The relevance of ratings for investors of (semi-)open-end real estate funds: Evidence from Germany

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ABSTRACT[1]

This paper investigates the relevance of investment ratings of German (semi-)open-end real estate funds (GOEREFs) from a capital markets perspective. GOEREFs are investment vehicles which, under normal circumstances, offer their investors a permanent redemption option at their estimated net asset values (NAVs) while their shares are also floating on secondary markets. However, share redemptions are suspended when investors' redemption demands exceed liquid assets. This setting provides a unique opportunity to study the information content of investment ratings when there is uncertainty with respect to the estimation of NAVs and the risk of "runs on the bank" (i.e., runs on the fund). Using a comprehensive hand-collected sample of 409 rating announcements for 49 funds and information from annual reports during the period 2004–2020, this study finds that whereas the predictive power of ratings for future fund returns does not exceed the predictive power of readily available publicly available information, ratings correlate significantly with the likelihood of future redemption suspensions. An event study shows that the spread between NAVs and secondary market share prices as well as trading volume react significantly to rating changes. The reactions of spreads are particularly pronounced when share redemptions are suspended, whereas trading volume is comparatively lower. The impact on spreads reverses only partially

[1] The author thanks Deborah Schwartz, Florence Koch, and Sarah Vanpeteghem (University of Luxembourg) for valuable assistance in the manual data collection. He thanks Dr. Michael Pirl (Bundesverband Investment und Asset Management e.V.) for providing data on fund flows. The author has no relevant disclosures, i.e., the study has been executed independently and without any support or solicitation from Scope SE & Co. KGaA or related parties.

in the long run. The results do not show evidence for rating changes having an impact on contemporaneous or near-term monthly net funds flows. However, the impact of downgrades on net fund flows might be masked by downgrades being more frequently followed by redemption suspensions.

Keywords: German open-end real estate funds, investment ratings, return prediction, event study

JEL Classification: G01, G11, G14, **G24**

I. INTRODUCTION

This study analyzes the information content of the SCOPE[2] investment rating of German (semi-)open-end real estate funds (GOEREFs). GOEREFs are unique in the sense that they share important characteristics with mutual funds, whose shares under normal circumstances can be redeemed at net asset values (NAVs), but also closed-end funds, whose shares trade on secondary markets. Their underlying assets are illiquid and subject to valuation uncertainty, which can result in strong redemption demands that in the past some funds sometimes were not fully able to satisfy, and thus had to temporarily suspend redemptions or even had to close permanently. In this setting, information asymmetries between fund managers and investors are high and fund ratings may play a pivotal role in supplying capital markets with important information on the quality of the funds' asset portfolios. This study exploits the uniqueness of GOEREFs to extend the research questions of whether qualitative investment ratings can predict future fund returns and flows to the questions whether they can also predict fund closures and explain secondary market discounts. Further, this is the first empirical analysis on how the relevance of qualitative investment ratings depends on fund status (open vs. closed). I capitalize on a unique survivorship-free dataset that I manually collected from several data sources, including news articles archived in Dow Jones Factiva and (semi-)annual fund reports. The sample includes 409 rating announcements for 49 funds over the period 2004–2020.

[2] A trademark of Scope SE & Co. KGaA, Lennéstraße 5, D-107855 Berlin.

The results of this study also have implications for other markets, for instance the French and UK open-end real estate funds markets, where ratings are not yet available. In the UK, the Financial Conduct Authority is currently discussing the introduction of a notice period of between 90 and 180 days for share redemptions. Similar discussions are ongoing in France (Schoeffler, 2020). This study contributes to answering the question whether ratings can provide useful information to investors and thus mitigate to some extent the need for other costly regulatory measures such as minimum holding periods and cash requirements. It extends the work of Fecht and Wedow (2014) on the liquidity risk of GOEREFs by shedding light on the role of investment ratings.

Prior research addresses the specifics of the GOEREF market, in particular the growing importance of the secondary market (Gerlach and Maurer, 2020), the discount to NAV when funds are distressed (Schnejdar et al., 2020), and the determinants of fund closure risk (Schnejdar et al., 2021). Another stream of research relates investment ratings to future fund performance (Blake and Morey, 2000). This study connects these three streams of literature by focusing on the GOEREF market, where all central elements are simultaneously present: open-end funds that are traded on primary and secondary markets, funds that are temporarily closed but for which NAVs are still quoted and trading occurs at secondary markets, and rating events with exact time stamps that are available for a sufficiently long and wide panel.

The results of my analyses show that the predictive power of ratings for future fund returns does not exceed the predictive power of readily available publicly available information. However, ratings correlate significantly with the likelihood of future redemption suspensions. An event study shows that the secondary market discount to NAVs as well as trading volume react significantly to rating changes, and that the impact on discounts reverses only partially in the long run. The reactions of discounts to rating announcements are particularly pronounced when share redemptions are suspended, whereas trading volume is comparatively lower. The introduction of the minimum holding period of two years in June 2013 has decreased the impact of rating changes on discounts. The results do not show evidence for rating changes having an impact on

contemporaneous or near-term monthly net funds flows. However, the impact of downgrades on net fund flows might be masked by downgrades being more frequently followed by redemption suspensions.

Overall, the results in this study indicate a specific type of relevance of ratings of semi-open-end real estate funds. Instead of being the best predictors of future returns, they can serve as predictors of future redemption suspensions, i.e., liquidity risk, and are perceived by capital markets as relevant in detecting gaps between NAVs and fair values when redemptions are suspended. By shedding light on the role of investment ratings, this study extends the literature that discusses the problems that arise from mutual funds investing in illiquid assets while providing liquid claims to shareholders (Bannier et al., 2008; Cucic, 2021; Fecht and Wedow, 2014; Jiang et al., 2022).

The remainder of this paper is structured as follows. The next section describes GOEREFs and the SCOPE investment rating. I put less emphasis on describing GOEREFs but focus more on the ratings, as the reader can find comprehensive descriptions of the former elsewhere (Bannier et al., 2008; Gerlach and Maurer, 2020; Schnejdar et al., 2020; Weistroffer and Sebastian, 2015). In Section III, I develop the research hypotheses. Section IV describes the data sources, Section V the methodology, and Section VI the results. I conclude this paper with Section VII.

II. RATINGS AND GERMAN OPEN-END REAL ESTATE FUNDS

GOEREFs are mutual funds that directly invest in real estate and, until the end of 2012, offered their investors a permanent option to redeem shares at daily NAVs. The assets of the funds registered with the German Investment Funds Association (Bundesverband Investment und Asset Management e.V. – BVI) in 2020 amounted to 117.5 billion euros.[3] Fund shares can either be acquired at NAV plus agio from the fund management company, i.e., via the issuance of new shares (primary market), or through one of the various German securities exchanges that organize the secondary market trading of select funds. For the primary market, the front loads (agios) that are paid to the distributor or the fund management company for some

[3] https://www.bvi.de/fileadmin/user_upload/Statistik/2021_07_27_Zeitreihen_bis_2020.pdf.

funds amount to up to 6 percent of their NAVs. Prices at the secondary markets are determined via supply and demand with investors facing the typical transaction costs such as trading fees and bid-ask spreads. As long as primary markets allow the redemption of shares at NAV, secondary market prices tend to stay within a narrow range around NAVs. This can change drastically when funds suspend the redemption or issue of shares (Gerlach and Maurer, 2020; Schnejdar et al., 2020). When funds suspend redemptions, they tend to trade on secondary markets at significant discounts because excessive redemption demands are the consequence of a mismatch between the NAVs calculated by the fund management and the market's view of the fundamental values of the funds' net assets. In that scenario, GOEREFs effectively become closed-end real estate investment funds, for which the fund management company nonetheless continues to disclose NAVs on a daily basis.

In December 2005 and in the aftermath of the financial crisis of 2008, some funds could not meet redemption demands, and either temporarily suspended the redemption of shares or ultimately entered liquidation. Since retail investors are an important class of shareholders and presumably were not sufficiently aware of the liquidity risks associated with GOEREFs, the German regulator reacted in 2013 by imposing a general minimum holding and notice period for new investments of 24 and 12 months, respectively. The rating agency SCOPE played an important role in the first liquidity crisis of 2005 when it issued an unfavorable and controversial opinion on one of the funds, which was followed by substantial outflows from this and other funds, resulting in several funds suspending their share redemptions (Fecht and Wedow, 2014: 383). While this particular incident could serve as a case study on the question whether investment ratings are solely informational in nature or can themselves be the cause of a "run on the fund" in the sense of a self-fulfilling prophecy (ECB, 2006), my study addresses the more general question whether these ratings have informational value in terms of predicting future performance and redemption suspensions, and whether they impact secondary market discounts.

Historically, there were also other providers of investment ratings for GOEREFs. In 2002, the industry representative body, BVI, solicited Moody's to rate select funds. While initially all ratings were favorable, Moody's soon started issuing more critical opinions (Knauß, 2002). At the end of 2003, Moody's

laid off its team of analysts responsible for rating GOEREFs without officially announcing the reasons. Soon thereafter, the lead analyst of the former Moody's team joined SCOPE and began issuing unsolicited and effectively more unfavorable ratings against the opposition of the fund industry (Haimann, 2004). The fund industry continued soliciting ratings by other ratings agencies, Fitch and RCP/DID, which never gained substantial market coverage and acceptance (Hönighaus and Atzler, 2006). From 2005 to 2016, FERI Euro Rating Services competed with SCOPE in the market for unsolicited ratings until it was acquired by the latter in August 2016. While FERI was well-positioned in the market for ratings of equity and bond funds, its ratings of GOEREFs never managed to surpass the level of popularity of the SCOPE ratings (Terliesner, 2017).

To which extent the SCOPE rating is independent from payments of the fund management companies, and thus really unsolicited, is unclear. Early newspaper articles state that fees come from fund distributors but not the fund management companies (Hönighaus and Atzler, 2006). As of the time this draft was written, SCOPE ratings were issued by SCOPE Analysis GmbH, which is a fully owned subsidiary of Scope SE & Co. KGaA. While Scope Analysis GmbH, due to the limited disclosure requirements for small unlisted companies, issues only a balance sheet in the official German gazette, the consolidated financial statements of the parent company provide more insights into the business model. In the management report of the 2019 annual report, Scope SE & Co. KGaA states that Scope Analysis GmbH aims at increasing the demand for its rating mandates from fund managers. Whether this statement only applies to equity and bond funds or also to GOEREFs is unclear. Further, the financial statements show that Scope SE & Co. KGaA as of 2019 has not broken even and regularly requires equity injections from its shareholders[4]. Thus, it is reasonable to assume that Scope Analysis GmbH has been under financial pressure to contribute positive results (which were exactly zero since at least 2016, the year for which consolidated financial statements of Scope SE & Co. KGaA are available), which should be considered in the assessment of potential threats

[4] Scope SE & Co. KGaA has numerous direct and indirect shareholders, including its CEO, Florian Schoeller, the RAG foundation (https://scopegroup.com/media-centre/RAG-Stiftung-invests-in-Scope-Group), and Stefan Quandt (https://www.scoperatings.com/static/149723EN.html).

to the independence and impartiality of SCOPE ratings. On the other hand, the historically strong market position of the SCOPE rating with no material competition might shield its analysts from the pressure to increase or maintain market share by issuing overly favorable ratings (Becker and Milbourn, 2011).

SCOPE ratings range from AAA (best) down to D (worst), on a scale with 26 notches. For this study, I adopt the approach from the literature on credit ratings (e.g., Becker and Milbourn, 2011) to translate the ordinal ratings to numerical values (see Table 1).

*** insert Table 1 about here ***

SCOPE issued their first ratings of GOEREFs in September 2004. The last ratings included in the sample of this study are from October 2020. Table 2 displays the list of 49 sample funds alongside descriptive statistics of the ratings. For funds still covered by SCOPE ratings, the column "date of last rating" represents the date of the last rating considered in this study. For funds currently still covered, I sourced the ratings from SCOPE's FundExplorer website. For funds no longer covered, I conducted comprehensive manual searches of the Dow Jones Factiva database and general web searches. This work comprised the reconciliation of information from various archived news articles, especially in terms of identifying the exact date of the earliest release of a rating change.

*** insert Table 2 about here ***

According to the company leaflet "Rating Methodology Alternative Investments // Open-Ended Real Estate Funds"[5], SCOPE ratings aim at assessing "a fund's ability to generate risk-adjusted returns". Risk-adjustments of returns are made relative to a "mapping table", while the mapping is based on an assessment of the various risks inherent in the real estate portfolio. The rating includes an assessment of the quality of the asset portfolio, the capital structure and the fund management process. While the leaflet provides a comprehensive high-level overview of which factors enter the rating, it does not reveal proprietary information on how exactly the rating is calculated, for instance how SCOPE exactly maps funds to a risk

[5] https://www.scopeanalysis.com/classic/resources/downloads/Scope_Analysis_Methodology_AI_OEREF_ENG_2020.pdf

benchmark and what determines the benchmark return. In sum, the information disclosed by SCOPE creates the impression that the rating covers all material aspects of GOEREFs, however, the information stays sufficiently vague to prevent an external analyst from assessing the rating on a detailed procedural level. Thus, the question whether the rating is useful remains an empirical one, which is targeted by this study.

III. HYPOTHESES DEVELOPMENT

Blake and Morey (2000) for the US equity fund market and Füss et al. (2010) for the German mutual fund market analyze whether Morningstar ratings predict future performance. They find that the Morningstar rating is capable of separating out extremely poorly performing funds but is unable to ex-ante differentiate between average and high performers. The Morningstar rating, in contrast to the SCOPE rating that also considers qualitative aspects, is a purely quantitative rating based on past performance. Thus, the question whether Morningstar ratings correlate with future performance is in essence equivalent to the extensively researched question whether fund performance is persistent (Carhart, 1997; Grinblatt and Titman, 1992). The question of whether SCOPE ratings predict future returns of GOEREFs extends further because it resembles a multifaceted analyst assessment of an investment product that is prone to substantial valuation uncertainties and liquidity transformation risks. The first set of hypotheses thus addresses the question whether the SCOPE ratings can predict future returns, and if so, whether their predictive power extends beyond what investors can extract from publicly available sources:

H1a: Scope's GOEREFs rating predicts future funds returns.

H1b: Scope's GOEREFs rating predicts future funds returns beyond readily available public information (e.g., past returns, leverage, fund size, total expense ratio)

While the investment risk of closed-end funds materializes in the volatility of share prices, the permanent redemption option of GOEREFs masks return volatility at the cost of a permanent liquidity risk. If the investor assessment of a fund's net real estate assets falls below its declared NAV, investors have the incentive to redeem their shares, which can deprive the fund of its cash reserves and lead to a temporary

redemption suspension, including fire sales of its assets, or a permanent fund closure and liquidation (Haß et al., 2012; Schweizer et al., 2013). An investment rating that is useful to investors should capture this risk:

H2: Higher ratings correlate with a lower probability of future redemption suspensions.

Traditionally, fund management companies of GOEREFs meet the demand for new investments by issuing shares. They redeem shares when investors demand being paid out. In 2002, local German stock exchanges began trading GOEREF shares and the importance of this secondary market has since increased (Gerlach and Maurer, 2020). This provides a unique setting in which NAVs, which are determined on the basis of real estate valuation techniques such as discounted cash-flow models, can be contrasted against market prices. Market prices, despite being determined by supply and demand, are to some extent coupled to NAVs by the law of one price, at least as long as the funds do not suspend redemptions. Thus, while in equity mutual funds information asymmetries exist mainly with regard to the fund managers' abilities and efforts, in GOEREFs additional information asymmetries exist with regard to the fundamental value of the portfolio assets. Since the latter type of information asymmetry is potentially much more important, the GOEREFs market provides the ideal setting to analyze the role of investment ratings in mitigating information asymmetries between investors and fund managers. If SCOPE ratings convey new relevant information to secondary market investors, if secondary market prices are not perfectly coupled to NAVs, and if investors recognize and interpret this information correctly, the secondary market discount should react to ratings changes as follows:

H3: Rating upgrades (downgrades) decrease (increase) the secondary market discount.

Gerlach and Maurer (2020), Haß et al. (2012), Schnejdar et al. (2020), and Schweizer et al. (2013) provide evidence that in the event of share redemptions secondary market prices decouple from NAVs and trading volumes increase. I conjecture that these decoupled secondary market prices reflect the fair or

fundamental value[6] of net real estate assets on a more timely basis, and thus SCOPE ratings, if they convey new and relevant information, should have a stronger impact on secondary market discounts:

H4: The impact of rating changes on secondary market discounts is stronger when fund redemptions and/or issues are suspended.

An alternative argument for SCOPE ratings having an impact on secondary markets is that, although SCOPE ratings might not convey relevant information, investors believe they do. In that case, the impact on secondary market discount should be observable on the day of the rating announcement and should reverse in the long run. A reversal should also be observable if the changes in discounts anticipate future adjustment to NAVs:

H5: The impact of rating changes on the secondary market discount is temporary and reverses in the long run.

