Key investor information disclosure regulation and retail mutual fund flows in the Finnish market

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Abstract

Purpose – In the European Union, the Undertakings for Collective Investment in Transferable Securities Directive (UCITS IV) requires fund management companies to provide a Key Investor Information Document (UCITS KIID) for investors. This papers uses archival data from the Finnish mutual fund market to test how the regulation's information disclosure requirements concerning past performance, risk and fund fees are associated with mutual fund flows.

Design/methodology/approach – The study uses archival data on the mutual funds market in Finland to test how the regulation relating to retail investors' information requirements is associated with mutual fund flows.

Findings – Our findings suggest that the UCITS KIID predicts retail investors' fund flows. While past performance is associated with fund flows throughout the observation period, retail investors appear to have become more sensitive to fund fees and invest in less risky funds following the adoption of the UCITS IV period.

Practical implications – Information relating to fund fees and risk appears to be relevant to retail investors, which should be acknowledged in future iterations of short-form disclosure and in mutual fund marketing.

Originality/value – This paper is the first to assess the significance of KIID in actual market environment.

Keywords Regulation, Disclosure, Mutual funds, Investor information

Paper type Research paper

1. Introduction

Retail asset management is a strictly regulated industry (Mugerman *et al.*, 2019). Retail investors are vulnerable to managerial opportunism in the mutual fund market, which necessitates market interventions such as mandating better disclosure (Zingales, 2009). Consequently, mandatory disclosure is an important tool in mutual fund investor protection in several jurisdictions (Moloney, 2014), because mandating financial service providers to supply relevant information is often the most efficient way to intervene in retail markets (Campbell *et al.*, 2011).

In the European Union (EU), mandatory disclosure of mutual fund product information began in 1985, with recent regulations including the Undertakings for Collective Investment in Transferable Securities Directive (UCITS IV, 2009/65/EC) and the Packaged Retail and

Insurance-based Investment Products Regulation (PRIIPs, 1286/2014/EU) concerning short-form disclosure (Scheld *et al.*, 2021). However, several experimental studies suggest that retail investors do not benefit from the short-form disclosure that resembles the Key Investor Information Document (UCITS KIID), as mandated by UCITS IV (e.g. Oehler *et al.*, 2014; Hüsser, 2015). Moreover, little attention has been paid to how the adoption of the UCITS KIID manifests itself in real-world mutual fund markets (Moloney, 2014). Hence, the objective of this study is to address this gap in the literature and examine retail investors' fund flows before and after UCITS IV, effective as of 2012, using actual market data.

The theoretical background for the need for mandatory disclosure in the mutual fund market lies in asymmetric information arising from the agent-principal relationship. In the mutual fund market, the investor hires the asset manager, who has better information which tends to exacerbate the agency conflict (Huhmann and Bhattacharyya, 2005). Consequently, increasing disclosure could reduce the problem of asymmetric information in the market (Zingales, 2009). Several jurisdictions, including the US and the EU, mandate information disclosure in the form of a prospectus (Khorana *et al.*, 2009). Disclosure is expected to improve decision-making, support optimal fund selection, enhance fund quality and lead to downward pressure on fund fees (Moloney, 2014).

However, providing more information for retail investors is problematic because behavioural economics suggests that individuals have limited cognitive abilities, such as information perception and processing ability, to make informed investment decisions (Simon, 1955; Oehler *et al.*, 2014). Thus, mandating additional information disclosure may be counterproductive by failing to mitigate biased decision-making (Johnson *et al.*, 2021) and by contributing to information overload (Black, 2008; Ceravolo *et al.*, 2019). Moreover, the theory of competition in retail financial product markets suggests that asset managers tend to make their products more complex to protect their market power (Carlin, 2009; deHaan, 2021). These limitations may impair consumers' ability to assess product quality and compare funds in the market where thousands of funds are available to invest in (e.g. Pellinen *et al.*, 2011; Hüsser and Wirth, 2013).

To improve comparability and provide information in an easily digestible format, many jurisdictions require mutual funds to issue short-form disclosure documents for retail financial products to assist retail investors in investment decisions (Beshears *et al.*, 2011; Godwin and Ramsay, 2015; Münchhalfen and Gaschler, 2021). However, experimental research has yielded mixed results on the effects of short-form disclosure on retail investors. While a simplified disclosure document increases willingness to invest in mutual funds (Arora and Chakraborty, 2021), it also appears to be unhelpful or of little value to retail investors (Oehler *et al.*, 2014), or makes no difference to the retail investor's decision-making (Beshears *et al.*, 2011; Hüsser, 2015). As regards the content of disclosures, consumers are sensitive to how information is presented in the document (Ceravolo *et al.*, 2019), including the way in which key metrics such as fees (Thorp *et al.*, 2020) and risk/return profile (Bussoli *et al.*, 2021) are presented. Further, investors rely on the past performance indicator in a short-form disclosure document despite the presence of a disclaimer stating its irrelevance as to predicting future returns (Hüsser and Wirth, 2014; Johnson *et al.*, 2021). However, an investigation into a change in disclosure requirements with the goal of increasing the transparency of pension plan fees using real US market data by Badoer *et al.* (2020) suggests that regulation can benefit retail investors whose fees reduced as a result.

This paper complements the above-mentioned studies by asking two general research questions. First, is the regulation mandating short-form disclosure associated with investors' behaviour in the actual mutual fund market? Second, do the regulatory goals of short-form disclosure correlate with retail investors' behaviour in the mutual fund market? We answer these research questions by investigating empirical relations between investor behaviour before and after UCITS IV, which mandated mutual funds to issue UCITS KIIDs in the EU

mutual fund market in 2012. The aim of a UCITS KIID is to inform retail investors about fund fees, risk and past performance, which have been regarded as relevant pieces of information for investors. In 2023, the UCITS KIID will be replaced by a Key Information Document (PRIIPs KID), as mandated by the PRIIPs Regulation.

We use data from the Finnish mutual fund market between 2007 and 2018. While US-based data dominate research into mutual funds, there are several reasons to examine non-US markets. First, mutual fund markets across the globe exhibit a great deal of variation in terms of market capitalization and importance (see Khorana *et al.*, 2005). Second, the level of regulation concerning mutual funds varies between jurisdictions. For instance, EU regulations in this area are more restrictive and inflexible than those in force in the US (Coates IV, 2009). Thus, this paper examines an institutional setting unexplored in previous studies. Third, non-US markets are gaining importance because their growth surpasses that of the US market (Coates IV, 2009). Finally, our empirical context, the Finnish mutual fund market, is dominated by banks, which makes investors less attentive to the characteristics that drive fund flows in the US market (Knuutila *et al.*, 2007). Hence, our study may provide relevant insights into other bank-dominated fund markets.

