# Does it pay to be employee-owned? On the performance of knowledge-intensive firms.

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**Abstract**

**Purpose-** This paper aims to examine the stock market performance of knowledge-intensive employee-owned firms.

**Design/methodology/approach-** It constructs a portfolio comprising stocks of employee-owned wealth management companies listed in the UK Employee Ownership Index. A simple equal-weighted portfolio simulation strategy with annual rebalancing is employed and returns are analysed for the period 01.2002-12.2015.

**Findings-** The employee-owned firms consistently generate significantly higher returns, averaging 13% per annum. During favourable market conditions, the returns are even significant at 16.40% higher than the market average annual returns. The outperformance persists in single-year and five-year investment periods, full and sub-sample periods, including bullish, stable and challenging economic times, and even at high transaction costs and zero dividends. This superior performance is linked to a positive feedback loop created by homogeneous knowledge-workers who are incentivised to perform better in employee-owned business setting through participative decision-making and exhibiting risk aversion skills.

**Practical implications-** Adoption of the employee ownership model of running a business can be highly rewarding within knowledge-intensive firms. This study emphasises the need for a comprehensive database of employee-owned companies, which is currently lacking in the UK.

**Originality/Value-** No prior study could be found to have studied the relationship between employee-owned knowledge-intensive firms and their stock market performance.

**Keywords** Employee-ownership, Employee-owned firms, Homogeneous employees, Knowledge-intensive firms, Knowledge workers, Stock market performance.

**JEL Classifications** : E20, B23, G11, J54

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**List of abbreviations**

BIS – Department of Business, Innovation and Skills

CEQ – Certainty Equivalent Returns

CSOP – Company Share Option Plans

EMI – Enterprise Management Incentives

EO – Employee ownership

EOFs – Employee-owned firms

ESOP – Employee Share Ownership Plan

GBP – British Pound

LSE – London Stock Exchange

MSR – Modified Sharpe Ratio

PI – Price Index

PDM – Participative Decision Making

SAYE – Save As You Earn

SIP – Share Incentive Plans

TR – Treynor Ratio

UKEOI – UK Employee Ownership Index

**Introduction**

The success of the employee ownership (EO) model has gained significant attention among both businesses and policymakers in recent years. With fewer layoffs and higher survival rates, employee-owned firms (EOFs) tend to exhibit greater stability, contributing to lower unemployment (Kruse, 2022).

In the UK, the enactment of laws supporting employee benefits has played a pivotal role in advancing EO. It was the Finance Act of 1973 that first provided favourable tax treatment to the Save As You Earn (SAYE) scheme allowing an employee to buy shares for a fixed price. Further, the budget in March 2000 introduced tax incentives aimed at encouraging employee shareholding. In 2012, the Department for Business, Innovation and Skills (BIS, now known as the Department for Business, Energy and Industrial Strategy, BEIS) accepted most of the recommendations forwarded by the Nuttall Review (Nuttall, 2012). These recommendations were designed to raise awareness and promote employee ownership (BIS, 2012, p. 16-22). Currently, employee ownership remains an important form of business model in the UK, contributing between £32 to £41 billion in gross value added terms annually to the economy (EOA, 2024). Furthermore, companies that embrace the EO model have demonstrated greater resilience. For instance, during the last financial crisis, the sales growth of employee-owned firms (EOFs) was more attractive at 11.1%, in comparison to only 0.6% by non-EOFs (Lampel et al., 2014).

The popularity of EO stems from its many advantages, including increased productivity, commitment, and loyalty. Scholars indicate that allowing employees to have an ownership stake is mutually beneficial for both the employees and the firm (Richardson and Nejad, 1986; Gates, 1998; Blair et al. 2000; Rosen et al., 2005; Lin, 2014; Kruse, 2022). EO fosters innovation (Chang et al., 2015). Erdal (2011) reinforces this argument with examples

from numerous EOFs, including Scott Bader, a century-old British chemical manufacturing company that has been employee-owned since 1951 and continues to be identified as one of the most innovative firms in the industry.

However, opponents of EO often cite high-profile failures like United Airlines and Enron as evidence against the business model. United's 2002 bankruptcy filing, influenced by various factors including the loss of two planes in the 9/11, was exacerbated by employee dissatisfaction with the Employee Share Option Plan (ESOP), leading to higher costs from wage increases demanded by the union. At Enron, the ownership model involved employees holding shares in a 401(k) plan. The collapse of Enron was primarily driven by accounting fraud known to a select group of employees. However, it is argued that employees were encouraged to actively participate and continuously invest, creating substantial holdings without fully comprehending the risks associated with the lack of diversification inherent in the 401(k) plan (Huberman and Sengmueller, 2004). Consequently, the EO model faced criticism for exposing employees to major financial risks, and significant retirement losses. Several previous studies have also highlighted the downsides of the EO model, such as inefficiencies in decision-making and limitations on a firm's ability to motivate its employees (Alchian and Demsetz, 1972; Blair et al., 2000; Park et al., 2004), including the high costs of managing ESOPs (Jones and Kato, 1995).

While the debate surrounding inconclusive findings persists (Mygind and Poulsen, 2021), this paper makes a new attempt to investigate whether EO is better suited for firms requiring knowledge-workers The importance of knowledge-intensive firms, mainly in the context of service-oriented economies like the UK, has been emphasised in the literature for some time now (see for example, Warhurst and Nickson, 2001) but whether it is rewarding for such firms to be owned by the employees is not researched adequately, making it a central contribution of this paper.

Additionally, this paper highlights a notable gap in the existing literature, with no prior studies exploring the stock market performance of knowledge-intensive firms. It further suggests that the knowledge workers from industries, such as the wealth management, tend to be homogenous labour force. Thus, this paper contributes to the current body of literature on EOFs by specifically examining the stock market performance of homogenous knowledge-workers from the wealth management industry. Moreover, this paper undertakes a thorough evaluation of the performance of EOFs across various scenarios, encompassing single-year and multiple-year analyses, bull and bear market conditions, periods of economic stability, and economic downturns. Thus, this study offers a comprehensive examination of the stock market performance of EOFs in diverse market conditions and over different time spans, addressing a notable gap in the existing literature.

The remainder of the paper is structured as follows. Next section presents a comprehensive review of the pertinent literature on EO. The rationale for choosing stock market as performance indicator, description of the sample companies, and details of comparable benchmark indices are presented after literature review. It then outlines the methodology, presents the empirical findings, and discusses the results. Final, section concludes the paper and discusses its limitations.

**Literature review**

This section, first, provides an explanation of the concept of EO. Subsequently, it makes a comprehensive review of the literature that explores both the advantages and disadvantages associated with this model. EO is then explained through the lenses of incentivisation, decision-making, and risk aversion.

What makes a company employee-owned? There are a variety of ways a firm can qualify as employee-owned. For instance, in direct ownership, employees possess all or a

certain percentage of the company's shares, whereas in indirect ownership, shares are held on behalf of the employees through an employee trust. However, there is no exact prescription in the literature as to what percentage of shares should be owned by the employees or held in such trusts, or how many employees should own shares to qualify as employee-owned. For example, NCEO has provided a broad definition of EO as owning stocks, directly or indirectly, in part or in whole, by some or all its employees. Nevertheless, it remains crucial that, in addition to share ownership, employees play an active role in the company's management. In the guidance document from the UK Department for Business, Energy & Industrial Strategy, this is explained in terms of employees having a "significant and meaningful" stake in the business (BIS, 2013, p. 3). Consequently, for a UK firm to be employee-owned, employees must have both a financial stake, such as shares, in the business and a say in how it is run known as "employee engagement".

EO has been an area of great interest for a prolonged period of time, with scholarly attention dating back to the late 1950s when investment banker, Louis Kelso, pioneered the ESOP in 1956 and promoted it through academic publications (Kelso and Adler, 1958; Kelso 1968) and among politicians in the United States to persuade them to form new legislation favouring EO.

The theoretical perspective on EO posits that having a stake in the firm can lead to increased motivation and commitment of employees, subsequently fostering efficiency, productivity, and overall corporate performance. This optimistic theoretical viewpoint, combined with Kelso's contributions, spurred a surge in research in this field, gaining further popularity within academia from the late 1970s and has since expanded into a substantial body of literature advocating for the merits of the EO model, as evidenced by numerous studies (Conte and Tannenbaum,1978; Richardson and Nejad, 1986; Jones and Kato, 1995; Blair et al.

2000; Park et al., 2004; Robinson and Zhang, 2005; Edmans and Gabaix, 2009; Mygind, 2012; Burdín, 2014; Lampel et al., 2014; Lin, 2014; O'Boyle et al., 2016; Mygind and Poulsen, 2021; Kruse, 2022).

Early empirical analysis conducted by Richardson and Nejad (1986) revealed that the average annual share price return of employee-owned firms was five percentage points higher than that of firms lacking an EO scheme. Similarly, Jones and Kato (1995) found a comparable four to five per cent productivity outperformance among EOFs. The positive correlation with productivity has also been explained and documented in several studies (Mitchell et al., 1990; Kumbhakar and Dunbar, 1993; Park and Song, 1995; Robinson and Wilson, 2006; Sesil, 2007; Kruse, 2022), including in a recent work by Young-Hyman et al. (2023) where they find higher productivity enjoyed by knowledge-intensive French cooperatives relative to their conventional peers.

Furthermore, the EO model plays a pivotal role in enhancing the survival rate of firms, primarily due to the greater employment stability and resilience (Blair et al. 2000; Park et al., 2004; Burdín, 2014; Lin, 2014). Additionally, other researchers have associated EO with valuable human capital (Robinson and Zhang, 2005) and increased innovation (Chang et al., 2015).

Despite the theoretical arguments and academic contributions that endorse the aforementioned benefits of EO, findings in numerous other studies remain fragmented (Hannsman, 1996; Caramelli, 2011; Mygind and Poulsen, 2021), marked by ambiguity, inconsistency, and conditionality (Faleye et al. 2006; Sengupta, 2008; Richter and Schrader, 2016, Kim and Patel, 2020).

Hansmann (1988, 1996) identified increased conflict among employees with differing abilities and asserted that the EO model would only be effective in firms requiring a

homogenous workforce. Blasi et al. (1996) further narrowed down the model's effectiveness by documenting that the enhanced corporate performance was more pronounced among smaller firms compared to larger ones. Moreover, the existing literature lacks clarity regarding the relationship between EO and productivity. For instance, Doucouliagos (1995) discovered a weak association between worker ownership and productivity, attributing it to low or zero dividends but did not explore the reasons. Richter and Schrader (2016) showed that while EO improved value by metrics like Tobin's Q and Return on Assets, results were inconsistent with Sales per Employee, which Kramer (2010) found to be higher in employee-owned firms. Richter and Schrader (2016) also observed diminishing marginal effects on firms' performance with increasing levels of employee share ownership, a finding echoed in other studies (Pendleton and Robinson, 2010; Lampel et al., 2012). Similarly, Kim and Ouimet (2014) reported that large ESOPs have only a modest impact on productivity and compensation, as they often substitute wages with shares to preserve cash; only small ESOPs (less than 5% of shares) with a moderate number of employees significantly boost productivity. A previous study by Gamble (2000) further criticised that concentrated ESOP ownership may hinder innovation, particularly in R&D, due to managers' incentives to reduce risk and stabilise earnings. Blanchett (2013) even argued that firms should minimise or even eliminate significant employee stock allocations, due to their potential negative impact on performance.

In Sengupta's (2008) study, the effect of ownership on productivity is contingent upon the coexistence of trade unions and EO; EO alone does not appear to enhance productivity. The "condition to" argument is also highlighted by Kim and Patel (2020). Their research, which involved a sample of 573 South Korean and 892 firms in 28 European countries, failed to find direct evidence linking the EO model to a firm's productivity. However, in high-growth and unstable environments, the authors observed higher productivity because employees anticipated greater incentives, leading to improved performance and growth for employee-

owned firms (Kim and Patel, 2020). In a separate study, Ren et al. (2019) analysed a large number of Chinese firms and found that EO adopters consistently outperformed matched non-EO firms both before and after adoption, although the relative performance did not increase after the adoption of EO.

In addition to the issues identified above, existing studies on EO face additional challenges. First, there are very few studies that have examined the relationship between EO and stock market performance. For example, although McCarthy et al. (2010) in their quantitative analysis identified substantial financial returns, these gains were the benefits to the current and former employees in the form of share distribution i.e., similar to bonus, and were not related to stock market performance. Secondly, the existing studies have mainly confined their analysis to the economic slowdown periods, such as those during the last financial crisis (Lampel et al., 2014), as well as in 2001 and 2008 (Kurtulus and Kruse, 2018), and specifically in 2008 (Kim and Patel, 2020), ignoring the influence of EO during other economic times, such as the normal and the bullish market periods. Thirdly, there are limited prior studies examining the relationship between EO of knowledge-intensive firms and stock market performance. Although Young-Hyman et al. (2023) evidenced positive economic explanations generated by knowledge-intensive French cooperatives, it utilised revenue as a measure of evaluation, not their stock market performance. Moreover, the importance of impression management in knowledge-intensive firms has been overlooked by the current literature on EO. Fourth, existing research neglects the potential rewards or penalties of purchasing employee-owned stocks, leaving unanswered whether individual investors can profit from and promote EO business models by investing in the stocks of these firms.

The literature presented above, therefore, evidences contrasting findings and gaps in knowledge. Arguments both in favour of and against EO have undergone extensive review in

numerous studies (Blair et al. 2000; Park et al. 2004), and there is now a substantial body of meta-analytic research on this subject (Doucouliagos, 1995; Kruse and Blassi, 1997; O' Boyle et al. 2016; Mygind and Poulsen, 2021; Kruse, 2022). Nevertheless, as reviewed above, the debate persists.

In addition to linking EO with various performance measures, academics study friends and foes of EO through the lenses of incentivisation, decision-making, and risk aversion.

Concerning *incentivisation*, as elucidated by the incentive theory of motivation (Skinner, 1965), individuals are primarily propelled by the anticipation of rewards (or the avoidance of negative outcomes). Employees are incentivised by the tax benefits bestowed upon them for embracing EO schemes (Nutall, 2012; GOV.UK, 2022), as well as by the prospect of additional income sources beyond their wages, including bonuses, dividend, and stock options, which they may receive as owners. Moreover, as a result of various incentives, EO serves to diminish conflict between management and employees. This reduction occurs because EO effectively aligns the interests of employees, such as employment security, with those of the firm, such as performance (Park et al. 2004). This alignment can be linked to agency theory, which posits that ownership and control are separate in conventional firms (Jensen and Meckling, 1976). EO mitigates this agency risk by providing incentives aligning both the employees' and the company's objectives (French, 1987; Welbourne and Cyr, 1999; Blair et al., 2000; Oyer, 2004; O'Boyle et al., 2016).

Second, in terms of *decision-making*, it is argued that EO prompts inefficiencies in the decision-making process of firms. Collective decision-making, within an EO business model may be inefficient, similar to the saying, "too many cooks spoil the broth". The associated connotations of this phrase can result in friction within EOFs, particularly in large ones, due to often diverse interests among employees (Hansmann, 1996; Blasi et al. 1996; Dow and

Putterman, 2000; Blair et al., 2000; Lampel et al. 2012). In contrast, Winther and Marens (1997) demonstrate that participatory decision-making within EOFs leads to relatively faster growth rates than in conventional firms. Furthermore, Cotton et al. (1988), in their assessment of six different forms of participation in decision making (PDM), identified EO as the most effective form for enhancing productivity and second best for increasing job satisfaction.

Thirdly, employee *risk aversion* in EOFs is shown to result in a higher survival rate during economic slowdowns (Lampel et al., 2014). This phenomenon can be described through the golden handcuffs hypothesis of Sengupta (2008), which promotes low employee turnover within EOFs. According to this theory, employee share options serve as a retention tool, making it costly for employees to leave the company. The sense of ownership and cooperative culture fostered by EOFs reduces redundancies and encourages lower quit rates compared to non-employee-owned companies, ultimately leading to increased survival (Perotni 1987, 1997). With reduced employee turnover, it is likely that firm-specific human capital will increase, consequently enhancing the likelihood of EOFs investing more in employee training and thereby improving corporate performance (Park et al., 2004).

In summary, the findings of the existing literature are quite varied and while the considerations outlined above emphasise the impact that incentivisation, decision-making, and risk aversion have on EOFs, the current body of knowledge falls short in adequately addressing the specific areas covered by this study.

Next, this paper constructs the portfolio of employee-owned wealth management firms and provides analysis in terms of returns, returns adjusted for transaction costs, and risk-adjusted returns.

**Performance measurement, sample firms and benchmark indices**

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This section outlines the rationales behind measuring the stock market performance of sample companies. It then explains the reasons for utilising wealth management firms, their source, and criteria for choosing them. Additionally, the conceptual framework of this study is presented. Finally, it details the comparable benchmark indices that are employed to evaluate the performance of the sample EOFs.

*Measuring firm performance*

Prior literature has evaluated employee-owned firms mainly in relation to their financial or non-financial performances. Non-financial performance assessment in employee-owned business can be used to test a variety of hypotheses. For example, scholars have tested and found benefits of employee ownership in terms of increased participation among employees (Cotton et al., 1988), stronger organisational commitment (Dong et al., 2002) improved positive behavioural outcomes (McCarthy et al., 2010), and increased innovation (Feng and Li, 2020) etc. Such studies were carried out mainly using qualitative methods, like survey and interviews. However, the primary objective of this study is to assess the financial rewards for investors in employee-owned firms, including the employee owners, particularly those with knowledge workers. This study is therefore interested in financial performance. Accordingly, it makes use of financial figures and therefore a quantitative approach is taken.

