Competition and structure of the mutual fund industry in Spain: the role of credit institutions

M.ª Isabel Cambón
Ramiro Losada

Working papers
Nº 54

Competition and structure of the mutual fund industry in Spain: the role of credit institutions

Mª Isabel Cambón
Ramiro Losada

Working papers

No. 54

September 2012

Mª Isabel Cambón Murcia and Ramiro Losada López, Research, Statistics and Publications Department, CNMV.

The opinions in this Working Paper are the sole responsibility of the authors and they do not necessarily coincide with those of the CNMV.

The CNMV publishes this Working Paper Series to spread research in order to contribute to the best knowledge of the stock markets and their regulation.

The CNMV distributes its reports and publications via the Internet at **www.cnmv.es**

Mª Isabel Cambón Murcia y Ramiro Losada López, Departamento de Estudios, Estadísticas y Publicaciones de la CNMV.

Las opiniones expresadas en este documento reflejan exclusivamente el criterio de las autoras y no deben ser atribuidas a la Comisión Nacional del Mercado de Valores.

La Comisión Nacional del Mercado de Valores, al publicar esta serie, pretende facilitar la difusión de estudios que contribuyan al mejor conocimiento de los mercados de valores y su regulación.

La Comisión Nacional del Mercado de Valores difunde la mayoría de sus publicaciones a través de la red Internet en la dirección **www.cnmv.es**

ISSN (printed edition): 2172-6337

ISSN (electronic edition): 2172-7147

Legal deposit: BI-2910-2010

Layout & printing: Composiciones Rali, S.A.

Abstract

In industries where consumers prefer to make all their purchases from a single company (for example, a supermarket), companies tend to offer a greater variety of products. With that strategy, they succeed in making their market share in the industry grow and gaining market power. This behaviour is also typical of the financial industry, where consumers usually prefer to concentrate all their financial operations in a single entity. In Spain, the big growth of mutual funds since 1995 and the model of universal banking suggest the existence of these cross-effects on demand (spillovers). In this paper, we provide empirical evidence of the presence of these effects in the Spanish mutual fund market. Moreover, these effects are stronger than in the US market. The intensity of the effects appears to be greater in the retail mutual fund segment than in the wholesale segment. This result would be consistent with the relative increase in the number of funds offered by fund managers, the higher fees charged, and the stronger degree of concentration of fund families found in the retail segment.

Table of contents

1	**Introduction**	**11**
2	**Competition in the mutual fund industry**	**15**
3	**Empirical analysis**	**23**
3.1	Data	23
3.1.1	Variables and descriptive statistics of the sample	23
3.2	The empirical model	27
3.2.1	Results: retail market versus wholesale market	29
3.2.2	Results: wholesale fund market	35
4	**Conclusions**	**39**
Bibliography		**41**

Index of charts

TABLE 1	Descriptive statistics of the sample of funds	26
TABLE 2	Descriptive statistics of the sample of fund managers	26
TABLE 3	Estimate in the area of funds: wholesale (W) versus retail (R)	31
TABLE 4	Estimate in the area of fund managers: wholesale (W) versus retail (R)	33
TABLE 5	Funds: wholesale market	36
TABLE 6	Fund managers: wholesale market	37

Index of figures

FIGURE 1	Indicators of the degree of bancarisation of an economy	12
FIGURE 2	Banking sector capacity indicators	13
FIGURE 3	Assets under management of the funds according to the type of fund manager and the fund profile	16
FIGURE 4	Revenue and expenses of fund managers	17
FIGURE 5	Total and average number of funds managed by fund managers in the wholesale and retail markets	19
FIGURE 6	Management and deposit fees	20
FIGURE 7	Management fees by group of fund manager and fund category	20
FIGURE 8	Herfindahl indices in the mutual fund market	21

1 Introduction

In some industries, the fact that the costs of making acquisitions from several suppliers may be too high (switching costs)[1] or that it is too difficult for buyers to find the best suppliers of the products that they want (search costs) means that they prefer to concentrate their acquisitions at one single seller.[2] Examples of this behaviour can be found in non-financial industries related to commercial distribution, particularly supermarkets, but also in the financial industry as many users of financial services prefer to centralise their financial operations in one single entity.

In this type of industry, the type and diversity of products offered by companies may become important strategic variables which end up having an impact on the structure and conditions of market competition. Accordingly, in an industry in which the demanders prefer to buy from companies which offer a wide variety of products, the companies compete with each other by increasing said range of products. If these demand spillover effects are strong, companies have more incentive to offer a wide variety of products and thus achieve greater market power.

According to Gavazza (2011),[3] the mutual fund industry may be considered as a natural terrain to study the presence of demand spillovers and the role played by the variety of products offered. It is reasonable to think that in this industry most buyers of mutual funds prefer to make their investments through one single financial institution or one single intermediary. This preference towards concentrating financial transactions at one single entity takes on special relevance in the case of Spain, where universal banking with close customer relations is the predominant model. This banking model, as opposed to specialised banking (or the Anglo-Saxon model), in which credit institutions are of two types, commercial banks and investment banks, is characterised both by the provision of all types of typical banking and investment services, and by business promotion and participation in the capital of companies through an extensive branch network.

The economies of Europe have ratios to GDP of banking deposits and credit which are appreciably higher than those of the United States (see figure 1). This fact suggests that European banks play a greater role in channelling the financial flows of the economy. Among European economies, Spain is clearly in the upper range of

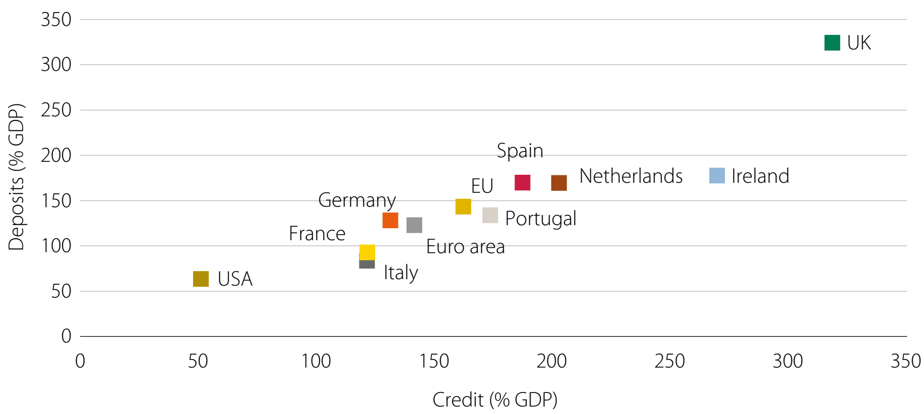
1 Most of the time, when customers of credit institutions decide to close their account and cancel the products which they have taken out with that entity to move them to another credit institution, they suffer costs, which include both time costs and money costs.

2 See, for example, P. Klemperer and J. Padilla (1997), "Do firm's product lines include too many varieties?", in *RAND Journal of Economics*, vol. 28, pp. 557-582.

3 Gavazza, A. (2011). "Demand spillovers and markets outcomes in the mutual fund industry", in *RAND Journal of Economics*, vol. 42, pp. 776-804.

this indicator. In particular, ratios to GDP of banking deposits and credit in Spain (170% and 187%, respectively) are significantly higher than in Germany, France or Italy. Only the United Kingdom has higher percentages in both cases, while in the Netherlands and Ireland the balance of bank deposits in terms of GDP is similar to that of Spain, but the credit balance is higher.[4]

Indicators of the degree of bancarisation of an economy FIGURE 1



Source: ECB ("EU Banking Structures", September 2010) and IMF.

During the decade prior to the crisis, Spanish banking followed a strategy of growth based on the physical proximity of its commercial branches to the clients. So, there was a considerable increase in the number of branches throughout Spain. The increase in the number of branches was of such a magnitude that the number of inhabitants per branch in September 2010 was 1,000 (see left hand panel of figure 2). This ratio contrasts with the considerably higher ratios observed in other advanced economies (for example, in the EU, USA and UK, the ratio is around 2,000, 3,000 and 5,000 inhabitants per branch, respectively). The high density of Spain's commercial banking network can also be seen in the number of ATMs (see right-hand panel of figure 2).

The Spanish model of retail banking in the years prior to the crisis was therefore characterised by a strong presence of domestic credit institutions[5] with many branches of two or three employees only.[6] These branches offered a full range of financial operations to their clients, whether in the form of financing (home and consumption) or investment products. Among the latter, traditional bank deposits, but also other more sophisticated financial products, including mutual funds. The great importance of banking branches in the provision of financial services has been documented by Datamonitor (2001). This study shows how the distribution

4 The case of the United Kingdom is special. Due to the fact that it is an international centre of finance, a large percentage of investment banking in Europe is concentrated in London. This means that the UK handles a significantly greater volume of both deposits and credit than other European countries.