While examining the Finnish mutual fund market as a whole suggests that UCITS IV is not correlated with fund flows, analysing retail and non-retail funds separately points to retail fund flows exhibiting patterns that are broadly consistent with the goals of the UCITS KIID. First, retail investors are positively correlated with risk in the pre-UCITS IV period, but this reverses in the post-implementation period. Second, retail investors appear to become sensitive to fund fees in the post-UCITS IV period.

We contribute to the literature on this subject in several ways. First, to our best knowledge, this paper is the first to report empirical evidence on correlations between the objectives of UCITS IV and mutual fund flows, whereas previous studies have relied on experiments that model its impacts on investors (e.g. Hüsser and Wirth, 2013; Hüsser and Wirth, 2014; Oehler *et al.*, 2014; Hüsser, 2015; see also Muchhalfen and Gaschler, 2021 in the PRIIPs KID context). Second, this paper adds to the empirical literature on the real-world impacts of financial regulation on the mutual funds market (Golec, 2003; Golec and Starks, 2004; Badoer *et al.*, 2020). Finally, we enrich the literature, which is dominated by US-based studies, by using empirical data from a European market which differs from the US market in terms of size and breadth (e.g. Otten and Schweitzer, 2002; Korkeamaki and Smythe, 2004; Korpela and Puttonen, 2006; Knuutila *et al.*, 2007; Korkeamaki *et al.*, 2007).

Our results have practical relevance because retail investors increasingly use mutual funds to supplement their pensions (Diltz and Rakowski, 2018). Moreover, mutual fund regulations are fairly similar across the globe (Mugerman *et al.*, 2019), which suggests that our results may be applicable to other jurisdictions as well. Finally, our findings are topical because the European Commission (EC) is currently revising the regulation concerning short-form disclosure requirements of mutual funds marketed in the EU.

2. Related research, institutional setting and research questions

2.1 Theoretical background

Asymmetric information arising from the agent-principal relationship between the asset manager and the investor characterizes the mutual fund market (Huhmann and Bhattacharyya, 2005). The agency conflict is further exacerbated by asset managers' strategic behaviour: the mutual fund market is highly competitive, and, to protect their market power, asset managers add complexity to mutual fund pricing and obfuscate the information content of disclosures (Carlin, 2009; deHaan *et al.*, 2021). The agency conflict affects retail mutual fund investors who are mostly naïve or unsophisticated retail investors with limited investment acumen (Capon *et al.*, 1996). In contrast, institutional and large private investors are sophisticated investors with more wealth and experience and better

information (e.g. Del Guercio and Tkac, 2002; James and Karceski, 2006; Bailey *et al.*, 2011; Salganik-Shoshan, 2017). As a result, retail investors often pay higher fees (Crespo, 2009; Khorana *et al.*, 2009) and receive less compensation in return for those fees (Korkeamaki and Smythe, 2004). Thus, mutual fund market regulation mainly focuses on the protection of retail investors because professional investors are regarded as being able to hold their own in the market (Wegman, 2015).

Disclosure is a commonly used tool used to reduce asymmetry information in financial markets (Zingales, 2009). Through mandatory disclosure, less informed investors are in a position where they can make informed investment decisions (Dyakov *et al.*, 2021). Regulators have regarded transparency and information disclosure as ways to improve market quality and fairness (Madhavan *et al.*, 2005). More precisely, they have expected that consumers become better informed and are able to make comparisons between financial products when asset managers disclose standardized and comprehensive information on their product offerings (Oehler *et al.*, 2014).

However, the way in which information is presented to retail investors is an important aspect of mutual fund regulation. Behavioural economics suggests that individuals have limited cognitive abilities, such as information perception and processing ability, to make use of relevant information in investment decisions (Simon, 1955; Oehler *et al.*, 2014). They often make complex decision in situations characterized by lack of time, knowledge or negotiation power (Reisch and Zhao, 2017). Moreover, emotional, contextual and motivational factors influence decisions (Oehler *et al.*, 2014; Reisch and Zhao, 2017; Oehler and Wendt, 2017). Rather than processing information extensively in an analytical way, individuals rely on heuristics in their decisions (Reisch and Zhao, 2017; Tversky and Kahneman, 1974).

These limitations may explain why retail investors do not read long and complex disclosures (Beshears *et al.*, 2011), which prompted the need to recalibrate mandatory disclosure in such a way that investors may easily benefit from it. A well-designed short-form disclosure attempts to overcome behavioural biases in human information processing by presenting a few key pieces of relevant information in a salient manner (Oehler *et al.*, 2014). As human beings are prone to use heuristics in decision-making, short-form disclosure taps into the availability bias which refers to heuristic decision-making based on information that is easily available in one's mind (Tversky and Kahneman, 1974; Reisch and Zhao, 2017). Salience of information can play an important role in decision-making because individuals primarily focus on product characteristics that make them stand out in comparison to other products (Tversky and Kahneman, 1974; Oehler and Wendt, 2017; Reisch and Zhao, 2017). Consequently, individuals tend to focus on information that is easily accessible and presented in the most prominent way (e.g. Diacon and Hasseldine, 2007). Alternatively, an investor may use the information that he or she is most familiar with instead of relevant information (Oehler and Wendt, 2017).

2.2 Short-form disclosure in the EU
In the EU, short-form UCITS disclosure has a long history. The simplified prospectus was initially introduced with the UCITS III (Directive 2001/107/EC) reforms in 2004. This was done without *ex ante* testing and only shortened the lengthy prospectus disclosures. Mutual funds were required to provide a simplified prospectus which provided basic information about possible risks, charges and expected outcomes related to investment products. The simplified prospectus did not engage with presentation or format (Moloney, 2014). According to the European Commission (2006), the document was regarded as too long and not understood by its intended readers. Consequently, a need for a short-form document that delivers a short and understandable statement of charges, risks and expected performance, and which is meaningful to investors, emerged. Moreover, it was required to contain the same basic disclosure for all UCITS funds regardless of their domicile in the EU.

UCITS IV, adopted in 2009, replaced the simplified prospectus requirement with the obligation for each investment fund to draw up a short document containing key information for investors. Before the adoption of the UCITS KIID rules, the EC conducted testing and assessment of the UCITS KIID (EC, 2009). Mutual funds were required to issue the UCITS KIID by 1 July 2012 at the latest.

UCITS IV prescribes several conditions for UCITS KIID. The nature of information in UCITS KIID is fully harmonized to ensure adequate investor protection and comparability. A single document of a concise length presents information in a specified sequence and in the most appropriate manner, that is, devoid of technical language and designed to achieve clarity and simplicity in presentation as required by retail investors. It should allow for useful comparisons that are relevant to the investment decision, most notably regarding costs and the risk profile associated with the investment. The UCITS KIID is a stand-alone document and is the only document that must be provided to clients free of charge in good time before subscription of units. A prospectus and the latest published annual and semi-annual reports are to be provided to investors upon request and free of charge.