To measure financial performance, this paper focuses on the stock market as key indicator for several compelling reasons. First, in developed countries like the United Kingdom, markets are generally efficient, meaning that stock prices tend to reflect all relevant aspects of a company, including its future earnings potential (Fama, 1965, 1970). Stock market performance thus serves as a reliable measure of overall company performance, applicable to all types of firms including knowledge-intensive ones. An alternative to assessing financial performance, which prior literature has focussed upon, is to use financial ratios. However, stock

market performance indicators hold a more direct connection to shareholders' value compared to other financial metrics, such as Profits, Returns on Assets (ROA), Returns on Equity (ROE), Sales, and Tobin's Q. In the case of employee-owned firms, it thus shows value being generated (or destroyed) for employee owners. The stock market is forward-looking and often reflects expectations about a company's future performance, whereas most financial metrics are inherently backward-looking. Second, the stock market is much better at capturing the external risks because the market is influenced by a broader set of factors and not just company specific ones. These factors may include market sentiment, economic conditions, interest rates, and geopolitical events. Therefore, by measuring stock market performance, this study will be able to capture the EOFs' resilience to various market-wide risks and fluctuations. Fourth, the literature exploring the relationship between employee ownership of firms and stock market performance is limited. While numerous studies have empirically analysed the performance of EOFs, and several papers have investigated the relationship of EO with accounting performance, capital market performance, productivity, and survival (as seen in Blasi et al., 1996; Park et al., 2004; Kalmi et al., 2005; Faleye et al., 2006; Sengupta et al., 2007; Freeman et al., 2010; Lin, 2014; Richter and Schrader, 2016; Kim and Patel, 2020), the stock market performance of EOFs remains a relatively less explored area of research. One reason for this scarce literature could be the lack of databases of employee-owned firms. For example, in the UK, at the time of writing this paper, there is no database available that provides information on which listed companies are employee-owned, the extent of employee ownership, and the details of the ownership schemes. Moreover, past findings surrounding employee ownership or engagement, and value generation has not consistently produced positive results. For example, Abowd (1989), in his study on the effects of wage bargains showed a negative effect as his regression analysis revealed shareholders' wealth moving in the opposite direction of union members' wealth. Gorton and Schmid (2004) investigated the implications of employee

participation in corporate decision-making of 250 listed companies and the impact on market to book ratio of firms. However, the participation was related to the German corporate governance system through seats on the board and not employee ownership. Their findings also suggested a negative impact leading to a decline of 31%.

*Sample Employee-owned Firms*

Motivated by the literature gap highlighted above, this paper focuses on knowledge intensive firms.

Existing literature defines knowledge-intensive firms as organisations where a significant portion of employees possesses advanced education and experience. These firms revolve around the use of intellectual and analytical tasks, are typically seen as requiring an extensive theoretical education and experience to be carried out successfully (Alvesson, 2004). They often have a strong focus on continuous learning, innovation, and adapting to new technologies or methodologies. They tackle complex, including non-routine problems that demand advanced knowledge, research and analytical thinking. Employees from wealth management industry should embodies most of these attributes in their regular duties. They deal with a wide range of financial market products to offer tailored solutions for individual investors. The market is regulated and full of uncertainty which requires the employees to gain specialised knowledge and skills related to fund management, including fundamental and technical analysis, market forecasting, taxation, and auditing. To fulfil the role, wealth managers acquire specialised qualifications and experience and therefore fall in the category of knowledge-intensive firms (Rylander and Peppard, 2005). Since this study aims to examine the rewards for investing in knowledge-intensive firms, wealth management companies, many of which are publicly traded and have accessible stock market performance indicator data, are an appropriate choice for investigation. Additionally, by examining wealth management firms,

where most employees display similar attributes, this study is able to investigate the hypothesis put forth in the existing literature that EOFs offer a more efficient model when employees are homogenous (Hansmann, 1996; Lampel et al., 2012). The homogeneity, however, does not imply absence of hierarchy (different levels of authority) or varying degrees of expertise and experience among employees. Instead, it refers to the uniformity in job roles and skills shaped by the nature of business, similarities in professional and educational backgrounds, common interests, common approach to client interaction, and shared professional values (Hansmann 1988, 1996). Wealth managers are expected to possess similar expertise, such as good numerical skills, an academic and/or professional degree (e.g., Associate Chartered Accountant, Chartered Financial Analyst, Chartered Wealth Manager of Chartered Institute for Securities and Investments, Fellow Chartered Accountant), similar substantial experience among managers, good attitude and presentation skills and therefore they are homogenous employees.

In this study, the sample EOFs are sourced from the database of UK Employee Ownership Index (UKEOI). UKEOI verifies employee ownership by reviewing annual reports, shareholder circulars, shareholding disclosures, and press coverage (UKEOI, 2016) of publicly listed companies. As a result, investors can efficiently identify employee-owned companies by accessing a single database like UKEOI, without the need to identify them from the entire list of London stock exchange companies. It may be noted that UKEOI has ceased producing the database of employee-owned firms nine years ago. Therefore the sample period of this study is limited to 2015. Currently, there is no database in the UK to indicate which listed companies are employee-owned, under what scheme or what is the stake of the employees. Sources, such as GOV.UK offer valuable information on EO, but do not have the list of employee-owned firms. In contrast, EOA while it offers the name list on its website, they are mainly for small firms and it doesn't include employee-owned companies from the London Stock Exchange.

Additionally, the website of EOA has no detail on ownerhisp characteristics, scheme types and the percentage of employee shareholding. These challenges of database persists despite considerable investment and interest by the UK government. Therefore, this paper highlights the need for a comprehensive and regularly updated database of employee-owned firms.

This study, however, takes additional measures to verify that the companies taken from the UKEOI list are mainly providing wealth management services for their clients. Additionally, the companies are screened to ensure that they are knowledge-intensive firms with homogeneous employees. The process of verifying and screening companies are discussed below.

Blair et al. (2000) have cautioned that publicly available databases on EO may contain inaccurate or unreliable information. Therefore, this study conducted a comprehensive search using every relevant data source to ensure that the companies listed in UKEOI continue to remain employee-owned throughout the sample period. To achieve this, content analysis was performed through key word searches of annual reports. This keyword search process was also extended to each company's website, further guaranteeing that only companies primarily engaged in core wealth management activities were included in the sample. The keywords used were obtained from the UK Government's website (GOV.UK, 2022) and encompassed EO schemes such as Share Incentive Plans (SIPs), Savings-related Save As You Earn share option plans (SAYE Share Option Plans), Company Share Option Plans (CSOPs), and the grant of Enterprise Management Incentives (EMI share options).

Next this paper checks for the presence of advanced and specialised education and experience criteria that are common among knowledge-intensive firms by visiting the biographies of wealth managers of all the wealth management companies available in the UKEOI list. This resulted in the identification of seven wealth management companies that were employee-

owned and belonging to the knowledge-intensive category with homogenous employees. They are Aberdeen Assets Management, Ashmore Group, Brewin Dolphin Plc, City of London Investment Group, Hargreaves Lansdown, Jupiter Fund Management and Liontrust Assets Management.

The following paragraph provides pertinent details regarding the education and experience of employees within the aforementioned seven companies.

First, on the education background, the staff members playing key roles in these companies have a relevant university degree, such as an MBA, Accounting or Law degree. Interestingly, several executive members of these companies also had their education completed in high-ranked and reputed schools. For example, executives at *Aberdeen Assets Management* have their MBA from Columbia Business School and MIT Sloan School of Management. Ashmore group staff members include qualified chartered accountants and postgraduate degree (such as MBA and Law) holders from high-ranked schools, such as Wharton School of Business and Cambridge University. Likewise, all seven companies have members with professional investment and accounting qualifications including at the executive level e.g., Brewin Dolphin's Managing Director has the qualification of Chartered Institute of Securities and Investment, and Jupiter Fund Management's top executive is a Chartered Financial Analyst (CFA charterholder), Ashmore and Liontrust have executives who are fellow of ICAEW (Institute of Chartered Accountants in England and Wales - a recognition which requires 10 years of experience as Associate Chartered Accountant). Secondly, in terms of work experience, key employees were found to have several years of experience with the majority of executives exceeding more than 20 years at large investment and financial service organisations, such as ANZ Bank, Bank of England, Barclays, CitiGroup, Deloitte, Lloyds Bank, Merill Lynch, National Australia Bank, PWC, Royal Bank of Scotland, UBS etc. The

education and experience criteria were therefore found to have been met to qualify the selected firms as knowledge-intensive with homogeneous employees.

The homogeneity characteristic can be additionally verified through the lens of impression management. The theory of impression management first appeared in the literature in 1956 to explain self presentation in the context of social interaction (Goffman; 1956). Since then, the theory has gained significant popularity and is now integral to various fields, including business, marketing, and human resources.

In the knowledge-intensive firms where employees engage directly with the clients, such as in law, accountancy, and wealth management firms, client relations become a key strategic focus with relationships often being individually controlled (Lowendahl, 1997). Hence, the importance of impression management as a facet of workplace appearance can be particularly critical for employees (Nickson and Hurst, 2020). In the context of wealth managers there are additional specific reasons why employees should display strong impression management skills.

First, because the business involves clients' money, it is crucial for the wealth manager to establish an environment of trust and confidence with the clients. Second, the client-facing managers provide consultations on different areas such as tax, savings, growth of money and risk. While playing such advisory roles, managers spend considerable time with clients to gather information, including personal and family circumstances, needs, risk tolerance, liquidity needs, and investment preferences. To secure and retain clients, wealth managers can not only focus on the technicalities of financial advice but also on the communication, client experience, and the overall impression created during interactions with the clients. This means the wealth managers should be able to make effective self presentation.

To gain some knowledge of whether or not the companies in the sample emphasise impression management criterion, this study made simple research of job adverts made by all seven companies. It was found that the companies in their advertisements clearly spelt out some key soft skills related to impression management traits. Some examples of desired skills that appeared in the vacancies of the companies' websites were: "High commercial and influencing skills", "Good influencing and communication skills to build and maintain trusted and strong relationships with clients to aid retention and introductions", "Excellent written and verbal communication skills – tailoring the message according to client type", "Excellent verbal and written communication skills with an aptitude for presenting – tailoring the message based on nature of client and size of audience".

Based on the similarities found among the employees in terms of education and experience, and emphasis on impression management maintained by the companies, there is enough evidence to suggest that the companies selected are knowledge-intensive firms with homogeneous employees. This, combined with the three theories discussed in the literature review, has enabled the development of the conceptual framework for this paper which is presented in Figure 1.

*[insert Figure 1 here]*

Figure 1 illustrates that in an employee-owned setting, firms with homogenous knowledge-workers will achieve superior performance. This is attributed to employees being incentivised as owners, granting them financial motivations as well as a significant role in the firm's operation, decision-making process, and risk aversion strategies. The framework enables the application of various attributes, such as those related to education, experience, and interaction with clients. In situations when there is homogeneity among employees, it enhances

understanding and cooperation, contributing to better and informed decision-making, and thereby achieving superior performance.

List of EOFs included in the portfolio can be found in Table 1.

*[insert Table 1 here]*

The sample covers the period from January 2002 to December 2015. The sample period could not be extended beyond this timeframe due to the lack of updates to the index since 2016.

As depicted in Table 1 the investment simulation begins with an investor holding a portfolio of three stocks that were available as EOFs in the main market of the London Stock Exchange (LSE) in January 2002. It is only from 01.2011 that the portfolio consisted of seven stocks. Importantly, none of the companies lost their EOF status throughout the sample period, as confirmed through the content analysis, hence the continuous presence of all companies in the portfolio.

Given the limited number of stocks and the challenges associated with precisely determining employees' ownership stakes in each company, along with the complexities related to fluctuations in employee share ownership over the years, it was not feasible to implement a rank-based portfolio weighting based on the percentage of EO. Therefore, an equally weighted 1/n portfolio was adopted as a reasonable method for such an investment strategy.

Furthermore, it is assumed that the investor rebalances the portfolio annually at the end of December, regardless of the specific time during the year when a particular company attains EOF status. This reflects the passive approach of the investors and their desire to minimize the efforts required for monitoring and transaction costs, aligning with the principles outlined by French (2008).

*Benchmark Indices*

In this study, the performance of the employee-owned wealth management companies' portfolio is compared with all major FTSE UK benchmark Index series (FTSE, 2023), namely FTSE 100, FTSE 250, FTSE 350, and FTSE All-Share Indices. Additionally, some other indices namely FTSE4Good (UK version), FTSE 350 Banks, and FTSE ASX Financial Services are also employed. In contrast to existing literature, which typically limits comparison against a single index (see for example, Brzeszczyński and McIntosh, 2014), this study includes several benchmark indices, providing a more comprehensive comparison of the portfolio's performance. Furthermore, the indices are employed both at the price and total return levels. Given that all the stocks in the employee-owned portfolio are UK-based, the analysis is exclusively focussed on UK benchmarks. Consequently, this provides a more accurate comparison of the stock market performance.

The FTSE 100 is defined as a market-capitalisation weighted index that reflects the performance of the largest 100 UK-listed blue-chip companies. In contrast, the FTSE 250 Index represents mid-cap stocks traded on the LSE. Many of the sample companies in this study, such as RBC Brewin Dolphin (formerly Brewin Dolphin), Ashmore Group, City of London Investment Group, and Aberdeen Asset Management before its merger with Standard Life, are constituents of the FTSE 250. Hence, the FTSE 250 serves as a highly representative benchmark for the necessary relative comparisons.

The FTSE 350 combines the constituents of both the FTSE 100 and FTSE 250, making it a representation of both large and mid-cap stocks on the LSE. Meanwhile, the FTSE All-Share Index signifies the performance of all eligible companies listed on the LSE main market. Statistically, the FTSE All-Share index captures 98% of the UK's market capitalisation (FTSE, 2023).

In contrast, the FTSE4GOOD index differs from the aforementioned indices as it has been specifically designed to assess the performance of companies that adhere to globally recognised corporate responsibility standards. The entry criteria for this index are subject to frequent revisions to ensure alignment with market expectations and evolving corporate social responsibility (CSR) practices.

To allow industry comparisons, FTSE350 Banks Index and FTSE ASX Financial Services Index are included in the benchmark set. The FTSE350 Banks Index is tailored to gauge the performance of the financial services sector of the FTSE350 Index, and includes all major banks in the UK. The FTSE ASX Financial Services Index includes wealth management and investment service firms.

An alternative approach to evaluate the performance would involve comparing it with the stock market performance of non-employee-owned knowledge-intensive wealth management firms. However, determining whether other wealth management companies are entirely not employee-owned, given the lack of information, poses a significant challenge. Nevertheless, by benchmarking against several indices including the FTSE ASX Financial Services Index, which includes both employee-owned and non-employee-owned firms, the performance evaluation is equally, if not more, effective. Additionally, through the inclusion of other major indices (surpassing the number used in the existing literature), this study provides a comprehensive picture of comparative performance, enhancing the depth and scope of the analysis.

**Methodology, empirical results and discussion**

In this section, the raw returns are analysed first. The performance of a portfolio consisting of employee-owned wealth management stocks of companies with homogenous labour force is compared to the performance of benchmark indices. The nature of the returns for different

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investment periods in both dividends-inclusive and dividends-exclusive variants are analysed. In the end, the risk-adjusted returns (the Modified Sharpe ratio and the Treynor ratio) and Certainty Equivalent values for both the portfolio and benchmark indices are computed and compared.

*Raw Returns*

Tables 2a-2b provide returns based on a simulated investment in the stocks of the wealth management companies for the period 2002-2015. These tables present 1) annual holding period returns for single-year investments, 2) average annual geometric returns for investment in 10 consecutive five-year periods, 3) average annual geometric return for a full 14-year period, and 4) average annual returns for bull market, bear market, expansion (positive GDP growth) and shrinkage (negative GDP growth) periods. These returns are compared with the price and total return version of seven different FTSE benchmark indices (FTSE 100, FTSE250, FTSE350, FTSE All-Share, FTSE4GOOD, FTSE350 Banks and FTSE ASX Financial Services). These raw returns are computed using the geometric mean formula:

$$Geometric\ Mean = \left(\prod_{n=1}^{n} (1 + R_n)\right)^{\frac{1}{n}} - 1 ............eq.(1)$$

Where, $\Pi$ is the product, $R$ and n represent returns and number of periods, respectively.

*[insert Tables 2a and 2b here]*

Table 2a compares the return performance of the employee-owned portfolio of wealth management companies with the seven FTSE benchmark indices mentioned above. These returns include dividends for both the portfolio and benchmark indices, facilitating like-to-like comparisons. The results indicate that, the employee-owned portfolio, in the full 14-year period

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delivered average annual returns that were 8.00, 1.94, 7.18, 7.15, 7.82, 15.56, and 4.46 percentage points higher than the total return version of the FTSE 100, FTSE 250, FTSE 350, FTSE All-Share, FTSE4GOOD UK, FTSE 350 Banks, and FTSE ASX Financial Services indices respectively. Table 2a also reveals that the employee-owned portfolio outperformed all seven indices in nine out of ten multiple-year investments of five consecutive years.

As a further robustness check, the returns were calculated for the bull and bear market periods, and for the periods when the UK economy experienced positive and negative economic growth. The employee-owned portfolio of wealth management stocks consistently outperformed all seven benchmarks in all such sub-periods except during the bear market period.

Table 2b compares the returns of the employee-owned portfolio (excluding dividends) with the price index version of benchmark returns, allowing for a direct comparison, similar to Table 2a. As expected, the single-year, multiple-year, and other sub-periods show lower returns compared to the dividend-inclusive version in Table 2a. However, similar to the dividend-inclusive version, the portfolio continued to outperform all benchmark indices in the full sample period and in nine out of ten multiple-year periods.

This comparison between the returns in Tables 2a and 2b shows a dividend yield of 4.52 per cent points enjoyed by the firms. This yield is higher than the yields of all benchmark indices except the sectoral benchmark (FTSE ASX Financial Services), which has a similar dividend yield but lower overall return in both dividend-inclusive (Table 2a) and dividend-exclusive (Table 2b) versions.

The results presented in Tables 2a-2b above demonstrate that the EOFs outperformed all seven indices in full 14-year periods, the bull market period, as well as during periods of economic expansion and contraction.

Such superior performance can be linked to the incentive theory of motivation (Skinner, 1965) i.e., additional benefits (beyond wage, such as the option to buy a large number of shares under the CSOP scheme, exemption from Tax or National Insurance, dividend income etc.) motivates an employee to achieve more. These incentives can also enhance job satisfaction, and aligning with the findings of the existing literature, the portfolio of satisfied EOFs may also have contributed to better performance, leading to higher stock returns (see for example, Edmans, 2011).

It can be further observed that during economic slowdowns, as indicated by the data in Tables 2a-2b (in the row labelled "Negative GDP Growth"), employee-owned companies continued to outperform all seven benchmark indices, both in the versions with and without dividends. This suggests that wealth managers can invest in low-risk, low-return (but more certain) assets during a slowdown in the economy. This phenomenon can be explained by participative decision-making and risk aversion theories. In this context, homogenous knowledge workers collaborate and make decisions collectively, often with director owners if the company is not 100% owned by the employees. They carefully deliberate on their course of action and utilise their skills, such as redefining assets allocation and increased diversification, to protect their firms, thereby safeguarding their jobs as well. Further validation of this cautious and skilful approach linked to participative decision-making and risk aversion can be found in the significant portfolio outperformance during the financial crisis. The portfolio outperformed all indices in 2007 and outpaced the industry and sectoral indices in 2008. These findings further support the existing literature (e.g., Lampel et al., 2012, 2014; Kurtulus and Kruse 2018; Kim and Patel, 2020) which suggests that EOFs exhibit greater resilience during economic downturns.

