

Passive Investing before and after the Crisis: Investors' Views on Exchange-Traded Funds and Competing Index Products[♦]

This version: 31.03.2010

Abstract

Investment in exchange-traded funds (ETFs) has been remarkably robust in the course of the recent financial crisis. This paper analyzes investors' perceptions of ETFs and other indexing products by comparing the answers to two surveys of ETF users carried out in 2008 and 2009, before and after the height of the financial crisis. We find that the crisis has divided the ETF market in two segments. Whereas ETFs in standard asset classes have been unaffected by the crisis, ETFs for alternative asset classes face challenges. However, ETFs are generally well ranked in comparison to other indexing products – presumably because of an increased focus on liquidity and transparency.

JEL Classification: G01, G10, G13

Keywords: exchange-traded funds, futures, index funds, total return swaps, survey, financial crises, liquidity, counterparty risk, index replication

Felix Goltz

EDHEC Risk Institute, EDHEC Business School
393-400, Promenade des Anglais – BP 3116, Nice Cedex 3, France
Tel: +33.4.93.18.99.66
felix.goltz@edhec-risk.com

David Schröder

Birkbeck College, University of London, Department of Economics, Mathematics and Statistics
Malet Street, London WC1E 7HX, United Kingdom
Tel: +44 (0)207 631 6403
d.schroeder@bbk.ac.uk

[♦] We would like to thank two anonymous referees for their helpful comments. This research has received the support of the Amundi ETF "Core-Satellite and ETF Investment" research chair.

1. Introduction

The 2007/2008 financial crisis that culminated in the bankruptcy of Lehman Brothers, a US investment bank, has had pronounced repercussions in almost all areas of financial markets. While the crisis was limited to mortgage backed securities initially, it spread to credit markets in general and - in the end - almost all asset classes were affected. Developed and emerging equity markets, corporate bond markets, real estate, commodities, and hedge funds have seen considerable losses. Arnott and West (2008) point out that returns were disappointing for all of 16 different asset classes in September 2008, as all of them were affected by the market turmoil at that time.

In line with this broad-based decline of asset prices, assets under management in investment products have diminished as well. In addition, significant withdrawals by mutual and hedge fund investors at the end of 2008 (IMF, 2008) have led to a further decline. Compared to the many financial products that have seen a substantial decrease in popularity, exchange-traded funds (ETFs) stand out as one of the few financial products that seem not to have been hit by the financial crisis. For example, European mutual funds suffered outflows of USD 570 billion over the course of 2008. ETFs, by contrast, collected USD 74 billion (Fuhr, 2009).

The objective of this paper is to shed some light on investors' perception of exchange-traded funds which may help explain this phenomenon. By comparing the answers to two surveys on the usage of exchange-traded funds by European investors carried out in 2008 and 2009, we aim to identify investors' perceptions before and after the crisis. Surveying investors allows us to gather information beyond publicly available data on assets under management and trading volume, and may help shed some light on investors' motivations and perceptions.

Since ETFs are not the only financial product that allows obtaining a broad exposure to asset markets, we compare the results of ETFs with investors' views of competing indexing products, such as futures, total return swaps, and traditional index funds. Thereby, we hope to give valuable insights not only the absolute impact of the crisis on ETFs, but also in relation to comparable vehicles. Finally, the data obtained from the surveys also offer the opportunity to compare the views of different types of investors.

The two surveys that this study draws on were conducted among European investors before and after the height of the financial crisis. When the first survey was conducted in the early months of 2008, the financial crisis was still in its early phase, and mostly limited to the US mortgage sector. In contrast, the second survey in 2009 can be regarded to be well impacted by the financial crises, following the bankruptcy of major international banks and insurance companies.

The first survey exclusively targeted at European institutional investors, such as asset management firms, insurance companies, and pension funds. To read the possibly diverging views and opinions on the use of exchange-traded funds and other indexing products across different investor types, the second survey in 2009 was extended to include private bankers, family offices, and private investors as well.

Although exchange-traded funds have existed for almost two decades, they have only recently drawn the attention of the research community. An excellent overview is provided by Deville (2007). First influential papers on ETFs include Gastineau (2001) on early developments of

ETFs, and Poterba and Shoven (2002) on ETF taxation. Cherry (2004), Engle and Sarkar (2006), Kayali (2007) and Madura and Ngo (2008) investigate the differences between ETF prices and their NAV. This paper is also related to the growing academic analysis of the financial crisis 2007/2008. Mizen (2008), Reinhard and Rogoff (2008), Shiller (2008), and Blanchard (2009) provide, for example, a detailed background of the financial crisis, Brunnermeier (2008) and Allen and Carletti (2008) investigate more closely the liquidity problems originating from the crisis, and Gorton (2008) looks at complex role of derivatives in the crisis.

To our knowledge, there is very little academic literature that examines the impact of the financial crisis on the exchange-traded fund market. The only paper that comes close to the analysis provided in this paper is by Tucker and Sanchez-Marín (2003), which investigates the performance of ETFs during crises caused by market interruptions and trade suspensions of key ETF constituents. By comparing usage and satisfaction of exchange-traded funds before and after the height of the recent financial crisis, our paper provides insights on the impact of this crisis on investors' perceptions. In addition, we provide survey evidence of how investors view different indexing products, thus complementing work that looks directly at product characteristics and capital flows (Elton, Gruber, Commer and Li (2001) or Elton, Gruber and Busse (2004)).

Our objective is not to give a comprehensive assessment of the quality of ETFs as a financial instrument. Rather, we focus on investor perceptions concerning ETFs and – more specifically – the dynamics of perceptions over the recent financial crisis. We find that overall investment in ETFs has been remarkably stable during the financial crisis. In some market segments, such as equity ETFs, both use and satisfaction even increased in the course of the year 2008. In 2009, more than 84% of all participating institutional investors have been investing in equity ETFs, up from 75% in 2008. Similarly, investment in government bond ETFs gained popularity during the financial crisis. In contrast, the financial crisis imposes severe challenges for ETFs in alternative asset classes, especially in the case of hedge fund ETFs, where both usage and satisfaction levels have dropped sharply within 12 months.

When comparing ETFs with other financial products that allow for trading baskets of assets, we find that ETFs and futures are the preferred indexing instruments. Compared to traditional index funds and total return swaps, these products are perceived to have an edge in terms of liquidity. In addition, the financial crisis has increased investors' attention to the main drawback of total return swaps: counterparty risk. The financial crisis may have led to an increased focus on liquidity and counterparty credit risk. Hence it would not be a surprise if after the financial crisis, ETFs and futures were to take market share from total return swaps which are judged to lead to significant counterparty risk.

The remainder of this paper proceeds as follows. In the next section, we shortly present the basic concept of exchange-traded funds and discuss the impact of financial crisis on indexing products. Section 3 outlines the methodology and data. The main results of the survey, the practitioners' view on ETFs and its alternatives, are presented in section 4. In addition, section 5 offers a comparison of responses obtained from private wealth managers to those from institutional investment managers. The conclusion in section 6 offers some implications of this research for both product providers and investors.

2. Exchange-Traded Funds and the Financial Crisis

Exchange-traded funds (ETFs) are an important product innovation of the past decade. In this section, we give first a short overview on ETFs. Then we analyze the financial crisis and its impact on ETFs and other financial products.