Another metric to measure the relevance of new information is trading volume around the announcement date (Beaver, 1968; Kim and Verrecchia, 1991). In comparison to equities, bonds, and closed-end funds, which trade exclusively on secondary markets, certain peculiarities need to be considered when hypothesizing the impact of ratings changes on secondary market trading volumes of GOEREFs. For retail investors in GOEREFs secondary markets constitute an option to fire-sell their shares if funds suspend redemptions, or in rare situations offer the opportunity to sell shares for a higher price than NAV.[7] From my own experience as a financial advisor for retail clients during the period 2003–2007, I can state that retail investors, based on their agents' advice, typically buy GEOREF shares via primary markets with the intention of holding them for many years but in good faith that redemption is possible at any time without substantial losses. Secondary markets only enter the sphere of attention of retail investors when bad news mounts and funds are at risk of suspending share redemptions. It is thus very likely that in the secondary

[6] Whether or not fair values or fundamental values differ is a complex debate beyond the scope of this paper. A discussion of this topic can be found in Laux and Leuz (2009).

[7] Situations in which the fair value is higher than NAV can occur even for funds that issue shares at NAV because the front load of new shares prevents traders from realizing arbitrage gains.

markets retail investors act as sellers and meet more sophisticated short-term oriented investors who act as buyers. This presumed setting, the existence of which I postulate based purely on my personal anecdotal evidence, has important implications for predicting the impact of rating changes on secondary market trading. First, better ratings will reassure retail investors of the quality of the fund and that their long-term investment will be successful. Lower ratings, however, will let retail investors doubt the quality of the funds and they might look for exit options. These can be redeeming the shares or, if more favorable, selling the shares via the secondary market. Thus, a positive rating surprise should decrease trading volume, whereas a negative surprise should increase secondary market trading volume:

H6: Rating upgrades (downgrades) decrease (increase) secondary market trading volume.

Predicting the impact of rating changes on trading volume is more complex when funds suspend redemptions. In that scenario, GOEREFs become essentially identical to real estate investment trusts. The long-term oriented risk-averse retail investors, who invested in those funds in best faith that there is no return variance and permanent liquidity, become holders of rather volatile stock investments and must decide whether to stick to their investment or fire-sell it via secondary markets. In the unlikely event that a positive rating change occurs for a distressed fund, retail investors might be encouraged to hold onto their shares and sit out the redemption of shares which is perceived to be temporary. Since secondary market trading volume is likely to be driven by the selling offer of retail investors, trading volume will be lower. This contradicts the traditional view of common stock markets, where relevant news irrespective of whether it is positive or negative will lead to a readjustment of individual investors' beliefs, thus portfolio rebalancing, and ultimately an increase in trading volume (Kim and Verrecchia, 1991). The prediction for rating downgrades of funds with suspended redemptions is ambiguous. Retail investors might lose trust in their investments, may even fall victim to panic, and sell their shares at a discount via secondary markets. Alternatively, retail investors might assess the substantial discount which has likely widened due to the negative rating change (see Hypotheses 3 and 4) and conclude that the secondary market price is unattractive, especially since the fund management still publishes NAV values on which the investors might

psychologically anchor. In this scenario, retail investors might experience the "holding losers" part of the disposition effect (Odean, 1998; Shefrin and Statman, 1985; Weber and Welfens, 2008), which describes how the aversion to realizing losses makes investors stick to investments that perform poorly. Due to the ambiguous predictions, I formulate Hypothesis 7 non-directionally:

H7: Rating upgrades/downgrades impact secondary market trading volume differently when fund redemptions are suspended compared to when redemptions are open.

For issue suspensions, the behavioral considerations on retail investors' reactions to rating changes do not apply. Secondary market transactions in funds that issue suspensions are typically driven by sophisticated investors who consciously approach secondary markets to obtain a financial product that is currently unavailable via primary markets. The sellers of these funds do not sell under pressure, as they could also redeem their shares via primary markets. If rating changes represent relevant information, market participants will update their prior beliefs and portfolio rebalancing will increase trading volume. Thus, I anticipate that rating upgrades will decrease trading volume less and rating downgrades will increase trading volume more when issues are suspended:

H8: Rating upgrades (downgrades) decrease (increase) secondary market trading volume less (more) when fund issues are suspended compared to when issues are open.

The German financial regulator reacted to the liquidity crises of several GOEREFs by introducing a general minimum holding period of 24 months and a notice period of 12 months for investments made after 1 January 2013. From 1 January 2013 to 21 July 2013, new investments up to 30,000 euros per half calendar year were still exempted from these redemption restrictions, which likely covered most retail investors' redemption demands until 21 July 2013. Thus, the new regulatory scheme effectively restricted redemptions of investments made after 21 July 2013. Gerlach and Maurer (2020) show that the secondary market's importance increased with this change. I conjecture that under the new regulatory regime, secondary market prices become more disconnected from NAVs and thus reflect the fundamental values on a more timely

basis. Then SCOPE ratings, if considered relevant, should have a stronger impact on secondary market discounts:

H9: The impact of rating changes on secondary market discounts is stronger after the introduction of the minimum holding period in July 2013.

The expectations on the impact of the introduction of the minimum holding period on trading volume are ambiguous for the same reasons as outlined for redemption suspensions. Therefore, I formulate Hypothesis 10 non-directionally:

H10: Rating upgrades/downgrades impact secondary market trading volume differently after the introduction of the minimum holding period in July 2013.

Regulators and academics have raised concerns that the SCOPE ratings themselves serve as a coordinating device that triggers runs on the funds, and thus lead to a self-fulfilling prophecy of fund closures (e.g., Bannier et al., 2008). An empirical research design that is capable of disentangling cause and effect would require control observations of funds with SCOPE ratings that are not publicly disclosed.[8] Since, to the best of my knowledge, such data does not exist, the question of whether SCOPE ratings reveal existing valuation issues, or themselves contribute to liquidity problems and resulting fire sales, is unanswerable. Notwithstanding the unavoidable ambiguity in the interpretation of the results, it is interesting to analyze whether rating changes systematically correlate with share redemptions. I expect that upgrades are associated with subsequent net inflows and downgrades with outflows:

H11: Rating upgrades (downgrades) are associated with a subsequent increase (decrease) in net fund flows.

[8] In an unpublished working paper, Carvalho et al. (2014) claim to have isolated the self-fulfilling prophecy of credit ratings using propensity score matching and a Heckman treatment effects approach. However, I am of the opinion that neither those nor any other known estimation approach alone can achieve that without having additional data on valid and relevant instruments or counterfactuals.

IV. DATA SOURCES

I source rating announcements from SCOPE's website and supplement it with manually collected information on rating announcements from news articles archived in Dow Jones Factiva and from other web sources. The information in news articles is essential because SCOPE stops publishing the ratings of the many distressed or dissolved funds. As described in more detail in Section II, SCOPE issued their first ratings of GOEREFs in September 2004. The last ratings included in the sample of this study are from October 2020. The total sample comprises 409 rating announcements for 49 funds. I ensure that the dataset has no gaps by reconciling the information on rating change direction (initiation / upgrade / affirmation / downgrade) with the rating grades themselves.

I manually source balance sheet data, fund redemption status, fees, and tenancy ratios from annual and semi-annual reports in the German official gazette and from reports directly requested from the fund management companies. For older reports, the official filings often do not contain tenancy ratios and fees, in which case I request the annual reports from the management companies or depository banks to minimize data loss. In panel data specifications, I apply an imputation technique based on multivariate regression to address missing values of control variables. This approach is justified as the interpretation of the coefficients on control variables is secondary to the results obtained for the coefficients on SCOPE ratings. Having the sample reduced due to missing control variables would increase the risk of a type II error (i.e., the SCOPE ratings have informational value, but the sample is too small to capture it).

Further to the annual and semi-annual reports, I obtain daily data on redemption and issue statuses of funds from web and Dow Jones Factiva searches, and reconcile this data with the information provided in Gerlach and Maurer (2020: 78), Schnejdar et al. (2020: 88) and Schnejdar et al. (2021).

I obtain monthly data on net fund flows and fund volume from the fund industry representative body, BVI. Data on primary and secondary market prices and secondary market trading volume comes from Ariva.de. For the funds that merged into other funds I complement the dataset with data from Refinitiv Eikon (formerly Datastream).

V. METHODOLOGY, SAMPLE REDUCTION, DESCRIPTIVE STATISTICS

Portfolio analyses

If SCOPE ratings predict future returns (Hypotheses 1a and 1b), a portfolio composed of funds with higher ratings should outperform a portfolio composed of funds with lower ratings. To test this, I build two portfolios of funds with ratings above and below median ratings. Funds with a rating that equals the median enter both the high and low portfolios.[9] I allow daily rebalancing of the portfolio taking into account the latest rating changes without considering transaction costs. That means I grant the ratings the maximum possible influence on portfolio returns, which minimizes a potential type II error (ratings have predictive power but the empirical design does not capture it). Since some funds trade on both primary and secondary markets, I run the analysis in three different scenarios. In the first scenario, I allow investments in either primary or secondary markets. I assume that investors chose the option with the lowest entry price while considering the front loads that must be paid when investing via primary markets. I carefully consider the issue of investability, which means that for an investment in primary markets the respective fund must issue and redeem[10] shares at that time, and that for an investment in secondary markets prices must be quoted. If the algorithm assumes that an investment occurs in one market, it assumes that the divestment occurs on the next trading day in that same market. Thus, I do not allow for arbitrage trading between primary and secondary markets since due to timing differences the price data from Ariva.de would suggest unreal arbitrage opportunities.[11] In the second and third scenarios I allow only investments in primary and secondary markets, respectively.

[9] Excluding ratings that equal the median rating or assigning them to either the high or low portfolio does not materially change the results.

[10] Redemption is actually not a necessary condition for investability; however, I assume that investors refrain from acquiring shares via primary markets if funds have suspended redemptions. Nonetheless, I allow the acquisition of shares via secondary markets.

[11] Primary market prices are quoted midday while secondary market prices are averages of daily highest and lowest prices, if available, or averages of the first and last daily price, or the latest available price on a trading day (Gerlach and Maurer, 2020: 74).

I form portfolios on each trading day between 14 September 2004 (first SCOPE rating issued) and 30 December 2020 (end of the sample period). I calculate continuously compounded fund and portfolio returns. For secondary markets, returns are trading volume-weighted if trading volume data is available for any of the Berlin, Düsseldorf, Frankfurt, Gettex, Hamburg, Lang & Schwarz, Munich, Stuttgart, or Quotrix exchanges. If no trading volume is available or trading volume is zero but prices are quoted, I consider the simple average of prices across exchanges while excluding Lang & Schwarz since an inspection of prices from Lang & Schwarz has revealed that their quotes often exhibit unreasonably high levels of volatility if not backed by trading volume. Table OA 1 in the online appendix displays the distribution of daily fund return observations across portfolios.

To check whether SCOPE ratings have predictive power beyond return persistence, I repeat the portfolio formation with prior 250-day primary market returns as a substitute for the rating selector, restricting the analysis to funds for which rating data is also available. I use primary market returns because these returns express the fund managements' opinions on the past development of the funds' net asset values. Thus, the prior 250-day primary market returns are not only a measure of past investment performance but also a signal of managers to investors. Finally, I compare the time-series of returns of high and low rating portfolios and high and low prior 250-day return portfolios to each other by calculating annualized differences in mean returns.

Annual panel analyses of ratings and future returns

The portfolio test described in the previous section dichotomizes the rating, i.e., it disregards information that is potentially embedded in rating differentials within the groups of high and low rated funds. Since the sample is not sufficiently broad to allow for finer portfolio sorts, I apply the alternative strategy of correlating ratings with future realized returns within a panel data setting. To that end, I define the cross-sections of fund ratings as the last available rating at the end of June[12] each year and build a panel

[12] About 80% of SCOPE ratings are released during the months April, May, and June, with a maximum of 146 out of 409 releases occurring in June.

dataset by merging these ratings with data from the latest annual report published[13] before the end of June, and with future returns calculated over the following 250 trading days. I also analyze future returns calculated over the 500 and 750 trading days and tabulate the results in the online appendix. To test Hypotheses 1a and 1b, I run variations of the following panel regression model:

$$\begin{aligned} RF250\_PS_{i,t} = {} & \beta_0 + \beta_1 RAT_{i,t} + \beta_2 RL250\_P_{i,t} + \beta_3 LEV_{i,t} + \beta_4 CH_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 TER_{i,t} + \beta_7 TEN_{i,t} \\ & + \beta_8 NF_{i,t} + \beta_9 TV_{i,t} + \beta_{10} INV\_P_{i,t} + \beta_{11} DEV\_P_{i,t} + \beta_{12} CIOR_{i,t} + \beta_{13} EPRA_{i,t} + \beta_{14} AGE_{i,t} \\ & + \beta_{15} AGIO_i + \beta_{16} BS_i + \beta_{17} N\_REDSUS_t + \beta_{18} DivDAX_t + \beta_{19} B1Y_t + \beta_{20} VOL_t + \beta_{21} PolU_t \\ & + \Sigma\, Market\ Fixed\ Effects_i + \Sigma\, Firm\ Fixed\ Effects_i + \Sigma\, Time\ Fixed\ Effects_t + \varepsilon_{i,t} \quad (1) \end{aligned}$$

where *RF250_PS* represents returns measured over the following 250 trading days when investments in primary and secondary markets are allowed. The returns are total returns accounting for distributions to shareholders and share splits. *RAT* is the scope rating, which I re-interpret as a continuous variable, whereas its actual values are discrete and range from 0 to 25. *RL250_P* is prior 250-day primary market fund return. *LEV* is leverage defined as the ratio of total liabilities including provisions to total assets. *CH* is the sum of cash and other short-term assets over total assets. *SIZE* is the natural logarithm of total assets. *TER* is the total expense ratio and *TEN* the tenancy ratio. *NF* is net fund inflows relative to net assets measured over the 12-month time span that ends in March of the year of the respective observation. Thus, I consider a three-month availability lag because BVI data is not immediately publicly available but has to be requested from BVI. *TV* is the average prior 250-day trading volume relative to net assets. *INV_P* (*DEV_P*) is a dummy variable indicating whether issue (redemption) of shares is open. *CIOR* is a dummy variable indicating the special situation where the issue of shares is suspended but redemption is open. This points towards a particularly high demand for new shares which the fund cannot or does not want to meet. *EPRA* is the prior 250-day return of the FTSE EPRA Nareit Germany, Europe, US, or Global index, depending on the target market of the fund. *AGE* is the natural logarithm of years since the fund's inception plus 1.

[13] Filings in the official German gazette provide exact filing dates. For the reports obtained from the fund management companies, I use the later between the auditor's signing date and the document creation date obtained from the meta data of the pdf files.

AGIO is the agio, or front load, in percent paid on new shares' NAVs. *BS* is a dummy variable indicating whether the fund is affiliated with a bigger financial institution. For instance, Deka funds are backed by DekaBank and the Sparkassen (mutual savings institutions) distribution channel, whereas KanAm is not affiliated with any bigger financial institution and its funds are typically distributed via independent financial advisors. *N_REDSUS* is the number of funds that have suspended the redemption of shares. *DivDAX* is the average dividend yield of the companies in the German share price index, DAX30, obtained from Boerse.de. *B1Y* is the yield on German government bonds with a remaining maturity of one year. *VOL* is the VSTOXX volatility index. *PolU* is the Economic Policy Uncertainty Index for Europe issued by the Federal Reserve Bank of St. Louis. Some of the variables in Equation (1) are collinear, which is why I run eight variations of this model with subsets of regressors.

I expect prior 250-day primary market funds returns, *RL_250_P*, to correlate positively with future returns because there is prior evidence of performance persistence in real estate funds in other markets than the German market (Aarts and Baum, 2016; Hahn et al., 2005). In addition, I expect a positive relation for the tenancy ratio, *TEN*, since higher tenancy goes hand in hand with more rental income. I also expect a positive relation for the closed issue and open redemption status, *CIOR*, since funds that suspend the issuance of new shares while maintaining open redemption represent closed clubs in which investors presumably would like to invest but are not allowed to do so. On the other hand, past secondary market trading volume, *TV*, is a proxy for uncertainty and restricted redemption options. Thus, I expect a negative relationship with future returns. I expect *DEV_P* to load positively since funds that are forced to suspend redemptions are likely forced to do so due to poor anticipated profitability and high redemption demands. I expect past returns of target market real estate share indices, *EPRA*, to correlate positively with future GOEREF returns because NAVs do not adjust as timely as stock markets to changes in real estate fair values, thus high (low) past index returns create hidden reserves (liabilities) in GOEREFs that will subsequently materialize in higher (lower) returns. I expect *N_REDSUS* to correlate negatively with future returns since it captures the general level of distress in the GOEREF market.