Under Article 78 of UCITS IV, the UCITS KIID must provide the following essential elements in respect to the UCITS fund concerned: (a) identification of the UCITS fund; (b) a short description of its investment objectives and investment policy; (c) past-performance presentation or, where relevant, performance scenarios; (d) costs and associated charges; and (e) risk/reward profile of the investment, including appropriate guidance and warnings in relation to the risks associated with investments in the relevant UCITS fund.

Experimental and survey-based research into key investor information documents suggests that there are problems with transparency, comprehensibility and comparability (Oehler *et al.*, 2014; Godwin and Ramsay, 2015). Based on a survey of finance students, Oehler *et al.* (2014) conclude that less sophisticated investors hardly benefit from a UCITS KIID that meets the regulatory requirements. Oehler and Wendt (2017) also criticize the UCITS KIID's use of the synthetic risk indicator, which ranges from one to seven according to the increasing level of the risk-reward profile, because investors rely too much on them at the expense of other information while the risk presented by a financial product is often investor-specific. Further, the presentation of risk often proves to be insufficient. Hence, it is challenging to adopt a consistent methodology that fits all financial products. Furthermore, the indicator is not accurate when there are no data on past performance (Godwin and Ramsay, 2015).

From 2023 onwards, the UCITS KIID will be succeeded by the PRIIPs KID in accordance with the PRIIPs Regulation and the PRIIPs Delegated Regulation (2017/653/EU). The PRIIPs KID is more forward-looking than the UCITS KIID as it requires performance scenarios. The PRIIPs KID applies the same 1–7 range in the risk indicator with a different calculation method and a disclosure of costs and charges. While the original PRIIPs KID did not require the reporting of past performance, mutual fund industry demanded the use of past performance (European Fund and Asset Management Association, EFAMA, 2020). Moreover, in the consumer testing, finding was that past performance is key information for retail investors (EC, 2020). As a result, past performance was added to the PRIIPs KID, but it must be published separately from the PRIIPs KID as "other relevant information". However, PRIIPs Regulation is under revision, with past performance information to be included within the main contents of the PRIIPs KID (EC, 2021; ESAs, 2020, 2021).

2.3 Research questions
We use the essential elements described in UCITS IV as a starting point for our research questions. Elements (a) and (b) mentioned in the previous section are qualitative fund-specific information, while elements (c), (d) and (e) are quantitative by nature. We posit our research questions based on the latter three elements, because their links with investor behaviour have been scrutinized in earlier literature.

Earlier literature suggests that past performance predicts fund flows (e.g. Gruber, 1996; Jiang and Yuksel, 2017). Further, studies also indicate that risk-adjusted performance is positively correlated with fund flows (e.g. Ippolito, 1992; Gruber, 1996; Sirri and Tufano, 1998). Experimental studies of short-form disclosure also indicate that retail investors focus on past performance when they make investment decisions (Hüsser and Wirth, 2013, 2014). However, experimental evidence also suggests that a mandated disclosure is ineffective in altering return expectations, regardless of investor clientele, whereas a stark warning label affects unsophisticated investors' expectations, but not those of sophisticated investors (Hüsser, 2015). Since one of the objectives of UCITS KIID is to inform investors on past performance with clarity, we ask:

> *RQ1.* Is UCITS KIID associated with past risk-adjusted performance (a) for investors in general and (b) for investor clientele?

However, while sophisticated investors tend to pick funds based on risk-adjusted returns, unsophisticated investors chase unadjusted returns (Tran and Wang, 2019). The viability of the performance-chasing strategy is debatable, with evidence both in favour (Deaves, 2004) and against (Friesen and Sapp, 2007). Since the UCITS IV requires the reporting of risk-reward ratios, we ask:

> *RQ2.* Is UCITS KIID associated with past unadjusted performance (a) for investors in general and (b) for investor clientele?

As a related matter, we also ask whether risk disclosure is linked with fund flows:

> *RQ3.* Is UCITS KIID associated with the fund manager's risk-taking (a) for investors in general and (b) for investor clientele?

The fee structure of mutual funds has also received attention in the relevant literature. Funds charging higher fees grow more slowly, and decreases in fees tend to be associated with faster fund growth (Sirri and Tufano, 1998). Retail investors tend to pay higher management fees (Crespo, 2009; Khorana *et al.*, 2009; see also Shu *et al.*, 2002 for the opposite finding) and receive less compensation in return for the fees paid (Korkeamaki and Smythe, 2004). Given that the objectives of UCITS KIID are to increase transparency in fund pricing and comparability between funds, we posit the following research question:

> *RQ4.* Is UCITS KIID associated with fund fees (a) for investors in general and (b) for investor clientele?

3. Research design

3.1 Empirical model

We test how the essential elements of UCITS IV (the fund's past return, management fees and risk) are associated with mutual fund flows. Our methodological approach is related to numerous studies that investigate associations between financial regulation and firm-level characteristics (e.g. Banerjee *et al.*, 2015; Badoer *et al.*, 2020). Namely, we analyse whether investors' sensitivity to the essential elements of UCITS IV is statistically different between the pre- and post-UCITS IV periods. Figure 1 illustrates our research model diagram.

Our dependent variable, fund flow (*NETFLOW*), measures the net change in the fund's assets under management. Fund flow is a commonly used measure in the literature (e.g. Sirri and Tufano, 1998; Del Guercio and Tkac, 2002; Korkeamaki *et al.*, 2007; Salganik-Shoshan, 2016), with retail fund flow being treated in the literature as equivalent to the overall capital flow (Cumming *et al.*, 2019). Relating to our research questions, fund flow is a feasible measure because it is linked with information asymmetry in the mutual fund market: Fund inflows

capture purchase decisions of (mostly) new investors who tend to be less informed about the fund, whereas fund outflows reflect decisions of investors who have insight into the fund and its management by the virtue of ownership (Cumming *et al.*, 2019). Thus, if the UCITS KIID reduces information asymmetry in the mutual fund market, fund flow should become more sensitive to the essential elements of UCITS IV in the post-implementation period. Following Korkeamaki *et al.* (2007), we use the measure of fund flow reported by our data source, Investment Research Finland's Monthly Mutual Fund Report data (Rahastoraportti). Unlike proxies of fund flow common in the literature, which extrapolate fund flows from the fund's assets (e.g. Sirri and Tufano, 1998; Del Guercio and Tkac, 2002), Monthly Mutual Fund Report data provides a direct measure in actual euros (Korkeamaki *et al.*, 2007). We use an aggregate of the net average of purchases into and redemptions from the fund over the previous six months.

