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Mutual fund quality, its importance and the most decisive characteristics

The perspective of Finnish mutual funds' managers

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ABSTRACT:
Investing in mutual funds has become increasingly popular globally and in Finland. As more people invest in mutual funds, funds' quality is becoming a central issue. The purpose of this Master's thesis is to study how important quality is for mutual funds. Also, the decisive characteristics of mutual fund quality are examined. Finnish funds' managers' perspective is examined in the thesis. Their perspective is central, as they have an in-depth understanding of funds and a direct impact on them. This study focuses on studying conventional mutual funds. A mutual fund is an investment product that combines investors' assets and acquires various investments in its portfolio.

The decisive characteristics affecting the quality of the funds were sought in the past literature. The literature focuses on studying the impact of different fund attributes on performance. Performance is one of the eight quality dimensions according to David Garvin's (1984) quality theory. The theory was chosen to be applied because it has been widely used as a theoretical framework for the analysis of the quality of intangible and tangible products. A mutual fund can be classified as an intangible product because it is an instrument designed to meet customers' needs.

The found characteristics' importance was asked to be assessed in an email survey. Based on the results, it was possible to rank the characteristics using a quantitative Fuzzy TOPSIS method. The most decisive factors are in order of importance: risk-adjusted profit, fund manager skill, fund age, turnover rate, fund manager reputation, responsibility and sustainability, fund size and management fee. The survey also provided background information on the importance of the factors. Additionally, respondents mentioned other important attributes, but their statistical significance was low.

The results of this thesis can be used to develop higher quality mutual funds. Higher quality products benefit both investors and fund management companies, for example, by improving customer satisfaction and increasing sales. In addition, the results of the thesis can be used to compare funds and in the marketing of funds.

This Master's thesis offers a new research perspective regarding the relationship between quality and mutual funds. The relationship has not been profoundly studied earlier and based on the responses to the survey, fund managers consider quality as an important aspect. Therefore, there is an interest and a need for more research on the topic.

KEYWORDS: Mutual fund, Quality, Fuzzy TOPSIS, Fund manager, Investing

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TIIVISTELMÄ:
Sijoitusrahastoihin sijoittamisesta on tullut sekä Suomessa, että maailmalla yhä suositumpaa viime vuosien aikana. Kun sijoitusrahastoihin sijoitetaan yhä enemmän, on rahastojen laadusta tullut keskeisempi aihe. Tämän Pro gradu- työn tarkoituksena onkin tutkia kuinka tärkeää laatu on sijoitusrahastolle. Lisäksi tutkitaan sijoitusrahastojen laatuun eniten vaikuttavia tekijöitä. Edellä mainittuja asioita tutkitaan suomalaisten rahastojen hoitajien näkökulmasta. Heidän näkökulmansa on keskeinen, sillä heillä on syvällinen ymmärrys rahastojen luonteesta ja suora vaikutus niihin. Tässä tutkimuksessa keskityttiin käsittelemään tavallisia sijoitusrahastoja poislukien erikoissijoitusrahastot. Sijoitusrahasto tarkoittaa sijoitustuotetta, joka kerää yksittäisten sijoittajien varoja yhteen ja hankkii varoilla erilaisia sijoituksia portfolioonsa.

Rahastojen laatuun vaikuttavia keskeisimpiä ominaisuuksia etsittiin aiheeseen liittyvästä kirjallisuudesta. Aiempi kirjallisyys keskittyy tutkimaan eri rahaston ominaisuuksien vaikutusta suorituskykyyn. Suorituskyky on yksi kahdeksasta laadun ulottuvuudesta David Garvinin (1984) laatuteorian mukaan. Teoria valikoitui käytettäväksi, koska sitä on laajasti käytetty aineettomien ja aineellisten hyödykkeiden laadun analysoinnin teoreettisena kehyksenä. Sijoitusrahasto voidaankin luokitella aineettomaksi hyödykkeeksi, koska se on aineeton väline jonka tarkoituksena on täyttää jokin asiakkaan tarve.

Kirjallisuudesta löydettyjen ominaisuuksien tärkeyttä pyydettiin arvioimaan sähköpostikyselyssä. Tulosten perusteella pystyttiin asettamaan ominaisuudet tärkeysjärjestykseen käyttäen kvantitatiivista Fuzzy TOPSIS-metodia. Ominaisuudet ovat tärkeysjärjestyksessä riskikorjattu tuotto, rahastonhoitajan ammattitaito, rahaston ikä, kiertonopeus, rahastonhoitajan maine, vastuullisuus, rahaston koko ja hallinnointipalkkio. Kyselyn avulla saatiin myös perusteluja ominaisuuksien tärkeydelle. Lisäksi vastaajat mainitsivat muita tärkeitä ominaisuuksia, mutta niiden tilastollinen merkittävyys jäi pieneksi.

Tämän tutkielman tuloksia voidaan käyttää sijoitusrahastojen kehittämisessä laadukkaammiksi. Laadukkaammat tuotteet hyödyttävät sekä sijoittajia, että rahoitusyhtiöitä esimerkiksi parantamalla asiakastyytyväisyyttä ja lisäämällä myyntiä. Lisäksi tutkielman tuloksia voidaan käyttää vertailtaessa eri rahastoja sekä rahastojen markkinoinnissa.

Tämä pro gradu-tutkielma tarjoaa uuden tutkimusnäkökulman liittyen laadun ja sijoitusrahastojen suhteeseen. Suhdetta ei ole aiemmin tutkittu kattavasti ja kyselyssä saatujen vastausten perusteella rahastonhoitajat pitävätkin laatua tärkeänä rahastoille. Aiheeseen liittyvälle tutkimukselle onkin siis kiinnostusta ja tarvetta.

AVAINSANAT: Sijoitusrahasto, Laatu, Fuzzy TOPSIS, Rahastonhoitaja, Sijoittaminen

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1 Introduction

In recent years, investing in funds has become increasingly popular amongst private and organizational investors globally and in Finland. Funds are appealing to many because of their versatility. (Finanssiala, 2021) They are versatile because they are investment products which contain a mix of other investment products, for example, equities and bonds (Elo & Saarhelo, 2018, p. 53). The selection of funds is wide and there is something for everyone (Finanssiala, 2021).

In the last quarter of 2021, there was an increase of investments to investment funds globally. The largest fund markets are the United States and Europe and both of them reported an approximate 5% growth in investments to funds. The United States' market share of investment fund assets in 4rt quarter of 2021 was 49,0% and Europe's 31,4%. (Efama, 2022a)

As seen in figure 1, investments in European funds have grown yearly. The amount has over doubled in ten years. In the 3rd quarter of 2021, there was a record-high amount of assets invested in UCITS- funds. In December 2021, the net inflows to UCITS- funds in Europe were 49 billion euros. (Efama, 2022b) UCITS- fund (Undertakings for Collective Investment in Transferable Securities- fund) is a type of investment fund that is regulated by the European Union investment fund directive, and that must follow rules concerning risk management. They are the most conventional fund type and are also referred to as "mutual funds". (Pörssisäätiö, 2015, p. 5; Sanastokeskus, 2013) Alternative investment funds (AIFs) are not as strictly regulated and are typically more complex including unconventional investment objects. They are typically targeted for professional or experienced investors. (Finanssivalvonta, 2022a) This thesis' scope only considers conventional mutual funds.

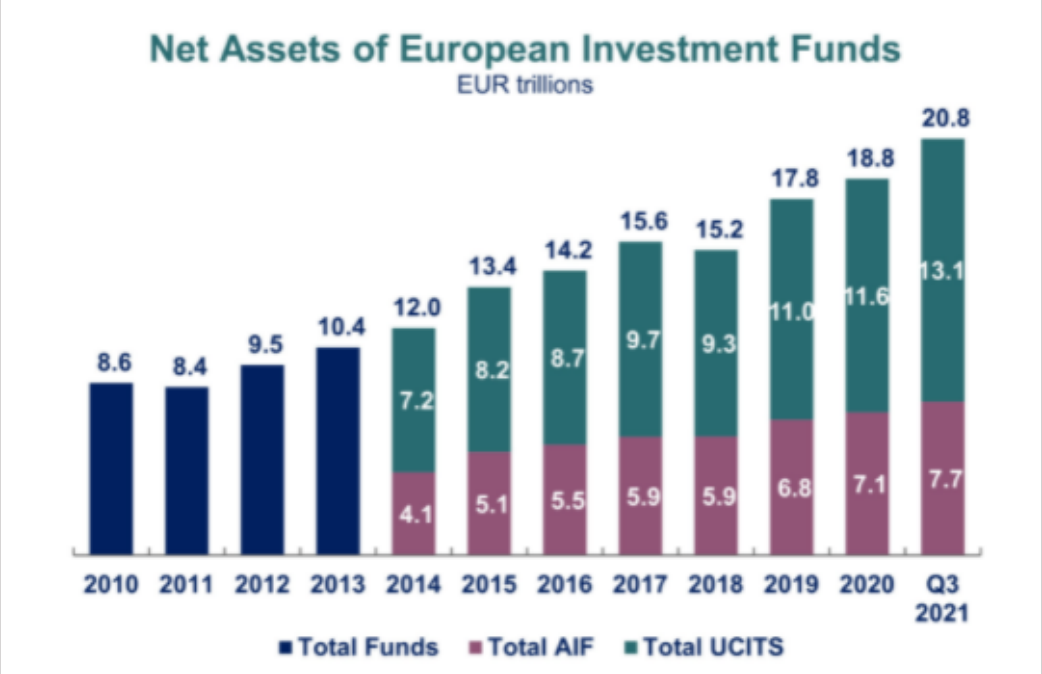

Figure 1. Net assets of European investment funds (Efama, 2022b).

In 2011 the amount invested in all funds in Finland was 55,4 billion euros whereas in December 2021 it was 158,9 billion as depicted in figure 2. This means that the amount of euros in funds has almost tripled in ten years as more investors have become familiar with their positive attributes. (Finanssiala, 2021) According to the Bank of Finland (2021b), households' fund investments were record-high in August 2021 with 33,1 billion invested assets. In the last quarter of 2021, the investments' values declined to 32,5 billion euros but the reason was mostly the Covid pandemic which lowered the investments' values. During the three first quarters of 2021, the Finnish households made 2 billion euros of new investments in investment funds. (Suomen Pankki, 2021b) A total of 138.000 million euros were invested in specifically mutual funds at the end of February 2022 in Finland (Finanssiala, 2022).

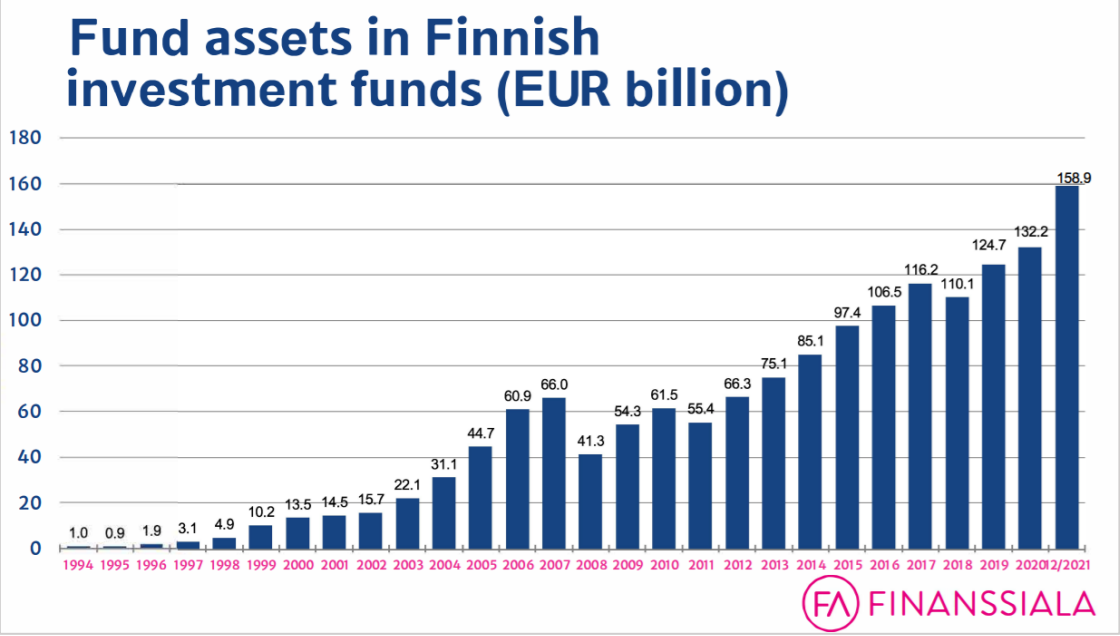

Figure 2. Fund assets in Finnish investment funds (Finanssiala, 2021).

According to Finanssiala (2021) and figure 3, the largest owners of all funds in 2020 were found amongst insurance companies, Finnish households, and Swedish investors. They owned a combined 60% of the invested assets. Financial institutions owned 15%. Companies and housing corporations as well as non-profit organizations, employee pension institutions and foreign investors (other than Swedish) each owned 4% to 6% of funds in Finland. The owner sector shares had remained quite similar from the previous year, 2019. (Finanssiala, 2021)

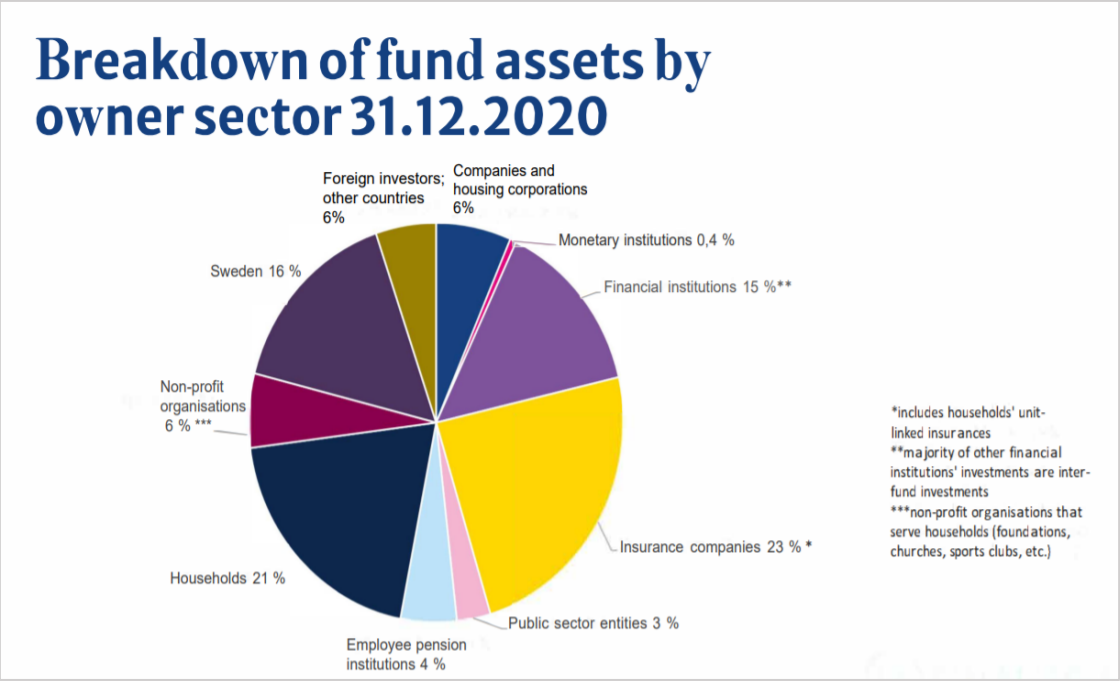

Figure 3. Breakdown of fund assets by owner sector 31 Dec 2020 (translated from Finanssiala, 2021).

As funds grow more popular and their numbers increase, it becomes more important for funds to differentiate from others. Higher quality helps as goods and services produce happier customers, leading to a positive circle and more sustainable competitive advantages. (Angle, 2019, p.7) To be able to produce a high-quality product, the selling company needs to dissect quality into measurable characteristics. (Schwager & Meyer, 2007) Equally, according to Garvin (1984, p. 26), one definition of quality is that quality is a sum of desirable attributes a product contains. Because quality is an important product element, this thesis studies quality's connection to mutual funds and funds' quality characteristics.

1.1 Thesis purpose

The purpose of this thesis is to examine the most decisive factors for mutual fund quality. Also, the importance of quality for mutual funds is examined. They are studied from the perspective of Finnish mutual funds' managers. Fund managers' view is central to the

topic because they are responsible for managing and designing funds (Luo & Qiao, 2020, p. 2075).

The most commonly mentioned decisive characteristics are searched for in a literature review on past fund studies. The found characteristics' importance is then asked to be evaluated by Finnish funds' managers using an email questionnaire. Also, reasons for the characteristics' importance are surveyed. The respondents are also asked to evaluate how important quality is for mutual funds.