For other variables, the ex-ante expectations are less clear. For instance, higher leverage (*LEV*), might boost profitability. However, it can backfire in times of crisis, which hit the GOEREF market hard in 2005/2006 and 2009/2010. Similarly, high cash holding (*CH*) might be detrimental to profitability during normal times but serve as a buffer against excessive redemption demands during times of crisis. It is tempting to increase the model fit by interacting these variables with crisis dummies and letting their coefficients vary accordingly. However, this would not be consistent with measuring predictive power since crises are only identifiable retrospectively. An ambiguous prediction also exists for the total expense ratio, *TER*. It is known from prior research on mutual equity funds that costs are a main driver of performance persistence and that high costs are associated with low performance (Carhart, 1997; Gruber, 1996; Otten and Bams, 2002). However, this does not necessarily apply to real estate funds because real estate markets might be less efficient (Ling and Naranjo, 2000; Nelling and Gyourko, 1998), and thus a higher quality of fund management, which might be more expensive, might translate into better fund performance (Ippolito, 1989; Lin and Yung, 2004). Higher net fund flows, *NF*, indicate that a fund was in high demand in the past, which is likely the result of high anticipated future profitability (Downs et al., 2016). However, prior research has shown that fund performance deteriorates with fund size and that this effect is stronger the less liquid the fund assets (Chen et al., 2004; Yan, 2008), and that subsequent returns of US real estate investment trusts are not systematically correlated with past inflows (Ling and Naranjo, 2003, 2006). This also explains why the prediction for the coefficient on *SIZE* is ambiguous. The relationship between fund age, *AGE*, and future returns is also unclear a-priori. While older funds have a proven track record and might have an experienced management team, younger funds might have a more recent real estate portfolio that is better suited to capturing current market trends. Front load (*AGIO*) and bank support (*BS*) also have ambiguous a-priori relationships with future returns. Higher agios can signal quality or simply indicate product design choices of the fund management company, i.e., either charging higher front load or higher operating fees (Houge and Wellman, 2007). Prior research on the relationship between front load and performance of US equity funds provides conflicting evidence (Ippolito, 1989; Morey, 2003). Bank support (*BS*) might provide stability to the fund, which might be beneficial for long-term performance, but also

implies that fund managers are less exposed to the disciplinary mechanisms of the primary fund market. The inclusion of macro-economic control variables *DivDAX*, *B1Y*, *VOL*, and *PolU* follows Schnejdar et al. (2021), with no strong a-priori prediction for the signs of coefficients. Nevertheless, higher general interest and dividend levels (*B1Y* and *DivDAX*) represent opportunity costs that are thus more likely to corelate positively with real estate assets returns.

My initial sample consists of 409 ratings of 49 funds over the period September 2004 to October 2020. The panel data structure, however, consists of 15 cross-sections ranging from June 2005 to June 2019. This implies a data loss of 24 rating observations. 45 further ratings are disregarded because they are not the latest rating available as of the end of June. 18 further observations are disregarded due to missing future 250-day returns. This leaves me with 322 rating observations before considering any data loss due to missing control variables. Table 3 shows that control variables would lead to a further data loss down to a total of 181 available observations if imputation was not applied.

*** insert Table 3 about here ***

Since this paper views the predictive power of SCOPE ratings from an a-priori critical perspective, accepting the data loss due to missing control variables would not be conservative. Therefore, I impute missing control variables using multivariate normal regression in connection with an iterative Markov Chain Monte Carlo method (Gelman et al., 2021; Li, 1988; Tanner and Wong, 1987). In my specification, the data augmentation algorithm creates 10 new datasets in which missing values of control variables are imputed. For instance, *RL_250_P* is missing two times in the 322 observations dataset, which means that it gets imputed 20 times in the 10 imputed datasets. The estimates of parameters in Equation (1) are then the average of the estimated coefficients from the 10 imputed datasets. The standard error of a parameter is calculated based on the standard errors of the coefficient in the imputed datasets and the degree to which the coefficient estimates vary across them, properly accounting for the within and between imputation

variance.[14] Table 4 shows the descriptive statistics for the non-imputed dataset and Table 5 the descriptive statistics for the imputed variables.

*** insert Table 4 about here ***

*** insert Table 5 about here ***

Annual panel analyses of ratings and future redemptions suspensions

To test whether higher (lower) ratings correlate with a lower (higher) probability of future redemption suspensions (Hypothesis 2), I run the following logit regression on annual data, which is similar to Schnejdar et al.'s (2021) specification based on monthly data:[15]

$$\begin{aligned} REDSUS_{i,t} = {} & \beta_0 + \beta_1 RAT_{i,t} + \beta_2 RL250\_P_{i,t} + \beta_3 LEV_{i,t} + \beta_4 CH_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 TER_{i,t} + \beta_7 TEN_{i,t} \\ & + \beta_8 NF_{i,t} + \beta_9 TV_{i,t} + \beta_{10} EPRA_{i,t} + \beta_{11} AGE_{i,t} + \beta_{12} AGIO_i + \beta_{13} BS_i + \beta_{14} N\_REDSUS_t \\ & + \beta_{15} DivDAX_t + \beta_{16} B1Y_t + \beta_{17} VOL_t + \beta_{18} PolU_t + \Sigma\, Market\ Fixed\ Effects_i + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where *REDSUS* is a placeholder for dummy variables *REDSUS250*, *REDSUS500*, *REDSUS750* indicating whether a fund suspends redemptions within 250, 500, or 750 trading days after the end of June in each year. The sample reduction displayed in Table 6 shows that I exclude 62 observations (76 and 91 observations for the 500 and 750-day trading horizons, respectively) for which either the redemption is already suspended at time t or the sample does not extend far enough into the future to fully observe the redemption status over the respective horizon. I apply the imputation technique described in the previous subsection to minimize data loss.

*** insert Table 6 about here ***

[14] I use the Stata command mi impute mvn *control variables* = RF_250_PS, add(10) to perform the imputations.

[15] The specification in this paper deviates from the one in Schnejdar et al. (2021) in two regards: 1) It uses leverage instead of change in leverage. I also tested the change in leverage and the results do not qualitatively differ. The change in leverage is closely related to prior fund flows (*NF*). However, I intend to capture financing risk rather than momentum in fund flows. 2) It does not yet include the share of institutional investors since at the time of writing this draft I did not have access to this data. I plan to enrich my dataset with data from the Deutsche Bundesbank Securities Holdings Statistics (SHS-Base plus), which can only be accessed on site and allows constructing firm-year measures of retail and institutional investments in GOEREFs.

In Equation (2), I expect *LEV* to load positively because higher leverage makes a fund more vulnerable to liquidity crises. *N_REDSUS* captures potential spillover effects from other fund closures and should thus also load positively (Schnejdar et al., 2021). I expect bank support, *BS*, to load negatively because large banks supported their funds during the times of crisis by either buying shares or mobilizing their retail distribution channels.

Daily event study of secondary market discounts and trading volume around rating changes

To test whether rating upgrades (downgrades) decrease (increase) the secondary market discount (Hypothesis 3), I apply the event study methodology (MacKinlay, 1997). I split the sample by the sign of the rating change and measure to which extent secondary market returns deviate from primary market returns during the time period 20 days before to 20 days after the announcement. To that end, I define *ABHRSP* as the average differential buy-and-hold return between secondary and primary market returns:

$$ABHRSP\,[\tau_1;\,\tau_2] \;=\; \frac{\sum_{i=1}^{N}\left[\prod_{t=\tau_1}^{t=\tau_2}\left(1+R\_S_{i,t}\right) - \prod_{t=\tau_1}^{t=\tau_2}\left(1+R\_P_{i,t}\right)\right]}{N} \tag{3}$$

where *R_S* and *R_P* are the secondary and primary market returns, respectively. τ_1 and τ_2 are the boundaries of the period over which the metric is calculated, e.g., −20 to +20 days around the event day. N is the total number of funds in the sample and i the index of the individual fund. To test the statistical significance of *ABHRSP*, I apply the bootstrapped skewness-adjusted t-statistic of Lyon et al. (1999).[16]

To test whether secondary market discount changes depend on fund status (redemptions or issues are suspended; Hypothesis 4) and/or the introduction of the minimum holding period of 24 months in July 2013 (Hypothesis 9), I run variations of the following cross-sectional models:

[16] I execute all event studies and calculate the respective test statistics with the user-written command *eventstudy2* (Kaspereit, 2021).

$$BHRSP_i[\tau_1; \tau_2] = \beta_0 + \beta_1 \Delta RAT_{i,t} + \beta_2 RED\_CLOSED_{i,t} + \beta_3 ISS\_CLOSED_{i,t} + \beta_4 AFTER\_MIN_{i,t} + \beta_5 \Delta RAT_{i,t} \times RED\_CLOSED_{i,t} + \beta_6 \Delta RAT_{i,t} \times ISS\_CLOSED_{i,t} + \beta_7 \Delta RAT_{i,t} \times AFTER\_MIN_{i,t} + \varepsilon_{i,t} \quad (4)$$

where *BHRSP* is the individual differential buy-and-hold return between secondary and primary market returns (see the term in the square brackets in the numerator of Equation (3)). ΔRAT is the change in rating, *RED_CLOSED* and *ISS_CLOSED* are dummy variables indicating whether redemption and/or issue is suspended at the time the rating change is announced. *AFTER_MIN* is a dummy variable indicating whether the rating change is announced after 22 July 2013. The coefficients of research interest are β_5, β_6, (Hypothesis 4), and β_7 (Hypothesis 9).

If rating changes induce only a temporary difference between primary and secondary market prices (Hypothesis 5), *BHRSP*s around the announcement date should correlate negatively with *BHRSP*s measured over a longer horizon after the announcement. To test this, I run the following cross-sectional models:

$$BHRSP_i[+21; +200] = \beta_0 + \beta_1 BHRSP_i[\tau_1; \tau_2] + \varepsilon_{i,t} \quad (5)$$

where $BHRSP_i[\tau_1; \tau_2]$ is either $BHRSP_i[-1_1; +1]$ or $BHRSP_i[-20_1; +20]$. I test the coefficient estimate β_1 both against the null hypothesis that is 0 and 1 since a value of 1 would imply a full reversal over the 180 trading days after the event period.

Table 7 displays the sample reduction for the event study and cross-sectional analyses. Most notably, I exclude 23 events from the analyses because the funds in question change their redemption or issue status during the event window of 20 trading days around the rating announcement. In my analysis of rating events, those changes in fund status represent confounding events, which themselves have a profound impact on secondary market prices (Gerlach and Maurer, 2020; Schnejdar et al., 2020), and thus the observations in question have to be excluded. I exclude a further 28 events because they have less than 10 secondary market return observations during the 41-day event window. Table 8 shows descriptive statistics for the variables in the cross-sectional analyses.

*** insert Table 7 about here ***

*** insert Table 8 about here ***

To test whether rating upgrades (downgrades) decrease (increase) secondary market trading volume (Hypothesis 6), I adopt the approach outlined in Karafiath (2009) and define cumulative average abnormal trading volume as follows:

$$CAATV\,[\tau_1;\,\tau_2] \;=\; \sum_{t=\tau_1}^{t=\tau_2}\left[\sum_{i=1}^{N}\left(\frac{ATV_{i,t}}{N}\right)\right] \tag{6}$$

where *ATV* is a fund's abnormal trading volume, measured from an index model that during the estimation window of −200 to −21 days relative to the event window regresses[17] fund-specific secondary market trading volume on the average daily turnover of all funds (see Equations (1)-(4) in Karafiath (2009); *ATV* in my setting is equivalent to *CPE* in Karafiath's (2009) Equation (4)).[18] To test the statistical significance of *CAATV*, I apply the crude dependence statistic (Brown and Warner, 1980).

To test whether individual secondary market price cumulative abnormal trading volume depends on fund status (redemption or issue are suspended; Hypotheses 7 and 8) and/or the introduction of the minimum holding period of 24 months in July 2013 (Hypothesis 10), I run variations of the following cross-sectional models:

$$\begin{aligned} CATV_i[\tau_1;\,\tau_2] \;=\;& \beta_0 + \beta_1 \Delta RAT_{i,t} + \beta_2 DOWN_{i,t} + \beta_3 \Delta RAT_{i,t} \times DOWN_{i,t} \\ &+ \beta_4 RED\_CLOSED_{i,t} + \beta_5 ISS\_CLOSED_{i,t} + \beta_6 AFTER\_MIN_{i,t} \\ &+ \beta_7 \Delta RAT_{i,t} \times RED\_CLOSED_{i,t} + \beta_8 \Delta RAT_{i,t} \times RED\_CLOSED_{i,t} \times DOWN_{,t} \\ &+ \beta_9 \Delta RAT_{i,t} \times ISS\_CLOSED_{i,t} + \beta_{10} \Delta RAT_{i,t} \times ISS\_CLOSED_{i,t} \times DOWN_{,t} \\ &+ \beta_{11} \Delta RAT_{i,t} \times AFTER\_MIN_{i,t} + \beta_{12} \Delta RAT_{i,t} \times AFTER\_MIN_{i,t} \times DOWN_{,t} + \varepsilon_{i,t} \end{aligned} \tag{7}$$

[17] In addition to applying ordinary least square estimation, I also test a GARCH(1,1) model, which does not materially change any results.

[18] In my setting, Karafiath's (2009) variable V_{it} is the overall secondary market trading volume in euro currency across all exchanges where the fund i is traded on day t. I obtain S_{it} from the BVI dataset, which provides fund volumes on a monthly basis. I apply a linear interpolation to transform this monthly data to a daily frequency. Using the latest available fund volumes does not materially change any results.

where *CATV* is fund i's cumulative abnormal trading volume, $\sum_{t=\tau_1}^{t=\tau_2} ATV_{i,t}$. ΔRAT is the change in rating, *DOWN* is a dummy variable indicating whether the rating change is negative, and *RED_CLOSED* and *ISS_CLOSED* are dummy variables indicating whether redemption and/or issue are suspended at the time of the rating announcement. *AFTER_MIN* is a dummy variable indicating whether the rating change is announced after 22 July 2013. The coefficients of research interest are β_1 and $\beta_{7-}\beta_{12}$. Nevertheless, including the term $\Delta RAT \times DOWN$ is important as it allows the marginal effect of a rating change to vary between upgrades and downgrades. Cumulative abnormal trading volume, other than secondary market discounts, is a non-signed metric and could be either similarly or differently influenced by upgrades and downgrades, which is captured by β_3. This is a more flexible way of testing whether the absolute value of the rating change, i.e., the overall news content, correlates with abnormal trading volume.[19] I include all constitutive terms for econometric reasons (Brambor et al., 2006). Table 7 displays the sample reduction, Table 9 the descriptive statistics.

*** insert Table 9 about here ***

Monthly event study of net fund flows after rating changes

To test whether fund redemptions react to rating changes, I apply the event study methodology to the monthly BVI data of net fund flows. I calculate cumulative average abnormal net flows, *CAANF*, around rating upgrades, affirmations, and downgrading according to:

$$CAANF\,[\mu_1; \mu_2] \;=\; \sum_{m=\mu_1}^{m=\mu_2} \left[\sum_{i=1}^{N} \left(\frac{ANF_{i,m}}{N} \right) \right] \tag{8}$$

where *ANF* is fund i's individual abnormal net flow (in percent of net assets) during month m. Based on a model similar to the one in Del Guercio and Tkac (2008: 916), I estimate abnormal net flows with a monthly index model that regresses individual net flows on the average net flows of all funds in the BVI dataset,

[19] Prior research has shown that trading volume increases both around credit rating downgrades and upgrades and that the effect is stronger the greater the change in the rating (Chae, 2005; Parnes, 2008). Whether this also applies to GOEREFs, for which secondary market trading volume interplays with primary market redemptions and issues, is an open empirical question that I address with this empirical specification.

one-month lagged net fund flow, one-month lagged primary market fund return, and a dummy variable indicating whether the one-month lagged primary market fund return is negative. The estimation period spans the 24 months ending one month prior to the event month, i.e., [−25; −2] relative to the event month. I restrict the sample selection to funds whose redemptions and issues are open in the month before and during the month of the rating announcement because redemption and issue suspensions constrain potential impacts of rating changes on net fund flows. If a fund changes its redemption or issue status later during the event period, I set the abnormal net flow to zero for the months in question. I require all funds that enter the sample to have at least 12 months of non-missing net flows during the estimation period and at least 3 months of non-missing net flows during the event window. Table 10 displays the sample reduction.

*** insert Table 10 about here ***

VI. RESULTS

Portfolio analyses

Figure 1 shows three graphs, each containing the average cumulated returns of four portfolios. The first graph shows portfolio returns when primary and secondary market investments are allowed, the second graph shows portfolio returns when only primary market investments are allowed, and the third graph shows portfolio returns when only secondary market investments are allowed. In all graphs, the solid black line shows the returns of the portfolio that consists of funds with SCOPE ratings above median. In the first graph, the total return of the high rating portfolio over the period 15 September 2004 to 31 December 2020 is +36.4 percent. This contrasts to a −21.2 percent return of the low rating portfolio, which is represented by the dashed black line. Thus, by investing in high rated funds, investors could have realized a substantially higher and positive return (shorting of GOEREF shares, to the best of my knowledge, is not feasible). This indicates a high relevance of SCOPE ratings for investors (Hypothesis 1a). However, an even more pronounced return spread can be observed when the prior 250-day market return serves as the selection criterion. The high rating portfolio exhibits a return of +57.9 percent, the low rating portfolio a return of

−37.9 percent. This speaks against Hypothesis 1b, which states that the SCOPE rating has more predictive power than a simple momentum strategy. Very similar patterns emerge in the second and third graphs, which restrict the investment opportunities to primary and secondary market effects, respectively.

*** insert Figure 1 about here ***

Table 11 contains a statistical analysis of the portfolio returns. Panel A shows the annualized average differential returns, both between high and low rating portfolios and high and low prior 250-day primary market return portfolios. In addition, it shows the difference between these two differential returns. This latter secondary degree differential return measures the excess predictive power of the SCOPE rating over the prior 250-day return selection criterion. For the entire sample period, the difference in differential returns is −2.278 percent (statistically significant at the 5 percent level). Panel B (primary market investments only) and Panel C (secondary market investments only) show statistically significant differences of −1.159 and −2.399 percent, respectively. These results point clearly towards a better predictive power of a split based on median prior 250-day primary market returns compared to a split based on median SCOPE ratings (evidence against Hypothesis 1b). The same result is observable if the sample is restricted to the period after the introduction of the minimum holding period in July 2013, after which SCOPE ratings appear to have entirely lost their predictive power for future returns (low rated funds perform on average 0.750 percent better than high rated funds).