Our empirical model predicts the net fund flows with focus variables and several control variables using the following regression equation:

$$NETFLOW_{i,t} = \beta_0 CONSTANT_{i,t} + \beta_1 SHARPE_{i,t} + \beta_2 KIID_{i,t} + \beta_3 SHARPE \times KIID_{i,t}$$

$$+ \beta_4 FEES_{i,t} + \beta_5 FEES \times KIID_{i,t} + \sum_{j=6}^{13} \beta_j CONTROLS_j + \varepsilon_{i,t} \qquad (1)$$

We interpret the estimated coefficients of the model as follows. First, the one-year Sharpe ratio (*SHARPE*) over the past 12 months relates to the fund's risk-adjusted returns over the past year. It is computed by subtracting the risk-free rate of return from the fund's rate of return, which is divided by the volatility of the fund's excess rate of return. We use it as a proxy for the past performance information that accounts for the risk-reward ratio as mandated by UCITS IV, which is provided to investors in the short-form disclosure. In principle, the Sharpe ratio mirrors the information content of these measures. Second, we use a dummy variable *KIID* as an indicator variable for UCITS IV. It equals one for the period after which UCITS KIID has been mandatory (1 July 2012), and is zero otherwise. If the estimated coefficient on *KIID* is statistically significant (or insignificant), it implies UCITS IV is (or is not) correlated with fund flows. If the interaction *KIID × SHARPE* is (or is not) positive and significant, it suggests that the importance of the risk-adjusted returns on mutual fund investments has (or has not) increased in the post-regulation period.

In a similar manner, we use ongoing fees (*FEES*), measured as a percentage of the fund's assets, as the indicator of the fund's management fees. An interaction (*KIID × FEES*) tests for whether UCITS IV is associated with investors' sensitivity to fund fees in the post-regulation period. If the estimated coefficient on the interaction term is negative (or positive) and significant, it suggests that investors have become more (or less) sensitive to fund fees in the post-regulation period.
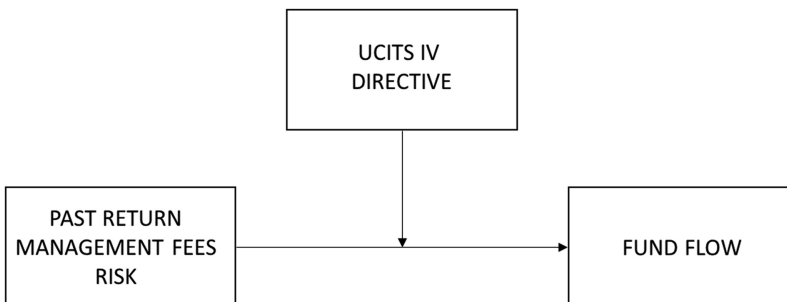

Figure 1.
Research model
diagram

Our second model uses past 12-month "raw returns" (*RETURN*), which are the fund's market returns unadjusted to risk taken to achieve those returns, past 12-month volatility (*VOLATILITY*), fund fees (*FEES*) and their interactions with *KIID* as the variables of interest

$$NETFLOW_{i,t} = \beta_0 CONST_{i,t} + \beta_1 RETURN_{i,t} + \beta_2 KIID_{i,t} + \beta_3 RETURN \times KIID_{i,t}$$
$$+ \beta_4 VOLATILITY_{i,t} + \beta_5 VOLATILITY \times KIID_{i,t} + \beta_6 FEES_{i,t}$$
$$+ \beta_7 FEES \times KIID_{i,t} + \sum_{j=8}^{14} \beta_j CONTROLS_j + \varepsilon_{i,t} \qquad (2)$$

If the estimated coefficient on the interaction term *RETURN × KIID* is (or is not) significant, it implies that past raw returns are (or are not) correlated with net fund flows in the post-UCITS IV period. Following the same logic, similar interpretations can be made for the estimated coefficients on *VOLATILITY × KIID* and *FEES × KIID*: if the coefficient of either variable is (or is not) statistically significant, the past 12-month volatility and fees are (or are not) associated with net fund flows in the post-UCITS IV period, respectively.

Since UCITS IV focuses on enhancing retail investors' informed investment decision-making, we take advantage of a characteristic of the Finnish mutual fund market to distinguish between retail and non-retail investors. In Finland, major retail banks have extensive sales networks, with the three largest banks (Danske Bank, Nordea and OP Group) accounting for two-thirds of the market (Grinblatt *et al.*, 2016). These major banks use existing customer relationships and convenience to market mutual funds to their customers (Korpela and Puttonen, 2006). As a result, retail investors are more likely to purchase their mutual funds from retail banks as opposed to vendors specializing in financial investment products (Keloharju *et al.*, 2012). Distribution channel has been used as a proxy for investor sophistication also in prior studies (e.g. Barber *et al.*, 2016). Following Grinblatt *et al.* (2016), we operationalize this characteristic by means of an indicator variable (*RETAIL*), which takes the value one in respect of the funds of the three largest retail banks and zero otherwise. Consequently, we estimate regression models (1) and (2) separately for retail funds and other funds and use the *z*-test to test whether the estimated coefficients for the two investor clientele differ from each other (Clogg *et al.*, 1995).

We control for several attributes related to mutual fund investments in the regression model. First, the fund's age moderates how sensitive fund flows are to changes in performance (Chevalier and Ellison, 1997). Hence, we control for the fund's age (*AGE*) measured in months since the fund's inception date. Second, fund size tends to correlate with inflows (Sirri and Tufano, 1998). Consequently, we control for fund size (*ASSETS*) with a log of total assets under the fund's management measured in millions of euros. Third, retail investors are more likely to purchase mutual funds that are easier or less costly for them to identify, as brand image, advertising and geographic metrics, such as the nearest store carrying the product, can impact flows (Sirri and Tufano, 1988). We use the number of shareholders (*OWNERS*) to control for a higher number of unsophisticated investors (Crespo, 2009). Fourth, we control for fund types as different fund flows may depend on demand for "fashionable" investment targets (see Grinblatt *et al.*, 2020). Our controls include developed markets (*D_DM*), emerging markets (*D_EM*), balanced funds (*D_BALANCED*) and sector funds (*D_SECTOR*). Finally, we control for time-fixed effects by including dummy variables for consecutive six-month time periods in the regression model, because business cycles and market fluctuation may influence fund flows over a period of time (Salganik-Shoshan, 2017).

3.2 Data and methods
The data consist of the mutual funds marketed in Finland between 1 January 2007 and 30 November 2018. This time interval contains roughly equal amount of data for the pre- and

post-UCITS IV periods, which provide sufficient time for the potential impact of UCITS IV to manifest itself in market behaviour. We obtained the data from Investment Research Finland's Monthly Mutual Fund Report, which has been used as a data source in previous studies (e.g. Korpela and Puttonen, 2006; Korkeamaki *et al.*, 2007; Grinblatt *et al.*, 2016). The data set includes 468 funds investing in equities or both in equities and fixed income (balanced funds). We removed the funds for which observations were available only for periods before or after UCITS IV was implemented. The data set contains information on the mutual fund's trailing 12-months raw returns, the Sharpe ratio, volatility, management fees, assets under management, number of owners, fund age, fund type and fund family. The raw data are in monthly format. We averaged monthly observations to a semi-annual frequency corresponding to the first half (from 1 January to 30 June) and the second half (from 1 July to 31 December) of the year. Averaging was necessary because monthly data were volatile and scarce in some instances.