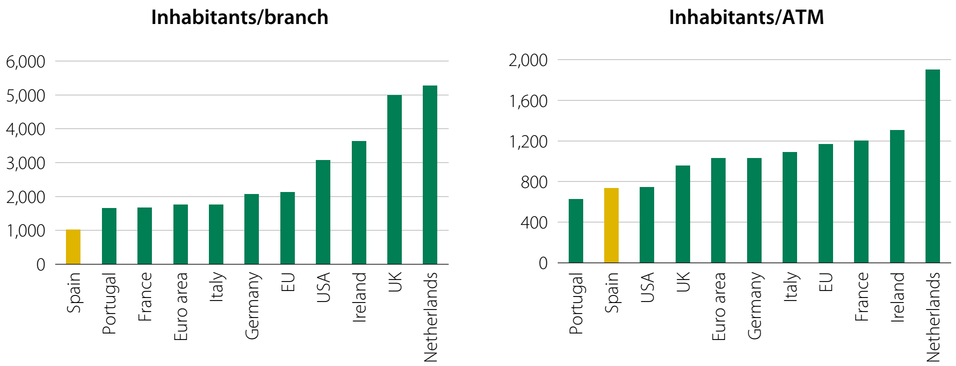
5 In 2009, domestic credit institutions in Spain accounted for around 90% of all banking assets, a higher percentage than the 73% reported as the EU average.

6 For a more detailed study of the strategic trends in banking management, see Fernández de Lis and García Mora (2008) or Delgado, Pérez and Salas (2003).

channel most used by users of banking services in Spain was the branch (nearly 90%, compared with a European average of 80%), in contrast to the marginal use of other channels such as telephone banking or the Internet.

This retail distribution model is in contrast to what we see in the USA, where the presence of financial advisers, not necessarily associated with any banking entity, plays a much more important role. In the specific case of the marketing of mutual funds, the Investment Company Institute (2012) revealed that in 2011, 44% of US households had some kind of participation in mutual funds, and that half of those households had made use of the financial services of a professional,[7] usually in the form of brokers or independent financial advisers. In Spain, the Household Financial Survey (EFF) for 2008 reported that 31.3% of all households had shares in some form of collective investment scheme (5.6% in investment funds), most of which were likely to have been acquired through a bank branch. This difference in the percentage of households having an investment fund is due to the fact that, in the United States, investment funds are the main financial instrument used by citizens to invest the money they will use for their retirement (Cohen and Schmidt, 2009).

Banking sector capacity indicators FIGURE 2



Source: ECB (*EU Banking Structures*, September 2010) and Retail Banking Research (*Global ATM Market and Forecasts to 2013*).

In addition to the signs which suggest that consumers of financial services, particularly in Spain, have a strong preference towards concentrating their financial operations in one single entity, there is a second reason why the mutual fund industry is appropriate for investigating the existence and intensity of demand spillovers. This industry may be segmented into two groups, depending on the type of investor, retail or wholesale, for which said demand spillovers are likely to be different. In general, it is reasonable to suppose that wholesale investors are more sophisticated in financial terms and, therefore, their costs for changing investment between funds of different fund managers would be lower and their ability to find funds with a higher expected return, or lower costs, would be greater. Therefore, the variety in the range of funds offered by fund manager should, *a priori*, be greater in the retail mutual fund segment, as these investors incur greater costs in order to find satisfactory investments with other fund managers.

7 The rest of the households had invested in investment funds, either directly or through the fund manager, or through a fund supermarket, or through their pension plan.

If this is the case, fund managers which market mutual funds in the retail segment would have incentives to increase the range of funds which they offer (in number and/or category). With this strategy, their market share in the industry would increase and they could charge higher prices (fees in this context) to their consumers. Finally, given this strategy, this fund segment should show a high level of concentration.

The preliminary data on the Spanish mutual fund industry for the period 1995-2010, which is described in the following section, suggests that demand spillovers may play a significant role in this industry and that, in addition, they seem to be more intense in the retail segment of the mutual fund industry. In particular, the data shows that (1) the average number of funds offered by fund managers in the retail sector is much higher than in the wholesale sector, (2) the fees applied to retail funds are higher than those applied to wholesale funds and (3) the concentration of fund managers is higher in the retail segment.

This paper, which follows the approach set by Gavazza (2011) for the fund industry in the USA between 1999 and 2007, aims to contribute towards the literature on mutual funds from two points of view. Firstly, it attempts to explain the competition conditions in the Spanish investment industry by using certain patterns of demand which, in this case, incorporate the preference of consumers for variety and/or depth in the offering of products. Secondly, it offers a comparison with the patterns identified in the US industry with regard to the presence of demand spillovers for mutual funds and the differences in their intensity between the wholesale and retail segment.

The document is structured in the following manner. In chapter 2 we describe the main characteristics of the supply of investment funds in Spain between 1995 and 2010, placing special emphasis on the conditions of competition in the industry. In chapter 3 we present an empirical analysis, in which we attempt to identify the presence of demand spillovers in the Spanish fund industry and the differences between the wholesale and retail segments. Finally, in the last chapter we draw our principal conclusions.

2 Competition in the mutual fund industry

The number of mutual funds in Spain, as well as their assets, grew significantly in the period 1995-2010, although we can divide this period into four sub-periods. Firstly, between 1995 and 2000, the industry expanded significantly, both in the number of funds and in the assets under management. This increase was due to the popularisation of this type of financial instrument among investors, especially among retail investors. In the years 2001 and 2002, the industry contracted as a consequence of the bursting of the technological bubble, which was reflected in a significant fall in the assets managed by mutual funds, although the number of funds remained stable. Coinciding with the sharp economic growth of the Spanish economy between 2003 and 2007, there was a new expansion, both in the number of funds and the volume of assets under management. In the final stage of the period under study, 2008-2010, both the number of funds and the assets under management fell significantly as a consequence of the financial crisis, which began in 2007.

As can be seen in figure 3, most of the assets of mutual funds were managed over the period by fund managers belonging to credit institutions. Specifically, this type of fund manager managed between 92% and 95% of the assets invested in mutual funds. Independent fund managers only had a noteworthy presence in the segment of equity and mixed funds[8] aimed at wholesale investors.[9]

Another of the most important characteristics of the mutual fund industry in this period was the level of importance of assets concentrated in retail and conservative mutual funds (on average, 60% of assets). Less important were the assets of equity funds and mixed funds (retail and wholesale), which averaged 18% of the total, as well as conservative funds aimed at wholesale investors, which accounted for 15% of total assets.[10]

8 Conservative funds are money market funds, all fixed-income funds and guaranteed funds. Equity funds and mixed funds also include global funds.

9 Mutual funds have been divided into wholesale and retail funds according to the following criteria: between 1995 and 1998 wholesale funds were those with a percentage greater than 50% of assets in the hands of investors with a minimum holding of 180,000 euros. From 1999 to 2010, as a result of the change in the circular on the reserved statements which fund managers must file for supervisory purposes, the criteria separating wholesale and retail funds changed. In this period, money market funds and short-term fixed-income funds are considered wholesale if more than 50% of their assets are in the hands of investors with a minimum of 300,000 euros. The other funds are considered wholesale when more than 50% of their assets are held by investors with a minimum holding of 150,000 euros.

10 For further details about the operating of mutual funds in Spain over the period 1995-2010, see M.I. Cambón and R. Losada (2012), "Development of mutual fund managers and products offered from 1995 to 2010", in the CNMV's *Quarterly Bulletin*, first quarter pp. 87-108.

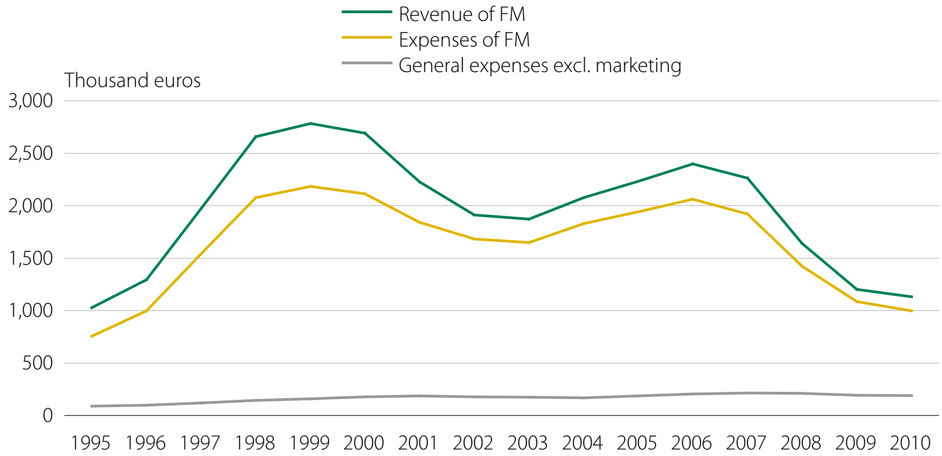
Assets under management of the funds according to the type of fund manager and the fund profile[1] FIGURE 3

Source: CNMV.

1 Conservative funds are money market funds, all fixed-income funds and guaranteed funds. Equity funds and mixed funds also include global funds.

Once described the characteristics of the investment funds offered in the market in recent years, the salient features of the competition between mutual fund managers can be established. One of the more important peculiarities of this industry lies in the fact that fund managers' aggregate profits depend to a large extent on the assets they manage and, by extension, on the economic cycle (see figure 4). However, if revenues and costs are analyzed separately, it can be observed that not all their components vary in line with the fluctuations of the managed assets. In particular, if all the costs incurred by a fund manager with the exception of marketing costs are considered, it can be noticed that their trend remains almost unchanged over time.

Revenue and expenses of fund managers[1] FIGURE 4



Source: CNMV.

1 The figures are expressed in constant euros. 1995 has been taken as the reference year.

For their part, the marketing costs incurred by fund managers depend on the assets under management. Given that the fund managers which belong to credit institutions mainly market their funds through the group's network of branches, it could be expected that their unit-holders would benefit to a large extent from the economies of scale and scope associated with both the fund manager and the marketing network belonging to the same financial group. However, the marketing fees charged by the group's distributors do not necessarily reflect these economies given that they may incorporate significant extractions from the consumer's surplus mainly as a result of factors which limit their mobility between financial institutions (switching costs, search costs, limited financial education, etc.).