*** insert Table 11 about here ***

Annual panel analyses of ratings and future returns

The results in Column (1) of Table 12 show that SCOPE ratings correlate positively with future 250-day returns if no other control variables enter the regression. However, the inclusion of prior 250-day primary market fund returns in Column (2) lets the coefficient on *RAT* become statistically insignificant, whereas the coefficient on *RL250_P* is highly significant. The more comprehensive specification with control variables and/or time and firm fixed effects in Columns (3) to (8) confirm this result. Prior 250-day

returns have a consistently positive relationship with future returns, whereas ratings do not correlate or, in Columns (5) and (7), even correlate negatively with future returns. These results confirm the results from the analyses of the portfolio returns that SCOPE ratings have predictive power for future returns but not beyond publicly available alternative predictors.

*** insert Table 12 about here ***

From the control variables, *DEV_P* loads consistently and positively on future returns, which indicates that buying distressed funds that have suspended redemptions is not a profitable strategy. In Columns (5) and (7), the total expense ratio, *TER*, has statistically negative coefficient estimates, which is consistent with the notion that fees are detrimental to performance. Prior year net flows, *NF*, tend to correlate positively with future returns (Columns (6) and (8)), which points towards a certain level of investor awareness of return persistence. Contrary to my expectations, the special situation in which funds suspend their issue but maintain open redemptions, captured by dummy variable *CIOR*, is negatively correlated with future returns. The number of funds with suspended redemptions, *N_REDSUS*, correlates negatively with future returns (Columns (7) and (8)).

Results tabulated in the online appendix (Table OA 2 to Table OA 9) show a very similar pattern as those reported in Table 12 when future 500 or 750-day returns serve as dependent variables, and when investments are restricted to either primary or secondary markets.

Annual panel analyses of ratings and future redemption suspensions

The logit regression results in Table 13 support Hypothesis 2 that higher ratings correlate with a lower probability of future redemption suspensions. The coefficient on *RAT* is negative and statistically significant for all time horizons. For the 250-day horizon, the odds ratio of redemption suspension to non-suspension decreases by (1-EXP(-0.231)) ≈ 20.6 percent per unit increase in the SCOPE rating. For instance, if a fund has an a-priori probability of a redemption suspension of 34/278 ≈ 12.2 percent, which is the share of funds that suspended redemptions over the 250-day horizon in my panel dataset, the odds

ratio of a redemption is 34 : 244 ≈ 0.14. A one unit increase in the SCOPE rating will decrease the odds ratio to 0.14 x (1-0.206) ≈ 0.11, which translates into a new redemption probability of about 9.7 percent. This drop in the redemption probability from 12.2 to 9.7 percent per rating notch is economically significant, considering that ratings are on a 26-notch scale.

*** insert Table 13 about here ***

From the control variables, fund size loads positively, which indicates greater vulnerability of bigger funds to excessive redemption demands. This appears reasonable as bigger funds are more difficult to maneuver and fire sales more difficult to realize. Fund age, on the other hand, is negatively related to redemption suspension probability, potentially due to an established track record shielding funds from excessive redemption demands during times of crisis. Bank support has a strong negative correlation with the probability of redemption suspension, which is consistent with banks like DekaBank and Commerzbank supporting their funds by buying shares or by mobilizing their retail distribution channels. From the macro-economic variables, the number of funds that have suspended redemptions, dividend yields, and interest levels correlate positively with redemption suspension probability.

Daily event study of secondary market discounts and trading volume around rating changes

Figure 2 and Table 14 display the results of the event study analyses of rating change announcements. For the 75 rating downgrades, the secondary market discounts on average widen to −1.88 percentage points, which is statistically and economically significant, considering the normally low return-variance profile of GOEREFs. For the 61 affirmations and 71 upgrades, no noteworthy reactions are observable. The reaction to downgrades already starts approximately 18 days before the event day, which is consistent with an event date identification that is not always exact but relies, among other things, on archived newspaper articles from weekly magazines. Further, it is reasonable to assume that SCOPE provides its ratings earlier to their paying institutional clients. The cumulative abnormal secondary market trading volume increases for downgrades and decreases for upgrades, which is consistent with higher (lower) ratings indicating higher

(lower) intrinsic values of GOEREFs' shares, making investment via the primary markets instead of secondary markets more (less) attractive. These results support Hypotheses 3 and 6.

*** insert Figure 2 about here ***

*** insert Table 14 about here ***

The results of the cross-sectional analyses displayed in Table 15 provide further support for the hypothesis that rating changes impact secondary market discounts since the coefficient on the rating changes, ΔRAT, is positive in the second, fifth and sixth columns. Over the [−20;+20] window, a one notch increase in the rating goes hand in hand with approximately half a percentage point decrease in discount.

When rating changes are interacted with redemption and issues status in the third and fourth columns, the coefficients on rating changes turn negative but the coefficients on the interaction terms $\Delta RAT \times RED\_CLOSED$ and $\Delta RAT \times ISS\_CLOSED$ are significantly positive. This implies that the overall negative impact of rating changes on discounts is driven by funds which suspended their redemptions and/or issue of shares (Hypothesis 4). For instance, the results in the fourth column indicate that a one notch rating change for a fund that suspended redemptions is associated with a (−0.0002 + 0.0025) = 0.0023, i.e., 0.23 percentage points, decrease in cumulated discount over the [−20;+20] window. For funds that suspended issuing shares, all else being equal, the effect of a one notch rating increase on discount is (−0.0002 + 0.0065) = 0.0043, i.e., 0.43 percentage points. These are economically reasonable effect sizes, considering that SCOPE ratings are on a 26-notch scale with one letter rating class spanning eight to nine notches. Thus, for a fund whose share redemptions are concurrently suspended, a full rating class downgrade, for instance from AA+ to BB+, results in the discount widening by 2.3 percentage points over the [−20;+20] window.

*** insert Table 15 about here ***

The fifth to eighth columns in Table 15 address the question whether the introduction of the minimum holding period in July 2013 has had an impact on the relevance of rating changes to secondary market discounts (Hypothesis 9). The coefficient on the interaction term $\Delta RAT \times AFTER\_MIN$ is consistently

negative (statistically significant in 3 out of 4 specifications). This speaks in favor of a lower relevance of ratings after the introduction of a minimum holding period, and thus against the direction in which I formulated Hypothesis 9. The introduction of the minimum holding period effectively transformed GOEREFs into semi-open funds, thus making them more similar to funds that suspend the redemption of shares, which is why I initially anticipated stronger effects of rating changes on secondary market prices. However, the introduction of a minimum holding period might also have achieved its aim to reduce the risks of runs on the funds, thus reducing the risk that investors excessively redeem shares because they anticipate that others will do the same. According to my results, this latter effect appears to be stronger than the increase in the relevance of ratings for secondary market prices due to the redemption restrictions.

The ninth and tenth columns in Table 15 correlate short-term changes in the secondary market discounts around rating announcements to the evolution of discounts over the longer term post-event period [−21;+200]. The coefficients are −0.6278 and −0.2395, respectively, and are statistically different from both 0 and −1. These results imply that the impact of rating changes on secondary market discounts partially reverses over the 180 trading days after the event (Hypothesis 5).

Table 16 displays the results of the cross-sectional analyses of cumulative abnormal trading volume. The previous result that the cumulative abnormal secondary market trading volume increases for downgrades and decreases for upgrades (see Table 14) translates into statistically non-significant negative estimates of β_1 and $(\beta_1 + \beta_3)$ in the first two specifications.

*** insert Table 16 about here ***

The results in the third and fourth columns of Table 16 indicate a decreasing effect of rating improvements on trading volume but no increasing effect of rating deteriorations when redemptions are suspended. The marginal effect of rating downgrades on trading volume for funds with suspended redemption equals the sum of coefficients β_7 and β_8, which tends to be positive (statistically significant in the eighth and ninth columns). The statistically significant positive coefficient β_8 offsets the negative coefficient β_7. I interpret this result as evidence for a combination of the “holding losers” (Odean, 1998;

Shefrin and Statman, 1985; Weber and Welfens, 2008) and "holding not so bad losers" effect, which is to the best of my knowledge unique to the GOEREF market, where in the past long-term retail investors with a strong liquidity preference got suddenly surprised by holding a closed-end fund, which could only be sold in rather thin markets to presumably more sophisticated buyers (Hypothesis 7).

The results in the third, fourth, seventh and eighth columns provide limited support for Hypothesis 8. For rating downgrades, stronger downgrades correlate with higher abnormal trading volume in the [−1;+1] window when issues are suspended (the sums of coefficients β_9 and β_{10} are statistically significant at the 10 percent level). The results in the fifth to eighth columns provide no statistical evidence for any impact of the introduction of the minimum holding period on the correlation between rating changes and trading volume (Hypothesis 10 not supported).

Monthly event study of net fund flows after rating changes

The results visualized in the left part of Figure 3 are surprising since they contradict Hypothesis 11. Over the 12 months after the event, cumulative average abnormal net fund flows are positive for downgrades and negative for upgrades. These results are confirmed by the statistical analyses of sub-periods in Table 17. However, the right part of Figure 3 provides additional information which is essential for the correct interpretation of the results. It complements the cumulative average abnormal net fund flows with the number of funds that suspend the redemption of shares. These funds can no longer enter the calculation of fund flows. At the end of the 12-month post-event period, six funds in the group of downgraded funds have suspended redemptions, while only two of the upgraded funds have suspended redemptions. Thus, over time the metric *CAANF* suffers from a potentially severe, uncorrectable, and asymmetric (upgrades vs. downgrades) survivorship bias. Funds which experience the most severe net outflows drop out of its calculation. Thus, my results can neither confirm nor reject the notion that the SCOPE ratings themselves triggered substantial outflows in the sense of a self-fulfilling hypothesis.

*** insert Figure 3 about here ***

*** insert Table 17 about here ***

VII. CONCLUSION

This study shows that SCOPE ratings of GOEREFs perform comparatively poorly in predicting future returns but excel in identifying funds that have a higher risk of redemption suspension (liquidity risk). Secondary markets recognize the information content of the ratings and react significantly to rating announcements. The reactions are more pronounced when funds have priorly suspended redemptions and/or issues. The regulatory measure of introducing a minimum holding period of 24 months has decreased the relevance of the ratings for secondary market participants. When funds suspend redemptions, secondary market trading volume decreases with rating upgrades and downgrades, for which I provide a behavioral interpretation in the sense of a combination of the "holding losers" (Odean, 1998; Shefrin and Statman, 1985; Weber and Welfens, 2008) and "holding not so bad losers" effects, which results from the specific situation in which risk-averse retail investors get surprised by holding an asset with higher risk than expected.

This paper, using a German sample, has important implications for other markets. For instance, the Financial Conduct Authority in the UK is discussing the introduction of a notice period of between 90 and 180 days for UK open-end real estate funds to "reduce the potential harm to investors from the liquidity match in open-end property funds"[20]. Similar discussions are ongoing for French open-end real estate funds (Schoeffler, 2020). The results in this study show that investment ratings can provide relevant information on the risk of redemption suspensions. This information can act as a substitute to mandatory minimum holding and notice periods. If investors with a strong liquidity preference can learn about liquidity risks via ratings, they can avoid high risk funds. This would decrease the need for long minimum holding periods and allow the regulator to refrain from eliminating the benefits that arise from a permanent individual redemption option. Thus, whereas in their early days investment ratings of GOEREFs were considered a

[20] https://www.fca.org.uk/news/statements/fca-statement-work-liquidity-mismatch-authorised-open-ended-property-funds

source of liquidity problems (Bannier et al., 2008; ECB, 2006), my results suggest considering them as part of the solution to the liquidity transformation problem of open-end real estate funds.

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Table 1 SCOPE ratings – translation to numerical values

Rating	Numerical value	Rating	Numerical value	Rating	Numerical value	Rating	Numerical value
AAA	25	BBB+	18	CCC+	9	D	0
AA+	24	BBB	17	CCC	8		
AA	23	BBB-	16	CCC-	7		
AA-	22	BB+	15	CC+	6		
A+	21	BB	14	CC	5		
A	20	BB-	13	CC-	4		
A-	19	B+	12	C+	3		
		B	11	C	2		
		B-	10	C-	1		

Table 2 Sample funds, ratings, and redemption/issue status

Name	ISIN	Ratings (2004–2020)			Date of first rating	Date of last rating	Earliest suspension dates		Status as of 12/31/2020	
		Number	Lowest	Highest			Redemption	Issue	Redemption	Issue
Haus-Invest Global	DE0002544731	5	16	22	04/26/2006	05/11/2010	-	-	Redemption open	Issue open
KanAm Grundinvest Fonds	DE0006791809	10	11	18	09/15/2004	05/18/2011	01/19/2006	06/03/2005	Depository control	Depository control
KanAm US-Grundinvest Fonds	DE0006791817	6	13	17	01/16/2006	05/11/2010	01/17/2006	10/01/2010	Notice of liquidation	Notice of liquidation
Leading Cities Invest	DE0006791825	6	20	21	06/11/2015	06/16/2020	-	-	Redemption open	Cash call
Deka-ImmobilienGlobal	DE0007483612	18	5	23	09/15/2004	06/16/2020	-	-	Redemption open	Issue open
DEGI International	DE0008007998	6	0	20	04/26/2006	05/18/2011	10/31/2008	11/17/2009	Depository control	Depository control
UBS (D) Euroinvest Immobilien I-dist	DE0009772616	14	2	20	09/05/2004	06/16/2020	-	04/12/2006	Redemption open	Issue suspended
UBS (D) 3 Sector Real Estate Europe	DE0009772681	8	2	19	04/14/2005	05/15/2012	09/05/2012	10/31/2008	Depository control	Depository control
Aachener Grund-Fonds Nr.1	DE0009800003	1	10	10	09/15/2004	09/15/2004	-	-	Redemption open	Issue open
WestInvest 1	DE0009801407	7	13	20	09/15/2004	02/19/2009	-	-	Redemption open	Issue open
WestInvest InterSelect	DE0009801423	18	14	23	09/15/2004	06/16/2020	-	-	Redemption open	Issue open
WestInvest ImmoValue	DE0009801431	14	21	25	04/26/2006	06/05/2019	-	-	Redemption open	Issue open
WestInvest TargetSelect Logistics	DE0009801449	7	23	23	08/12/2013	06/05/2019	-	-	Redemption open	Issue open
WestInvest TargetSelect Hotel	DE0009801456	7	23	24	08/12/2013	06/05/2019	-	-	Redemption open	Issue open
WestInvest TargetSelect Shopping	DE0009801464	7	22	24	08/12/2013	06/05/2019	-	-	Redemption open	Issue open
SEB ImmoInvest P	DE0009802306	9	15	19	09/15/2004	05/18/2011	03/01/2012	10/29/2008	Depository control	Depository control
SEB ImmoPortfolio TRF	DE0009802314	9	3	23	04/26/2006	06/11/2014	06/13/2012	06/05/2014	Depository control	Depository control
Credit Suisse Euroreal A EUR	DE0009805002	8	11	18	09/15/2004	05/18/2011	10/30/2008	05/21/2012	Depository control	Depository control
CS-WV ImmoFonds	DE0009805010	4	0	6	09/15/2004	05/08/2008	06/30/2016	06/30/2016	Notice of liquidation	Notice of liquidation
UniImmo: Deutschland	DE0009805507	17	15	23	09/15/2004	06/16/2020	-	05/17/2007	Redemption open	Issue suspended
UniImmo: Europa	DE0009805515	18	17	23	09/15/2004	06/16/2020	-	10/02/2009	Redemption open	Issue suspended
UniInstitutional European Real Estate	DE0009805549	14	20	23	04/26/2006	06/16/2020	-	07/23/2012	Redemption open	Issue suspended
UniImmo: Global	DE0009805556	15	11	23	04/26/2006	06/16/2020	-	-	Redemption open	Issue open
DEFO IMMOBILIEN	DE0009805705	1	10	10	09/15/2004	09/15/2004	-	-	Redemption open	Issue open
Grundbesitz Europa RC	DE0009807008	18	17	24	09/15/2004	06/16/2020	-	-	Redemption open	Issue open
HausInvest	DE0009807016	18	19	23	09/15/2004	06/16/2020	-	-	Redemption open	Issue open
Grundbesitz Global RC	DE0009807057	17	13	23	09/15/2004	06/16/2020	-	-	Redemption open	Issue open
Grundbesitz Fokus Deutschland RC	DE0009807081	3	20	22	06/12/2018	06/16/2020	-	06/05/2015	Redemption open	Issue suspended
DEGI Europa	DE0009807800	8	11	18	09/15/2004	05/11/2010	10/31/2008	11/17/2009	Depository control	Depository control
Deka-ImmobilienFonds	DE0009809509	7	6	20	09/15/2004	02/19/2009	-	-	Redemption open	Issue open
Deka-ImmobilienEuropa	DE0009809566	19	17	22	09/15/2004	06/16/2020	-	06/10/2019	Redemption open	Issue suspended
HansaImmobilia	DE0009817700	10	2	19	09/15/2004	05/15/2012	08/23/2012	08/23/2012	Notice of liquidation	Notice of liquidation
III FONDS NR 1	DE0009820001	1	3	3	09/15/2004	09/15/2004	-	-	Redemption open	Issue open
Euro ImmoProfil	DE0009820019	8	0	16	09/15/2004	05/11/2010	-	-	Redemption open	Issue open
INTER ImmoProfil	DE0009820068	12	6	20	09/15/2004	06/11/2014	-	-	Redemption open	Issue open
AXA Immoselect	DE0009846451	9	4	17	09/15/2004	05/18/2011	10/28/2008	04/27/2011	Depository control	Depository control
KanAm Spezial grundinvest Fonds	DE000A0CARS0	2	17	17	04/15/2013	06/06/2013	02/02/2012	12/16/2013	Depository control	Depository control
TMW Immobilien Weltfonds P	DE000A0DJ328	5	11	24	05/08/2007	05/18/2011	10/28/2008	05/07/2007	Depository control	Depository control
DEGI GLOBAL BUSINESS	DE000A0ETSR6	3	0	22	05/08/2008	05/11/2010	11/11/2009	08/18/2011	Depository control	Depository control
Morgan Stanley P2 Value	DE000A0F6G89	3	0	20	05/08/2008	05/11/2010	10/30/2008	07/13/2009	Depository control	Depository control
DEGI German Business	DE000A0J3TP7	4	0	22	02/19/2009	05/15/2012	11/29/2010	11/22/2012	Depository control	Depository control
Fokus Wohnen Deutschland	DE000A12BSB8	4	20	22	04/06/2017	06/16/2020	-	-	Redemption open	Cash call
WERTGRUND WohnSelect D	DE000A1CUAY0	7	19	25	06/06/2013	06/16/2020	-	02/28/2018	Redemption open	Cash stop
UniInstitutional German Real Estate	DE000A1J16Q1	6	20	22	06/11/2015	06/16/2020	-	-	Redemption open	Issue open
Swiss Life REF (DE) European Real Estate	DE000A2ATC31	4	21	21	11/28/2018	06/16/2020	-	-	Redemption open	Issue open
Commerz Real Institutional Hotel Fund	DE000A2DHSK4	3	17	22	01/14/2019	10/13/2020	-	-	Redemption open	Issue open
KGAL immoSUBSTANZ	DE000A2H9BS6	3	18	19	09/13/2019	10/28/2020	-	-	Redemption open	Issue open
Deka ImmobilienStrategieInstitutionell	DE000DK0LL42	4	22	23	06/08/2016	06/05/2019	-	-	Redemption open	Issue open
Deka-ImmobilienNordamerika	DE000DK0LLA6	2	19	20	06/20/2017	06/12/2018	-	-	Redemption open	Issue open

