Saving with group or individual personal pension schemes:

How much difference does it make?

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Abstract

In a market with frictions, investors with different exit rights and financial understanding may receive more or less attractive investment opportunities because financial intermediaries may have different incentives to develop long-term relational contracts with them. We develop a simple, partial equilibrium model to show that there are sound theoretical grounds to expect that different groups of investors may be treated differently by pension providers. Then, using a sample of 14,429 individual personal pension (IPP) funds and 1,681 group personal pension (GPP) funds offered to UK investors over the 1986-2015, we show that pension providers provide less attractive investment opportunities to the atomless IPP investors than to the GPP investors protected by bargaining power of the management/companies where they are employed. We show that GPP funds outperform IPP funds, have tougher performance benchmarks, when there is a scope for it, and are better at tracking these benchmarks. These results have important implications for investors and policy makers.

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1. Introduction

Individuals are often blamed for being lethargic, myopic and lacking initiative when it comes to saving for old age (e.g., Rae, 1834; Pigou, 1920; Ramsey, 1928; Strotz, 1955; Phelps and Pollak, 1968). The lack of participation in financial markets is associated with lower IQ, and insufficient general and financial education (Bernheim 1995, 1998; Moore, 2003; Mandell, 2004; Guiso and Jappelli, 2005; Lusardi and Mitchell, 2006; Grinblatt et al., 2011; van Rooij et al., 2011; Cole et al., 2014). Moreover, it is argued that seeking the advice and services of financial professionals is financially more rewarding than when individuals invest by themselves (Beshears et al., 2009; van Rooij et al., 2011; Campbell, 2006; von Gaudecker, 2015; Gennaioli et al., 2015; Guiso and Viviano, 2015; Ahmed et al., 2016). In defence of these individuals, it may be said that their reservations towards trusting life-long savings to wealth managers may not be completely unfounded and, not necessarily, blamed on financial illiteracy. Even, if institutional investors are expected to possess better investment skills than individual investors (e.g., Lakonishok and Maberly, 1990; Dorn and Huberman 2005; Barber and Odean, 2008), they do not necessarily deliver good performance (e.g., Jensen, 1968; Gruber, 1996; French, 2008; Bergstresser et al., 2009, Fama and French, 2010; Del Guercio and Reuter, 2014). Moreover, numerous newspaper articles report examples where the industry has taken advantage of particular investors by providing misleading and incomplete information, imposing excessive charges, miss-selling products and miss-investing money.[2] While there are numerous papers documenting 'cherry-picking' and selective treatment of various groups of investors by banks (e.g., Cavalluzzo et al., 2002; Collin and Baker, 2005; Beck and Brown, 2015; Palia, 2016) and mutual funds (e.g., Christoffersen and Musto, 2002; Houge and Wellman, 2007; Gil-Bazo and Ruiz-Versy, 2009; Shirley and Stark, 2016), there is a dearth of academic evidence on how pension funds treat their customers. Indeed, while the academia and regulators around the world are concerned with protecting minority shareholders rights, how individuals are treated by pension funds is grossly overlooked. In this paper, using a sample of UK personal pension funds offered under group agreements (i.e., agreements negotiated and overseen by management/companies where they are employed), and personal pension funds offered directly to the public, we address the question of whether there is evidence that pension providers systematically treat individual and group investors differently by offering one less attractive investment opportunities than the other. We suggest that such 'discriminatory' behaviour echoes aspects of relational contracting theory (Allen and Gale, 1999; Baker et al., 2002; Gibbons and Henderson, 2012).

[2] E.g., "South Korea pension fund chief detained by special prosecutor", Reuters, 28 Dec 2016; "Ontario spent $70 million on its now-defunct pension plan, including $8M just on marketing", National Post, 28 July 2016; "Japan Government Pension Fund Sues Toshiba Over Accounting Scandal", Wall Street Journal, 23 June 2016; "Poor decisions cost UK local pensions £17bn", The Financial Times, 8 May 2014; "£30bn in 'dog' pension funds", The Telegraph, 20 October 2013; "Pension Fund Scandal Shows That Corruption Still Pays Well in New York", The Huffington Post, 23 August 2011; "Royal & SunAlliance was fined more than £1.35m for failing to identify and compensate 13,500 victims", The Guardian, "The six scandals from the darkest days of already murky industry", 21 June 2009 http://www.theguardian.com/money/2009/jun/21/financial-advisers-scandals

The UK personal pension industry provides a unique sample to extend our understanding of relational type contracts by studying whether investors who differ in their mobility, monitoring and bargaining abilities receive different quality services (i.e., investment opportunities). The UK personal pension industry is one of the oldest and biggest in Europe with about £3 trillion asset under management (OECD, 2015) and 11 million contributors in March 2014 (HMRC, 2016).[3] It provides a rich sample of nearly 1,700 group personal pension (GPP) schemes, i.e., schemes that are negotiated with a pension provider by an employer for her employees, and over 14,000 individual personal pension (IPP) schemes that are offered directly to the public by pension providers and, as such, do not have any formal bodies that monitor their performance. In contrast, the GPP schemes are negotiated by employers' legal and financial representatives, who will, on average, be more financially savvy, have a better understanding of the letter of law, and be more thorough performance monitors than the average IPP investor. Indeed, companies that offer GPP schemes often establish a management committee that is similar to a board of pension scheme trustees, which meets regularly and assesses the performance of the fund.[4] Moreover, when a company is dissatisfied with the level of services provided and decides to change the pension provider, this can carry considerable reputational and financial loss to the pension provider, which may put extra pressure on the pension providers to deliver good returns. Although such switches are kept away from the public eye, they do happen.[5] In contrast, IPP investors, like any other body of dispersed and atomless investors, have low bargaining and monitoring abilities and face high charges if they want to swap pension providers.[6]

The paper provides a simple, partial equilibrium model of the incentives for pension providers to choose different levels of effort when servicing different markets. A feature of the model is that the general probability that clients terminate an agreement is an important variable for providers to even consider providing differential levels of effort to clients and that differences in termination rates between clients determine where additional effort is applied. The clients whose probability of termination is most sensitive to performance receive higher quality services. Although differing in some regards, this approach echoes aspects of the large literature on relational contracts (e.g., Baker et al., 2002; Degryse and Ongena, 2005; Plambeck and Taylor, 2006; Taylor and Plambeck, 2007; Jiménez

[3] The Pension Act 2008 defined an automatic enrolment programme, NEST. It started to operate in October 2012 by imposing that employers with 250 and more staff had to set up pensions for employees. In April 2014, employers with 50-249 staff had to set up pensions for employees. In August 2015, the obligation to set up pensions started to apply to employers with 30-49 staff, and finally, in January 2016 employers with less than 30 staff were included in the NEST programme. The NEST had a big impact on the increase in the numbers of contributors which increased to 10.74 million by February 2016 (HMRC, 2016).

[4] http://www.thepensionsregulator.gov.uk/docs/employer-management-committees.pdf

[5] The Department for Work and Pension's survey (2014) documents that out of 717 companies with DC schemes they interviewed 79% reviewed whether the scheme in place remains suitable for their needs. Of these who reviewed their schemes 20% have switched providers as the result of the review (author's calculations based on the survey statistics).

[6] **"**Rip-off pension charges: how much am I paying?", The Telegraph, 18 July 2012; Blake (2003) estimates that if a personal scheme was terminated after only one year, a contributor might lose as much as 90% of his/her contributions.

et al., 2011; Belavina nd Girotra, 2012; Gibbons and Henderson, 2012; Vanneste and Frank, 2014; Höwer 2016). Gibbons and Henderson (2012) discuss how relational contracts can create an environment where some parties perform better consistently relative to others and show that exogenous termination rates and punishment strategies, which can be interpreted as penalties applied to the other side of the contract if that party defaults (to obtain a short term gain), on an implicit agreement, are central to the ability to sustain relational contracts. The sensitivity of termination to a provider's effort plays a somewhat similar role in our model.

In the empirical part of the paper, we test whether there is evidence that the GPP funds outperform the IPP funds, have tougher performance benchmarks where there is a scope for it, and whether there are differences in how successful the funds are in tracking these performance targets. We find strong statistical support that indeed, the GPPs are more attractive investment opportunities than IPPs.

As far as we are aware this is the first paper that documents differences in services provided by pension funds to individual investors and, in particular, the differences in the quality of financial products offered to investors protected by the power of their employers' group pension contracts and atomless individual investors. The pension literature focuses on the link between the level of financial education and understanding of basic financial concepts on financial decision making and financial returns (e.g., Stanton, 2000; Lusardi and Mitchell, 2006; 2014; Alessie et al., 2014; Massa et al., 2015) and the importance of support from financial intermediaries (e.g., Allen and Gale, 1999; Looney and Hardin, 2009; Sialm et al., 2015) In contrast, this paper shows that financial intermediaries systematically differentiate between investors with low and high mobility, negotiating and monitoring abilities in favour of the latter ones. The results are consistent with the theoretical predictions and the strand of the literature that documents the importance of relational contracts for the provision of banking services (Jiménez et al., 2011; Benczúr and Iluti, 2016). The paper also adds to the literature on fund performance by exposing wealth managers' weak performance when monitoring pressure is low (e.g., Almazan et al., 2004; James and Karceski, 2006; Adams et al., 2016). It also contributes to our understanding of the importance of proper benchmarking (e.g., Lakonishok et al., 1992; Blake et al., 1999; Dor et al., 2003; Chan et al., 2009; Petraki and Zalewska, 2016). Finally, it adds to the regulatory literature on the effectiveness of different saving schemes (e.g., Poterba et al., 1995; Lindbeck and Persson, 2003; Ahmed et al., 2016; Boes and Siegman, 2016).

Policy-wise, the paper has far reaching implications. Provision for old-age is a major headache for many governments in spite of a wide spread privatisation of the pension industry. It is now the norm that individuals are expected to save in some form of personal defined contribution (DC) schemes as state pensions are low and insufficient for living above the poverty level. The UK DC system is one of the oldest and biggest in the world and given that the UK (or more precisely the City of London) is one of the world's biggest financial centres, one would expect that the quality of services provided is high. The paper highlights weaknesses of the system in place and of the importance of setting appropriate

performance standards and monitoring mechanisms. Appropriate steps should be taken that minimise differences in the performance of personal individual and group pension schemes so that investors trust is rebuilt.[7]

2. Institutional background, theoretical model and hypothesis statement

The 1986 Social Security Act established personal pensions as the first organised form of non-occupational pension provision. Personal pensions available through individual or group agreements started to be provided by insurance companies, friendly societies, and banks. Under group personal pension (GPP) schemes employers enter into an agreement with a financial institution to provide personal pensions to their employees. As such, GPPs are organised by employers even though, the legal contract exists only between a financial institution that is to provide the pension and the individual employee who signed the contract. Due to the collective nature of the scheme, economies of scale can arise for the pension provider, resulting in lower costs and, consequently, lower charges than those associated with individual personal pensions (IPPs) which are offered directly to the public.[8] For instance, a study conducted by the Dutch Central Bank showed that, on average in The Netherlands, the costs of collective pensions, which are somewhat similar to the British GPPs, were 0.15% of total assets versus 1.27% for the schemes operating under individual contracts.[9]

Figure 1 documents the time-pattern of the development of the GPP (Panel A) and the IPP (Panel B) schemes. It shows the number of funds opened in each calendar year based on the information provided by Morningstar Direct.[10]

********** insert Figure 1 here **********

It is clear that the two types of funds had a different time pattern of development. First, many IPP funds operated before the 1986 Social Security Act was passed, but 1986 and 1987 are the years of a considerable increase in the number of new funds being created although, formally, the Social Security Act 1986 became operational in 1988. The next substantial increase in the numbers of new IPP funds was in 2000, and then in 2006 and 2011. In 2011 a record number of 1,417 IPP funds was created. By 2013-2014 the annual numbers of IPP funds' inceptions declined to the numbers observed in 2000-2006 period, i.e., to about 600 a year.

[7] The National Employment Savings Trust's report published in 2014 documents that UK investors associate the pension industry with corruption and incompetence (NEST, 2014).
[8] Complementary and Private Pensions throughout the World 2008 – ISSA/IOPS/OECD © 2008 - ISBN 9789264043473.
[9] Cited after D. Pitt-Watson and H. Mann (2012) "Collective pensions in the UK", RSA Projects, www.thersa.org.
[10] The detailed sample description is in Section 3.

A slightly different pattern is observed for the GPP funds. Here the numbers of new funds started to grow from 1993 onwards, with clear jumps in 1997, 2000, 2002, and 2006. The start of the financial crisis in 2007 coincided with a drop in the number of inceptions and the decline continued until the end of the sample. In 2013 and 2014, the annual numbers of inceptions were 14 and 10 respectively, which is comparable with the numbers of inceptions reported twenty years earlier, i.e., in the early 1990s.