Thus, when establishing the characteristics of the Spanish fund industry and, in particular, the market power of fund managers belonging to credit institutions, the indicator based on the margin of the fund managers (the ratio between revenues net of expenses and gross revenues) may not be adequate if the fees paid for marketing are included among the expenses. However, other indicators suggest that this market power is considerable. Thus, for example, when we exclude marketing fees, the costs of this type of fund manager are very low in relation to their revenues, and in any event are appreciably lower than those of independent fund managers. Also, even when the number of fund managers is high, the market share of the four largest companies, all belonging to credit institutions, ranged between 36.2% in 1995 and 49.2% in 2010, with a high of 57.4% in 2003. Furthermore, not too many new fund managers entered the market during the period under study.[11]

11 The average annual number of fund managers which began operating in the period 1995-2010 was two. This is in line with the predictions of Schmalensee (1978), "Entry deterrence in the ready-to-eat cereal industry", in *Econometrica*, vol. 9, pp. 305-37 and Shaked and Sutton (1990), "Product differentiation and industrial structure", in *Journal of Industrial Economics*, vol. 9, pp. 305-327, who showed that the entry of new companies in industries where companies offer a wide variety of products is very limited.

The market power enjoyed by fund managers in Spain is not a characteristic which is only seen in the Spanish fund industry. Gruber (1996)[12] and Korkeamaki and Smythe (2004)[13] found numerical evidence for the industries in the US and Finland relating to the existence of economies of scale which final investors do not benefit from. Ferreira and Ramos (2009)[14] calculated a Herfindahl index[15] for the fund industry in Spain of 0.1 in 2006, similar to the average index in a sample of Eurozone countries (0.12), specifically Austria, Belgium, Finland, France, Germany, Italy, Netherlands and Portugal.

As Gavazza (2011) shows, in order to understand this evidence, it is important to segment the fund market between those aimed at retail investors and those aimed at wholesale investors. The underlying idea behind this division lies in the fact that demand from both markets belongs to investors from two differentiated segments and, therefore, their demands may exhibit different characteristics.

This article demonstrates that retail investors prefer fund managers which offer a wide variety of funds. This is seen in the fact that a fund manager which extends the number of funds increases its market share through the new fund and an increase in the assets of its other funds. This demand spillover leads fund managers to offer a large number of funds at relatively high fees. In addition, it introduces the necessary conditions for the fund industry to have a market structure in which a few fund managers have a large management share.

In general, retail investors usually make their investments in funds from one single fund manager as the search for the most suitable fund by this type of investor is usually a very costly process. It would require them to know and analyse a large number of funds of different fund managers. They therefore prefer not to incur this cost even if the fund which they buy from the fund manager (normally belonging to the credit institution where they have their financial products) is not the optimal fund and there is another in the market which better matches their investor profile. Consequently, a wider and more varied fund catalogue of a particular fund manager leads to greater variety and ease of investment for retail investors, without having to resort to funds of other fund managers.

This article indicates that wholesale investors in mutual funds usually exhibit another pattern of demand. These investors have greater financial knowledge, which allows them to compare existing funds in the market and check which best suits their investment profile. They also more frequently incur the cost of searching for

12 Gruber, M. (1996). "Another puzzle: The growth in actively managed mutual funds". *Journal of Finance*, vol. 51, pp. 783-807.

13 Korkeamaki, T. and Smythe, T.I. (2004). "Effects of market segmentation and bank concentration on mutual fund expenses and returns: evidence from Finland". *European Financial Management*, vol. 10, pp. 403-456.

14 erreira, M.A. and Ramos, S. (2009). "Mutual fund industry competition and concentration: International evidence". SSRN working paper.

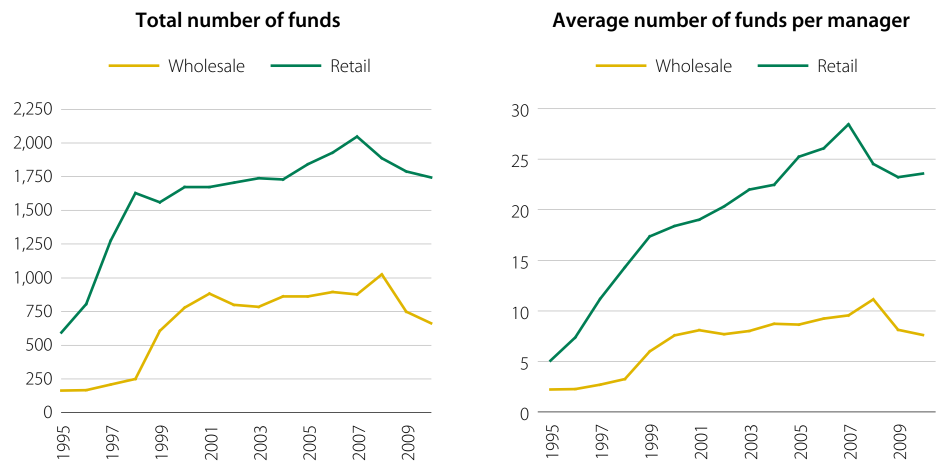
15 The Herfindahl is calculated by taking sum of the squares of the market share held by each company and makes it possible to measure the level of competition in an industry. The possible values of this index range from 0, which reflects perfect competition, up to 1, which reflects an industry dominated by a monopoly.

the funds with the highest returns and/or lowest fees and do not normally exhibit such a high level of loyalty with regard to a specific fund manager.

If this author's theory were true in the case of Spain, we would expect fund managers offering a greater number of funds and/or categories to the retail segment than to the wholesale segment, and the funds charging higher fees and market shares more concentrated in a low number of fund managers.

As can be seen in figure 5, in Spain, the number of funds available for the retail public was more than twice the number available for the wholesale segment over the period under consideration. We can also see that the average number of funds which fund managers offered to retail investors was much higher than that offered to wholesale investors.

Total and average number of funds managed by fund managers in the wholesale and retail markets FIGURE 5

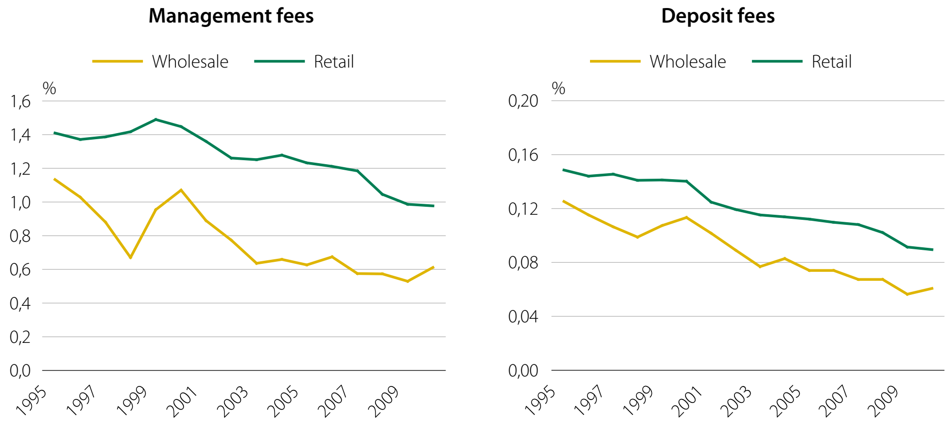


Source: CNMV.

In figures 6 and 7 we can see that the fees charged to retail investors were higher than those charged to wholesale investors. We can also see how fund managers belonging to credit institutions are able to charge their clients higher fees than independent fund managers. This fact may be telling us that fund managers belonging to credit institutions have a greater market power over their clients and that this is exploited through the marketing networks of their parent companies.

Management and deposit fees

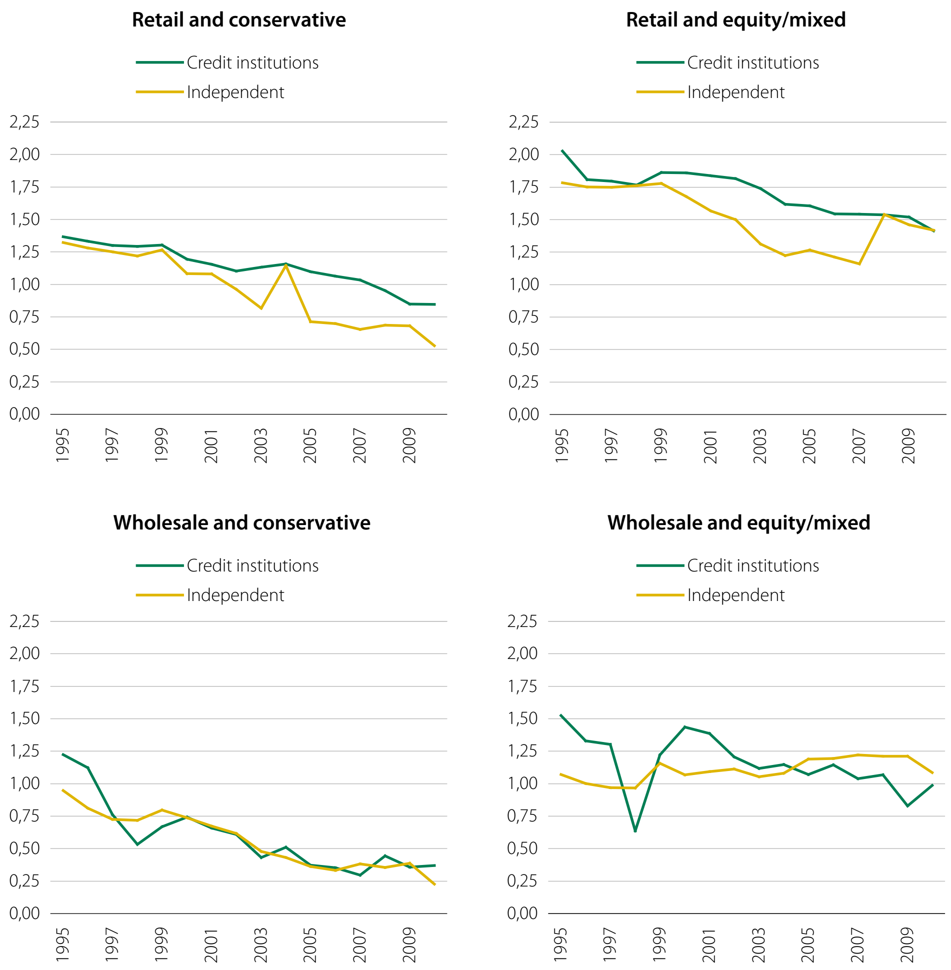
FIGURE 6



Source: CNMV.