Table 3 Sample reduction for panel analyses of future 250-day returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All ratings in sample period	409	409	409	409	409	409	409	409
− Outside 06/2005−06/2019	24	24	24	24	24	24	24	24
− Not the latest rating as of June	45	45	45	45	45	45	45	45
− n/a future return	18	18	18	18	18	18	18	18
= Sample before control variables	322	322	322	322	322	322	322	322
− n/a lagged prim. market return	n/a	2	n/a	2	2	2	2	2
− n/a balance sheet data	n/a	n/a	n/a	n/a	25	25	25	25
− n/a total expense ratio	n/a	n/a	n/a	n/a	19	19	19	19
− n/a net flow data	n/a	n/a	n/a	n/a	25	25	25	25
− n/a trading volume	n/a	n/a	n/a	n/a	48	48	48	48
− n/a tenancy ratio	n/a	n/a	n/a	n/a	20	20	20	20
= Final sample (before imputation)	322	320	322	320	183	183	183	183
= Final sample (after imputation)	322	322	322	322	322	322	322	322

This table shows the sample reduction for eight specifications of Equation (1): (1) univariate regression of future returns on ratings, (2) regression of future returns on ratings and prior 250-day primary market fund returns, (3) regression of future returns on ratings and firm and time fixed effects, (4) regression of future returns on ratings, prior 250-day primary market fund returns and firm and time fixed effects, (5) regression of future returns on ratings, prior 250-day primary market fund returns, firm and time fixed effects, and any of the regressors that are not collinear with firm and time fixed effects, (6) regression of future returns on ratings, prior 250-day primary market fund returns, time fixed effects, and any of the regressors that are not collinear with time fixed effects, which encompasses market fixed effects, (7) regression of future returns on ratings, prior 250-day primary market fund returns, firm fixed effects, and any of the regressors that are not collinear with firm fixed effects, and (8) regression of future returns on ratings, prior 250-day primary market fund returns, only market fixed effects, and the full set of control variables.

Table 4 Descriptive statistics for panel analyses of future 250-day returns (non-imputed)

Variable	Obs.	Mean	Sd.	Min.	25th	Med.	75th	Max.
RF250_PS	322	0.006	0.095	-0.540	0.000	0.026	0.044	0.421
RAT	322	18.320	5.014	0.000	16.000	20.000	22.000	25.000
RL250_P	320	0.005	0.006	-0.055	0.004	0.006	0.008	0.031
LEV	297	0.191	0.093	0.000	0.128	0.182	0.239	0.464
CH	297	0.253	0.103	0.001	0.186	0.245	0.322	0.745
SIZE	297	21.572	1.301	17.499	20.703	21.791	22.607	23.668
TER	277	0.802	0.237	0.000	0.660	0.790	0.950	1.660
TEN	243	0.935	0.046	0.650	0.908	0.944	0.968	1.000
NF	277	0.119	0.364	-0.720	-0.045	0.049	0.171	2.526
TV	217	0.010	0.036	0.000	0.001	0.003	0.006	0.483
INV_P	322	0.839	0.369	0.000	1.000	1.000	1.000	1.000
DEV_P	322	0.925	0.263	0.000	1.000	1.000	1.000	1.000
CIOR	322	0.137	0.344	0.000	0.000	0.000	0.000	1.000
EPRA	322	0.032	0.223	-0.485	-0.069	0.069	0.187	0.808
AGE	322	2.521	0.807	0.673	1.898	2.471	3.098	3.989
AGIO	322	0.048	0.014	0.000	0.050	0.050	0.055	0.060
BS	322	0.848	0.360	0.000	1.000	1.000	1.000	1.000
N_REDSUS	322	2.031	3.152	0.000	0.000	0.000	3.000	9.000
DivDAX	322	2.897	1.005	1.700	2.200	2.500	3.700	5.300
B1Y	322	1.257	1.910	-0.700	-0.270	0.290	3.380	4.600
VOL	322	0.219	0.067	0.124	0.169	0.216	0.261	0.343
PolU	322	1.660	0.877	0.608	1.064	1.683	2.055	4.333

RF250_PS represents fund returns over the following 250 trading days when investments in primary and secondary markets allowed. *RAT* is the Scope rating ranging from 0 to 25. *RL250_P* is prior 250-day primary market funds returns. *LEV* is leverage defined as the ratio of total liabilities including provisions over total assets. *CH* is the sum of cash and other short-term assets over total assets. *SIZE* is the natural logarithm of total assets. *TER* is the total expense ratio and *TEN* the tenancy ratio. *NF* is net fund inflows relative to net assets measured during the 12-month time span that ends in March. *TV* is the average prior 250-day trading volume relative to net assets, multiplied by 100. *INV_P* (*DEV_P*) is a dummy variable indicating whether issuance (redemption) of shares is open. *CIOR* is a dummy variable indicating that the issuance of shares is suspended but redemption is open. *EPRA* is the prior 250-day return of the FTSE EPRA Nareit Germany, Europe, US, or Global index, depending on the target market of the fund. *AGE* is the natural logarithm of years since the fund's inception plus one. *AGIO* is the agio or front load in percent. *BS* is a dummy variable indicating whether the fund is affiliated with a bigger financial institution. *N_REDSUS* is the number of funds that have suspended the redemption of shares. *DivDAX* is the average dividend yield of the German share price index, DAX30. *B1Y* the yield on German government bonds with a remaining maturity of one year. *VOL* is the VSTOXX volatility index. *PolU* is the Economic Policy Uncertainty Index for Europe issued by the Federal Reserve Bank of St. Louis.

Table 5 Descriptive statistics for panel analyses of future 250-day returns (imputed observations)

Variable	Obs.	Mean	Sd.	Min.	25th	Med.	75th	Max.
RL250_P	20	0.009	0.006	-0.001	0.005	0.008	0.012	0.024
LEV	250	0.086	0.066	0.000	0.032	0.079	0.129	0.286
CH	250	0.272	0.105	-0.048	0.197	0.275	0.342	0.545
SIZE	250	20.810	0.897	18.899	20.179	20.643	21.236	23.919
TER	450	0.616	0.225	0.000	0.459	0.603	0.759	1.319
TEN	790	0.937	0.045	0.781	0.909	0.942	0.967	1.085
NF	450	0.245	0.351	-0.589	-0.030	0.247	0.468	1.628
TV	1050	0.027	0.036	0.000	0.000	0.008	0.045	0.166

This table shows descriptive statistics for imputed values of missing control variable observations in the panel analyses of future 250-day returns. As displayed in Table 3, the variable *RL250_P* has missing values in 2 occurrences. Since the imputation algorithm creates 10 new datasets with imputed values of missing observations, this table shows 20 observations of *RL250_P*. The imputations are based on multivariate normal regressions in connection with an iterative Markov Chain Monte Carlo method (Gelman et al., 2021; Li, 1988; Tanner and Wong, 1987).

Table 6 Sample reduction for the analyses of future redemption suspensions

	REDSUS250	*REDSUS500*	*REDSUS750*
All ratings in sample period	409	409	409
− Outside 06/2005−06/2019	24	24	24
− Not the latest rating as of June	45	45	45
− Redemption already suspended or no future redemption status observable	62	76	91
= Sample before control variables	278	264	249
− n/a lagged primary market return	2	2	2
− n/a balance sheet data	25	21	18
− n/a total expense ratio	20	20	20
− n/a net flow data	21	20	18
− n/a trading volume	55	53	50
− n/a tenancy ratio	19	19	19
= Final sample (before imputation)	136	129	122
= Final sample (after imputation)	278	264	249

Table 7 Sample reduction for the event study analyses of secondary market discounts and trading volume

	(A)BHRSP	*C(A)ATV*
All ratings in sample period	409	409
− Funds with no secondary market data at all	108	108
− Exact event date not identifiable	13	13
− Rating change cannot be calculated	30	30
− Confounding events during event period	23	23
− Insufficient secondary market data around the event	28	38
= Final sample	207	197

Table 8 Descriptive statistics for cross-sectional analyses with *BHRSP* as dependent variable

Variable	Obs.	Mean	Sd.	Min.	25th	Med.	75th	Max.
BHRSP[−1,+1]	207	0.000	0.013	-0.159	-0.001	0.000	0.002	0.042
BHRSP[−20,+20]	207	-0.007	0.036	-0.308	-0.005	0.000	0.004	0.047
BHRSP[+21,+200]	207	-0.007	0.049	-0.216	-0.012	-0.001	0.011	0.151
Δ*RAT*	207	-0.309	3.491	-22.000	-1.000	0.000	1.000	15.000
RED_CLOSED	207	0.092	0.289	0.000	0.000	0.000	0.000	1.000
ISS_CLOSED	207	0.164	0.371	0.000	0.000	0.000	0.000	1.000
AFTER_MIN	207	0.304	0.461	0.000	0.000	0.000	1.000	1.000
Δ*RAT* × *RED_CLOSED*	207	-0.406	2.445	-22.000	0.000	0.000	0.000	5.000
Δ*RAT* × *ISS_CLOSED*	207	-0.222	2.315	-20.000	0.000	0.000	0.000	15.000
Δ*RAT* × *AFTER_MIN*	207	0.159	1.178	-2.000	0.000	0.000	0.000	15.000

BHRSP is the funds' individual differential return between secondary and primary market buy-and-hold returns. Δ*RAT* is the change in rating. *RED_CLOSED* and *ISS_CLOSED* are dummy variables indicating whether redemptions and/or issues were suspended at the time the rating change was announced. *AFTER_MIN* is a dummy variable indicating whether the rating change was announced after 22 July 2013.

Table 9 Descriptive statistics for cross-sectional analyses with *CATV* as dependent variable

Variable	Obs.	Mean	Sd.	Min.	25th	Med.	75th	Max.
CATV[−1,+1]	197	-0.052	4.646	-15.924	-1.766	0.122	1.539	18.754
CATV[−20,+20]	197	-1.366	31.797	-110.029	-15.763	-4.452	13.014	124.265
Δ*RAT*	197	-0.289	3.071	-20.000	-1.000	0.000	1.000	15.000
DOWN	197	0.376	0.486	0.000	0.000	0.000	1.000	1.000
Δ*RAT* × *DOWN*	197	-1.046	2.266	-20.000	-1.000	0.000	0.000	0.000
RED_CLOSED	197	0.071	0.258	0.000	0.000	0.000	0.000	1.000
ISS_CLOSED	197	0.198	0.399	0.000	0.000	0.000	0.000	1.000
AFTER_MIN	197	0.371	0.484	0.000	0.000	0.000	1.000	1.000
Δ*RAT* × *RED_CLOSED*	197	-0.345	1.917	-20.000	0.000	0.000	0.000	2.000
Δ*RAT* × *RED_CLOSED* × *DOWN*	197	-0.355	1.910	-20.000	0.000	0.000	0.000	0.000
Δ*RAT* × *ISS_CLOSED*	197	-0.264	2.382	-20.000	0.000	0.000	0.000	15.000
Δ*RAT* × *ISS_CLOSED* × *DOWN*	197	-0.437	2.011	-20.000	0.000	0.000	0.000	0.000
Δ*RAT* × *AFTER_MIN*	197	0.096	1.284	-4.000	0.000	0.000	0.000	15.000
Δ*RAT* × *AFTER_MIN* × *DOWN*	197	-0.127	0.494	-4.000	0.000	0.000	0.000	0.000

CATV is a fund's cumulative abnormal trading volume (see Equation (4)). *DOWN* is a dummy variable indicating whether the rating change is negative. The other variables are as defined in Table 8.

Table 10 Sample reduction for the event study analyses of net fund flows

All ratings in sample period	409
− Funds with no net flow data at all	31
− Exact event date not identifiable	17
− Rating change cannot be calculated	42
− Change in redemption or issue status during the event month	14
− Redemption suspended at the beginning of the event month	23
− Issue suspended at the beginning of the event month	49
− Insufficient net flow data (min. 3 (12) months during event (estimation) window)	37
= Final sample (34 distinct funds)	196

Figure 1 Returns of portfolios formed on the basis of SCOPE ratings vs. returns of portfolios formed on the basis of prior 250-day primary market returns

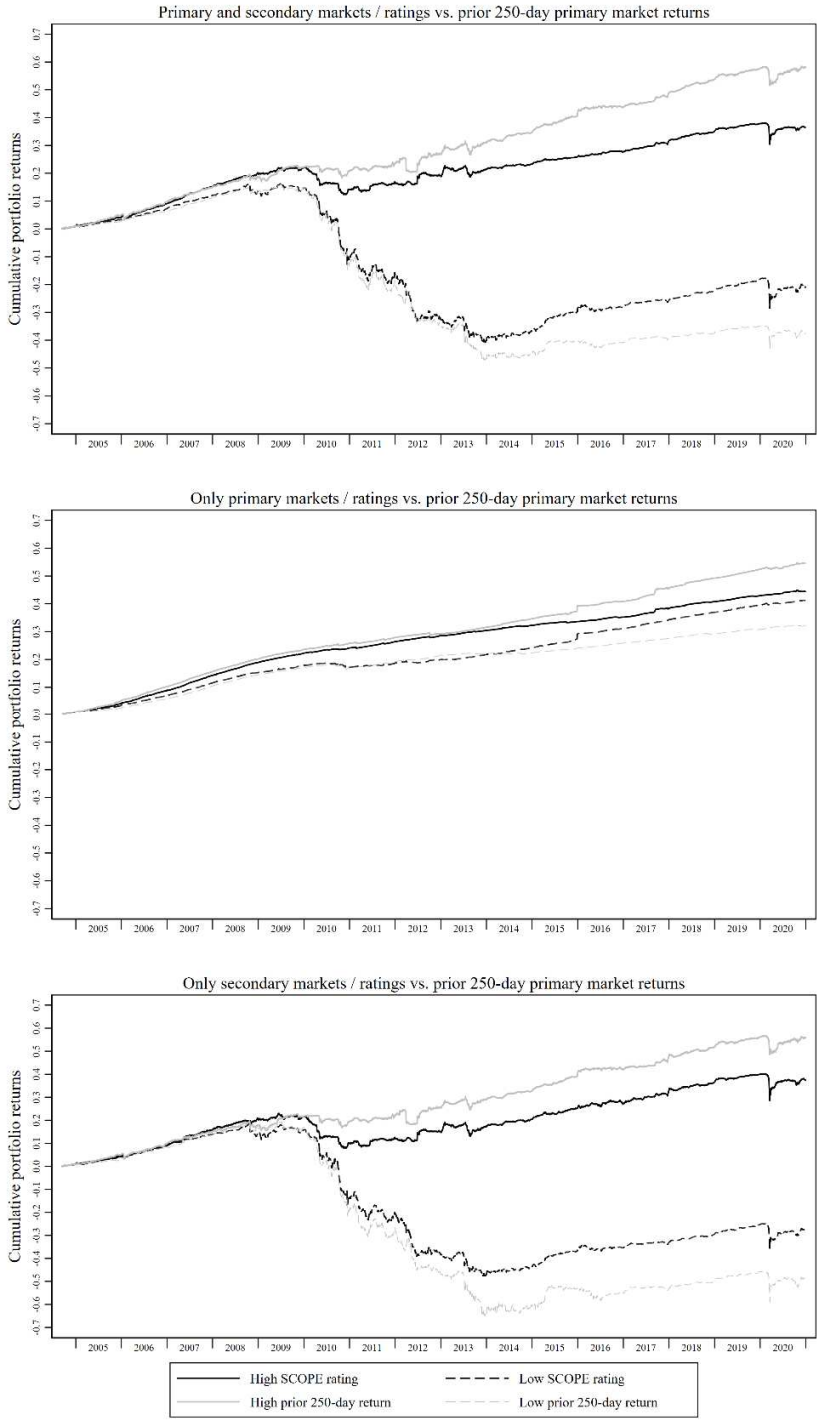


Table 11 Annualized average daily return differentials of portfolios formed on the basis of SCOPE ratings vs. returns of portfolios formed on the basis of prior 250-day primary market returns