In spite of the slowdown in the numbers of new openings, personal pensions are an important part of the social security system, of the financial system and of the financial markets. However, the issues of the pension industry have been grossly overshadowed by problems with the banking industry, its post-2007 rescuing packages and policies, and subsequent changes in regulatory structures and requirements. Nonetheless, as the underfunding of defined benefits (DB) schemes started to surface, and changes in investment strategies started to take their toll[11], there is a growing need to recognise and understand the pension industry's issues. In addition, as Bucher-Koenen and Ziegelmeyer (2014) argue, individuals, especially those with lower financial knowledge and experience, are more likely to withdraw from financial market participation if they experienced losses. Moreover, trust is one of the fundamental factors explaining financial market participation (Ballock et al., 2015). Therefore, to ensure that individuals save for old age rather than abstain from joining pension funds it is important to ensure the soundness of the industry. Before we specify hypotheses to be tested, we discuss a simple model that illustrates why there are sound theoretical grounds to expect that different groups of investors may be treated differently by pension providers.[12]

2.1. Theoretical model

Let us assume that the pension provider offers a pension fund for the annual fee f. The effort, $e > 0$ that she makes to run the pension fund costs her $c(e)$. This cost is an increasing function of her effort and $0 < c(e) < f$. Let us also assume that the fund's performance is positively correlated with the effort made by the provider. Each period, a pension contributor who invests with the fund observes the fund's performance and decides whether to stay with the provider or leave. If the provider makes effort level, e, the probability of staying with the provider is p, $0 \leq p < 1$. For simplicity of calculations, let us assume that the investor can save in perpetuity. Then, the provider's return from the investor is:

[11] Bank of England (2014) reports a massive trend towards 'de-risking' that has negative consequences for the investment returns as well as the development of the financial market. Changes in investment strategies are not UK specific, i.e., "A Dallas public pension fund suffers a run", The Economist, 8 December 2016;

[12] We discuss the issue from the pension provider – saver perspective, but the argument is general and can be adopted to any provider – customer situation in which customers are not homogeneous in their ability to terminate a contract with the provider. The related notion of relational contract was developed by (Gibbons and Henderson, 2012).

$$R = (f - c(e)) + p(f - c(e)) + p^2(f - c(e)) + ... = \frac{f - c(e)}{1 - p}. \quad (1)$$

Now, let us assume that the provider can lower the amount of effort she puts into running the fund. Denote this lower amount of effort by $e_L \geq 0$. Less effort means lower cost, i.e., $0 \leq c(e_L) < c(e)$. However, the lower effort means worse performance, and therefore, the probability of the investor to stay with the provider may decline. Let us assume that when the effort e_L is made, the probability of staying with the provider is equal to λp, where $0 \leq \lambda \leq 1$. In this case, the provider's return from the investor is

$$R_L = (f - c(e_L)) + \lambda p(f - c(e_L)) + (\lambda p)^2(f - c(e_L)) + ... = \frac{f - c(e_L)}{1 - \lambda p}. \quad (2)$$

Clearly, if the investor's decision to stay with or leave the provider is unaffected by the fund performance (which is the case of $\lambda = 1$), the provider does not benefit from working hard and delivering the good return on the investment. Hence, when $\lambda = 1$, the provider will prefer to deliver a lower level of effort as $R < R_L$. But if $\lambda < 1$, it is important to know whether, and if so – how, the choice of the effort made by the provider depends on λ.

To answer this question, using Equations (1) and (2) it is easy to calculate that $R \geq R_L$ when

$$\frac{f - c(e)}{f - c(e_L)} \geq \frac{1 - p}{1 - \lambda p}. \quad (3)$$

To focus our attention, let us assume that f, $c(e_L)$, $c(e)$ and p are exogenously fixed, so the decision of how much effort the provider makes is a function of λ only.

First, notice that for any given f, $c(e_L)$, and $c(e)$ there will always be a critical level p^*, such that for every $p < p^*$ it will never be optimal for the provider to make the effort to deliver good performance (i.e., Inequality (3) does not hold). This case is illustrated in Figure 2 in which the line L denotes the value of the left hand side of Inequality (3) for given f, $c(e)$ and $c(e_L)$, and R_1 denotes the values of the right hand side of Inequality (3) for some $p < p^*$ determined for this case. It is clear that the value of λ will not affect the provider's motivation to increase the effort. This case of low probability of staying, hence high probability of leaving, is of low interest to us.

However, when $p \geq p^*$, λ matters for the effort-making decision. That is, if $p \geq p^*$, there will always exist a critical level λ^*, such that if $0 \leq \lambda < \lambda^*$, it will be optimal for the provider to make the high level of effort, and if $\lambda^* \leq \lambda \leq 1$, it will be optimal to make the low level of effort. This case is illustrated by the position of curve R_2 in Figure 2.

********** insert Figure 2 here **********

In other words, for a given level of fees and costs, and sufficiently high level of the probability of keeping the investor, *p*, it is optimal for the provider to make an effort to deliver good performance if the investor's decision to leave/stay, λ, is sufficiently sensitive to the level of the performance delivered by the provider. In any other case, it is optimal for the provider to lower her effort.

Hence if we have two different types of consumers in the market place, one with high λ and one with low λ, although the provider of services could take short term advantage of both types of customers, she will only do so with those with the high λ. For those with the low λ the provider will offer high effort and avoid the customer adopting the punishment strategy. We thus have a more stable ongoing relationship between the provider and the low λ customers whereas those with higher λs will receive lower effort and poorer service. As noted in the introduction, this echoes aspects of the relational contract literature since the provider and customer are engaged in a longer term relationship with (in equilibrium) lower separation rates than other customers. The lower λ having served as a punishment strategy, if the provider opts for short term gain over longer term return.

2.2. Hypotheses

It can be expected that trustees of GPP schemes, on average, have a far better understanding and awareness of the performance than individual IPP investors and, hence, the GPP schemes have higher sensitivity to performance than IPP schemes. Therefore, following from the model presented in Section 2.1, pension providers should have a higher incentive to put more effort in running the GPP funds than the IPP funds. The difference in the effort provided is not directly observable but as greater effort should be positively correlated with higher average performance, the performance of the GPP funds should be better than the performance of the IPP funds.

Given that trustees of GPP funds are, on average, more financially savvy and have greater bargaining powers than individual IPP investors, they should be in a better position to negotiate higher performance benchmarks than those IPP investors are typically offered. However, differences in the performance targets might be asset class specific with those asset classes which have greater scope for arbitrarily set performance benchmarks to show greater differences in the choice of the performance benchmarks, and those asset classes that have limited flexibility in the choice of the performance benchmarks to manifest smaller, if any, differences in the choice of the performance benchmarks.

For instance, if a fund specialises in UK equity, then it may be hard to convince investors why one of the core FTSE indexes (All Shares, 100, 350, etc.) should not be the performance benchmark. However, if there is no obvious index associated with an investment style, then the story may be different. For example, allocation funds that only specify limits of the weights for equity and fixed income components may have greater flexibility in choosing 'tougher' or 'softer' performance benchmarks than funds based on 'strictly' defined asset classes. Indeed, in the sample we use for the

empirical analysis (described in detail in Section 3) while as many as 78 allocation IPP funds are benchmarked to the Consumer Price Index (CPI), no allocation GPP has a CPI benchmark. The only GPP allocation fund using the CPI as the base for its benchmark definition, defines the PPB as CPI + 4%.

In other words, where there is a discretion in the choice of benchmarks (like in the case of the allocation funds), IPPs may have less challenging benchmarks than GPP schemes. If so, we should observe that GPP's PPBs outperform IPP's PPBs where there is a discretion in the choice of benchmarks.

Regardless of what the performance benchmarks are, if similar effort is put towards achieving good results in both the GPP and the IPP schemes, then their record of benchmark tracking should be comparable. However, if their success in tracking/achieving the performance targets is different, it indicates that the wealth managers of the better performing scheme work harder and/or are more skilled than their colleagues working for the other scheme. In particular, if we find that it is the GPP schemes that perform better than the IPP schemes in comparison to their performance targets, we get yet another confirmation of the conjecture that the GPP investors get better quality investment products than the IPP investors. This difference in treatment cannot, however, be attributed to the providers offering different funds due to differences in investors' preferences. This is a sign of GPP investors receiving better treatment than the IPP investors, which is consistent with the argument that the pension providers take advantage of asymmetry between the two groups of investors.

3. Data

Morningstar Direct lists 1,843 GPP funds that opened between January 1968 and December 2014, and 15,165 IPP funds that opened between January 1963 and December 2014. For each if these funds information about the funds' monthly returns (gross of costs and fees), the date of inception, the name of insurance company providing the fund, investment style as specified by the Global Broad Category Group (GBCG), ABI Pension Classification (ABI PC), the Primary Prospectus Benchmark (PPB) and a short description of the investment strategy were collected. The GBCG and the ABI PC classifications group funds into ten and 34 investment asset classes, respectively.[13] Morningstar also

[13] The GBCG investment asset classes are: allocation, alternative, commodities, convertibles, equity, fixed income, miscellaneous, money market, specialist, and property. The ABI PC investment asset classes are: Asia Pacific excl. Japan Equities, Asia Pacific incl. Japan Equities, Commodity/Energy, Deposit & Treasury, Europe excl. UK Equities, Europe incl. UK Equities, Flexible Investment, Global Emerging Markets Equities, Global Equities, Global Fixed Interest, Global High Yield, Global Property, Japan Equities, Mixed Investment 0%-35% Shares, Mixed Investment 20%-60% Shares, Mixed Investment 40%-85% Shares, Money Market, North American Equity, Protected/Guaranteed Funds, Specialist, Sterling Corporate Bond, Sterling Fixed Interest, Sterling High Yield, Sterling Long Bond, Sterling Strategic Bond, UK All Companies, UK Direct Property, UK Equity Income UK Gilt, UK Index-Linked Gilts, UK Property Securities, UK Smaller Companies and Unclassified.

provides some information about asset class allocation and the value of assets under management but these statistics are available from 2006 only and have many missing observations.

For the purpose of this research funds' monthly returns were collected from January 1986 till December 2015. This means that funds included in the sample have at least one full year of the performance data. The quality of data improves with time, i.e., there are considerably more missing observations in the 1980s and in the 1990s, than in the 2000s. Given that the 1986 Social Security Act was a milestone in creating personal pensions and the quality of the data is particularly poor before 1986, January 1986 is chosen as the starting point for the fund performance evaluation. However, as there were a few other regulatory and market events that can be expected to impact on the development of personal pensions, two sub-periods are also considered. These are (i) January 1996 – December 2015, and (ii) August 2007 – December 2015. The first sub-period marks the creation of the Occupational Pension Regulatory Authority (OPRA) and gives up to 20 years of data that cover the dotcom rise and decline of the stock markets and of the financial crisis. August 2007 – December 2015 is chosen to cover the period of market turbulences following the 2007 credit crunch. August 2007 is chosen as the starting point of the sub-period because, on 9 August 2007, BNP Paribas announced that it was ceasing activities in three large hedge funds specialising in the US mortgage market. This was probably the first point in time that it was stated openly that many trillions of dollars of derivatives were likely to be worth far less than was assumed at the time. The decline of many markets in the following years resulted in substantial losses in pension funds' holdings.

The 17,008 funds listed by Morningstar include funds that stopped operating. For these funds no information about the before-the-closure performance is available. This applies to 70 IPP funds and eight GPP funds opened in the 1980s. Among the funds incepted in the 1990s, 30 IPPs and 12 GPPs closed down. For the 2000s, these statistics increase to 155 for IPPs and 42 GPPs, and among those created since 2010, 171 IPPs and 44 GPPs have ceased. Given that these funds are excluded from the calculations, the sample is subject to a potential survivorship bias. However, as the dead funds account for a small fraction of the sample and are similar proportions for the two groups of funds (about 3% of the IPP sample and about 5% of the GPP samples), the effect of the bias should not be detrimental to our findings, especially that we are interested in the relative performance of the GPP and the IPP schemes. In total, the sample has 16,456 funds that opened before 1 January 2015 and were still in operation on 31 December 2015.

Table 1 shows that for 74.2% of the sample of operating funds, i.e., 12,214 funds out of 16,456 complete return time series are available in the 1986-2015 period. The number of funds with the complete return data increases to 14,429, i.e., 87.7% of the population, when the period of the investigation is shortened to 2007-2015. This increase in the number of funds with the complete return data is driven by older funds, many of which do not have complete return statistics in the 1980s and 1990s. Therefore, using different sub-periods allows to test for robustness of our findings over different

time periods and for different sample compositions (with shorter samples having more older funds included).

********** insert Table 1 here **********

Table 1 shows that the investment style could not be determined for 162 funds. In fact, based on the Morningstar information only 11,054 funds were GBCG classified. To complete the investment style classification ABI classification and 'soft' information about 'Investment Strategy – English' provided by Morningstar were used and cross-checked with information about regional asset allocation, where available.

In this way a further 3,375 funds were classified into one of the following investment styles: equity, fixed income, money market, allocation, alternative, specialist, miscellaneous, convertibles, commodities and property to follow the GBCG classification. Table 2 shows the numbers of funds of each of the ten investment styles for each of the three sub-periods for the IPPs and GPPs (the top numbers in each asset class row). It shows that funds specialising in equity investments are most numerous. Allocation is the second most numerous investment style among the IPP funds. In contrast, fixed income funds are most numerous among the GPPs. There is only a handful of IPPs specialising in convertibles and commodities. No GPP specialises in these two categories.