Management fees by group of fund manager and fund category

GRÁFICO 7



Source: CNMV.

The one piece of evidence which supports this last statement is the fact that this type of fund manager concentrates a large part of retail investment. Specifically, in the period 1995-2010, these fund managers managed an average of 96.4% of the total assets of retail investors. On the other hand, independent fund managers focused more on the wholesale segment, specifically in the wholesale segment of equity and mixed funds. In this fund segment, independent fund managers managed an average of 36.4% of the assets in the period analysed.

There is no major difference with regard to market shares between the wholesale and retail market. The average market share of the four largest fund managers was 51% for the retail market and 49.2% for the wholesale market. Even if we calculate the averages of the Herfindahl index for the period analysed, which stand at 0.099 for the retail market and 0.085 for the wholesale market, there are no significant differences. The fact that the level of concentration of fund managers in the wholesale market is similar to that seen in the retail segment may be determined by the situation of the conservative fund market. This type of fund is dominated by the fund managers of credit institutions, while in the equity and mixed fund market, the presence of funds of independent fund managers is much more important.

Herfindahl indices in the mutual fund market FIGURE 8

Source: CNMV.

1 This category includes equity funds and mixed funds.

2 This category includes equity funds and mixed funds.

As can be seen in figure 8, which shows the Herfindahl indices for the four segments of mutual funds analysed, the level of competition is only significantly higher in the segment of wholesale equity and mixed funds. The similarity between levels of competition in the wholesale segment of conservative funds and the retail segment would suggest that wholesale investors in conservative funds exhibit similar patterns of demand to retail investors. In fact, the market share of the fund managers of credit institutions in this segment averaged 81.4%. However, the wholesale market of equity and mixed funds exhibits a noticeably higher level of competition, in which independent fund managers may compete aggressively with fund managers of credit institutions. The characteristics of this last segment will be more similar to the patterns of demand envisaged in Gavazza (2011) for a wholesale market.

Therefore, the characteristics of a large part of the demand for funds (conservative retail and wholesale) could mean that the competition in prices is limited, enabling the existence of mutual funds with higher fees and lower returns. This could be a possible explanation for the apparent paradox resulting from the presence of mutual funds which demonstrate low returns and which may charge higher fees as shown in Cambón (2011)[16] in the case of Spain and Gil-Bazo and Ruiz-Verdú (2009)[17] in the case of the US.

The critical analysis of this industry conducted below aims to verify and, in some cases, confirm the intuitions deriving from the descriptive analysis of the data carried out in this chapter.

16 See M.I. Cambón (2011), *Spanish mutual fund performance: an analysis of the determinants*, CNMV, Working Paper No. 48.

17 See J. Gil-Bazo and P. Ruiz-Verdú (2009), "The relationship between price and performance in the mutual fund industry", in *Journal of Finance*, vol. 42, pp. 776-804.

3 Empirical analysis

3.1 Data

The empirical analysis presented herein has been conducted using the information which the CNMV periodically receives in the context of its supervision of collective investment schemes. Annual data has been obtained on all the existing mutual funds and fund managers, including those which disappeared, between 1995 and 2010. Information has also been obtained on certain variables which characterise the financial group to which the fund manager belongs. When the financial group related to the fund manager is a credit institution, the information has been obtained from the annual reports of the Spanish Banking Association (AEB), from the Spanish Confederation of Savings Banks (CECA) and the National Union of Credit Cooperatives (UNACC).

3.1.1 Variables and descriptive statistics of the sample

The database built for the analysis uses variables which characterise each mutual fund and each fund manager in each one of the years under consideration. The variables which characterise the mutual funds are defined for each fund and bearing in mind its category, the fund manager to which it belongs and the year. With regard to the category, the funds have been grouped into three major categories depending on their risk profile and their capacity to substitute bank deposits. Consequently, "conservative funds" have been considered to include money market funds, short-term fixed-income funds, long-term fixed-income funds and guaranteed funds, "mixed funds" include mixed equity or fixed-income funds, and "risky funds" include pure equity funds and global funds. The other variables used to characterise the funds are as follows:

– The fund's market share ($\text{Market share}_{jkit}$): defined as the ratio between the assets of each fund and the total assets of the funds in each one of the years making up the sample.

– Price (Price_{jkit}): defined as the sum of the management fee, the deposit fee, 1/7 of the subscription fee and 1/7 of the redemption fee of each fund in each one of the periods making up the sample.[18]

– Return (Ret_{jkit}): defined as the percentage change in the net asset value of the unit of each fund between the close of one year and the close of the previous year.

18 This variable has been defined in a similar manner to that of Gavazza (*op. cit.*), where it is assumed that investors make the investment at a time horizon of seven years.

- Volatility ($Volt_{jkit}$): defined as the typical annualised deviation of the fund's monthly returns over the last 12 months. This is a standard risk measure to assess the profile of mutual funds.

- Age (Age_{jkit}): defined as the number of years the fund has existed in each one of the years under consideration.

- Merger ($Merg_{jkit}$): this variable takes into consideration mergers between funds over the period under consideration. It takes a value of zero up to the year prior to the merger and one as from the year of the merger.

In addition to the variables characterising the funds, we also use other variables as instruments in the estimation:

- Return of the other funds belonging to the same category as fund j in period t (Ret_{jkit})

- Volatility of the other funds belonging to the same category as fund j in period t ($Volt_{jkit}$).

There are also variables which characterise fund managers. These are:

- Market share of the fund manager (Market FM_{it}): defined as the ratio between the total assets of the funds managed by a fund manager in a period and the total assets of the funds in that period

- Price of the fund manager ($PriceFM_{it}$): defined as the average price charged on each one of the fund manager's funds in each period weighted by the assets of each fund

- Variety: we consider two types of variety offered by a fund manager. The first corresponds to the number of funds offered in each year ($NumF_{it}$), and the second refers to the number of categories offered in each year ($NumC_{it}$).

- Net return ($RetFM_{it}$): defined as the average of the net return of each one of the funds each year weighted by the assets of each fund

- Volatility ($VoltFM_{it}$): defined as the average volatility of each one of the funds each year weighted by the assets of each fund

- Age ($AgeFM_{it}$): defined as the number of years of the fund manager's oldest fund.

- Type of financial group to which the fund manager belongs (CI_{it}): this variable takes a value of one if it belongs to a credit institution (bank, savings bank or credit cooperative) and zero if it belongs to an independent financial group.

- Turnover ($Turn_{it}$): percentage of the assets managed by the fund manager in equity and mixed funds.

– Merger ($MergFM_{it}$): this variable takes into consideration mergers between fund managers over the period under consideration. It takes a value of zero up to the year prior to the merger and one as from the year of the merger.

In addition to the variables characterising the fund manager, there are also other variables used as instruments in the estimation:

– Number of branches of the financial group to which the fund manager belongs ($NumBFM_{it}$).

– Number of employees of the financial group to which the fund manager belongs ($NumEFM_{it}$).

– Marketing expenses which the fund manager incurs each year in order to sell its funds ($FMMExp_{it}$).

– Personnel expenses of the fund manager ($PFMExp_{it}$).

– Return of the other fund managers in the period t ($RetGi_{it}$).

– Volatility of the other fund managers in the period t ($VoltGi_{it}$).

Tables 1 and 2 show a summary of the main descriptive statistics of the most relevant variables considered in the empirical analysis. With regard to the variables which characterise funds (see table 1), we can see that, in the retail segment, the average market share of the funds in the period under consideration stands at 0.062%, while it is greater in the wholesale segment, standing at 0.159%. Among the most relevant differences between both fund segments, we can see that the fees of retail funds were higher on average than those of wholesale funds (1.59% versus 1.31%).

The return, on average, of retail funds is also higher than that of wholesale funds in the period under consideration. The fact that the proportion of risky funds in the wholesale segment is higher (over 67% of the observations correspond to pure equity or mixed funds) together with the different periods of turmoil in equity markets, in which these funds may lose a substantial part of their assets, would help to understand the lower return in this segment. One final significant difference between both fund segments lies in the type of financial group to which the fund manager belongs. In the retail segment, over 91% of the observations correspond to funds with a fund manager belonging to a credit institution, while this percentage falls to 70% in the wholesale segment.