		15 Sep 04 – 30 Dec 20	22 Jul 13 – 30 Dec 20
Panel A:	Mean (High – Low | RATING)	3.425	0.016
Primary or secondary market	Mean (High – Low | $NAV\_RET_{[-250;-1]}$)	5.704	3.285
	Mean (Δ(High – Low))	**-2.278****	**-3.268*****
	t-statistic (Mean (Δ(High – Low)))	-2.228	-2.718
	Number of observations	4.199	1.911
Panel B:	Mean (High – Low | RATING)	0.193	-0.750
Primary market	Mean (High – Low | $NAV\_RET_{[-250;-1]}$)	1.352	1.903
	Mean (Δ(High – Low))	**-1.159*****	**-2.654*****
	t-statistic (Mean (Δ(High – Low)))	-3.768	-4.472
	Number of observations	4.199	1.911
Panel C:	Mean (High – Low | RATING)	3.911	0.761
Secondary market	Mean (High – Low | $NAV\_RET_{[-250;-1]}$)	6.309	3.178
	Mean (Δ(High – Low))	**-2.399***	**-2.417**
	t-statistic (Mean (Δ(High – Low)))	-1.835	-1.475
	Number of observations	4.199	1.911

Mean (High – Low | RATING) is the annualized average differential return between a portfolio that consists of funds with a SCOPE rating above median and a portfolio of funds with a rating below median (equal-weighted, daily rebalancing). Mean (High – Low | $NAV\_RET_{[-250;-1]}$) is the equivalent of that differential portfolio return when prior 250-day return is used as a selection criterion. The table shows annualized averages of continuously compounded returns (average logarithmic returns multiplied by 250). Mean (Δ(High – Low)) is the average difference between the returns of the (High – Low | RATING) and the (High – Low | $NAV\_RET_{[-250;-1]}$) portfolio returns. The sample comprises only those observations for which both ratings and prior 250-day primary returns are available. Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

Table 12 Results of panel analyses of future 250-day returns (missing control variables imputed)

	Dependent variable: *RF250_PS*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.077**	-0.050	0.054	0.097*	-0.288	-0.049	-0.194	-0.091
	(0.037)	(0.031)	(0.060)	(0.056)	(0.246)	(0.153)	(0.258)	(0.157)
RAT	**0.005****	**0.001**	**0.000**	**-0.005**	**-0.007****	**-0.002**	**-0.007****	**-0.002**
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
RL250_P		5.844***		5.619***	5.127***	5.259***	5.136***	5.278***
		(0.869)		(1.446)	(1.192)	(1.216)	(1.130)	(1.193)
LEV					-0.106	0.130	-0.043	0.159
					(0.106)	(0.089)	(0.105)	(0.096)
CH					0.130**	0.052	0.102*	0.059
					(0.060)	(0.038)	(0.062)	(0.037)
SIZE					0.013	-0.005	0.015	-0.002
					(0.013)	(0.005)	(0.014)	(0.005)
TER					-0.050*	-0.024	-0.062**	-0.031
					(0.028)	(0.022)	(0.029)	(0.020)
TEN					0.104	0.114	-0.018	0.044
					(0.182)	(0.137)	(0.170)	(0.134)
NF					0.024	0.022*	0.023	0.025**
					(0.016)	(0.012)	(0.015)	(0.011)
TV					-0.373*	-0.263*	-0.225	-0.158
					(0.197)	(0.153)	(0.164)	(0.128)
INV_P					-0.095	-0.082	-0.105	-0.096
					(0.058)	(0.067)	(0.064)	(0.073)
DEV_P					0.139***	0.146***	0.143***	0.153***
					(0.034)	(0.045)	(0.037)	(0.047)
CIOR					-0.112*	-0.122*	-0.126*	-0.138*
					(0.061)	(0.072)	(0.067)	(0.079)
EPRA					-0.149	-0.155*	0.005	0.016
					(0.092)	(0.092)	(0.029)	(0.029)
AGE					0.044	0.015	-0.021	0.010
					(0.030)	(0.009)	(0.018)	(0.009)
AGIO						-0.308		-0.252
						(0.387)		(0.424)
BS						0.021		0.022
						(0.021)		(0.022)
N_REDSUS							-0.011***	-0.012***
							(0.004)	(0.004)
DivDAX							0.014	0.011
							(0.014)	(0.013)
B1Y							0.001	-0.002
							(0.005)	(0.005)
VOL							0.084	0.045
							(0.071)	(0.071)
PolU							0.002	0.003
							(0.008)	(0.009)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.054	0.164	0.379	0.431	0.537	0.469	0.491	0.430
Obs.	322	322	322	322	322	322	322	322

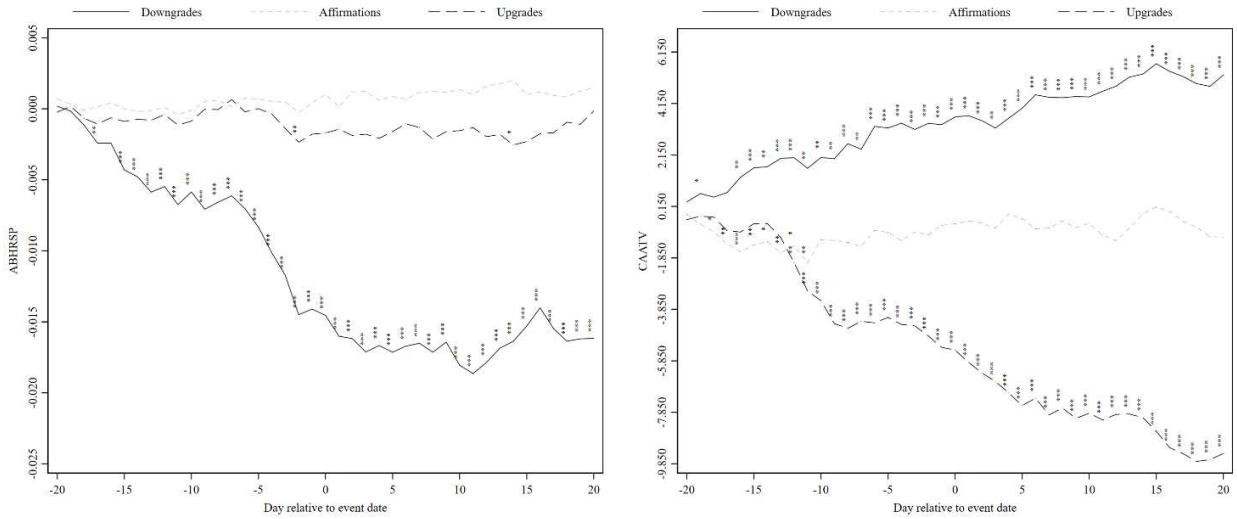
This table shows results for variations of regression specifications in accordance with Equation (1). Variables are defined as in Table 4. Robust standard errors are displayed in parentheses. Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

Table 13 Results of panel analyses of future redemption suspensions (missing control variables imputed)

	REDSUS250	*REDSUS500*	*REDSUS750*
Intercept	-31.900**	-36.596**	-16.573
	(13.272)	(16.079)	(10.225)
RAT	-0.231**	-0.290**	-0.192**
	(0.093)	(0.115)	(0.095)
RL250_P	-71.323	-51.271	-101.869
	(80.575)	(120.706)	(124.797)
LEV	7.916	8.015	9.687*
	(4.826)	(5.903)	(5.571)
CH	-2.082	1.061	2.919
	(4.604)	(4.505)	(4.068)
SIZE	1.605***	1.599***	1.690***
	(0.518)	(0.557)	(0.521)
TER	1.546	0.554	1.409
	(2.144)	(2.359)	(2.525)
TEN	-3.503	-5.967	-20.496*
	(9.220)	(14.398)	(10.664)
NF	-1.526	-0.218	0.516
	(1.417)	(1.249)	(1.143)
TV	-3.723	-10.023	-2.786
	(14.755)	(19.422)	(13.265)
EPRA	-2.505	1.976	1.219
	(2.254)	(2.310)	(2.150)
AGE	-1.796**	-2.028**	-2.409***
	(0.735)	(0.852)	(0.806)
AGIO	-37.737	-55.782	-46.163
	(28.712)	(38.999)	(38.103)
BS	-2.496***	-4.082***	-5.957***
	(0.889)	(1.195)	(1.715)
N_REDSUS	0.391*	0.687**	0.363
	(0.232)	(0.303)	(0.227)
DivDAX	0.391*	0.687**	0.363
	(0.232)	(0.303)	(0.227)
B1Y	0.273	2.904***	1.358
	(0.945)	(1.113)	(0.863)
VOL	0.924	3.163***	1.673**
	(0.760)	(1.086)	(0.716)
PolU	10.475	-16.367	3.056
	(10.751)	(12.613)	(9.703)
Market FE	YES	YES	YES
Pseudo R^2	0.542	0.604	0.609
REDSUS = 1	34	43	53
Obs.	278	264	249

This table shows results for variations of logit regression specifications in accordance with Equation (2). *REDSUS* is a dummy variable taking a value of 1 if a fund suspends redemption of shares in the future 250, 500, or 750 days. Other variables are defined as in Table 4. Robust standard errors are displayed in parentheses. Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

Figure 2 Average buy-and-hold secondary market discounts (*ABHRSP*) and cumulative average abnormal trading volume (*CAATV*) around rating announcements



Asterisks denote statistical significance at the 10 percent $(*)$, 5 percent $\binom{*}{*}$, and 1 percent $\binom{*}{*}_{*}$, levels.

Table 14 Average cumulated buy-and-hold secondary market discounts and abnormal trading volume around rating announcements

	Downgrades		Affirmations		Upgrades		Downgrades		Affirmations		Upgrades	
	Obs.	*ABHRSP*	Obs.	*ABHRSP*	Obs.	*ABHRSP*	Obs.	*CAATV*	Obs.	*CAATV*	Obs.	*CAATV*
[0;0]	75	-0.0011	61	0.0005	71	0.0000	74	0.2984	60	0.0619	63	-0.1006
		(-0.90)		(1.13)		(0.03)		(1.19)		(0.25)		(-0.38)
[−1;+1]	75	-0.0012	61	0.0002	71	0.0009*	74	0.3008	60	0.5374	63	-1.0267**
		(-0.67)		(0.32)		(1.89)		(0.69)		(1.23)		(-2.27)
[−2;+2]	75	-0.0044**	61	0.0005	71	-0.0006	74	0.3419	60	0.3417	63	-1.8231***
		(-2.07)		(0.59)		(-0.91)		(0.61)		(0.61)		(-3.12)
[−5;+5]	75	-0.0113***	61	0.0008	71	-0.0010	74	0.7027	60	0.4522	63	-3.2154***
		(-4.57)		(0.85)		(-1.13)		(0.85)		(0.54)		(-3.71)
[−10;+10]	75	-0.0128***	61	0.0006	71	0.0001	74	2.7732**	60	1.5302	63	-4.7515***
		(-4.29)		(0.42)		(-0.02)		(2.42)		(1.32)		(-3.97)
[−20;+20]	75	-0.0188***	61	0.0003	71	-0.0009	74	5.2562***	60	-1.0396	63	-9.4546***
		(-4.03)		(0.16)		(-0.59)		(3.28)		(-0.64)		(-5.65)
[−20;-6]	75	-0.0084***	61	0.0000	71	-0.0008	74	3.2610***	60	-0.7802	63	-4.3721***
		(-4.04)		(-0.02)		(-0.85)		(3.37)		(-0.80)		(-4.32)
[−5;-2]	75	-0.0083***	61	-0.0006	71	-0.0015*	74	0.1161	60	-0.1695	63	-0.5104
		(-4.90)		(-1.22)		(-1.83)		(0.23)		(-0.34)		(-0.98)
[+2;+5]	75	-0.0018	61	0.0012**	71	-0.0004	74	0.2857	60	0.0843	63	-1.6782***
		(-1.31)		(2.06)		(-0.55)		(0.57)		(0.17)		(-3.21)
[6;20]	75	0.0004	61	-0.0005	71	0.0009	74	1.2925	60	-0.7115	63	-1.8672*
		(0.11)		(-0.54)		(0.99)		(1.33)		(-0.73)		(-1.84)

This table shows the results of an event study on rating change announcements. *ABHRSP* is the average differential return between secondary and primary market buy-and-hold returns (see Equation (3)). *CAATV* is the cumulative average abnormal trading volume (see Equation (4)). Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

Table 15 Results of the cross-sectional regressions of buy-and-hold secondary market discounts around rating change announcements

	Dependent variable: *BHRSP*									
	[−1,+1]	[−20,+20]	[−1,+1]	[−20,+20]	[−1,+1]	[−20,+20]	[−1,+1]	[−20,+20]	[+21,+200]	[+21,+200]
	0.0004	-0.0055**	0.0011	-0.0001	0.0006	-0.0057**	0.0012	0.0000	-0.0073**	-0.0089***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)	(0.003)	(0.003)
Δ*RAT*	0.0014	0.0049***	-0.0010***	-0.0002	0.0016***	0.0053***	-0.0007**	0.0006		
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)		
RED_CLOSED			0.0046	-0.0279***			0.0043	-0.0284***		
			(0.003)	(0.008)			(0.003)	(0.008)		
ISS_CLOSED			-0.0016	-0.0122**			-0.0004	-0.0085		
			(0.002)	(0.005)			(0.002)	(0.005)		
AFTER_MIN					-0.0001	0.0032	-0.0001	0.0007		
					(0.002)	(0.005)	(0.002)	(0.004)		
Δ*RAT* × *RED_CLOSED*			0.0025***	0.0025**			0.0021***	0.0011		
			(0.000)	(0.001)			(0.000)	(0.001)		
Δ*RAT* × *ISS_CLOSED*			0.0029***	0.0065***			0.0033***	0.0078***		
			(0.000)	(0.001)			(0.000)	(0.001)		
Δ*RAT* × *AFTER_MIN*					-0.0013	-0.0042**	-0.0017**	-0.0057***		
					(0.001)	(0.002)	(0.001)	(0.002)		
BHRSP[−1,+1]									-0.6278**	
									(0.255)	
F-Statistic H_0: Coef. = -1									2.1372***	
BHRSP[−20,+20]										-0.2395**
										(0.093)
F-Statistic H_0: Coef. = -1										66.3576***
Adj. R^2	0.134	0.223	0.402	0.444	0.137	0.232	0.411	0.460	0.024	0.026
Obs.	207	207	207	207	207	207	207	207	207	207

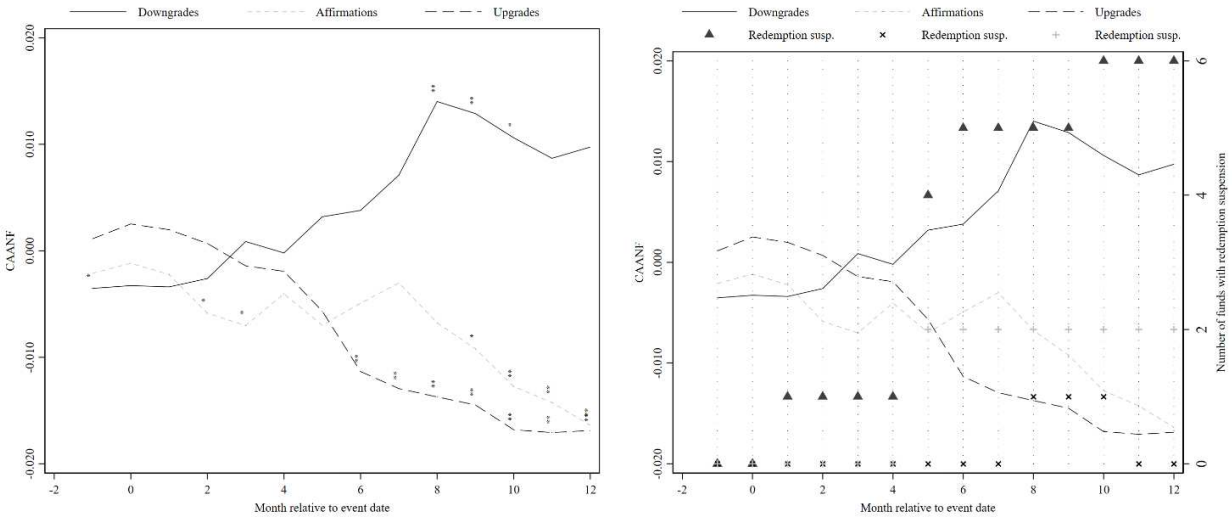
Variables are defined as in Table 8. Robust standard errors are displayed in parentheses. Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

Table 16 Results of the cross-sectional regressions of cumulative abnormal trading volume around rating change announcements