Next, it is noteworthy that the margins of outperformance for both variants of employee-owned portfolios (with and without dividends) are quite substantial during bull market periods. The average annual returns achieved by the EOFs are 16.40% and 15.36% higher than the market average in dividend-inclusive and dividend-exclusive variants, respectively. This can be linked to both participative decision-making and incentive theories as knowledge workers of wealth management firms agree and capitalise on favourable market conditions.

However, in bear market periods, as seen in both the dividend-inclusive and dividend-exclusive versions, the employee-owned portfolio was beaten by five out of seven benchmarks (marginally outperforming only its sector and industry counterparts, FTSE 350 Banks and FTSE ASX Financial Services indices, respectively). This is an important finding which indicates that employee-owned wealth management companies outperform more in proportion to the market during a rise in the market but underperform proportionately more when the market falls. This is further evidenced by the fact that the beta of the portfolio has remained higher than 1. To be precise, betas computed were 1.148, 1.143, 1.196, 1.211, and 1.181 for FTSE 100, FTSE 250, FTSE 350, FTSE All Share and FTSE4Good benchmark indices respectively (Here, a beta of 1 implies that the portfolio's risk sensitivity will be equal to that of the market). Consequently, during bearish market phases, the employee owners predominantly underperform main market indices and may only be able to match sectoral performance. For instance, in the bearish market, as shown in Table 2a, the return of the portfolio and sectoral benchmark closely align at -42.77% and -43.71% respectively. However, as explained above, during more recognisable downturns, such as economy-wide slowdowns or recessions, knowledge workers exhibit risk aversion and emerge as clear winners.

Interestingly, in 2014 and 2015, the best return results are achieved by FTSE ASX Financial Services Index, with rates of 12.52% and 13.96%, respectively. At first look, it may seem that EOF's were no longer an attractive investment, as they failed to outperform the benchmark first time in two consecutive years. This can lead to the conclusion that the superior returns previously associated with the EO model diminished after 2014, and that the good performance of EOFs prior to 2014, in line with Fama's (1998) theory, could have been just chance results, signaling that the earlier outperformance was more attributable to the industry or some other factors rather than the EO model itself. However, this apparent shift might actually reinforce the case for EO model effectiveness, as the increased presence of EOFs in the index could reflect their growing influence and effectiveness. A closer examination reveals that between 2013 and 2015, employee-owned wealth management companies, such as John Laing PLC, were listed and joined the FTSE ASX Financial Services Index. Meanwhile, other companies, like Allied Minds PLC, that were already constituents of the index, began their EO programs during this period. Therefore, EO became more common among the FTSE ASX Financial Services constituents which should have allowed this benchmark to enjoy the positive effects of EO in those two years.

Above, this paper presented the superior returns enjoyed by employee-owned wealth management firms. However, the differences in returns, as measured by matched-pair *t*-statistics, are not statistically significant in most cases in Tables 2a-2b, although the positive outperformance is consistent and high against all seven benchmark indices. It may be noted, in portfolio analysis studies, statistical significance is not consistently attained (see for example, Brzeszczyński et al., 2019). Nevertheless, this paper employs stress tests involving high trading costs to assess the reliability and consistency of the observed outperformance.

As an additional assessment of the previously highlighted superior performance, this study recalculates returns by introducing various levels of trading (also commonly known as "transaction") costs. To conduct this analysis, the paper continues with the same strategy outlined in section 3. In keeping with the passive nature of this approach, the investor acquires employee-owned stocks of wealth management firms at the start of each year, regardless of when during the year these stocks become available. Consequently, the investor incurs trading costs at the beginning of each year to buy stocks of employee-owned wealth management companies, as well as during the rebalancing process. Rebalancing, necessary to maintain the equal-weighted (1/n) investment strategy, is also assumed to occur at the beginning of each year. Dividends are held as cash during the year and invested only at the commencement of the subsequent year, thereby mirroring the passiveness of the strategy. Similarly, returns of all seven benchmark indices mentioned earlier are calculated both at price (without dividend) and at total return (with dividend) levels.

In the case of benchmark indices, the strategy is to buy at the start and hold until the end. Consequently, the hypothetical investor endures transaction costs only at the beginning and end of the sample period. By such design, trading costs are naturally lower for the indices, therefore these cost adjustment of total returns serves as a better robustness check. If the superiority of performance persists even in the presence of reasonably high trading costs, it validates the outperformance outlined in Tables 2a-2b and also ensures the attractiveness of investing in EOFs. The treatment of trading cost adjustment as a "stress test" for ensuring performance superiority is a common method highlighted in the literature (Brzeszczyński and McIntosh, 2014). There are two key points: first, the level of transaction cost at which the employee-owned portfolio performs identically to the best-performing benchmark i.e., the indifference point, and second, the level of transaction cost at which the EO portfolio's return

equals zero i.e., breakeven point. The EOFs portfolio returns, after adjusting for the trading

costs, are presented in Tables 3a-3b and Charts 1a-1b.

*[insert Tables 3a and 3b here]*

*[insert Charts 1a and 1b here]*

The findings presented above highlight the substantial and superior outperformance of

the employee-owned portfolio. The indifference points, the level of transaction costs at which

an investor is indifferent between investing in the EOFs and FTSE250 Index, are 14.43% and

3.31% for portfolios with and without dividends, respectively. Breakeven points are 33.29%

and 22.11% respectively. It shows that the dividend factor is especially important when the

transaction costs are very high. Notably, the portfolio outperforms all the benchmarks except

when the trading costs are at unrealistically high levels.

The results above illustrate the consistency and robustness of superior EOFs returns

and therefore its attractiveness for investors.

*Risk-adjusted returns*

In the risk-adjusted return calculations, this paper makes use of the improvised version of the

Sharpe ratio, *Modified Sharpe Ratio* (Israelsen, 2005) using the formula given in equation 2.

$$MSR = \frac{ER}{SD^{(ER/absER)}} ............eq. (2)$$

Where, *ER* is excess return defined as the mean monthly difference between the

portfolio (or index) return and the risk-free return. SD is the Standard Deviation of returns and

the notation "abs" gives absolute value for ER.

Another commonly used risk-adjusted return measure is the Treynor Ratio (Treynor, 1966). It is given by the following equation:

$$TR = \frac{ER}{\beta} \quad ............eq. (3)$$

In equation three, $\beta$ is beta and therefore the Treynor ratio represents the ratio of excess returns to beta. Much like the Sharpe ratio, the Treynor ratio is a valuable tool for evaluating portfolio performance. This is particularly important because the market is anticipated to behave differently in various time periods, such as during bear and bull markets, and the beta here is the sensitivity of the portfolio to movements in the market.

The results of the two risk-adjusted return measures, Modified Sharpe Ratio (MSR) and Treynor Ratio (TR), as well as the standard deviation of portfolio and benchmarks' returns (SD) are presented in Tables 4a-4b. Similar to Tables 2a-2b, Tables 4a-4b provide results for the single-year, multiple-year, full period and sub-periods consisting of bull and bear market trends, and economic expansion and contraction periods. These tables provide comparisons between the TR and MSR of the employee-owned portfolio (with and without dividends) against the total return and price index versions of FTSE100, FTSE250, FTSE350, FTSE All-Share, FTSE4GOOD UK, FTSE350 Banks and FTSE ASX Financial Services benchmarks.

*[insert Tables 4a and 4b here]*

Similar to the raw returns (Tables 2a-2b), Tables 4a-4b reveal that the employee-owned portfolio of wealth management companies has outperformed all seven benchmark indices in nine out of ten consecutive five-year periods when adjusted for systematic risk as given by the TR ratio. Notably, the employee-owned portfolios have enjoyed superior risk-adjusted return performance in the full 14-year period and also during the bullish trend on the stock market, as

evidenced by the highest TR values. An important discovery is that the superior risk-adjusted performance is maintained even in the periods when the risk is higher (given by standard deviations) for the portfolio compared to the benchmark indices. However, during the bear market period, the risk-adjusted returns of the portfolio lag behind all benchmarks except for FTSE 350 Banks.

In the table high standard deviation shows a high idiosyncratic risk. It is so because, firstly, the portfolio comprises at most seven companies, which exposes it to a certain degree of idiosyncratic risk, since seven is insufficient to form a fully diversified portfolio (Statman, 1987). Secondly, all these companies belong to the same industry and provide similar services, further representing mainly the industry-specific risk.

The portfolio demonstrates the highest TR for the full-period, suggesting that if there were the possibility to form a fully diversified portfolio of employee-owned stocks, it would outperform all the benchmarks on a risk-adjusted basis. Moreover, even when adjusting for such high elevated levels of idiosyncratic risk, the portfolio still boasts the highest MSR in seven out of ten multiple five-year periods. Indeed, it may be possible to form a more diversified portfolio, but this will require knowledge of other publicly listed companies that have employee ownership structures. Currently, no database provides information about which listed companies in the UK stock market are employee-owned.

*Certainty Equivalent (CEQ) Returns*

This section provides results for the CEQ return which is defined by equation 4:

$$CEQ = \hat{\mu}_k - \frac{\gamma}{2}\hat{\sigma}_k^2 \ldots \ldots \ldots \ldots \; eq.(4)$$

where $\hat{\mu}_k$ and $\hat{\sigma}_k^2$ are the mean and variance of excess returns of a given portfolio of an index $k$ and $\gamma$ is the risk aversion parameter.

Since it has been previously established that the portfolio consistently outperforms the indices (with or without dividends), in this section, only the dividend-inclusive version of the CEQ returns is presented. In table 5, the values of Certainty Equivalent (*CEQ*) return for three variants representing investors with lower ($\gamma = 0.5$), normal ($\gamma = 1.0$), and higher ($\gamma = 2.0$) risk aversions are reported.

*[insert Table 5 here]*

In the case of single-year performance, Table 5 reveals that the employee-owned portfolio exhibits the highest CEQ returns in seven out of fourteen instances (six out of 14 for highly risk-averse investors). When it comes to multiple-year performance, the employee-owned portfolio dominated the benchmarks by having at least six (out of ten) highest CEQ return values for all risk aversion levels.

The CEQ results for low-risk aversion levels are also highest for the employee-owned portfolios in the full 14-year period, bull market period and in periods when the economy expanded or contracted. However, it is worth noting that CEQ returns during bear market periods are unfavourable for employee-owned portfolios across all three risk aversion levels. This underperformance during the bear market period is consistent with the results of the raw returns and risk-adjusted return ratios presented in Tables 2a-2b and Tables 4a-4b.

The findings presented above indicate that the employee-owned portfolio of wealth management firms offers highly attractive CEQ return values for investors with low to medium risk aversion tendencies. However, for investors characterised by high-risk aversion

tendencies, the comparative performance can be less appealing, primarily due to elevated levels of idiosyncratic risk.

The CEQ analysis presented above provided some insights about the certainty equivalent performance (utility), which was found higher than the benchmarks for EOFs investors taking between low to medium risk in their investments.

In terms of the process of investment, it is economical and less time-consuming since it only requires once-a-year rebalancing. Companies to invest can be identified from sources, such as UKEOI (when such a database is publicly available), and no further monitoring will be required. This means individual investors can earn high as well as promote the employee-ownership model of running a business by taking low to medium risks while investing in the stocks of wealth management firms owned by employees.

**Conclusions**

This study aimed to examine whether knowledge-intensive employee-owned firms generate higher stock market returns. Unlike existing literature that mainly relies on financial metrics, such as ROE, ROA and Tobin's Q, this paper focused on stocks' performance to assess the value created (destroyed) by the employee owners.

Sample companies were taken from UKEOI and the method of content analysis was applied to ensure that only the companies delivering the wealth management services and listed on the main LSE market are employed by this study. To assess return performance, a portfolio comprising these companies was constructed, and an equally weighted investment strategy was employed for the management of the portfolio. Rebalancing occurred annually to align with the passive approach taken by this study so it can be easy (less monitoring) and cost-effective (less trading cost) to implement by all types of investors including private individual investors.

Methodologically, this paper made use of several established performance evaluation tools, such as the geometric mean returns, Modified Sharpe ratio, Treynor ratio and Certainty Equivalent returns, enabling effective comparisons. The results of the performance analysis encompassing raw, risk-adjusted and certainty equivalent returns demonstrate a consistently high level of superiority enjoyed by the portfolio of employee-owned companies in both the dividend-inclusive and dividend-exclusive versions of the returns, when compared to a large number of benchmark indices, including FTSE100, FTSE250, FTSE350, FTSE All Share, FTSE4GOOD UK, FTSE350 Banks and FTSE ASX Financial Services. The raw return for the full-period observed (2002 to 2015), at 13%, significantly surpassed the combined average of all benchmark indices, which stood at 5.5%. This notable outperformance persisted for both variants of the portfolio (with and without dividends), even in the presence of high transaction costs and across various time horizons including single-year, multiple-year, bull and bear market periods, as well as during periods of economic expansion and contraction.

Another noteworthy finding of this paper is that EOFs excessively outperformed all benchmark indices during bullish market trends (16.4% higher than the market average), but their returns are comparatively weaker during bearish market periods. This phenomenon has been attributed to the betas of employee-owned wealth management companies consistently exceeding 1 when evaluated against benchmark indices employed by this study. Furthermore, although the incentive to become risk averse is less informed during a bearish market, knowledge-workers are more cautious and take effective decisions, particularly regarding risk reduction, during economic slowdowns. As a result, the employee-owned portfolio of wealth managers achieves superior performance during the economy-wide slowdown periods.

The superior return performance of employee-owned companies presented in this paper is attributed to incentivisation (share ownership, tax-incentives and dividend income),

participative decision-making (participation in decisions through a say in management eased by homogeneity factor among employees) and risk-aversion (cautious approach of knowledge workers) theories.

The above findings clearly indicate several benefits of knowledge-intensive EOFs, however, further research may strengthen the various limitations. Firstly, the sample period of this study could not be extended beyond 2015 because of the discontinuation of data by UKEOI. Secondly, this paper suggested a strategy that is efficient and economical to investors, allowing them to bypass extensive research by simply selecting knowledge-intensive employee-owned firms from an index like UKEOI. As such, the sample companies required by this study had to be taken from UKEOI, which, after verifying the homogeneity characteristics, limited sample size to just seven employee-owned companies. This limitation also meant that other employee-owned wealth management firms listed in the London stock exchange, could not be included in the sample because they were not available in the UKEOI Index. Third, the investment strategy itself could not be modified to account for the degree of EO, i.e., the strategy of investing more in companies with higher level of EO could not be implemented. Fourth, it would be a good verification of the performance by involving companies from other sectors, such as Law firms, but this study is limited to just wealth management firms. As a result, the benefit of diversification is compromised. Fifth, the issue of bear market underperformance could be addressed more comprehensively, as they may be influenced by factors not discussed in this paper, such as aggressive trading by employee owners to recover the losses, known as loss aversion behaviour. Sixth, this study made a suggestion that effective wealth managers embrace impression management while dealing with clients. While impression management primarily focuses on self presentation, employees can enhance their interactions with clients and peers by displaying both the right appearance and attitude, which aligns with the concept of aesthetic labour (Warhurst et al., 2000; Warhurst et

al., 2003; Warhurst and Nickson, 2020). However, this study could not accommodate to test for the presence of aesthetic labour force among its sample firms. Future research involving a larger set of knowledge-intensive employee-owned firms could therefore gain valuable insights by exploring the impact of aesthetic labour.

Overall, this paper provides empirical evidence to demonstrate that the EO model is well-suited for knowledge-intensive firms with homogenous employees, especially in sectors where knowledge workers constitute the majority, such as the wealth management. It further shows that investing in employee-owned knowledge-intensive firms can generate substantial returns promoting wider adoption of the EO business model. While the results are promising, they can be further strengthened by expanding the sample to include a larger number of employee-owned knowledge-intensive firms. Currently, despite considerable investment and interest from the UK government, there is no comprehensive database of companies that are employee-owned. This study, thus, urges policymakers and organisations involved to develop a database for both the private firms and publicly listed companies, including details, such as ownership schemes and ownership percentages.

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## References

Abowd, J. M. (1989). The effect of wage bargains on the stock market value of the firm. *The American Economic Review*, 79(4), 774-800.

Alchian, A. & Demsetz, H. (1972). Production, information costs, and economic organization. *American Economic Review, 62*(5), 777-795.

Alvesson, M. (2004). *Knowledge work and knowledge-intensive firms*. OUP Oxford.

BIS. (2012). *Government response to the Nuttall review: next steps for employee ownership*, Department for Business, Innovation & Skills, Ref: 12/1161. Retrieved 13th December, 2022, from: https://www.gov.uk/government/publications/employee-ownership-next-steps-government-response-to-the-nuttall-review.

BIS. (2013). *Moving to employee ownership: a brief guide for employees*, BIS/13/939. Retrieved 13th December, 2022, from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment _data/file/210441/bis-13-939-moving-to-employee-ownership-guide-for-employees.pdf

Blair, M., Kruse, D. L., & Blasi, J. R. (2000). Employee ownership: An unstable form or a stabilizing force? In: M. Blair & Kochan (Eds.), *The new relationship: Human capital in the American corporation*. Washington, DC: Brookings Institution Press.

Blanchett, D. (2013). Employer stock ownership in 401(k) plans and subsequent company stock performance. *Morningstar Investment Management*, Morningstar, Inc.

Blasi, J., Conte, M., & Kruse, D. (1996). Employee stock ownership and corporate performance among public companies. *International Labour Review*, 50(1), 60-79.

Brzeszczyński, J., Ghimire, B., Jamasb, T., & McIntosh, G. (2019). Socially Responsible Investment and Market Performance. *The Energy Journal*, 40(5), 17-72.

Brzeszczyński, J., & McIntosh, G. (2014). Performance of portfolios composed of British SRI stocks. Journal of business ethics, 120, 335-362.

Burdín, G. (2014). Are worker-managed firms more likely to fail than conventional enterprises? Evidence from Uruguay. *International Labour Review, 67(1),* 202-238.

Caramelli, M. (2011). *Employee ownership and share capitalism: assessing the experience, research and policy implications*. In E.J Carberry (Ed.). Employee ownership and share capitalism: *New directions in Research*. Ithaca, NY: Cornell University Press.

Chang, X., Fu, K., Low, A., & Zhang, W. (2015). Non-executive stock options and corporate innovation. *Journal of Financial Economics, 115*(1), 168-188.

Conte, M., & Tannenbaum, A. (1978). Employee-owned companies: Is the difference measurable? *Monthly Labor Review, 101(7),* 23-28.

*Does it pay to be employee-owned?*

Cotton, J. L., Vollrath, D. A., Froggatt, K. L., Lengnick-Hall, M. L., & Jennings, K. R. (1988). Employee participation: Diverse forms and different outcomes. *Academy of Management Review, 13*(1), 8-22.