Descriptive statistics of the sample of funds

TABLE 1

	Retail segment		Retail segment	
	Average	Standard deviation	Average	Standard deviation
Market share (%)	0.062	0.181	0.159	0.468
Price (%)	1.59	0.608	1.31	0.715
Yield (%)	3.58	16.393	2.45	16.29
Volatility (%)	5.93	7.453	7.21	7.64
Age (years)	6.67	4.585	6.58	4.61
No. of observations	24,191		9,271	
No. of funds[1]	3,542		1,976	

Source: CNMV.

1 Note that a fund may have been in both segments if there have been changes in the percentages invested by the unit-holders. Therefore, the sum of the number of funds in both segments does not coincide with the total number of funds in the sample, which stands at 4,178.

With regard to the variables which characterise the fund managers, as we can see in table 2, the average market share of the fund managers in the retail fund market was 1.08%, somewhat higher than that of fund managers present in the wholesale fund market (1.06%). The fund managers present in the retail segment charge higher fees, by 1.50%, and offered, on average, more funds (18.5) and more categories, 38% in relation to the total categories available, than fund managers in the wholesale market. The return obtained by fund managers in the retail fund market was slightly higher than that for fund managers in the wholesale market as a result of the high presence of more conservative funds, which suffered less during the different periods of turmoil.

Descriptive statistics of the sample of fund managers

TABLE 2

	Retail segment		Retail segment	
	Average	Standard deviation	Average	Standard deviation
Market share of the fund manager (%)	1.08	2.98	1.06	2.63
Price (%)	1.50	0.40	1.26	0.61
Variety: no. of funds	18.5	32.0	7.3	10.54
Variety: no. of categories (% of the total)	0.38	0.25	0.25	0.17
Return (%)	4.27	10.21	3.95	11.80
Volatility (%)	6.04	4.99	6.80	4.99
Employees of financial group	2,249	5,103	2,051	5,004
Branches of financial group	344	770	313	761
Marketing costs (thousand euros)	17,804	58,380	16,515	56,161
Staff costs (thousand euros)	1,205	2,006	1,250	2,008
No. of observations	1,367		1,414	
No. of fund managers[1]	156		153	

Source: CNMV.

1 Note that a fund manager may be present in both segments as it markets both types of funds. Therefore, the sum of the number of fund managers in both segments does not coincide with the total number of fund managers in the sample, which stands at 163.

On average, the fund managers which marketed retail funds belong to financial groups with more employees and branches than the fund managers which marketed wholesale funds. In addition, the fund managers of retail funds, on average, incurred greater marketing costs, and lower staff costs than the fund managers of wholesale funds.

3.2 The empirical model

A demand equation has been estimated for both segments of mutual funds which takes into account not only the price and other characteristics of the product, but also the variety of the offering of said product.[19] This demand equation makes it possible to measure the demand spillover which may be present, both in the retail segment of the fund industry and in the wholesale segment. In order to measure the spillover, we have checked whether a fund with a family which offers more funds or categories than its rivals enjoys a higher market share. The second part of the analysis checks whether a fund manager which offers more funds or categories than its rivals enjoys a higher market share.

For the case in which the funds are analysed individually, the demand equation considers the fund's market share in the period under consideration as a dependent variable. The explanatory variables include the price (fees of the fund or of the fund manager), the variety of funds offered by fund manager (measured by the number of funds or categories) and other variables which characterise the fund or the fund manager.

In the case of funds, the equation to be estimated is as follows:

$$\text{In}(\text{Fund MS}_{jkit}) = \text{In}(\text{variety}_{it}) - \beta(\text{price}_{jkit}) + \delta(X_{jkit}) + \gamma(Z_{it}) + \lambda_{kt} + \eta_t + \varepsilon_{jkit}\ ,$$

where the dependent variable is the market share of the fund (Fund MS) j, with category k, which belongs to the fund manager i in the period t. The explanatory variables are variety, interpreted as the number of funds or categories offered by the fund manager, price, (the weighted average of its fees), a set of variables which characterise the fund manager (Z_{it}), and a set of variables characterising the fund (X_{jkit}). Among these latter variables, the most important are the net yield, volatility and age of the fund i in the period t. The model also includes dummies to identify the fund manager financial group and any merger processes that the fund may have undergone. Finally, the model includes time and category dummies.

In addition to analysing retail and wholesale fund markets separately, we also carried out an analysis within the wholesale market, distinguishing between conservative funds and equity and mixed funds. In light of the evidence set out in section 2, where the competition in the funds market was described, we can observe how these two wholesale markets may present differentiated patterns.

19 For further details on the specifications of the demand equations, see M.I. Cambón and R. Losada, *op. cit.* (footnote No. 7).

In the case of fund managers, the estimated equation is as follow:

$$\text{In(Fundfamily MS}_{it}) = \alpha \ \text{In(variety}_{it}) - \beta(\text{price}_{it}) + \gamma(Z_{it}) + \eta_t + \varepsilon_{it} ,$$

where the market share of the fund manager (Fundfamily MS) i in the period t is the dependent variable of the model, and the explanatory variables are: variety (number of funds or categories offered by the fund manager i in the period t), the price of the fund manager i in the period t (weighted average of the prices or fees of their funds), and a set of variables related to the fund manager (Z_{it}). The model includes dummies which identify the fund family financial group. These dummies differentiate between credit institutions and independent financial groups, and take into account whether the fund family has undergone any merger in the analysed period. Finally, time dummies are also included.

These models were estimated using the Generalised Method of Moments.[20] Given the specification of these models, it is necessary to take track of the existence of endogenous regressors. In particular, the variables related to the variety and price (fees) of the fund, since these variables are also chosen by the fund family to maximise profits.

In this case, the best way for extracting the cross-effects related with the demand of mutual funds is to find the appropriate instruments. Instruments need to be related with the variety and with the price of the funds by reasons of supply and not linked to any demand shock. In the case of variety, the instrumental variables used are the number of branches and the number of employees of the fund family financial group, and the marketing and personnel expenses of the fund family.

The validity of these instruments requires that any positive variation in demand due to a shock should not immediately be converted into an increase in the variable used as an instrument. For this reason, these variables need to meet a number of conditions which ensure they are correlated with the original variable (variety) and not with the idiosyncratic error in each of the equations. Thus, for the instruments "number of employees" and "branches", it must be ensured that, within the period under study, none of these variables has increased or decreased as a result of an unexpected rise in the demand of funds. This assumption is reasonable under the hypothesis that the shocks occurring in this period were not of great intensity.

This same argument may be applied to the personnel expenses of the fund managers. It is reasonable to think that a fund manager will not suddenly take on more employees unless the increase in the demand as a result of the shock was very intense. Furthermore, recruiting staff is a costly process in terms of time. If a fund manager decided to take on new staff in one of the years under consideration, the effective incorporation of that staff would not occur until the following period.

20 Since instruments are used in the estimation, the models make use of two-stage least squares estimations controlling any possible heteroscedasticity and autocorrelation in observation errors, as well as model identification and instrument validity.

Finally, the variable related to marketing expenses is the one which presents a higher level of uncertainty in terms of its validity as an instrument. It may appear to be obvious that the more funds that are placed, regardless of the reason, the more marketing expenses are generated. However, given the system of commercial incentives in Spanish banking based on *a priori* forecasts, it is not so obvious that an increase in the demand of funds due to a shock should immediately result in an increase in marketing expenses. In this scheme, fund placers may perceive their incentives reduced when fund placements are near the target assigned at the start of the year. The benefit of placing funds over and above the target set will not very often offset the cost of doing so (higher targets in the future), giving rise to a ratchet effect as described by Laffont and Tirole (1988).

For the variable price, we have employed instruments used in other empirical works (for example Berry, 1994 or Nevo, 2001), which have already demonstrated their usefulness. Specifically, we have taken the averages of the yield and volatility of other funds within the same category over a certain period of time in the fund level regression, and the averages of the yield and volatility of the other fund managers over a certain period of time in the fund manager level regression. The validity of these instruments is based on the assumption that unanticipated changes in the demand for each fund and fund manager are identical and independently distributed. In addition to the arguments in support of the validity of the instruments, all the estimations that we present in the following sections pass the tests normally used to check the validity of instruments.

Finally, it should be pointed out that in order to test for the possible existence of a variable that was unobservable and constant over time and was specific to each fund (or fund family) and which was correlated with the explanatory variables of the model, we have carried out the usual testing of fixed effects, the Hausman test (1978), for both funds and fund families,. In general terms, these tests have ruled out the existence of any such fixed effects.

3.2.1 Results: retail market versus wholesale market

The result of the estimates of these models will indicate the role played by variety in the Spanish mutual fund industry and whether said role is different in the fund retail or wholesale segment. If the investors in mutual funds value an increase in the number of funds or categories offered by the fund manager, we can expect a positive and significant coefficient for the parameter associated with "variety" in our estimate. If we also think, as suggested by the preliminary information of the data sample, that retail investors rate variety more highly, then this coefficient would be higher in the retail segment than in the wholesale segment. Furthermore, the estimates will allow us to establish other differences between the demand for wholesale funds and retail funds, such as in terms of price elasticity of the fund and other variables of interest. The differences between these demand equations could justify some of the decisions taken by fund managers and, ultimately, explain the different level of concentration between the industry's wholesale and retail segments.

