; Ng y Wang, 2004; Haug y Hirschey, 2006).

El siguiente análisis consiste en la detección de anomalías alrededor del cambio de trimestres. Los resultados no muestran evidencia clara de anomalías en los tres primeros trimestres del año, aunque se logró comprobar nuevamente la existencia del efecto enero en el mercado español, es cual es más fuerte en acciones pequeñas y en aquellas que han tenido bajo rendimiento en el pasado.

La ausencia de anomalías significativas durante los tres primeros trimestres parece indicar que no existen presiones relevantes sobre los precios de las acciones alrededor de dichos cambios de trimestre. Es claro que los inversores individuales no tienen motivos fiscales que puedan afectar el mercado en esas fechas, por lo tanto, los resultados sugieren que el comportamiento inversor de los fondos tampoco ejerce presión suficiente sobre el mercado durante esas fechas. Estos resultados podrían explicarse a través de la hipótesis de que los inversores prestan mayor atención a los informes anuales, con lo cual los fondos de inversión no tendrían suficientes motivos para maquillar sus carteras durante la primera parte del año (Elton *et al.*, 2010).

Por su parte, las anomalías detectadas alrededor del fin de año podrían estar explicadas, tal como se había mencionado anteriormente, por las hipótesis de *tax-loss selling* y de *window dressing*. Cualquiera de las dos hipótesis podría estar detrás del efecto enero, pero también es posible que sea causado por la participación conjunta de inversores individuales e institucionales, unos motivados por fines fiscales y los otros para manipular sus carteras.

Con el objetivo de contrastar la robustez de los resultados anteriores y determinar la relación del efecto enero con la rentabilidad del mercado, se llevó a cabo el mismo análisis en dos periodos diferentes. El primero se caracteriza por ser un periodo bajista y abarca desde diciembre de 1999 hasta febrero de 2003. Por el contrario, el segundo periodo es alcista y va desde marzo de 2003 hasta enero de 2007. Los resultados muestran que el efecto enero en acciones pequeñas persiste a pesar de la tendencia del mercado, aunque dicho efecto es mayor en mercados bajistas, lo cual coincide con las evidencias presentadas por Rozeff (1985), De Bond y Thaler (1987), Dhaliwal y Trezevant (1993), y Gu (2003).

Una vez demostrado que en el mercado español aún existe efecto enero, se hace un análisis complementario acerca del comportamiento de la rentabilidad diaria acumulada de las acciones durante los primeros días del año. Este nuevo enfoque permite descubrir que el

efecto enero en el mercado español dura más de los 10 días normalmente analizados, aunque también es evidente que el mayor aumento en la rentabilidad de las acciones ocurre durante los primeros días de enero.

Por último, se analiza la influencia de la ley del impuesto sobre la renta de personas físicas (Ley 40/1998, de 9 de diciembre) sobre el efecto enero y su duración. Para ello se compara la rentabilidad diaria acumulada del Ibex-35 y del Índice General de la Bolsa de Madrid Total (IGBMT) antes y después de entrar en vigor dicha ley. Los resultados revelan que la magnitud del efecto no ha cambiado significativamente, aunque la nueva normativa sí que parece haber prolongado la duración del efecto enero.

Capítulo 3: Maquillaje de carteras en los fondos de inversión españoles: una mirada a la composición de sus carteras

En el mercado de las instituciones de inversión colectiva es frecuente que los gestores sean evaluados por los resultados obtenidos durante el año, además que éstos tienen la obligación de hacer públicos periódicamente ciertos informes de gestión, que contienen, entre otros, la composición de las carteras. Dado que en España la periodicidad de los informes obligatorios es trimestral, significa que los gestores se ven expuestos a un seguimiento de sus carteras por lo menos cuatro veces en el año. Esto puede convertirse en motivo de preocupación para los gestores de los fondos de inversión, pues cada vez los inversores son más exigentes con la calidad, la fiabilidad y los resultados obtenidos por sus gestores.