Dong, X. Y., Bowles, P., & Ho, S. P. (2002). Share ownership and employee attitudes: Some evidence from China's postprivatization rural industry. *Journal of Comparative Economics*, *30*(4), 812-835.

Doucouliagos, C. (1995). Worker participation and productivity in labour-managed and participatory capitalist firms: A meta-analysis. *International Labour Review*, *49(1),* 58-77.

Dow, G. K., & Putterman, L. (2000). Why capital suppliers (usually) hire workers: What we know and what we need to know. *Journal of Economic Behaviour & Organization, 43(3),* 319-336.

EOA, (2024). Understanding the scale and impact of employee and worker ownership in the UK, EO Knowledge Programme 2023. Employee Ownership Association. Retrieved 6th August, 2024, from: www.eoa.org

Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial Economics*, *101*(3), 621-640.

Edmans, A., & Gabaix, X. (2009). Is CEO pay really inefficient? A survey of new optimal contracting theories. *European Financial Management, 15*(3), 486-496.

Erdal, D. (2011). *Beyond the corporation*. London: Bodley Head.

Faleye, O., Mehrotra, V., & Morck, R. (2006). When labour has a voice in corporate governance. *Journal of Financial and Quantitative Analysis, 41*(3), 489-510.

Fama, E. F. (1965). The behavior of stock-market prices. *The Journal of Business*, *38*(1), 34-105.

Fama, E. F. (1970). Efficient capital markets. *Journal of Finance*, *25*(2), 383-417.

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, *49*(3), 283-306.

Feng, K., and Li, Y. (2020). Employee Ownership and Industrial Innovation. *China Review*, *20*(4), 39-68.

Freeman, R. B., Kruse, D. L. and Blasi, J. R. (2010). 'Worker responses to shirking under shared capitalism'. In D. L. Kruse, R. B. Freeman and J. R. Blasi (Eds.), *Shared capitalism at work: employee ownership, profit and gain sharing, and broad-based stock options*. Chicago, IL: University of Chicago Press, pp. 77–104

French, J. L. (1987). Employee perspectives on stock ownership: financial investment or mechanism of control? *The Academy of Management Review*, *12(3),* 427.

*Does it pay to be employee-owned?*

French, K. R. (2008). Presidential address: The cost of active investing. *The Journal of Finance*, *63*(4), 1537-1573.

FTSE (2023). *FTSE Russel Factsheet*. Financial Times Stock Exchange. Retrieved 1st May, 2023, from: https://www.ftserussell.com/analytics/factsheets/home/search

Gamble, J. E. (2000). Management commitment to innovation and ESOP stock concentration. *Journal of Business Venturing, 15(5),* 433-447.

Gates, J. (1998). *The ownership solution. Toward a shared capitalism for the 21st century*. London: Penguin.

Goffman, E. (1959). *The presentation of self in everyday life*. Doubleday.

Gooding, A. E., & O'Malley, T. P. (1977). Market phase and the stationarity of beta. *Journal of Financial and Quantitative Analysis*, *12*(5), 833-857.

Gorton, G., & Schmid, F. A. (2004). Capital, labor, and the firm: A study of German codetermination. *Journal of the European Economic Association*, *2*(5), 863-905.

GOV.UK (2022) Tax and Employee Share Schemes, Retrieved: 16th May, 2024, from https://www.gov.uk/tax-employee-share-schemes

Hansmann, H. (1988). Ownership of the Firm. *The Journal of Law, Economics, and Organization*, *4*(2), 267-304.

Hansmann, H. (1996). A Theory of enterprise ownership. *The Ownership of Enterprise*, 11-49.

Huberman, G., & Sengmueller, P. (2004). Performance and employer stock in 401 (k) plans. *Review of Finance, 8*(3), 403-443.

Israelsen, C. (2005). A refinement to the Sharpe ratio and information ratio. *Journal of Asset Management*, *5*(6), 423-427.

Jones, D. & Kato, T. (1995). The productivity effects of employee stock-ownership plans and bonuses: evidence from Japanese panel data. *American Economic Review*, *85*(391-414).

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics, 3*(4), 305-360.

Kalmi, P., Pendleton, A., & Poutsma, E. (2005). Financial participation and performance in Europe. *Human Resource Management Journal, 15*(4), 54-67.

Kelso, L. O., & Adler, M. J. (1958). *The capitalist manifesto*. Random House.

Kelso, L. O (1968). *Two-factor theory: the economics of reality; how to turn eighty million workers into capitalists on borrowed money, and other proposals*. New York: Vintage Books.

Kim, K. Y., & Patel, P. C. (2020). Broad-based employee ownership and labour productivity during the 2008 recession: Evidence from public firms in Europe. *British Journal of Industrial Relations, 58*(2), 396-423.

Kim, E., & Ouimet, P. (2014). Broad-based employee stock ownership: motives and outcomes. *The Journal of Finance, 69(3),* 1273-1319.

Kramer, B. (2010). Employee ownership and participation effects on outcomes in firms majority employee-owned through employee stock ownership plans in the US. *Economic and Industrial Democracy, 31(4),* 449-476.

Kruse, D. L. (2022). Does employee ownership improve performance? *IZA World of Labor*

Kruse D.L. and Blasi J.R. (1997), Employee ownership, employee attitudes and firm performance: a review of the evidence, In: David Lewin, Mitchell, Daniel J.B. and Mahmood A. Zaidi, (Eds.), *The Human Resource Management Handbook*, pp 113-151. JAI Press: Greenwich.

Kumbhakar, S. & Dunbar, A. (1993). The elusive ESOP—productivity link. *Journal of Public Economics*, *52*(2), 273-283.

Kurtulus, F. A., & Kruse, D. (2018). An empirical analysis of the relationship between employee ownership and employment stability in the US: 1999–2011. *British Journal of Industrial Relations*, *56*(2), 245-291.

Lampel, J., Bhalla, A., & Jha, P. (2012). *The employee-owned business model during growth and adversity: how well does it hold up? European Business Review*. Retrieved 11th August, 2024, from: employee-owned-business-model-during-growth-adversity.pdf.

Lampel, J., Bhalla, A., & Jha, P. (2014). Does governance confer organisational resilience? Evidence from UK employee-owned businesses. *European Management Journal*, *32(1),* 66-72.

Lowendahl, B. R. (1997). *Strategic management of professional service firms*. Copenhagen Business School Press.

Lin, Y. P. (2014). Equity compensation and organizational survival: A conceptual framework. *Journal of Accounting and Finance, 14(4),* 141.

McCarthy, D., Reeves, E., & Turner, T. (2010). Can employee share-ownership improve employee attitudes and behaviour?. *Employee Relations*, *32*(4), 382-395.

Mitchell, D., Lewin, D., & Lawler, E. (1990). *Alternative pay systems, firm performance, and productivity*. Los Angeles, Calif: University of California, Institute of Industrial Relations.

Mygind, N. (2012). Trends in employee ownership in Eastern Europe. *The International Journal of Human Resource Management*, 23(8), 1611-1642.

*Does it pay to be employee-owned?*

Mygind, N., & Poulsen, T. (2021). Employee ownership–pros and cons–a review. *Journal of Participation and Employee Ownership*, 4(2), 136-173.

Nuttall, G. (2012). *Sharing Success: The Nuttall review of employee ownership*. Department for Business, Innovation & Skills, UK.

O'Boyle, E., Patel, P., & Gonzalez-Mulé, E. (2016). Employee ownership and firm performance: a meta-analysis. *Human Resource Management Journal*.

ONS (2022) Gross Domestic Product. Office for National Statistics Online. Retrieved 10th November, 2022, from https://www.ons.gov.uk/economy/grossdomesticproductgdp#timeseries

Oyer, P. (2004). Why do firms use incentives that have no incentive effects? *The Journal of Finance*, *59*(4), 1619-1650.

Park, R., Kruse, D., & Sesil, J. (2004). Does employee ownership enhance survival? Employee Participation, Firm Performance and Survival*, Advances in the Economic Analysis of Participatory and Labor-Managed Firms*, *8,* 3-33.

Park, S. & Song, M. (1995). Employee stock ownership plans, firm performance, and monitoring by outside block holders. *Financial Management*, *24*(4), 52.

Pendleton, A. & Robinson, A. (2010). Employee stock ownership, involvement, and productivity: An interaction-based approach. *International Labour Review*, *64(1),* 3-29.

Perotin, V (1987). Conditions of survival and closure of French worker cooperatives: Some preliminary findings. In: D. Jones & J. Svejnar (Eds), Advances in the Economic Analysis of Participatory and Labor-Managed Firms (Vol. 2). Greenwich, CT: JAI Press.

Perotin, V. (1997). What makes coops work? Institutional viability, firm creation, survival and closure among workers' cooperatives in France. Ph.D. dissertation, Cornell University.

Ren, T., Xiao, Y., Yang, H., & Liu, S. (2019). Employee ownership heterogeneity and firm performance in China. *Human Resource Management*, *58*(6), 621-639.

Richardson, R., & Nejad, A. (1986). Employee share ownership schemes in the UK-an evaluation. *British Journal of Industrial Relations*, *24(2),* 233-250.

Richter, A. & Schrader, S. (2016). Levels of employee share ownership and the performance of listed companies in Europe. *British Journal of Industrial Relations*.

Robinson, A. M., & Wilson, N. (2006). Employee financial participation and productivity: An empirical reappraisal. *British Journal of Industrial Relations*, *44(1),* 31-50.

Robinson, A. & Zhang, H. (2005). Employee share ownership: Safeguarding investments in human capital. *British Journal of Industrial Relations*, *43*(3), 469-488.

*Does it pay to be employee-owned?*

Rosen, C., Case, J. and Staubus, M. (2005). *Equity: Why employee ownership is good for business*. Boston, MA: Harvard Business School Press.

Rylander, A., & Peppard, J. (2005). What really is a knowledge-intensive firm. *Royal Institute of Technology*, *3*, 1-28.

Sengupta, S. (2008). The impact of employee-share-ownership schemes on performance in unionised and non-unionised workplaces. *Industrial Relations Journal*, *39*(3), 170-190.

Sengupta, S., Whitfield, K., & McNabb, B. (2007). Employee share ownership and performance: golden path or golden handcuffs? *The International Journal of Human Resource Management*, *18*(8), 1507-1538.

Sesil, J, C. (2007). Broad-based stock options program, organization, capital and productivity. In *Academy of Management Proceedings*, Academy of Management, 2007(1), 1-6.

Skinner, B. F. (1965). Science and human behavior (No. 92904). Simon and Schuster.

Statman, M. (1987). How many stocks make a diversified portfolio? *Journal of Financial and Quantitative Analysis*, *22*(03), 353-363.

Treynor, J. L. (1966). How to rate management of investment funds. *Harvard Business Review*, 44(1), 63-75.

UKEOI (2016). *UK employee ownership index*. Capital Strategies. Retrieved: 17th July, 2018, from: http://www.employeeownershipindex.co.uk/.

Warhurst, C., Nickson, D., Witz, A., & Marie Cullen, A. (2000). Aesthetic labour in interactive service work: some case study evidence from the 'new' Glasgow. *Service Industries Journal*, *20*(3), 1-18.

Warhurst, C., & Nickson, D. (2001). *Looking good, sounding right*. London: Industrial Society.

Warhurst, C., Nickson, D., & Witz, A. (2003). The labour of aesthetics and the aesthetics of organisation. *Organization*, *10*(1), 33-54.

Warhurst, C., & Nickson, D. (2020). *Aesthetic Labour*. Sage.

Welbourne, T. M., & Cyr, L. A. (1999). Using ownership as an incentive: Does the "too many chiefs" rule apply in entrepreneurial firms? *Group & Organization Management, 24*(4), 438-460.

Winther, G. & Marens, R. (1997). Participatory democracy may go a long way: comparative growth performance of employee ownership firms in New York and Washington States. *Economic and Industrial Democracy*, *18*(3)*, 393-422.*

*Does it pay to be employee-owned?*

Woodward, G., & Anderson, H. M. (2009). Does beta react to market conditions? Estimates of 'bull'and 'bear'betas using a nonlinear market model with an endogenous threshold parameter. *Quantitative Finance, 9(8),* 913-924.

Young-Hyman, T., Magne, N., & Kruse, D. (2023). A real utopia under what conditions? The economic and social benefits of workplace democracy in knowledge-intensive industries. *Organization Science*, *34*(4), 1353-1382.

**Figure 1.** Conceptual Framework in a Knowledge-intensive employee-owned firms with homogenous and aesthetic employees leading to superior performance
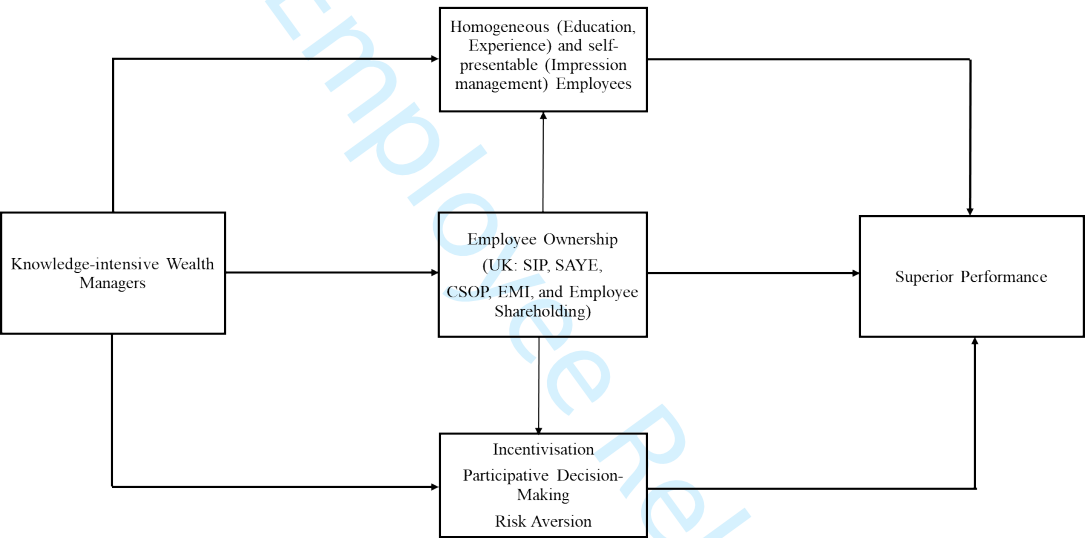
**Table 1.** List of employee-owned wealth management firms listed in the main market of London Stock Exchange and available in the UK Employee Ownership Index during 2002-2015

| Year | Aberdeen Asset Management | Ashmore Group | Brewin Dolphin Holdings Plc | City of London Investment Group | Hargreaves Lansdown | Jupiter Fund Management | Liontrust Asset Management |
|------|---------------------------|---------------|------------------------------|----------------------------------|---------------------|-------------------------|----------------------------|
| 2002 | * | | * | | | | * |
| 2003 | * | | * | | | | * |
| 2004 | * | | * | | | | * |
| 2005 | * | | * | | | | * |
| 2006 | * | | * | | | | * |
| 2007 | * | * | * | * | | | * |
| 2008 | * | * | * | * | * | | * |
| 2009 | * | * | * | * | * | | * |
| 2010 | * | * | * | * | * | | * |
| 2011 | * | * | * | * | * | * | * |
| 2012 | * | * | * | * | * | * | * |
| 2013 | * | * | * | * | * | * | * |
| 2014 | * | * | * | * | * | * | * |
| 2015 | * | * | * | * | * | * | * |

Notes: 1) Company websites and annual reports were consulted to verify their roles as wealth managers. Some companies listed in the UKEOI index as wealth managers were excluded because their primary business activity was not core wealth management 2) Data is limited to 2015 due to the Index discontinuing the publication of list from 2016. 3) Content analysis was applied to ensure that the companies remain employee-owned throughout the sample period. 4) Not all companies were available for trading from 2002 and for this reason the portfolio consisted fewer than seven companies until 2011.