As mentioned above, two alternative variables have been used to measure the variety of funds offered by fund managers in the market: the number of funds and the number of categories offered by fund managers in the market. It is important to bear in mind that these two methods of reflecting the variety may mean that the results of the estimates do not allow a perfect comparison. When the variety is calculated using the number of funds, this reflects the demand of investors which place more importance on the offering of funds than the possibility that the fund manager allows them to invest in a more varied risk portfolio. Consequently, this possibility reflects more the preferences of conservative investors. On the other hand, we can conclude that when variety is calculated using the number of categories, the model reflects an investor profile which is riskier than that of the average investor in the Spanish fund market.

Funds

The results of the estimate of the demand equation proposed at the level of funds is shown in table 3, which breaks down the results of the two types of variety considered: the number of funds and the number of categories offered by the fund manager. As shown in said table, the coefficients associated with variety are positive and significant both in the wholesale fund market and in the retail fund market and for the two ways of calculating variety. We can conclude that there is a positive relationship between the market share of a mutual fund and the number of categories and/or funds offered by its fund manager. Furthermore, the estimated coefficients for variety in the retail segment are higher than the coefficients estimated for the wholesale fund segment. These results would support the hypotheses put forward at the start of the study, which suggested a possible presence of spillover demand in the Spanish mutual fund industry and the fact that this spillover could be more intense for retail investors as a whole. They would also be in line with the universal banking model present in Spain, in which investors show a greater preference for entities which offer a greater variety of financial products.

Gavazza (2011)[21] also finds the presence of spillover demand in the US fund industry, which is more intense in the retail fund segment. However, the intensity of the spillover demand is lower than in the Spanish market, which suggests that the same increase in the number of funds or categories by a fund manager in Spain would lead to a greater increase in the market share obtained by its funds.

21 *Op. cit.*

Estimate in the area of funds: wholesale (W) versus retail (R) TABLE 3

	Variety					
	Number of categories (over total available)			Number of funds		
	Total	R	W	Total	R	W
Variety	1.81***	1.96***	1.05***	0.33***	0.67***	0.44***
	(0.104)	(0.11)	(0.119)	(0.017)	(0.03)	(0.047)
Price	-0.38***	-0.23***	-0.66***	-0.34***	-0.16***	-0.65***
	(0.027)	(0.04)	(0.04)	(0.025)	(0.045)	(0.040)
Return	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Volatility	-0.02***	-0.02***	-0.001	-0.01***	-0.03***	0.003
	(0.002)	(0.003)	(0.005)	(0.002)	(0.003)	(0.005)
Age of the fund	0.49***	0.51***	0.48***	0.41***	0.49***	0.46***
	(0.023)	(0.03)	(0.048)	(0.020)	(0.027)	(0.046)
Return fund manager	-0.003	-0.01***	0.004	0.002	-0.005*	0.005
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Volatility fund manager	0.02***	-0.02***	0.02***	0.02***	0.02**	0.03***
	(0.01)	(0.006)	(0.008)	(0.005)	(0.006)	(0.007)
Age of the fund manager	-0.49***	-0.90***	-0.26***	0.05	-0.85***	-0.05
	(0.082)	(0.11)	(0.098)	(0.056)	(0.09)	(0.075)
Credit institution	-0.11*	0.06	0.02	0.39***	0.33***	0.11**
	(0.061)	(0.072)	(0.061)	(0.042)	(0.064)	(0.056)
Category DEP. SUB.	0.31***	0.18**	0.75***	0.40***	0.13***	0.85***
	(0.036)	(0.041)	(0.07)	(0.033)	(0.043)	(0.067)
Category EQUITY	-0.07***	-0.04	0.19***	0.10***	0.02	0.21***
	(0.039)	(0.048)	(0.067)	(0.037)	(0.052)	(0.065)
Merger	0.28***	0.16***	0.48***	0.31***	0.16	0.48***
	(0.040)	(0.045)	(0.081)	(0.038)	(0.046)	(0.080)
Hansen test (p-value)	0.18	0.31	0.37	0.62	0.35	0.39
Fixed effects test (Hausman)	NO	NO	NO	NO	NO	NO

Estimate GMM with instrumental variables robust to heteroskedasticity and autocorrelation.

Estimated coefficients and standard deviation in brackets.

* Significance at 10%

** Significance at 5%.

*** Significance at 1%.

The Hansen test compares the validity of the instruments used. It provides the p-value. The null hypothesis which is tested is "the set of instruments used is valid", and, therefore, a sufficiently high p-value would not reject the validity of the instruments.

The results of the estimate reveal other interesting differences between the demand for funds in the retail and in the wholesale segments. With regard to the variables which characterise a mutual fund, we can see that, firstly, in both segments, the market share of the fund is negatively correlated to its price (fees), with the elasticity being much greater in the case of wholesale investors. This greater elasticity of wholesale investors seems reasonable given that they have a greater level of sophistication and can gather more information about the funds, and can compare them in better conditions and more quickly, ruling out those which are more expensive. This type of investor is generally more willing to change entity.

With regard to the fund's (net) return, we can see a positive relation between the return offered by a fund and its market share in both segments. However, the relation seen between the fund's volatility and its market share is negative in the retail fund segment, while the coefficient is not significantly different from zero in the wholesale segment. This result would indicate that investors in the retail fund segment are generally more conservative. The funds which have a greater market share are those with the least volatility i.e. those with the least risk. Finally, the age of the mutual fund is a variable with a positive relation with the fund's market share in both segments of the industry, i.e. the oldest funds have a higher market share.

With regard to the variables which characterise the fund manager, we should also indicate some differences between the retail and wholesale fund segments. The most significant difference relates to the return of the fund manager (understood as the weighted average of the return of its funds). As shown in table 3, the relationship between the return of the fund manager and the market share of a mutual fund is negative in the retail mutual fund segment, while it is not significantly different from zero in the wholesale segment. According to this result, the funds of managers which on average offer lower returns tend to have a higher market share.

The coefficient which identifies the type of financial group which the fund manger belongs to, and which tells us whether this is a credit institution or not (in which case it would be considered as an independent fund manager) is not significant in either fund segment when the variety considered is the number of categories, and is positive when the variety considered is the number of funds offered by the fund manager. It therefore seems that the fund managers which belong to credit institutions and which decide to increase the number of funds are able to increase the market share of their funds to a greater extent.

The coefficient associated with variables providing information on the category of the funds and which segment them into those which can be considered as substitutes for bank deposits, of a conservative nature, and equity funds, which are riskier, show interesting results. The first of these is positive in both fund segments i.e. in both segments the market share of the funds which are substitutes of deposits is greater. This relation would fit with the profile of retail investors, which is more conservative, but seems less intuitive, *a priori*, for wholesale investors as a whole. However, as shown in figure 3, in the wholesale fund segment, the relative importance of the assets of conservative funds is very high, which would help to explain this positive coefficient. For its part, the coefficient associated with riskier funds is only significant and positive in the wholesale segment.[22]

22 The fact that the wholesale mutual fund segment has a very high proportion of assets invested in conservative funds, mostly in the hands of companies, which could present demand patterns similar to those for retail investors has led to separate estimates of the model for the wholesale sub-market of conservative funds and for the wholesale submarket of risky funds. The results of these estimates show that the behaviour of wholesale demand of conservative funds is similar to retail demand in several aspects. For example, relating to the coefficients associated with "variety", the estimated values in the wholesale submarket of conservative funds is very high and significantly higher than those obtained for the wholesale segment of risky funds.

Finally, the coefficient which includes mergers between mutual funds is positive and significant in both mutual fund segments, although greater for retail funds as a whole. Therefore, the funds which are the result of a merger have generally tended to show higher market shares.

Fund managers

Table 4 shows the main results of the model estimated for fund managers as a whole. The coefficients of the two variables which show the variety of funds and the number of funds and categories which the fund manager distributes among its customers are significant both for the retail market and for the wholesale market. In both cases they are positive, which indicates that, on average, the market share of fund managers which offer a greater variety of funds is higher. This would confirm the hypothesis that demand spillover plays a significant role in the Spanish fund market.

Estimate in the area of fund managers: wholesale (W) versus retail (R) CUADRO 4

	Variety					
	Number of categories (over total available)			Number of funds		
	Total	**R**	**W**	**Total**	**R**	**W**
Variety	4.71***	4.14***	2.26***	1.76***	1.62***	1.83***
	(0.44)	(0.47)	(0.11)	(0.08)	(0.11)	(0161)
Price	-0.85***	-0.61	-1.74***	-0.68***	-0.40	-0.54***
	(0.30)	(0.52)	(0.54)	(0.18)	(0.37)	(0.178)
Return	0.024	0.01	0.01*	0.04***	0.021***	0.02**
	(0.017)	(0.02)	(0.006)	(0.01)	(0.007)	(0.008)
Volatility	-0.11***	-0.16***	-0.0008	-0.07**	0.015	-0.05***
	(0.039)	(0.05)	(0.02)	(0.02)	(0.013)	(0.017)
Age	-0.022	-0.02	0.02	0.02*	0.014	0.02**
	(0.023)	(0.029)	(0.01)	(0.01)	(0.013)	(0.011)
Credit institution	-0.62**	0.47	-0.12	0.25**	0.48***	0.009
	(0.27)	(0.36)	(0.10)	(0.119)	(0.174)	(0.12)
Turnover	2.70***	1.28**	0.39	0.46*	-0.18	-0.18
	(0.59)	(0.65)	(0.25)	(0.247)	(0.317)	(0.198)
Merger	-0.14	-0.24	-0.24	-0.38***	-0.03	-0.52*
	(0.249)	(0.22)	(0.28)	(0.139)	(0.15)	(0.30)
Hansen test (p-value)	0.22	0.21	0.23	0.18	0.00[1]	0.21
Test fixed effects (Hausman)	NO	NO	NO	NO	NO	NO

Estimate GMM with instrumental variables robust to heteroskedasticity and autocorrelation.