2.1. Overview of Exchange-Traded Funds and Other Indexing Products

2.1.1. Understanding Exchange-Traded Funds

An exchange-traded fund is an investment vehicle whose shares (units) are traded on stock exchanges at market-determined prices. Most ETFs are similar to traditional index funds that consist of a basket of securities and attempt to track, as closely as possible, the performance of market indices or benchmarks. With ETFs, investors can gain broad exposure to equity, fixed income, and alternative asset markets with little effort and at low cost.

As such, an ETF is a hybrid of a stock and a fund. Like mutual funds, ETFs are registered as open-end funds, continuously offering new fund shares to the public and required to buy back outstanding shares upon a shareholder's request and at a price based on the current value of the fund's net assets. Unlike traditional index funds, however, they are distinct investment vehicles with stock-like characteristics: they are listed on the exchange and, like stocks, they can be bought and sold at market prices during trading hours. Similar to stocks, they can also be sold short, lent out, or bought on the margin.

An ETF's replication mechanism is one of its defining features. ETFs come in three flavors: physical index replication funds, statistical replication, and swap-based replication. An ETF is considered a physical replicating index fund (sometimes also cash-based replication) if the ETF manager holds all the constituents of the underlying index in the same proportion as the constituent securities of the index. This approach offers a natural replication of the target index. The drawback is that this is difficult to implement when the index to be replicated is a broad index with a large number of securities. This difficulty arises from liquidity problems with index constituents, clearing and settlement problems, and the high cost of executing the basket of securities. So, even physical replication will lead to tracking error.

ETFs can also use statistical sampling strategies to replicate the chosen index. Instead of fully replicating the index, the fund invests in only a fraction of the total index constituents. The aim is to replicate the index by focusing on highly liquid underlyings. This form is generally used for very broad indices, where it is less costly than full replication. But it necessarily leads to tracking error, the magnitude of which depends on the accuracy of the statistical replication model.

Finally, there are swap-based ETFs. The basic idea of these funds is to outsource the tracking error management to a counterparty: the fund itself invests in a broad basket that does not fully replicate the index. The replication itself is provided by the swap counterparty, and any differences in the performance of the basket and that of the index are counterbalanced by the swap payments. The advantages of this third replication technique are that the ETF does not bear tracking error risk and that swap-based replication comes at low cost. However, it leads to counterparty risk with respect to the outperformance of the index over the ETF's physical basket of securities, and which is limited by European regulation to 10% of the fund's value.

2.1.2. Alternatives to Exchanged-Traded Funds

In addition to ETFs, there is a variety of financial products that allow simple trades of large baskets of assets: traditional index funds, futures, and total return swaps. Because of their similar features, they can be regarded—depending on the investment purpose—as alternatives to ETFs.

The closest of these alternatives are traditional index funds. Index funds can be viewed as unlisted ETFs, and hence can be bought from and sold only to the managing company of the mutual fund. Investors can also opt for derivative instruments (futures and total return swaps) to trade large baskets of assets. Futures are standardized forward contracts that are exchange-traded and thus highly liquid. Total return swaps, by contrast, are not traded on an exchange; they are over-the-counter contracts. Here, the total return of an index (made up of both price changes and dividends) is swapped for fixed regular cash flows. It is important to note that OTC instruments like total return futures expose index investors to counterparty credit risk exchange-traded instruments like futures mitigate this risk through the clearinghouse mechanism.

2.2. The Financial Crisis

The objective of our paper is to assess evolutions in investors' attitudes towards the instruments listed above in the context of the recent financial crisis. Therefore, it is useful to recall the main developments as well as their implications for investors.

2.2.1. The Financial Crisis 2007-2009

The sub prime mortgage crisis began in 2007 and was triggered by a dramatic rise in mortgage delinquencies in the United States. The crisis first affected the financial sector in February 2007, when HSBC, one of the world's largest banks, wrote down its holdings of sub prime-related mortgage-backed securities. However, the crisis reached its peak only in late 2008, when large US banks needed to either get bailed out or declare bankruptcy, as for example Merrill Lynch and Lehman Brothers.

We can draw conclusions from our survey on how investor perceptions changed over this crisis, as the two surveys were conducted before and after the height of the crisis. As an indicator to time when the crisis reached its height, it is useful to look at the TED spread, which is shown in exhibit 1. The TED spread, defined as the difference between the three-month T-bill interest rate and three-month LIBOR, is an indicator of stress in the money market, reflecting both liquidity risk and credit risk in the banking sector (see Brunnermeier (2008)). The initial sub prime crisis led to a first sharp rise in the TED spread in August 2007. The TED spread however only reached its peak about one year later, in October 2008.

[EXHIBIT 1 goes here]

2.2.2. Implications of the Financial Crisis

The financial crisis had many implications for financial markets and investors. However, for exchange traded funds and other indexing products, the two most important problems arose from liquidity constraints and increased counterparty risk.

Because of high uncertainty in financial markets the liquidity of many traded assets decreased sharply, especially those that face even liquidity problems in normal financial conditions, such as corporate bonds or alternative assets. As a consequence of illiquid underlying assets, ETF have

seen partly large pricing differences with respect to their net asset value (NAV). For example, because of thinly traded corporate bonds with high bid-ask spreads, arbitrageurs could not profit from pricing differences without distorting the prices altogether. Of course, illiquid underlying assets posed also problems for other indexing products, such as traditional mutual funds some of which had to be closed temporarily.

Besides liquidity problems, counterparty risk was one of the major problems of financial markets during the financial crisis. At the latest since the prominent failure of Lehman Brothers, a leading provider of derivate products, on September 15, 2008, market participants increasingly became aware of the risks related to their counterparty positions. Counterparty risk is especially a problem for non-traded derivate instruments, such as swaps. As a consequence, the financial crisis can be expected to have a strong impact on the perceived risk of OTC instruments, such as total return swaps.

3. Methodology and Data

3.1. Survey Design and Methodology

This study draws on the answers to two surveys on the usage of exchange-traded funds by European investors carried out in the years 2008 and 2009. When the first survey was conducted in the first four months of 2008, the financial crisis was still in its early phase, and mostly limited to the US mortgage sector. In contrast, the second survey was conducted in January and February 2009 and can be regarded to be well impacted by the financial crises, following the bankruptcy of major international banks and insurance companies¹. Hence, opposing the results of the two surveys allows to directly analyse the impact of the financial crisis on the investors' perception of indexing products.

Besides minor modifications, both surveys had identical questionnaires, thereby permitting for a convenient comparison of the results before and during the crisis. Most of the questions were multiple-choice questions, with the possibility to choose one or more answers, depending on the question. The questionnaires had three parts. In the first series of questions, survey participants were asked about the role ETFs play in their asset allocation decisions. The next set of questions turned to practical aspects of ETF investment, such as satisfaction with ETF products and applications of ETFs for portfolio optimization. In the last set of questions, the questionnaire asks the respondents to compare ETFs and other investment instruments that can be considered close substitutes: index funds, futures, and total return swaps. Finally, we invited the survey respondents to express their views of future developments in the ETF market. The extract of the survey questions that have been used for this study can be found in the appendix.

The first survey exclusively targeted at European institutional investors, such as asset management firms, insurance companies, and pension funds. To read the possibly diverging views and opinions on the use of exchange-traded funds and other indexing products across different investor types, the second survey in 2009 was extended to include respondents from the private wealth management sector (private bankers, family offices, private investors) as well.