The data are analysed using panel data regression analysis. Following Korkeamaki *et al.* (2007), we report the results obtained using a random-effects OLS regression model which accounts for both within- and between-subject variations. To ensure that the results are not sensitive to the chosen regression method, we also estimate the empirical models using a population-averaged and fixed-effects OLS regression model.

4. Results

4.1 Descriptive statistics

Table 1 reports descriptive statistics for the variables used in regression analyses. All reported figures for continuous variables are computed from the average values of a variable over a six-month period. There are 24 periods in the data. The left-hand panel reports figures for all funds. The average net fund flow is 0.117 million euros. The mean one-year Sharpe ratio is 0.55%. The average fund has 116.8 million euros in assets under management, of which it charges 0.94% as fees. The average fund has been in the market for 103 months (8½ years). A retail bank manages 33% of the funds. Regarding the funds' investment areas, 45.6% of them invest in developed markets (e.g. The USA, Japan and the EU), 24.7% in emerging markets (e.g. Asia excluding Japan, Latin America), 23.6% are balanced funds invested in equities and fixed income and 6% invest in specific sectors (e.g. pharmaceuticals, technology).

The panels in the middle show descriptive statistics for retail and non-retail funds. We also report *t*-test statistics for the differences between the group means in the right-hand panel. The average net fund flow is 0.556 million euros for retail and −0.094 million euros for non-retail funds, which is statistically significant difference. Risk-adjusted and raw returns are 0.56% and 3.02%, respectively, for retail funds. The figures for non-retail funds are comparable at 0.54% and 3.37%. The differences in performance measures are not statistically significant between the investor clientele. The *KIID* dummy indicates that there are proportionally more retail (0.604) than non-retail (0.527) funds in the post-UCITS IV period, which is a statistically significant difference. Retail funds as opposed to non-retail funds exhibit lower volatility (9.52% vs 11.23%), which is statistically significant. On average, retail funds charge lower fees than non-retail funds (0.76% vs 1.02%), which is a statistically significant difference. While some previous studies find that retail investors pay higher fees (e.g. Crespo, 2009), this is consistent with Shu *et al.* (2002), who find that sophisticated investors pay higher management fees.

Regarding the control variables, the fund age does not exhibit a significant difference: an average retail fund has been 106 months in the market, whereas an average non-retail fund's age is 102 months. By size, an average retail fund holds 209.61 million euros in assets, which is three times that of the average non-retail fund's asset value (72.15 million euros).

	All funds (Obs. = 468)			Retail funds (Obs. = 152)			Non-retail funds (Obs. = 316)			t-statistic of mean differences
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	
Dependent variable										
NETFLOW	0.117	2.259	0.013	0.556	2.960	0.055	−0.094	1.796	−0.001	2.50**
Focus variables										
SHARPE	0.549	0.741	0.578	0.561	0.333	0.592	0.544	0.873	0.573	0.30
RETURN	3.257	3.346	2.807	3.023	2.331	2.584	3.369	3.735	2.865	−1.22
D_KIID	0.491	0.203	0.507	0.604	0.167	0.542	0.527	0.191	0.542	4.25***
VOLATILITY	10.671	5.613	11.265	9.517	5.052	10.209	11.226	5.790	11.575	−3.26***
FEES	0.939	0.646	0.815	0.763	0.425	0.795	1.024	0.715	0.821	−4.93***
Control variables										
AGE	103.406	65.128	85.931	105.847	61.149	94.918	102.232	67.020	81.335	0.58
ASSETS	116.800	177.881	53.662	209.607	251.973	125.978	72.153	101.582	38.922	6.48***
OWNERS	7213.19	1961.17	7298.27	12089.70	18501.44	4225.09	4643.53	10423.67	1047.14	4.62***
D_DM	0.456	0.486	0.167	0.498	0.498	0.000	0.435	0.479	0.167	1.30
D_EM	0.247	0.430	0.000	0.257	0.414	0.000	0.243	0.426	0.000	0.34
D_BALANCED	0.236	0.424	0.000	0.224	0.418	0.000	0.241	0.428	0.000	−0.41
D_SECTOR	0.060	0.211	0.000	0.022	0.132	0.000	0.079	0.238	0.000	−3.32***

Note(s): *NETFLOW* measures the net average of purchases into and redemptions from the fund over the previous 12 months. *D_KIID* is an indicator variable for UCITS IV. It equals one for the period after which UCITS KIID has been required (1 July 2012), and is zero otherwise. *FEES* measures the fund's ongoing fees as a percentage of assets under management. *RETURN* measures the fund's raw return over the past 12 months. *VOLATILITY* measures the fund's volatility over the past 12 months. *AGE* measures the fund's age in months since its inception. *ASSETS* measures the fund's size in million euros. *OWNERS* records the number of owners in a fund. *D_DM* is a dummy variable for a fund investing in developed markets. *D_EM* is a dummy variable for a fund investing in emerging markets. *D_BALANCED* is a dummy variable for a balanced fund. *D_SECTOR* is a dummy variable for a sector fund

Table 1.
Descriptive statistics
for retail and non-
retail funds

Moreover, the average retail fund has three times more shareholders than the average non-retail fund (12,090 vs 4,644), which is a statistically significant difference. By investment focus, retail and non-retail funds exhibit less variation with developed markets (48.8% vs 43.5%), emerging markets (25.7% vs 24.3%) and blended funds (22.4% vs 24.1%) holding comparable proportions. The only statistically significant difference concerns sector funds, which are more prominently offered by non-retail vendors (7.9% vs 2.2%).

Table 2 reports a correlations matrix for the variables used in regression analyses. It indicates that fund flows are positively correlated with the performance measures (*SHARPE, RETURN*) and negatively correlated with fund fees (*FEES*). The KIID dummy variable is positively correlated with the Sharpe ratio and negatively correlated with fund fees and volatility. Although statistically significant, correlations between explanatory variables remain generally low. This suggests that multicollinearity may not confound results.

4.2 Regression results for all funds

Table 3 reports the results for the regression analyses of all funds. The left-hand panel uses the Sharpe ratio as an indicator of returns. The estimated coefficient on *SHARPE* (0.687) is positive and significant, which indicates that past risk-adjusted returns are positively correlated with mutual fund flows. A one percentage point increase in the Sharpe ratio predicts an inflow of 687,000 euros into the fund. However, neither *KIID* nor *KIID* × *SHARPE* is statistically significant. This suggests that UCITS IV is not associated with mutual fund flows. Regarding the control variables, our results indicate that the fund age is negatively associated with net fund flows. We also find that the number of shareholders is a positive predictor of fund flows.