En este entorno aparece la estrategia del maquillaje de carteras, que tal como se había mencionado en el capítulo anterior, es una estrategia que utilizan algunos inversores institucionales justo antes de hacer públicos sus informes, con el objetivo de mejorar la apariencia de la cartera y hacerla más atractiva para sus clientes. Si los gestores actúan de forma similar, el comportamiento agregado en ciertos periodos de tiempo, puede provocar anomalías en el precio y rentabilidad de las acciones, y con ello efectos tan conocidos como el efecto enero, que se analizó en el capítulo anterior.

El *window dressing* ha sido estudiado, tanto como explicación al efecto enero como estrategia propiamente dicha de los inversores institucionales (Haugen y Lakonishok, 1988; Musto, 1997; Sias y Starks, 1997; Lee *et al.*, 1998; Ackert y Athanassakos, 2000; Ng y Wang, 2004). Uno de los trabajos pioneros en esta línea de investigación fue el de Lakonishok *et al.* (1991), en el cual se presenta evidencia empírica de que los gestores de fondos de pensiones utilizan estrategias consistentes con el maquillaje de carteras, dado que estos fondos venden acciones que han tenido bajo rendimiento en forma desproporcionada respecto a los valores que tienen en sus carteras, especialmente en el cuarto trimestre del año.

En la literatura financiera también se encuentran trabajos en esta línea de investigación aplicados al mercado español. Tal es el caso de Basarrate y Rubio (1994a), quienes analizan las anomalías alrededor del fin de año a través de las estrategias de compras y ventas de siete instituciones de inversión colectiva. Los resultados sugieren que los fondos no maquillan sus carteras y que, por lo tanto, las motivaciones fiscales continúan siendo la explicación principal al efecto enero en el mercado español.

Los trabajos más recientes, relacionados con el tema del maquillaje de carteras, son los publicados por Matallín (2006) y Miralles y Miralles (2007). En el primero de ellos se encuentran indicios de la utilización de la estrategia de *window dressing* por los fondos de inversión mobiliaria analizados. En el segundo se llega a la conclusión de que el efecto enero en el mercado español se produce por la convergencia de las actuaciones de los inversores individuales e institucionales alrededor fin de año. Ambos inversores motivados por diferentes razones: los individuales por motivos fiscales y los institucionales por las estrategias de maquillaje de sus carteras.

Algunos estudios sobre *window dressing* analizan esta estrategia examinando la composición de las carteras en forma trimestral o semestral, dada la dificultad de acceder a este tipo de información con una mayor frecuencia. Sin embargo, Elton *et al.* (2010) muestran que las evidencias previas sobre manipulación de carteras están limitadas por la utilización de bases de datos de composición de carteras con baja frecuencia y que ofrecen conclusiones erróneas debido a las operaciones que no se pueden observar entre reportes periódicos (por ejemplo, una compra seguida de una venta o una venta seguida por una recompra entre dos fechas de publicación de informes). Por lo tanto, estos autores concluyen que para obtener conclusiones más precisas sobre la relación entre la actividad comercial de los fondos de inversión y la publicación de las carteras, es necesaria una mayor frecuencia de los datos, por ejemplo, composición mensual de las carteras.

En este sentido, el estudio que se presenta en este capítulo tiene la ventaja de abordar adecuadamente el maquillaje de carteras a partir de una base de datos única de composición mensual de las carteras de los fondos de inversión de renta variable nacional. Este tópico de investigación resulta de indudable interés dadas las implicaciones sociales que puede tener si existiese dicho comportamiento en estos fondos, pues en muchos casos, éstos pueden esconder decisiones de los gestores poco éticas, al presentar una información que realmente no coincide con lo que fue la gestión del periodo.

Datos

La base datos empleada en este capítulo consiste en la composición mensual de las carteras de todos los fondos de inversión de renta variable nacional durante diciembre de 1999 a diciembre de 2006. La base de datos contiene 7.032 carteras mensuales de 125 fondos y está libre de sesgos de supervivencia, look-ahead y de selección. La Comisión Nacional del Mercado de Valores (CNMV) suministró dicha información de forma exclusiva, de tal forma que no está disponible para ningún inversor.