********** insert Table 2 here **********

The next challenge was to identify PPBs and obtain their performance statistics. Morningstar provides several performance statistics in relation to the PPBs, but these are available for about 40% of the sample only. Therefore, to utilise the size of the sample, further effort had to be made to identify individual PPBs and obtain their performance statistics (numerous data sources were used to achieve this).[14]

As Table 1 specifies, 591 IPPs and 21 GPPs declare not to have any PPB. Moreover, 2,511 IPPs and 158 GPPs do not provide any information about their potential PPB. Out of the remaining 11,768 IPPs and 1,511 GPPs we succeeded in finding and calculating monthly returns of the corresponding PPBs for 8,988 (76%) IPPs and 1,120 (74%) GPPs, respectively. These were used to calculate various performance statistics as described in the next section. In total 863 PPBs were named, of which 114 were with incomplete specification. Out of the remaining 749 PPBs with full names

[14] Return statistics of the PPBs were downloaded from Morningstar, Datastream, Bank of England official statistics, and other web resources.

returns for 472 were calculated (these correspond to 10,108 funds). The remaining 267 PPBs remained unidentified.[15]

Table 2 shows that the success rate in obtaining the PPB returns varies considerably across the investment styles. The numbers in round brackets show the numbers of funds for which their corresponding PPB returns were calculated and the numbers in square brackets show the percentage of the funds with the PPB returns have in their corresponding samples.

The highest rates of the PPB returns calculations are for the equity, fixed income, money market and alternative funds. Also GPPs' miscellaneous funds have a rate of 63%. Consequently, to have considerably representative samples for both the IPP and the GPP funds, when individual investment styles are analysed, the focus is on seven styles: equity, fixed income, money market, allocation, miscellaneous, alternative and property.

Three months' T-bills are used as a proxy for the risk-free rate of return.

4. Variables and methodology

4.1. Performance measures

All the monthly returns of the pension funds are denominated in pound sterling. However, the PPBs are denominated in a wide range of currencies given that they often are international indexes. To make the comparison of returns possible, the returns on the PPBs were converted into pound sterling using the Bank of England's end of month exchange rate of pound sterling to the foreign currency the PPB was originally denominated in.

For each fund and for each of the periods (i.e., 1986-2015, 1996-2015, and 2007-2015), the annualised average compounded returns were calculated. This means that if a fund opened before the start of a given period, then only those observations that were within that period were taken into account. If a fund started to operate after the starting date of the period, then all its observations were included into the calculations. Using these annualised returns the excess returns for the funds against annualised average returns on T-bills were calculated, and denoted as $R\text{-}R_{TB}$. The calculations were repeated for each funds' PPB resulting in the annualised average compounded returns for the same time period as the fund's calculations were performed. The annualised excess returns against the PPBs are denoted $R\text{-}R_{PPB}$ and annualised excess PPB returns against T-bills are denoted as $R_{PPB}\text{-}R_{TB}$.

[15] The difficulties with identification of the PPBs were typically related to an incomplete specification of the benchmark. For instance, it was stated that a fund was benchmarked to a composite or bespoke index without any details how individual components were weighted.

To adjust for risk, both R-R_{TB} and R_{PPB}-R_{TB} are divided by annualised standard deviations of the corresponding pension funds' and of the PPBs' returns respectively. These ratios are denoted as Sharpe and $Sharpe_{PPB}$, respectively.[16] To adjust R-R_{PPB} for risk, the Modigliani-Modigliani measure, M^2 (Modigliani and Modigliani, 1997), is adopted. For each fund, it is calculated as $M^2 = Sharpe \times \sigma_{PPB} + R_{TB} - R_{PPB}$, where σ_{PPB} denotes the annualised standard deviation of the PPB monthly returns, and Sharpe, R_{TB}, and R_{PPB} are, as defined above, the risk adjusted annualised excess returns, annualised average return on T-bills and annualised average return on the PPB, respectively.

In addition, the tracking error, TE, and the annualised downside risk, DR, are calculated. TE is defined as the annualised standard deviation of differences between monthly fund returns and its PPB's monthly returns. DR is defined as the annualised semi-standard deviation of fund's monthly returns. The Sharpe and the M^2 statistics are winsorized at 0.01% to reduce the impact of outliers. The summary statistics of these measures are shown in Table 3.

********** insert Table 3 here **********

A quick look at the excess returns shows that regardless of the period of calculations, on average, the GPPs perform better than the IPPs when compared against T-bills and their PPBs. Over the 30 years, the average excess return of the GPP funds was 4.481%, while the corresponding average for the IPPs was 4.273%. The difference between the GPPs and the IPPs is higher the shorter periods of assessment were used. In particular, the differences in the performance since the financial crisis (the 2007-2015 period) are clearly pronounced. The GPPs outperform the IPPs by 0.84% on an annual basis. To check whether this increase in the difference is driven by older funds that are included in the 2007-2015 calculations, the averaging over the 2007-2015 period was repeated for the same set of funds as it was used in the 1986-2015 and the 1996-2015 calculations. The mean returns for the reduced GPP sample were 4.998% and 5.001%, respectively. The analogous figures for the IPPs changed to 4.406% and 4.390%. This means that the addition of the older funds does not drive the results. Quite the opposite, the exclusion of the older funds increases the means for both the IPPs and the GPPs and the differences between them.

The difference between the GPPs and the IPPs is also strongly pronounced when the fund returns are compared against the returns on their PPBs (i.e., R-R_{PPB}). All the averages reported for the GPPs are positive. In contrast, all the averages reported for the IPPs are negative. Again, the shorter the period of the analysis is, the bigger is the difference between the GPP and the IPP funds. In particular, in 2007-2015 the GPP funds outperformed their PPBs by 0.304%, while the corresponding statistic for the IPP funds was -0.374%.

[16] Sharpe ratios are commonly used to assess the quality of portfolios, see e.g., Goldreich and Hałaburda (2017).

The comparison of the average risk adjusted returns suggests that although the GPPs may be earning higher returns than the IPPs, they may also be subject to higher risk. The higher excess returns of the GPPs are associated with higher Sharpe ratios only for the 2007-2015 sample. However, the underperformance of the PPBs by the IPPs translates into the negative M^2s. All these statistics, although rough, as taken across all the possible funds and without controlling for any fund characteristics, seem consistent with our hypothesis that the IPPs underperform the GPPs.

The tracking errors, TEs, calculated for all the three sub-periods are higher for the IPP funds than for the GPP funds, what in combination with the R-R_{PPB} and M^2 statistics may mean that the GPP funds are more active than the IPP ones. That is, it may be that the GPPs make an effort to follow the PPBs' movement, while the IPPs stay passive which results in comparatively weaker performance and higher tracking errors volatility. Differences between the two groups of funds are also observed for the downside risk (DR). On average, the risk of earning negative returns is lower for the GPP funds than for the IPP funds.

All these statistics suggest that there are considerable differences in the performance of the IPPs and the GPPs but given that the IPP sample is considerably more numerous than the sample of the GPP funds with many funds being created after 2006 (see Figure2), a higher weight on the financial crisis years is placed in the IPP sample, and potentially biases the assessment. Moreover, as Table 2 documents, there are considerable differences in the structure of the samples, which affect weights with which the individual investment styles contribute to the averages presented in Table 3. For instance, the allocation funds constitute over 20% of the IPP sample, while they account for just 3% of the GPP one. Therefore, to understand the differences in the performance of the two groups a more careful analysis is required.

4.2. Fund characteristics

In the regression analysis several variables will be used to control for fund characteristics. The dummy D_{GPP} separates GPPs from IPPs and is defined as one for funds offered under GPP agreements and zero otherwise (i.e., for IPPs). Tables 1 - 3 show that the IPPs account for about 89% of the sample. The dummy $D_{external}$ separates internally from externally managed funds and is equal to one if a fund is externally managed and zero otherwise. Table 4 shows that outsourcing is a recent phenomenon. The inclusion of older funds causes the IPPs' mean of the $D_{external}$ to drop from 74.8% for 1986-2015 to 67.8% for 2007-2015. The corresponding figures for the GPPs are 31.8% and 29.2%.

********** insert Table 4 here**********

The variable Size shows that on average funds' assets under management as of December 2015. On average, as intuition would suggest, the GPPs are bigger than the IPPs. The size differences within

both groups are considerable. This is the consequence of the fact that some very young funds are part of the sample and these are more numerous in the IPP sample as Figure 2 shows. To account for potential size effects the variable LnSize, the natural logarithm of Size, is used in the regression analysis. Fund age (Age) is measured in years from the month of its inception till 31 December 2016. The average age of the GPP funds is about 11 years regardless of the period of the performance calculations. In contrast, the average age of the IPP funds changes between 8.9 years for the 1986-2015 period and 10.8 years for the 2007-2015 period as the shorter the sample is, the more older funds are included in it.

We also control for whether a fund is offered by a provider who offers both individual and group agreement contracts or only one contract type (i.e., individual or group). For this purpose, a dummy $D_{individual}$ is created and equal to one when the fund's provider does not offer both types of contracts and zero when she does. About 21% and 24% of funds are offered by one-type contract providers among the IPP and the GPP funds, respectively.

Controlling for funds' investment style creates certain challenges. For the purpose of this research classifications based on the GBCG and the ABI PC classifications were adopted. We use the ABI classification for clustering. The GBCG classification is used to define ten broad style dummies used in the regression specifications and when the individual investment styles are analysed.[17] Given that the GBCG classification does not control for the region of investment, a dummy D_{UK} equal to one when a fund specialises in UK assets and zero otherwise, and a dummy D_{nonUK} equal to one when a fund specialises in overseas assets were introduced.

Table 4 shows that the proportions of funds specialising in domestic assets are similar across the three periods, and are about 21% for the IPPs and 24% for the GPPs. The proportion of funds specialising in the overseas investments also does not change much with the length of the period, and that the IPPs are slightly more overseas focused (18%) than the GPPs (15%).

To account for potential time effects, especially given that these can be expected to be non-linear, time dummies associated with three potentially important regulatory events were created. Dummy D_{1995} is equal one for all the funds incepted from January 1995 onwards, and zero otherwise. The dummy is associated with the creation of the OPRA. D_{2004} is equal to one for funds created from December 2004 onwards and zero otherwise. The dummy is associated with the 2004 Pension Act establishing the Fraud Compensation Fund. Finally, the D_{2008} dummy is equal to one for funds created from November 2008 onwards. It is associated with the creation of the NEST. Even though the timing of the dummies is determined by the major regulatory events in the pension industry, they can be perceived as dummies mimicking major stock market events. In 1995 the London Stock Exchange, like several other developed stock markets, started to grow rapidly driven by the dotcom bubble. Hence, the D_{1995} dummy can also be perceived as the dummy of increased market instability. The D_{2004} dummy,

[17] We also run regressions with 34 ABI PC dummies (and ABI PC clustering). The results were very similar to those obtained for the regressions with the GBCG dummies and ABI PC clustering. We do not present them to save space but they can be obtained from the authors on request.

on the other hand, marks the post dotcom period with the D_{2008} dummy being close to the time when the stock markets hit the bottom during the financial crisis (which happened in March 2009). In some sub-samples some of these time dummies caused multicollinearity, hence occasionally some of them were dropped from regressions.

5. Hypotheses testing

To test the hypotheses we employ a set of regressions in the form

$$\text{Performance measure} = \alpha_0 + \alpha_1 D_{GPP} + \alpha_2 D_{external} + \alpha_3 \text{LnSize} + \alpha_4 D_{UK} + \alpha_5 D_{nonUK} + \\ + \alpha_6 D_{1995} + \alpha_7 D_{2004} + \alpha_8 D_{2008} + \sum_i \alpha_i D_{style,i} + \varepsilon, \quad (4)$$

where performance measure is one of the performance measures defined in Section 4.1, and the regressants are as specified in Section 4.2. $D_{style,i}$ refers to one of the ten GBCG investment style dummies. The standard errors, ε, are clustered by ABI PC investment style. When the performance of the individual styles is analysed, the $D_{style,i}$ dummies are dropped from the regression specifications.[18] To save space for the vast majority of the regressions, we only report the coefficient of D_{GPP} as the coefficient of the main interest. Only the first set of regressions (Table 5) reports the estimates of the remaining coefficients (i.e., α_0, α_2-α_8) to show the magnitude and significance. The coefficients estimated for the $D_{style,i}$ dummies are also dropped to save space. The complete estimates of the regression specifications can be found in the Appendix.

In regressions that address the issue of potential differences within the IPP (GPP) funds, the regression specification changes to:

$$\text{Performance measure} = \alpha_0 + \alpha_1 D_{individual} + \alpha_2 D_{external} + \alpha_3 \text{LnSize} + \alpha_4 D_{UK} + \alpha_5 D_{nonUK} + \\ + \alpha_6 D_{1995} + \alpha_7 D_{2004} + \alpha_8 D_{2008} + \sum_i \alpha_i D_{style,i} + \varepsilon, \quad (5)$$

where all the regressants are defined as in specification (4) except for $D_{individual}$ which denotes funds that are provided by pension providers who offer one type of contract only (i.e., IPP funds only in the IPP regressions and GPP funds only in the GPP regressions, Table 6).

The differences in the performance of the GPP and of the IPP funds are also assessed through the Jensen's alpha. The simple CAPM specification is used given that it is impossible to construct additional factors commonly used in the literature (i.e., Fama-French factors, momentum, etc.) for the

[18] We do not use funds' age, size and the time dummies in a single regression specification because of multicollinearity. Given that the regressions controlling for the funds' size and the time dummies have considerably higher R^2-adjusted than the regressions controlling for Age, and the statistical significance of the variables of interest is similar across the specifications, Lnsize is used in the analysis. Age will be used in propensity score matching (Section 5.4).

funds in the sample given their multi-asset and multi-market nature. The PPBs are assumed to proxy for the market portfolios. This seems a rough assumption, if wealth managers are allowed to invest in asset classes not included in their PPBs, or the PPBs are inefficient in relation to asset classes they are made of.[19] Therefore, it may not be accurate to interpret the size and significance of the alphas themselves. However, it still makes sense to look at the sign and significance of the coefficient of the D_{GPP} dummy (which formally is the interactive term of the alpha and of D_{GPP}), if one assumes that if PPBs are inefficient, they are inefficient for both the GPP and the IPP funds. Indeed, one could speculate that the bias might be in favour of the IPP funds if, indeed, they have easier to beat benchmarks.