¹ For the first survey, the first response was received on January 29, 2008, the last on April 21, 2009. For the second survey, the first response was received on January 23, 2009, the last on February 26, 2009

Both surveys were taken with an online questionnaire that was distributed through electronic mail messages and through a link on a website devoted to asset management research.² Respondents were asked to submit their responses by filling out the online questionnaire and leaving their contact details.

3.2. Data

In total we received 100 full answers to the first survey, and 357 to the second survey. The final data set used in this study hence contains 457 responses, 100 of which obtained in 2008, and 357 in the year 2009, where the target audience was larger.³

[EXHIBIT 2 goes here]

Exhibit 2 summarises the breakdown of professional groups of the respondents. Institutional investors account with 74.8% for the large majority of the sample. Representatives of investment and asset management companies are the most important professional group out of institutional investors (58.2%), followed by pension funds (6.3%) and banks (3.9%). The remaining 25.2% of the data set belongs to the private wealth management sector.

Since private asset management and institutional asset management are typically understood to be of different nature, we focus on respondents from institutional investment management when comparing the results between 2008 and 2009. Since respondents from private wealth management make up a significant part of responses in 2009, we present an analysis of their responses in section 5 of this paper.

[EXHIBIT 3 goes here]

Most of the 457 respondents are based in Europe, a large part of which are from France, Switzerland, and the UK, as exhibit 3 shows. Finally, exhibit 4 shows the assets under management of the companies for which the survey respondents work. As was to be expected, there are a few large firms in the asset management industry that have more than EUR 100bn in assets under management. However, the surveys mainly reflect the views of medium-sized companies, with assets under management of between EUR 100mn and 10bn.

[EXHIBIT 4 goes here]

3.3. Limitations

Like any study based on surveys, this study might suffer from some problems. First, the sample of survey participants was not taken randomly from the target population for this study, but is based on a database of contacts of institutional and private investors. Since this sample might differ from the total population of the ETF investors, this procedure could lead to sample-selection bias. Participation was also entirely voluntary, so there is a non-response (or self-selection) bias. Practitioners who responded to the questionnaire could have views different from those of the industry as a whole. Non-response could involve other biases as well. Professionals from smaller companies, for example, may have been more (or less) likely to respond to our

² We used the website of the EDHEC-Risk Institute to publish the survey: www.edhec-risk.com.

³ The large increase in responses obtained in 2009 compared to the year before can be explained by the enlarged target group, and a larger set of contacts to which the 2009 survey was distributed. Note that we omit respondents who did not give full details on their professional affiliation and the category of their company, since we need this data to sort respondents.

questionnaire. As a consequence, the results of the study could be biased in one direction or the other. Finally, survey respondents had no economic incentive to report their true beliefs, especially since the survey was not anonymous. But we see no compelling reason to hide true opinions, and we find no empirical evidence that respondents did so. However, overall, we believe that the regional diversity and fair balance of asset management professionals make the study largely representative of European ETF investors.

4. Results

In this section, we present the main results of this study by comparing the answers to the two surveys conducted in 2008 and 2009. Comparing the results from both surveys allows us to analyse the impact of the crisis on the investors' perception of exchange-traded funds and other indexing products.

In the first subsection, we take a close look at the use of and satisfaction with ETFs of institutional investors. In section 4.2, we then compare the institutional investors' views of ETFs with their views of investment instruments that can be considered close substitutes: futures, total return swaps, and index funds. In addition, we invite survey respondents to express their views of future developments in the index product market.

4.1. Use and Satisfaction with Exchange-traded Funds

First, we analyse the use of exchange-traded funds in different asset classes. Exhibit 5 shows the proportion of institutional investors that indicate they have invested a positive fraction of total assets in exchange-traded funds. The table divides assets in six different asset classes: equities, government bonds, corporate bonds, commodities, real estate, and hedge funds. The results show that equity ETFs are by far the most popular ETF segment: in 2009, more than 83% of all participating institutional investors have been investing in these products. Commodities ETFs, government and corporate bond ETFs come next, with a market penetration between 31%-42%. Real estate and hedge fund ETFs are less popular.

When comparing the respondents' answers of 2008 and 2009, we can detect remarkable changes that occurred in the course of the financial crisis for two asset classes. On the one hand, the fraction of investors using equity ETFs increased significantly by 8.5% from 75% in 2008 to 83.5% in 2009. On the other hand, real estate ETFs have experienced a significant decrease in usage in the course of the financial crisis, declining from 31% in 2008 to only 21.5% a year later. In all other asset classes, ETF usage remained largely constant.

[EXHIBIT 5 goes here]

Next, we investigate the institutional investors' satisfaction with ETFs or ETF-like products. Exhibit 6 shows that most investors are highly satisfied with their ETFs, generally attaining satisfaction levels in the range from 70% to 90%. In 2009, equity ETFs achieve the highest satisfaction with more than 91% of investors indicating to be satisfied. Government bond ETFs rank second (88.4%), followed by commodity ETFs (79.6%). Only hedge fund ETFs obtain rather poor views by investors. In 2009, only about one in three investors is satisfied with his hedge fund ETF (34.2%).

Looking at the impact of the financial crisis, it can be seen that satisfaction remained stable for equity and bond ETFs. However, alternative asset class ETFs suffered in popularity among investors. Especially investors' satisfaction with hedge fund ETFs decreased by more than 50%, which is an economically important and statistically significant change in satisfaction level.

[EXHIBIT 6 goes here]

Finally, exhibit 7 presents the fraction of total investments accounted for by exchange-traded funds. In this table, only respondents that actually have invested into this asset class are considered. In 2009, ETFs account for almost a third of total investments in equity (32.3%) by ETF users. It should be noted that this number is not representative of the overall assets represented by ETFs compared to the amount of equity held market-wide. The number simply reflects the average proportion that an equity ETF user holds in such ETFs compared to his other equity holdings⁴. Exchange-traded funds are also an important means to obtain exposure to commodity markets (21.9% in 2009). For other asset classes, ETFs are rather unimportant.

With the exception of hedge fund investment which declined slightly from 6.9% to 5.5%, the percentage of investments accounted for by ETFs increased in almost all asset classes compared to 2008. Relative growth was especially remarkable in the equity universe, for government bonds, and real estate products – despite the financial crisis. The increase in these segments is in the order of 7% to 10%, which is significant at the 5% level.

[EXHIBIT 7 goes here]

Taken together, these results suggest that the financial crisis has not affected all ETF products in the same way. Equity and government bond ETF products can be regarded as clear winners of the crisis; they gained in both market share and satisfaction levels. Against the backdrop of the financial turmoil, equity and government bond ETFs are probably perceived to be a convenient tool to obtain liquid exposure to these asset classes – despite considerable losses in equity markets. These figures highlight the on-going popularity of ETFs in standard asset classes.