The questionnaire's data is used to rank the central fund quality characteristics to discover the most decisive ones. The ranking will be done by implementing a quantitative methodology, Fuzzy TOPSIS. A second quantitative methodology, categorizing and coding, is used to discover the fund quality attributes that fund managers value but which are not mentioned in the past studies. Also, tables and graphs are used in analysing the data.

The research gap of the thesis is fund quality. No prior studies were found that discuss conclusively funds' relation to quality. The finding was also seconded by a finance industry-academic. Most of the past literature concentrates on studying various characteristics' impact on fund performance. According to David Garvin's (1984, p. 29–30) quality theory, performance is one of the eight quality dimensions. Therefore, this thesis aims to assess which characteristics affect fund quality as a total taking into consideration all applicable quality dimensions.

The scope of the thesis limits the topic to only covering conventional mutual funds, also referred to as "mutual funds" and "UCITS-funds". Therefore, alternative investment funds are excluded. Also, the thesis has an emphasis on Finnish investment funds as Finnish funds' managers' perspective on fund quality is studied.

The justification for the thesis topic can be found in the global and regional popularity of fund investing and the existing gap in the fund quality literature. About 30% of Finns invest in investment funds. Also, an increasing amount of assets are invested in funds, mostly conventional mutual funds. (Finanssiala, 2021) Higher quality products have many positive implications for investors and the producing companies (Garvin, 1984, 33–38). Therefore, the impact of this thesis' study results is wide, and the importance can be justified by the number of people affected and the amount of assets invested in funds.

The following two research questions are identified based on the research purpose. They will be answered by the end of this thesis.

RQ 1: How important is quality for mutual funds?
RQ 2: What are the most important characteristics of mutual fund quality?

1.2 Thesis structure and objectives

This thesis contains five chapters. The first chapter introduces the thesis topic and objectives. The topic is introduced in a current context.

The second chapter includes a literature review. The literature review introduces recent studies which are related to investment funds and quality. It also includes the theoretical framework for defining quality. Moreover, by the end of the chapter the most often mentioned fund characteristics are chosen to be examined further in the thesis.

In the third chapter, the data analysis methods are introduced. Firstly, the research philosophy and approach are discussed. Then, survey design and empirical data collection are depicted. Also, the quantitative methodologies are discussed.

The fourth chapter includes the thesis' study results. The purpose of the chapter is to answer the two research questions. The chapter begins by depicting the respondent

demographics. Then the fund quality characteristics' rank of importance is introduced. Also, the reasons behind importance are considered. Further, additional fund characteristics and the importance of quality are examined.

In the fifth chapter, conclusions are drawn. Also, future research possibilities are contemplated. Finally, research reliability and validity, and ethics are discussed.

The thesis process and objectives are further described in the flowchart in figure 4.

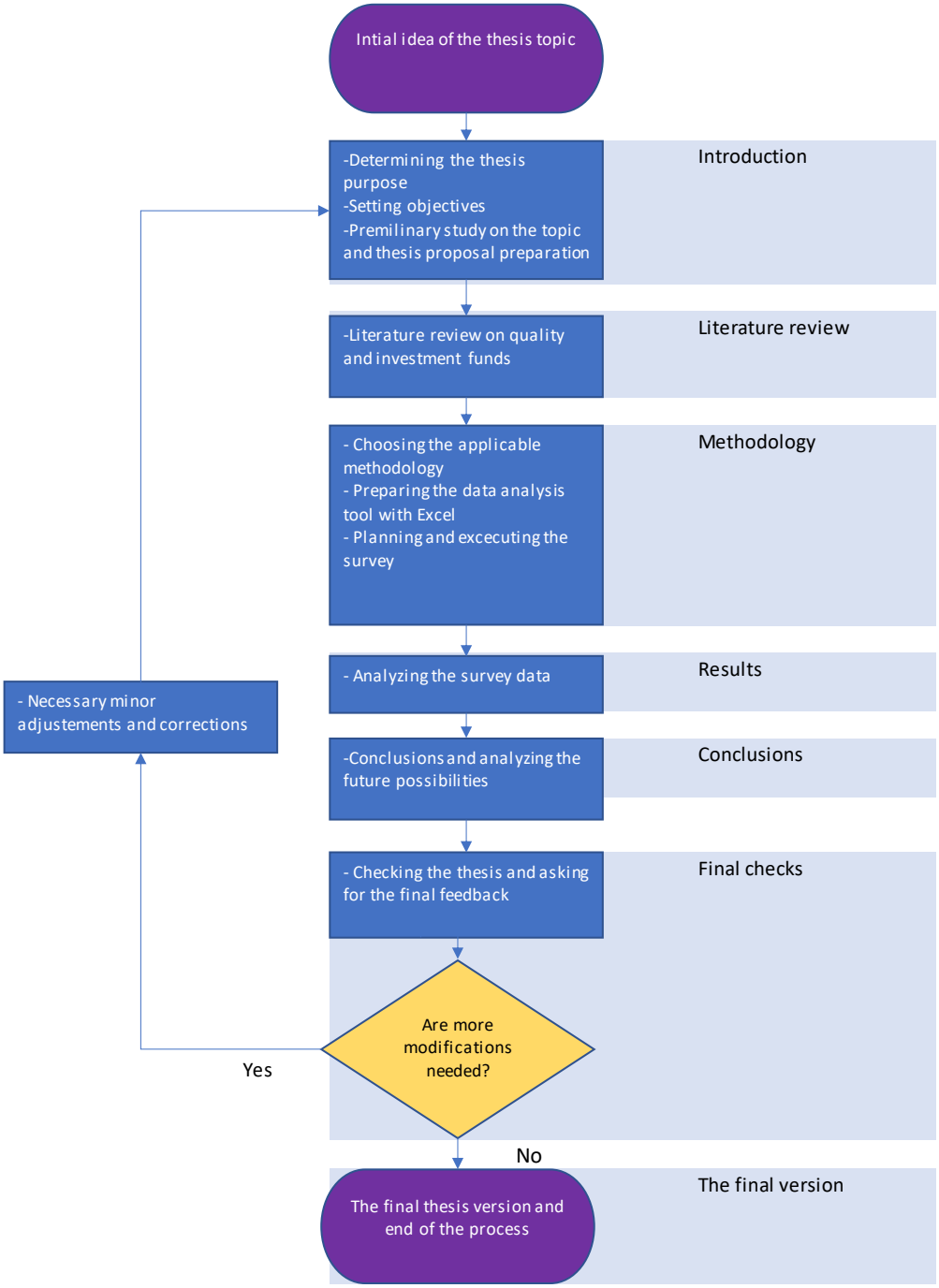

Figure 4. The thesis process, objectives and structure.

1.3 Key Terms

Table 1 contains the key terms used in this thesis.

Table 1. Key terms.

Term	Synonym/ Abbreviation	Definition
Portfolio	-	A set of investments (Puttonen & Repo, 2011, p. 200).
Equity	Share, Stock	Company unit of ownership (Nordea, 2022a).
Bond	-	An investment vehicle producing interest of public or private obligations (Merriam-Webster, 2022a).
Quality	-	"A high level of value or excellence" (Merriam-Webster, 2022b).
Key information document	KID	A document containing essential information on a fund's nature. Helps investors to compare funds and to understand them. (Nordea, 2022b)
Index	Benchmark index	Describes general market value and is used to measure how well funds perform in comparison to it (Clare & Clare, 2019, p. 177).
Fund manager	Manager	A fund manager works for a fund management company and is responsible for a fund's investment decisions and strategy (Luo & Qiao, 2020, p. 2074, 2093).

2 Literature review

At the beginning of this chapter mutual funds are introduced. Secondly, the chosen quality framework is discussed as this thesis' methodology relies on existing theory. Thirdly, the relevant earlier studies in the field of fund characteristics and quality are reviewed. According to Saunders et al. (2007, pp. 57–58) developing an understanding of the existing research is vital to be able to understand what has already been studied and found in the field. It also helps to understand gaps in the past research and justify the topic of this thesis study. Lastly, the chapter also builds a bridge between quality and fund characteristics.

2.1 Mutual funds

There are approximately 700 mutual funds in Finland and each of them has their own mix of characteristics. (Suomen Pankki, 2021a) The reason for the versatility is that in Finland mutual funds can invest a maximum of ten per cent of their assets into a single investment object, and the funds need to contain a minimum of 16 different objects (Danske Invest, 2022; Puttonen & Repo, 2011, p.64). The inclusion of different objects in a mutual fund means that an investor can easily diversify their own investment portfolio (Kallunki et al., 2019, p.117; Puttonen & Repo, 2011, p.30). For instance, with about sixty euros one can buy units of the Finland Index Fund containing shares of 41 major Finnish companies, including Kone, Wärtsilä and Nokia, or buy one share of Kone manufacturing company (Kauppalehti, 2022; Seligson, 2022). According to Markowitz's (1971) portfolio theory by investing in a variety of products, rather than just one, it is possible to get higher profit with less risk. The lesser risk is a result of carefully choosing products whose values have low correlations with market fluctuations. Risk refers to the possibility of the investments' outcome differing from investor expectations, for example, an investment producing loss rather than profit (Elo & Saarhelo, 2018, p.32; Markowitz, 1971, pp. 4–5).

Mutual funds have predominantly decided investment strategies where they decide which asset classes they invest in, for example, equities, bonds or both. Moreover, to asset classes, funds also have an investment focus, for example, they can invest in a specific geographic area, in certain sized companies or a certain risk category. (Elo & Saarhelo, 2018, p. 54; Puttonen & Repo, 2011, pp. 8, 53, 67) The contents of funds determine the funds' risk and profit levels. For example, if a fund contains equities, profit or loss is generated based on how well the target company's equities' values grow and how much the company pays dividends. (Elo & Saarhelo, 2018, p. 53; Pörssisäätiö, 2015, p.7) Similarly, if a fund contains bonds, the fund's profit is generated by the interest which is paid by the bond issuer. Typically, the issuer is a government or an institution. (Kallunki et al., 2019, pp. 119–120)

As indicated in figure 5, typically the highest risks and highest profits are with equity funds. Opposingly, the lowest risk and profit are usually associated with bond funds. Balanced funds are the middle option as it is a mix of the two earlier mentioned fund types. (Pörssisäätiö, 2015, pp. 17–18)

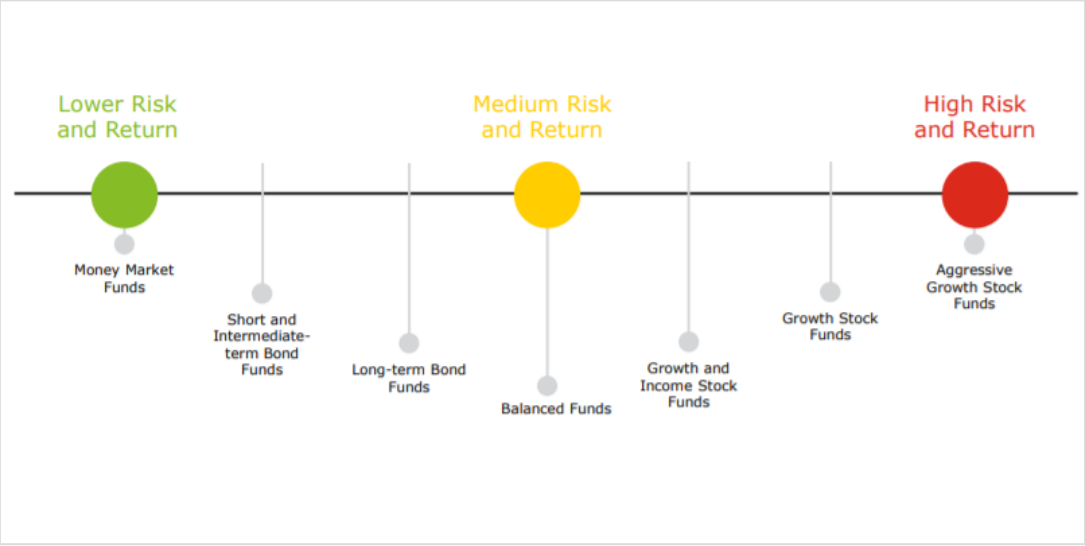

Figure 5. Risk and return of fund types (Deloitte, 2018).

Fund management companies manage funds. The companies handle legal responsibilities, reporting and funds' investment activities. The fund management companies are

supervised by the Finnish Financial Supervisory Authority (The FIN-FSA). (Finanssivalvonta, 2022b) Fund managers work for the management companies. They are responsible for all fund-related core decisions. For example, they design and implement funds' investment strategies. They are also responsible for the fund reaching its targets, for example, profitability. Therefore, fund managers are essential components of funds. (Luo & Qiao, 2020, p. 2074; Pörssisäätiö, 2015, pp. 9, 27)

Figure 6 depicts the general concept of investing with a mutual fund. A mutual fund gathers investors' assets, and the fund manager invests them. The bought securities, for example, equities generate profit which is returned to investors. (CFI, 2022)

Figure 6. How mutual funds work (CFI, 2022).

Mutual funds' popularity with investors can be easily explained by their high variety. There are options for investors who only wish to maintain their assets' value against inflation, investors who seek high yields and are not afraid to take risks, first-time investors

and professional investors. Also, funds automatically contain professional portfolio management services in the form of a fund manager. Therefore, they are in many cases also suited to investors who are not interested in making their own investment decisions and do not follow the general market conditions or stock markets. Moreover, to the wide selection and management services, fund investments' appeal can also be explained by them being easier to sell compared to, for example, stocks. The liquidation is easy because a fund is in most cases obligated to buy back its units from investors, and the fund units can be bought and sold continuously and unlimitedly. The price of a mutual fund unit is determined once a day. The price of the unit is calculated by dividing the fund's fair market value by the number of fund units in circulation. (Elo & Saarhelo, 2018, p. 53; Pörssisäätiö, 2015, pp. 7–8)

2.2 Quality

Quality is an important characteristic of products. It is usually easily recognizable when a product or a service does not possess it. Also, consumers are usually willing to pay more for products and services which they feel are of good quality. However, when asked what makes quality, the question can be challenging to answer, or different answers are received from different people in different contexts. Generally, it can be defined as being a synonym for excellence. (Veselova, 2018, p. 11)

Quality is discussed in many well-known frameworks. For example, Crosby (1979) considers quality as completing something without a need for making corrections later. His model considers the whole company from top to bottom including, for example, employee training, management commitment and process improvements. Deming (1986) defines quality as being the level of consistency to standards. He emphasises companies' management responsibility for improving companies' quality. Moreover, he developed a plan-do-check-act model which highlights continuous improvement for processes and products. In Feigenbaum's (1991) and Ishikawa's (1985) frameworks customer defines what is high-quality. Ishikawa developed a fishbone quality improvement model, which

begins with a problem that needs to be solved and helps map the causes of the problem. However, as the frameworks are either very wide and comprise whole companies or do not aim to identify quality affecting factors, they do not seamlessly contribute to this thesis' purpose.

The most prominently product-related quality view is included in David Garvin's quality theory (1984). The theory focuses merely on product and service quality. It agrees with some of the mentioned frameworks' arguments, such as Crosby's (1979) who explains that higher quality saves costs by preventing redesign costs and Deming's (1986) who states that standards are crucial to quality. However, Garvin (1984) dissects product quality into approaches and dimensions, which is helpful for this thesis' purpose of determining the most decisive fund quality characteristics. The product emphasis is necessary as mutual funds are intangible investment products (Vakuutus- ja rahoitusneuvonta, 2022). A product can be defined as being something that is produced and marketed as a commodity, it can also mean service (Merriam-Webster, 2022c).

A second reason for applying Garvin's (1984) theory in this thesis is that it is widely applied in various industries to examine products' and services' quality and therefore, it has been proved to be able to capture various products' and services' quality. It is important as there are no earlier similar studies to this thesis and therefore earlier studies' frameworks could not be referred to or applied. Garvin's (1984) theory is applied, for example, in the following studies. Kumar et al. (2021) study polymer industry products and assesses how Garvin's (1984) quality dimensions rank in importance with regard to the industry's products. Veselova (2018) studies how quality dimensions matter for consumers in the choice of services. Buell et al. (2016) apply a user-based view, which is a part of Garvin's (1984) framework, as an approach in their study on the banking sector's increasing service quality. Gouda et al. (2018) apply Garvin's (1984) framework for recognizing ecological products' and services' quality characteristics.