5.1 Do GPP funds outperform IPP funds?

Table 5 shows the coefficients estimated for the regressions as specified by Equation (4) for the whole sample (Panel A) and for the PPB-restricted sample, i.e., the sample of funds with PPB returns (Panel B). The results show that the GPP funds statistically significantly outperform the IPP funds regardless of the performance measures used, and the sample specification. This outperformance is also economically significant. For instance, in the 2007-2015 period the GPPs outperformed the IPPs by over 1% per annum whether the full or the PPB-restricted samples are used.

********** insert Table 5 here **********

The coefficients estimated for the other variables are similar in size and statistical significance across the specifications. That is, the regressions show that the size of funds and the external management, specialisation in UK assets and, to a lower degree, specialisation in overseas assets are positively related to the performance. The coefficients estimated for the regulatory time dummies confirm that explanatory power of time is non-(log)linear. While all the estimates of the D_{1995} are positive and statistically significant, many of the estimates of the D_{2004} coefficients are not statistically significant, and none is statistically significant for D_{2008}.

One could argue that the differences in the performance between the GPP and the IPP funds may result from these two groups being run by different types of providers. Indeed, in total, there are 75 different providers of pension funds of which only 22 service both group and individual agreement schemes. The remaining 46 provides offer only IPP funds and seven providers offer only GPP funds. Therefore, it is possible that the differences in the performance could be the result of differences in unobserved provider specific factors which happen to be correlated with the services they offer. That

[19] For instance, many equity PPBs are constructed as a combination of well-known international markets stock market indexes. If the weights of these 'compound' PPBs are not the weights that would be assigned through the theory of the CAPM, then these PPBs automatically violate the theoretical predictions of the Jensen's alpha.

is, the differences between GPPs' and IPPs' performances result from a sample selection. If this was the case, then the differences in the performance between the GPP and the IPP funds should not be observable once the sample is restricted to those funds whose providers offer both types of contracts. This is because, the provider specific factors would be common for the providers' services whether they be GPP or IPP funds. However, if the differences in the performance of the GPP and the IPP funds persist in the sample of the providers offering both types of contracts, then we can say that these differences are not the result of the sample selection arising from the unobserved provider specific factors.

To test whether the results are driven by the differences in the types of providers, Table 6 provides regression results for several sample specifications. First, the sample is restricted only to the funds that are provided by those 22 providers who offer both the GPP and the IPP funds (Table 6 Panel A). The restriction removes 3,717 observations from the IPP sample and 223 observations from the GPP sample. All the estimates of the D_{GPP} coefficients remain positive and highly statistically significant showing that the GPP funds outperform the IPP funds in the sample of the providers who offer both types of contracts. Hence, the poorer performance of the funds offered through the individual contracts is not a sample selection phenomenon.

********** insert Table 6 here **********

To go one step further, we test whether there are differences in the performance between the IPP funds offered by those providers who offer both types of agreements and those who offer just individual agreements. Similarly, are there any statistically significant differences between the GPP funds offered by the providers who offer both types of agreements and those who offer just group agreements?

Table 6 Panels B shows that whether an IPP fund is offered by a provider who offers IPP contracts only or by a provider who offers both IPP and GPP schemes does not impact on the performance as all the coefficients estimated for $D_{individual}$ are statistically insignificant. An analogous conclusion can be drawn for GPP funds, although, there is some evidence that the GPP providers who offer group contracts only perform better than providers of both types of contracts as one of the coefficient estimated for the Sharpe ratio is statistically positive and significant at 5% (Table 6 Panel C).

Finally, Table 6 Panel D shows the D_{GPP} coefficient estimates when the sample is restricted to funds that have the same PPBs, i.e., an IPP fund is included in the sample only if there is a GPP fund, in the same GBCG category, with the same benchmark, and vice versa. Table 6 Panel E further restricts the sample used in the regressions presented in Table 6 Panel D to the providers who provide both types of contracts. This is a tough test and reduces the sample substantially but provides a valuable robustness

test for our findings. Most importantly, it confirms our previous findings that GPP funds outperform the IPP ones and that this result is not driven by the type-of-provider selection bias.

To shed light on the performance of individual investment styles Tables 7 and 8 provide the estimates of the D_{GPP} coefficients for each of the seven most numerous investment styles for the PPB-restricted sample and for the PPB-restricted sample of providers who offer both GPP and IPP schemes, respectively.

********** insert Table 7 here **********

********** insert Table 8 here **********

Both tables show that the GPP funds' outperformance of the IPPs is, more or less, universal across all the investment styles. The GPP equity, money market, allocation alternative and property funds deliver statistically higher excess returns and/or Sharpe ratios. The economic significance of the coefficients is also high. Practically, no statistical difference is observed for the fixed income and the miscellaneous funds for which none but one coefficient is statistically significant, and this significance is at 10% only.

The general expectation is that investors holding portfolios with higher downside risk require premium for doing so (e.g., Ang, Chen and Xing 2006). Therefore, the higher returns of the GPP funds might be nothing more but a compensation for their higher downside risk. Table 9 shows that only the fixed income funds show some weak evidence of the GPP funds have higher downside risk than the IPP funds (two out of three coefficients are positive and statistically significant at 10%). All the other coefficients are statistically insignificantly different from zero (the whole sample, equity, allocation and miscellaneous funds) or highly statistically negative (money market, alternative and property funds). Therefore, it is impossible to conclude that the higher returns earned by the GPP funds are the compensation for their higher probability of losing money.

********** insert Table 9 here **********

5.2 Do GPP funds have tougher benchmarks than IPP funds?

We hypothesised that the GPP funds may have 'tougher' PPBs than the IPP funds and that differences in the performance of the PPBs might be more pronounced for investment styles that are associated with a greater level of discretion in choosing a benchmark. To test whether this is the case we assessed the performance of the PPBs using the regression specification (4) with R_{PPB}-R_{TB} and $Sharpe_{PPB}$ as the dependent variables. Table 10 shows that the GPP PPBs earn statistically significantly higher excess returns than the IPP PPBs. Moreover, as conjectured, there are considerable differences

across the investment styles. The largest difference, in the size and statistical significance, is obtained for the allocation funds which, regardless of the period of the performance calculations, have GPP PPBs earning over 3.6% per annum more than PPBs of the IPP funds. The property funds also show statistically significantly 'tougher' PPBs for the GPP schemes in two out of the three periods (both in nominal and risk adjusted terms), and the estimates obtained for the equity funds show that GPP PPBs have statistically significantly larger Sharpe ratios than the IPP PPBs. In contrast, the money market funds' Sharpe ratios of the GPP PPBs are statistically lower than the Sharpe ratios of the IPP PPBs in 1996-2015 (1% significance) and in 1985-2015 (10% significance).

********** insert Table 10 here **********

The results obtained for the allocation funds are consistent with our hypothesis as it can be argued that the allocation funds may have the greatest discretion in choosing benchmarks among the considered investment styles. A closer look at the range of benchmarks chosen by the property funds reveals that the vast majority of the GPP PPBs are closely related to the property market, while the IPP PPBs have a much wider range with LIBOR and MSCI equity indexes being used as performance targets. Moreover, although not included in the comparison of the PPBs as many as 44 IPP funds declare not to have a benchmark at all. No such case is reported for the GPP funds.

The negative sign of the D_{GPP} in the money market Sharpe regressions may result from the fact that the vast majority of GPP funds is benchmarked to 1 week LIBID, while the IPP in the vast majority are benchmarked to the 3 month LIBOR.

5.3 Who is better at tracking benchmarks?

To answer the question the differences in the performance of the GPP and the IPP funds in relation to their benchmarks is analysed. To do so we study tracking errors, the differences in the returns earned by funds and their PPBs, the M^2 statistics and, finally, we estimate CAPM implied differences in alphas.

Table 11 presents the coefficients estimated for the D_{GPP} dummy in the regressions with the tracking errors (TEs) as the dependent variable. It shows that, on average, the GPP funds have a lower tracking error than the IPP funds. In particular, the statistically significantly lower tracking errors are obtained for the equity and property funds and, to some degree, for the money market funds (the 2007-2015 coefficient is statistically significantly negative). In contrast, the GPP allocation funds have highly statistically significantly higher tracking errors than the IPP allocation funds.

********** insert Table 11 here **********

To shed more light on the funds' ability to meet their performance targets Table 12 shows the results for the regressions that assess the performance of the funds against their PPBs. It is clear that the GPP funds, on average, perform better than the IPP funds in relation to their PPBs in nominal and risk adjusted terms. This difference is also economically significant and varies between 0.540% (significant at 5%) and 0.798% (significant at 1%) per annum depending on the period of calculations. The superior performance of the GPP funds is also strong after risk adjustment. The estimates of the D_{GPP} coefficients with M^2 as the dependent variable vary between 0.475% (significant at 1%) and 0.730% (significant at 1%).

********** insert Table 12 here **********

The individual investment style regressions show that the GPP equity and property funds are most consistent in outperforming their IPP counterparts as all the estimated coefficients are statistically significant at 1%. The difference between the GPP and IPP alternative funds is statistically significant for excess returns of funds against their PPBs, but there is no difference between the two groups of funds after the risk of the portfolios is accounted for. There is also some evidence that the GPP money market funds perform better against their PPBs than the IPP money market funds perform against their PPBs. The D_{GPP} coefficient estimated for $R\text{-}R_{PPB}$ for the 2007-2015 period is positively statistically significant at 5% while two of the three M^2 coefficients are statistically significant at 10%. However, the GPP allocation funds perform worse against their PPBs than the IPP allocation funds do against their benchmarks. This relative underperformance is strongly pronounced in all $R\text{-}R_{PPB}$ and M^2 regressions.

Finally, to complete the analysis Table 13 shows the results of the CAPM regressions with interactive terms for the intercept (D_{GPP}) and the slope (beta x D_{GPP}). The regressions are obtained for the whole sample and for the individual investment styles. Table 13 shows that there is some statistical evidence that GPP fund managers are more successful than the IPP funds in 'beating their PPBs'. Strong 'stock picking skills' of the GPP managers are depicted for the money market, alternative and miscellaneous funds. Some evidence is also found for the equity and the fixed income funds. There are no statistically significant differences for the allocation funds. In contrast, the GPP money market funds have statistically significantly lower alphas than the IPP property funds in two out of the three periods.

********** insert Table 13 here **********

5.4. Propensity score matching

Finally, to complete the analysis we adopted propensity score matching regressions with the GPPs being the treated population and the IPPs being the control. A logit model was used for probability

treatment in finding propensity scores in nearest-neighbour matching that allows for ties. GPP and IPP funds are matched by the ABI PC investment style (as it is more detailed than GBCG)[20], management type (i.e., whether the fund was internally or externally managed, as $D_{external}$ was often statistically significant), and by their size and age to utilise a wide range of funds' characteristics. Inclusion of funds' age is particularly interesting given that we had to drop age from the regression specifications. To further illustrate the robustness of the matching, in some specifications we drop size and match funds by ABI PC investment style, management type and age only.

Table 14 shows the estimates of the average treatment effects on treated (ATT) for the sample of all the funds that have PPB returns for the three periods. Table 14 shows the ATTs for the $R\text{-}R_{TB}$ and the Sharpe ratios (Panel A), $R_{PPB}\text{-}R_{TB}$ and $Sharpe_{PPB}$ (Panel B), and $R\text{-}R_{PPB}$ and M^2 (Panel C). These results are equivalent to those presented in Table 5 Panel B, Table 10 (All funds) and Table 12 (All funds), and confirm the better performance of GPPs than that of the IPPs. In other words, if we assume that, after matching by the investment style, management type, and age (and also by size) any other differences between the treatment (GPPs) and the control (IPP) populations are a result of the treatment, e.g., GPPs being under more scrutiny than the IPP funds, than this treatment is worth the additional return of 1.539% per annum over the period 2007-2015, and is highly statistically significant. The 'treatment' is also associated with the performance benchmarks earning 0.492% per annum more, and the funds beating these benchmark by 1.047% more per annum than if the 'treatment' was not in place.

********** insert Table 14 here **********

Table 15 show the ATTs for the comparisons of the downside risk (also see Table 9 (All funds)) and the tracking errors (also see Table 11 (All Funds)). The format of the table is similar to the one of Table 14. Once more, we get strong confirmation of our earlier results. The differences in the returns cannot be attributed to the statistically significantly higher DR of GPPs and, in addition, GPPs are statistically significantly more successful in tracking their benchmarks.

********** insert Table 15 here **********

[20] We have also used the GBCG specification plus dummies D_{UK}, D_{nonUK}, to control for investment regions. Given that the results were very similar, to save space we present the ABI PC matching only.

6. Conclusions

The paper uses a data set of over 14,000 personal pension funds offered to investors through individual agreement contracts (IPPs) and nearly 1,700 personal pension funds offered to individuals through group contract agreements (GPPs) over the period 1986-2015 to test whether there is evidence that pension providers systematically treat the two groups of the investors differently. It is hypothesised that the GPP funds outperform the IPP funds, have tougher performance benchmarks where there is a scope for it, and are better at tracking these benchmarks than their IPP counterparts.