Exchange-traded funds in the alternative asset universe are, in contrast, adversely affected by the financial crisis, especially those that are replicate real estate investments and hedge funds. The decline in ETF usage by about a third in the real estate segment is remarkable, and might be explained by the special nature of real estate ETFs. Instead of directly investing in real estate, real estate ETFs usually replicate real estate indices that are based on real estate investment trusts (REITs), listed collective equity investment vehicles that provide relatively high liquidity. However, these indices cannot be considered fully representative of institutional investment in real estate, basically because of the criteria—listing, capitalization, and liquidity—on which their components are selected. As a result of this design, real estate ETFs usually have much higher equity market beta than unlisted funds and therefore offer different risk and return characteristics (Lee and Stevenson, 2005). So, in the wake of the financial crisis, real estate ETFs have lost considerably more than comparable directly invested assets, which has presumably led to greater dissatisfaction as well. However, it should be recalled that in 2009, real estate ETFs account for more of total real estate assets compared to 2008 (exhibit 7). At first sight, this seems to be contradicting to lower satisfaction and a decline in real estate ETF users. Still, it might that the real estate sector got relatively less interesting to investors, but not so much the ETFs themselves. The reasons for the increasing dissatisfaction with hedge fund ETFs may have different origins. Recent surveys, for example, have shown that many practitioners are not convinced of the value of the hedge fund ETFs offered on the markets (Amenc and Schröder, 2008). They believe that the behaviour of hedge fund managers is not replicable as such and consequently that any

⁴ As of the first quarter of 2009, the assets managed by equity ETFs in Europe made up € 62.5 billion, which does not correspond to a large part of equity market capitalisation (Constandinides et al., 2010)..

replication product is unlikely to replicate any managerial skill. And with the crisis many of these products have performed poorly.

Although also part of the alternative investment class, commodity ETFs are rather stable during the crisis, even increasing their market share out of total commodity investments. Still, satisfaction levels declined as well. Finally, corporate bond ETFs are remarkably robust to the financial crisis. Despite temporarily pricing problems with respect to NAV, their usage and satisfaction remained rather unchanged.

The bottom line is that the financial crisis appears to have divided the ETF market in two distinct segments: ETF in standard asset classes have benefited from the financial crisis. In contrast, more exotic ETFs in alternative asset classes face some severe challenges, especially in the case of hedge fund ETFs.

In the next question, respondents are asked to express their opinion on their preferred replication method for ETFs. Exhibit 8 shows that more than two thirds of ETF investors prefer the pure replication method. Synthetic ETF replication that relies on derivatives, such as swaps, comes second. Only less than 10% of respondents favor statistical replication methods.

In the course of the year 2008, the fraction of investors favoring pure replication increased significantly; most of all at the cost of the synthetic replication. In the light of the financial crisis, most of all after the Lehman collapse, investors probably fear increased counterparty risk concerning the swap position of the ETF. However, it should be noted, that even with this increased reluctance to accept counterparty risk, investors prefer synthetic replication to statistical replication techniques. The counterparty credit risk of synthetic replication ETFs is in fact confined to the outperformance of the index with respect to the physical basket of assets and it is limited to 10% of the ETF's net asset value due to European regulations. These limits on counterparty risk may explain that, despite of the financial crisis, synthetic replication ETFs are still more popular than statistical replication ETFs. Moreover, in section 4.2., it will become evident that investors make a distinction between such limited counterparty risk and the full counterparty risk of direct investments in total returns swaps.

[EXHIBIT 8 goes here]

For some asset classes, the full replication of a given index by buying all underlying securities is difficult, or even not possible. This is especially the case for alternative asset ETFs that invest largely in illiquid assets exhibiting high transaction costs, thereby reducing overall performance of the ETF. Corporate bond ETFs face this problem as well, since very few corporate bonds are actively traded. Hence, other replication methods have to be used in these asset classes. In the light of low acceptance of alternative replication methods as displayed in exhibit 8, alternative asset ETF providers face challenges in marketing their products. In order to evaluate whether at least users of alternative asset ETFs are more open to advanced replicating methods, we compare their answers to the remaining respondents. Indeed, we find that users of ETFs for hedge funds, real estate, and corporate bonds significantly more accept other replication techniques, such as those based on sampling or using derivatives (a Fisher test yields a p-value below 0.1, the detailed results are not shown for brevity).

Finally, we examine whether and how the financial crisis has changed investors' use of advanced ETF forms and ETF products, or of sophisticated ETF trading techniques. Exhibit 9 shows that the use of sophisticated forms of ETFs has increased in 2009—albeit from a low basis. The use of inverse ETFs (also called short ETFs) has doubled; about one in three ETF investors now use

them. Other advanced practices, such as shorting ETFs and securities lending, are more widespread as well. But options on ETFs are still used by only 6% of respondents.

Using inverse ETFs or shorting ETFs is a means of hedging the portfolio's exposure to declining markets, a practice that might well have some appeal in times of financial crisis. These products enjoyed little favor before 2008; by 2009, however, views of them have changed and use of inverse ETFs and short sales of ETFs have increased significantly (at the 5% level).

[EXHIBIT 9 goes here]

Another interesting question is whether a higher familiarity with exchange-traded funds leads to differences in ETF usage. In fact, it appears a reasonable conjecture that investors that are actively using ETFs in an advanced way are also investing into more exotic ETF products, or invest higher fractions of their wealth into ETFs. What is more, advanced ETF users might be more critical with their ETF investments in terms of product quality and performance, as expressed by their overall satisfaction.

Hence, we sort all institutional investors into two different groups: we call *sophisticated ETF users* those who use at least one of the advanced ETF usages as presented in exhibit 9, i.e. using short ETFs, options on ETFs, shorting ETFs themselves, or lending ETF units. Then we compare their use and satisfaction with those of *non-sophisticated ETF users*, the remaining institutional ETF users.

The results, see exhibit 10, clearly indicate that sophisticated ETF users exhibit different investment patterns compared to non-sophisticated investors: sophisticated investors rely more often on ETFs for investments in equities (88.9% vs. 76.4%), commodities (52.4% vs. 36.1%), real estate (30.9% vs. 20.3%), and hedge funds (26.2% vs. 12.5%) compared to non-sophisticated investors. All these differences are significant at the 5% level (Fisher-test). Only for the usage of bond ETFs, no difference between sophisticated investors and less sophisticated investors is detectable.

[EXHIBIT 10 goes here]

Next, sophisticated investors also invest significantly higher fractions out of their total investments into ETFs. For example, sophisticated investors have invested on average 33.5% of their equity assets into ETFs compared to 27.0% of non-sophisticated investors ($p < 0.1$, Fisher test), see exhibit 11. The same holds true for the commodity investments, where sophisticated investors allocate 27.0% of their asset to ETFs, as opposed to 16.4% of non-sophisticated investors ($p < 0.05$, Fisher test).

[EXHIBIT 11 goes here]

However, being a sophisticated investor does not appear to have a big impact on the satisfaction with ETFs. In contrast to the conjecture, sophisticated ETF investors are even happier with their equity ETFs, e.g.: 94.6% of sophisticated investors declare to be satisfied with their equity ETFs compared to 88.3% of non-sophisticated investors ($p < 0.1$, Fisher test). For all other asset classes, there is no difference in reported satisfaction (exhibit 12).

[EXHIBIT 12 goes here]

All in all, these findings suggest that familiarity with ETF products translates positively in their usage. This might not be completely surprising as such. However, given that ETFs are still a

rather new financial product, growing familiarity with ETFs might explain their strong development even during the crisis.

4.2. Comparing ETFs to Competing Indexing Products

In this section, we compare institutional investors' views on four investment instruments that allow the simple execution of trades in large baskets of assets: exchange-traded funds, futures, total return swaps, and traditional index funds. We first compare respondents' views on liquidity and on the future use of these indexing products, then we look at some specific aspects of each of these products.⁵

We ask respondents to rate the liquidity of the four indexing products. For each product, respondents had the possibility to choose between "very good", "fairly good", and "poor". We translate these answers to a scale from one to three. The average scores of the answers are presented in exhibit 13. The higher the score, the better the products are judged.