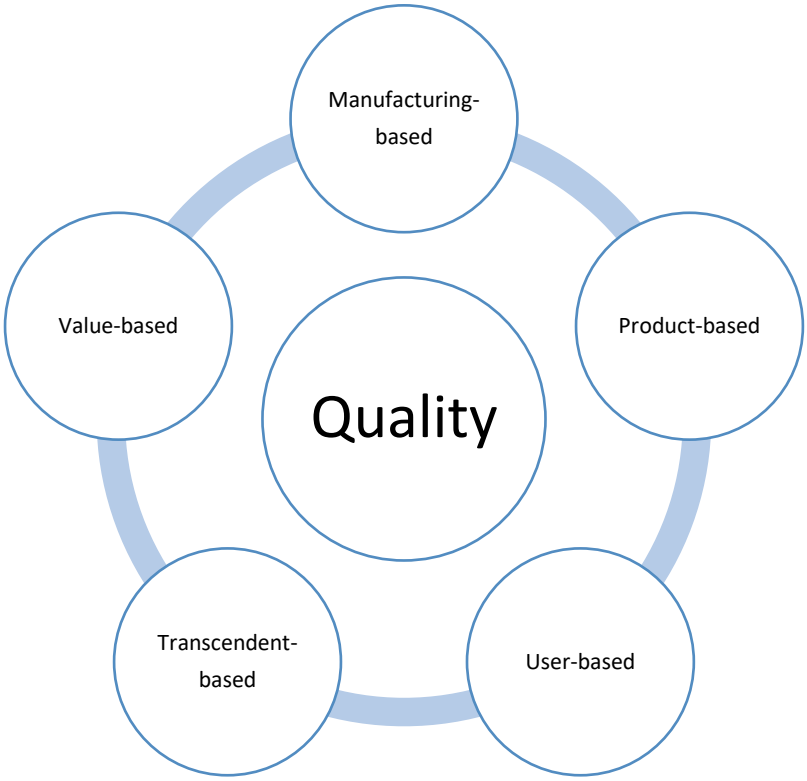

Figure 7. Quality approaches.

Garvin (1984, p. 26) defines quality depending on the approach which is best applicable to the context and viewpoint as seen in figure 7. The five approaches are transcendent-, product-, user-, manufacturing-, and value-based. The transcendent definition is a philosophical approach, and it means instinctive excellence which is universally identifiable but impossible to explain precisely and therefore not as helpful for this thesis' purposes. The rest of the approaches are, however, somewhat connected to the thesis' topic.

The second approach is product-based and the most central one for the thesis as it states that quality is made of desirable components that can be measured. According to it, goods and services can be ranked based on if they possess the desirable attributes and based on the amount of the desirable attributes. (Garvin, 1984, pp. 25–26) To this thesis, it means recognizing funds' quality attributes and ranking them by importance to discover the most decisive ones.

Also, the manufacturing approach considers products' components. It defines quality through cost savings. The cost savings are generated through diligent design and analysis of a products' components and finding and fixing possible problem areas before launching the product. The diligent groundwork saves money by preventing issues and by reducing post-launch redesign and reclamation costs according to the manufacturing-based approach. (Garvin, 1984, pp. 27–28) It is applicable to this thesis as the thesis' results on the most decisive fund quality attributes can be used in designing funds into higher quality ones in the future.

The user-based approach defines quality from a demand perspective where the degree of quality is defined by how well the product satisfies customers' needs. Central to the approach is to try to combine the various desires of customers into a widely selling product. (Garvin, 1984, p. 27) The approach is therefore loosely attached to this thesis' aims because one goal for fund managers is to design the funds to sell well and to answer customer needs (Dyakov & Verbeek, 2019, p. 508). However, this thesis does not consider the consumer- view directly.

Lastly, the value-based approach describes quality as the optimal outcome of the relationship between cost and performance. According to it high-quality product or service needs to have a price that matches the value it possesses. (Garvin, 1984, p. 28) The value-based approach is applicable for this thesis' purposes because fund fees and performance are considered central quality characteristics in chapter 2.4.

In addition to the different quality approaches, there are eight dimensions that make quality (Garvin, 1984, pp. 29–30; Garvin, 1987, pp. 104–108). The dimensions are described in table 2. Six of them are applicable to this thesis' topic and they are performance, features, conformance, serviceability, aesthetics and perceived quality. Two dimensions, reliability and durability are excluded, as they are related to durable goods.

Table 2. The eight quality dimensions.

Dimension	Meaning	Examples of relation to funds
Performance	Central product attributes	How well the fund does in terms of profit and loss compared to other funds.
Features	Secondary & supplementary attributes, sometimes challenging to separate from central attributes	Does the fund focus on investing in socially conscious stocks.
Reliability	Does a product cease to function in a certain time period	More related to durable goods, than products and services that are consumed immediately (Garvin, 1984, pp. 30–31).
Conformance	How well the product attributes answer to standards and requirements	How well the fund answers to legislative requirements regularly surveilled by the FINFSA (Finanssivalvonta, 2022b).
Durability	How much usage a product lasts before malfunctioning	More related to durable goods, than products and services which are consumed immediately (Garvin, 1984, p. 31).
Serviceability	All product-related service aspects, e.g., professionalism, manners, care, speed	Fund managers provide indirect service to customers by managing the customers' assets with professionalism. Direct serviceability shows when a customer meets the banker selling the product or uses an online service.
Aesthetics	Subjective and user-based view on product attributes; how the product sounds, feels and looks	How the fund name sounds and what kind of image it offers, e.g., "Seligson Top 25 Brands" & "Nordea Global Gender Diversity" (Talous-Sanomat, 2022). How the fund's investment strategy is described and what kind of language is used.
Perceived quality	Subjective and user-based view on indirectly related product attributes	The environment where funds are sold (e.g., online, banks) impacts the quality perception. Also, fund marketing material falls into this category.

According to Garvin's theory, not all products need to focus on all dimensions to succeed (Garvin, 1984, p. 33). For example, Seiko watches are known for their long and precise basic functioning, and relatively low price, whereas they are not as highly equipped with extra features, such as high-end material choices, as Rolex watches are. Therefore, Seiko has reached a place amongst the most well-known watch brands by focusing on the quality of basic attributes over secondary features. Similarly, the most important mutual funds' characteristics do not distribute evenly to all the dimensions. Most fall under

“features”. This will become evident in paragraph 2.3 where characteristics will be further discussed.

All the studies and frameworks mentioned in this paragraph find quality highly meaningful and important. Quality is meaningful, for example, because it can be used as a tool to produce more sustainable competitive advantages, better business profit, larger market share and reduced costs. It also produces better customer experiences. By improving quality, a company can gain positive status among consumers resulting in higher prices and a larger market share which leads to better profits. Moreover, higher quality saves costs in a company which also leads to better profits. When the product is successfully designed to answer standards and customer wishes, it reduces redesign and service costs. (Garvin, 1984, pp. 33–38; Kumar et al., 2021, pp. 896–897; Pakurar et al., 2019, pp. 2–4; Veselova, 2018, pp. 11–13)

Similarly, improved fund quality has many positive effects. For instance, if a fund is managed well and it continues to implement the fund strategy as marketed to the customer, the customer knows what to expect and should be less interested in reclaiming or contacting customer service which lessens service costs. Customer happiness also increases inflowing assets which are vital for the fund’s existence. It can also contribute to establishing a well-known name for the fund and the fund manager which means they can perhaps charge higher fees. A well-designed fund investment strategy can contribute to finding suitable investment objects which can produce better profits and contain other desired attributes to serve the fund’s objectives. If a fund is not fulfilling conformance standards or other official demands, it can lead to fines from the supervisor FIN-FSA and costly legal cases. Of course, there is a risk involved in fund investing and even if the fund would be well designed and implements a successful investment strategy, still unexpected surprises might occur which do not always lead to excellent customer experiences. For instance, the fund value fluctuations might surprise investors even though it is compulsory for bankers to go through all risks and fees diligently with the investor before investing. Nevertheless, according to David Garvin’s (1984, p. 37) quality

framework, a high-quality mutual fund should produce lower costs and higher profits compared to a lower-quality one.

2.3 Fund characteristics

Past scientific articles that relate to the topic of this thesis concentrate on studying various fund characteristics' impact on fund performance by applying statistical methods in order to depict correlation. Consequently, they only consider one dimension of quality. According to Garvin's quality theory (1984, p. 30) performance is a core dimension of quality but there are other dimensions to consider as well. This chapter introduces the characteristics which are most commonly discussed in past studies. Then, chapter 2.4. builds a connection between the fund characteristics discussed in this chapter and Garvin's (1984, p. 29–30) quality dimensions.

Investment products' core meaning is to produce profit which shows in the perspective the past studies have chosen (Rachmad & Sugiharto, 2021, p. 313). The past studies often define performance as meaning risk-adjusted profit. One of them is "An examination of ex -ante fund performance: identifying indicators of future performance" (Clare & Clare, 2019, pp. 177-178). The study explains how different characteristics affect over 2,000 United States of America (U.S.A) based equity funds' performances between 2010 and 2017. In the study, Jensen's alpha is used for defining performance. It is also mentioned in many other studies and is widely used to describe fund profit. Jensen's alpha actually describes the profit fund produces above the benchmark index's profit and takes into account risk in the form of volatility as described below. (Clare & Clare, 2019, p. 178; Dyakov & Verbeek, 2019, p. 512; Rachmad & Sugiharto, 2021, p. 312–314)

$$\text{Jensen's Alpha} = r_p - ((r_f + \beta \times (r_m - r_f)), \text{ where} \quad (1)$$

r_p = Average fund return

r_f = Average risk-free rate (a theoretical profit of an investment with no risk)

r_m = Average expected market return (the benchmark index's return)
β = Portfolio beta (determines if a fund is more volatile than the benchmark market)

Even though profit is mentioned in almost all studies referred to in this thesis, its presence is not widely justified, it is usually only defined. The reason is probably that profit is a self-explanatory part of investing. Clare & Clare (2019, p. 177) mention that fund managers are evaluated by investors and superiors by their ability to beat benchmark profit. Also, Parida (2018, p. 1) and Dyakov and Verbeek (2019, p. 518) logically explain that investors typically choose funds strongly based on past returns.

The view is also supported by Oehler et al. (2018) and Kamal (2013) who studied fund ratings. Funds are sometimes rated to help investors gain knowledge on funds in an easier form. For example, Morningstar's Star ratings and Analyst ratings are well-known and widely used forms of ranking funds. They both aim to predict superior future fund performance. Oehler et al. (2018, p. 148) say that many investors choose to invest based on the Star ratings even though, according to the study, the ratings do not succeed in estimating future performance. Also, Kamal (2013, p. 1665) adds that Morningstar's Analyst ratings, which base more widely on both quantitative and qualitative aspects than the Star ratings, are very popular amongst investors. However, Kamal (2013, p. 1671) adds that the Analyst ratings capture future performance better than the Star ratings. All in all, performance is a central fund attribute according to many studies.

Fund managers' impact on funds is discussed in multiple studies and from various perspectives. The same studies discuss fees, as management and fees have a strong connection. The reason is that management fee is often considered as being fund managers' reward for their work. Active funds, which aim to produce higher profit than the benchmark, often have higher fees as they require more active managing. Active funds' managers try to find atypically high profiting investment objects with their stock selection skills and by timing the buying and selling optimally for profit creation. In contrast, passive funds need less active attending as they merely aim to follow the general market

profit and therefore they have lower fees. (Clare & Clare, 2019, p. 193; Hajduova et al., 2019, pp. 70, 81; Potter, 2021)

Management fee was mentioned in all studies which discussed expenses. There were ten studies discussing them, for example, Clare (2017, p. 154), Amaral et al. (2019, p. 191) and Vidal et al. (2018, p. 557). Vidal et al. (2018, p. 557) explained that management fee covers 90% of total mutual fund expenses. Therefore, management fee is considered the most central expense type in this thesis. Also, other costs than management fee were mentioned in the studies, but the number of mentions was low. Nguyen et al. (2018, p. 1295) operational expenses and Malhotra et al. (2018, p. 63) and Rahman et al. (2017, p. 98) transaction-related expenses.

As shown in figure 8, the amount of management fee has a remarkable impact on profit. The difference between a 1% and 0,25% annual fee is $30.000 in 20 years for a $100.000 initial investment. The management fee is paid to the managing company and the fee is often automatically deducted from the annual profit, or loss, of the fund (Nordea Bank, 2022c).

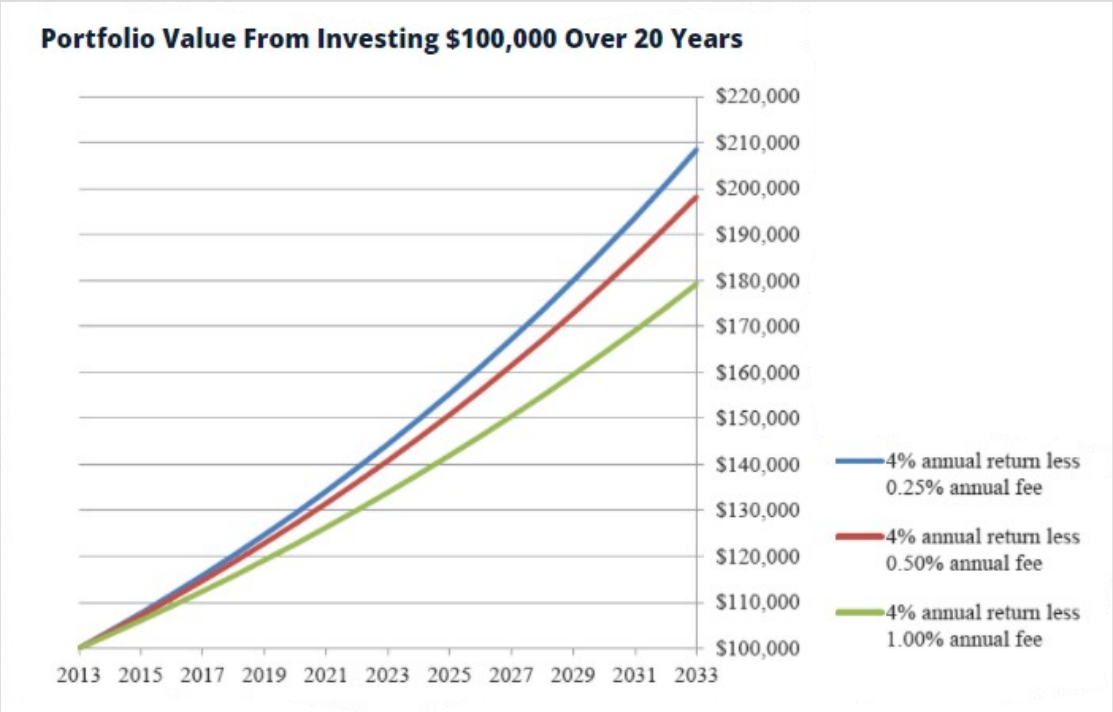

Figure 8. Portfolio value from investing $100.000 over 20 years (U.S. Securities and Exchange Commission, 2014).

There are certain characteristics and skills which may help portfolio managers to be successful in their performance according to past studies. Praether et al. (2004) and Clare (2017) discuss manager experience. Praether et al. (2004, p. 323) say that manager experience enhances management skills and has a small positive impact on fund profit. Clare (2017, p. 159) adds that managers who have more than ten-year experience with a fund perform better than managers on average.

Andreu and Puetz (2017, p. 144) explain that a fund manager's education level is significant and that in their study higher education was found to lessen risky investment strategies and overall excess risk-taking. Adding to the relevant fund manager skills, Gusni and Faisal (2018, p. 1) say that fund managers' stock selection skills have an impact on the fund's performance, however, they add that timing skills are not relevant. Also, Prather et al. (2004, p. 324) state that fund managers who can concentrate on managing only one fund at a time produce better profits than the ones that have multiple to manage.

Hajduova et al. (2019, p. 82), Clare and Clare (2019, p. 193) and Prather et al. (2004, pp. 324–325) studies mention that contrary to popular belief, management skills and efforts in total do not have a major positive impact on the funds' performance. While some attributes have positive effects, they do not profit the fund enough to cover the costs of active management. According to them, actively managed funds profit the same as the benchmark if the management fee is subtracted from the fund profit. Also, Hajduova et al. (2019, pp. 70, 82) add that in their 15 years tracking period only four out of 22 worldwide equity funds exceeded the benchmark profit. When fees were removed from the profit, none exceeded the benchmark. This finding is supported by the fact that passive funds have grown their popularity with investors (Hajduova et al., 2019, p. 81). Clare and Clare (2019, p. 178) also add that managers' actions might even have negative implications. Managers might take too many risks trying to produce higher profit which can lead to losses. Clare and Clare (2019) conclude that winning the benchmark needs skill but also luck. Cornell et al. (2017, pp. 40–41) finally add that managers' past outperformance does not guarantee future outperformance and thus choosing a fund based on managers' past performance is not ideal.