The paper provides a basic model which suggests that individual investors may get worse returns on their investments than the GPP investors, as employers who negotiate GPP contracts may be able to exercise better monitoring power and mobility than dispersed and atomless individual investors of IPP schemes. Such 'preferential' treatment of the GPP investors is consistent with the relational contract arguments (Allen and Gale, 1999; Baker et al., 2002; Gibbons and Henderson, 2012).

The paper provides statistically strong evidence that the IPP investors receive less attractive investment opportunities than the GPP investors. In particular, GPP funds earn higher excess and risk adjusted returns than IPP funds. The differences in returns earned by the two groups of funds are highly economically significant with the IPP investors being worse off over 1% per annum in comparison with the GPP investors. The paper suggests that IPP investors seem to be offered worse financial deals to start with, i.e., the performance targets (PPBs) of the IPP funds are typically less challenging than the PPBs of the GPP funds, that IPP fund managers tend to be less successful in tracking their PPBs (IPP tracking errors tend to be bigger than GPP tracking errors), and that IPP fund managers have lower stock selecting skills (Jensen's alphas tend to be statistically higher for the GPP funds than for the IPP funds).

The allocation funds are, to some extent, an exception in the above described pattern. There is strong evidence that GPP allocation funds are less successful in meeting and tracking their performance targets than the IPP allocation funds. However, there is also strong evidence that the GPP allocation funds highly outperform the IPP allocation funds and have much tougher performance targets. This suggests, that the PPBs of the GPP allocation funds may be so tough in comparison with those of the IPPs that GPP managers find it more difficult to meet them. However, this does not leave GPP investors worse off, in comparison with the IPP investors, as the GPP funds highly outperform the IPP funds.

These results are consistent with the predictions of economic theory for markets with frictions, and they cannot be attributed to selection bias resulting from differences across investors saving individually and under group agreements, risk sharing in big insurance groups, or window-dressing by mutual funds.

Regarding selection bias there is a theoretical possibility that firms have firm specific differences and that providers able to offer better deals (through, for example, offering funds with more challenging performance targets) or offering funds that earn higher returns, for some (random)

reason. offer GPP funds only, while those funds offering "worse" deals have randomly chosen to offer IPP funds only (as opposed to IPPs being their only customers in equilibrium). However, we show that the differences in the performance of the GPP and the IPP funds persist in the sample of providers who offer both the GPP and the IPP schemes.

In the context of risk sharing, pooling investors with different risk characteristics together can improve a scheme's risk diversification opportunities if it is a DB scheme. However, in the case of DC schemes, the investors are the risk bearers, hence this risk-sharing argument does not hold for DC funds (the funds analysed in the paper).

Turning to window dressing, we cannot completely exclude the possibility of window-dressing practices in the data. However, window dressing of performance results is more likely to be present in the case of IPPs than GPPs given the differences in the financial experience, monitoring powers and abilities, etc., between the two groups of investors. Indeed, the IPP schemes weaker performance benchmarks could themselves be interpreted as a form of window-dressing. But if window-dressing of some sort is present in the data, it would not weaken our results since correction for any window dressing would reduce IPPs' reported performance more than that of GPPs. Hence, this would widen the performance gap between the schemes.

Finally, the argument that the differences in performance result from the providers responding to different characteristics of the IPP and of the GPP cohorts can also be dismissed. This is because, if anything, one would expect that individual investors who start 'consciously' saving for retirement, i.e., enter IPP agreements, are also likely on average to be expecting to live longer. If so, they may feel the need to have more, rather than less, retirement income and hence have a stronger incentive to seek out the best performing schemes, not settle with the worst.

These results have important policy-making implications. They suggest that individual investors need more protection from regulatory bodies than is currently provided. In particular, the results suggest that empowering individual investors may not be enough to solve the problem of the weak performance of pension funds. For as long as individual investors remain dispersed, their individual voice will not be heard. Given that monitoring and bargaining power of employers seem to play an important role in the provision of quality services, managed accounts may be a better form of pension provision than empowering individual investors.

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Table 1. The number of the individual personal pension (IPP) funds and the group personal pension (GPP) funds with the complete statistics as specified in the left column for each of the three periods considered in the paper.

	IPP funds			GPP funds		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Complete returns	12,214	12,332	14,429	1,441	1,444	1,681
Complete returns and style info	12,017	12,130	14,137	1,430	1,433	1,669
Complete returns, style spec but no PPB spec	1,960	2,006	2,511	94	94	158
Complete returns, style spec and some PPB spec	10,057	10,124	11,626	1,336	1,339	1,511
Of which with						
PPB identified	7,912	7,950	8,988	979	981	1,120
No PPB	582	582	591	20	20	21
Incomplete PPB	565	582	927	138	139	152
PPB not identified	998	1,010	1,120	199	199	218

Table 2. The number of the IPP and of the GPP funds for each GBCG investment category and period. The numbers in round brackets shows the numbers of funds for which Primary Prospectus Benchmark (PPB) returns were calculated. The numbers in square brackets show the funds for which PPB returns were calculated as the percentage of all the funds in the given category.

	IPP funds			GPP funds		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Equity	6,338	6,387	7,278	845	847	981
	(5,209)	(5,232)	(5,5783)	(632)	(634)	(721)
	[82%]	[82%]	[79%]	[75%]	[75%]	[73%]
Fixed Income	1,670	1,681	1,965	259	260	314
	(1,177)	(1,185)	(1,389)	(192)	(192)	(225)
	[70%]	[70%]	[71%]	[77%]	[77%]	[72%]
Money Market	301	313	313	48	48	48
	(167)	(172)	(172)	(33)	(33)	(33)
	[55%]	[55%]	[55%]	[69%]	[69%]	[69%]
Allocation	2,631	2,657	3,113	134	134	152
	(975)	(1,009)	(1064)	(33)	(33)	(37)
	[48%]	[38%]	[34%]	[25%]	[25%]	[24%]
Specialist	192	194	199	2	2	2
	(37)	(37)	(39)	(0)	(0)	(0)
	[19%]	[19%]	[19%]	[0%]	[0%]	[0%]
Alternative	218	218	219	16	16	16
	(143)	(143)	(144)	(15)	(15)	(15)
	[65%]	[65%]	[65%]	[94%]	[94%]	[94%]
Miscellaneous	383	390	390	109	109	109
	(74)	(74)	(74)	(69)	(69)	(69)
	[19%]	[19%]	[19%]	[63%]	[63%]	[63%]
Convertibles	10	10	10	0	0	0
	(6)	(6)	(6)	(0)	(0)	(0)
	[60%]	[60%]	[60%]	[0%]	[0%]	[0%]
Commodities	4	4	4	0	0	0
	(2)	(2)	(2)	(0)	(0)	(0)
	[50%]	[50%]	[50%]	[0%]	[0%]	[0%]
Property	267	274	378	17	17	23
	(123)	(124)	(187)	(5)	(5)	(7)
	[46%]	[45%]	[49%]	[29%]	[29%]	[30%]

Table 3. The summary statistics of the performance measures calculated for the IPP and the GPP funds for the three periods considered in the paper. The statistics are annualised and expressed in percentage points. $R\text{-}R_{TB}$ denotes funds the excess return above the T-bill; $R\text{-}R_{PPB}$ denotes the excess return above the return of the fund's PPB return; $R_{PPB}\text{-}R_{TB}$ denotes the excess return of the PPBs above the T-Bill; Sharpe denotes the funds' Sharpe ratio; $Sharpe_{PPB}$ denotes the Sharpe ratio for the PPBs; M^2 denotes the Modigliani-Modigliani measure for the funds against their PPBs; TE denotes the tracking error and DR denotes the downside risk.

	IPP funds					GPP funds				
	N	Mean	Stdev	Min	Max	N	Mean	Stdev	Min	Max
$R\text{-}R_{TB}$										
1986-2015	10,057	4.273	4.444	-44.436	24.418	1,336	4.481	2.900	-25.169	17.512
1996-2015	10,124	4.250	4.446	-44.436	24.418	1,339	4.482	2.899	-25.169	17.512
2007-2015	11,626	4.088	4.325	-44.436	24.418	1,511	4.928	2.701	-25.169	18.348
$R\text{-}R_{PPB}$										
1986-2015	7,912	-0.171	3.243	-37.620	15.194	979	0.229	2.543	-31.292	9.139
1996-2015	7,950	-0.177	3.246	-37.620	15.194	981	0.236	2.547	-31.292	9.139
2007-2015	8,988	-0.374	3.288	-37.620	15.194	1,120	0.304	2.523	-31.292	9.325
$R_{PPB}\text{-}R_{TB}$										
1986-2015	7,912	4.666	4.426	-34.296	40.974	979	4.562	3.392	-23.399	35.073
1996-2015	7,950	4.650	4.418	-34.296	40.974	981	4.556	3.391	-23.399	35.073
2007-2015	8,988	4.649	4.314	-34.296	40.974	1,120	4.975	3.386	-33.366	35.073
Sharpe										
1986-2015	10,036	0.417	0.423	-0.972	1.657	1,336	0.392	0.287	-0.972	1.657
1996-2015	10,124	0.413	0.431	-1.047	1.693	1,339	0.394	0.290	-1.047	1.693
2007-2015	11,625	0.380	0.467	-1.633	1.821	1,511	0.427	0.295	-1.493	1.821
$Sharpe_{PPB}$										
1986-2015	7,912	0.594	1.044	-0.637	8.570	979	0.619	1.217	-0.637	8.570
1996-2015	7,950	0.592	1.043	-0.701	8.570	981	0.619	1.217	-0.701	8.570
2007-2015	8,988	0.600	1.047	-0.646	8.626	1,120	0.647	1.255	-0.646	8.626
M^2										
1986-2015	7,912	-0.259	2.679	-8.951	7.685	979	0.030	1.931	-8.951	7.685
1996-2015	7,950	-0.267	2.689	-9.072	7.685	981	0.038	1.943	-9.072	7.685
2007-2015	8,987	-0.437	2.807	-9.013	7.781	1,120	0.124	2.032	-9.013	7.781
TE										
1986-2015	7,912	6.046	3.075	0.020	28.240	979	4.902	2.931	0.036	42.342
1996-2015	7,950	6.027	3.084	0.020	28.240	981	4.895	2.937	0.036	42.342
2007-2015	8,988	5.992	3.132	0.020	29.478	1,120	5.035	3.045	0.036	43.171
DR										
1986-2015	7,912	1.619	0.164	0.000	1.788	979	1.595	0.245	0.000	1.729
1996-2015	7,950	1.619	0.166	0.000	1.788	981	1.595	0.245	0.000	1.729
2007-2015	8,988	1.626	0.167	0.000	1.788	1,120	1.606	0.241	0.000	1.729

Table 4. The summary statistics for independent variables used in the regression analysis. $D_{external}$ equals one if a fund is run by an external manager, and zero otherwise; $D_{individual}$ is equal one if a fund is offered by a provider who offers only IPP or GPP schemes and zero if she offers both IPP and GPP schemes; D_{UK} is equal to one if a fund specialises in domestic assets and zero otherwise; D_{nonUK} is equal one if a fund specialises in overseas assets and zero otherwise; Size is the size of funds as of 31 December 2015; Age is the age of funds measured from inception till 31 December 2016.

	IPP funds					GPP funds				
	N	Mean	Stdev	Min	Max	N	Mean	Stdev	Min	Max
$D_{external}$										
1986-2015	10,057	0.748	0.434	0	1	1,336	0.318	0.466	0	1
1996-2015	10,124	0.743	0.437	0	1	1,339	0.317	0.466	0	1
2007-2015	11,626	0.678	0.467	0	1	1,511	0.292	0.455	0	1
$D_{individual}$										
1986-2015	10,057	0.204	0.403	0	1	1,336	0.111	0.314	0	1
1996-2015	10,124	0.204	0.403	0	1	1,339	0.113	0.316	0	1
2007-2015	11,626	0.200	0.400	0	1	1,511	0.114	0.319	0	1
D_{UK}										
1986-2015	10,057	0.206	0.404	0	1	1,336	0.237	0.426	0	1
1996-2015	10,124	0.206	0.405	0	1	1,339	0.237	0.425	0	1
2007-2015	11,626	0.210	0.407	0	1	1,511	0.240	0.427	0	1
D_{nonUK}										
1986-2015	10,057	0.184	0.388	0	1	1,336	0.153	0.360	0	1
1996-2015	10,124	0.184	0.388	0	1	1,339	0.152	0.359	0	1
2007-2015	11,626	0.178	0.382	0	1	1,511	0.150	0.357	0	1
Size (£mln)										
1986-2015	8,999	178	851	1.01	20,300	832	313	1,280	2.70	23,700
1996-2015	9,066	183	861	1.01	20,300	835	313	1,280	2.70	23,700
2007-2015	10,463	277	1,150	1.01	43,000	950	382	1,600	2.70	23,700
Age (years)										
1986-2015	10,057	8.954	6.680	1	47	1,336	11,004	4.828	1	44
1996-2015	19,124	9.083	6.848	1	47	1,339	11.037	4.874	1	44
2007-2015	11.626	10.853	8.499	1	52	1,151	11.496	4.958	1	44