Las carteras de los fondos analizados detallan de manera exhaustiva cada uno de los títulos que la conforman, los cuales han sido identificados a través de su respectivo código ISIN (*International Securities Identification Numbering system*). Como el estudio de maquillaje de carteras se realiza en fondos de renta variable nacional, la mayor parte de sus carteras está invertida en acciones españolas. Por tal motivo, centramos nuestros esfuerzos en estudiar el comportamiento inversor de los fondos sobre dichas acciones.

Tal como se mencionó en el Capítulo 2, las acciones españolas se clasifican cada trimestre en los siguientes grupos:

- Por tamaño: *Ibex-Large*, *Ibex-Small*, *NoIbex-Large*, y *NoIbex-Small*.
- Por performance: *Winner*, *Medium-Winner*, *Medium-Loser*, y *Loser*.

- Por tamaño y luego por performance: *Ibex-LargeW*, *Ibex-LargeL*, *Ibex-SmallW*, *Ibex-SmallL*, *NoIbex-LargeW*, *NoIbex-LargeL*, *NoIbex-SmallW*, y *NoIbex-SmallL*.

Metodología y resultados

La parte empírica de este capítulo comienza con un análisis de la rotación de los fondos de inversión para identificar la intensidad de las actividades de compraventa durante el año. Con nuestra base de datos mensual fue posible calcular la rotación promedio de cada fondo a partir de información mensual y trimestral. De esta forma, se comprobó la conclusión obtenida por Elton *et al.* (2010) sobre la pérdida de información cuando se utiliza información trimestral para analizar decisiones de inversión en los fondos de inversión. En nuestro caso, la rotación promedio anual obtenida con datos mensuales es 51%, mientras que con datos trimestrales es 32%, lo cual conlleva a una pérdida del 38% de la información contenida en los datos mensuales. Estos resultados apoyan la validez de los datos mensuales con el objetivo de reducir el impacto de las operaciones que no se pueden observar entre reportes periódicos.

Por medio de un modelo de regresión se obtiene un primer acercamiento al comportamiento de la rotación mensual de los fondos de inversión durante algunos meses del año. Específicamente, se analizan los meses que implican cambios de trimestre para identificar posibles rotaciones atípicas en aquellos momentos en que los fondos tienen que hacer públicas sus carteras. Los resultados sugieren que los fondos incrementan significativamente su actividad de compraventa en enero y al final de los tres primeros trimestres del año.

Sin embargo, para entender mejor el comportamiento inversor de los fondos durante el año, se analizan los ratios de rotación para cada mes, trimestre y semestre. Los resultados muestran ciertos comportamientos interesantes, por ejemplo se encuentra que la mayor rotación del año ocurre en enero, mientras que la menor se observa en agosto. La alta rotación en enero puede estar reflejando la participación de los fondos de inversión en el efecto enero, confirmado previamente en el Capítulo 2. Por su parte, la baja rotación en agosto puede estar reflejando un efecto de vacaciones de verano en la gestión de los fondos.

En cuanto a la rotación promedio por trimestres, encontramos que el primer trimestre del año presenta una mayor rotación que los demás trimestres. Este resultado podría ser consistente con prácticas de *risk-shifting*, ya que los fondos, una vez publicados los informes de fin de año, pueden tener incentivos de incrementar temporalmente el riesgo de sus carteras para aprovechar oportunidades de rentabilidad (Chevalier y Ellison, 1997; Ackert y Athanassakos, 2000; Ng y Wang, 2004). Por lo tanto, dichas prácticas pueden dar lugar a altos niveles de compraventa que se traducen en altas rotaciones.

Las evidencias empíricas sobre manipulación de carteras en fondos de Estados Unidos revelan que esta estrategia de inversión es especialmente relevante a final de año (Lakonishok *et al.*, 1991; He *et al.*, 2004; Ng y Wang, 2004; Elton *et al.*, 2010). Sin embargo, la baja rotación encontrada en diciembre nos hace cuestionar la posibilidad de identificar maquillaje de carteras en los fondos españoles antes del final del año fiscal. Por su parte, la alta rotación en marzo y junio muestran una tendencia de los fondos a incrementar sus compraventas antes de presentar los dos primeros informes del año.