Pinto et al. (2016, pp. 46, 48) explain in their study of Indian retail investors' preferences for mutual funds that fund manager reputation is the fourth most important factor out of nine when choosing a fund which means that management matters to consumers. Asano (2016, pp. 1, 32) confirms that according to their study on worldwide capital markets managers with good reputations are more popular among investors and can raise more investments. Also, managers with better reputations receive a higher payoff. Also, Cornell et al. (2017, p. 33) and Clare & Clare (2019, p. 175) concur that actively managed funds with a bigger impact from fund managers have remained popular even though passive ones gained market share. In 2019 in the U.S.A mutual funds market, about half of the assets were allocated to passive funds and a half to active, the other market areas are following the trend (Potter, 2021). Therefore, even if the impact of fund managers on fund performance is debatable at the best, it still seems to matter to consumers.

Consumers might not always value merely performance and might feel more comfortable knowing their assets are actively managed by a well-known manager with a good reputation compared to lesser active management. Figure 9 indicates the discussed managerial attributes.

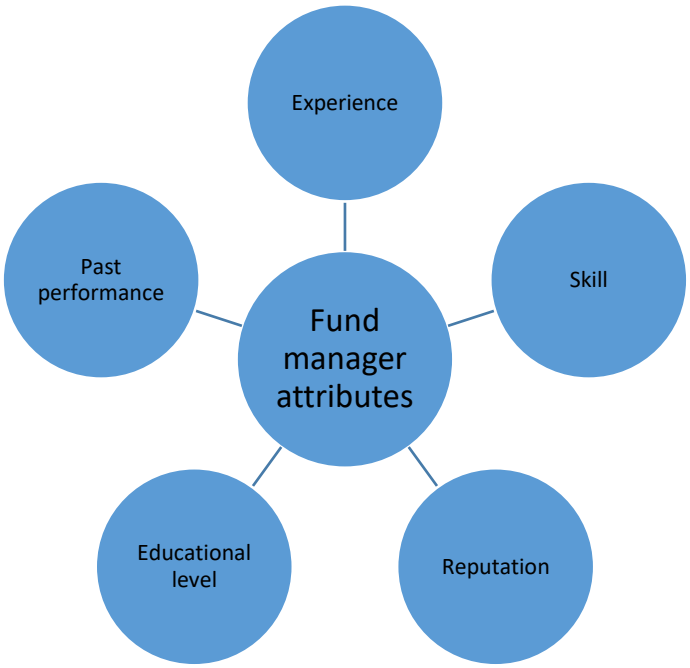

Figure 9. Fund manager attributes.

Clare and Clare (2019, pp. 189, 193) and Prather et al. (2004, p. 313, 324) mention fund flow and size as significant matters for performance. Fund size refers to the amount of assets under management in the fund. Fund flow means the assets which flow to the fund as investments. Clare and Clare (2019, p. 189) state that the most money attracting funds are unable to consistently perform well, whereas Prather et al. (2004, p. 324) mention that inflowing assets are vital for a fund to survive and succeed. Prather et al. (2004) studies 5.000 worldwide equity and mixed funds' data for five years between 1996-2000. In a smaller Portuguese market, innuendos of larger size correlating positively with performance were found as fixed costs have a wider spread between assets and a wider selection of investment objects can be accessed with higher asset amounts (Amaral, 2019, p. 201).

In contrast, Babbar and Sehgal (2018, p. 26) find that fund size and growth negatively impact fund performance according to their study of mutual funds in India. The negative impact of the fund size appears after a certain point when the purchasing power and expected value are very high. As the performance expectations grow, it gets more and more challenging to buy strategy aligned investments that are of reasonable size and price. Also, Clare and Clare (2019, p. 189, 191) add that high amounts of inflowing assets cause managers to divert from their original fund managing plans. The high amounts of inflowing money might cause managerial behavioural issues because popularity easily results in overconfidence. Overconfidence then might cause high turnover rates and more risk-taking. A successful fund manager, Mika Heikkilä adds in Helsingin Sanomat's interview that he kept his profitable growth stock-oriented fund small because a larger fund would have had challenges in finding strategy compatible investment objects. Heikkilä's fund Mikro Markka has been the best performing Finnish stock fund for the past several years and it invests in small companies. (Saarinen, 2021) The issue of finding suitable investment objects may be especially prominent in the funds concentrated investing in the Finnish market because the market is relatively small. However, as Amaral's (2019, p. 201) study suggests funds in small markets might also benefit from a larger fund size. Also, the issue of many too large funds existing in the Finnish market might not be a common one.

Moreover, to fund size also the fund turnover rate has been considered several times in the past literature as one of the funds' important technical characteristics. Turnover can be defined as the average amount of investments a fund has bought and sold divided by the average of the fund's assets in a year (Cici et al., 2018, p. 4). According to Rahman et al. (2017, p. 94), the average turnover rate of a mutual fund is approximately 85% in a year. Nguyen et al. (2018, p. 1300) find in their study "Investor confidence and mutual fund performance in emerging markets - Insights from India and Pakistan" that a high portfolio turnover rate correlates with lower profit. Also, Amaral et al. (2019, p. 199) and Vidal et al. (2018, p. 578) state that even though many past studies have found a positive

correlation between enhanced performance and turnover rate, all three studies found that a higher turnover rate does not correlate with positive performance in terms of profit. The reason is that more transactions mean more transaction-related costs, such as subscription and brokerage fees. Parida (2018, p. 6) adds that further to transaction costs, also fund marketing costs rise with a higher transaction activity. Cici et al. (2018, p. 6) disagree with the earlier mentioned studies and say that as funds trade more, they have less idle cash which results in them performing better. Cici et al. (2018) studied over 3.000 U.S. equity funds in 2000-2013. The technical attributes discussed in this chapter are depicted in figure 10.

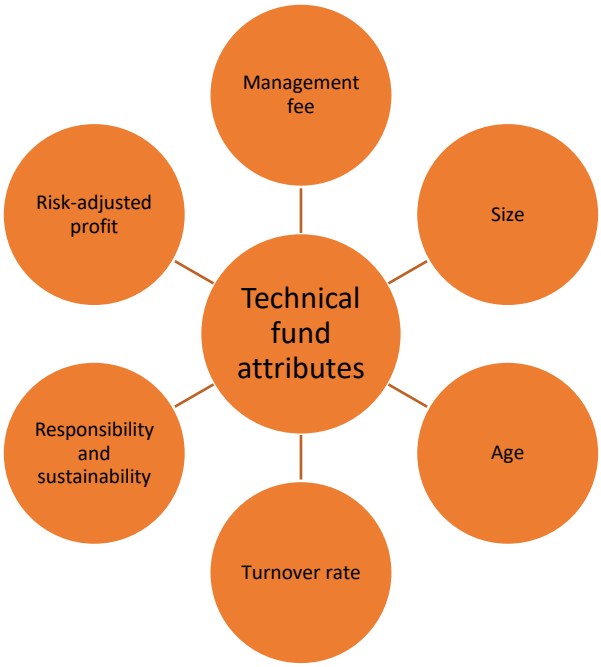

Figure 10. Technical fund attributes.

Another technical characteristic that is often discussed in the past literature is fund age. Nguyen et al. (2018, p. 1306) and Babbar and Sehgal (2018, p. 26) mention it on a positive note. Nguyen et al. (2018, p. 1306) say that a higher fund age helps funds operate more efficiently by being able to divide operational expenses over a longer period of time. Babbar and Sehgal (2018, pp. 25-26) add that higher age brings higher risk-adjusted profits as older funds can find suitable investment objects to suit all market cycles.

Surviving the market fluctuations is respected by investors which draws them to the fund. Also, older funds are better known and respected in the market. Consequently, Parida (2018, p. 5) adds that funds' marketing costs are lowered as funds age.

Completely contradicting the earlier mentioned studies Amaral et al. (2019, p. 199) explain that high fund age and performance correlate negatively. They suggest that younger funds tend to be able to detect better investment objects and develop strategies to stay successful in the market. However, at the end of their study, they add that fund age's impact on performance and reasons for the impact need more studying. Also, the study was performed in a smaller Portuguese market compared to the two earlier mentioned ones, Nguyen et al. (2018) and Babbar and Sehgal (2018), who conducted their studies in India and Pakistan which might affect the result. Prather et al. (2004, p. 323) conclude that based on their findings fund age and performance do not have a significant correlation. They say that the result may indicate that older funds may have performed well in the past, but the performance has not endured at the same level throughout history.

Fund sustainability and responsibility is a more recent topic with funds and perhaps because of that, it is absent in many of the older studies. For example, the earlier mentioned studies in this thesis which typically studied various factors' impact on fund performance did not contain sustainability or responsibility as one of the factors. Socially responsible investment (SRI) includes finding sustainable and responsible investment objects which consider environmental, social and corporate governance (ESG) attributes as depicted in figure 11. (Duran-Santomil et al., 2019, pp. 1-2)

Figure 11. ESG investing (DBS Bank, 2022).

A study by Rahman et al. (2017, p. 92) was an exception with their research on U.S.A equity funds. They explain that sustainability has become very interesting to many investors lately and therefore socially responsible funds have grown very popular in recent years. Kerber & Jessop (2021) add in their Reuters article "Analysis: How 2021 became the year of ESG investing" that climate change and social fairness trends are driving investors to find responsible investment objects. It has driven companies and funds to develop the related aspects. A record of 649 billion dollars was invested into ESG funds in 2021 and ESG funds now possess 10% of the world's fund assets. The sum has risen by approximately 100 billion dollars from 2020 and by 360 billion dollars from 2019.

Duran-Santomil et al. (2019, p. 14) find in their study "Does Sustainability Score Impact Mutual Fund Performance?" that sustainability and responsibility have a positive impact on the fund performance. A fund that has a high sustainability and responsibility rate attracts more investors than a low one. Rahman et al. (2017, pp. 109-110) say that in

their study socially responsible funds performed on average similarly to the traditional ones in terms of profit. Traditional funds had more abnormal behaviour with very low returns or very high returns. According to the study findings investors do not need to sacrifice profit if they decide to choose a responsible fund instead of a traditional one.

In Finland, ESG funds have had a pricy reputation and based on Nordea Bank's funds listing the traditional equity funds' management fees are between 0,40%-2,02% whereas the sustainable funds' are between 0,55%-2,37% per year. (Nordea, 2022d; Thuren, 2018) However, according to a Finnish equity savers association, Osakesäästäjien keskusliitto (2019), 42% of investors would avoid investing in companies with responsibility issues and 35% would avoid investing in industries that might have responsibility issues. These kinds of industries can be, for example, the weapons industry. All in all, fund responsibility and sustainability is a current fund trend, and it is highly interesting to investors.

Further to the characteristics mentioned in this chapter, there are also other factors that were not mentioned as frequently in the past studies. Because of the low number of mentions they were not considered as central to the topic and were not discussed further. They were, for example, minimum initial investment amount, liquidity and price per fund unit. (Babbar et al., 2018, p. 6; Nguyen et al. 2018, p. 1293; Pinto, 2016, p. 46) Moreover, to the low number of mentions, some of the attributes which were not discussed further were external and not tightly about funds. They were, for example, area-specific tax benefits, inflation and general market conditions and withdrawal services. (Gusni & Faisal, 2018, p. 1; Nguyen, 2018, p. 1295; Pinto, 2016, p. 43)

In conclusion to this chapter, there are many studies on fund characteristics. They investigate the connection between fund performance, or more precisely risk-adjusted profit, and other fund characteristics. As there is a gap in the literature on the characteristics affecting total fund quality, performance-related studies needed to be used. However, as there is a wide range of characteristics that were discussed and which were closely related to funds' core functions, they are likely to affect funds' total quality as well as

their performance. Fortification for the importance of the found characteristics is found in the survey results in chapter 4.

2.4 The central characteristics

The most central fund characteristics were chosen to be studied further in this thesis. The characteristics were chosen based on the literature review and the most mentioned topics discussed in it and the past studies. Table 3 exhibits the chosen characteristics, the quality dimension they can be associated with and the reason for the association.

Table 3. The central characteristics and quality dimensions.

Characteristic	**Quality dimension**	**Reason for the dimension allocation**
Risk-adjusted profit	Performance	Profit and risk are core characteristics of a fund based on past studies
Fund manager skill	Serviceability	Managers serve customers indirectly by managing customers' assets
Fund manager reputation	Perceived quality	Reputation can be considered as a subjective, user-based matter
Management fee	Features	A technical fund characteristic that supplements core characteristics
Fund size	Features	A technical fund characteristic that supplements core characteristics
Turnover rate	Features	A technical fund characteristic that supplements core characteristics
Fund age	Features	A technical fund characteristic that supplements core characteristics
Responsibility and sustainability	Features	A technical fund characteristic that supplements core characteristics

As seen in table 3, the characteristics do not cover all of Garvin's (1984, pp. 29-30) quality dimensions. They cover performance, features, serviceability and perceived quality. This means that aesthetics and conformance are not covered, in addition to reliability and durability which were excluded earlier in chapter 2.2. This was to be expected, as mentioned in chapter 2.2., as Garvin (1984, p. 33) explains that not all products need to excel in all dimensions to be of high quality. However, conformance to standards is vital for

mutual funds as they cannot function without compelling law (Finanssivalvonta, 2022b). As they cannot function without conforming to standards, it is a self-evident attribute and probably because of that, it has not been studied in past studies. Aesthetics might be too vague to be assessed by applying statistical means which were mostly applied in the past studies and perhaps therefore excluded.

3 Methodology

This chapter begins by introducing the applied research philosophy and approach. Then survey and empirical data collection are discussed. Lastly, the chapter describes the quantitative methodologies that are used for analysing the gathered data.

3.1 Research philosophy and approach

Research philosophy explains how a researcher understands the world. It explains the dependabilities between the means of obtaining new knowledge and the discovered knowledge. The research strategy and chosen method are also related to the applied research philosophy. (Saunders et al., 2007, pp. 102-103)

The research philosophy which is applied in this thesis is positivism. Positivism relies on the detectable reality. It uses existing theories as the basis for planning new research. Extensive sample sizes are needed to help comprehensive conclusions be drawn. The conclusions aim to represent reality. The researcher's assumptions and preconceptions are not considered when applying a positivist approach. Therefore, the results should be based on the findings of the research and not impacted by the researcher. (Saunders et al., 2007, pp. 103-104) However, there is a human element involved in planning and performing the study, so while the thesis writer's impact is diminished, it might not be possible to remove it completely. The methodologies which are used with positivism are typically very structured ones to ensure replication (Saunders et al., 2007, pp. 103-104). Positivism is typically related to quantitative studies but is not only limited to them. It can be used in qualitative research as well (Saunders et al., 2007, pp. 103-104).

This thesis uses a deductive approach. A deductive approach relies on prior theory and data. It makes deductions based on prior facts and compares the research results with them. A deductive approach is typically associated with quantitative research. (Hirsjärvi & Hurme, 2015, p. 25) Quantitative research searches for possibilities for generalization

in populations. It aims to describe and predict human affairs and other phenomena with numerical means. This means changing data into a numerical format to be able to analyse it. (Vilkka, 2007, p. 14) This thesis is quantitative as quantitative methods are applied for analysing numerical and literal data gained through a survey. The methods are further discussed in chapters 3.3 and 3.4.

Studies can be divided into groups based on their research purposes. This thesis mainly has an explanatory purpose. It tries to find connections that have not been discovered earlier between variables in the existing data. (Saunders et al., 2007, p. 131) The variables in this thesis are fund quality and the characteristics which formulate it. Moreover, to the explanatory purpose, the thesis has features of exploratory purpose as well. Exploratory research aims to study questions that have not been profoundly studied earlier. (Saunders et al., 2007, p. 369). In this thesis, it is related to the survey's questions which ask to explain if there are fund quality characteristics that the respondents think should be considered and which are not mentioned in past literature. As fund quality has not been profoundly studied earlier, the answers to the question is difficult to predict and hence it includes an exploratory dimension.

3.2 Survey and empirical data collection

This thesis uses survey as a research strategy. A survey is usually used for researching people's opinions, attitudes, values and general social phenomena (Vehkalahti, 2019, p. 11). It is convenient because it does not typically require a lot of time and resources to be able to offer large data sets by reaching sizeable populations. A survey aims to receive an answer from a representative sample of the population. In this thesis, a self-administered and internet-mediated email survey was performed. (Saunders et al., 2007, p. 356) This means that respondents answered independently to a questionnaire that was sent on Wednesday 16.2.2022. The time to respond was two weeks, ending Wednesday 2.3.2022. The end date was mentioned in the email. A reminder email was sent on

Thursday 24.2.2022. Most answers were received during or near the initial date when the survey was sent.