Table 5. Regression results for the whole sample (Panel A) and for the PPB-restricted sample (Panel B). The standard errors are clustered by the ABI PC investment style classification. The GBCG dummies are included by not reported. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R-R_{TB}			**Sharpe**		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Panel A						
Const.	-1.878**	-1.830**	-0.440	-0.100	-0.097	-0.000
	(0.013)	(0.019)	(0.493)	(0.197)	(0.215)	(1.000)
D_{GPP}	0.883***	0.905***	1.139***	0.060***	0.064***	0.089***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
$D_{external}$	1.050***	1.057***	0.650***	0.066***	0.066***	0.040*
	(0.000)	(0.000)	(0.004)	(0.006)	(0.007)	(0.056)
LnSize	0.187***	0.182***	0.159***	0.018***	0.018***	0.015***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
D_{UK}	1.167***	1.167***	0.631***	0.120***	0.110***	0.076***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{nonUK}	0.585*	0.588*	0.438*	0.066***	0.066***	0.060***
	(0.089)	(0.087)	(0.080)	(0.008)	(0.009)	(0.000)
D_{1995}	1.826***	1.828***	1.696***	0.300***	0.301***	0.287***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{2004}	0.802**	0.824**	0.517	0.070**	0.073**	0.062*
	(0.029)	(0.025)	(0.122)	(0.044)	(0.040)	(0.064)
D_{2008}	-0.589	-0.623	0.002	-0.073	-0.075	-0.020
	(0.599)	(0.575)	(0.999)	(0.402)	(0.387)	(0.853)
GBCG dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2adj	0.166	0.168	0.166	0.309	0.327	0.366
N	11,443	11,552	13,539	11,395	11,551	13,538
Panel B						
Const.	-2.941***	-3.023***	-1.465**	-0.149*	-0.157**	-0.080
	(0.002)	(0.002)	(0.027)	(0.051)	(0.043)	(0.247)
D_{GPP}	0.888***	0.915***	1.163***	0.066***	0.073***	0.100***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.001)	(0.001)
$D_{external}$	1.180***	1.201***	0.623**	0.079***	0.080***	0.044**
	(0.001)	(0.001)	(0.016)	(0.003)	(0.004)	(0.047)
LnSize	0.238***	0.239***	0.206***	0.020***	0.021***	0.018***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{UK}	1.329***	1.371***	0.859***	0.123***	0.123***	0.106***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{nonUK}	0.372	0.373	0.319	0.044*	0.044*	0.040**
	(0.362)	(0.360)	(0.306)	(0.074)	(0.074)	(0.021)
D_{1995}	1.980***	1.981***	1.902***	0.289***	0.290***	0.281***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{2004}	1.122**	1.125**	0.817*	0.073*	0.073*	0.072
	(0.018)	(0.018)	(0.071)	(0.080)	(0.087)	(0.109)
D_{2008}	-0.641	-0.665	-0.113	-0.091	-0.092	-0.038
	(0.588)	(0.572)	(0.940)	(0.306)	(0.294)	(0.723)
GBCG dummies	Yes	Yes	Yes	Yes	Yes	Yes
	0.150	0.153	0.150	0.282	0.298	0.361
D_{2008}	7,718	7,758	8,800	7,718	7,758	8,800

Table 6. Extract of the regression results for the PPB-restricted sample of funds offered by providers offering both GPP and IPP funds (Panel A), by providers offering IPP funds only (Panel B), by providers offering GPP funds only (Panel C), and funds that have PPBs used by IPP and GPP funds (Panel D) and additionally provide funds of both types (Panel E). Complete results are presented in the Appendix (Tables A1-A5). $D_{individual}$ equals one if a fund is offered by a provider offering individual contracts only (i.e., does not offer GPP funds in the Panel B specification, and does not offer IPP funds in the Panel C specification). The standard errors are clustered by ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R-R_{TB}			**Sharpe**		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Panel A						
D_{GPP}	0.805***	0.816***	0.977***	0.053**	0.057**	0.080**
	(0.004)	(0.004)	(0.000)	(0.016)	(0.014)	(0.011)
R^2adj	0.140	0.143	0.151	0.262	0.279	0.368
N	6,189	6,219	7,066	6,171	6,219	7,066
Panel B						
$D_{individual}$	-0.123	-0.126	-0.107	0.004	0.004	0.007
	(0.428)	(0.414)	(0.492)	(0.768)	(0.777)	(0.613)
R^2adj	0.149	0.153	0.149	0.281	0.299	0.367
N	7,099	7,137	8,085	7,080	7,137	8,085
Panel C						
$D_{individual}$	-0.289	-0.224	0.282	0.033	0.040	0.076**
	(0.436)	(0.499)	(0.360)	(0.328)	(0.228)	(0.037)
R^2adj	0.297	0.292	0.271	0.437	0.456	0.503
N	619	621	715	619	621	715
Panel D						
D_{GPP}	0.886***	0.911***	1.034***	0.067***	0.073***	0.091***
	(0.001)	(0.001)	(0.000)	(0.003)	(0.002)	(0.002)
R^2adj	0.194	0.194	0.188	0.295	0.302	0.347
N	5,328	5,352	6,048	5,314	5,352	6,048
Panel E						
D_{GPP}	0.817***	0.819***	0.842***	0.056**	0.059**	0.075**
	(0.005)	(0.006)	(0.003)	(0.015)	(0.015)	(0.022)
R^2adj	0.183	0.183	0.192	0.285	0.292	0.357
N	4,333	4,351	4,936	4,320	4,351	4,936

Table 7. Extract of the regression results for the seven most numerous GBCG investment styles, i.e., equity, fixed income, money market, allocation, alternative, miscellaneous and property, for the PPB-restricted sample. Complete results are presented in the Appendix (Table A6). The standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R-R_{TB}			**Sharpe**		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Equity						
D_{GPP}	1.239***	1.269***	1.232***	0.080***	0.081***	0.074***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)
R^2adj	0.115	0.119	0.094	0.220	0.224	0.200
N	5,143	5,167	5,728	5,129	5,167	5,728
Fixed Income						
D_{GPP}	0.166	0.134	0.893*	-0.020	-0.030	0.028
	(0.526)	(0.636)	(0.054)	(0.582)	(0.383)	(0.270)
R^2adj	0.190	0.182	0.164	0.170	0.152	0.080
N	1,183	1,191	1,406	1,182	1,191	1,406
Money Market						
D_{GPP}	0.392**	0.401	0.513**	0.432***	0.515***	0.658***
	(0.042)	(0.106)	(0.034)	(0.001)	(0.002)	(0.000)
R^2adj	0.222	0.259	0.130	0.140	0.184	0.153
N	180	185	311	179	185	311
Allocation						
D_{GPP}	1.706***	1.707***	2.301***	0.039	0.040	0.079**
	(0.004)	(0.004)	(0.000)	(0.219)	(0.211)	(0.049)
R^2adj	0.175	0.180	0.203	0.277	0.281	0.310
N	828	830	909	826	830	909
Alternative						
D_{GPP}	3.358***	3.358***	3.397***	0.925***	0.932***	0.992***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
R^2adj	0.287	0.287	0.293	0.251	0.249	0.241
N	136	136	137	136	136	137
Miscellaneous						
D_{GPP}	-0.345	-0.335	1.432	0.064	0.073	0.214*
	(0.706)	(0.726)	(0.108)	(0.584)	(0.562)	(0.090)
R^2adj	0.119	0.110	0.166	0.259	0.236	0.228
N	100	100	103	100	100	103
Property						
D_{GPP}	1.305***	2.064***	2.353***	0.354***	0.743***	0.464***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
R^2adj	0.653	0.615	0.611	0.531	0.510	0.520
N	118	119	174	117	119	174

Table 8. Extract of the regression results for the performance of the seven most numerous GBCG investment styles, i.e., equity, fixed income, money market, allocation, alternative, miscellaneous and property for the PPB-restricted sample when funds are offered by providers offering both IPP and GPP funds. Complete results are presented in the Appendix (Table A7). The standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R-R_{TB}			**Sharpe**		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Equity						
D_{GPP}	1.280***	1.287***	1.111***	0.084***	0.083***	0.066***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)
R^2adj	0.100	0.104	0.079	0.192	0.197	0.170
N	4,161	4,181	4,628	4,148	4,181	4,628
Fixed Income						
D_{GPP}	-0.008	-0.045	0.666	-0.059	-0.070*	-0.018
	(0.977)	(0.885)	(0.151)	(0.165)	(0.080)	(0.561)
R^2adj	0.181	0.171	0.147	0.146	0.129	0.059
N	962	967	1,144	961	967	1,144
Money Market						
D_{GPP}	0.328**	0.322*	0.518***	0.406**	0.485**	0.668***
	(0.015)	(0.088)	(0.001)	(0.010)	(0.011)	(0.004)
R^2adj	0.221	0.259	0.120	0.126	0.171	0.142
N	159	163	283	158	163	283
Allocation						
D_{GPP}	1.382**	1.378**	1.961***	0.008	0.008	0.041
	(0.026)	(0.026)	(0.002)	(0.777)	(0.772)	(0.200)
R^2adj	0.122	0.131	0.158	0.221	0.227	0.264
N	600	600	651	598	600	651
Alternative						
D_{GPP}	2.554***	2.554***	2.681***	0.899***	0.916***	1.056***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
R^2adj	0.264	0.264	0.267	0.240	0.238	0.227
N	110	110	111	110	110	111
Miscellaneous						
D_{GPP}	-0.916	-0.895	1.120	0.011	0.021	0.187
	(0.395)	(0.428)	(0.325)	(0.944)	(0.898)	(0.274)
R^2adj	0.245	0.230	0.196	0.283	0.253	0.245
N	82	82	84	82	82	84
Property						
D_{GPP}	2.102***	3.011***	3.839***	0.536***	0.974***	0.725***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2adj	0.729	0.667	0.618	0.602	0.569	0.542
N	100	101	149	99	101	149

Table 9. Extract of the regression results for the specifications using the downside risk (DR) as the dependent variable in the PPB-restricted sample. Complete results are presented in the Appendix (Table A8).The standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
	All Funds			**Equity**		
D_{GPP}	-0.018	-0.019	-0.026	0.000	-0.000	0.002
	(0.317)	(0.292)	(0.316)	(0.985)	(0.926)	(0.565)
R^2adj	0.610	0.586	0.415	0.089	0.089	0.019
N	7,718	7,758	8,800	5,143	5,167	5,728
	Fixed Income			**Money Market**		
D_{GPP}	0.021*	0.019*	0.009	-0.489***	-0.495***	-0.501***
	(0.074)	(0.085)	(0.322)	(0.000)	(0.000)	(0.003)
R^2adj	0.029	0.026	0.070	0.163	0.158	0.264
N	1,183	1,191	1,406	180	185	311
	Allocation			**Alternative**		
D_{GPP}	-0.009	-0.009	-0.005	-0.091**	-0.091**	-0.092**
	(0.255)	(0.248)	(0.551)	(0.023)	(0.023)	(0.023)
R^2adj	0.085	0.078	0.053	0.163	0.163	0.167
N	828	830	909	136	136	137
	Miscellaneous			**Property**		
D_{GPP}	-0.030	-0.029	-0.037	-0.126***	-0.173***	-0.056**
	(0.471)	(0.478)	(0.351)	(0.001)	(0.001)	(0.025)
R^2adj	0.138	0.138	0.165	0.484	0.479	0.570
N	100	100	103	118	119	174

Table 10. Extract of the regression results for the specifications using the PPB performance measures as the dependent variables. Complete results are presented in the Appendix (Table A9).The standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R_{PPB}-R_{TB}			$Sharpe_{PPB}$		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
All Funds						
D_{GPP}	0.433*	0.443*	0.495**	0.145	0.146	0.111
	(0.060)	(0.055)	(0.023)	(0.139)	(0.133)	(0.296)
R^2adj	0.088	0.090	0.082	0.368	0.367	0.319
N	7,718	7,758	8,800	7,718	7,758	8,800
Equity						
D_{GPP}	0.361	0.369	0.172	0.039**	0.039**	-0.028
	(0.287)	(0.270)	(0.522)	(0.022)	(0.015)	(0.621)
R^2adj	0.048	0.052	0.039	0.093	0.095	0.050
N	5,143	5,167	5,728	5,143	5,167	5,728
Fixed income						
D_{GPP}	0.056	0.037	0.499*	-0.041	-0.046	-0.017
	(0.828)	(0.883)	(0.079)	(0.411)	(0.356)	(0.709)
R^2adj	0.154	0.156	0.201	0.098	0.097	0.052
N	1,183	1,191	1,406	1,183	1,191	1,406
Money Market						
D_{GPP}	0.078	0.090	0.001	-0.051*	-0.032***	-0.051
	(0.217)	(0.190)	(0.972)	(0.058)	(0.007)	(0.129)
R^2adj	0.232	0.270	0.598	0.153	0.181	0.396
N	180	185	311	180	185	311
Allocation						
D_{GPP}	3.633***	3.631***	3.840***	-0.037	-0.037	-0.021
	(0.000)	(0.000)	(0.000)	(0.707)	(0.705)	(0.845)
R^2adj	0.118	0.118	0.101	0.167	0.168	0.156
N	828	830	909	828	830	909
Alternative						
D_{GPP}	-0.059	-0.059	-0.020	-0.350	-0.350	-0.348
	(0.865)	(0.865)	(0.950)	(0.783)	(0.783)	(0.787)
R^2adj	0.091	0.091	0.088	0.276	0.276	0.277
N	136	136	137	136	136	137
Miscellaneous						
D_{GPP}	-0.569	-0.530	0.795	1.052	1.054	1.309
	(0.548)	(0.577)	(0.493)	(0.137)	(0.136)	(0.102)
R^2adj	0.149	0.152	0.136	0.740	0.740	0.747
N	100	100	103	100	100	103
Property						
D_{GPP}	0.503**	0.887**	0.453	0.116**	0.219***	0.079
	(0.046)	(0.013)	(0.228)	(0.015)	(0.003)	(0.213)
R^2adj	0.119	0.118	0.102	0.171	0.171	0.160
N	118	119	174	118	119	174