**Table 2a**. Average annual geometric returns of employee-owned wealth management firms' (with dividends) for single-year periods (1-year, January to December), multiple-year periods (5-year and full-period of 14-year returns, January to December) and other sub-periods between January 2002 and December 2015 for the stocks of Employee-owned portfolio (with dividends) compared with the total return indices of 1. FTSE 100 2. FTSE 250 3. FTSE 350 4. FTSE All-Share 5. FTSE4GOOD 6. FTSE 350 Banks and 7. FTSE ASX Financial Services benchmarks.

| Period | EOFs Returns with Dividend | FTSE 100 TR Index | | | FTSE 250 TR Index | | | FTSE 350 TR Index | | | FTSE All-Share TR Index | | | FTSE4GOOD UK TR Index | | | FTSE 350 Banks TR Index | | | FTSE ASX Financial Services TR Index | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Return | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat |
| 2002 | -56.67% | -22.17% | -34.49% | -0.7529 | -25.04% | -31.62% | -0.7396 | -22.53% | -34.14% | -0.7525 | -22.68% | -33.98% | -0.7531 | -23.68% | -32.99% | -0.7234 | -19.04% | -37.62% | -0.7301 | -36.01% | -20.66% | -0.4649 |
| 2003 | 69.70% | 17.89% | 51.8% | 1.1585 | 38.86% | 30.84% | 0.6649 | 20.33% | 49.37% | 1.1105 | 20.86% | 48.84% | 1.1004 | 18.99% | 50.7% | 1.135 | 24.05% | 45.65% | 0.9434 | 33.45% | 36.25% | 0.8773 |
| 2004 | 14.74% | 11.25% | 3.5% | -0.0019 | 22.88% | -8.14% | -0.5752 | 12.80% | 1.94% | -0.0643 | 12.84% | 1.9% | -0.0666 | 11.71% | 3.03% | -0.0201 | 11.62% | 3.12% | -0.0171 | 10.77% | 3.97% | 0.0227 |
| 2005 | 49.94% | 20.78% | 29.16% | 1.0755 | 30.23% | 19.71% | 0.7125 | 22.04% | 27.9% | 1.0411 | 22.04% | 27.9% | 1.0454 | 18.45% | 31.49% | 1.1906 | 12.09% | 37.85% | 1.6321 | 30.16% | 19.78% | 0.8318 |
| 2006 | 27.15% | 14.43% | 12.73% | 0.5549 | 30.21% | -3.06% | -0.4786 | 16.62% | 10.53% | 0.435 | 16.75% | 10.4% | 0.4312 | 15.25% | 11.9% | 0.5083 | 14.80% | 12.35% | 0.5412 | 45.35% | -18.2% | -2.205** |
| 2007 | 11.10% | 7.36% | 3.74% | -0.0191 | -2.46% | 13.57% | 0.6153 | 5.89% | 5.21% | 0.0746 | 5.32% | 5.79% | 0.1124 | 2.91% | 8.19% | 0.2672 | -17.42% | 28.52% | 1.7332 | 5.99% | 5.12% | 0.0916 |
| 2008 | -38.54% | -28.33% | -10.21% | -0.7079 | -38.15% | -0.39% | -0.2937 | -29.53% | -9.01% | -0.6818 | -29.93% | -8.61% | -0.6692 | -27.92% | -10.62% | -0.738 | -53.57% | 15.03% | 0.4461 | -51.72% | 13.18% | 0.4186 |
| 2009 | 64.89% | 27.33% | 37.56% | 1.4782 | 50.64% | 14.25% | 0.3771 | 29.67% | 35.22% | 1.4269 | 30.12% | 34.77% | 1.4208 | 26.03% | 38.85% | 1.6192 | 27.95% | 36.93% | 0.7241 | 48.15% | 16.74% | 0.4079 |
| 2010 | 43.07% | 12.62% | 30.44% | 1.7131 | 27.40% | 15.67% | 0.7534 | 14.39% | 28.67% | 1.6314 | 14.51% | 28.55% | 1.64 | 11.84% | 31.23% | 1.7753 | 2.30% | 40.76% | 1.4585 | 25.42% | 17.64% | 0.9725 |
| 2011 | -11.98% | -2.18% | -9.8% | -1.7117 | -10.06% | -1.92% | -0.7278 | -3.24% | -8.74% | -1.6264 | -3.46% | -8.52% | -1.6035 | -3.17% | -8.8% | -1.615 | -27.29% | 15.32% | 0.9639 | -24.72% | 12.75% | 1.0688 |
| 2012 | 41.95% | 9.97% | 31.97% | 1.6961 | 26.11% | 15.84% | 0.8574 | 11.97% | 29.97% | 1.6263 | 12.30% | 29.64% | 1.6136 | 14.09% | 27.85% | 1.4932 | 39.40% | 2.55% | -0.2019 | 29.92% | 12.03% | 0.6013 |
| 2013 | 54.07% | 18.66% | 35.41% | 2.6514** | 32.27% | 21.8% | 1.4955 | 20.53% | 33.55% | 2.5142** | 20.81% | 33.26% | 2.491** | 22.67% | 31.4% | 2.3407** | 11.35% | 42.72% | 3.4116*** | 47.42% | 6.65% | 0.2285 |
| 2014 | -0.12% | 0.74% | -0.86% | -0.493 | 3.66% | -3.78% | -0.827 | 1.19% | -1.31% | -0.5658 | 1.18% | -1.3% | -0.5665 | 2.11% | -2.23% | -0.6378 | -6.37% | 6.25% | 0.1322 | 12.52% | -12.64% | -1.9036* |
| 2015 | 11.00% | -1.13% | 12.13% | 1.0718 | 11.06% | -0.07% | -0.4972 | 0.83% | 10.16% | 0.7539 | 1.10% | 9.9% | 0.7019 | 1.18% | 9.82% | 0.6476 | -9.15% | 20.15% | 1.3775 | 13.96% | -2.96% | -1.0815 |
| 2002-2006 | 9.97% | 7.12% | 2.85% | -0.0312 | 16.75% | -6.77% | -0.3692 | 8.40% | 1.58% | -0.072 | 8.48% | 1.49% | -0.0751 | 6.73% | 3.24% | -0.019 | 7.60% | 2.37% | -0.0435 | 12.34% | -2.37% | -0.2213 |
| 2003-2007 | 32.76% | 14.24% | 18.52% | 0.5625 | 23.06% | 9.7% | 0.2285 | 15.39% | 17.38% | 0.5277 | 15.40% | 17.36% | 0.5304 | 13.30% | 19.46% | 0.6074 | 8.03% | 24.73% | 0.825 | 24.27% | 8.49% | 0.1914 |
| 2004-2008 | 8.36% | 3.42% | 4.94% | 0.0351 | 4.68% | 3.67% | -0.0342 | 3.68% | 4.68% | 0.023 | 3.48% | 4.88% | 0.0336 | 2.50% | 5.86% | 0.0825 | -11.25% | 19.6% | 0.7686 | 1.41% | 6.95% | 0.1649 |
| 2005-2009 | 16.51% | 6.25% | 10.26% | 0.2782 | 9.03% | 7.47% | 0.1572 | 6.61% | 9.9% | 0.2694 | 6.47% | 10.04% | 0.2798 | 5.00% | 11.5% | 0.3514 | -8.79% | 25.3% | 0.8504 | 7.48% | 9.03% | 0.2382 |
| 2006-2010 | 15.42% | 4.77% | 10.64% | 0.3222 | 8.56% | 6.86% | 0.1281 | 5.24% | 10.18% | 0.3082 | 5.12% | 10.29% | 0.3189 | 3.80% | 11.62% | 0.3862 | -10.44% | 25.86% | 0.8474 | 6.68% | 8.73% | 0.2308 |
| 2007-2011 | 7.23% | 1.54% | 5.69% | 0.0486 | 0.81% | 6.42% | 0.1178 | 1.38% | 5.85% | 0.061 | 1.20% | 6.03% | 0.0734 | 0.25% | 6.99% | 0.131 | -18.26% | 25.49% | 0.8554 | -6.47% | 13.7% | 0.5714 |
| 2008-2012 | 12.62% | 2.03% | 10.59% | 0.3294 | 6.13% | 6.49% | 0.1054 | 2.52% | 10.1% | 0.3139 | 2.51% | 10.11% | 0.3182 | 2.34% | 10.28% | 0.319 | -9.24% | 21.85% | 0.6857 | -2.58% | 15.2% | 0.6552 |
| 2009-2013 | 35.34% | 12.85% | 22.49% | 1.179 | 23.55% | 11.79% | 0.5441 | 14.14% | 21.2% | 1.1334 | 14.31% | 21.03% | 1.1313 | 13.82% | 21.52% | 1.151 | 8.12% | 27.23% | 0.9773 | 21.79% | 13.56% | 0.6665 |
| 2010-2014 | 22.43% | 7.69% | 14.74% | 0.7976 | 14.65% | 7.78% | 0.291 | 8.61% | 13.82% | 0.7503 | 8.70% | 13.73% | 0.7482 | 9.13% | 13.3% | 0.703 | 1.57% | 20.86% | 0.9988 | 15.26% | 7.17% | 0.2541 |
| 2011-2015 | 16.37% | 4.92% | 11.45% | 0.6155 | 11.55% | 4.82% | 0.0305 | 5.91% | 10.46% | 0.5454 | 6.02% | 10.35% | 0.5366 | 6.96% | 9.41% | 0.4471 | -0.81% | 17.18% | 0.9598 | 13.08% | 3.3% | -0.1373 |
| full period | 12.99% | 5.00% | 8% | 0.1556 | 11.05% | 1.94% | -0.1317 | 5.82% | 7.18% | 0.1216 | 5.84% | 7.15% | 0.1214 | 5.18% | 7.82% | 0.1492 | -2.57% | 15.56% | 0.4265 | 8.53% | 4.46% | -0.0033 |
| bull market | 39.75% | 19.64% | 20.11% | 0.7922 | 29.68% | 10.08% | 0.2903 | 20.99% | 18.77% | 0.7389 | 21.08% | 18.67% | 0.7384 | 20.07% | 19.68% | 0.7787 | 18.81% | 20.94% | 0.7249 | 33.25% | 6.51% | 0.0819 |
| bear market | -42.77% | -30.86% | -11.91% | -0.4841 | -32.40% | -10.37% | -0.4894 | -31.07% | -11.69% | -0.4862 | -31.19% | -11.58% | -0.4853 | -31.16% | -11.61% | -0.4787 | -48.35% | 5.58% | 0.0776 | -43.71% | 0.95% | -0.0602 |
| positive GDP growth | 16.33% | 7.72% | 8.6% | 0.1833 | 14.94% | 1.39% | -0.1486 | 8.71% | 7.61% | 0.1424 | 8.75% | 7.58% | 0.1416 | 7.67% | 8.66% | 0.1875 | 2.13% | 14.2% | 0.3857 | 13.24% | 3.09% | -0.0687 |
| negative GDP growth | -7.82% | -12.25% | 4.44% | -0.0232 | -12.72% | 4.9% | 0.0007 | -12.40% | 4.59% | -0.0167 | -12.46% | 4.65% | -0.0135 | -10.73% | 2.92% | -0.1032 | -29.91% | 22.09% | 0.5693 | -19.39% | 11.57% | 0.3394 |

Notes: 1) ***, ** and * represent significant at 1%, 5% and 10% respectively. 2) The t-statistic was calculated using matched paired t-test formula. 3) Bull and bear market periods have been identified using the idea of non-overlapping 'bull' and 'bear' phases based on major peaks and troughs found in the stock market indices, presented in Gooding and O'Malley (1977) and in Woodward and Anderson (2009), i.e. based on the variability of indices. In case of this study, FTSE 100 index and FTSE All-Share index are utilised to identify the bull/ bear periods, they both provided same variability with peaks and troughs falling at same time. A bull/bear market period is established if the returns of the market index is positive/negative for three months or more. 4) Bull market periods cover 128 months over 02.2003-10.2007, 03.2009-03.2010, 07.2010 - 04.2011, 10.2011-02.2012 and 06.2012-12.2015 and bear market periods cover 40 months during: 01.2002-01.2003, 11.2007-02.2009, 04.2010 - 06.2010, 05.2011-09.2011 and 03.2012-05.2012. 5) Economic growth and shrinkage periods have been identified based on economic growth data released by Office for National Statistics Online (ONS, 2022). Economic shrinkage recorded a 21-month period from 04.2008-06.09, 04.2012-06.2012, 10.2012-12.2012, remaining 147 months pertaining to growth period. 6) Single-year period covers 12 months between 1st January to 31st December 7) Multiple-year period covers five consecutive single-year period. 8) Duration for Bull, Bear, growth and shrinkage periods are different in length than full calendar year, so returns in those rows are presented as annualised returns based on monthly returns. 9) Cells highlighted in grey identify the portfolio or index with the highest return for that period. These notes are same for Table 2b except that the returns do not include dividends for both the portfolio and the benchmark indices.

*Does it pay to be employee-owned?*

**Table 2b**. Average annual geometric returns of employee-owned wealth management firms' (without dividends) for for single-year periods (1-year, January to December), multiple-year periods (5-year and full-period of 14-year returns, January to December) and other sub-periods between January 2002 and December 2015 for the stocks of Employee-owned portfolio (with dividends) compared with the total return indices of 1. FTSE 100 2. FTSE 250 3. FTSE 350 4. FTSE All-Share 5. FTSE4GOOD 6. FTSE 350 Banks and 7. FTSE ASX Financial Services benchmarks.

| Period | EOFs Returns without Dividend | FTSE 100 Index | | | FTSE 250 Index | | | FTSE 350 Index | | | FTSE All-Share Index | | | FTSE4GOOD UK Index | | | FTSE 350 Banks Index | | | FTSE ASX Financial Services Index | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Return | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat | Return | Difference | t-stat |
| 2002 | -58.04% | -24.48% | -33.56% | -0.7029 | -27.27% | -30.76% | -0.6892 | -24.83% | -33.21% | -0.7024 | -24.97% | -33.07% | -0.7031 | -25.95% | -32.09% | -0.6741 | -22.13% | -35.91% | -0.6704 | -37.77% | -20.27% | -0.4289 |
| 2003 | 61.97% | 13.62% | 48.36% | 1.2752 | 34.33% | 27.64% | 0.7942 | 16.02% | 45.95% | 1.2285 | 16.56% | 45.41% | 1.2184 | 14.72% | 47.25% | 1.2514 | 17.80% | 44.18% | 1.1087 | 29.05% | 32.92% | 1.0203 |
| 2004 | 11.20% | 7.54% | 3.66% | 0.1388 | 19.55% | -8.35% | -0.3984 | 9.13% | 2.06% | 0.0809 | 9.21% | 1.98% | 0.0784 | 8.01% | 3.18% | 0.1224 | 6.84% | 4.36% | 0.1733 | 7.79% | 3.41% | 0.1746 |
| 2005 | 44.16% | 16.71% | 27.45% | 1.2812 | 26.78% | 17.38% | 0.8885 | 18.04% | 26.12% | 1.2458 | 18.10% | 26.06% | 1.2484 | 14.45% | 29.71% | 1.3982 | 7.33% | 36.83% | 1.8905* | 26.43% | 17.73% | 1.043 |
| 2006 | 23.55% | 10.71% | 12.84% | 0.7908 | 27.10% | -3.55% | -0.2585 | 12.98% | 10.57% | 0.6728 | 13.15% | 10.4% | 0.6686 | 11.45% | 12.1% | 0.7523 | 9.99% | 13.57% | 0.8187 | 36.32% | -12.77% | -1.4637 |
| 2007 | 7.06% | 3.80% | 3.26% | 0.206 | -4.65% | 11.71% | 0.7715 | 2.55% | 4.51% | 0.2927 | 2.03% | 5.03% | 0.3295 | -0.58% | 7.64% | 0.5025 | -21.30% | 28.36% | 2.1742* | 0.13% | 6.93% | 0.5915 |
| 2008 | -42.29% | -31.33% | -10.97% | -0.5823 | -40.32% | -1.98% | -0.1444 | -32.42% | -9.88% | -0.5545 | -32.78% | -9.51% | -0.5412 | -31.14% | -11.15% | -0.6017 | -56.78% | 14.48% | 0.6468 | -55.25% | 12.96% | 0.5989 |
| 2009 | 56.17% | 22.07% | 34.1% | 1.7927* | 46.32% | 9.86% | 0.7382 | 24.50% | 31.67% | 1.758 | 24.96% | 31.21% | 1.7568 | 20.64% | 35.53% | 1.9771* | 23.80% | 32.37% | 0.859 | 40.61% | 15.56% | 0.85 |
| 2010 | 37.16% | 9.00% | 28.16% | 1.984* | 24.20% | 12.97% | 0.9999 | 10.81% | 26.35% | 1.8994* | 10.94% | 26.22% | 1.9088* | 8.02% | 29.14% | 2.0688* | -0.10% | 37.27% | 1.5487 | 19.91% | 17.25% | 1.5226 |
| 2011 | -15.21% | -5.55% | -9.66% | -1.187 | -12.60% | -2.62% | -0.3537 | -6.49% | -8.72% | -1.1079 | -6.69% | -8.52% | -1.0866 | -6.61% | -8.6% | -1.0768 | -29.62% | 14.41% | 1.0409 | -27.81% | 12.59% | 1.4437 |
| 2012 | 36.40% | 5.84% | 30.56% | 1.9795* | 22.49% | 13.91% | 1.1605 | 7.90% | 28.5% | 1.9143* | 8.24% | 28.16% | 1.9023* | 9.77% | 26.63% | 1.7992* | 34.46% | 1.94% | 0.1206 | 24.04% | 12.35% | 1.13 |
| 2013 | 49.11% | 14.43% | 34.68% | 3.1463*** | 28.77% | 20.34% | 1.8125* | 16.39% | 32.73% | 2.9882** | 16.69% | 32.42% | 2.9619** | 18.36% | 30.75% | 2.8252** | 7.79% | 41.33% | 3.8626*** | 42.06% | 7.05% | 1.0201 |
| 2014 | -4.25% | -2.71% | -1.54% | -0.1429 | 0.94% | -5.19% | -0.4902 | -2.15% | -2.1% | -0.2031 | -2.13% | -2.12% | -0.2054 | -1.28% | -2.97% | -0.2767 | -9.48% | 5.23% | 0.3068 | 8.96% | -13.21% | -1.4127 |
| 2015 | 6.06% | -4.74% | 10.8% | 1.8256* | 8.27% | -2.21% | -0.2228 | -2.66% | 8.72% | 1.4086 | -2.38% | 8.44% | 1.3338 | -2.28% | 8.34% | 1.2142 | -12.73% | 18.78% | 1.9035* | 10.92% | -4.87% | -0.7034 |
| 2002-2006 | 6.12% | 3.58% | 2.54% | 0.0792 | 13.48% | -7.36% | -0.2552 | 4.89% | 1.24% | 0.0392 | 5.00% | 1.12% | 0.0358 | 3.20% | 2.93% | 0.0917 | 2.96% | 3.17% | 0.0931 | 8.33% | -2.2% | -0.0788 |
| 2003-2007 | 27.99% | 10.38% | 17.61% | 0.7216 | 19.80% | 8.19% | 0.379 | 11.61% | 16.38% | 0.6868 | 11.66% | 16.33% | 0.6887 | 9.46% | 18.53% | 0.7682 | 3.18% | 24.81% | 1.0309 | 19.14% | 8.85% | 0.4589 |
| 2004-2008 | 4.12% | -0.19% | 4.31% | 0.2181 | 1.86% | 2.26% | 0.1372 | 0.17% | 3.95% | 0.2068 | 0.02% | 4.1% | 0.2168 | -1.16% | 5.28% | 0.2709 | -15.57% | 19.69% | 1.0187 | -3.60% | 7.72% | 0.4763 |
| 2005-2009 | 11.44% | 2.37% | 9.06% | 0.4966 | 6.05% | 5.38% | 0.3612 | 2.85% | 8.59% | 0.4901 | 2.75% | 8.69% | 0.5009 | 1.05% | 10.39% | 0.5819 | -13.05% | 24.48% | 1.0758 | 1.66% | 9.78% | 0.6135 |
| 2006-2010 | 10.33% | 0.98% | 9.35% | 0.5538 | 5.62% | 4.71% | 0.3504 | 1.55% | 8.78% | 0.5435 | 1.47% | 8.86% | 0.5554 | -0.12% | 10.45% | 0.6345 | -14.28% | 24.62% | 1.0449 | 0.59% | 9.74% | 0.6513 |
| 2007-2011 | 2.33% | -2.18% | 4.51% | 0.2829 | -2.00% | 4.33% | 0.3465 | -2.22% | 4.54% | 0.2989 | -2.37% | 4.7% | 0.3126 | -3.59% | 5.91% | 0.3814 | -21.61% | 23.94% | 1.0317 | -11.42% | 13.75% | 0.9345 |
| 2008-2012 | 7.41% | -1.80% | 9.2% | 0.5738 | 3.03% | 4.38% | 0.37 | -1.22% | 8.62% | 0.5648 | -1.20% | 8.61% | 0.5707 | -1.66% | 9.07% | 0.5829 | -12.74% | 20.15% | 0.8514 | -7.54% | 14.95% | 1.025 |
| 2009-2013 | 29.87% | 8.76% | 21.1% | 1.4831 | 20.16% | 9.7% | 0.8563 | 10.13% | 19.74% | 1.4433 | 10.32% | 19.55% | 1.4429 | 9.60% | 20.27% | 1.4796 | 4.75% | 25.11% | 1.134 | 16.49% | 13.38% | 1.1602 |
| 2010-2014 | 17.76% | 3.94% | 13.82% | 1.0919 | 11.56% | 6.2% | 0.5686 | 4.95% | 12.81% | 1.0461 | 5.05% | 12.71% | 1.0438 | 5.29% | 12.47% | 1.0116 | -1.60% | 19.37% | 1.1525 | 10.70% | 7.06% | 0.7257 |
| 2011-2015 | 11.86% | 1.17% | 10.68% | 0.9482 | 8.54% | 3.31% | 0.3221 | 2.26% | 9.59% | 0.8785 | 2.40% | 9.46% | 0.8688 | 3.20% | 8.66% | 0.7889 | -4.23% | 16.08% | 1.1714 | 8.99% | 2.87% | 0.322 |
| full period | 8.47% | 1.30% | 7.16% | 0.3226 | 7.99% | 0.48% | 0.0244 | 2.21% | 6.26% | 0.2885 | 2.25% | 6.21% | 0.2881 | 1.44% | 7.02% | 0.3201 | -6.47% | 14.93% | 0.5825 | 4.01% | 4.46% | 0.2292 |
| bull market | 34.50% | 15.48% | 19.02% | 1.0185 | 26.27% | 8.23% | 0.4948 | 16.93% | 17.58% | 0.9648 | 17.05% | 17.45% | 0.9638 | 15.90% | 18.6% | 1.0089 | 14.23% | 20.27% | 0.9389 | 28.10% | 6.4% | 0.4228 |
| bear market | -45.51% | -33.38% | -12.13% | -0.4027 | -34.54% | -10.97% | -0.4118 | -33.55% | -11.96% | -0.405 | -33.64% | -11.87% | -0.4043 | -33.77% | -11.75% | -0.3938 | -50.66% | 5.15% | 0.1432 | -46.61% | 1.1% | 0.0371 |
| positive GDP growth | 11.88% | 4.03% | 7.86% | 0.3474 | 11.90% | -0.01% | -0.0007 | 5.10% | 6.78% | 0.3055 | 5.17% | 6.72% | 0.3042 | 3.97% | 7.91% | 0.3534 | -1.99% | 13.88% | 0.5511 | 8.81% | 3.08% | 0.1575 |
| negative GDP growth | -12.71% | -15.86% | 3.15% | 0.1617 | -15.82% | 3.11% | 0.2756 | -15.95% | 3.24% | 0.1782 | -16.00% | 3.29% | 0.1834 | -14.62% | 1.91% | 0.1009 | -32.57% | 19.85% | 0.6778 | -24.17% | 11.46% | 0.5942 |