The table shows that respondents believe that futures are the most liquid indexing product, attaining very high ratings of up to 2.80, close to 3.0, the maximum score possible. The liquidity of ETFs ranks second, obtaining scores between 2.23 and 2.40. By contrast, respondents view index funds as slightly less liquid than ETFs and they view total return swaps to be the least liquid among the indexing instruments.

When looking at the respondents' answers over time, the analysis shows that the liquidity of ETFs is rated better in 2009 compared to the year before, despite the financial crisis. The opposite holds true for total return swaps; compared to 2008, the liquidity of this OTC derivative is clearly judged worse. Finally, the financial crisis has no impact on the respondents' views of the liquidity of futures and traditional index funds. These results underscore the importance of liquidity during financial crises from an investor's perspective: both exchange-traded indexing products, i.e. futures and ETFs, have clearly an edge over their non-listed counterparts, index funds and total return swaps.

[EXHIBIT 13 goes here]

How does the financial crisis affect the expected future use of indexing products? Exhibit 14 shows the respondents' expected use of the four product categories we analyzed. The higher the score, the more the products are expected to be used in the future by institutional investors.

Respondents report that they expect to use both futures and ETFs more heavily in the future. In fact, those who plan to use these two instruments more heavily far outnumber those who plan to use them less heavily, with scores close to their maximal level of three. Despite the strong past

⁵ Other than the criteria we list here, there are of course other aspects that investors may use to rate the various indexing vehicles. For example, indexing is often justified by its low cost. However, we do not report such results here, since our focus is on the dynamics of investor perceptions before and after the crisis and the fees of the various instruments tend to be rather stable over short time periods. It should also be noted that the evaluation of costs of these instruments is specific to the usage that is made. In particular, the position size and frequency of trading determine the relative merits of each instrument. For example, ETFs tend to have lower management fees than index funds. Gastineau (2001) underlines the reasons for the cost efficiency of ETFs over index funds. First, ETFs are typically very large funds, allowing for economies of scale and, second, expenses for the transfer agency function of mutual funds do not occur with ETFs. When analysing overall costs of the investment, Kostovetsky (2003) finds that for large amounts invested, ETFs are favourable to index funds, while for small amounts, the high trading costs make ETFs less attractive unless the holding period is very long. In the current paper, perceptions of costs are not analysed directly but are indirectly reflected in the overall satisfaction of respondents with ETFs.

growth of ETFs, investors expect to rely on these products even more in the future. Total return swaps and traditional index funds, by contrast, are likely to play smaller and smaller roles: the asset managers who expect to rely less on these instruments outnumber those who expect to rely more heavily on them, with scores below their neutral level of two points.

When looking at expected developments in the four indexing products over time, the table shows very clearly that total return swaps seem to be the losers of the crisis: expected future use of these OTC derivatives has decreased significantly in the course of the year 2008. Presumably because of their low liquidity and their exposure to counterparty credit risk, total return swaps have got less attractive. Taken together, the table indicates that the crisis does not harm indexing vehicles as such, but shifts the focus on liquid financial products, at the expense of less liquid products, most of all total return swaps and traditional index funds.

[EXHIBIT 14 goes here]

In exhibit 15, we look at several specific problems of some indexing products – and the impact the financial crisis had on them.

First, we ask respondents for their opinions on ETF pricing errors with respect to the net asset value (NAV). In 2009, possible mispricing with respect to NAV was of concern to 64% of respondents, compared to 72% in the year before (see panel A). This finding is somewhat surprising, because of two reasons: First, Engle and Sarkar (2006) find that the premiums or discounts on fund NAVs are typically small and disappear very quickly, suggesting that respondents might overstate the problem. It may be that the respondents to our survey associate the problem of non-synchronous observations of fund prices and fund NAVs with the problem of mispricing, which is in fact another problem altogether. Second, some ETF products, such as ETFs on corporate bonds, have seen mispricing problems during the peak of the financial crisis at the end of 2008 caused by illiquid underlying securities. Hence, if at all, one may have expected that the investors got more sensitive to this problem, and not less. This finding suggests that the ETF pricing mechanism is regarded to be reliable, even in times of a liquidity crisis.

In a direct comparison of all four instruments, futures fare remarkably well and can be viewed as the greatest rival to ETFs in implementing indexing strategies. A drawback of futures is that they are derivative instruments, require roll-over transactions, and involve margin calls. When asked directly, around 40% of the respondents report that margin calls are problematic for them (see panel B). The rolling over of positions and the fact that futures are derivatives is seen less problematic, especially in 2009.

Overall, the significant percentage of respondents seeing margin calls jibes with the relatively negative view of the operational burdens futures entail. The financial crisis may again be the reason: the combination of high market volatility and dried up liquidity makes it harder to supply the cash to meet the margin calls. On the other hand, the comparison of answers between 2008 and 2009 reveals that rolling over positions is perceived significantly less a problem compared to the year before. Finally, the percentage of investors having a problem with the fact that futures are derivatives has not changed in the course of the financial crises.

In the last part of this section, we turn to investor's views on specific issues related to investment in total return swaps. The survey addresses two specific problems with TRSs: the requirement for over-the-counter trading and the associated counterparty credit risk.

As panel C of exhibit 15 shows, trading over the counter is problematic for the majority of respondents, expressed by 65% of respondents in 2009. They view counter party risk (89%) as an

even greater problem. Most important, both the fact that they are traded OTC and the related counterparty risk are viewed as significantly more problematic than before: The fraction of respondents that worry about counterparty risk has increased by 9% in just 12 months; over-the-counter trading is seen as problematic by 12% more. Very clearly, the financial crisis in 2008/2009 has influenced investors' views of total return swaps, a possible alternative to ETFs.

[EXHIBIT 15 goes here]

To be able to compare the results across time, we only reported the results for respondents from institutional asset management. For this group, we have responses for both 2008 and 2009. Since the survey was extended to respondents from private wealth management only in 2009, we only have one dataset for this group. In the final section of the paper, we analyse these responses for 2009 by comparing respondents from private wealth management to those from institutional asset management.

5. Use and Perception of ETFs within Private Wealth Management

One of the most appealing characteristics of exchange-traded funds is that they are a convenient indexing product for both institutional investors and wealthy individuals. However, private investors have different investment needs – and usually less sophisticated investment possibilities. In this last section, we compare the answers obtained from institutional investors to those of private individuals and private wealth management in order to detect possible differences between both investor types. Note that the analysis is restricted to the answers obtained in 2009, since we do not have responses of private investors and private wealth managers in 2008.

Exhibit 16 shows the proportion of investors that use exchange-traded funds for various asset classes, divided into institutional investors and private investors. The results convey a clear message: private investors are more focused on equity ETFs compared to institutional investors: 93% of all ETF users invest in equity ETFs, which is even a higher level than the fraction of ETF users out of institutional investors. Other asset classes are significantly less used by private investors, attaining at maximum around 28% for commodity ETFs. The differences to institutional investors are most remarkable for government bond ETFs and hedge fund ETFs.