Table 11. Extract of the regression results for the specifications using the tracking error (TE) as the dependent variable. Complete results are presented in the Appendix (Table A10).The standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
	All Funds			**Equity**		
D_{GPP}	-0.944***	-0.922***	-0.818***	-1.321***	-1.285***	-1.116***
	(0.000)	(0.001)	(0.004)	(0.000)	(0.001)	(0.004)
R^2adj	0.378	0.378	0.380	0.182	0.182	0.189
N	7,718	7,758	8,800	5,143	5,167	5,728
	Fixed income			**Money Market**		
D_{GPP}	-0.260	-0.255	-0.573	-0.237	-0.236	-0.616**
	(0.361)	(0.370)	(0.231)	(0.404)	(0.317)	(0.048)
R^2adj	0.087	0.088	0.098	0.205	0.152	0.081
N	1,183	1,191	1,406	180	185	311
	Allocation			**Alternative**		
D_{GPP}	1.215***	1.222***	1.947***	-0.037	-0.037	-0.040
	(0.009)	(0.010)	(0.000)	(0.893)	(0.893)	(0.884)
R^2adj	0.106	0.105	0.137	0.286	0.286	0.322
N	828	830	909	136	136	137
	Miscellaneous			**Property**		
D_{GPP}	-0.069	-0.058	0.569	-2.256***	-2.554***	-2.290***
	(0.953)	(0.961)	(0.637)	(0.001)	(0.001)	(0.004)
R^2adj	0.327	0.329	0.314	0.362	0.376	0.351
N	100	100	103	118	119	174

Table 12. Extract of the regression results for the specifications using the performance measures against funds' PPBs as the dependent variables. Complete results are presented in the Appendix (Table A11).The standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R\text{-}R_{PPB}$			M^2		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
All funds						
D_{GPP}	0.540**	0.555**	0.798***	0.475**	0.496**	0.730***
	(0.024)	(0.020)	(0.001)	(0.041)	(0.033)	(0.001)
R^2adj	0.057	0.058	0.074	0.053	0.053	0.068
N	7,718	7,758	8,800	7,718	7,758	8,800
Equity						
D_{GPP}	1.022***	1.039***	1.232***	0.896***	0.916***	1.109***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
R^2adj	0.079	0.077	0.078	0.064	0.063	0.065
N	5,143	5,167	5,728	5,143	5,167	5,728
Fixed Income						
D_{GPP}	0.051	0.093	0.410	0.127	0.170	0.425*
	(0.759)	(0.564)	(0.180)	(0.397)	(0.267)	(0.075)
R^2adj	0.054	0.058	0.155	0.037	0.040	0.084
N	1,183	1,191	1,406	1,183	1,191	1,406
Money Market						
D_{GPP}	0.328	0.315	0.511**	0.283*	0.268	0.383*
	(0.117)	(0.242)	(0.026)	(0.065)	(0.271)	(0.099)
R^2adj	0.290	0.314	0.235	0.193	0.234	0.276
N	180	185	311	180	185	311
Allocation						
D_{GPP}	-1.924***	-1.924***	-1.539***	-0.984***	-0.983***	-0.355**
	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	(0.045)
R^2adj	0.082	0.083	0.079	0.140	0.142	0.137
N	828	830	909	828	830	909
Alternative						
D_{GPP}	3.417***	3.417***	3.417***	-0.163	-0.163	-0.227
	(0.001)	(0.001)	(0.001)	(0.295)	(0.295)	(0.158)
R^2adj	0.209	0.209	0.208	0.158	0.158	0.183
N	136	136	137	136	136	137
Miscellaneous						
D_{GPP}	0.155	0.061	0.638	-0.151	-0.234	0.296
	(0.914)	(0.966)	(0.614)	(0.905)	(0.854)	(0.797)
R^2adj	0.194	0.182	0.187	0.396	0.389	0.393
N	100	100	103	100	100	103
Property						
D_{GPP}	0.905***	1.177***	1.900***	0.818***	1.758***	2.258***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
R^2adj	0.121	0.133	0.354	0.203	0.200	0.351
N	118	119	174	118	119	174

Table 13. The estimates of the CAPM specification with interaction terms. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	Alpha	D_{GPP}	Beta	Beta x D_{GPP}	R^2adj	N
All funds						
1986-2015	0.898*	0.583	0.771***	-0.045	0.549	8,891
	(0.065)	(0.164)	(0.000)	(0.668)		
1996-2015	0.881*	0.610	0.772***	-0.048	0.548	8,931
	(0.068)	(0.143)	(0.000)	(0.650)		
2007-2015	0.706	1.117***	0.768***	-0.073	0.529	10,108
	(0.147)	(0.007)	(0.000)	(0.425)		
Equity						
1986-2015	0.518	0.316	0.892***	0.066	0.644	5,841
	(0.225)	(0.419)	(0.000)	(0.270)		
1996-2015	0.511	0.339	0.893***	0.064	0.645	5,866
	(0.227)	(0.383)	(0.000)	(0.290)		
2007-2015	0.455	0.781**	0.872***	0.021	0.619	6,504
	(0.307)	(0.045)	(0.000)	(0.707)		
Fixed income						
1986-2015	0.198	0.319	0.847***	0.011	0.645	1,369
	(0.487)	(0.224)	(0.000)	(0.861)		
1996-2015	0.163	0.349	0.851***	0.008	0.631	1,377
	(0.577)	(0.182)	(0.000)	(0.894)		
2007-2015	0.410	1.065*	0.776***	-0.048	0.501	1,614
	(0.302)	(0.098)	(0.000)	(0.695)		
Money Market						
1986-2015	-0.524***	0.533***	1.035***	-1.950**	0.794	200
	(0.001)	(0.002)	(0.000)	(0.021)		
1996-2015	-0.613***	0.621***	1.036***	-1.951**	0.700	205
	(0.004)	(0.007)	(0.000)	(0.021)		
2007-2015	-1.109***	1.303***	1.016***	-2.516*	0.447	341
	(0.002)	(0.006)	(0.000)	(0.087)		
Allocation						
1986-2015	3.638***	0.557	0.118*	-0.037	0.061	1,008
	(0.000)	(0.485)	(0.093)	(0.683)		
1996-2015	3.622***	0.573	0.120*	-0.038	0.062	1,009
	(0.000)	(0.472)	(0.093)	(0.674)		
2007-2015	3.617***	1.156	0.107*	-0.037	0.052	1,101
	(0.000)	(0.247)	(0.089)	(0.715)		
Alternative						
1986-2015	1.243**	3.858***	0.409***	-0.635***	0.174	157
	(0.012)	(0.000)	(0.007)	(0.001)		
1996-2015	1.243**	3.858***	0.409***	-0.635***	0.174	157
	(0.012)	(0.000)	(0.007)	(0.001)		
2007-2015	1.375***	3.733***	0.381***	-0.628***	0.152	158
	(0.004)	(0.000)	(0.009)	(0.001)		
Miscellaneous						
1986-2015	-0.015	2.574**	0.946***	-0.801***	0.420	143
	(0.986)	(0.029)	(0.000)	(0.007)		
1996-2015	0.033	2.526**	0.942***	-0.797***	0.420	143
	(0.968)	(0.030)	(0.000)	(0.007)		
2007-2015	0.590	2.992**	0.840***	-0.691**	0.314	149
	(0.444)	(0.028)	(0.000)	(0.015)		
Property						
1986-2015	-0.051	-3.213***	0.789***	0.802***	0.662	128
	(0.787)	(0.001)	(0.000)	(0.000)		
1996-2015	0.008	-6.546***	1.265***	0.761***	0.612	129
	(0.970)	(0.000)	(0.000)	(0.000)		
2007-2015	-1.321***	0.385	0.784***	0.408*	0.413	194
	(0.000)	(0.464)	(0.000)	(0.079)		

Table 14. Average treatment effects on treated obtained from the propensity score matching based on logit regressions for the sample of all funds with PPB returns. Excess returns denote R-R_{TB} in Panel A, R_{PPB}-R_{TB} in Panel B and R – R_{PPB} in Panel C. Risk adjusted excess returns denote the Sharpe ratio in Panel A, $Sharpe_{PPB}$ in Panel), and M^2 in Panel C. In each panel, the matching is by age, management type and ABI PC investment style (indicated by 'Age'), and by age, size, management type and ABI PC investment style (indicated by 'Age and size'). P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

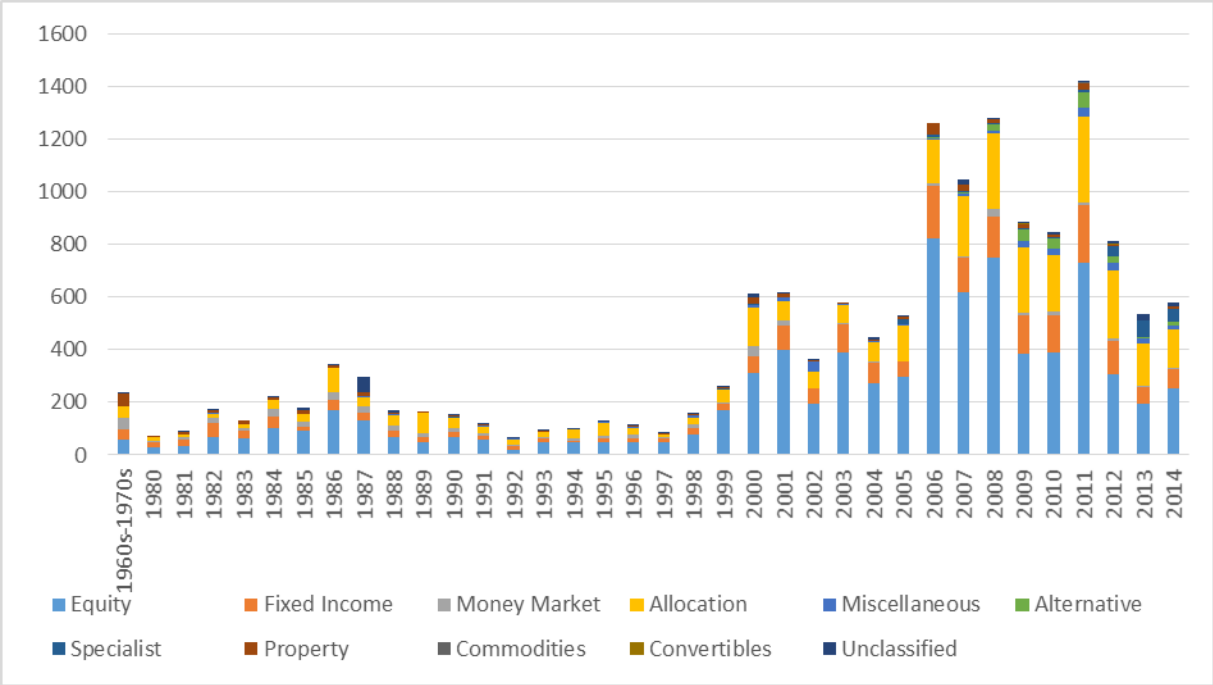
	Excess returns			**Risk adjusted excess returns**		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Panel A						
Age						
	1.104***	1.192***	1.560***	0.087***	0.058**	0.136***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.019)	(0.000)
No of pairs	979	981	1,120	979	981	1,120
Age and size						
	0.745***	1.451***	1.539***	0.019	0.0411*	0.130***
	(0.006)	(0.000)	(0.000)	(0.424)	(0.065)	(0.000)
No of pairs	619	621	715	619	621	715
	979	981	1,120	979	981	1,120
Panel B						
Age						
	0.455**	0.241	0.451**	0.199***	0.084*	0.150***
	(0.040)	(0.218)	(0.011)	(0.000)	(0.089)	(0.001)
No of pairs	979	981	1,120	979	981	1,120
Age and size						
	0.248	0.733***	0.492**	0.138**	0.164***	0.125**
	(0.346)	(0.002)	(0.031)	(0.017)	(0.001)	(0.026)
No of pairs	619	621	715	619	621	715
Panel C						
Age						
	0.649***	0.951***	1.110***	0.447***	0.805***	0.749***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
No of pairs	979	981	1,120	979	981	1,120
Age and size						
	0.497***	0.718***	1.047***	0.334**	0.560***	0.810***
	(0.004)	(0.002)	(0.000)	(0.031)	(0.005)	(0.000)
No of pairs	619	621	715	619	621	715

Table 15. Average treatment effects on treated obtained from the propensity score matching based on logit regressions for the downside risk (DR) and the tracking error (TE) using the sample of all the funds with PPB-returns. The matching is by age, management type and ABI PC investment style (indicated by 'Age'), and by age, size, management type and ABI PC investment style (indicated by 'Age and size'). P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	DR			**TE**		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Age						
	-0.017	-0.003	-0.000	-0.461***	-0.374**	-0.541***
	(0.365)	(0.825)	(0.974)	(0.004)	(0.021)	(0.001)
No of pairs	979	981	1,120	979	981	1,120
Age and size						
	-0.009	0.023	0.022	-1.062***	-0.452**	-0.418*
	(0.653)	(0.382)	(0.272)	(0.001)	(0.048)	(0.071)
No of pairs	619	621	715	619	621	715

Figure 1. Time evolution of individual (Panel A) and group (Panel B) personal pension funds. Each bar shows the number of new fund openings per calendar year.