Notes: same as in Table 2a above

**Table 3a.** Cumulative returns of investment in employee-owned portfolio of wealth management firms (with dividends) and returns earned through a buy-and-hold strategy by the total return versions of FTSE100, FTSE250, FTSE350, FTSE All-Share, FTSE4GOOD UK, FTSE 350 Banks and FTSE ASX Financial Services indices in the period from 2002 to 2015 calculated at different levels of trading costs.

| Portfolio and Benchmark | Transaction Cost | | | | |
|---|---|---|---|---|---|
| | **0.00%** | **1.00%** | **2.00%** | **14.43%** | **33.29%** |
| EOFs Returns with dividend | *452.99%* | *439.39%* | *425.78%* | *256.69%* | 0.00% |
| FTSE 100 TR GBP | 97.91% | 94.93% | 91.95% | 54.93% | -1.27% |
| FTSE 250 TR Index | 333.68% | 328.34% | 323.00% | *256.69%* | *156.01%* |
| FTSE 350 TR Index | 120.69% | 117.48% | 114.27% | 74.43% | 13.93% |
| FTSE All-Share Index TR | 121.33% | 118.12% | 114.90% | 74.97% | 14.36% |
| FTSE4GOOD UK TR | 102.74% | 99.71% | 96.68% | 59.06% | 1.95% |
| FTSE 350 Banks TR | -30.50% | -32.20% | -33.89% | -54.96% | -86.93% |
| FTSE ASX Financial Services TR | 214.53% | 210.39% | 206.24% | 154.73% | 76.53% |

**Table 3b.** Cumulative returns of investment in employee-owned portfolio of wealth management firms (without dividends) and returns earned through a buy-and-hold strategy by the price return versions of FTSE100, FTSE250, FTSE350, FTSE All-Share, FTSE4GOOD UK, FTSE 350 Banks and FTSE ASX Financial Services indices in the period from 2002 to 2015 calculated at different levels of trading costs.

| Portfolio and Benchmark | Transaction Cost | | | | |
|---|---|---|---|---|---|
| | **0.00%** | **1.00%** | **2.00%** | **3.31%** | **22.11%** |
| EO Returns without dividend | *211.94%* | *202.35%* | *192.77%* | *180.21%* | 0.00% |
| FTSE 100 TR GBP | 19.88% | 17.68% | 15.48% | 12.60% | -28.74% |
| FTSE 250 TR Index | 193.23% | 189.30% | 185.36% | *180.21%* | *106.27%* |
| FTSE 350 TR Index | 35.74% | 33.38% | 31.02% | 27.94% | -16.39% |
| FTSE All-Share Index TR | 36.64% | 34.27% | 31.90% | 28.80% | -15.69% |
| FTSE4GOOD UK TR | 22.22% | 20.00% | 17.78% | 14.87% | -26.92% |
| FTSE 350 Banks TR | -60.79% | -62.18% | -63.57% | -65.39% | -91.57% |
| FTSE ASX Financial Services TR | 73.29% | 70.56% | 67.83% | 64.25% | 12.86% |

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**Chart 1a.** Cumulative returns of investment in employee-owned portfolio of wealth management firms (with dividends) and returns earned through a buy-and-hold strategy by the total return versions of FTSE100, FTSE250, FTSE350, FTSE All-Share, FTSE4GOOD UK, FTSE 350 Banks and FTSE ASX Financial Services indices in the period from 2002 to 2015 calculated at different levels of trading costs.
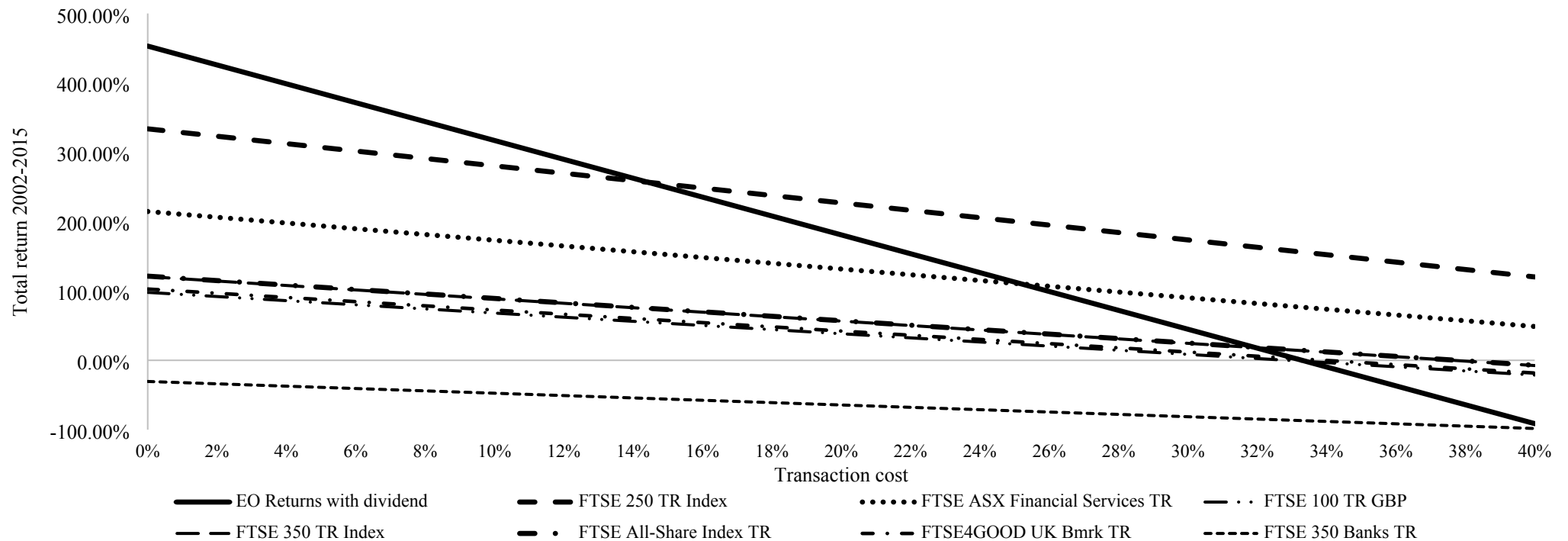
**Chart 1b.** Cumulative returns of investment in employee-owned portfolio of wealth management firms (without dividends) and returns earned through a buy-and-hold strategy by the price return versions of FTSE100, FTSE250, FTSE350, FTSE All-Share, FTSE4GOOD UK, FTSE 350 Banks and FTSE ASX Financial Services indices in the period from 2002 to 2015 calculated at different levels of trading costs.
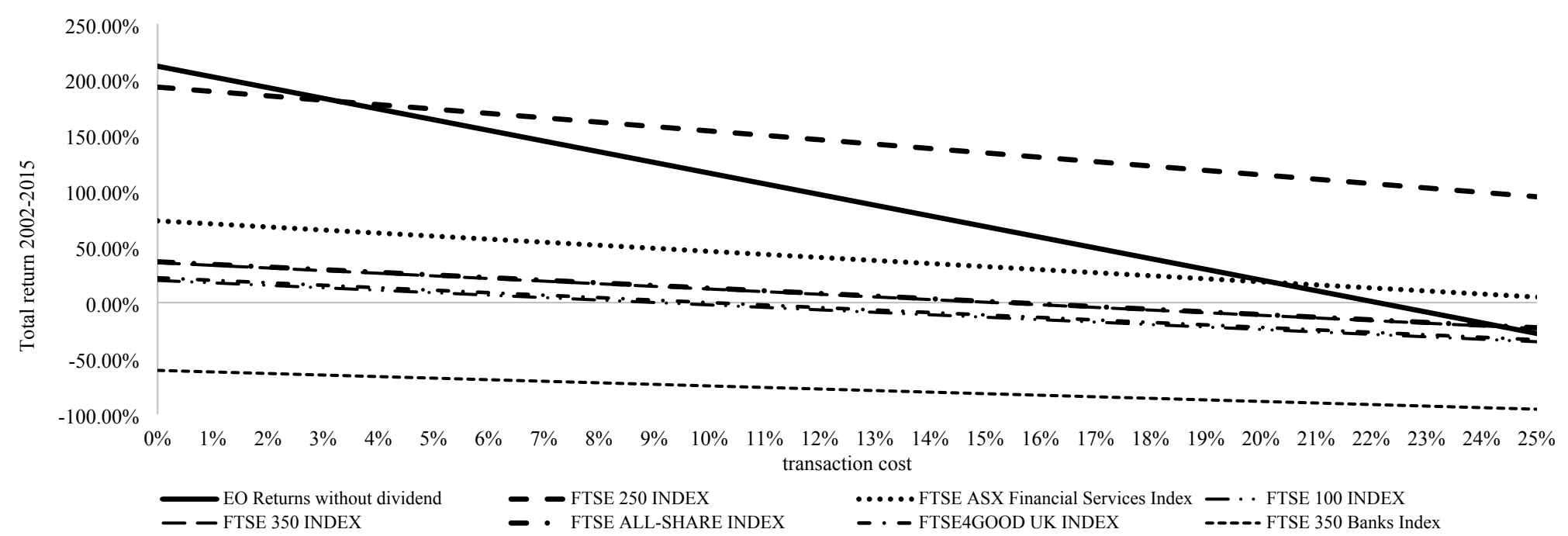
*Does it pay to be employee-owned?*

**Table 4a.** Treynor ratios *(TR)*, Modified Sharpe ratios *(MSR)*, and Standard Deviations *(SD)* for single-year periods (1-year, January to December), multiple-year periods (5-year and full-period of 14-year returns, January to December) and other sub-periods between January 2002 and December 2015 for the stocks of Employee-owned portfolio (with dividends) compared with the total return indices of 1. FTSE 100 2. FTSE 250 3. FTSE 350 4. FTSE All-Share 5. FTSE4GOOD 6. FTSE 350 Banks and 7. FTSE ASX Financial Services benchmarks.