The survey email seconded as a cover letter. Its purpose was to introduce the survey topic and raise interest and motivation to answer (Vilkka, 2007, pp. 80–82). The cover letter was written in a respective and neutral tone, and it contained an English section and an equivalent Finnish section. The translation in the two languages was done taking into consideration the possible different meanings of expressions in the two languages, however for this survey mostly established fund-related terms were used. Also, while the survey was only sent to industry professionals, all the characteristics and quality were shortly defined to ensure a mutual understanding of the terms. The cover letter also contained information on how long it takes to answer the questionnaire. After testing it was determined to be approximately 5 minutes. The questionnaire is found in Appendices 1 and 2 in English and Finnish.

The questionnaire was formed with Microsoft Forms and included in the sent emails as a link. Microsoft Forms is a popular survey tool, it helps create professional-looking and clear questionnaires. It was chosen because it is well-known and widely used by corporations, so it was assumed to be familiar to at least some of the respondents and therefore easy to access.

According to Bourke et al. (2010, pp. 42–43), too long and short questionnaires should be avoided. The respondents might find the longer ones time-consuming and very short ones not worth answering (Saunders et al., 2007, p.381). The thesis' questionnaire included ten questions and a feedback section. Eight questions were closed multiple-choice questions and two open ones. Open questions can be considered more laborious to answer and more challenging to analyse as the data they offer can be literal and imprecise. Therefore, their usage should be minimized. However, they might offer deeper and unexpected knowledge on issues as respondents can express their opinions freely. (Bourke et al., 2010, p. 43; Vilkka, 2007, p. 68) Two open questions were asked because

there was a need to understand the reasons for quality attributes' importance and to understand if the most decisive attributes had been found.

Two closed questions asked to choose the best-describing adjective on a Likert scale. The Likert scale options range between two opposite opinions (Vilkka, 2007, p. 46). In this thesis' questionnaire "Not important" and "Very important" were chosen after studying past studies' similar scales. "Neutral" was chosen for the middle option as, according to Vehkalahti (2019, p. 35), it needs to separate the negative end and the positive end of the scale.

As explained, the survey was carefully planned as its design and structure affect the validity and reliability of the thesis (Saunders et al., 2007, p. 364). Study validity is related to the right things being measured and reliability to the accuracy of measurement (Saunders et al., 2007, p. 366-367; Vehkalahti, 2019, pp. 41-42). The challenges often connected to surveys are that respondents read the questions forms by themselves and might understand the questions differently if they are not carefully represented (Vilkka, 2007). Therefore, the way the questions are asked in the questionnaire needs to be planned well and possibly tested with a test group before doing the actual survey (Vehkalahti, 2019, p. 41-42). Moreover, the questions need to describe the studied phenomenon and offer enough data and the right kind of data for the thesis writer to be able to draw correct conclusions (Vilkka, 2007, p. 38).

To enhance the validity of the survey results, the survey was sent to a small test group of five people for feedback. They were individual investors with more than five years of experience in fund investing. They were chosen because of their easy reachability and a probable full response rate. While they are not professionals, Saunders et al. (2007, p. 386) explain that all feedback is valuable at this stage of the survey and that testing is vital for the success of the survey. The purpose of the testing was to ensure all possible aspects were taken into consideration in the survey design (Saunders et al., 2007, p. 364). The purpose was also to receive feedback on if the questions were easy to answer and

understand (Heikkilä, 2014, p. 58). Also, the technical side was tested as in how easy it was to gather the received data and transfer it to Excel. The test group filled in the questionnaire and afterwards the respondents were shortly interviewed on the phone by the thesis writer. As a result, minor modifications were made to the covering letter and the questionnaire's gender question was added with an alternative "I do not wish to answer".

The population size considered in this thesis is an approximation that is based on the Bank of Finland's 2021 mutual fund listing and the two largest Finnish banks' fund manager listings (Nordea Funds, 2020; OP-ryhmä, 2020; Suomen Pankki, 2021a). There were about a thousand investment funds in Finland in 2021 of which 700 were mutual funds (Suomen Pankki, 2021a). The survey population consists of fund managers who work with Finnish mutual funds. Some managers may manage more than one fund, and some funds may have more than one manager. There is no conclusive list available that would list all managers and the funds they manage. However, after reviewing both the largest banks' fund listings, it came apparent that fewer managers are managing Finnish funds than there are funds. In Nordea Banks's annual fund report there were 95 funds and 42 managers (Nordea Funds, 2020). In a similar report from OP-ryhmä (2020), there were 22 managers for 66 funds. OP -ryhmä and Nordea Bank have a combined 66% market share of the Finnish market based on the amount of deposits (Suomen Pankki, 2021c). Based on the calculations each Nordea manager manages approximately two funds and OP-ryhmä managers three funds. It means that in Finland there are about 233 – 350 fund managers for 700 funds. However, as mentioned earlier, there is no conclusive list available of all fund managers and thus the contact information for the managers was collected from separate sources mainly on banks' websites. A total of 120 fund manager contact details were discovered.

A simple random sampling (SRS) technique was applied for sample choosing. SRS's purpose is to minimize the effect of the thesis writer's perceptions. It means that each respondent had the same likeability to be chosen for the thesis' study. It was applicable because the population of fund managers is homogenous and little variation occurs in

the population characteristics. (Vehkalahti, 2019, p. 43) It needs to be noted that not all fund managers were accounted for in the list of 120 contacts which might affect the reliability of the sampling.

The SRS was performed by the Excel function RANDBETWEEN which gives 80 random numbers between one and 120. The numbers represent the respondents' contact details which were listed in Excel in alphabetical order. (Heikkilä, 2014, pp. 34–35) The sample size of 80 respondents was chosen to maximize the sample size and its representability. However, enough contact details were needed to be left out of the sample size to be able to perform the SRS. Therefore, a third of the available 120 contact details were left out and two-thirds were included. However, according to Vehkalahti (2019, p. 43), the sample size can be considered secondary in importance. According to them, sample choosing has more effect on the accuracy of study results.

Table 4. Survey answer rate.

Population size, approximation	Number of surveys sent	Number of surveys delivered	Number of answers received	Answer rate
235-350	80	65	19	29,2%

As indicated in table 4. the questionnaire was sent via email to 80 respondents. It was sent in sets of five recipients to avoid the danger of email servers sorting it as junk email (Saunders et al., 2007, p. 390). Even with the taken precautions 15 emails were undelivered and came back from the respondents' email servers. The number of received answers was 19 and the answer rate was 29,2%. According to Vilkka (2007, p. 59), 25%–30% is a typical answer rate for questionnaires. Also, Vehkalahti (2019, p. 44) says that a less than 50% rate is usual. Therefore, the answer rate can be considered as being parallel to other questionnaires and the results can be considered as representative.

3.3 Fuzzy TOPSIS

Fuzzy Topsis is used as a quantitative method for deducting the rank of fund quality characteristics based on the questionnaire results. The usage of Fuzzy Topsis is related to Multi-Criteria Decision Making (MCDM) problems. The problems usually try to find an ideal solution amongst many criteria, and it is widely used in many fields of science. (Kore et al., 2017, pp. 1–2; Nadaban et al., 2016, pp. 823–824) Similarly, this thesis tries to find an ideal solution for fund quality criteria.

TOPSIS, the Technique for Order of Preference by Similarity to Ideal Solution, was originally developed by Hwang and Yoon (1981). The principle of TOPSIS is that it aims to find the attribute with the closest geometric distance from the positive ideal solution (PIS) and longest from the most negative ideal solution (NIS). (Kore et al., 2017, p. 1–2) Fuzzy TOPSIS is an addition to the conventional TOPSIS method. It uses linguistic variables to determine ratings for each attribute (Sevkli et al., 2010, p. 1–2). The linguistic fuzzy variables refer to the Likert scale alternatives in the survey, which range between “Not important” and “Very important”. In other words, the linguistic fuzzy variables allow the usage of terms that cannot be otherwise defined with quantitative means. Fuzzy also takes into consideration the uncertainty and possible bias in the data which is resulted from the human element involved. (Kore et al., 2017, p. 2; Sevkli et al., 2010, p. 2) This means, for example, that the possible bias in fund managers’ answers on fund management’s importance will be somewhat diminished.

It is possible to use various fuzzy numbers to represent the linguistic variables, but often triangular fuzzy numbers are used. The reason is their simple computability and realistic modelling. (Ansari et al., 2020, p. 7; Sevkli et al., 2010, p. 1) Figure 12 depicts the triangular membership function. The membership function consists of three figures representing the fuzzy number, a, b and c. A, b and c indicate the smallest, the ideal and the largest values. The possible values of the membership function $\mu\tilde{a}(x)$ are depicted in formula 2. (Sevkli et al., 2010, p. 2)

$$\mu\tilde{a}(x) = \begin{cases} 0, & x < a \\ \frac{x-a}{b-a}, & b \geq x \geq a \\ \frac{c-x}{c-b}, & c \geq x \geq b \\ 0, & x > c \end{cases} \quad (2)$$

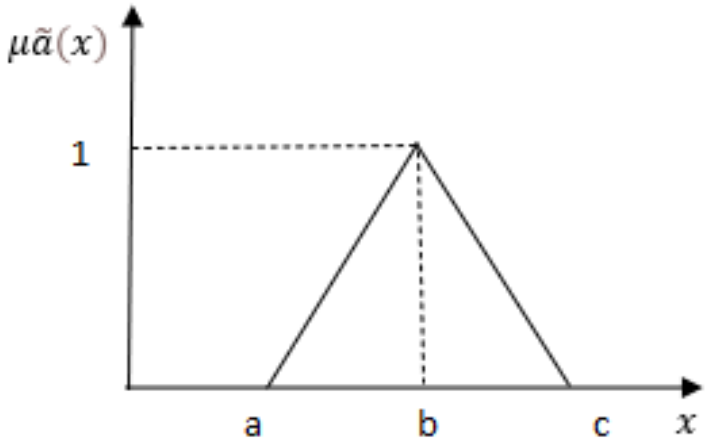

Figure 12. The triangular membership function.

The process for Fuzzy Topsis can be divided into eight steps according to figure 13.

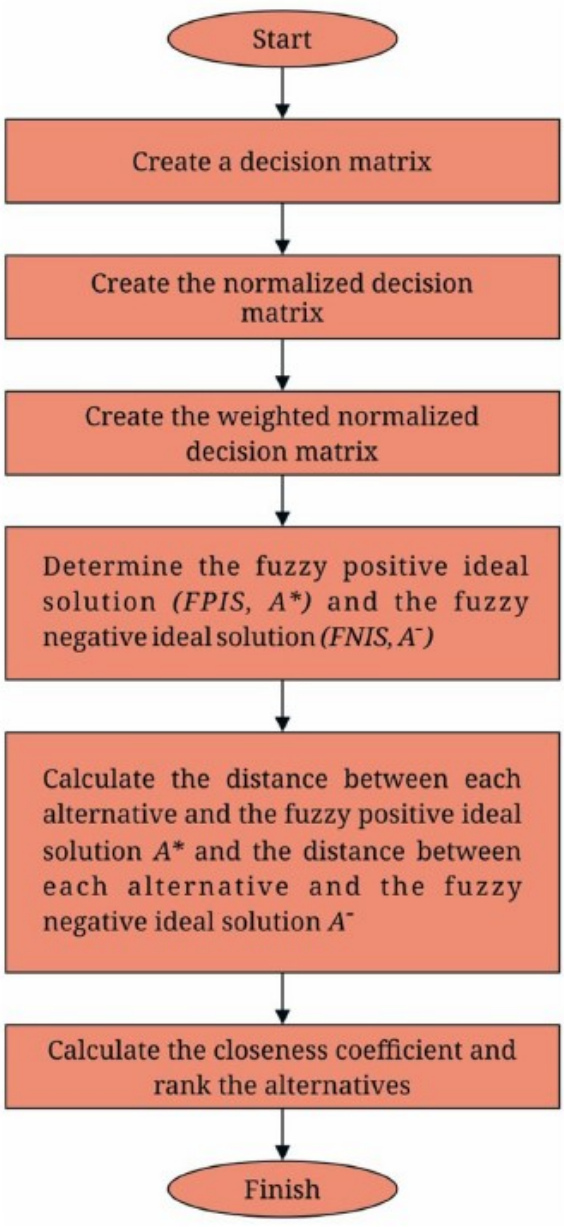

Figure 13. Fuzzy TOPSIS process flowchart (Ansari, 2020, p. 8).

The first step is to form a decision matrix as indicated in table 5 (Ansari et al., 2020, p. 8; Mathew, 2018). In the table, decision-makers refer to the fund managers who have answered the survey. The tables are examples indicating the mathematical method and do not represent the actual survey results. The results are discussed in chapter 4. Appendix 3 includes detailed sample calculations for Fuzzy TOPSIS.

Table 5. Decision matrix with linguistic fuzzy variables.

Characteristic	Decision maker 1	Decision maker 2
Risk-adjusted profit	Very important	Important
Fund manager skill	Not important	Important
Fund manager reputation	Not important	Neutral
Management fee	Neutral	Slightly important
Fund size	Slightly important	Slightly important
Turnover rate	Neutral	Very important
Fund age	Important	Important
Responsibility and sustainability	Important	Important

Then the decision matrix's linguistic variables are replaced with the equivalent fuzzy numbers according to the Fuzzy conversions scale in table 6 (Ansari et al., 2020, p. 8; Mathew, 2018). Table 7 indicates the decision matrix with the fuzzy numbers.

Table 6. Fuzzy conversion scale.

Linguistic ratings	Fuzzy numbers
Not important	1,1,3
Slightly important	1,3,5
Neutral	3,5,7
Important	5,7,9
Very important	7,9,9

Table 7. Decision matrix with fuzzy numbers.

Characteristic	Decision Maker 1			Decision Maker 2		
Risk-adjusted profit	7	9	9	5	7	9
Fund manager skill	1	1	3	5	7	9
Fund manager reputation	1	1	3	3	5	7
Management fee	3	5	7	1	3	5
Fund size	1	3	5	1	3	3
Turnover rate	3	5	7	7	9	9
Fund age	5	7	9	5	7	9
Responsibility and sustainability	5	7	9	5	7	9

Step two is to normalize the decision matrix. The normalization aims to minimize cost attributes and maximize beneficial attributes as depicted in formulas 2 and 3. All fund attributes, except the management fee, are considered being beneficial attributes. They

are considered beneficial as they cannot be unanimously and distinctly categorized as non-beneficial. (Ansari et al., 2020, pp. 8-9; Kore et al., 2017, p. 3; Mathew, 2018)

$$\text{Beneficial attribute: } \tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*}\right); c_j^* = max_i\ c_{ij} \quad (2)$$

$$\text{Cost attribute: } \tilde{r}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}\right); a_j^- = min_i\ a_{ij} \quad (3)$$

Step three in the Fuzzy TOPSIS process is to determine the weights (w_j) for each characteristic by applying formulas 4 and using figures from table 7. Then the weights are applied to the normalized decision matrix using formula 5. (Mathew, 2018; Nadaban et al., 2016, p. 827)

$$w_{j1} = \min_k(w_{j1}^k), \quad w_{j2} = \frac{1}{K}\sum_{k=1}^{K} w_{j2}^k\ ,\ w_{j3} = \max_k(w_{j3}^k) \quad (4)$$

$$\tilde{v}_{ij} = \tilde{r}_{ij} \times w_j\ , \quad (5)$$

Step four in the process is to find the fuzzy positive ideal solution (A^*) and the negative solution (A^-) by applying the formulas 6 and 7. In other words, the maximum ($\tilde{v}_n^*$)and minimum ($\tilde{v}_n^-$) figures are found in the matrix's columns. (Mathew, 2018; Nadaban et al., 2016, p. 827)

$$A^* = (\tilde{v}_1^*, \tilde{v}_2^*, \dots, \tilde{v}_n^*)\text{ , where } \tilde{v}_j^* = \max_i\left(v_{ij3}\right) \quad (6)$$

$$A^- = (\tilde{v}_1^-, \tilde{v}_2^-, \dots, \tilde{v}_n^-)\text{ , where } \tilde{v}_j^- = \min_i\left(v_{ij1}\right) \quad (7)$$

Step five is to calculate the triangular distance (d) between each criterion and the positive and the negative ideal solutions (Kore et al., 2017, p. 4; Nadaban et al., 2016, p. 828).

$$d(\tilde{x},\tilde{y}) = \sqrt{\frac{((a_1-a_2)^2+(b_1-b_2)^2+(c_1-c_2)^2)}{3}} \quad (7)$$

Then, the triangular distances are summed to get the distance of the attributes from the positive and negative ideal solutions. As seen in formulas 8 and 9. (Ansari et al., 2020, p. 9; Mathew, 2018)

$$d_i^* = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^*\right) \quad (8)$$

$$d_i^- = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^-\right) \quad (9)$$

The last and sixth step is to determine the closeness coefficient value (CC_i) for the attributes according to the following formula 10 (Kore et al., 2017, p. 4; Mathew, 2018; Sevkli et al., 2010, p. 3).

$$CC_i = \frac{d_i^-}{d_i^- + d_i^*} \quad (10)$$

The closeness coefficient determines the rank of the attributes (Ansari et al., 2020, p. 11, Mathew, 2018). The largest coefficient number indicates that the attribute is ranked number one and the smallest coefficient number indicates that the attribute is the eighth and last one.