Una vez comprendido el comportamiento de la rotación durante el año, se busca determinar si los gestores de los fondos siguen estrategias de inversión para manipular sus carteras antes de ser presentadas a los clientes, o si por el contrario, siguen las estrategias habituales de gestión. Para ello se calculan dos tipos de medidas complementarias que permiten

entender el comportamiento inversor de los fondos.

Las dos primeras medidas están basadas en la actividad de compraventa de los fondos y permiten identificar las acciones que se compran y se venden con mayor intensidad cada mes. Los ratios de compra y venta han sido calculados siguiendo la metodología utilizada en los trabajos de Lakonishok *et al.* (1991) y Ng y Wang (2004).

Por su parte, en este capítulo se proponen dos nuevas medidas complementarias: aumento/disminución de participación en la cartera. Estas medidas permiten identificar las variaciones en la asignación estratégica de los diferentes grupos de acciones en la cartera total, es decir, que permiten identificar las acciones que más aumentan o disminuyen de peso con respecto a la cartera global. Una de las ventajas de este método radica en la información adicional que ofrece, pues trabaja sobre los datos que finalmente son mostrados a los clientes, es decir, sobre el porcentaje que cada acción tiene en la cartera. Este nuevo enfoque capta el efecto general sobre los porcentajes invertidos en las acciones, que son los que determinan principalmente la imagen de la cartera. Por lo tanto, los fondos que tienen incentivos para manipular la imagen de sus carteras deben preocuparse por este efecto global.

Una vez calculadas todas las medidas para todas las carteras mensuales de los fondos, se promedian las medidas de todos los fondos en cada grupo de acciones y se llevan a cabo varios análisis para entender el comportamiento inversor de los fondos cuando tienen que publicar los informes. Si los fondos de inversión maquillaran sus carteras, se esperarían algunos de los siguientes resultados alrededor del cambio de trimestre, por ejemplo, mayor intensidad vendedora de acciones perdedoras, mayor intensidad compradora de acciones ganadoras, disminución de participación en la cartera de acciones perdedoras y/o aumento de participación de acciones ganadoras.

Los resultados de estos análisis revelan diferencias significativas en el patrón de inversión de los fondos dependiendo del mes. En los meses de publicación de informes, especialmente en Junio y Septiembre, los fondos muestran preferencias por acciones de alta capitalización bursátil y por acciones reconocidas en el mercado (acciones del Ibex-35). Además, muestran tendencia a aumentar la participación en la cartera de acciones recientemente ganadoras y a disminuir la participación de las perdedoras. Por el contrario, en los meses en que los clientes no reciben información, los fondos tienden a comprar y aumentar la participación de las acciones más pequeñas.

Al final del capítulo se presenta un mapa de gestión que recoge el comportamiento de gestión de los fondos mes a mes. Este nivel de detalle permite determinar aspectos de gran importancia, por ejemplo, saber qué tipo de acciones prefieren o evitan los fondos cada mes, conocer las principales actividades de compraventa, identificar los principales cambios en la composición de las carteras, entre otros.

El análisis del primer trimestre del año muestra que los fondos participan en el efecto enero a través de la compra de acciones de baja capitalización (*NoIbex*) en enero. Sin embargo, dado que los fondos de inversión poseen un pequeño porcentaje de la capitalización total del mercado de valores español, es posible que los fondos se aprovechen de esta anomalía del mercado, en lugar de causarla.

El resultado de agosto parece apoyar la hipótesis planteada anteriormente sobre el efecto de las vacaciones de verano en el comportamiento inversor de los fondos. En este caso, las diferencias entre las medidas de compra/venta y aumento/disminución no muestran ninguna tendencia significativa, a excepción de una tendencia a vender acciones de baja capitalización (*NoIbex-Large*). Estos resultados parecen indicar que, en vacaciones de verano, los

fondos están interesados en deshacerse de las acciones pequeñas y mantener sus posiciones en acciones con mayor liquidez y capitalización bursátil, probablemente para evitar riesgos excesivos.