The right-hand panel replaces the Sharpe ratio with raw returns and volatility. The results indicate that raw returns (0.020) correlate positively with fund flows. Hence, a one percentage point increase in returns predicts an investment of an additional 20,000 euros in the fund. While the *KIID* dummy variable is not significant, the interaction term *KIID* × *RETURN* is positive and significant (0.027), which suggests that earlier raw returns predict fund flows in the post-UCITS IV period. Furthermore, volatility is also positively associated with fund flows (0.054), with a one percentage point increase in volatility predicting an additional 54,000 euros in the fund. Fees are negative and significant (−0.268), predicting an outflow of 268,000 euros from the fund as the fund's expenses increase by a one percentage point. However, the *KIID* dummy variable and its interactions with these focus variables are not significant. The estimated coefficients on the control variables are almost identical to the Sharpe model except for the fund size and the dummy variable for balanced funds, which are both statistically significant.

In summary, our results suggest that with regard to research questions RQ1, RQ3 and RQ4 for investors in general, UCITS IV is not associated with fund flows. However, concerning RQ2, the findings indicate that unadjusted returns are more predictive of fund flows in the post-implementation period for investors.

4.3 Regression results for investor clientele

Table 4 reports the regression results for retail and non-retail funds. The panels show estimated coefficients for retail funds, non-retail funds and *t*-statistics for the differences between these coefficients, respectively. The Sharpe ratio is positive and significant for retail funds (0.993) and non-retail funds (0.505), with a one percentage point increase in the Sharpe ratio predicting a one million euro and a 0.5 million euro increase in fund flows, respectively. The difference between the two estimates is not statistically significant, as indicated by the *z*-statistic. This result suggests that earlier risk-adjusted performance is a positive predictor of fund flows for both fund types. Concerning UCITS IV, the *KIID* dummy variable is not

	SHARPE	D_KIID	RET	VOL.	FEES	AGE	Log(ASSETS)	OWNERS	D_DM	D_EM	D_BALANCED	D_SECTOR
NETFLOW	0.10*	0.01	0.03*	0.01	−0.04*	−0.06*	0.04*	0.04*	−0.03*	0.3×10^{-3}	0.04*	−0.01
SHARPE	–	0.25*	0.65*	−0.26*	−0.11*	0.08*	0.15*	0.05*	0.01	−0.05*	0.01	0.05*
D_KIID	0.25*	–	0.01	−0.71*	−0.16*	0.34*	0.15*	0.08*	−0.01	0.01	−0.01	0.02*
RET	0.65*	0.01	–	−0.05*	0.4×10^{-2}	−0.03	0.07*	0.2×10^{-2}	−0.01	0.01	−0.03*	0.04*
VOLATILITY	−0.26*	−0.71*	−0.05*	–	0.25*	−0.29*	−0.13*	−0.04*	0.11*	0.11*	−0.24*	0.01
FEES	−0.11*	−0.16*	0.4×10^{-2}	0.25*	–	0.01*	−0.18*	0.07*	−0.19*	0.36*	−0.13*	−0.02
AGE	0.08*	0.34*	−0.03	−0.29*	0.01*	–	0.37*	0.30*	0.19*	−0.19*	−0.07*	0.08*
Log(ASSETS)	0.15*	0.15*	0.07*	−0.13*	−0.18*	0.37*	–	0.67*	0.20*	−0.17*	−0.03*	0.08*
OWNERS	0.05*	0.08*	0.2×10^{-2}	−0.04*	0.07*	0.30*	0.67*	–	0.40*	0.01	0.3×10^{-2}	−0.07*
D_DM	0.01	−0.01	−0.01	0.11*	−0.19*	0.19*	0.20*	0.40*	–	−0.52*	−0.52*	−0.10*
D_EM	−0.048	0.01	0.01	0.11*	0.36*	0.19*	−0.17*	0.01	−0.52*	–	−0.30*	−0.26*
D_BALANCED	0.01	−0.01	−0.03*	−0.24*	−0.13*	−0.07*	−0.03*	0.3×10^{-2}	−0.52*	−0.30*	–	0.15*
D_SECTOR	0.05*	0.02*	0.04*	0.01	−0.02	0.08*	−0.07*	−0.10*	−0.26*	−0.15*	−0.14*	–

Note(s): Statistical significance: * p-value < 0.05

Table 2.
Correlations matrix

| | All funds | | | All funds | |
	Coef.	SE		Coef.	SE
Focus variables					
SHARPE	0.687***	0.092		–	–
D_KIID	0.671	1.563		1.026	0.674
D_KIID × SHARPE	0.025	0.140		–	–
RET	–	–		0.020***	0.004
D_KIID × RET	–	–		0.027**	0.014
VOLATILITY	–	–		0.054***	0.016
D_KIID × VOLATILITY	–	–		−0.081	0.055
FEES	−0.162	0.119		−0.268***	0.120
D_KIID × FEES	−0.321	0.225		−0.293	0.212
Control variables					
AGE	−0.031***	0.009		−0.032***	0.010
Log(*ASSETS*)	0.056	0.084		0.101*	0.087
OWNERS	0.185**	0.053		0.179***	0.053
D_EM	0.213	0.168		0.172	0.192
D_BALANCED	0.348	0.275		0.626**	0.307
D_SECTOR	−0.003	0.117		0.066	0.118
CONSTANT	−2.301***	0.644		−2.666***	0.710
Time-fixed effects	Yes			Yes	
Obs.	468			468	
R^2	0.034			0.061	

Note(s): Random-effects OLS regressions of the empirical models specified in equations (1) and (2) used
Statistical significance: *** p-value < 0.001; ** p-value < 0.01; * p-value < 0.05

Table 3.
Regression analyses of
all funds using risk-
adjusted, raw
performance and
volatility measures

significant, and its interaction with *SHARPE* is not significant either. This implies that UCITS IV is not correlated with fund flows and is also not linked with how risk-adjusted performance predicts fund investments.

Regarding fees, the results indicate that non-retail investors appear to be sensitive to fund expenses, as the estimated coefficient for *FEES* is negative and significant (−0.272), whereas the estimate is not significant for retail investors. However, the z-statistics indicates that the difference between the two investor clientele is not statistically significant. The interaction term between the *KIID* dummy variable and fund fees is negative and significant (−2.613) for retail funds. This suggests that retail investors have become more sensitive to fund fees in the post-UCITS IV period. Further, the difference between non-retail funds, for which the interaction term is insignificant, is statistically significant. Hence, the combined effect suggests that a one percentage point increase in fund fees predicts 1.9 million euro decrease in retail fund flows in the post-UCITS IV period.