| Period | EOFs with Dividend | | | FTSE 100 TR Index | | | FTSE 250 TR Index | | | FTSE 350 TR Index | | | FTSE All-Share TR Index | | | FTSE4GOOD UK TR Index | | | FTSE 350 Banks TR Index | | | FTSE ASX Financial Services TR Index | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD |
| 2002 | -0.7478 | -0.3131 | 0.5169 | -0.2311 | -0.0529 | 0.203 | -0.2895 | -0.0609 | 0.2102 | -0.2381 | -0.0535 | 0.2022 | -0.2398 | -0.0537 | 0.2018 | -0.2443 | -0.0562 | 0.2037 | -0.2651 | -0.0749 | 0.3262 | -0.4032 | -0.1108 | 0.2777 |
| 2003 | 0.5949 | 1.6393 | 0.4034 | 0.1996 | 0.9362 | 0.1531 | 0.3530 | 1.9131 | 0.1845 | 0.2224 | 1.0910 | 0.1537 | 0.2270 | 1.1262 | 0.1536 | 0.2088 | 1.0061 | 0.1534 | 0.2302 | 0.9568 | 0.2141 | 0.2816 | 1.4231 | 0.21 |
| 2004 | 0.0407 | 0.3587 | 0.2865 | 0.2245 | 1.0985 | 0.0617 | 0.1842 | 1.8055 | 0.102 | 0.2085 | 1.3545 | 0.0615 | 0.1995 | 1.3594 | 0.0616 | 0.2112 | 1.1752 | 0.0616 | 0.1840 | 0.8249 | 0.0867 | 0.0461 | 0.3648 | 0.1728 |
| 2005 | 0.4040 | 1.8642 | 0.2435 | 0.3240 | 2.0328 | 0.0799 | 0.2567 | 1.9291 | 0.1331 | 0.3063 | 2.0651 | 0.0847 | 0.3047 | 2.0669 | 0.0846 | 0.2752 | 1.8103 | 0.0768 | 0.1125 | 0.7727 | 0.0976 | 0.2151 | 1.4775 | 0.1733 |
| 2006 | 0.1616 | 1.1458 | 0.1962 | 0.1666 | 1.2638 | 0.0772 | 0.2554 | 2.4740 | 0.1032 | 0.1849 | 1.5282 | 0.0782 | 0.1843 | 1.5401 | 0.0784 | 0.1717 | 1.4026 | 0.0754 | 0.1643 | 0.8977 | 0.1128 | 0.3162 | 2.7565 | 0.1476 |
| 2007 | 0.0535 | 0.2677 | 0.2086 | 0.0365 | 0.2047 | 0.0901 | -0.0798 | -0.0107 | 0.1345 | 0.0064 | 0.0399 | 0.0927 | -0.0012 | -0.0002 | 0.0931 | -0.0149 | -0.0024 | 0.0911 | -0.1759 | -0.0259 | 0.113 | 0.0065 | 0.0324 | 0.1436 |
| 2008 | -0.4250 | -0.1325 | 0.3098 | -0.2212 | -0.0705 | 0.2166 | -0.4237 | -0.1175 | 0.2772 | -0.2418 | -0.0746 | 0.221 | -0.2465 | -0.0757 | 0.2218 | -0.2167 | -0.0691 | 0.215 | -0.5593 | -0.1915 | 0.3313 | -0.4403 | -0.1524 | 0.2724 |
| 2009 | 0.8268 | 2.8605 | 0.225 | 0.3700 | 1.4156 | 0.1893 | 0.5011 | 2.2324 | 0.2245 | 0.3843 | 1.5390 | 0.1893 | 0.3849 | 1.5541 | 0.1904 | 0.3210 | 1.2905 | 0.1976 | 0.1301 | 0.5300 | 0.5174 | 0.4440 | 1.7606 | 0.2705 |
| 2010 | 0.4916 | 2.1113 | 0.2016 | 0.1342 | 0.7028 | 0.1726 | 0.2690 | 1.5218 | 0.1768 | 0.1517 | 0.8101 | 0.1716 | 0.1535 | 0.8228 | 0.1704 | 0.1250 | 0.6675 | 0.1699 | 0.0240 | 0.0943 | 0.1917 | 0.2506 | 1.2065 | 0.2066 |
| 2011 | -0.1304 | -0.0206 | 0.1654 | -0.0226 | -0.0035 | 0.1311 | -0.1054 | -0.0151 | 0.1434 | -0.0322 | -0.0049 | 0.1318 | -0.0340 | -0.0052 | 0.1308 | -0.0302 | -0.0046 | 0.1253 | -0.3513 | -0.0590 | 0.2126 | -0.2711 | -0.0434 | 0.1723 |
| 2012 | 0.3216 | 2.1571 | 0.193 | 0.1314 | 0.9476 | 0.1019 | 0.2579 | 2.0905 | 0.1234 | 0.1515 | 1.1328 | 0.1029 | 0.1551 | 1.1661 | 0.1028 | 0.1883 | 1.3842 | 0.0995 | 0.2518 | 1.8559 | 0.2106 | 0.2197 | 1.6474 | 0.1797 |
| 2013 | 0.4301 | 3.0703 | 0.1751 | 0.1793 | 1.5458 | 0.1187 | 0.3196 | 2.8898 | 0.1106 | 0.1982 | 1.7312 | 0.1168 | 0.2020 | 1.7647 | 0.1161 | 0.2162 | 1.8816 | 0.1188 | 0.0790 | 0.6109 | 0.1807 | 0.3202 | 2.7336 | 0.1723 |
| 2014 | -0.0035 | -0.0006 | 0.1118 | 0.0053 | 0.0360 | 0.0961 | 0.0327 | 0.3260 | 0.1002 | 0.0113 | 0.0862 | 0.0924 | 0.0114 | 0.0868 | 0.0908 | 0.0246 | 0.1817 | 0.0945 | -0.0221 | -0.0085 | 0.126 | 0.0939 | 0.8317 | 0.1458 |
| 2015 | 0.0668 | 0.5961 | 0.177 | -0.0179 | -0.0021 | 0.1301 | 0.1062 | 1.0649 | 0.0997 | 0.0035 | 0.0314 | 0.1225 | 0.0059 | 0.0538 | 0.1202 | 0.0069 | 0.0613 | 0.1186 | -0.1079 | -0.0143 | 0.1487 | 0.1059 | 0.9353 | 0.1444 |
| 2002-2006 | 0.0398 | 0.1587 | 0.3618 | 0.0409 | 0.2211 | 0.1308 | 0.1252 | 0.7772 | 0.161 | 0.0557 | 0.3149 | 0.1323 | 0.0564 | 0.3212 | 0.1323 | 0.0345 | 0.1902 | 0.1313 | 0.0393 | 0.1790 | 0.1883 | 0.0716 | 0.3836 | 0.2115 |
| 2003-2007 | 0.2212 | 1.0321 | 0.2733 | 0.1768 | 1.0187 | 0.0951 | 0.1851 | 1.3691 | 0.1352 | 0.1774 | 1.1162 | 0.0971 | 0.1747 | 1.1150 | 0.0973 | 0.1493 | 0.9196 | 0.0952 | 0.0458 | 0.2578 | 0.1349 | 0.1868 | 1.1671 | 0.169 |
| 2004-2008 | 0.0326 | 0.1420 | 0.2584 | -0.0077 | -0.0016 | 0.1263 | -0.0001 | 0.0000 | 0.1763 | -0.0067 | -0.0013 | 0.1301 | -0.0081 | -0.0016 | 0.1307 | -0.0135 | -0.0027 | 0.1248 | -0.1460 | -0.0306 | 0.1923 | -0.0324 | -0.0069 | 0.2112 |
| 2005-2009 | 0.1261 | 0.5013 | 0.2517 | 0.0366 | 0.1573 | 0.1503 | 0.0515 | 0.2562 | 0.2009 | 0.0394 | 0.1770 | 0.1537 | 0.0370 | 0.1672 | 0.1546 | 0.0168 | 0.0739 | 0.151 | -0.1489 | -0.0376 | 0.2969 | 0.0361 | 0.1534 | 0.2342 |
| 2006-2010 | 0.1269 | 0.5065 | 0.2438 | 0.0249 | 0.1044 | 0.1636 | 0.0549 | 0.2653 | 0.2069 | 0.0299 | 0.1306 | 0.1661 | 0.0281 | 0.1234 | 0.1667 | 0.0104 | 0.0448 | 0.1641 | -0.1559 | -0.0412 | 0.3047 | 0.0370 | 0.1515 | 0.2388 |
| 2007-2011 | 0.0515 | 0.2075 | 0.2412 | -0.0048 | -0.0012 | 0.1696 | -0.0142 | -0.0030 | 0.2107 | -0.0063 | -0.0015 | 0.172 | -0.0077 | -0.0018 | 0.1723 | -0.0142 | -0.0034 | 0.1692 | -0.2424 | -0.0643 | 0.3137 | -0.0842 | -0.0209 | 0.2403 |
| 2008-2012 | 0.1150 | 0.4739 | 0.241 | 0.0115 | 0.0485 | 0.171 | 0.0493 | 0.2340 | 0.2106 | 0.0176 | 0.0762 | 0.1733 | 0.0173 | 0.0756 | 0.1737 | 0.0156 | 0.0667 | 0.1707 | -0.1310 | -0.0342 | 0.3282 | -0.0387 | -0.0094 | 0.2476 |
| 2009-2013 | 0.3536 | 1.7647 | 0.1979 | 0.1577 | 0.8638 | 0.1439 | 0.2312 | 1.4131 | 0.1636 | 0.1684 | 0.9513 | 0.1441 | 0.1698 | 0.9642 | 0.144 | 0.1650 | 0.9278 | 0.1443 | 0.0528 | 0.2645 | 0.2908 | 0.1850 | 1.0167 | 0.2101 |
| 2010-2014 | 0.2070 | 1.2294 | 0.1792 | 0.0901 | 0.5857 | 0.1245 | 0.1425 | 1.0467 | 0.1362 | 0.0984 | 0.6618 | 0.1241 | 0.0996 | 0.6728 | 0.1234 | 0.1065 | 0.7111 | 0.1227 | 0.0109 | 0.0613 | 0.1909 | 0.1236 | 0.8119 | 0.1831 |
| 2011-2015 | 0.1329 | 0.9247 | 0.1728 | 0.0552 | 0.3955 | 0.1145 | 0.1116 | 0.9331 | 0.1196 | 0.0654 | 0.4898 | 0.1127 | 0.0670 | 0.5043 | 0.1117 | 0.0798 | 0.5914 | 0.1111 | -0.0147 | -0.0022 | 0.1842 | 0.0976 | 0.7412 | 0.1712 |
| full period | 0.0922 | 0.3863 | 0.2742 | 0.0362 | 0.1849 | 0.1404 | 0.0865 | 0.5116 | 0.169 | 0.0453 | 0.2418 | 0.1413 | 0.0453 | 0.2434 | 0.1413 | 0.0379 | 0.1986 | 0.1399 | -0.0540 | -0.0118 | 0.2382 | 0.0572 | 0.2907 | 0.2108 |
| bull market | 0.3495 | 1.7292 | 0.217 | 0.2713 | 1.6580 | 0.105 | 0.2745 | 2.0963 | 0.1309 | 0.2726 | 1.7898 | 0.1048 | 0.2718 | 1.8039 | 0.1045 | 0.2683 | 1.7328 | 0.103 | 0.1605 | 0.8645 | 0.1918 | 0.2825 | 1.8548 | 0.1672 |
| bear market | -0.5029 | -0.1596 | 0.3492 | -0.2470 | -0.0585 | 0.1729 | -0.3535 | -0.0709 | 0.2007 | -0.2595 | -0.0591 | 0.1737 | -0.2620 | -0.0593 | 0.1737 | -0.2509 | -0.0592 | 0.1734 | -0.5306 | -0.1473 | 0.287 | -0.4134 | -0.1080 | 0.2314 |
| positive GDP growth | 0.1123 | 0.5121 | 0.2707 | 0.0696 | 0.4093 | 0.1285 | 0.1247 | 0.8486 | 0.147 | 0.0793 | 0.4867 | 0.1284 | 0.0794 | 0.4909 | 0.1281 | 0.0674 | 0.4083 | 0.1275 | -0.0032 | -0.0006 | 0.1895 | 0.0980 | 0.5721 | 0.1884 |
| negative GDP growth | -0.0981 | -0.0292 | 0.2984 | -0.0915 | -0.0288 | 0.2029 | -0.1468 | -0.0405 | 0.276 | -0.0984 | -0.0299 | 0.208 | -0.0999 | -0.0302 | 0.2094 | -0.0833 | -0.0261 | 0.2055 | -0.4114 | -0.1443 | 0.4528 | -0.2142 | -0.0692 | 0.3241 |

*Does it pay to be employee-owned?*

Notes: 1) The Treynor ratio was calculated using the formula developed in this paper, $TR = \frac{ER}{\beta}$ The modified Sharpe ratio was calculated based on the formula from Israelsen (2005), MSR = ER/SD$^{(ER/absER)}$, where ER is the excess return defined as mean monthly difference between the portfolio (or index) return and the risk-free return computed for n equal to 12, 60 or 168 months, respectfully, and SD is the sample standard deviation of the monthly returns. 2) Bull and bear market periods have been identified using the idea of non-overlapping 'bull' and 'bear' phases based on major peaks and troughs found in the stock market indices, presented in Gooding and O'Malley (1977) and in Woodward and Anderson (2009), i.e. based on the variability of indices. In case of this study, FTSE 100 index and FTSE All-Share index are utilised to identify the bull/ bear periods, they both provided same variability with peaks and troughs falling at same time. A bull/bear market period is established if the returns of the market index is positive/negative for three months or more. 3) Bull market periods cover 128 months over 02.2003-10.2007, 03.2009-03.2010, 07.2010 - 04.2011, 10.2011-02.2012 and 06.2012-12.2015 and bear market periods cover 40 months during: 01.2002-01.2003, 11.2007-02.2009, 04.2010 - 06.2010, 05.2011-09.2011 and 03.2012-05.2012. 4) Economic growth and shrinkage periods have been identified based on economic growth data released by Office for National Statistics Online (ONS, 2022). Economic shrinkage recorded a 21-month period from 04.2008-06.09, 04.2012-06.2012, 10.2012-12.2012, remaining 147 months pertaining to growth period. 5) Single-year period covers 12 months between 1st January to 31st December 6) Multiple-year period covers five consecutive single-year period. 8) Cells highlighted in grey identify the portfolio or index with the highest MSR and TR values for that period.

**Table 4b**. Treynor ratios *(TR)*, Modified Sharpe ratios (*MSR*), and Standard Deviations (*SD*) for single-year periods (1-year, January to December), multiple-year periods (5-year and full-period of 14-year returns, January to December) and other sub-periods between January 2002 and December 2015 for the stocks of Employee-owned portfolio (without dividends) compared with the price indices of 1. FTSE 100 2. FTSE 250 3. FTSE 350 4. FTSE All-Share 5. FTSE4GOOD 6. FTSE 350 Banks and 7. FTSE ASX Financial Services benchmarks.

| Period | EOFs Returns without Dividend | | | FTSE 100 Index | | | FTSE 250 Index | | | FTSE 350 Index | | | FTSE All-Share Index | | | FTSE4GOOD UK Index | | | FTSE 350 Banks Index | | | FTSE ASX Financial Services Index | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD | TR | MSR | SD |
| 2002 | -0.7532 | -0.3198 | 0.5163 | **-0.2466** | **-0.0570** | 0.2009 | -0.3118 | -0.0657 | 0.2107 | -0.2544 | -0.0576 | 0.2003 | -0.2561 | -0.0577 | 0.1999 | -0.2596 | -0.0603 | 0.2019 | -0.2865 | -0.0845 | 0.3244 | -0.4195 | -0.1158 | 0.278 |
| 2003 | **0.5380** | 1.4586 | 0.4004 | 0.1389 | 0.6604 | 0.1522 | 0.3077 | **1.6917** | 0.1819 | 0.1641 | 0.8161 | 0.1527 | 0.1695 | 0.8520 | 0.1526 | 0.1503 | 0.7326 | 0.1524 | 0.1540 | 0.6548 | 0.2174 | 0.2425 | 1.2397 | 0.2056 |
| 2004 | 0.0265 | 0.2298 | 0.2929 | 0.1012 | 0.4867 | 0.0631 | **0.1509** | **1.4669** | 0.1028 | 0.1165 | 0.7446 | 0.0627 | 0.1128 | 0.7555 | 0.0628 | 0.1042 | 0.5640 | 0.0629 | 0.0569 | 0.2628 | 0.0904 | 0.0239 | 0.1900 | 0.1747 |
| 2005 | **0.3693** | 1.6437 | 0.241 | 0.2470 | 1.5040 | 0.0808 | 0.2223 | **1.6488** | 0.1348 | 0.2395 | 1.5770 | 0.0855 | 0.2391 | 1.5849 | 0.0855 | 0.2004 | 1.2850 | 0.077 | 0.0404 | 0.2612 | 0.1063 | 0.1857 | 1.2651 | 0.1729 |
| 2006 | 0.1290 | 0.9447 | 0.1998 | 0.1040 | 0.7650 | 0.0789 | 0.2243 | **2.1440** | 0.1046 | 0.1294 | 1.0426 | 0.0797 | 0.1301 | 1.0603 | 0.0799 | 0.1103 | 0.8757 | 0.0774 | 0.0915 | 0.4452 | 0.1193 | **0.2497** | 2.0690 | 0.1529 |
| 2007 | **0.0140** | **0.0732** | 0.2098 | -0.0084 | -0.0015 | 0.0885 | -0.1017 | -0.0135 | 0.1331 | -0.0167 | -0.0027 | 0.0908 | -0.0200 | -0.0032 | 0.0912 | -0.0339 | -0.0055 | 0.0895 | -0.1858 | -0.0303 | 0.113 | -0.0384 | -0.0076 | 0.1415 |
| 2008 | -0.4574 | -0.1417 | 0.3046 | -0.2360 | -0.0757 | 0.213 | -0.4454 | -0.1230 | 0.2761 | -0.2575 | -0.0797 | 0.2175 | -0.2622 | -0.0808 | 0.2184 | **-0.2328** | **-0.0746** | 0.2109 | -0.5668 | -0.1929 | 0.3162 | -0.4708 | -0.1618 | 0.2721 |
| 2009 | 0.6774 | **2.4866** | 0.2238 | 0.2922 | 1.1372 | 0.1894 | 0.4578 | 2.0797 | 0.2201 | 0.3114 | 1.2681 | 0.189 | 0.3130 | 1.2858 | 0.19 | 0.2483 | 1.0180 | 0.1975 | 0.1094 | 0.4527 | 0.514 | 0.3721 | 1.4921 | 0.2686 |
| 2010 | **0.4048** | **1.7789** | 0.2061 | 0.0916 | 0.4906 | 0.1733 | 0.2370 | 1.3534 | 0.1751 | 0.1100 | 0.5990 | 0.1722 | 0.1119 | 0.6107 | 0.171 | 0.0805 | 0.4394 | 0.1712 | -0.0047 | -0.0012 | 0.1941 | 0.1930 | 0.9425 | 0.206 |
| 2011 | -0.1680 | -0.0267 | 0.1704 | **-0.0520** | **-0.0081** | 0.1339 | -0.1307 | -0.0188 | 0.144 | -0.0613 | -0.0094 | 0.1343 | -0.0627 | -0.0096 | 0.1332 | -0.0595 | -0.0091 | 0.128 | -0.3883 | -0.0663 | 0.2203 | -0.3059 | -0.0492 | 0.1739 |
| 2012 | **0.2871** | **1.8738** | 0.1926 | 0.0756 | 0.5385 | 0.1026 | 0.2217 | 1.7562 | 0.1262 | 0.0989 | 0.7292 | 0.1039 | 0.1030 | 0.7628 | 0.1039 | 0.1300 | 0.9400 | 0.1005 | 0.2196 | 1.5817 | 0.2158 | 0.1760 | 1.3046 | 0.1819 |
| 2013 | **0.3826** | **2.7475** | 0.1776 | 0.1357 | 1.1517 | 0.1226 | 0.2846 | 2.5441 | 0.1119 | 0.1554 | 1.3371 | 0.1202 | 0.1592 | 1.3703 | 0.1195 | 0.1711 | 1.4653 | 0.1232 | 0.0537 | 0.4034 | 0.1852 | 0.2846 | 2.3981 | 0.1741 |
| 2014 | -0.0313 | -0.0055 | 0.1193 | -0.0185 | -0.0029 | 0.092 | 0.0055 | 0.0545 | 0.1012 | -0.0168 | -0.0023 | 0.0888 | -0.0164 | -0.0022 | 0.0873 | -0.0109 | -0.0015 | 0.0908 | -0.0292 | -0.0124 | 0.1257 | **0.0672** | **0.5858** | 0.1463 |
| 2015 | 0.0367 | 0.3243 | 0.1729 | -0.0590 | -0.0069 | 0.1325 | 0.0782 | **0.7826** | 0.0999 | -0.0345 | -0.0039 | 0.1243 | -0.0310 | -0.0035 | 0.122 | -0.0288 | -0.0033 | 0.121 | -0.1497 | -0.0197 | 0.1499 | **0.0820** | 0.7241 | 0.1446 |
| 2002-2006 | 0.0132 | 0.0524 | 0.3615 | -0.0046 | -0.0008 | 0.1303 | **0.0925** | **0.5741** | 0.1611 | 0.0088 | 0.0497 | 0.1317 | 0.0103 | 0.0584 | 0.1317 | -0.0074 | -0.0014 | 0.1307 | -0.0108 | -0.0024 | 0.1901 | 0.0364 | 0.1944 | 0.2108 |
| 2003-2007 | **0.1827** | 0.8562 | 0.2737 | 0.1072 | 0.6124 | 0.0952 | 0.1524 | **1.1320** | 0.1347 | 0.1162 | 0.7280 | 0.0969 | 0.1151 | 0.7315 | 0.0971 | 0.0845 | 0.5165 | 0.095 | -0.0104 | -0.0019 | 0.1385 | 0.1378 | 0.8647 | 0.1687 |
| 2004-2008 | **-0.0064** | **-0.0015** | 0.2598 | -0.0293 | -0.0061 | 0.1258 | -0.0283 | -0.0050 | 0.1766 | -0.0294 | -0.0058 | 0.1295 | -0.0308 | -0.0061 | 0.1301 | -0.0356 | -0.0073 | 0.1242 | -0.1815 | -0.0387 | 0.191 | -0.0829 | -0.0177 | 0.2131 |
| 2005-2009 | **0.0745** | **0.3006** | 0.2512 | -0.0097 | -0.0023 | 0.1496 | 0.0217 | 0.1083 | 0.2002 | -0.0071 | -0.0016 | 0.1529 | -0.0079 | -0.0017 | 0.1538 | -0.0187 | -0.0043 | 0.1501 | -0.1957 | -0.0500 | 0.295 | -0.0223 | -0.0052 | 0.2352 |
| 2006-2010 | **0.0731** | **0.2973** | 0.2444 | -0.0142 | -0.0034 | 0.163 | 0.0255 | 0.1241 | 0.2057 | -0.0109 | -0.0025 | 0.1654 | -0.0116 | -0.0026 | 0.166 | -0.0223 | -0.0052 | 0.1635 | -0.1979 | -0.0525 | 0.3027 | -0.0244 | -0.0059 | 0.2394 |
| 2007-2011 | **0.0010** | **0.0042** | 0.2415 | -0.0310 | -0.0075 | 0.1693 | -0.0423 | -0.0089 | 0.2094 | -0.0329 | -0.0076 | 0.1714 | -0.0343 | -0.0079 | 0.1718 | -0.0416 | -0.0098 | 0.1688 | -0.2799 | -0.0744 | 0.3122 | -0.1332 | -0.0328 | 0.2404 |
| 2008-2012 | **0.0618** | **0.2576** | 0.2411 | -0.0215 | -0.0051 | 0.1708 | 0.0183 | 0.0874 | 0.2098 | -0.0182 | -0.0042 | 0.1731 | -0.0182 | -0.0042 | 0.1735 | -0.0208 | -0.0049 | 0.1706 | -0.1747 | -0.0456 | 0.3274 | -0.0901 | -0.0217 | 0.2484 |
| 2009-2013 | **0.2902** | **1.4777** | 0.1992 | 0.1042 | 0.5745 | 0.1451 | 0.1974 | 1.2119 | 0.1628 | 0.1176 | 0.6684 | 0.1452 | 0.1195 | 0.6822 | 0.145 | 0.1112 | 0.6291 | 0.1457 | 0.0295 | 0.1482 | 0.292 | 0.1383 | 0.7643 | 0.2101 |
| 2010-2014 | **0.1609** | **0.9525** | 0.1823 | 0.0434 | 0.2822 | 0.1254 | 0.1117 | 0.8166 | 0.1367 | 0.0542 | 0.3639 | 0.1251 | 0.0556 | 0.3745 | 0.1243 | 0.0592 | 0.3943 | 0.124 | -0.0217 | -0.0039 | 0.1947 | 0.0854 | 0.5598 | 0.184 |
| 2011-2015 | **0.0959** | 0.6575 | 0.1744 | 0.0096 | 0.0677 | 0.1158 | 0.0815 | **0.6756** | 0.1207 | 0.0222 | 0.1646 | 0.1139 | 0.0240 | 0.1781 | 0.1129 | 0.0341 | 0.2495 | 0.1126 | -0.0565 | -0.0087 | 0.1878 | 0.0662 | 0.4989 | 0.1723 |
| full period | 0.0526 | 0.2210 | 0.2744 | -0.0078 | -0.0015 | 0.1403 | **0.0559** | **0.3311** | 0.1687 | -0.0015 | -0.0003 | 0.1411 | -0.0011 | -0.0002 | 0.1411 | -0.0070 | -0.0013 | 0.1398 | -0.0956 | -0.0212 | 0.2386 | 0.0149 | 0.0760 | 0.2112 |
| bull market | **0.2967** | 1.4829 | 0.2176 | 0.2059 | 1.2558 | 0.1055 | 0.2405 | **1.8471** | 0.1302 | 0.2130 | 1.3989 | 0.1051 | 0.2132 | 1.4150 | 0.1047 | 0.2050 | 1.3218 | 0.1034 | 0.1154 | 0.6166 | 0.1946 | 0.2356 | 1.5507 | 0.1669 |
| bear market | -0.5296 | -0.1683 | 0.3472 | **-0.2613** | **-0.0623** | 0.1715 | -0.3749 | -0.0751 | 0.2004 | -0.2748 | -0.0629 | 0.1722 | -0.2774 | -0.0631 | 0.1723 | -0.2660 | -0.0631 | 0.1719 | -0.5357 | -0.1509 | 0.2814 | -0.4413 | -0.1147 | 0.2314 |
| positive GDP growth | 0.0759 | 0.3478 | 0.2709 | 0.0208 | 0.1215 | 0.1286 | **0.0943** | **0.6425** | 0.1468 | 0.0336 | 0.2056 | 0.1284 | 0.0343 | 0.2113 | 0.128 | 0.0196 | 0.1183 | 0.1276 | -0.0431 | -0.0085 | 0.1912 | 0.0579 | 0.3379 | 0.1878 |
| negative GDP growth | -0.1477 | -0.0437 | 0.298 | -0.1138 | -0.0359 | 0.2014 | -0.1778 | -0.0488 | 0.2744 | -0.1219 | -0.0370 | 0.2065 | -0.1237 | -0.0373 | 0.2079 | **-0.1081** | **-0.0338** | 0.204 | -0.4405 | -0.1552 | 0.4494 | -0.2665 | -0.0855 | 0.3272 |