Finalmente, el análisis del comportamiento de los fondos de inversión en diciembre muestra resultados variados. Por un lado, los fondos tienden a disminuir la participación de las acciones pequeñas y perdedoras (*NoIbex-SmallL*) en su cartera, lo cual es consistente con el maquillaje de carteras. Sin embargo, los fondos también parecen seguir estrategias contrarias, ya que muestran tendencias a comprar acciones perdedoras (*Ibex-LargeL* y *Ibex-SmallL*), y a vender y disminuir la participación de algunas acciones ganadoras (*Ibex-LargeW*, *Ibex-SmallW*, y *NoIbex-LargeW*). Estas estrategias contrarias también son evidentes cuando se analizan independientemente las acciones clasificadas por performance. Encontrar estas dos estrategias en el mismo mes ha sido sorprendente, pero es importante mencionar que Lakonishok *et al.* (1991) también encuentran las mismas estrategias a fin de año en una muestra de fondos de pensiones en Estados Unidos. Por lo tanto, nuestros resultados constituyen una evidencia débil de maquillaje de carteras en los fondos españoles de renta variable nacional a finales de año.

Capítulo 4: Evaluación del maquillaje de carteras usando la rentabilidad de los fondos y la composición de sus carteras

Con el objetivo de detectar el fenómeno del *window dressing* con otra perspectiva diferente a la presentada anteriormente, en el presente capítulo se buscarán evidencias de la utilización de esta estrategia entre los fondos de inversión españoles, pero empleando para ello otro tipo de información y una metodología diferente.

La mayoría de estudios que han evaluado el maquillaje de carteras en instituciones de inversión colectiva lo han hecho analizando el comportamiento inversor de los fondos a partir de la comparación de la composición de sus carteras (Lakonishok *et al.*, 1991; Basarrate y Rubio, 1994a; Eakins y Sewell, 1994; Musto, 1997, 1999; He *et al.*, 2004; Ng y Wang, 2004). Sin embargo, esta metodología tiene la limitación de que la información de partida no permite observar las transacciones que ocurren entre los informes periódicos ni conocer cuando se compraron o vendieron las acciones. Tal como se mencionó anteriormente, el estudio presentado en el Capítulo 3 trata de superar estas limitaciones al aumentar la frecuencia de la información empleada, pues se utilizó una base de datos de composición de carteras mensual.

Como metodología alternativa al tradicional análisis del comportamiento inversor de los fondos, se encuentran algunos trabajos que analizan anomalías en la rentabilidad de los fondos para detectar manipulación en las carteras presentadas a los clientes. En esta línea metodológica se encuentran trabajos como los de O'Neal (2001), Torre-Olmo y Fernández (2002), Morey y O'Neal (2006), y Meier y Schaumburg (2006). Estos trabajos han analizado fondos de inversión en Estados Unidos, excepto el trabajo de Torre-Olmo y Fernández (2002) que analiza patrones en la rentabilidad de una muestra de fondos de renta variable españoles. A través de la comparación de la rentabilidad de los fondos los últimos días del trimestre

con la rentabilidad obtenida en los demás días del año, estos autores encuentran que los fondos españoles obtienen rentabilidades más altas justo antes de presentar la información trimestral a los partícipes. Aunque los autores explican este resultado a partir de la hipótesis del maquillaje de carteras, no llegan a verificarlo directamente.

Es importante destacar el trabajo de Meier y Schaumburg (2006), pues en él se plantea una nueva metodología que combina la utilización de la composición de las carteras con la rentabilidad de los fondos. De este modo, los autores plantean identificar el maquillaje de carteras a partir de la comparación de la rentabilidad diaria obtenida por el fondo y la que hubiera tenido si durante el trimestre hubiera seguido una estrategia de comprar y mantener (*buy-and-hold*). Esta comparación de rentabilidades se hace alrededor de las fechas de publicación de informes y constituye la clave para la identificación de las carteras que han sido manipuladas.