The estimated coefficients on the control variables indicate that there are no large differences between the investor clientele. The only statistically significant difference can be found with regard to the fund age. The result suggests that retail, as opposed to non-retail, investors purchase more recently established mutual funds.

Table 5 shows estimates for the model in which raw returns and volatility replace the Sharpe ratio. The estimated coefficient on the *KIID* dummy variable is positive and significant (4.035) for retail funds, but insignificant for non-retail funds. The difference between the two estimates is statistically significant. This suggests that retail funds have attracted more inflows in the post-UCITS IV period. The estimates on raw returns are positive and significant for both retail (0.028) and non-retail funds (0.014), but the z-statistic indicates that the difference between the two is not statistically significant. The interaction term *KIID × RETURN* is positive for retail (0.071) and non-retail funds (0.029), but is statistically

	Retail funds		Non-retail funds		z-statistic of estimate differences
	Coef.	SE	Coef.	SE	
Focus variables					
SHARPE	0.993***	0.242	0.505***	0.0769	1.922
D_KIID	2.733	1.563	−0.316	0.470	1.868
D_KIID × SHARPE	0.692	0.480	0.0411	0.0794	1.338
FEES	0.519	0.555	−0.272**	0.0912	1.406
D_KIID × FEES	−2.613**	0.804	0.356	0.209	−3.574***
Control variables					
AGE	−0.0511*	0.0209	−0.00669	0.00679	−1.988*
Log(ASSETS)	0.255	0.223	−0.0595	0.0557	1.366
OWNERS	0.292*	0.129	0.0428	0.0515	1.795
D_EM	0.414	0.458	0.282*	0.121	0.279
D_BALANCED	1.122	0.620	−0.0433	0.223	1.767
D_SECTOR	0.0392	0.386	0.0345	0.104	0.010
CONSTANT	−2.301***	0.644	−2.551***	0.675	−3.265**
Time-fixed effects	Yes		Yes		−
Obs.	152		316		−
R^2	0.0668		0.0408		−

Note(s): Random-effects OLS regressions of the empirical models specified in equations (1) and (2) used
Statistical significance: *** p-value < 0.001; ** p-value < 0.01; * p-value < 0.05

Table 4.
Regression analyses of retail and non-retail funds using a risk-adjusted performance measure

	Retail funds		Non-retail funds		z-statistic of estimate differences
	Coef.	SE	Coef.	SE	
Focus variables					
D_KIID	4.035*	1.666	−0.246	0.490	2.465*
RET	0.0277**	0.0106	0.0139***	0.00382	1.196
D_KIID × RET	0.0713	0.0410	0.0288**	0.0108	1.012
VOLATILITY	0.121**	0.0372	0.0249**	0.00903	2.521*
D_KIID × VOLATILITY	−0.292*	0.125	0.0302	0.0380	−2.465*
FEES	0.582	0.529	−0.347**	0.109	1.723
D_KIID × FEES	−2.537**	0.804	0.314	0.194	−3.447***
Control variables					
AGE	−0.0567**	0.0210	−0.00781	0.00875	−2.145*
Log(ASSETS)	0.407	0.233	−0.00155	0.0629	1.695
OWNERS	0.268*	0.123	0.0361	0.0580	1.713
D_EM	−0.0509	0.430	0.361	0.205	−0.865
D_BALANCED	1.641*	0.717	0.179	0.236	1.937
D_SECTOR	0.297	0.373	0.0904	0.109	0.533
CONSTANT	−7.380***	1.817	−0.427	0.557	−3.659***
Time-fixed effects	Yes		Yes		−
Obs.	152		316		−
R^2	0.0612		0.0198		−

Note(s): Random-effects OLS regressions of the empirical models specified in equations (1) and (2) used
Statistical significance: *** p-value < 0.001; ** p-value < 0.01; * p-value < 0.05

Table 5.
Regression analyses of retail and non-retail funds using volatility and raw performance

significant only for non-retail funds. While the statistical significance of the coefficient estimate for non-retail funds is somewhat unexpected, it is consistent with Hüsser (2015) who reports that sophisticated investors do not adjust their return expectations in response to disclosures. However, the difference between the two investor clientele is not statistically

significant, as indicated by the *z*-statistic. Thus, the two investor clientele do not appear to be statistically different from each other in their sensitivity to past returns.

With regard to volatility, the estimated coefficients indicate that both retail (0.121) and non-retail (0.025) funds are positively correlated with fund flows. The magnitude of the estimate for retail funds is nearly five times that of non-retail funds, which is a statistically significant difference. Hence, it seems that retail investors bought riskier funds, as measured by volatility, in the pre-UCITS IV period. The interaction term *KIID × VOLATILITY* is negative and significant (−0.292) for retail funds and insignificant for non-retail funds. The difference between the two estimates is statistically significant. This finding suggests that less risky funds are positively correlated with retail fund flows in the post-UCITS IV period.

Concerning fund fees and the control variables, the results are very close to those reported in the model that uses the Sharpe ratio. Retail investors appear to purchase funds with lower expenses in the post-implementation period. The control variables exhibit similar patterns as well: the only statistically significant difference is that younger funds attract more retail capital.

With respect to the research questions, we can draw the following conclusions. Concerning RQ1, *KIID* does not appear to be correlated with how risk-adjusted returns predict investor clientele's fund flows. With regard to RQ2, however, there is some indication that raw returns are a positive predictor of fund flows, especially for non-retail investors in the post-UCITS IV period. More importantly, concerning RQ3 and RQ4, our findings suggest that retail investors are more sensitive to risk-taking and fund fees after the implementation of UCITS IV.

4.4 Robustness checks
We carry out additional analyses to check that our results are robust to alternative model specifications. The results of these estimations are presented in a separate Web Appendix.

As the first robustness check, we changed the date for the post-UCITS IV period, because UCITS IV was implemented in Finnish legislation on 30 June 2011, but mutual funds were required to issue a UCITS KIID on 30 June 2012 at the latest. Consequently, there was a 12-month period during which mutual funds could have issued their UCITS KIIDs. For this reason, we estimated the regression models in which the *KIID* dummy variable obtained the value of one beginning on 1 January 2012 for all funds and for the two investor clientele. The results were similar, both quantitatively and qualitatively, to those reported as the main results in the paper.

As the second robustness check, we estimated the empirical models using fixed-effects and population-averaged regression techniques. The results of these models were qualitatively similar to those obtained with a random-effects model. Thus, we conclude that the results are robust to alternative estimation methods.

5. Conclusion
5.1 Discussion
In this paper, we use a data set of the Finnish mutual funds market between 2007 and 2018 to examine empirical relations between a short-form key investor information document, which was mandated by UCITS IV, and mutual fund flows. In particular, we investigate how investor clientele, namely retail and non-retail investors, respond to UCITS KIID's information on past performance, risk and fund management fees.