[EXHIBIT 16 goes here]

Next, in exhibit 17, we investigate the satisfaction of private investors with their ETF investment, and relate it to the perceived satisfaction by institutional investors. The table shows that private investors are remarkably satisfied with their ETF products. Across all asset classes, more than 60% of the private investors and wealth managers report to be satisfied. In the case of equity ETFs, even 98% of respondents judge their ETF investment positively. Thereby private investors clearly surpass the satisfaction levels of institutional investors. The difference in satisfaction levels is most pronounced for hedge fund ETFs, which are perceived twice as good, compared to institutionals. However, because of a very low usage of hedge fund ETFs by private investors (see exhibit 12), this difference is not significant.

[EXHIBIT 17 goes here]

Finally, exhibit 18 analyses the fraction of total investments accounted for by exchange-traded funds. Similar to exhibit 7, only respondents that actually have invested into this asset class are considered. The table shows that, for many asset classes, the fraction of ETF investment out of total investment does not differ between institutional and private investors. Only in the equity ETF segment, there is a highly significant difference: whereas institutional investors allocate about a third of their equity investment into ETFs, this fraction is 11.5% higher for private investors, attaining almost 44% of equity investments that are accounted for by ETFs.⁶

[EXHIBIT 18 goes here]

One can draw two main conclusions out of this comparison between private and institutional investors. First the results suggest that private investors focus their ETF usage mainly to equity ETFs, leaving out other ETF types to institutional investors. A second conclusion is that private investors are less critical about their ETFs compared to institutional investors. Furthermore, the results might indicate that private investors' opinion on ETFs is less affected by the financial crisis than those of institutional investors. Although a direct comparison between 2008 and 2009 is not possible (because of the lack of data for 2008), the partly very high satisfaction levels imply that ETF satisfaction could not have been much higher before the crisis. It is however difficult to say whether the higher satisfaction levels originate from a better match of ETF products with private investors' needs, a better selection of existing ETF products, or – by contrast – a sign that private investors are less sophisticated, and thus less worried about the consequences of the impact of the financial crisis on their overall portfolio performance. However, when we compare advanced ETF usage and ETF trading (see exhibit 9) between institutional and private investors, we do not detect significant differences.⁷

6. Conclusion

This paper analyses the impact of the recent financial crisis on investors' perceptions of exchange-traded funds and other indexing products by comparing the answers to two comprehensive surveys on such products carried out in 2008 and 2009.

The results show that overall investment in ETF products has been remarkably stable during the financial turmoil. Compared to 2008, both usage of ETFs and average amount of money invested into these products remained largely constant. A more detailed analysis however reveals that the crisis has divided the ETF market in two distinct segments. Whereas ETFs in standard asset classes, such as equities and government bonds, are more heavily used compared to the year before and thus have actually benefited from the crisis, ETFs in some alternative asset classes have seen a decrease in usage and get considerably worse evaluations by investors. The findings indicate that the more liquid the financial instruments under consideration, the higher the satisfaction by investors. Hence, in times of financial crisis, a flight to liquidity can be observed in these indexing products, giving ETFs on standard asset classes a clear edge over alternative asset class ETFs.

⁶ As already stressed in section 4.1, these findings do not imply that 44% of all private equity holdings are held in ETFs. Rather, this figure states that among private ETF investors, almost half of their equity holdings are allocated in ETFs.

⁷ For completeness, we have to say that private investors are significantly less involved in ETF securities lending than institutional investors. This is presumably not related to the ETFs, but the fact that securities lending is generally less an issue for private investors. From this point of view it is not clear that the definition of „sophisticated investors“ used in section 4.1 is appropriate for private investors.

The crisis appears to have strengthened the position of ETFs compared to other index tracking products as well. ETFs seem to emerge as the favoured instrument among the different possibilities to track an index. In particular, the recent crisis has also increased investors' concerns over counterparty credit risk, especially with total return swaps. ETFs, along with futures, are appreciated for their high liquidity, which leads investors to prefer these instruments to total return swaps or traditional index funds. The rather positive evaluation of ETFs compared to other indexing vehicles also suggests being one of the main reasons why investors plan to increase their future use of ETFs.

Appendix:

Extract of the survey questions that have been used for this study

This appendix shows the questions of the 2009 survey that have been used for this study. Note that besides minor changes, the questionnaire in 2008 was almost identical to the questionnaire used in 2009.

1. For each asset class below, please indicate the percentage of total investment accounted for by ETFs and ETF-like products (open-end question for each asset class, number between 0 and 100)

Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds

2. If you use ETFs or ETF-like products, are you satisfied by them (multiple-choice, select one for each asset class)?

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
satisfied						
not satisfied						

3. Which of the following passive ETFs do you prefer (multiple-choice, select one)?

Pure replication	
Synthetic replication (i.e., using derivatives)	
Statistical replication (i.e., sampling)	

4. Advanced use and forms of ETF (multiple-choice, select one for each question)?

	Yes	No	Not familiar with this practice	No answer
Do you use inverse ETFs (short ETFs) as a hedging tool?				
Do you use options on ETFs?				
Do you short ETFs yourself?				
Do you lend your ETF units?				

5. How would you rate ETFs futures, total return swaps, and index funds according to their liquidity (market size, counterparties) (multiple-choice, select one for each indexing product)?

	ETFs	Futures	Total return swaps	Index funds
Very good				
Fairly good				
poor				

6. How do you predict your future use of the following instruments (multiple-choice, select one for each indexing product)?

	ETFs	Futures	Total return swaps	Index funds
Increase				
Stay the same				
decrease				

7. Detailed analysis of ETFs, futures, and total return swaps (multiple-choice, select one for each question)

Concerning ETFs...	yes	no
Is the mispricing with regard to net asset value a problem for you?		
Concerning futures...	yes	no
Is the fact that they are derivative instruments a problem for you?		
Are margin calls a problem for you?		
Is the requirement to roll over positions a problem for you?		
Concerning total return swaps...	yes	no
Is the fact that they are traded OTC a problem for you?		
Is the counterparty risk a problem for you?		