Estimated coefficients and standard deviation in brackets.

* Significance at 10%

** Significance at 5%.

*** Significance at 1%.

The Hansen test compares the validity of the instruments used. It provides the p-value. The null hypothesis which is tested is "the set of instruments used is valid", and, therefore, a sufficiently high p-value would not reject the validity of the instruments.

1 In this case the number of instruments is equal to the number of endogenous variables and the F-test reflects a p-value very close to zero. Therefore, it is not possible to reject the null hypothesis that both instruments are valid at a level of significance of 1%.

When the variety is calculated using the number of categories, the intensity of the demand spillover is much higher in the retail fund market. However, when it is calculated using the number of funds, the intensities of the demand spillover in the retail market and in the wholesale market are very similar. These results can be explained based on the interpretation which has been given to the two ways to calculate variety. In the first case, when variety is calculated using the number of categories, the estimates essentially gather the preferences of investors in equity and mixed funds, which form part of the wholesale market where there is greater competition (see, once again, figure 6). In this case, it is consistent that the demand spillover will be lower in the wholesale segment. In the second case, when variety is calculated using the number of funds, the model tends to gather the behaviour of more conservative investors, and given that both in the retail segment and in the wholesale segment these types of investors are a majority, the intensity of the demand spillover is similar.

One of the results which helps to understand the difference between the retail fund market and the wholesale market lies in the coefficient obtained for the fees paid by wholesale investors, which is significant and, as expected, negative. This significance is present, both when considering the number of funds and when considering the number of categories. However, in the retail market, the fees do not seem relevant when investing in the funds of a specific fund manager. This result could help to explain why retail investors pay higher fees than wholesale investors when they invest in funds with similar portfolios.

As shown in table 4, in addition to fees, conservative wholesale investors also take into account the fact that the funds of the fund manager have a high return and the manager has a long history in the fund market. On the other hand, retail investors only take into account the past return obtained by the manager's funds. When the variety is calculated using the number of categories, the parameter of return is only marginally significant. In this last case, and given the number of observations, it is possible that this estimate is over-weighting the variance of the estimated coefficients. Retail investors focus their attention on fund managers with an extensive catalogue of funds which are not fixed income and with a volatility which is not excessive.

Finally, it should be pointed out that the coefficient associated with the fund manager belonging to the group of a credit institution is only significant and positive in the retail market when the variety is defined through the number of funds. Bearing in mind the interpretations being given to the two definitions proposed for variety, the above results suggest that the fact a fund manager belongs to a credit institution is only important when the investor profile is retail and conservative. In this regard, it is worth remembering that most of the assets invested in mutual funds in Spain correspond to retail investors that hold money market funds and short-term fixed-income funds.

The variable corresponding to whether the fund manager belongs to a credit institution can be broken down into three parts: one corresponding to bank fund managers, another corresponding to savings bank fund managers and a third corresponding to credit cooperative fund managers. Where the equations are estimated with these sub-groups, we can see that in the conservative retail fund market, the three coefficients are positive and significant. In this case, the largest coefficient corresponds to savings bank fund managers (0.75), in second place bank fund managers (0.53) and finally, credit cooperative fund managers (0.42). In the other specifications, both retail and wholesale, these variables lack significance.

When the results obtained are compared with those of Gavazza (2011), we can see that the demand spillover estimated for the Spanish fund market is stronger than that found in the US market. In addition, the estimates identify the presence of demand spillover in the wholesale market of Spanish mutual funds, which is not present in the US market. The explanation could lie in the fact that in the segment of wholesale investors in Spain, in which the importance of companies is very high, the average size of the investor is lower than in the US. In such a case, many of the Spanish wholesale investors could show behaviour similar to that of retail investors and prefer to invest in funds managers of credit institutions whose range of products is wider and thus reduce the cost of searching for financial products.

A result which is new in relation to the previous study is related to the variable which identifies whether the fund manager belongs to a credit institution, as indicated above. The fact that the fund managers which belong to credit institutions enjoy a higher market share than independent fund managers in the retail market of conservative funds (the largest in terms of size) is in line with the different methods for marketing funds in the period analysed. In Spain, funds are mainly marketed through credit institutions managed under a universal banking model, which have in place a large sales force.

3.2.2 Results: wholesale fund market

As can be deduced from chapter 2 of this working paper, the wholesale fund market can be subdivided into two submarkets: the conservative fund market (money market and fixed income) and the equity and mixed fund market. In the former we can observe how their level of competition is similar to that of the retail fund market. However, in the equity and mixed fund market we can observe an appreciably higher level of competition (see figure 9). Given this difference in the level of competition of the two submarkets, it would seem advisable to look at the wholesale market separately and study the possible drivers of this difference.

Table 5 shows the results of the estimation for the wholesale fund segment in the two forms under consideration: conservative funds and equity and mixed funds. These results evidence the presence of cross-effects in both fund submarkets, although these effects are stronger for the conservative funds. This result would confirm the hypothesis that wholesale investors in conservative funds may behave partly as retail investors as they place a high value on fund managers which offer them a wide variety of funds. In this market we can also observe that volatility is negatively related to the market share of the fund, which speaks to the conservative nature of these investors. Also, the dummy referring to the credit institution of the fund manager is positive and significant for the two varieties considered. As in the retail fund market, in the conservative wholesale fund market an increase in the variety offered by the credit institutions fund families makes their market share grow in a greater proportion.

Regarding the wholesale demand for riskier funds, it should be noted that, most of the fund manager variables are not significant. Only the variable referring to the age of the fund manager exhibits a negative coefficient; in other words, wholesale investors prefer to invest in funds of younger fund managers. In this fund market, the investors do not show any greater preference for fund manager belonging to credit institutions and are more orientated towards pure equity funds rather than mixed category funds.

Funds: wholesale market TABLE 5

	Variety			
	Number of categories (over total available)		Number of funds	
	Conservative funds	Equity and mixed funds	Conservative funds	Equity and mixed funds
Variety	1.322*** (0.176)	0.873*** (0.139)	0.553*** (0.070)	0.418*** (0.069)
Price	-0.647*** (0.072)	-0.401*** (0.051)	-0.648*** (0.071)	-0.378*** (0.051)
Return	0.040*** (0.009)	0.011*** (0.002)	0.044*** (0.008)	0.010*** (0.002)
Volatility	-0.115*** (0.020)	0.006 (0.005)	-0.090*** (0.019)	0.006 (0.005)
Age of the fund	0.430*** (0.075)	0.548*** (0.058)	0.457*** (0.076)	0.542*** (0.057)
Return fund manager	0.039** (0.019)	0.003 (0.003)	0.030 (0.019)	0.004 (0.003)
Volatility fund manager	0.002 (0.040)	0.003 (0.006)	-0.017 (0.040)	0.011* (0.006)
Age of the fund manager	0.183 (0.178)	-0.355*** (0.107)	0.197 (0.167)	-0.188** (0.086)
Credit institution	0.187* (0.11)	-0.025 (0.067)	0.283*** (0.104)	0.012 (0.063)
Category (Short-Term Fixed Income/Equity)	0.649*** (0.11)	0.261*** (0.067)	0.640*** (0.110)	0.224*** (0.066)
Merger	0.553*** (0.14)	0.454*** (0.092)	0.410*** (0.127)	0.500*** (0.090)
Hansen test (p-value)	0.14	0.31	0.23	0.20
Test fixed effects (Hausman)	NO	NO	NO	NO
Number of observations	799		799	

Estimate GMM with instrumental variables robust to heteroskedasticity and autocorrelation.
Estimated coefficients and standard deviation in brackets.
* Significance at 10%
** Significance at 5%.
*** Significance at 1%.
The Hansen test compares the validity of the instruments used. It provides the p-value. The null hypothesis which is tested is "the set of instruments used is valid", and, therefore, a sufficiently high p-value would not reject the validity of the instruments.

Table 6 describes the results at fund manager level for both wholesale submarkets. It can be seen how both variety and price are significant in the case of conservative wholesale funds. This result is regardless of whether variety is approximated by the number of funds or by the number of categories. It should be borne in mind that most assets invested by wholesale investors were invested in conservative funds. As can be seen in table 6, the results from this submarket are influencing the results described previously for the wholesale market as a whole. It should be noted that wholesale investors prefer funds that are managed by a fund manager belonging to a credit institution. This may confirm the strong link between this type of investor and the banking system.