Coef.	Variable	Dependent variable: *CATV*							
		[−1,+1]	[−20,+20]	[−1,+1]	[−20,+20]	[−1,+1]	[−20,+20]	[−1,+1]	[−20,+20]
		-0.2009	-4.1921	-0.4894	-3.6866	-0.8090	-3.5384	-0.7510	-3.8229
		(0.409)	(3.357)	(0.545)	(3.773)	(0.748)	(5.051)	(0.736)	(5.084)
β_1	Δ*RAT*	-0.0519	-0.9557	0.0558	-1.7217	0.0267	-2.4618	0.0775	-2.0551
		(0.158)	(1.468)	(0.303)	(2.097)	(0.324)	(2.186)	(0.331)	(2.288)
β_2	*DOWN*	0.2764	8.2335	0.2935	0.4166	0.8931	9.1768	0.6822	2.0721
		(0.599)	(6.054)	(1.099)	(7.601)	(1.050)	(7.097)	(1.215)	(8.399)
β_3	Δ*RAT* × *DOWN*	-0.0291	0.5193	0.1279	-1.1077	-0.1179	2.1343	0.0910	-0.7677
		(0.198)	(1.922)	(0.510)	(3.526)	(0.380)	(2.567)	(0.536)	(3.701)
$\beta_1 + \beta_3$	Sum of coefficients	*-0.0809*	*-0.4364*	*0.1837*	*-2.8295*	*-0.0912*	*-0.3275*	*0.1685*	*-2.8228*
	F-Statistic H_0: $\beta_1 + \beta_3 = 0$	*(0.295)*	*(0.124)*	*(0.215)*	*(1.065)*	*(0.241)*	*(0.068)*	*(0.178)*	*(1.044)*
β_4	*RED_CLOSED*			1.9175	20.6090			1.7406	18.2673
				(2.138)	(14.792)			(2.184)	(15.092)
β_5	*ISS_CLOSED*			1.9011*	2.5358			1.9903*	4.7767
				(1.062)	(7.346)			(1.150)	(7.946)
β_6	*AFTER_MIN*					1.1346	0.0830	0.3773	-0.9902
						(0.950)	(6.421)	(0.992)	(6.859)
β_7	Δ*RAT* × *RED_CLOSED*			-6.2449**	-34.1683*			-5.7761**	-30.5877*
				(2.541)	(17.579)			(2.586)	(17.870)
β_8	Δ*RAT* × *RED_CLOSED* × *DOWN*			7.0087**	41.8082**			6.5344**	37.9087**
				(2.708)	(18.737)			(2.755)	(19.040)
$\beta_7 + \beta_8$	Sum of coefficients			*0.7638*	*7.6399***	*0.8358*	*3.8832*	*0.7583*	*7.3210***
	F-Statistic H_0: $\beta_7 + \beta_8 = 0$			*(2.599)*	*(5.432)*	*(0.988)*	*(0.467)*	*(2.483)*	*(4.844)*
β_9	Δ*RAT* × *ISS_CLOSED*			-0.2356	1.4410			-0.5514	-1.6877
				(0.410)	(2.838)			(0.596)	(4.117)
β_{10}	Δ*RAT* × *ISS_CLOSED* × *DOWN*			-0.5436	-4.5429			-0.2033	-0.9860
				(0.650)	(4.494)			(0.816)	(5.641)
$\beta_9 + \beta_{10}$	Sum of coefficients			-0.7793*	-3.1020			-0.7548*	-2.6736
	F-Statistic H_0: $\beta_9 + \beta_{10} = 0$			(3.316)	(1.098)			(3.002)	(0.789)
β_{11}	Δ*RAT* × *AFTER_MIN*					-0.0358	3.1658	0.3553	4.0821
						(0.438)	(2.962)	(0.607)	(4.195)
β_{12}	Δ*RAT* × *AFTER_MIN* × *DOWN*					0.8716	0.7174	0.2939	-0.3686
						(1.044)	(7.053)	(1.147)	(7.929)
$\beta_{11} + \beta_{12}$	Sum of coefficients							*0.6493*	*3.7135*
	F-Statistic H_0: $\beta_{11} + \beta_{12} = 0$							*(0.608)*	*(0.416)*
	Adj. R^2	-0.011	0.014	0.049	0.028	-0.016	0.010	0.041	0.021
	Obs.	197	197	197	197	197	197	197	197

Variables are defined as in Table 9. Robust standard errors or F-statistics are displayed in parentheses. Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels.

Figure 3 Cumulative average abnormal net fund flows (*CAANF*) around rating announcements



Asterisks denote statistical significance at the 10 percent $(*)$, 5 percent $\binom{*}{*}$, and 1 percent $\begin{pmatrix}*\\*\\*\end{pmatrix}$, levels.

Table 17 Cumulative abnormal net fund flows around rating announcements

	Downgrades		Affirmations		Upgrades	
	Obs.	*CAANF*	Obs.	*CAANF*	Obs.	*CAANF*
[−1;-1]	65	-0.0035*	60	-0.0021	71	0.0011
		(-2.02)		(-1.37)		(0.62)
[0;0]	65	0.0003	60	0.0009	71	0.0014
		(0.15)		(0.61)		(0.76)
[0;+1]	65	0.0001	60	-0.0001	71	0.0008
		(0.06)		(-0.05)		(0.33)
[0;+2]	65	0.0009	60	-0.0038	71	-0.0004
		(0.30)		(-1.41)		(-0.14)
[−1;+1]	65	-0.0034	60	-0.0022	71	0.0020
		(-1.12)		(-0.83)		(0.62)
[−1;+5]	65	0.0032	60	-0.0070	71	-0.0057
		(0.69)		(-1.72)		(-1.17)
[−1;+12]	65	0.0097	60	-0.0164**	71	-0.0169**
		(1.49)		(-2.85)		(-2.46)
[+1;+5]	65	0.0065	60	-0.0058	71	-0.0082*
		(1.65)		(-1.69)		(-2.00)
[+1;+12]	65	0.0130**	60	-0.0152**	71	-0.0194***
		(2.15)		(-2.86)		(-3.05)
[+5;+12]	65	0.0099*	60	-0.0123**	71	-0.0150***
		(2.01)		(-2.84)		(-2.88)

This table shows the results of a monthly event study on rating change announcements. *CAANF* is the cumulative average abnormal net fund flow (see Equation (8)). Asterisks denote statistical significance at the 10 percent (*), 5 percent (**), and 1 percent (***) levels

ONLINE APPENDIX

The relevance of ratings for investors of (semi-)open-end real estate funds: Evidence from Germany

Table OA 1 Distribution of daily fund return observations across portfolios formed on the basis of SCOPE ratings and portfolios formed on the basis of prior 250-day primary market returns

		Primary or secondary markets				Primary markets				Secondary markets			
		Rating		Prior 250-day primary market returns		Rating		Prior 250-day primary market returns		Rating		Prior 250-day primary market returns	
Name	ISIN	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Haus-Invest Global	DE0002544731	1.046	365	758	391	1.046	365	758	391	0	0	0	0
KanAm Grundinvest Fonds	DE0006791809	1.185	1.571	1.376	753	78	363	413	0	1.185	1.571	1.376	753
KanAm US-Grundinvest Fonds	DE0006791817	0	1.635	902	733	0	663	663	0	0	1.635	902	733
Leading Cities Invest	DE0006791825	904	1.428	1.305	123	311	531	524	7	904	1.428	1.305	123
Deka-ImmobilienGlobal	DE0007483612	2.306	2.646	2.914	1.285	2.306	2.646	2.914	1.285	2.306	2.646	2.914	1.285
DEGI International	DE0008007998	434	1.822	560	1.262	314	860	324	536	434	1.822	560	1.262
UBS (D) Euroinvest Immobilien I-dist	DE0009772616	788	2.819	2.530	649	0	411	411	0	788	2.819	2.530	649
UBS (D) 3 Sector Real Estate Europe	DE0009772681	803	2.076	834	1.511	645	895	741	423	803	2.076	834	1.511
Aachener Grund-Fonds Nr.1	DE0009800003	0	524	113	411	0	524	113	411	0	0	0	0
WestInvest 1	DE0009801407	468	994	0	1.199	468	994	0	1.199	0	0	0	0
WestInvest InterSelect	DE0009801423	2.246	3.443	1.635	2.564	2.246	3.443	1.635	2.564	2.246	3.443	1.635	2.564
WestInvest ImmoValue	DE0009801431	3.699	0	1.638	2.061	3.699	0	1.638	2.061	0	0	0	0
WestInvest TargetSelect Logistics	DE0009801449	1.896	0	0	1.896	1.896	0	0	1.896	0	0	0	0
WestInvest TargetSelect Hotel	DE0009801456	1.896	0	0	1.896	1.896	0	0	1.896	0	0	0	0
WestInvest TargetSelect Shopping	DE0009801464	1.896	0	0	1.896	1.896	0	0	1.896	0	0	0	0
SEB ImmoInvest P	DE0009802306	954	2.092	1.787	456	690	1.162	1.026	287	954	2.092	1.787	456
SEB ImmoPortfolio TRF	DE0009802314	1.621	1.241	1.773	827	1.381	467	1.586	0	240	774	187	827
Credit Suisse Euroreal A EUR	DE0009805002	151	1.827	1.085	893	151	1.146	602	695	151	1.827	1.085	893
CS-WV ImmoFonds	DE0009805010	0	1.352	0	1.352	0	1.352	0	1.352	0	0	0	0
UniImmo: Deutschland	DE0009805507	3.775	1.399	3.045	1.153	2.548	849	1.849	1.035	3.775	1.399	3.045	1.153
UniImmo: Europa	DE0009805515	4.059	1.574	2.297	1.902	2.845	397	1.590	1.255	4.059	1.574	2.297	1.902
UniInstitutional European Real Estate	DE0009805549	1.711	0	1.520	191	1.711	0	1.520	191	0	0	0	0
UniImmo: Global	DE0009805556	2.231	2.311	1.910	1.868	1.996	1.848	1.724	1.527	2.231	2.311	1.910	1.868
DEFO IMMOBILIEN	DE0009805705	0	0	0	0	0	0	0	0	0	0	0	0
Grundbesitz Europa RC	DE0009807008	4.059	1.441	2.898	1.301	3.517	1.063	2.545	1.112	4.059	1.441	2.898	1.301
HausInvest	DE0009807016	3.278	1.703	2.327	1.872	3.278	1.703	2.327	1.872	3.278	1.703	2.327	1.872
Grundbesitz Global RC	DE0009807057	2.243	1.956	2.460	1.739	2.243	1.956	2.460	1.739	2.243	1.956	2.460	1.739
Grundbesitz Fokus Deutschland RC	DE0009807081	513	140	449	204	10	0	10	0	513	140	449	204
DEGI Europa	DE0009807800	540	1.984	252	1.732	540	1.078	47	1.031	540	1.984	252	1.732
Deka-ImmobilienFonds	DE0009809509	1.006	725	18	1.181	1.006	725	18	1.181	0	0	0	0
Deka-ImmobilienEuropa	DE0009809566	3.675	1.439	2.821	1.378	3.274	1.299	2.420	1.378	3.675	1.439	2.821	1.378
HansaImmobilia	DE0009817700	396	1.674	208	1.736	396	1.674	208	1.736	0	0	0	0
III FONDS NR 1	DE0009820001	0	0	0	0	0	0	0	0	0	0	0	0
Euro ImmoProfil	DE0009820019	0	1.477	0	1.477	0	1.477	0	1.477	0	0	0	0
INTER ImmoProfil	DE0009820068	690	2.723	1.215	1.815	690	2.723	1.215	1.815	690	2.723	1.215	1.815
AXA Immoselect	DE0009846451	690	1.804	883	958	690	1.094	859	272	690	1.804	883	958
KanAm Spezial grundinvest Fonds	DE000A0CARS0	0	0	0	0	0	0	0	0	0	0	0	0
TMW Immobilien Weltfonds P	DE000A0DJ328	777	776	515	1.038	226	0	186	40	777	776	515	1.038
DEGI GLOBAL BUSINESS	DE000A0ETSR6	338	722	353	582	311	205	353	38	27	517	0	544
Morgan Stanley P2 Value	DE000A0F6G89	434	1.032	215	817	125	125	50	75	434	1.032	215	817
DEGI German Business	DE000A0J3TP7	454	144	358	96	454	144	358	96	0	0	0	0
Fokus Wohnen Deutschland	DE000A12BSB8	761	692	946	10	552	432	686	10	761	692	946	10
WERTGRUND WohnSelect D	DE000A1CUAY0	1.664	778	1.569	113	958	778	976	0	1.624	738	1.529	113
UniInstitutional German Real Estate	DE000A1J16Q1	1.288	407	1.386	41	1.288	407	1.386	41	0	0	0	0
Swiss Life REF (DE) European Real Estate	DE000A2ATC31	532	532	309	223	532	532	309	223	532	532	309	223
Commerz Real Institutional Hotel Fund	DE000A2DHSK4	0	0	0	0	0	0	0	0	0	0	0	0
KGAL immoSUBSTANZ	DE000A2H9BS6	0	211	211	0	0	210	210	0	0	211	211	0
Deka ImmobilienStrategieInstitutionell	DE000DK0LL42	1.172	268	49	1.123	1.172	268	49	1.123	0	0	0	0
Deka-ImmobilienNordamerika	DE000DK0LLA6	0	738	468	270	0	738	468	270	0	284	81	203

Table OA 2 Results of panel analyses of future 500-day returns (missing control variables imputed)

	Dependent variable: *RF500_PS*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.135***	-0.112**	0.132	0.161**	-0.136	-0.084	0.043	-0.049
	(0.052)	(0.047)	(0.083)	(0.080)	(0.458)	(0.269)	(0.465)	(0.268)
RAT	**0.008*****	**0.005****	**-0.001**	**-0.004**	**-0.009***	**0.000**	**-0.008**	**0.000**
	(0.003)	(0.002)	(0.004)	(0.004)	(0.005)	(0.003)	(0.005)	(0.003)
RL250_P		5.088***		3.711	3.525	4.225**	3.073	4.023**
		(1.502)		(2.547)	(2.228)	(1.804)	(2.134)	(1.755)
LEV					-0.101	0.269*	-0.019	0.307**
					(0.151)	(0.147)	(0.151)	(0.147)
CH					0.159*	0.109	0.089	0.105
					(0.087)	(0.082)	(0.086)	(0.081)
SIZE					-0.008	-0.018**	-0.001	-0.015*
					(0.023)	(0.009)	(0.024)	(0.009)
TER					-0.051	-0.004	-0.083**	-0.019
					(0.043)	(0.037)	(0.042)	(0.036)
TEN					0.403	0.291	0.200	0.162
					(0.286)	(0.255)	(0.258)	(0.244)
NF					0.029	0.010	0.030	0.016
					(0.024)	(0.020)	(0.022)	(0.020)
TV					-0.909***	-0.697**	-0.782***	-0.606***
					(0.263)	(0.269)	(0.218)	(0.220)
INV_P					-0.160**	-0.145*	-0.163**	-0.152**
					(0.079)	(0.074)	(0.079)	(0.077)
DEV_P					0.207***	0.248***	0.208***	0.254***
					(0.043)	(0.055)	(0.041)	(0.053)
CIOR					-0.167*	-0.207**	-0.176*	-0.215**
					(0.093)	(0.081)	(0.092)	(0.083)
EPRA					0.012	-0.033	0.091**	0.111***
					(0.102)	(0.113)	(0.037)	(0.040)
AGE					0.083*	0.023	-0.032	0.016
					(0.047)	(0.015)	(0.033)	(0.015)
AGIO						-0.137		0.054
						(0.718)		(0.707)
BS						0.063**		0.062**
						(0.031)		(0.031)
N_REDSUS							-0.013***	-0.014***
							(0.004)	(0.004)
DivDAX							0.022	0.015
							(0.019)	(0.019)
B1Y							0.006	-0.002
							(0.007)	(0.006)
VOL							-0.204*	-0.292**
							(0.110)	(0.128)
PolU							0.012	0.012
							(0.011)	(0.012)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.064	0.096	0.524	0.532	0.634	0.513	0.614	0.500
Obs.	296	296	296	296	296	296	296	296

Table OA 3 Results of panel analyses of future 750-day returns (missing control variables imputed)