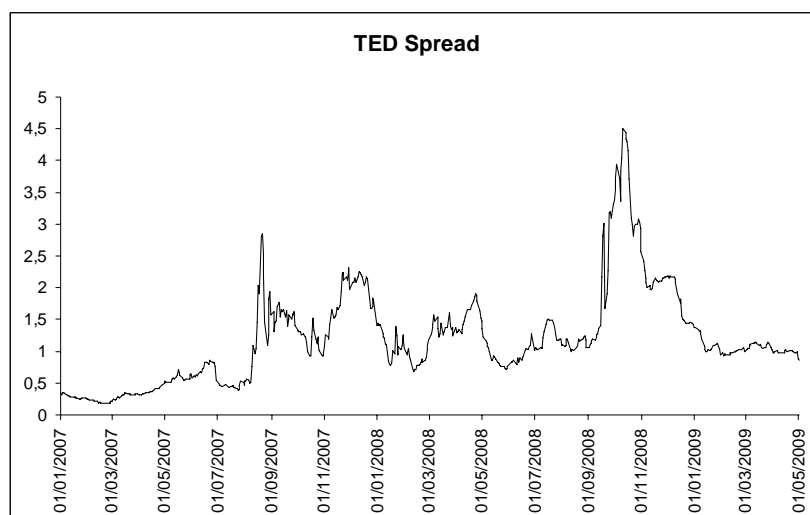
References

- Allen, F. and E. Carletti (2008): The role of liquidity in financial Crises. University of Pennsylvania, working paper.
- Amenc, N., and D. Schröder (2008): The pros and cons of passive hedge fund replication. working paper
- Arnott, R. and J. West (2008), What a Difference a Quarter Makes, IndexUniverse, October 30th, <www.indexuniverse.com>
- Blanchard, O. J. (2009): The Crisis: Basic Mechanisms, and Appropriate Policies. IMF Working Paper.
- Brunnermeier, M.K. (2008): Deciphering the Liquidity and Credit Crunch 2007-08. *Journal of Economic Perspectives*. 23(1), 77–100.
- Cherry, J. (2004): The Limits of Arbitrage: Evidence from Exchange-Traded Funds. University of California, Berkeley, Working Paper.
- Constandinides, C., S. Lan, and B. Huang (2010): ETPs & ETFs: 2009 Market Review & 2010 Outlook. Deutsche Bank, working paper.
- Deville, L. (2007): Exchange Traded Funds: History, Trading and Research, Handbook of Financial Engineering, C. Zopounidis, M. Doumpos, and P. Pardalos (eds.), Springer
- Elton, E.J., M. J. Gruber, G. Comer, and K. Li, 2001, Spiders: Where are the Bugs?, *Journal of Business*, 75(3)
- Elton, E.J., M.J. Gruber and J.A. Busse, 2004, Are Investors Rational? Choices Among Index Funds, *Journal of Finance*, 59(1)
- Engle, R., and D. Sarkar (2006): Premiums-discounts and exchange traded funds. *Journal of Derivatives* 13(4): 27-45.
- Fisher, R.A. (1922). “On the interpretation of χ^2 from contingency tables, and the calculation of P”, *Journal of the Royal Statistical Society* 85(1), pp. 87-94.
- Fuhr, D. (2009): ETF industry review. Barclays Global Investors, working paper.
- Gastineau, G. (2001): Exchange-traded funds: An Introduction. *Journal of Portfolio Management* 27(3), 88-93
- Gorton, G. (2008): The panic of 2007. Yale School of Management and NBER, Working Paper.
- International Monetary Fund (2008): Global Financial Stability Report, October
- Kayali, M.M. (2007): Pricing Efficiency of Exchange Traded Funds in Turkey: Early Evidence from the Dow Jones Istanbul 20. *International Research Journal of Finance and Economics* 10, 14-23.
- Kostovetsky, L., 2003: “Index Mutual Funds and Exchange-Traded Funds”, *Journal of Portfolio Management*, 29, 80-92.
- Lee, S., and S. Stevenson (2005): The case for REITs in the mixed-asset portfolio in the short and long run. *Journal of Real Estate Portfolio Management* 11(1): 55-80.

- Madura, J. and T. Ngo (2008): Pricing Behavior of Exchange-Traded Funds. *Journal of Economics and Finance* 32(1), 1-23.
- Mizen, P. (2008): The Credit Crunch of 2007-2008: A discussion of the Background, Market Reactions and Responses. *Federal Reserve Bank of St. Louis Review* 90(5), pp. 531-67.
- Poterba, J.M. and J.B. Shoven (2002): Exchange-Traded Funds: A New Investment Opportunity for Taxable Investors. *American Economic Review* 92(2), 422-427.
- Reinhart, C.M. and K.S. Rogoff (2008): It the 2007 U.S. Sub-Prime Financial Crisis So Different? An International Historical Comparison. NBER working paper 13761.
- Shiller, R.J. (2008): *The Subprime Solution: How Today's Global Financial Crisis Happened, and What to Do About it*. Princeton University Press, New Jersey, USA.
- Tucker, J. and P. Sanchez-Marin (2003): Stress Testing ETFs: Will they deliver in Times of Crisis? *Institutional investor Guides: ETF and indexing* 2, 76-80.

Exhibits

Exhibit 1: TED spread of before and during the financial crisis



The TED spread is computed as the difference between the rate reported for the Merrill Lynch indices for LIBOR and for US Treasury Bills.

Exhibit 2: Type of Activity of the Respondents

	2008		2009		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Investment/Asset management	72	70.6%	194	54.3%	266	58.2%
Life insurance	5	4.9%	8	2.2%	13	2.8%
Non-life insurance	0	0.0%	4	1.1%	4	0.9%
Pension fund	14	13.7%	15	4.2%	29	6.3%
Banks	8	7.8%	10	2.8%	18	3.9%
Other institutional investors	1	1.0%	11	3.1%	12	2.6%
Total institutional investors	100	100.0%	242	67.8%	342	74.8%
Private investor	0	0.0%	18	5.0%	18	3.9%
Family office, private banker	0	0.0%	97	27.2%	97	21.2%
Total private wealth management	0	0.0%	115	32.2%	115	25.2%
Total	100	100.0%	357	100.0%	457	100.0%

Exhibit 3: Country of respondents

	Institutional investors			Private wealth management	Total
	2008	2009	Total	2009	2008-2009
France	20.4%	28.1%	25.8%	21.7%	24.8%
Germany	6.1%	5.1%	5.4%	10.4%	6.7%
Italy	14.3%	5.1%	7.8%	5.2%	7.1%
Luxembourg	2.0%	5.5%	4.5%	2.6%	4.0%
Switzerland	15.3%	15.3%	15.3%	21.7%	17.0%
UK	11.2%	17.0%	15.3%	26.1%	18.1%
other EU	26.5%	20.9%	22.5%	10.4%	19.4%
non-EU	4.1%	3.0%	3.3%	1.7%	2.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Exhibit 4: Assets under management (in EUR)

	Institutional investors			Private wealth management	Total
	2008	2009	Total	2009	2008-2009
<10mn EUR	5.1%	2.2%	3.0%	23.5%	8.2%
10-100mn EUR	7.6%	12.1%	10.9%	13.7%	11.6%
100mn-1bn EUR	22.8%	24.7%	24.2%	15.7%	22.0%
1-10bn EUR	35.4%	23.3%	26.5%	18.6%	24.5%
10-100bn EUR	19.0%	22.4%	21.5%	12.7%	19.3%
>100bn EUR	10.1%	15.2%	13.9%	15.7%	14.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Exhibit 5: Usage of exchange-traded funds by institutional investors

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
	2008	75.0%	38.0%	33.0%	42.0%	31.0%
2009	83.5%	38.8%	31.0%	42.1%	21.5%	17.8%
Difference	8.5%*	0.8%	-2.0%	0.1%	-9.5%*	0.8%

We define exchange-traded fund users as investors that indicate to have invested a positive fraction of total assets within a given asset class in exchange-traded funds. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test.⁸

Exhibit 6: Satisfaction levels of exchange-traded funds by institutional investors

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
	2008	90.5%	86.8%	71.0%	90.5%	83.3%
2009	91.0%	88.4%	70.0%	79.6%	68.8%	34.2%
Difference	0.5%	1.5%	-1.0%	-10.9%	-14.6%	-54.0%***

The table shows the percentage of users of ETFs and ETF-like products that are satisfied with their investment. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test.

Exhibit 7: Percentage of total investments accounted for by exchange-traded funds (institutional investors)

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds

⁸ Fisher's exact test (1922) is a statistical significance test to examine the significance of association of contingency tables. We do not report the complete contingency tables, but provide only the p-values under which the null hypothesis of no association (i.e. independence) is rejected.

2008	22.6%	9.5%	7.0%	16.2%	5.9%	6.9%
2009	32.3%	16.6%	10.7%	21.9%	14.2%	5.5%
Difference	9.6%**	7.1%**	3.7%	5.7%	8.3%**	-1.4%

The table indicates the average fraction of assets accounted for by exchange-traded funds or similar products for each asset class. Only respondents that actually have invested into this asset class are considered, i.e. only respondents that indicated a fraction of ETF usage, including a fraction of 0. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: t-test of differences of means.