3.4 Categorizing and coding

The second method used in this thesis is for analysing the data the questionnaire's open question number nine provides. Open questions offer textual data which cannot be clearly measured quantifiably or ranked but can be categorized. The nominal, or descriptive, data needs to be categorized and coded before it can be further analysed in quantitative means. (Saunders et al., 2007, p. 409; Vilkka, 2007, p. 111)

The categorizing and coding process begins with gathering the questionnaire answers into an Excel data matrix. Each row contains all data from one of the respondents. The respondents' survey answers, or rows, are given numbers for data checking purposes. (Vilkka, 2007, p. 111)

The analysis of the nominal data entails five steps. The first one is to roughly group the data. The data categories should be created so that each category is distinctly separated from another and that the categories do not overlap. However, too narrow categories should be avoided to prevent a low number of answers per category. (Bourke et al., 2010, p. 33) The second step is to examine the groups and divide the data into more detailed subcategories if necessary. The third step is to give numeral codes for each of the categories. For example, in table 8 the category "Hidden expenses" (code 10-19) was divided into two subcategories "Taxes" (code 11) and "Internal transaction costs" (code 12). The fourth step is to code missing data. The missing data means an unanswered question. There are multiple possible reasons for not answering an open question, for example, refusal, not having an opinion or not understanding the question. The fifth and final step is to produce a codebook based on the created codes. (Saunders et al., 2007, p. 415) An extract of the codebook for survey question number nine is illustrated in table 8. The characteristics are defined and further discussed in the next chapter 4.

Table 8. An extract of the codebook.

Code	Category	Code	Subcategory
1-9	Continuity	1	Continuity
10-19	Hidden costs		
		11	Taxes
		12	Internal transaction costs
20-29	Managing drawdowns	20	Managing drawdowns
40-49	Investor communications		
		41	Marketing
		42	Investment advice
50-59	Portfolio management process	50	Portfolio management process
60-69	Fund management		
		61	Fund management company
		62	Fund management team
.	Missing data		

After coding, the data is ready for analysis. The analysis is done by forming illustrative Excel tables and graphs as shown in chapter 4.

A remark on the categorizing and coding method can be done. The data which was analysed with the method was imprecise, it was words and sentences written by the respondents in two languages. Therefore, there is a risk of misinterpretation when the meaning of an answer cannot be discussed with the respondents. Interpretation is also connected to the created categories. The thesis writer needs to decide how to divide the data into appropriate categories. While the category titles are created based on the respondents' answers, there is a subjective element involved in the creation of the categories and aggregating of the answers. Therefore, the interpretation of the data may affect the reliability of the results. However, carefulness and consideration were applied to the analysis process for diminishing the possibility of misinterpretation.

4 Results

This chapter depicts the results of the thesis. The results are analysed with the help of tables and graphs. Also, the reasons behind the results are discussed. Moreover, similarities and differences between the past literature and this thesis' results are examined.

4.1 Demographics

Table 9 indicates the demographics of the respondents. It shows that most of the respondents are men (84,2%) at the age of 51-60 (52,6%) with a Master's degree (78,9%) and have worked as fund managers for twenty to thirty years (42,1%). Because of their long work experiences in the fund industry, the respondents have a deep knowledge of the field of study this thesis investigates. Therefore, it can be assumed that the questionnaire's target group was reached, and the survey was successfully sent to industry professionals with the needed knowledge.

Table 9. Respondent demographics.

Category	Subcategory	Frequency (N)	Percent (%)
Work experience in fund management	Yes	19	100
	No	0	0
Total		19	100
Years of experience in fund management	1-2	1	5,3
	3-5	3	15,8
	5-10	4	21,1
	10-20	3	15,8
	20-30	8	42,1
	Over 30 years	0	0
Total		19	100
Age	18-30	0	0
	31-40	4	21,1
	41-50	5	26,3
	51-60	10	52,6
	Over 60	0	0
Total		19	100
Highest educational level	Primary school	0	0
	Vocational school	0	0
	High school	0	0

Category	Subcategory	Frequency (N)	Percent (%)
	Bachelor's degree	3	15,8
	Master's degree	15	78,9
	Doctoral degree	1	5,3
	Other	0	0
Total		19	100
Gender	Female	3	15,8
	Male	16	84,2
	Other	0	0
	Do not wish to tell	0	0
Total		19	100

As explained in chapter 3.2 the number of answers received to the survey was 19. All the received answers contained answers to the closed questions. However, the open questions were not always answered. The unpopularity of the open questions was to be expected as they are sometimes considered more laborious to answer (Saunders et al., 2007, p. 369). Even though not all respondents answered the open questions, still in-depth knowledge was discovered in the received responses. The respondents who answered the open questions answered with care and with lengthy explanations including new aspects.

4.2 Fund characteristics' rank of importance

The rank of the most important fund characteristics was determined with the data received from questionnaire question number six. Determining the decisive characteristics and ranking them is central to this thesis' contribution as they answer research question number two.

RQ 2: What are the most important characteristics of mutual fund quality?

The eight most central characteristics were found in chapter 2.4 and table 10 shows their rank of importance. The rank was determined according to the calculations presented in chapter 3.3. and Appendix 3. Reasons for the characteristics' importance were asked in open question number seven. Only four respondents provided answers to the question.

Presenting reasons for all eight fund characteristics' importance was perhaps found too time-consuming or laborious. Because of the low number of answers, the results are explained in the below paragraphs literally and not further analysed statistically.

Table 10. Rank of characteristics.

Rank	Coefficient (CC_i)	Characteristic
1	0,98	Risk-adjusted profit
2	0,67	Fund manager skill
3	0,56	Fund age
4	0,53	Turnover rate
5	0,50	Fund manager reputation
6	0,48	Responsibility and sustainability
7	0,41	Fund size
8	0,06	Management fee

The characteristics' coefficients to the positive ideal solution are depicted in a graph format in figure 14. The coefficient difference between the most important quality characteristic, risk-adjusted profit with a coefficient value of 0,98, and the lowest ranking characteristic, management fee with a coefficient of 0,06, was a significant 0,92. The characteristics ranking from third to sixth, fund age, turnover rate, fund manager reputation and responsibility and sustainability, only have a small 0,08 difference in their coefficient values.

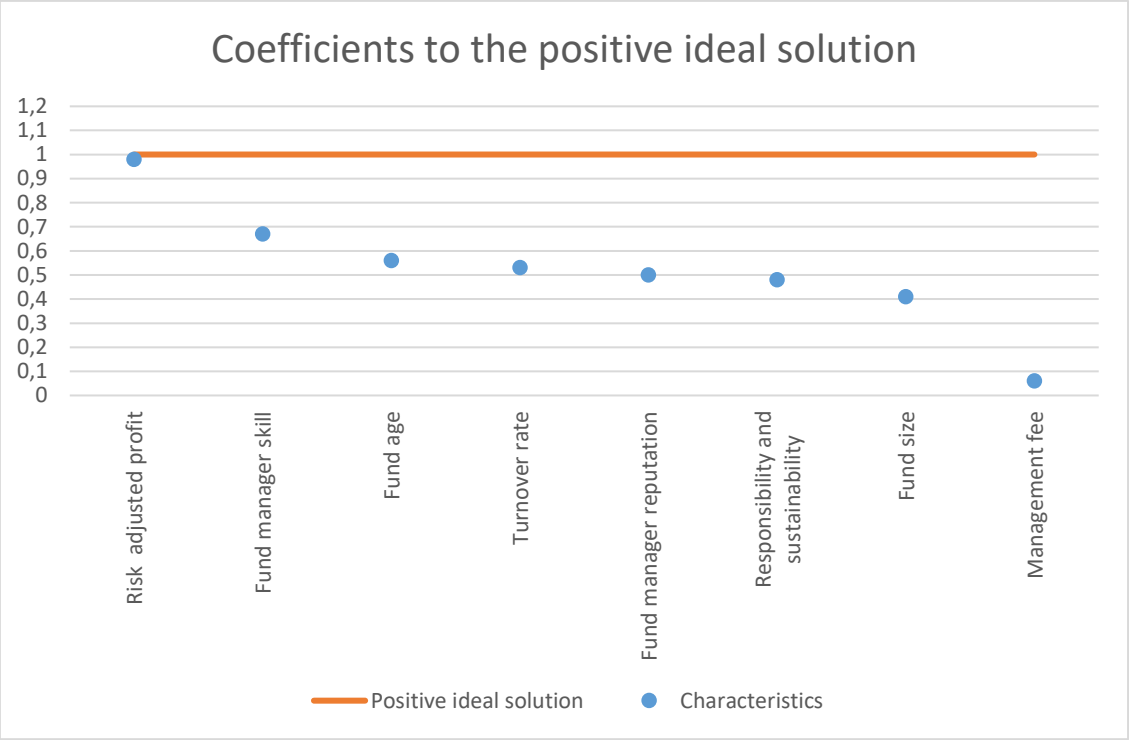

Figure 14. Coefficients to the positive ideal solution.

As mentioned, the most important characteristic of fund quality is risk-adjusted profit according to the respondents. It was mentioned in all earlier studies referred to in chapter 2.3. Also, it was concluded as representing performance in Garvin's (1984) framework, which entails a core element of a product. Therefore, a very high rank of risk-adjusted profit was to be expected. Also, Parida (2018, p. 1) seconds that most investors choose funds that have a good past track record in producing profit. Moreover, fund managers' peers and superiors also look at fund profits when discussing the superiority of funds and managers (Clare & Clare, 2019, p. 177). This was seconded by an answer from a respondent, explaining that profit is generally used for assessing managers' performance.

Fund manager skill ranked second in importance. The high ranking result is not a surprise when the survey's target group is taken into account, however, the result contradicts most of the past studies referred to in this thesis. For example, Praether et al. (2004, pp. 324-325) and Hajduova et al. (2019, p. 82) stated that management efforts do not have a notable impact on fund performance.

It was to be expected that fund managers see their skills as an important part of funds' quality. Fund managers have a deep understanding of their day-to-day work and undoubtedly their efforts have an impact on the quality of funds even though performance would not be remarkably affected. For example, they impact serviceability by communicating to investors, conformance by designing funds that follow the law and responsible practices and features by selecting, for example, socially conscious investment objects.

Fund age was ranked third in importance for fund quality, however as mentioned its coefficient value is very close to characteristics ranking from four to six. Two respondents explained that higher fund age is important for fund quality as it means that the fund has successfully survived past endeavours and market cycles. This is in line with the findings of Babbar and Sehgal (2018, p. 26) who explained logically that longer surviving funds have survived market fluctuations and might be able to do so in the future too. They explained that it is appealing to investors who look for continuity. Moreover, if thinking of fund age from a fund manager angle, it is probably more efficient to try to keep a fund alive and prospering as long as possible, rather than discontinue a fund and start a new one. A new fund needs to find investors, draw assets and go through rigorous and time-consuming regulation related procedures. The past studies did not agree on fund age's impact on performance, but it appears it affects total quality according to the respondents.

Turnover rate was rated fourth in importance. It was found as negatively affect fund performance by most of the past studies because a high transaction rate produces transaction-related costs and marketing costs (Parida, 2018, p. 6; Nguyen, 2018, p. 1300; Amaral et al., 2019, p. 199; Vidal et al., 2018, p. 578). A respondent agreed that to their mind a low turnover rate is one of the most important characteristics because it helps to minimize transaction costs. They added that lower turnover rate and lower costs help funds survive and make them more popular in investors' minds. A lower turnover rate means that more sustainable investment decisions need to be made and that market

fluctuations cannot always be answered immediately, but patience and careful consideration need to be applied to transactions.

Fund manager reputation was ranked fifth by the respondents. Its importance was not explained by any of the respondents. However, as Pinto et al. (2016, pp. 46, 48) explained, manager reputation is an important factor for investors. Also, the successful fund manager Mika Heikkilä, whose fund was discussed in chapter 2.3, explained that after the reputation of the successfully managed and profitable fund reached investors, he needed to limit investments into the fund because of the high and sudden popularity (Saarinen, 2021). Logically, fund managers with better reputations probably have better possibilities in drawing investors than the ones with an inferior or failing reputation. Therefore, fund manager reputation affects fund quality.

Responsibility and sustainability was rather surprisingly ranked sixth. The topic has been highly prominent in investment-related articles recently as, for example, Kerber & Jessop (2021) explained in their article “Analysis: How 2021 became the year of ESG investing”. Also, a large proportion of investors would avoid investing in objects with responsibility issues (Osakesäästäjien keskusliitto, 2019). Most past articles in chapter 2.3 stated that paying attention to responsibility and sustainability does not negatively affect fund performance but attracts more investors. However, the past studies were performed in international markets and did not include a Finland-specific view. No additional comments were received from the respondents regarding the responsibility and sustainability characteristic. Perhaps, one reason for Finnish funds’ managers not emphasizing responsibility and sustainability as high as other characteristics, is because of responsible funds’ traditional reputation as pricy and thinking the responsibility label would repel some investors.

Fund size was ranked seventh in the questionnaire. The past articles represent views on it affecting fund performance both negatively and positively. Perhaps, this is also the reason for it ranking low in the survey. Possibly, the issue of funds being too large and

finding strategy-aligned investments is not common in the small Finnish market. Too small funds probably is not a common challenge either as they would not survive without investors' assets and investments. Most past articles concentrated on studying fund size's effect in much larger markets than the Finnish one. However, Amaral (2019, p. 201) studied it in the Portuguese market and concluded that larger size affects positively performance which might give innuendoes on the Finnish market too. No comments were received on fund size from the respondents.

Management fee was ranked the last and eighth one. Most past studies in chapter 2.3 mentioned that management fee has a remarkable impact on fund performance. A higher fee has a direct negative impact on profit (U.S. Securities and Exchange Commission, 2014). According to Garvin's (1984, p. 28) value-based quality approach cost needs to match the value a product provides. Therefore, the management fee may not negatively affect fund quality if its level is appropriate to the benefit it provides. However, as the management fee's level was not studied in this thesis and it negatively impacting performance, a core attribute, it was decided to be allocated as a cost attribute in the applied quantitative methodology Fuzzy TOPSIS. The rest attributes were determined as being beneficial for quality, as they are not distinctly one or the other.

The fund management fee is generally seen as a reward for managers' for managing the fund and it would not be expected for managers to think that even a sizeable fee would negatively affect a fund's quality. A respondent concluded that management fee can be precisely justified, and it is the price an investor needs to pay to receive professional portfolio management services. The managers' view might differ from investors' as there is a conflict of interest with managers evaluating their own compensation.

There are many reasons for the eight fund characteristics being ranked in the particular order represented in table 10. Comments explaining their rank were not received for all attributes but the comments which were received shed light on the reasons behind the ranking choices. However, more study would be needed in order to understand the

importance of fund quality characteristics in the Finnish market. The past studies represent reasons for their importance, but their findings were not often unanimous and not from Finland. Also, comparing the questionnaire results to the past studies is not seamless. The past studies study various characteristics' impact on performance, not on quality as a whole. Therefore, there might still be uncharted reasons for the importance of fund characteristics.

4.3 Additional characteristics

Survey questions eight and nine asked if there are additional highly important characteristics that should be considered impacting fund quality. Ten respondents answered that there are more highly important attributes. Eight of them explained which characteristics. The mentioned characteristics are depicted in figure 15.