Fund managers: wholesale market TABLE 6

	Variety			
	Number of categories (over total available)		Number of funds	
	Conservative funds	Equity and mixed funds	Conservative funds	Equity and mixed funds
Variety	2.71***	-0.65	1.90***	1.62***
	(0.679)	(0.95)	(0.459)	(0.385)
Price	-2.22***	0.30	-0.63***	0.20
	(0.518)	(0.34)	(0.21)	(0.287)
Return	0.049**	-0.003	0.02	0.006
	(0.02)	(0.004)	(0.016)	(0.004)
Volatility	0.15**	0.001	-0.07	0.008
	(0.074)	(0.013)	(0.05)	(0.011)
Age of the fund manager	-0.01	0.18**	-0.001	-0.06
	(0.047)	(0.088)	(0.043)	(0.039)
Credit institution	1.22***	0.33	0.49*	-0.13
	(0.460)	(0.28)	(0.28)	(0.160)
Turnover[1]		0.59*		0.05
		(0.108)		(0.26)
Merger	0.15	0.18*	-0.649	0.009
	(0.457)	(0.311)	(0.319)	(0.086)
Hansen test (p-value)	0.25	0.31	0.00[2]	0.28
Test fixed effects (Hausman)	YES	YES	YES	YES
Number of observations	1,070		1,070	

GMM estimation with instrumental variables robust to heteroscedasticity and autocorrelation.
Estimated coefficients and standard deviation in brackets.
* 10% significance level.
** 5% significance level.
*** 1% significance level.

1 Given the way in which the "turnover" variable has been constructed, this always takes zero as its value in the case of money market and short-term fixed income funds.

2 In this case, the number of instruments is equal to the number of endogenous variables and the F-tests reflect a p-value very close to zero. Therefore, the null hypothesis that the two instruments are valid cannot be rejected at a 1% significance level.

With regard to the results of the wholesale market of mixed and equity funds, we can see that when variety is approximated by the number of funds, only the variety coefficient is significant. However, when variety is approximated by the number of categories, we find that the coefficient relating to the age of the fund manager is significant and that the coefficients associated with turnover and mergers are marginally significant. These results suggest that the estimations may not have the desired reliability. This would occur either because the number of observations is not large enough, or because the instrumental variables considered are not appropriate for estimating this wholesale fund submarket. One of the reasons why the instrumental variables may not be appropriate in this case could be because the distribution channel in the case of wholesale equity funds is not so strongly tied to the main fund family marketing channel, the traditional bank branches.

4 Conclusions

The Spanish mutual fund market is characterised by the presence of a high number of fund managers which offer a significant number of mutual funds. However, this is an industry with a high level of concentration, similar to that of other European economies. In particular, the four leading fund managers in Spain enjoy a market share which ranged between 36.2% in 1995 and 49.2% in 2010, which is a sign that the competition in this industry could be more limited than could be expected *a priori* from the high number of funds available in the market and the strong competition between financial institutions to win new customers.

The presence of a wide variety of funds is the variable which may be negatively affecting competition conditions in this industry. The finance industry is characterised by the fact that consumers, particularly retail investors, tend to concentrate their purchase of financial products in a single supplier. This behaviour may be due to the high price of searching for financial products among a number of different suppliers. In industries which have this characteristic, such as retail sale in supermarkets, variety is a strategic variable which companies use to ease competition (Klemperer and Padilla, 1997).

In this paper we look into the competition conditions in the Spanish fund industry which might arise from the characteristics of the demand patterns of retail and wholesale investors. To cover this aim, we have looked for empirical evidence of the possibility that fund managers offering more variety in their range of products may enjoy larger market shares. We have also compared our results with the findings of Gavazza (2011), who conducted the same analysis for the United States market. This comparison is interesting because of the different ways mutual funds are distributed in the two countries. In the United States these products are marketed either by independent brokers or directly through the fund manager itself. However, in Spain, where the level of bancarisation is significantly higher, the mutual funds are distributed mainly through the branches of credit institutions.

The results of the empirical work suggest the existence of demand spillover relating to the variety of funds offered by fund managers, both in the wholesale market and in the retail market. Fund managers can differentiate their offering with regard to their competitors and increase their market share in relative terms by increasing the variety of their funds. The intensity of this demand spillover is higher in the market of funds aimed at retail investors. In addition, in this market, with the same offering of funds, the fund managers which belong to credit institutions enjoy a higher market share and the demand for their products seems insensitive to the fees charged to unit-holders. All of this would demonstrate a strong relationship between credit institutions and their retail investors.

When the results of this paper are compared with those obtained by Gavazza (2011), where the same analysis is conducted for the US market, we can see that the increase in market share which a fund manager obtains by increasing the range of products is noticeably higher in Spain, both in the retail fund segment and in the wholesale segment. This contrast would reflect the differences in the distribution model of financial products between the two economies. In the case of Spain, this distribution model is characterised by the strong relationship of customers with a universal banking entity. This characteristic may be the reason why there is a higher level of concentration in the Spanish market. This difference is especially significant in the case of the wholesale fund market, in which no evidence of demand spillover was found in the USA while it was found in the case of Spain. The greater importance of SMEs in the wholesale fund segment in Spain would explain this outcome, since they are mainly interested in investing in conservative products and share some patterns of behaviour with retail investors.

In view of the results of this paper, it seems appropriate to encourage the adoption of measures which help to reduce the cost faced by investors, particularly retail investors, when investing in financial products which are not provided by their usual financial institutions. These measures could be directed towards creating public and independent tools which will make it easier to compare the different funds available in the market. Promoting financial education for investors, so as to make a comparison of the products more efficient, may also play a significant role.

Bibliography

Agarwal, S., Chang, Y. and Yavas, A. (2010). "Adverse Selection in Mortgage Securitization". Federal Deposit Insurance Corporation, available at http://www.fdic.gov/bank/analytical/cfr/mortgage_future_house_finance/papers/Chang.PDF.

Bank of Spain (2008). "*Encuesta Financiera de las Familias" (EFF).*

Berry, S. (1994). "Estimating discrete-choice models of product differentiation". *RAND Journal of Economics*, vol. 25, pp 242-262.

Cambón, M.I. (2011). "*Rentabilidad de los fondos de inversión españoles: una análisis de sus determinantes"*. CNMV, Working Paper no. 48.

Cambón M.I. and Losada R. (2012). "*Evolución de las sociedad gestoras de fondos de inversión y de su oferta desde 1995 hasta 2010*". CNMV Quarterly Bulletin, Q1, pp 87-108.

Coates, J. and Hubbard, G. (2007). "Competition in the mutual fund industry: Evidence and implications for policy". *Journal of Corporation Law* 33, pp 151-222.

Cohen, L. and Schmidt, B. (2009). "Attracting flows by attracting big clients". *Journal of Finance*, vol. 64, pp 2125-2151.

Datamonitor (2001). "Impact 2001 Survey".

Delgado J., Pérez, D. and Salas, V. (2003). "*Especialización crediticia y resultados en la banca europea*". Bank of Spain, *Revista de Estabilidad Financiera*, no. 5, pp 273-294.

Del Guercio, D., Reuter, J. and Tkac, P. (2010). "Broker incentives and mutual fund market segmentation (mimeo)".

European Central Bank (2010). "EU Banking Structures".

European Commission (2005). "Green book on the enhancement of the EU framework for investment funds*".*

Fernández de Lis, S. and García Mora, A. (2008). "*Algunas implicaciones de la crisis financiera sobre la banca minorista española*". Bank of Spain, *Revista de Estabilidad Financiera*, no. 15, pp 55-72.

Fernández, P. and Bermejo, V. (2009). "*Rentabilidad de los fondos de inversión en España: 1991-2008"*. IESE, University of Navarre. Research Paper 788.

Ferreira, M.A. and Ramos, S. (2009). "Mutual fund industry competition and concentration: International evidence". SSRN working paper.

Gavazza, A. (2011). "Demand spillovers and markets outcomes in the mutual fund industry". *RAND Journal of Economics*, vol. 42, pp 776-804.

Gil-Bazo, J. and Ruiz-Verdú, P. (2009). "The relation between price and performance in the mutual fund industry". *Journal of Finance*, vol. 64, pp 2153-2183.

Gruber, M. (1996). "Another puzzle: The growth in actively managed mutual funds". *Journal of Finance*, vol. 51, pp 783-807.

Hausman, J.A. (1978). "Specification tests in econometrics". *Econometrica*, vol. 46, pp 1251-1271.

Hortacsu, A. and Syverson, C. (2004). "Product differentiation, search costs, and competition in the mutual fund industry: A case study of S&P 500 index funds". *Quarterly Journal of Economics* 119, pp 403-456.

Investment Company Institute (2012). *2012 Investment Company Fact Book.*

Klemperer, P. and Padilla, J. (1997). "Do firms' product lines include too many varieties? *RAND Journal of Economics*, vol. 57, pp 557-582.

Korkeamaki, T. and Smythe, T.I. (2004). "Effects of market segmentation and bank concentration on mutual fund expenses and returns: evidence from Finland". *European Financial Management*, vol. 10, pp 413-438.

Laffont, J.J. and Tirole, J. (1988). "The dynamics of incentive contracts". *Econometrica*, vol. 56, pp 1153-1175.

Nevo, A. (2001). "Measuring market power in the ready-to-eat cereal industry". *Econometrica*, vol. 69, pp 307-342.

Retail Banking Research (2008). "Global ATM Market and Forecasts to 2013".

Schmalensee, R. (1978). "Entry deterrence in the ready-to-eat breakfast cereal industry". *Bell Journal of Economics*, vol. 9, pp 305-327.

Shaked, A. and Sutton, J. (1990). "Product differentiation and industrial structure". *Journal of Industrial Economics*, vol. 36, pp 131-146.

Sutton, J. (1991). "Sunk Costs and Market Structure. Price Competition, Advertising, and the Evolution of Concentration". *The MIT Press*.

WSBI (World Savings Banks Institute) and ESBG (European Savings Banks Group) (2006). "A comparative analysis of the US and EU retail banking markets".