Notes: same as in Table 4a

Employee Relations

**Table 5.** Certainty Equivalent (*CEQ*) returns (for risk aversion parameters: $\gamma = 0.5$, $\gamma = 1$ and $\gamma = 2$) for single-year periods (1-year, January to December), multiple-year periods (5-year and full-period of 14-year returns, January to December) and other sub-periods between January 2002 and December 2015 for the stocks of Employee-owned portfolio (with dividends) compared with CEQ returns of 1. FTSE 100 2. FTSE 250 3. FTSE 350 4. FTSE All-Share 5. FTSE4GOOD 6. FTSE 350 Banks and 7. FTSE ASX Financial Services benchmarks.

| Period | EOFs Returns with Dividend | | | FTSE 100 TR Index | | | FTSE 250 TR Index | | | FTSE 350 TR Index | | | FTSE All-Share TR Index | | | FTSE4GOOD UK TR Index | | | FTSE 350 Banks TR Index | | | FTSE ASX Financial Services TR Index | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) | CEQ (0.5) | CEQ (1.0) | CEQ (2.0) |
| 2002 | -0.6335 | -0.7003 | -1.1010 | -0.2320 | -0.2423 | -0.3041 | -0.2615 | -0.2725 | -0.3388 | -0.2355 | -0.2457 | -0.3071 | -0.2370 | -0.2472 | -0.3083 | -0.2472 | -0.2575 | -0.3198 | -0.2170 | -0.2436 | -0.4032 | -0.3794 | -0.3986 | -0.5143 |
| 2003 | 0.6563 | 0.6156 | 0.3714 | 0.1731 | 0.1672 | 0.1321 | 0.3801 | 0.3716 | 0.3205 | 0.1974 | 0.1915 | 0.1560 | 0.2027 | 0.1968 | 0.1614 | 0.1840 | 0.1782 | 0.1429 | 0.2290 | 0.2176 | 0.1488 | 0.3234 | 0.3124 | 0.2463 |
| 2004 | 0.1269 | 0.1064 | -0.0167 | 0.1115 | 0.1106 | 0.1049 | 0.2262 | 0.2236 | 0.2080 | 0.1270 | 0.1261 | 0.1204 | 0.1274 | 0.1265 | 0.1208 | 0.1161 | 0.1152 | 0.1095 | 0.1143 | 0.1124 | 0.1012 | 0.1002 | 0.0928 | 0.0480 |
| 2005 | 0.4846 | 0.4698 | 0.3808 | 0.2063 | 0.2047 | 0.1951 | 0.2978 | 0.2934 | 0.2668 | 0.2186 | 0.2168 | 0.2060 | 0.2186 | 0.2168 | 0.2061 | 0.1830 | 0.1815 | 0.1727 | 0.1185 | 0.1162 | 0.1019 | 0.2941 | 0.2866 | 0.2415 |
| 2006 | 0.2619 | 0.2523 | 0.1946 | 0.1428 | 0.1413 | 0.1324 | 0.2995 | 0.2968 | 0.2808 | 0.1647 | 0.1631 | 0.1540 | 0.1660 | 0.1644 | 0.1552 | 0.1511 | 0.1497 | 0.1412 | 0.1448 | 0.1416 | 0.1226 | 0.4481 | 0.4427 | 0.4100 |
| 2007 | 0.1002 | 0.0893 | 0.0240 | 0.0716 | 0.0696 | 0.0574 | -0.0291 | -0.0337 | -0.0608 | 0.0568 | 0.0546 | 0.0417 | 0.0510 | 0.0488 | 0.0358 | 0.0270 | 0.0250 | 0.0125 | -0.1774 | -0.1806 | -0.1997 | 0.0547 | 0.0496 | 0.0186 |
| 2008 | -0.4094 | -0.4334 | -0.5774 | -0.2950 | -0.3068 | -0.3771 | -0.4007 | -0.4199 | -0.5352 | -0.3075 | -0.3197 | -0.3930 | -0.3116 | -0.3239 | -0.3977 | -0.2907 | -0.3023 | -0.3716 | -0.5632 | -0.5906 | -0.7553 | -0.5358 | -0.5543 | -0.6656 |
| 2009 | 0.6362 | 0.6236 | 0.5476 | 0.2643 | 0.2553 | 0.2016 | 0.4938 | 0.4812 | 0.4056 | 0.2877 | 0.2787 | 0.2250 | 0.2921 | 0.2831 | 0.2287 | 0.2506 | 0.2408 | 0.1822 | 0.2126 | 0.1457 | -0.2559 | 0.4632 | 0.4449 | 0.3352 |
| 2010 | 0.4205 | 0.4103 | 0.3493 | 0.1188 | 0.1114 | 0.0667 | 0.2661 | 0.2583 | 0.2115 | 0.1366 | 0.1292 | 0.0851 | 0.1379 | 0.1306 | 0.0871 | 0.1111 | 0.1039 | 0.0606 | 0.0138 | 0.0046 | -0.0505 | 0.2436 | 0.2329 | 0.1689 |
| 2011 | -0.1266 | -0.1335 | -0.1745 | -0.0261 | -0.0304 | -0.0562 | -0.1057 | -0.1109 | -0.1417 | -0.0367 | -0.0410 | -0.0671 | -0.0389 | -0.0432 | -0.0688 | -0.0357 | -0.0396 | -0.0632 | -0.2842 | -0.2955 | -0.3633 | -0.2547 | -0.2621 | -0.3066 |
| 2012 | 0.4101 | 0.4008 | 0.3450 | 0.0971 | 0.0945 | 0.0790 | 0.2573 | 0.2535 | 0.2306 | 0.1171 | 0.1144 | 0.0986 | 0.1204 | 0.1178 | 0.1019 | 0.1384 | 0.1360 | 0.1211 | 0.3829 | 0.3718 | 0.3053 | 0.2911 | 0.2830 | 0.2346 |
| 2013 | 0.5331 | 0.5254 | 0.4794 | 0.1831 | 0.1796 | 0.1584 | 0.3197 | 0.3166 | 0.2983 | 0.2019 | 0.1984 | 0.1780 | 0.2047 | 0.2013 | 0.1811 | 0.2232 | 0.2197 | 0.1985 | 0.1053 | 0.0972 | 0.0482 | 0.4668 | 0.4594 | 0.4148 |
| 2014 | -0.0043 | -0.0075 | -0.0262 | 0.0051 | 0.0027 | -0.0111 | 0.0341 | 0.0316 | 0.0165 | 0.0097 | 0.0076 | -0.0052 | 0.0097 | 0.0077 | -0.0047 | 0.0188 | 0.0166 | 0.0032 | -0.0677 | -0.0716 | -0.0955 | 0.1198 | 0.1145 | 0.0827 |
| 2015 | 0.1021 | 0.0943 | 0.0473 | -0.0156 | -0.0198 | -0.0452 | 0.1082 | 0.1057 | 0.0908 | 0.0046 | 0.0008 | -0.0217 | 0.0073 | 0.0037 | -0.0180 | 0.0083 | 0.0047 | -0.0164 | -0.0970 | -0.1026 | -0.1357 | 0.1344 | 0.1292 | 0.0979 |
| 2002-2006 | 0.0670 | 0.0343 | -0.1620 | 0.0670 | 0.0627 | 0.0370 | 0.1610 | 0.1545 | 0.1156 | 0.0796 | 0.0752 | 0.0490 | 0.0804 | 0.0761 | 0.0498 | 0.0630 | 0.0587 | 0.0328 | 0.0672 | 0.0583 | 0.0051 | 0.1123 | 0.1011 | 0.0340 |
| 2003-2007 | 0.3089 | 0.2903 | 0.1782 | 0.1402 | 0.1379 | 0.1243 | 0.2260 | 0.2215 | 0.1941 | 0.1515 | 0.1492 | 0.1350 | 0.1516 | 0.1493 | 0.1351 | 0.1308 | 0.1285 | 0.1149 | 0.0758 | 0.0712 | 0.0439 | 0.2356 | 0.2285 | 0.1856 |
| 2004-2008 | 0.0669 | 0.0502 | -0.0500 | 0.0302 | 0.0262 | 0.0023 | 0.0390 | 0.0313 | -0.0153 | 0.0325 | 0.0283 | 0.0029 | 0.0305 | 0.0263 | 0.0006 | 0.0211 | 0.0172 | -0.0062 | -0.1217 | -0.1310 | -0.1864 | 0.0029 | -0.0082 | -0.0751 |
| 2005-2009 | 0.1492 | 0.1334 | 0.0383 | 0.0569 | 0.0512 | 0.0173 | 0.0802 | 0.0701 | 0.0096 | 0.0602 | 0.0543 | 0.0188 | 0.0587 | 0.0528 | 0.0169 | 0.0443 | 0.0386 | 0.0044 | -0.1099 | -0.1320 | -0.2642 | 0.0611 | 0.0474 | -0.0349 |
| 2006-2010 | 0.1393 | 0.1244 | 0.0353 | 0.0411 | 0.0344 | -0.0058 | 0.0748 | 0.0641 | -0.0001 | 0.0455 | 0.0386 | -0.0028 | 0.0443 | 0.0373 | -0.0043 | 0.0313 | 0.0246 | -0.0158 | -0.1276 | -0.1509 | -0.2901 | 0.0526 | 0.0383 | -0.0472 |
| 2007-2011 | 0.0578 | 0.0432 | -0.0440 | 0.0082 | 0.0010 | -0.0421 | -0.0030 | -0.0141 | -0.0807 | 0.0064 | -0.0010 | -0.0453 | 0.0046 | -0.0028 | -0.0474 | -0.0047 | -0.0118 | -0.0548 | -0.2072 | -0.2318 | -0.3794 | -0.0791 | -0.0936 | -0.1802 |
| 2008-2012 | 0.1116 | 0.0971 | 0.0100 | 0.0130 | 0.0057 | -0.0382 | 0.0502 | 0.0391 | -0.0274 | 0.0177 | 0.0102 | -0.0349 | 0.0176 | 0.0100 | -0.0352 | 0.0161 | 0.0088 | -0.0349 | -0.1193 | -0.1462 | -0.3078 | -0.0412 | -0.0565 | -0.1484 |
| 2009-2013 | 0.3436 | 0.3338 | 0.2751 | 0.1234 | 0.1182 | 0.0871 | 0.2288 | 0.2221 | 0.1820 | 0.1362 | 0.1310 | 0.0998 | 0.1379 | 0.1327 | 0.1016 | 0.1330 | 0.1278 | 0.0965 | 0.0600 | 0.0389 | -0.0879 | 0.2068 | 0.1958 | 0.1296 |
| 2010-2014 | 0.2163 | 0.2082 | 0.1601 | 0.0730 | 0.0691 | 0.0459 | 0.1419 | 0.1373 | 0.1094 | 0.0823 | 0.0784 | 0.0553 | 0.0832 | 0.0794 | 0.0566 | 0.0875 | 0.0837 | 0.0611 | 0.0066 | -0.0025 | -0.0572 | 0.1443 | 0.1359 | 0.0856 |
| 2011-2015 | 0.1562 | 0.1488 | 0.1040 | 0.0459 | 0.0426 | 0.0230 | 0.1119 | 0.1083 | 0.0869 | 0.0559 | 0.0527 | 0.0337 | 0.0571 | 0.0540 | 0.0353 | 0.0665 | 0.0634 | 0.0449 | -0.0166 | -0.0251 | -0.0760 | 0.1234 | 0.1161 | 0.0722 |
| full period | 0.1111 | 0.0923 | -0.0205 | 0.0450 | 0.0401 | 0.0105 | 0.1033 | 0.0962 | 0.0533 | 0.0532 | 0.0482 | 0.0182 | 0.0534 | 0.0484 | 0.0185 | 0.0469 | 0.0420 | 0.0127 | -0.0398 | -0.0540 | -0.1391 | 0.0742 | 0.0631 | -0.0036 |
| bull market | 0.3858 | 0.3740 | 0.3033 | 0.1936 | 0.1909 | 0.1743 | 0.2925 | 0.2882 | 0.2625 | 0.2071 | 0.2044 | 0.1879 | 0.2081 | 0.2054 | 0.1890 | 0.1981 | 0.1954 | 0.1795 | 0.1789 | 0.1697 | 0.1145 | 0.3255 | 0.3185 | 0.2765 |
| bear market | -0.4581 | -0.4886 | -0.6715 | -0.3160 | -0.3235 | -0.3684 | -0.3340 | -0.3441 | -0.4045 | -0.3183 | -0.3258 | -0.3711 | -0.3194 | -0.3270 | -0.3722 | -0.3191 | -0.3266 | -0.3717 | -0.5041 | -0.5247 | -0.6483 | -0.4505 | -0.4639 | -0.5443 |
| positive GDP growth | 0.1449 | 0.1266 | 0.0167 | 0.0731 | 0.0690 | 0.0442 | 0.1440 | 0.1386 | 0.1061 | 0.0830 | 0.0789 | 0.0541 | 0.0834 | 0.0793 | 0.0547 | 0.0726 | 0.0686 | 0.0442 | 0.0123 | 0.0033 | -0.0505 | 0.1235 | 0.1147 | 0.0614 |
| negative GDP growth | -0.1004 | -0.1227 | -0.2562 | -0.1328 | -0.1431 | -0.2049 | -0.1462 | -0.1653 | -0.2796 | -0.1349 | -0.1457 | -0.2106 | -0.1356 | -0.1466 | -0.2123 | -0.1179 | -0.1284 | -0.1917 | -0.3504 | -0.4016 | -0.7091 | -0.2201 | -0.2464 | -0.4039 |

Notes: 1) Certainty Equivalent (*CEQ*) returns are defined as: $\hat{\mu}_k - (\gamma/2)\hat{\sigma}_k^2$, where $\hat{\mu}_k$ and $\hat{\sigma}_k^2$ are the mean and variance of excess returns of a portfolio or an index $k$ and $\gamma$ is the risk aversion parameter. 2) This formulation of *CEQ* assumes a multi-period investor with quadratic utility. The 'normal' level of risk aversion is 1, while higher (lower) values indicate higher (lower) levels of risk aversion. 3) Bull and bear market periods have been identified using the idea of non-overlapping 'bull' and 'bear' phases based on major peaks and troughs found in the stock market indices, presented in Gooding and O'Malley (1977) and in Woodward and Anderson (2009), i.e. based on the variability of indices. In case of this study, FTSE 100 index and FTSE All-Share index are utilised to identify the bull/ bear periods, they both provided same variability with peaks and troughs falling at same time. A bull/bear market period is established if the returns of the market index is positive/negative for three months or more. 4) Bull market periods cover 128 months over 02.2003-10.2007, 03.2009-03.2010, 07.2010 - 04.2011, 10.2011-02.2012 and 06.2012-12.2015 and bear market periods cover 40 months during: 01.2002-01.2003, 11.2007-02.2009, 04.2010 - 06.2010, 05.2011-09.2011 and 03.2012-05.2012. 5) Economic growth and shrinkage periods have been identified based on economic growth data released by Office for National Statistics Online (ONS, 2022). Economic shrinkage recorded a 21-month period from 04.2008-06.09, 04.2012-06.2012, 10.2012-12.2012, remaining 147 months pertaining to growth period. 6) Single-year period covers 12 months between 1st January to 31st December 7) Multiple-year period covers five consecutive single-year period. 8) Duration for Bull, Bear, growth and shrinkage periods are different in length than full calendar year, so returns in those rows are presented as annualised returns based on monthly returns. These notes are same for Table 2b except that the returns do not include dividends for both the portfolio and the benchmark indices. 8) Cells highlighted in grey identify the portfolio or index with the highest CEQ value for that period for a given risk aversion level.