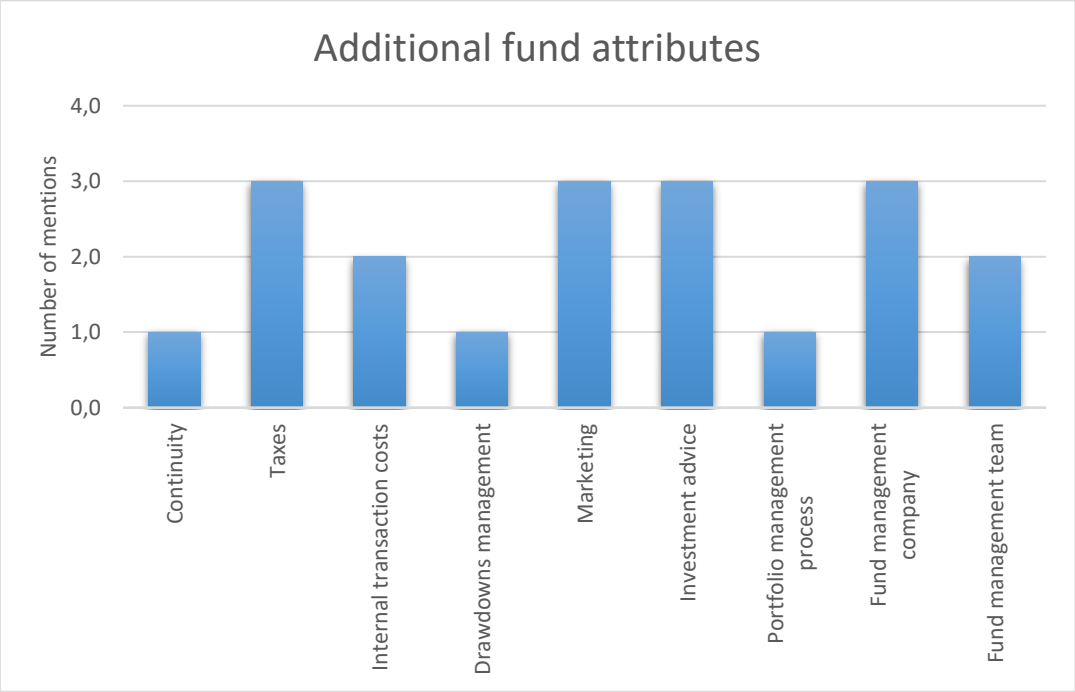

Figure 15. Additional fund attributes.

Nine new characteristics were discovered in the survey's open questions. Some of them were mentioned by multiple respondents but some by only one. The first one on the list is continuity. It was not elaborated on in the answer. The assumption is that it might be related to the fund's operation continuity. This means that the respondent thinks a fund is of better quality if it can operate for a longer period. It means that the fund would need to make sustainable strategic choices in terms of investments, personnel and fund management. Continuity was not found in the past literature which was reviewed in this thesis. It can be thought of as being related to the fund attribute "fund age" but perhaps entails more specific attributes that help funds survive in the long run.

Hidden costs were mentioned by five respondents. This means costs that are not depicted in the fund marketing material or the Key information document. Taxes and internal transaction costs were mentioned. Taxes are subject to local legislation, so a fund manager needs to understand the tax system in the market they invest in to be able to manage the tax costs. One past study mentioned taxes, Pinto et al. (2016, p. 46) discussed Indian funds. However, they were not extensively discussed in the past literature and vary regionally. Therefore, they were excluded from this thesis but offer grounds for future research.

Internal transaction costs are, for example, foreign currency-related costs and value changes. One respondent explained that they need to be well managed, and their negative impact minimized. They suggested that effective means for managing them would be, for example, using the management company's foreign currency accounts for foreign transactions. Foreign currency-related costs would offer grounds for future research as they were not considered in the past scientific literature.

Managing drawdowns was mentioned by one respondent. Drawdown means a sudden value decline from a peak to a slump in the fund's value (Heidorn et al., 2009, p. 89). The respondent suggested that preventing drawdowns and a quick recovery from them is important for funds' quality. Drawdowns were not discussed in the past scientific articles

referred to in the thesis. They are included in the characteristic risk-adjusted profit as past profit includes all the value highs and lows. However, explicitly studying drawdowns' effect on quality might offer grounds for future research.

Investor communications, or more specifically, marketing and investment advice were mentioned six times. One respondent explained that the investors need to be informed about funds' operations as openly as possible, especially in a marketing material that is first introduced to the investor before making the investment decision. The openness in information sharing during the market highs and lows would prevent investor panic during the market downfalls, according to the respondent. Knowing beforehand that the fund's strategy considers also difficult market situations and is prepared for declines perhaps helps investors to stay calm. Another respondent added that the information sharing is highly dependable on the investment advice given to the investor by investment advisors and bankers. Also, the fund management company has a responsibility to share information with investors by publishing regular fund reports with fund manager input. Marketing was discussed by Parida (2018). However, Parida (2018) studied various attributes' impact on fund marketing costs. Therefore, the perspective of how quality is affected by marketing and investment advice was not discussed in the studies referred to in this thesis.

Portfolio management process was described as being important to funds' quality by one respondent. They mentioned that process documentation ensures that the fund management is repeatable. The process being repeatable and clearly structured might help ensure that investment decisions are done based on facts rather than feelings or situation-specific circumstances. Also, a clear and documented process might help investors trust funds better.

A fund management team and a fund management company were mentioned five times. Two respondents explained that the company policies have an impact on the way a fund can be managed and that not everything is dependent only on the actions and decisions

of the fund manager. The respondents added that sometimes the investment decisions are done in a team and that the team's skills matter in fund management. The fund management company probably has many ways of impacting funds' quality. For example, fund management company's staff happiness, executive management's actions, company tools and processes all have an impact on the product, or the fund, the company produces and manages. Fund management as an attribute in terms of company and team was only discussed by one past study, Luo & Qiao (2020). They studied if management teams with committed members perform better than teams with non-committed members and therefore the study does not offer further information on the respondents' views.

In terms of Garvin's (1984, pp. 29-30) quality theory's eight dimensions, the nine additional fund attributes would fall mostly under features similar to most of the eight original dimensions. Continuity, drawdowns and hidden costs can be allocated into that category, similarly as management fee and age were allocated. Marketing can be allocated to perceived quality as it is highly related to consumers' perceptions of the product. Investment advice, fund management team and company can be allocated into serviceability, similarly, as, for example, fund manager skill was allocated into that category. However, as mentioned in the previous paragraph, the nine mentioned new attributes would need to be carefully defined and considered in light of the past scientific literature to be able to be sure of their nature and to be sure of the allocation of the attributes into quality dimensions.

While new attributes were mentioned, each new attribute received a maximum of only three mentions. Therefore, the number of mentions for each of the attributes is not statistically high. Also, as nine of the nineteen respondents answered that there were no additional attributes to the eight original ones, it can be concluded that the eight original characteristics which were found in the past literature seem to be the most decisive ones according to the respondents. A new study would need to be performed to assess the additional nine characteristics' importance for quality.

4.4 Importance of quality

The importance of quality was considered in the questionnaire's question ten. It answers research question 1 which asked how important quality is for mutual funds. The answer to the questions was quite unanimous with 6 respondents answering "Important" and 13 answering "Very important". The distribution of answers is depicted in figure 16.

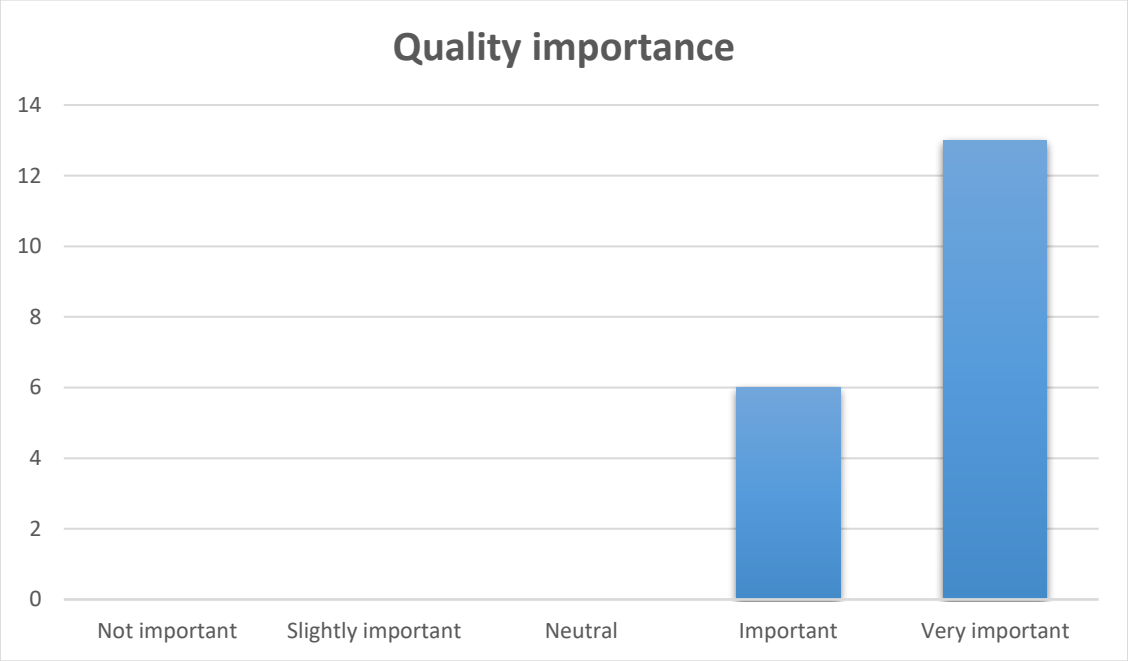

Figure 16. Quality importance.

The respondents thinking unanimously that quality is important for mutual funds gives assurance to the purpose of this thesis. In this light, quality in relation to funds seems like an important topic to study in the future. Also, it seems as there is a considerable gap in the existing fund literature and that there is a demand for studying fund quality more closely according to the industry professionals' opinions on fund quality importance.

There are multiple possible reasons for the lack of fund quality-related studies. One is that researchers have not found quality an important aspect when it comes to funds. This would contradict fund managers' views. However, the reason might be also that performance is so decisive for funds that other characteristics' importance has not been seen as valuable enough to study. However, thinking that investors only think of profit when investing might not be true in the contemporary environment where investors are interested in companies' responsibility aspects and caring for the environment is a global trend. All in all, fund quality is either important or very important to fund managers who manage Finnish mutual funds.

The last question in the questionnaire, number 11, asked to give feedback on the questionnaire or the topic. Actual feedback was not obtained, however, one respondent commented that the eight original attributes are important for fund quality especially if one wants "to sell a fund". This means that at least to the respondent the fund characteristics seem important from a customer perspective. This view is in line with David Garvin's quality theory's (1984) user-based approach which explains that customer satisfaction is a central tool for enhancing product quality.

4.5 Results implications

There are many implications for the results of this thesis. By applying Garvin's (1984) theory's quality dimensions, the quality affecting characteristics have been recognized. The recognizing is especially important according to the product-based quality approach (Garvin, 1984, pp. 25–26). Evaluation and recognition of quality characteristics help provide insight into a fund's current state and how it should be developed to meet the stakeholders' demands. The recognized characteristics can then be evaluated at their current level and a goal level can be set for a high-quality fund. Then, fund quality can be evaluated and measured. (Garvin,1984; Salminen, 2014) Therefore, the results provide valuable information for fund managers and management companies that develop funds.

When quality enhancing characteristics have been recognized and evaluated and goal levels determined, funds can also be compared by fund quality. This helps investors choose higher quality funds. Also, higher quality funds can be marketed as such, which can draw more investments from investors. The customer-view is important according to the user-based quality approach, which explains that taking customer view into considerations results in the positive circle of producing better customer experiences and gaining a larger market share. (Garvin, 1984, pp. 27, 35; Veselova, 2018, pp. 11–13) However, more study on specifically customer-view should be performed to ensure the characteristics' importance is similar to them as to fund managers.

Recognizing and evaluating the decisive quality characteristics and determining their optimal level also gives information to managers. It helps them understand how their fund compares to others. It also provides means for possible improvement. Moreover, fund management companies can differentiate from others by developing their fund selection to offer higher quality funds. Additionally, according to the manufacturing based quality approach (Garvin, 1984, pp. 27–28), fund management companies can reach cost-savings by improving fund quality. Developing funds lessens, for example, re-design related costs. Also, according to the value-based approach fund management companies can ask higher fees for higher quality funds.

This thesis also provides information on the overall importance of quality in relation to funds. As fund managers found quality important, there is validation for the need of developing funds into higher quality ones. Perhaps, it has been done earlier but not as knowingly. Therefore, the result offer validation for fund managers to begin consciously developing funds from the quality angle.

There are many positive implications for the results of this thesis. However, to gain the best potential of the topic, more research is needed especially on the ideal levels of each fund quality characteristic. Further research possibilities are discussed in chapter 5.1.

5 Conclusions

Investing in mutual funds has become a popular investment method with invested assets growing in value each year globally and in Finland. Therefore, determining if funds are of high quality and the aspects influencing their quality has become an interesting matter. Thus, this thesis aims to contribute to the study of mutual fund quality from the perspective of Finnish mutual funds' managers. Two research questions were identified to answer the thesis purpose.

RQ 1: How important is quality for mutual funds?
RQ 2: What are the most important characteristics of mutual fund quality?

The first research question was answered by the survey respondents. The results highlight the significance of quality. All of the 19 respondents answered that quality is either important or very important to funds. Regardless of the managers valuing quality's relation to funds, no past studies were found that study the topic conclusively. This finding was also seconded by a finance industry-academic. In the light of the importance of quality and the high popularity of fund investing, more research on the topic of quality and mutual funds is needed.

The second research question was answered by first performing a literature review. As literature that discusses the relation of quality and funds conclusively was not found, performance-related literature was used. Most of the past literature discusses various fund attributes' impact on fund performance. Performance is closely related to quality as, according to David Garvin's (1984) theory, performance is one of the eight quality dimensions.

The most central eight fund characteristics were found in the literature review. They represent four of Garvin's (1984) eight quality dimensions. The represented dimensions are performance, features, serviceability and perceived quality. The central attributes' importance was evaluated by the survey respondents. The purpose was to answer the

second research question and find the most decisive attributes. The rank was determined to be the following ranking from the most important to the least important: risk-adjusted profit, fund manager skill, fund age, turnover rate, fund manager reputation, responsibility and sustainability, fund size and management fee.

All in all, this thesis successfully answered the research questions and by answering contributed to the study of mutual funds. This thesis also highlighted the importance of quality. Therefore, a new perspective on researching funds was discovered. It will hopefully result in more quality and funds related studies in the future.

5.1 Future possibilities

This thesis' topic offers many further possibilities for research. One option would be to apply qualitative research methods to gain a deeper understanding of the reasons behind the fund characteristics' ranking and to better understand the reasons for the importance of each characteristic. As mentioned, a few answers were gained to the open survey questions and the ones which were, offered new insights and deeper background information. Therefore, a semi-structured interview could be performed with fund managers. The interview would offer a chance for an open conversation between the interviewee and the researcher, and it could offer new viewpoints on fund quality (Saunders et al., 2007, p. 311). The gained new information could be used to further assess the importance of fund characteristics and to gain an understanding if some characteristics are more applicable to types of funds than others.

A necessary future research topic would also be to determine the ideal levels of each fund quality characteristic for a high-quality fund. This would contribute to making the funds more easily comparable. It would also help fund managers to measure and develop funds from the quality perspective. Another possibility would be to further examine the additional characteristics, which were discussed in chapter 4.3., impact on quality. Also, the topic could be studied from an investor's point of view. Afterwards, investors'

and managers' views could be compared to see if there are differences in them. This way funds could be developed to be more appealing to investors. Also, the reasons behind possible differences could be studied. Further, a similar study to this could also be performed on a wider country scale by surveying managers who manage other countries' funds. Later, differences between countries' emphasises on fund quality and their reasons could be studied. Also, specific fund types, for example, non-UCITS funds, could be studied to assess which characteristics best apply to each fund type. Lastly, a specific quality approach or dimension could be taken into analysis and define characteristics that are important from their perspectives. As discussed, the past literature mostly discusses performance and little information is available on the other dimensions.

5.2 Reliability, validity and limitations

Study validity explains if the right things are measured and reliability if they are measured with the right accuracy. (Saunders et al., 2007, p. 366–367; Vehkalahti, 2019, pp. 41–42). A reliable study can be repetitioned by other researchers to produce the same results as the first one (Vilkka, 2007, p. 149). Limitations aim to identify the aspects which affect the study results' generalization (Saunders et al., 2007, p. 531). Some of the validity, reliability and limitations affecting aspects have already been discussed in the previous chapters.

The validity of this thesis includes, for example, the successfulness of applying theory to practice, the successfulness of the survey design and the suitableness of the chosen methodologies. This thesis validity was enhanced by carefully studying and following common scientific practices which were studied from the related literature. For example, before deciding on the research approach and survey data collection method, many sources were studied. For instance, Saunders et al. (2007) and Vehkalahti (2019) who discuss common scientific practices were referred to.

Similarly, before deciding on using Fuzzy TOPSIS as a data analysis method, literature related to it was studied. For example, Nadaban et al. (2016) and Kore et al. (2017) used Fuzzy TOPSIS in their studies. Their methodology and formulas were studied, amongst other ones, for the purpose of designing a correctly functioning Excel tool for the data analysis.