El planteamiento se fundamenta en el hecho de que los fondos que emplean estrategias de maquillaje de carteras reportan en sus informes acciones que recientemente han tenido alta rentabilidad, con el objetivo de trasmitir a sus inversores respaldo y seguridad al tener gestores que tienen la habilidad de seleccionar las acciones más rentables. Por lo tanto, antes de hacer públicos los informes, los gestores tienden a reemplazar en sus carteras las acciones que recientemente han tenido un rendimiento pobre, por acciones que se están comportando bien. Es así como la rentabilidad de las acciones reportadas ya no es representativa de la rentabilidad que los fondos realmente tuvieron a lo largo del trimestre. En este caso, la rentabilidad *buy-and-hold* será mayor que la obtenida por el fondo, dando indicios de manipulación por parte de los gestores.

Dicho de otra forma, la metodología consiste en calcular la rentabilidad hipotética que el fondo hubiera obtenido si éste hubiera mantenido la cartera reportada durante todo el trimestre. Esta rentabilidad se convierte en el punto de referencia (*benchmark*) contra el cual se compara la rentabilidad obtenida verdaderamente por el fondo, de tal forma que la diferencia entre rentabilidades permite identificar si la cartera fue maquillada o no. Por lo tanto, la hipótesis nula que se plantea es que los fondos no maquillan sus carteras y que ambas rentabilidades no deberían ser significativamente diferentes.

Siguiendo la metodología planteada por Meier y Schaumburg (2006), este capítulo pretende ampliar el estudio de maquillaje de carteras presentado en el Capítulo 3 a través del análisis de la rentabilidad de los fondos y la composición de sus carteras. Según nuestro conocimiento en el tema, este sería el primer trabajo que examina directamente el maquillaje de carteras en fondos de inversión españoles a través del análisis de rentabilidades. Por otro lado, el test estadístico que empleamos para detectar carteras que han sido manipuladas difiere del propuesto por estos autores, pues buscamos corregir posibles problemas de varianza en las rentabilidades analizadas, tales como heterocedasticidad y autocorrelación.

En este capítulo también se hace evidente la ventaja de tener una base de datos de composición de carteras con periodicidad mensual, pues es posible analizar tanto carteras reportadas obligatoriamente cada trimestre como las demás carteras de fin de mes y determinar de este modo las diferencias de comportamiento entre los diferentes meses del año. Aunque la metodología empleada en este capítulo no puede capturar directamente las operaciones que realizan los fondos entre los informes periódicos, trata de superar esta limitación a través del análisis diario de la diferencia de rentabilidades, lo cual permite un acercamiento más profundo al comportamiento de los fondos al interior de cada mes. Adicionalmente, esta metodología tiene la característica de realizar el análisis de forma individual sobre cada una

de las carteras, mientras que la empleada en el capítulo anterior lo hace de forma agregada.

Datos

Para cumplir los objetivos propuestos se emplean varias bases de datos. La primera, descrita en el Capítulo 3, consiste en la composición mensual de las carteras de 125 fondos de inversión de renta variable nacional durante diciembre de 1999 a diciembre de 2006. La segunda base de datos, suministrada por la CNMV, contiene el valor diario de los activos netos (NAV) y las comisiones de gestión de los fondos de la muestra para el periodo comprendido entre diciembre 1 de 1999 y enero 31 de 2007.

Para calcular la rentabilidad diaria de la cartera bajo el supuesto *buy-and-hold* es necesario conocer la rentabilidad diaria de todos los activos que la componen. Por lo tanto, se cuenta con las siguientes bases de datos de precios de cierre diarios para cada tipo de activo: las acciones españolas están controladas con la base de datos descrita en el Capítulo 2. Para las acciones extranjeras, que en su mayoría son europeas, se controlaron las acciones que componen los dos principales índices europeos, el Euro Stoxx 50 y el Stoxx Europe 50. Esta información fue suministrada por Reuters DataLink. La rentabilidad de los activos de renta fija se calcula a partir de índices publicados por Analistas Financieros Internacionales (AFI), así: Deuda española a 3 años, para activos españoles de renta fija a largo plazo; Deuda española - letras a 1 año, para activos españoles de renta fija a corto plazo; y Deuda soberana área Euro a 3 años, para activos de renta fija europeos. Finalmente, un pequeño porcentaje de los activos dentro las carteras queda sin controlar, menos del 4%, a los cuales se les asigna una rentabilidad de cero.