Exhibit 8: Preferred replication methods over time (institutional investors)

	Pure replication	Synthetic replication (i.e., using derivatives)	Statistical replication (e.g., sampling)	Total
2008	66.3%	24.1%	9.6%	100%
2009	78.0%	13.3%	8.7%	100%
Difference	11.7%	-10.8%	-0.9%	0%

The differences are jointly significant at the 10% level. Test: Fisher-test

Exhibit 9: Advanced forms and use of ETFs (institutional investors)

Panel A: Use of inverse ETFs

	yes	no	not familiar with this practice	Total
2008	14.0%	80.7%	5.4%	100.0%
2009	27.7%	67.1%	5.2%	100.0%
Difference**	13.7%	-13.6%	-0.2%	

Panel B: Use of options on ETFs

	yes	no	not familiar with this practice	Total
2008	4.4%	91.1%	4.4%	100.0%
2009	6.6%	83.8%	9.6%	100.0%
Difference	2.1%	-7.3%	5.2%	

Panel C: Shorting ETFs

	yes	no	not familiar with this practice	Total
2008	5.4%	91.4%	3.2%	100.0%
2009	17.3%	77.0%	5.8%	100.0%
Difference***	11.9%	-14.4%	2.5%	

Panel D: Lending ETF units

	yes	no	not familiar with this practice	Total
2008	8.6%	87.1%	4.3%	100.0%
2009	16.4%	76.4%	7.3%	100.0%
Difference	7.8%	-10.7%	3.0%	

In this table, the Fisher-test indicates the joint statistical difference of the four panels. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level.

Exhibit 10: Differences in usage of exchange-traded funds between sophisticated and non-sophisticated ETF users (institutional investors)

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
Sophisticated investors	88.9%	42.1%	35.7%	52.4%	31.0%	26.2%
Non-sophisticated investors	76.4%	36.6%	29.2%	36.1%	20.4%	12.5%

Difference	12.5%***	5.5%	6.5%	16.3%***	10.6%**	13.7%***
------------	----------	------	------	----------	---------	----------

We define sophisticated ETF users those who use at least one of the advances ETF usages as presented in exhibit 9, i.e. using short ETFs, options on ETFs, shorting ETFs themselves, or lending ETF units. For a definition of ETF usage, please refer to the explanation provided in table 5. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test.

Exhibit 11: Differences in percentage of total investments accounted for by exchange-traded funds between sophisticated and non-sophisticated ETF users (institutional investors)

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
Sophisticated investors	33.5%	16.2%	10.2%	27.0%	14.6%	8.2%
Non-sophisticated investors	27.0%	13.4%	9.3%	16.4%	10.0%	4.6%
Difference	6.5%*	2.8%	0.9%	10.6%**	4.6%	3.5%

*** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Two-sample t-test with unequal variances.

Exhibit 12: Differences in satisfaction between sophisticated and non-sophisticated ETF users (institutional investors)

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
Sophisticated investors	94.6%	89.8%	72.1%	80.7%	73.7%	50.0%
Non-sophisticated investors	88.3%	86.7%	69.0%	84.9%	75.0%	52.0%
Difference	6.3%*	3.1%	3.1%	-4.3%	-1.3%	-2.0%

*** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test.

Exhibit 13: Rating of liquidity of indexing products (institutional investors)

Average score	2008	2009	Difference
ETFs	2.23	2.40	0.16**
Futures	2.80	2.73	-0.07
Total return swaps	1.96	1.77	-0.18*
Index funds	2.10	2.15	0.05

The table presents the average score to the question: “How would you rate ETFs, futures, total return swaps, and index funds according to the following criteria?” The higher the score, the better the products are judged. The score is calculated as the mean of the answers, where “very good” is set equal to 3 points, “fairly good” is set equal to 2 points, and “poor” is set to 1 point. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Two-sample Wilcoxon rank-sum test (Mann-Whitney).

Exhibit 14: Future use of indexing products (institutional investors)

Average score	2008	2009	Difference
ETFs	2.75	2.79	0.04

Futures	2.44	2.33	-0.10
Total return swaps	2.13	1.85	-0.28***
Index funds	2.07	1.86	-0.22

The table presents the average score to the question: “How do you predict would you rate ETFs, futures, total return swaps, and index funds according to the following criteria?” The higher the score, the more the products are expected to be used. The score is calculated as the mean of the answers, where “increase in usage” is set equal to 3 points, “stay the same” is set equal to 2 points, and “decrease in usage” is set to 1 point. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Two-sample Wilcoxon rank-sum test (Mann-Whitney).

Exhibit 15: Specific problems of exchange-traded funds, futures, and total return swaps

Panel A: ETFs

	2008	2009	Difference
Mispricing with respect to NAV is a problem	72.0%	63.8%	-8.3%

Panel B: Futures

	2008	2009	Difference
Margin calls are a problem	42.9%	39.4%	-3.5%
Rolling over position is a problem	41.8%	24.3%	-17.4%*
Being a derivative product is a problem	25.3%	25.6%	0.3%

Panel C: Total return swaps

	2008	2009	Difference
OTC trading is a problem	53.0%	65.1%	12.1%*
Counterparty risk is a problem	80.0%	88.9%	8.9%*

*** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test

Exhibit 16: Usage of exchange-traded funds by institutional investors and private wealth managers in 2009

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
Institutional Investors	83.5%	38.8%	31.0%	42.1%	21.5%	24.4%
Private Wealth Management	93.0%	20.2%	14.9%	27.7%	10.7%	6.6%
Difference	9.6%	-18.6%**	-16.1%	-14.5%	-10.7%***	-17.8%
Average	86.6%	40.1%	31.1%	47.3%	21.8%	21.0%

We define exchange-traded fund users as investors that indicate to have invested a positive fraction of total assets within a given asset class in exchange-traded funds. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test.

Exhibit 17: Satisfaction levels of exchange-traded funds by institutional investors and private wealth managers in 2009

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
Institutional Investors	91.0%	88.4%	70.0%	79.6%	68.8%	34.2%
Private Wealth Management	98.1%	84.4%	67.7%	87.9%	80.8%	61.5%
Difference	7.1%**	-3.9%	-2.3%	8.3%	12.0%	27.3%

The table shows the percentage of users of ETFs and ETF-like products that are satisfied with their investment. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: Fisher-test.

Exhibit 18: Percentage of total investments accounted for by exchange-traded funds in 2009 (institutional investors and private wealth managers)

	Equities	Government bonds	Corporate bonds	Commodities	Real estate	Hedge funds
Institutional Investors	32.3%	16.6%	10.7%	21.9%	14.2%	5.5%
Private Wealth Management	43.8%	18.7%	16.2%	23.9%	8.3%	3.7%
Difference	11.5%***	2.1%	5.6%	2.0%	-5.9%	-1.9%

The table indicates the average fraction of assets accounted for by exchange-traded funds or similar products for each asset class. Only respondents that actually have invested into this asset class are considered, i.e. only respondents that indicated a fraction of ETF usage, including a fraction of 0. *** denotes statistical significance at the 1% level, ** statistical significance at the 5% level, and * the statistical significance at the 10% level. Test: t-test of differences of means.