One validity affecting aspect might be the lack of exactly related literature. As explained, the past literature concentrates on one quality aspect, performance and lacks study for the rest of the dimensions. Therefore, the characteristics which affect performance might differ from the ones which affect total quality. However, according to the thesis survey results, the most decisive quality affecting attributes were found. This became apparent in the respondents answers as explained in chapter 4. However, the validity of the results could be further improved by further studying the relation between quality and funds.

A practical example of this thesis' reliability is related to the survey. In this thesis, 80 questionnaires were sent which is a considerable share of the population. The response rate was 29,2% which can be considered a representative one (Vilkka, 2007, p. 59). The answer rate enhances this thesis' reliability. However, the answer rate with open questions was not as high and possibly many meaningful insights were not received. Therefore, the open questions' reliability might not be as high as the closed ones.

The study reliability also includes possible calculation mistakes and mistakes in transferring data from the questionnaires to the analysis tools. Precaution was taken in the calculation and transferral process and the data was checked multiple times. Also, the excel formulas were tested on a smaller scale to assess their functioning, before applying them to the whole data.

The main limitations of this thesis are related to the sample and population. The population estimation was imprecise as a conclusive list of fund managers was not found. In

future studies a larger sample could be taken, or the entire population included if the contact information could be found. This would help to enhance the generalization of the results. Also, the survey was performed only with Finnish funds' managers and therefore the results are only applicable in Finnish environment. However, the fund industry is global and the related literature international, which might diminish the issue of the results' generalization.

The thesis validity and reliability are vast topics and only some aspects were mentioned in this chapter. However, each step of the thesis process was carefully considered and studied before taking it. Consideration and carefulness were applied to the whole of the thesis process to avoid issues with validity and reliability. Objectivity was also implemented throughout the thesis by drawing conclusions based on found facts.

5.3 Ethics

Ethics were considered throughout the thesis. Study ethics refer to a good scientific practice that is applied throughout a study. It means that the science community, colleagues and the studied people and phenomena are respected while applying scientific basic rules as well as the law. The basic rules mean that the study was done applying, for example, honesty, openness and confidentiality. (Vilkka, 2007, p. 90)

This thesis was written, and all the data was handled, with care and objectively. References were done carefully and showing the original author. The data was interpreted diligently and using the best knowledge the thesis writer has. The results were represented honestly. The thesis' validity, reliability and limitations were considered and openly discussed. Also, the thesis survey was conducted with respect. All in all, ethics were considered and applied to the whole thesis process diligently.

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Appendices

Appendix 1. The survey questionnaire, English

Mutual fund quality, survey for Master's thesis in the University of Vaasa, Finland

The thesis aims to identify the most important characteristics for high-quality mutual (UCITS) funds. The survey is sent to Finnish mutual funds' managers. Quality can be defined as, for example, excellence and the ability for a product to meet customers' needs.

1. Do you work or have you worked as a fund manager or in a similar position?

- ◯ Yes
- ◯ No

2. Years of experience in fund management

- ◯ 0 years
- ◯ 1-2 years
- ◯ 3-5 years
- ◯ 5-10 years
- ◯ 10-20 years
- ◯ 20-30 years
- ◯ Over 30 years

3. Respondent's age

- ◯ 18-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51-60
- ◯ Over 60

4. Respondent's highest educational level

- ◯ Primary school
- ◯ Vocational school
- ◯ High school
- ◯ Bachelor's degree
- ◯ Master's degree
- ◯ Doctoral degree
- ◯ Other

5. Respondent's gender

- ◯ Female
- ◯ Male
- ◯ Other
- ◯ I do not want to tell

6. Determine how important each below mentioned characteristic is for a high-quality fund

	Not important	Slightly important	Neutral	Important	Very important
Risk adjusted profit	○	○	○	○	○
Fund manager's skill	○	○	○	○	○
Fund manager's reputation	○	○	○	○	○
Management fee	○	○	○	○	○
Fund size	○	○	○	○	○
Turnover rate	○	○	○	○	○
Fund age	○	○	○	○	○
Responsibility and sustainability	○	○	○	○	○

7. Kindly give reasons for the above mentioned characteristics' importance/ lack of importance.

Kirjoita vastaus

8. Are there other characteristics that were not mentioned in the above list and that are highly important for fund quality?

- ◯ Yes
- ◯ No

9. If you answered **Yes**, kindly explain which characteristics and why. If you answered **No**, kindly move forward to the next question.

Kirjoita vastaus

10. How important is quality for mutual funds?

	Not important	Slightly important	Neutral	Important	Very important
Quality is	◯	◯	◯	◯	◯

11. Give feedback on the form or topic if you wish

Kirjoita vastaus

Appendix 2. The survey questionnaire, Finnish

Sijoitusrahastojen laatu, Pro gradu -tutkielma Vaasan Yliopistossa

Tässä Pro gradu-tutkimuksessa pyritään selvittämään, mitkä ominaisuudet ovat kaikkein tärkeimpiä sijoitusrahaston laadun kannalta. Tutkimus koskee UCITS-rahastoja ja kysely on tarkoitettu rahastonhoitajille. Laatu voidaan määritellä tarkoittamaan esimerkiksi erinomaisuutta ja tuotteen kykyä vastata asiakkaan tarpeeseen.

1. Työskenteletkö tai oletko työskennellyt rahastonhoitajana tai vastaavassa tehtävässä

- ◯ Kyllä
- ◯ Ei

2. Kokemus vuosina rahastojen hoidosta

- ◯ 0 vuotta
- ◯ 1-2 vuotta
- ◯ 3-5 vuotta
- ◯ 5-10 vuotta
- ◯ 10-20 vuotta
- ◯ 20-30 vuotta
- ◯ Yli 30 vuotta

3. Vastaajan ikä

- ◯ 18-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51-60
- ◯ Yli 60

4. Vastaajan ylin koulutustaso

- ◯ Peruskoulu
- ◯ Ammattikoulu
- ◯ Lukio
- ◯ Alempi korkeakoulututkinto
- ◯ Ylempi korkeakoulututkinto
- ◯ Tohtoritutkinto
- ◯ Muu

5. Vastaajan sukupuoli

- ◯ Nainen
- ◯ Mies
- ◯ Muu
- ◯ En halua kertoa

6. Määrittele kuinka tärkeä kukin alla mainittu ominaisuus on mielestäsi laadukkaan rahaston kannalta

	Ei lainkaan tärkeä	Vähän tärkeä	Neutraali	Tärkeä	Erittäin tärkeä
Riskikorjattu tuotto	◯	◯	◯	◯	◯
Rahastonhoitajan ammattitaito	◯	◯	◯	◯	◯
Rahastonhoitajan maine	◯	◯	◯	◯	◯
Hallinnointipalkkio	◯	◯	◯	◯	◯
Rahaston koko	◯	◯	◯	◯	◯
Salkun kiertonopeus	◯	◯	◯	◯	◯
Rahaston ikä	◯	◯	◯	◯	◯
Kestävyys ympäristön kannalta ja vastuullisuus	◯	◯	◯	◯	◯

7. Perustele miksi yllämainitut ominaisuudet ovat tärkeitä/ eivät ole tärkeitä.

Kirjoita vastaus

8. Onko olemassa muita rahaston laadun kannalta erittäin tärkeitä ominaisuuksia, mitä ei oltu mainittu listassa?

- ◯ Kyllä
- ◯ Ei

9. Jos vastasit **Kyllä:** Mitä kyseiset ominaisuudet ovat ja miksi ne ovat tärkeitä? Jos vastasit **Ei**: Siirry seuraavaan kysymykseen

Kirjoita vastaus

10. Kuinka tärkeää laatu on rahastolle?

	Ei lainkaan tärkeää	Vähän tärkeää	Neutraali	Tärkeää	Erittäin tärkeää
Laatu on	◯	◯	◯	◯	◯

11. Anna halutessasi palautetta lomakkeesta tai aiheesta

Kirjoita vastaus

Appendix 3. Fuzzy TOPSIS calculations

This Appendix entails sample calculations for Fuzzy TOPSIS. The formulas and steps are also explained in chapter 3.3. The tables are examples indicating the mathematical method and do not contain actual survey data.

Figure 1 depicts the Fuzzy TOPSIS triangular membership function. The membership function consists of three figures representing the fuzzy number, a, b and c. A, b and c indicate the smallest, the ideal and the largest values. The possible values of the membership function $\mu\tilde{a}(x)$ are depicted in formula 1. (Sevkli et al., 2010, p. 2)

$$\mu\tilde{a}(x) = \begin{cases} 0, & x < a \\ \frac{x-a}{b-a}, & b \geq x \geq \text{a} \\ \frac{c-x}{c-b}, & c \geq x \geq b \\ 0, & x > c \end{cases} \qquad (1)$$

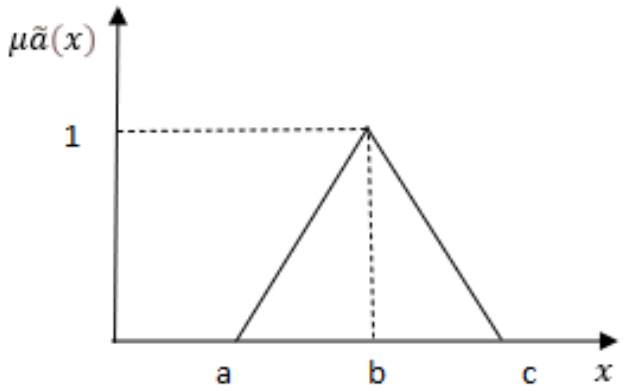

Figure 17. The triangular membership function.

Table 1. Fuzzy conversion scale.

Linguistic ratings	Fuzzy numbers
Not important	1,1,3
Slightly important	1,3,5
Neutral	3,5,7
Important	5,7,9
Very important	7,9,9

Step 1. Form the decision matrix as indicated in table 2. Then the decision matrix's linguistic variables are replaced with the equivalent fuzzy numbers from table 1. The results are shown in table 3.

Table 2. The decision matrix with linguistic fuzzy variables.

	Decision Maker-1	Decision Maker-2
Risk -adjusted profit	Very important	Very important
Fund manager skill	Very important	Important
Fund manager reputation	Very important	Slightly important
Management fees	Neutral	Slightly important
Fund size	Neutral	Important
Turnover rate	Important	Very important
Fund age	Important	Important
Responsibility and sustainability	Neutral	Slightly important

Table 3. Decision matrix with fuzzy numbers.

Risk -adjusted profit	7	9	9	7	9	9
Fund manager skill	7	9	9	5	7	9
Fund manager reputatior	7	9	9	1	3	5
Management fees	3	5	7	1	3	5
Fund size	3	5	7	5	7	9
Turnover rate	5	7	9	7	9	9
Fund age	5	7	9	5	7	9
Responsibility and sustai	3	5	7	1	3	5

Step 2. Normalize table 3 decision matrix. The result is indicated in table 4 where the normalization is done according to formulas 2 and 3. All fund attributes, except the management fee, are considered as being beneficial attributes.

$$\text{Beneficial attribute: } \tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*}\right); c_j^* = max_i\ c_{ij} \qquad (2)$$

$$\text{Cost attribute: } \tilde{r}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}\right); a_j^- = min_i\ a_{ij} \qquad (3)$$

Table 4. Normalized decision matrix.

Risk -adjusted profit	0,78	1,00	1,00	0,78	1,00	1,00
Fund manager skill	0,78	1,00	1,00	0,56	0,78	1,00
Fund manager reputatior	0,78	1,00	1,00	0,11	0,33	0,56
Management fees	1,00	0,60	0,43	1,00	0,33	0,20
Fund size	0,33	0,56	0,78	0,56	0,78	1,00
Turnover rate	0,56	0,78	1,00	0,78	1,00	1,00
Fund age	0,56	0,78	1,00	0,56	0,78	1,00
Responsibility and sustai	0,33	0,56	0,78	0,11	0,33	0,56

Step 3. Determine the weights (w_j) for each characteristic according to the formulas 4 and by using figures from table 3. The weights are shown in table 5. The weights are applied according to formula 5. The weighted normalized decision matrix is shown in table 6.

$$w_{j1} = \min_k(w_{j1}^k),\quad w_{j2} = \frac{1}{K}\sum_{k=1}^{K} w_{j2}^k\ ,\ w_{j3} = \max_k(w_{j3}^k) \qquad (4)$$

$$\tilde{v}_{ij} = \tilde{r}_{ij} \times w_j \qquad (5)$$

Table 5. Weights for the attributes.

w_{j1}	w_{j2}	w_{j3}
7,00	**9**	**9,00**
5,00	**8**	**9,00**
1,00	**6**	**9,00**
1,00	**4**	**7,00**
3,00	**6**	**9,00**
5,00	**8**	**9,00**
5,00	**7**	**9,00**
1,00	**4**	**7,00**

Step 4. Find the fuzzy positive ideal solution (A*, PIS) and the negative solution (A-, NIS) by applying the formulas 6 and 7. The PIS and NIS are shown in the two bottom rows of table 6.

Table 6. Weighted Normalized fuzzy decision matrix with PIS and NIS.

Risk -adjusted profit	5,44	9,00	9,00	5,44	9,00	9,00
Fund manager skill	3,89	8,00	9,00	2,78	6,22	9,00
Fund manager reputatio	3,89	6,00	9,00	0,56	2,00	5,00
Management fees	5,00	2,40	3,86	5,00	1,33	1,80
Fund size	1,67	3,33	7,00	2,78	4,67	9,00
Turnover rate	2,78	6,22	9,00	3,89	8,00	9,00
Fund age	2,78	5,44	9,00	2,78	5,44	9,00
Responsibility and sustai	1,67	2,22	7,00	0,56	1,33	5,00
A* (max of the column)	**5,44**	**9,00**	**9,00**	**5,44**	**9,00**	**9,00**
A- (min of the column)	**1,67**	**2,22**	**3,86**	**0,56**	**1,33**	**1,80**

$$A^* = (\tilde{v}_1^*, \tilde{v}_2^*, \dots, \tilde{v}_n^*) \text{ , where } \tilde{v}_j^* = \max_i(v_{ij3}) \quad (6)$$

$$A^- = (\tilde{v}_1^-, \tilde{v}_2^-, \dots, \tilde{v}_n^-) \text{ , where } \tilde{v}_j^- = \min_i(v_{ij1}) \quad (7)$$

Step 5. Calculate the triangular distance (d) between each criterion and the positive and the negative ideal solutions by applying the formula 8. The distances from PIS are shown in table 7 and from NIS are shown in table 8.

$$d(\tilde{x}, \tilde{y}) = \sqrt{\frac{((a_1 - a_2)^2 + (b_1 - b_2)^2 + (c_1 - c_2)^2)}{3}} \quad (8)$$

Table 7. Distance from PIS.

	Decision maker - 1	**Decision maker - 2**	**di***
Risk -adjusted profit	0,000	0,000	0,000
Fund manager skill	1,068	2,223	3,291
Fund manager reputatio	1,951	5,444	7,395
Management fees	4,838	6,078	10,915
Fund size	4,098	2,938	7,036
Turnover rate	2,223	1,068	3,291
Fund age	2,566	2,566	5,132
Responsibility and sustai	4,626	5,735	10,362

Table 8. Distance from NIS.

	Decision maker - 1	Decision maker - 2	di-
Risk -adjusted profit	5,375	6,696	12,071
Fund manager skill	4,647	5,186	9,832
Fund manager reputatior	3,901	1,887	5,788
Management fees	1,927	2,566	4,493
Fund size	1,925	4,757	6,682
Turnover rate	3,816	5,983	9,799
Fund age	3,562	4,956	8,518
Responsibility and sustai	1,815	1,848	3,662

Then, the triangular distances are determined to get the distance of the attributes from the positive and negative ideal solutions. They are determined according to formulas 9 and 10. The results are shown on the right of tables 7 and 8.

$$d_i^* = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^*\right) \quad (9)$$

$$d_i^- = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^-\right) \quad (10)$$

Step 6. Determine the closeness coefficient value (CC_i) for the attributes according to formula 11.

$$CC_i = \frac{d_i^-}{d_i^- + d_i^*} \quad (11)$$

The closeness coefficient determines the rank of the attributes. The largest coefficient number indicates that the attribute is ranked number one and the smallest coefficient number indicates that the attribute is the eighth and last one. The rank is shown in table 9.

Table 9. Rank of the attributes

CC_i	Rank	Attribute
1,0000	**1**	Risk-adjusted profit
0,7492	**2**	Fund manager skill
0,4391	**6**	Fund manager reputation
0,2916	**7**	Management fees
0,4871	**5**	Fund size
0,7486	**3**	Turnover rate
0,6240	**4**	Fund age
0,2611	**8**	Responsibility and sustainability