Metodología y resultados

Tal como se había mencionado antes, la metodología utilizada en este capítulo para detectar manipulación en las carteras publicadas por los fondos de inversión se fundamenta en la propuesta de Meier y Schaumburg (2006). Por lo tanto, análisis se centra en la comparación diaria de dos rentabilidades, la de la cartera bajo el supuesto *buy-and-hold* y la obtenida por el fondo, la cual se calcula a partir del valor diario de los activos netos.

El estudio de patrones en la rentabilidad de los fondos asociados con posibles prácticas de maquillaje de carteras se realiza en un intervalo que comienza un mes antes del día del informe y termina un mes después. Por lo tanto, para cada uno de esos días analizados se calcula la rentabilidad de la cartera bajo el supuesto *buy-and-hold*. Para ello se utiliza un procedimiento que garantiza la correcta actualización de la participación de cada activo en la cartera y su revalorización en el tiempo.

En presencia de prácticas de maquillaje de carteras, se espera que, antes de hacer públicos los informes, la rentabilidad de la cartera sea mayor que la obtenida por el fondo. Por lo tanto, se propone un modelo para detectar estas diferencias positivas durante los días previos a la fecha del informe. El modelo está basado en el análisis de la serie de tiempo de rentabilidades diarias creada para cada una de las carteras de cada fondo en la muestra. Aunque el objetivo final es determinar si, en promedio, dichas diferencias de rentabilidades son positivas antes del día del informe, optamos por estimar la media a través de un modelo de heterocedasticidad condicional autorregresivo generalizado (GARCH), pues es más adecuado que el simple modelo de regresión lineal en estudios donde la varianza condicional es

cambiante. Así, la media se modela a través de una ecuación con dos variables dummy que permiten identificar el comportamiento de la diferencia de rentabilidades antes y después del informe.

La estimación del modelo GARCH definido permitió la identificación de un pequeño porcentaje de carteras que muestran signos de manipulación por parte de los gestores, ya que tienen diferencias de rentabilidades significativamente positivas antes de la fecha de publicación y coinciden con informes obligatorios trimestrales. Por su parte, la comparación de los patrones de rentabilidad de las carteras en los diferentes meses del año muestra que la diferencia de rentabilidades es mayor en las carteras publicadas obligatoriamente cada trimestre que en las demás carteras de fin de mes, lo cual también es consistente con la hipótesis de maquillaje de carteras. Adicionalmente, los resultados muestran que junio y septiembre son los meses con mayor porcentaje de carteras maquilladas respecto al número total de carteras de la muestra y que dichas carteras son las que tienen una mayor diferencia de rentabilidades antes de la fecha de publicación. Estos resultados están de acuerdo con la hipótesis de maquillaje de carteras y más aún con los resultados obtenidos en el capítulo anterior. El análisis del comportamiento inversor de los fondos mostró que en los meses de publicación de informes, especialmente en junio y septiembre, los fondos de inversión prefieren acciones de alta capitalización, con incentivos para aumentar la participación de acciones ganadoras en la cartera y disminuir la participación de las perdedoras. Por lo tanto, los enfoques metodológicos utilizados en los dos capítulos parecen captar el comportamiento de los fondos de inversión en los meses de publicación de informes, dotando de robustez las conclusiones obtenidas en este estudio.

El pequeño porcentaje de carteras identificadas como maquilladas dentro de la amplia muestra analizada sugiere que el maquillaje de carteras no es una práctica generalizada en el mercado de fondos de renta variable español durante el periodo de tiempo estudiado. Esta percepción se confirma con los resultados obtenidos en el estudio de las características de las carteras maquilladas, pues se encuentra que dichas carteras están dispersas entre los fondos y compañías gestoras analizadas. Sin embargo, se deben resaltar otros dos resultados interesantes. Por un lado, se encuentra que los fondos con peor rendimiento pasado muestran una mayor tendencia a manipular sus carteras. Por otro lado, se encuentra que un alto porcentaje de las carteras maquilladas están concentradas en meses de rendimientos negativos del mercado bursátil español, lo cual se podría explicar como una respuesta que tienen los fondos para mitigar los malos resultados de esos meses.

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