	Dependent variable: *RF750_PS*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.095	-0.085	0.334**	0.356***	0.796	0.076	0.940	0.071
	(0.075)	(0.069)	(0.134)	(0.123)	(0.620)	(0.419)	(0.618)	(0.389)
RAT	**0.006***	**0.005**	**-0.008**	**-0.010**	**-0.008**	**0.002**	**-0.008**	**0.001**
	(0.004)	(0.003)	(0.007)	(0.007)	(0.008)	(0.004)	(0.009)	(0.004)
RL250_P		2.136		2.498	2.705	2.743	2.249	3.345
		(3.433)		(4.920)	(4.119)	(2.602)	(3.833)	(2.530)
LEV					-0.055	0.411**	0.079	0.446**
					(0.202)	(0.169)	(0.213)	(0.183)
CH					0.094	0.115	-0.047	0.092
					(0.137)	(0.111)	(0.142)	(0.112)
SIZE					-0.051*	-0.026**	-0.030	-0.020*
					(0.027)	(0.011)	(0.028)	(0.011)
TER					-0.049	0.013	-0.108*	-0.020
					(0.062)	(0.054)	(0.062)	(0.049)
TEN					0.659*	0.365	0.371	0.260
					(0.396)	(0.381)	(0.370)	(0.354)
NF					-0.006	-0.025	-0.009	-0.022
					(0.047)	(0.030)	(0.041)	(0.030)
TV					-1.039**	-0.804**	-0.733***	-0.580**
					(0.411)	(0.389)	(0.260)	(0.268)
INV_P					-0.333***	-0.319***	-0.326***	-0.317***
					(0.103)	(0.108)	(0.110)	(0.112)
DEV_P					0.147**	0.237***	0.161**	0.243***
					(0.060)	(0.069)	(0.064)	(0.072)
CIOR					-0.300**	-0.386***	-0.325**	-0.389***
					(0.122)	(0.118)	(0.126)	(0.121)
EPRA					0.079	0.048	0.153***	0.186***
					(0.146)	(0.162)	(0.058)	(0.067)
AGE					0.132*	0.018	-0.088*	0.007
					(0.077)	(0.020)	(0.046)	(0.020)
AGIO						0.718		0.912
						(1.088)		(1.096)
BS						0.149***		0.147***
						(0.044)		(0.045)
N_REDSUS							-0.017***	-0.018***
							(0.006)	(0.007)
DivDAX							0.025	0.020
							(0.029)	(0.029)
B1Y							-0.005	-0.012
							(0.011)	(0.010)
VOL							-0.402***	-0.517***
							(0.145)	(0.176)
PolU							0.025	0.018
							(0.017)	(0.019)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.021	0.021	0.508	0.508	0.580	0.444	0.547	0.423
Obs.	271	271	271	271	271	271	271	271

Table OA 4 Results of panel analyses of future 250-day returns (primary markets only; missing control variables imputed)

	Dependent variable: *RF250_P*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.019***	0.008	0.044***	0.040***	0.023	-0.026	0.065	-0.009
	(0.007)	(0.006)	(0.014)	(0.015)	(0.075)	(0.039)	(0.069)	(0.042)
RAT	**0.000**	**0.000**	**0.000**	**-0.001**	**-0.001**	**0.001**	**0.000**	**0.001**
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
RL250_P		3.791***		1.149*	1.068	2.696***	1.230*	2.755***
		(0.296)		(0.662)	(0.665)	(0.555)	(0.630)	(0.539)
LEV					0.044	0.045	0.040	0.048*
					(0.034)	(0.027)	(0.036)	(0.028)
CH					0.025	0.022*	0.008	0.013
					(0.020)	(0.013)	(0.018)	(0.013)
SIZE					0.000	0.000	0.000	0.000
					(0.004)	(0.001)	(0.003)	(0.001)
TER					-0.012	0.011	-0.022**	0.006
					(0.010)	(0.009)	(0.010)	(0.008)
TEN					-0.016	-0.015	-0.031	-0.046
					(0.044)	(0.035)	(0.042)	(0.035)
NF					0.005	-0.001	0.005	0.000
					(0.004)	(0.004)	(0.004)	(0.004)
TV					-0.030	-0.030	-0.026	-0.026
					(0.036)	(0.028)	(0.033)	(0.027)
INV_P					-0.004	0.001	-0.003	0.001
					(0.006)	(0.005)	(0.005)	(0.005)
DEV_P					0.037***	0.026***	0.045***	0.032***
					(0.010)	(0.010)	(0.009)	(0.008)
CIOR								
EPRA					-0.014	-0.015	-0.005	0.008
					(0.021)	(0.025)	(0.009)	(0.009)
AGE					0.001	-0.001	-0.008	-0.002
					(0.010)	(0.002)	(0.006)	(0.002)
AGIO						0.223		0.301*
						(0.158)		(0.167)
BS						0.002		0.001
						(0.006)		(0.006)
N_REDSUS							-0.001*	-0.001
							(0.001)	(0.001)
DivDAX							-0.001	0.000
							(0.003)	(0.003)
B1Y							0.002	0.002*
							(0.001)	(0.001)
VOL							-0.050***	-0.068***
							(0.017)	(0.016)
PolU							0.000	0.003
							(0.002)	(0.002)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.005	0.355	0.552	0.559	0.563	0.507	0.514	0.451
Obs.	259	259	259	259	259	259	259	259

Table OA 5 Results of panel analyses of future 500-day returns (primary markets only; missing control variables imputed)

	Dependent variable: *RF500_P*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.052***	0.026	0.114***	0.120***	0.196	-0.036	0.307*	0.010
	(0.016)	(0.018)	(0.024)	(0.030)	(0.160)	(0.085)	(0.175)	(0.087)
RAT	**0.000**	**0.000**	**-0.001**	**-0.001**	**-0.001**	**0.001**	**-0.001**	**0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
RL250_P		5.923***		-1.083	-1.030	4.966***	-0.387	5.320***
		(0.914)		(2.140)	(1.905)	(1.422)	(1.847)	(1.367)
LEV					0.019	0.068	0.030	0.080
					(0.053)	(0.047)	(0.059)	(0.049)
CH					0.028	0.047	-0.018	0.033
					(0.036)	(0.028)	(0.037)	(0.029)
SIZE					-0.012	-0.004	-0.011	-0.003
					(0.008)	(0.003)	(0.009)	(0.003)
TER					-0.029*	0.036*	-0.057***	0.023
					(0.017)	(0.018)	(0.019)	(0.018)
TEN					0.053	0.006	0.005	-0.054
					(0.080)	(0.081)	(0.077)	(0.080)
NF					0.003	-0.008	0.002	-0.006
					(0.008)	(0.008)	(0.008)	(0.008)
TV					-0.199***	-0.204***	-0.182**	-0.197**
					(0.075)	(0.077)	(0.076)	(0.077)
INV_P								
DEV_P					0.097***	0.065***	0.104***	0.066***
					(0.018)	(0.017)	(0.023)	(0.015)
CIOR					0.013	-0.006	0.004	-0.004
					(0.019)	(0.016)	(0.018)	(0.011)
EPRA					0.050	0.044	0.019	0.047***
					(0.037)	(0.051)	(0.012)	(0.015)
AGE					0.022	0.000	-0.015	-0.003
					(0.017)	(0.004)	(0.013)	(0.004)
AGIO						0.587*		0.713**
						(0.330)		(0.337)
BS						0.007		0.003
						(0.010)		(0.011)
N_REDSUS							-0.004***	-0.003**
							(0.001)	(0.001)
DivDAX							-0.001	0.002
							(0.005)	(0.006)
B1Y							0.004	0.003
							(0.003)	(0.003)
VOL							-0.090**	-0.147***
							(0.037)	(0.037)
PolU							0.005	0.008
							(0.004)	(0.005)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.000	0.215	0.653	0.653	0.690	0.516	0.633	0.454
Obs.	239	239	239	239	239	239	239	239

Table OA 6 Results of panel analyses of future 750-day returns (primary markets only; missing control variables imputed)

	Dependent variable: *RF750_P*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.092***	0.063***	0.206***	0.223***	0.369*	-0.102	0.527**	-0.040
	(0.021)	(0.023)	(0.030)	(0.032)	(0.211)	(0.118)	(0.207)	(0.108)
RAT	**0.000**	**-0.001**	**-0.003***	**-0.002***	**-0.003***	**0.000**	**-0.002**	**-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
RL250_P		6.487***		-3.209	-3.265	6.185***	-2.698	7.614***
		(1.239)		(2.352)	(2.080)	(1.832)	(2.229)	(1.735)
LEV					0.036	0.129**	0.070	0.133**
					(0.068)	(0.061)	(0.079)	(0.065)
CH					0.029	0.061	-0.050	0.037
					(0.045)	(0.039)	(0.049)	(0.041)
SIZE					-0.019*	-0.004	-0.019*	-0.003
					(0.010)	(0.005)	(0.010)	(0.005)
TER					-0.040	0.048*	-0.094***	0.020
					(0.027)	(0.026)	(0.026)	(0.025)
TEN					0.110	0.057	0.090	0.042
					(0.121)	(0.116)	(0.132)	(0.116)
NF					0.001	-0.011	-0.001	-0.010
					(0.013)	(0.012)	(0.013)	(0.014)
TV					-0.256**	-0.303**	-0.248**	-0.286**
					(0.124)	(0.123)	(0.119)	(0.112)
INV_P					-0.004	0.017	0.009	0.010
					(0.019)	(0.017)	(0.018)	(0.014)
DEV_P					0.141***	0.101***	0.159***	0.096***
					(0.026)	(0.023)	(0.035)	(0.020)
CIOR								
EPRA					0.046	0.056	0.013	0.055***
					(0.040)	(0.059)	(0.015)	(0.020)
AGE					0.021	0.000	-0.052***	-0.004
					(0.025)	(0.007)	(0.018)	(0.007)
AGIO						0.959**		1.075**
						(0.430)		(0.425)
BS						0.013		0.009
						(0.014)		(0.014)
N_REDSUS							-0.006***	-0.004**
							(0.002)	(0.002)
DivDAX							-0.005	-0.003
							(0.006)	(0.007)
B1Y							-0.003	-0.006
							(0.004)	(0.004)
VOL							-0.084	-0.224***
							(0.052)	(0.052)
PolU							0.003	0.005
							(0.006)	(0.007)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.000	0.138	0.710	0.719	0.768	0.544	0.710	0.471
Obs.	219	219	219	219	219	219	219	219

Table OA 7 Results of panel analyses of future 250-day returns (secondary markets only; missing control variables imputed)

	Dependent variable: *RF250_S*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.123**	-0.067	0.040	0.043	-0.448	-0.362	-0.255	-0.410
	(0.058)	(0.052)	(0.054)	(0.054)	(0.485)	(0.250)	(0.548)	(0.270)
RAT	**0.007****	**0.002**	**-0.001**	**-0.004**	**-0.009****	**-0.002**	**-0.009***	**-0.003**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
RL250_P		6.417***		4.324*	4.321**	5.293***	4.782***	5.410***
		(1.078)		(2.225)	(1.858)	(1.300)	(1.828)	(1.308)
LEV					-0.257*	0.187	-0.165	0.241
					(0.147)	(0.136)	(0.153)	(0.148)
CH					0.037	0.010	0.029	0.037
					(0.077)	(0.067)	(0.083)	(0.066)
SIZE					0.008	-0.004	0.011	0.000
					(0.020)	(0.007)	(0.023)	(0.008)
TER					-0.031	-0.016	-0.046	-0.025
					(0.032)	(0.034)	(0.034)	(0.031)
TEN					0.381	0.429*	0.175	0.329
					(0.260)	(0.259)	(0.248)	(0.260)
NF					0.041**	0.035**	0.035**	0.036**
					(0.018)	(0.018)	(0.017)	(0.017)
TV					-0.347*	-0.357*	-0.157	-0.182
					(0.201)	(0.216)	(0.169)	(0.169)
INV_P					-0.075	-0.084	-0.089	-0.095
					(0.048)	(0.062)	(0.056)	(0.069)
DEV_P					0.173***	0.142***	0.175***	0.152***
					(0.034)	(0.047)	(0.035)	(0.049)
CIOR					-0.097*	-0.133*	-0.114*	-0.149*
					(0.055)	(0.070)	(0.063)	(0.078)
EPRA					-0.176*	-0.182	-0.003	0.021
					(0.106)	(0.116)	(0.039)	(0.040)
AGE					0.067*	0.020	-0.016	0.015
					(0.040)	(0.014)	(0.026)	(0.014)
AGIO						-0.772		-0.675
						(0.774)		(0.863)
BS						0.029		0.027
						(0.026)		(0.028)
N_REDSUS							-0.009**	-0.015***
							(0.004)	(0.005)
DivDAX							0.006	0.010
							(0.017)	(0.018)
B1Y							0.002	-0.005
							(0.007)	(0.007)
VOL							0.187**	0.090
							(0.089)	(0.098)
PolU							-0.002	0.002
							(0.009)	(0.012)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.076	0.171	0.456	0.472	0.602	0.477	0.541	0.427
Obs.	233	233	233	233	233	233	233	233

Table OA 8 Results of panel analyses of future 500-day returns (secondary markets only; missing control variables imputed)

	Dependent variable: *RF500_S*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.197***	-0.160**	0.089	0.088	-1.080	-0.769*	-0.423	-0.760*
	(0.074)	(0.073)	(0.088)	(0.087)	(0.988)	(0.426)	(1.063)	(0.441)
RAT	**0.011***	**0.008***	**-0.004**	**-0.003**	**-0.010***	**0.000**	**-0.008**	**0.000**
	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.004)	(0.006)	(0.004)
RL250_P		4.214**		-1.141	-0.648	2.709	-0.654	2.689
		(1.955)		(3.708)	(3.934)	(1.970)	(3.873)	(1.942)
LEV					-0.122	0.391*	-0.017	0.438*
					(0.222)	(0.221)	(0.241)	(0.224)
CH					0.130	0.031	0.064	0.039
					(0.117)	(0.140)	(0.132)	(0.141)
SIZE					0.007	-0.012	0.007	-0.009
					(0.039)	(0.011)	(0.043)	(0.012)
TER					-0.023	0.015	-0.064	-0.011
					(0.047)	(0.050)	(0.049)	(0.049)
TEN					0.905**	0.874*	0.463	0.774*
					(0.430)	(0.443)	(0.408)	(0.436)
NF					0.066*	0.020	0.045	0.014
					(0.036)	(0.029)	(0.031)	(0.029)
TV					-0.916***	-0.828***	-0.787***	-0.742***
					(0.307)	(0.286)	(0.244)	(0.221)
INV_P					-0.116	-0.142*	-0.119	-0.149**
					(0.084)	(0.073)	(0.087)	(0.075)
DEV_P					0.209***	0.250***	0.207***	0.260***
					(0.042)	(0.056)	(0.043)	(0.053)
CIOR					-0.131	-0.218***	-0.136	-0.229***
					(0.100)	(0.083)	(0.103)	(0.084)
EPRA					0.008	-0.023	0.116**	0.143***
					(0.129)	(0.139)	(0.049)	(0.052)
AGE					0.128*	0.027	-0.047	0.019
					(0.066)	(0.021)	(0.046)	(0.022)
AGIO						-0.473		-0.277
						(1.278)		(1.296)
BS						0.077*		0.073*
						(0.041)		(0.041)
N_REDSUS							-0.015***	-0.019***
							(0.006)	(0.006)
DivDAX							0.026	0.020
							(0.025)	(0.025)
B1Y							0.013	-0.004
							(0.010)	(0.009)
VOL							-0.162	-0.374**
							(0.134)	(0.171)
PolU							0.014	0.018
							(0.015)	(0.017)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.081	0.095	0.565	0.563	0.665	0.528	0.634	0.512
Obs.	218	218	218	218	218	218	218	218

Table OA 9 Results of panel analyses of future 750-day returns (secondary markets only; missing control variables imputed)

	Dependent variable: *RF750_S*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.137	-0.132	0.254**	0.252**	-1.134	-0.219	-0.729	-0.320
	(0.107)	(0.102)	(0.126)	(0.120)	(1.326)	(0.465)	(1.428)	(0.478)
RAT	**0.008**	**0.008**	**-0.012***	**-0.007**	**-0.010**	**0.005**	**-0.009**	**0.004**
	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)	(0.006)	(0.010)	(0.006)
RL250_P		0.588		-8.724	-7.320	-0.739	-6.904	0.128
		(4.451)		(5.416)	(5.206)	(3.108)	(5.318)	(2.955)
LEV					0.044	0.648**	0.250	0.692**
					(0.273)	(0.267)	(0.307)	(0.290)
CH					0.163	0.170	0.077	0.187
					(0.166)	(0.145)	(0.194)	(0.150)
SIZE					-0.002	-0.008	0.020	-0.001
					(0.047)	(0.015)	(0.052)	(0.014)
TER					-0.048	0.012	-0.107	-0.028
					(0.067)	(0.072)	(0.069)	(0.065)
TEN					1.389**	0.191	0.841	0.159
					(0.536)	(0.366)	(0.514)	(0.357)
NF					0.029	-0.035	0.000	-0.051
					(0.072)	(0.042)	(0.059)	(0.041)
TV					-1.066**	-0.829*	-0.749***	-0.617**
					(0.428)	(0.432)	(0.284)	(0.294)
INV_P					-0.236**	-0.321***	-0.232**	-0.322***
					(0.101)	(0.111)	(0.110)	(0.113)
DEV_P					0.116**	0.216***	0.125**	0.227***
					(0.055)	(0.070)	(0.056)	(0.072)
CIOR					-0.209*	-0.380***	-0.232*	-0.389***
					(0.121)	(0.124)	(0.129)	(0.126)
EPRA					0.071	0.045	0.216***	0.226***
					(0.154)	(0.191)	(0.067)	(0.080)
AGE					0.140	-0.003	-0.155***	-0.021
					(0.099)	(0.028)	(0.059)	(0.028)
AGIO						1.955		2.012
						(1.878)		(1.938)
BS						0.167***		0.160***
						(0.051)		(0.054)
N_REDSUS							-0.023***	-0.023***
							(0.007)	(0.008)
DivDAX							0.045	0.024
							(0.036)	(0.036)
B1Y							0.011	-0.016
							(0.016)	(0.014)
VOL							-0.373**	-0.613***
							(0.167)	(0.225)
PolU							0.035	0.027
							(0.021)	(0.025)
Market FE	NO	NO	NO	NO	NO	YES	NO	YES
Firm FE	NO	NO	YES	YES	YES	NO	YES	NO
Year FE	NO	NO	YES	YES	YES	YES	NO	NO
Adj. R^2	0.023	0.018	0.572	0.588	0.638	0.468	0.598	0.453
Obs.	205	205	205	205	205	205	205	205