Our results suggest that when investors are examined in general, UCITS IV does not appear to be correlated with fund flows. First, past returns predict investors' fund flows,

which is consistent with previous research (e.g. Ippolito, 1992; Gruber, 1996; Sirri and Tufano, 1998). Second, risk-taking is positively associated with fund flows, which is inconsistent with the literature where the fund's volatility is uncorrelated with or a negative predictor of fund flow (e.g. Jank and Wedow, 2013; Chen *et al.*, 2021). Finally, fees are negatively associated with fund flows, which is consistent with the literature (Chen *et al.*, 2021). Compared to Korkeamaki *et al.* (2007), who find no correlation between expenses and fund flows in a different observation period in the Finnish market, our results suggest that investors in the Finnish market have become more sensitive to fees in more recent times when the UCITS KIID has been mandatory.

When retail and non-retail mutual funds are studied separately, our findings point to changes in retail investors' behaviour in the post-UCITS IV period. Consistent with Hüsser and Wirth (2013), who report that retail investors that have lower information processing capability use previous performance as a yardstick when they invest in a fund, our results indicate that retail investors appear to rely on past performance, whether risk-adjusted or raw return is used, in the pre- and post-UCITS IV periods. In this respect, retail investors do not differ from non-retail investors. The finding that non-retail investors are also sensitive to past performance is consistent with Hüsser (2015) who argues that they may hold strong beliefs or biases, which lead to such behaviour. It is also possible that non-retail investors use more sophisticated investment strategies (Barber *et al.*, 2016), such as momentum investing, which might explain this finding in the given time period.

However, an investigation into how the UCITS KIID is linked with retail investors' sensitivity to risk-taking and fund fees yields results that are consistent with the goals of UCITS IV. First, retail investors appear to become more sensitive to fund fees in the post-UCITS IV period. To some extent, this is also consistent with Badoer *et al.* (2020) who report lower retail investor fees following a change in the US regulation that increased transparency in pension plan fees. Second, retail investors' appetite for the fund's risk-taking reduces after the introduction of UCITS KIID. In both aspects, the difference between retail and non-retail investors is statistically significant.

Taken together, our results are consistent with retail investors responding to the essential elements requiring disclosure in UCITS KIID. Our results suggest that regulation could reduce the information asymmetry between the asset manager and the retail investor (Huhmann and Bhattacharyya, 2005). Consequently, our findings may be construed as empirical evidence in support of the argument that correctly drafted information disclosure regulations may benefit retail investors (Zingales, 2009), a belief held, for example, by the US Securities and Exchange Commission (Palmitier and Taha, 2008). In particular, increasing price sensitivity among retail investors in the post-UCITS IV period suggests that unsophisticated investors have become more sophisticated with respect to fund fees during this period. In that sense, our findings are, to some extent, inconsistent with investor surveys and experiments (Oehler *et al.*, 2014; Oehler and Wendt, 2017), which point to UCITS KIID being insufficient in terms of providing good consumer information and improving comparability. In particular, contrary to Hüsser (2015), our evidence suggests that mandatory UCITS KIID disclosure may be informative for retail investors. However, we must emphasize that further real-world evidence on investor behaviour following changes in regulation relating to information disclosure is needed to make conclusive judgements on the merits of such regulations.

5.2 Practical implications

Our empirical results have practical implications, most notably in relation to the PRIIPs KID. Moreover, since mutual fund regulations are fairly similar across the world (Mugerman *et al.*, 2019), our findings may generalize to other jurisdictions as well. As a practical implication for

the industry, asset managers may use our results to identify pieces of information that are relevant to investors and use such information for marketing purposes. In particular, retail investors appear to have become more sensitive to management fees and risk in the post-UCITS IV period, which suggests that fund marketers could emphasize them in fund advertising.

Our study also points to past performance being relevant information for retail and non-retail investors. Policywise, this is a complicated issue because information on past performance may lead to biased decision-making (chasing returns), which is hard to change with additional information (Hüsser and Wirth, 2014; Johnson *et al.*, 2021). In this respect, our results support the PRIIPs KID Regulation, which makes information on past performance less salient in the document.

While our research provides empirical support for the proposition that the key investor document may have made retail investors more aware of key elements in investment decisions, it is also important to be aware of the limitations of disclosure requirements. It is hard to design a short-form disclosure document that fits every investor's personal needs. In addition, how key investor document serves financial advisors in their advisory role should also be accounted for (see also Godwin and Ramsay, 2015). Further, proper consumer testing of short-form disclosure, which accounts for various aspects of decision-making, could improve future incarnations of the key investor document. This is particularly relevant in the future because UCITS funds are required to make disclosure on sustainability-related investments in their periodic reports, which might eventually be included in the PRIIPs KID. This, in turn, adds to the complexity of key investor document from an investor perspective. As a result, there is need for an empirical assessment as to how investors understand, interpret and use information. In this respect, policy-makers should be encouraged to continue wide-ranging consumer testing to assess the clarity of the PRIIPs KID.

Finally, there may also be a need to strengthen investor education and the quality of financial advice. For example, guiding investors on how they should read mutual fund disclosures could help them in decision-making. Improving the means of making systematic comparisons across competing mutual funds could enhance consumers" ability to take informed investment decisions (see Ippolito, 1992).

5.3 Limitations and future research

This study has some limitations. First, our findings may be attributable to some other mechanism that we have been unable to control for. Second, our results are based on a small European market. Third, the empirical metrics used in the study are noisy proxies for the actual aspects prescribed in the *KIID*. Finally, our focus is at the level of an individual fund. However, there may be differences between individual investors in terms of how they react to short-form disclosures. For this reason, a more fine-grained analysis at the level of an individual investor might yield different results.

Future research could address the shortcomings described above. For instance, changes in investors' information environment could be explored. Additional insight into how financial regulation is associated with investor behaviour could be gleaned from individual-level data sets. Furthermore, obtaining data from other European mutual fund markets, which are subject to the same regulation but may have characteristics that differ from the Finnish market, might yield additional insight into how the regulation on information disclosure is linked with investor behaviour.

5.4 Concluding remarks

This paper investigates retail investors' fund flows before and after UCITS IV, effective as of 2012. The regulation mandated asset managers to disclose essential information on past

performance, management fees and risk in the UCITS KIID to assist retail investors in investment decisions. However, several experimental studies indicate that retail investors do not respond to the UCITS KIID. Using data from the Finnish mutual fund market, our findings demonstrate that while past performance predicts fund flows throughout the observation period, retail investors became more sensitive to management fees and volatility in the post-UCITS IV period. These findings suggest that mandating the UCITS KIID may have been relevant to retail investors.

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Appendix
The Appendix file is available online for this article.

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