Panel A. Individual personal pension (IPP) funds



Panel B. Group personal pension (GPP) funds

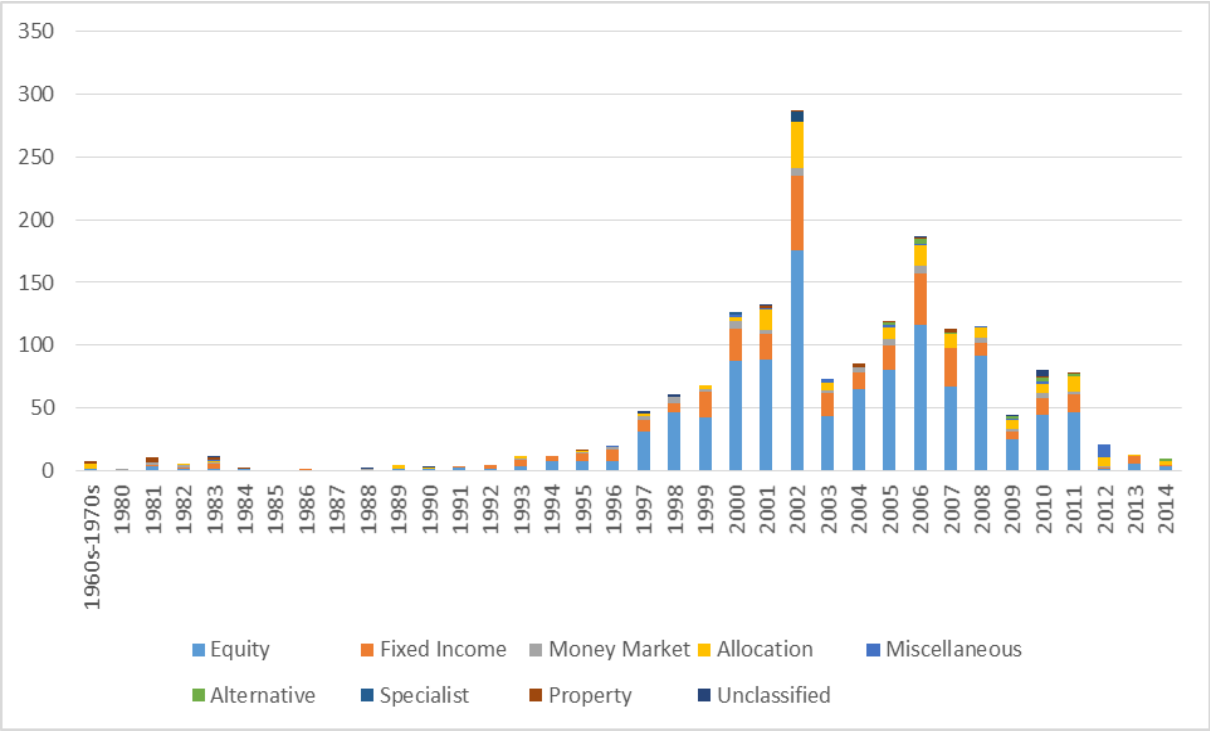
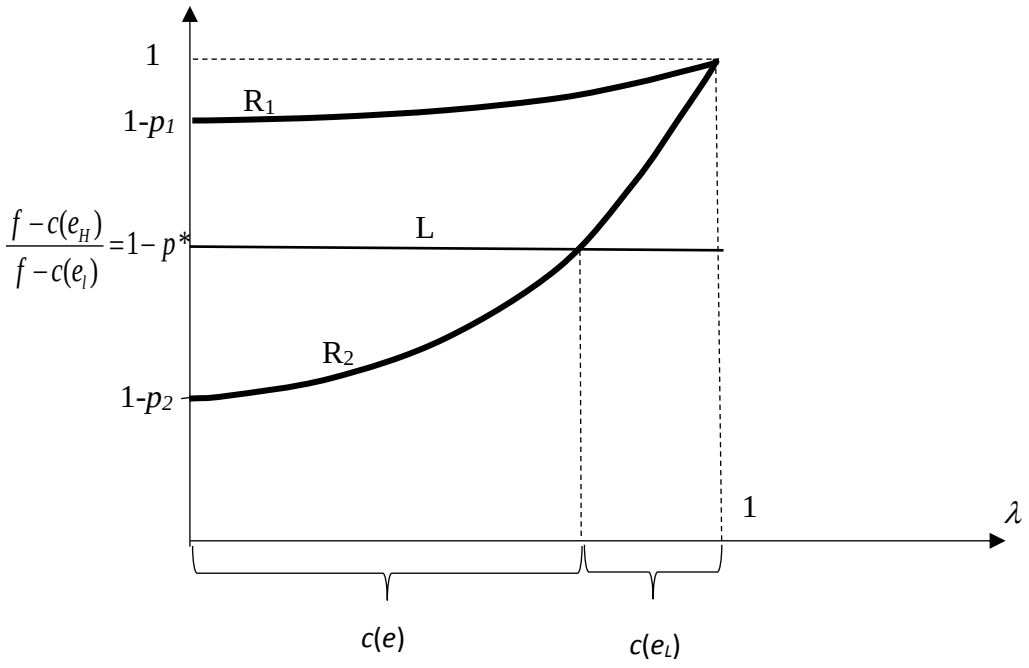


Figure 2. The graphical illustration of the condition when a provider is (R_2) and is not (R_1) motivated to make an effort to deliver a higher quality services to customers characterised by a different probability λ of staying with the provider in response to the quality of the provider's services.



Appendix

Table A1. Regression results summarised in Table 6 Panel A. Sample: pension funds offered by providers who offer both IPP and GPP schemes. Excess returns (R-R_{TB}) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R-R_{TB}			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Const.	-2.199**	-2.326**	-0.954	-0.070	-0.082	-0.023
	(0.026)	(0.021)	(0.183)	(0.390)	(0.323)	(0.772)
D_{GPP}	0.805***	0.816***	0.977***	0.053**	0.057**	0.080**
	(0.004)	(0.004)	(0.000)	(0.016)	(0.014)	(0.011)
$D_{external}$	1.149***	1.167***	0.563**	0.073***	0.072**	0.036
	(0.003)	(0.003)	(0.042)	(0.009)	(0.010)	(0.117)
LnSize	0.194***	0.198***	0.171***	0.016***	0.016***	0.015***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
D_{UK}	1.083**	1.090**	0.772*	0.067*	0.066*	0.067
	(0.017)	(0.017)	(0.080)	(0.083)	(0.093)	(0.124)
D_{nonUK}	-0.521	-0.541	0.109	-0.083	-0.084	-0.022
	(0.621)	(0.605)	(0.939)	(0.298)	(0.287)	(0.829)
D_{1995}	1.322***	1.370***	0.942***	0.127***	0.130***	0.117***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{2004}	0.435	0.437	0.386	0.046*	0.046*	0.043**
	(0.303)	(0.300)	(0.231)	(0.062)	(0.063)	(0.021)
D_{2008}	1.621***	1.622***	1.571***	0.249***	0.251***	0.243***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
$D_{Alternative}$	-3.047***	-3.041***	-2.767***	-0.091*	-0.092*	-0.069
	(0.000)	(0.000)	(0.000)	(0.086)	(0.084)	(0.134)
$D_{Commodities}$	-12.518***	-12.481***	-13.053***	-1.247***	-1.243***	-1.284***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Convertibles}$	-0.209	-0.186	-0.156	0.213***	0.216***	0.234***
	(0.745)	(0.772)	(0.812)	(0.000)	(0.000)	(0.000)
D_{Equity}	1.141*	1.145*	0.852	-0.091**	-0.090**	-0.105**
	(0.078)	(0.076)	(0.191)	(0.025)	(0.027)	(0.015)
$D_{Fixed\ Income}$	-0.828*	-0.792*	0.320	0.051	0.059	0.174***
	(0.082)	(0.100)	(0.530)	(0.388)	(0.325)	(0.004)
$D_{Miscellaneous}$	-0.446	-0.415	0.055	-0.048	-0.047	-0.019
	(0.548)	(0.582)	(0.952)	(0.458)	(0.481)	(0.804)
$D_{Money\ Market}$	-4.567***	-4.610***	-4.429***	-0.747***	-0.839***	-1.009***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Property}$	-2.033***	-1.867***	-3.320***	-0.107**	-0.067	-0.364***
	(0.001)	(0.002)	(0.000)	(0.022)	(0.150)	(0.000)
$D_{Specialist}$	-1.518***	-1.505***	-1.747***	-0.034	-0.044	0.103***
	(0.002)	(0.002)	(0.000)	(0.322)	(0.212)	(0.006)
R^2adj	0.140	0.143	0.151	0.262	0.279	0.368
N	6,189	6,219	7,066	6,171	6,219	7,066

Table A2. Regression results summarised in Table 6 Panel B. Sample: pension funds offered by providers who offer IPP schemes only. Excess returns ($R\text{-}R_{TB}$) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R\text{-}R_{TB}$			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Const.	-3.259***	-3.349***	-1.764***	-0.175**	-0.185**	-0.101
	(0.001)	(0.001)	(0.005)	(0.025)	(0.019)	(0.167)
$D_{individual}$	-0.123	-0.126	-0.107	0.004	0.004	0.007
	(0.428)	(0.414)	(0.492)	(0.768)	(0.777)	(0.613)
$D_{external}$	1.231***	1.248***	0.628**	0.081***	0.079**	0.038
	(0.003)	(0.003)	(0.034)	(0.008)	(0.011)	(0.125)
LnSize	0.252***	0.253***	0.219***	0.022***	0.022***	0.020***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{UK}	1.226**	1.231**	0.907*	0.079*	0.079*	0.074
	(0.017)	(0.017)	(0.059)	(0.076)	(0.080)	(0.103)
D_{nonUK}	-0.586	-0.610	-0.063	-0.087	-0.089	-0.036
	(0.642)	(0.627)	(0.969)	(0.354)	(0.343)	(0.751)
D_{1995}	1.459***	1.521***	0.939***	0.135***	0.139***	0.113***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{2004}	0.268	0.268	0.326	0.036	0.036	0.041**
	(0.531)	(0.531)	(0.312)	(0.173)	(0.171)	(0.027)
D_{2008}	2.031***	2.030***	1.916***	0.290***	0.291***	0.278***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Alternative}$	-3.517***	-3.516***	-3.256***	-0.177**	-0.177**	-0.154**
	(0.000)	(0.000)	(0.000)	(0.011)	(0.011)	(0.015)
$D_{Commodities}$	-12.538***	-12.513***	-12.986***	-1.253***	-1.250***	-1.283***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Convertibles}$	-0.187	-0.184	-0.172	0.213***	0.215***	0.231***
	(0.760)	(0.765)	(0.783)	(0.000)	(0.000)	(0.000)
D_{Equity}	1.104*	1.101*	0.865	-0.097**	-0.095**	-0.104**
	(0.091)	(0.092)	(0.183)	(0.019)	(0.021)	(0.015)
$D_{Fixed\ Income}$	-1.028**	-0.990**	-0.007	0.042	0.050	0.151**
	(0.030)	(0.039)	(0.989)	(0.517)	(0.436)	(0.015)
$D_{Miscellaneous}$	-0.585	-0.556	-0.455	-0.094	-0.093	-0.090
	(0.334)	(0.367)	(0.409)	(0.179)	(0.189)	(0.282)
$D_{Money\ Market}$	-4.766***	-4.787***	-4.515***	-0.818***	-0.922***	-1.076***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Property}$	-2.073***	-1.933***	-3.237***	-0.100	-0.068	-0.340***
	(0.002)	(0.004)	(0.000)	(0.107)	(0.279)	(0.000)
$D_{Specialist}$	-2.239***	-2.231***	-0.757*	-0.167***	-0.171***	-0.019
	(0.000)	(0.000)	(0.054)	(0.000)	(0.000)	(0.546)
R^2adj	0.149	0.153	0.149	0.281	0.299	0.367
N	7,099	7,137	8,085	7,080	7,137	8,085

Table A3. Regression results summarised in Table 6 Panel C Sample: pension funds offered by providers who offer both GPP schemes only. Excess returns ($R\text{-}R_{TB}$) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R\text{-}R_{TB}$			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Const.	3.627**	3.730**	4.713***	0.260**	0.279**	0.335***
	(0.015)	(0.016)	(0.001)	(0.011)	(0.015)	(0.000)
$D_{individual}$	-0.289	-0.224	0.282	0.033	0.040	0.076**
	(0.436)	(0.499)	(0.360)	(0.328)	(0.228)	(0.037)
$D_{external}$	0.656	0.676	0.375	0.058*	0.060*	0.033
	(0.137)	(0.122)	(0.252)	(0.076)	(0.065)	(0.190)
LnSize	0.002	0.007	0.048	0.001	0.001	0.004
	(0.970)	(0.912)	(0.393)	(0.882)	(0.788)	(0.284)
D_{UK}	-0.022	-0.033	-0.487	0.013	0.009	-0.037
	(0.964)	(0.945)	(0.289)	(0.758)	(0.834)	(0.268)
D_{nonUK}	-1.100	-1.124	-0.710	-0.105*	-0.108*	-0.075
	(0.331)	(0.320)	(0.408)	(0.096)	(0.086)	(0.129)
D_{1995}	0.494*	0.293	-0.145	0.042	0.012	-0.019
	(0.062)	(0.253)	(0.622)	(0.287)	(0.758)	(0.618)
D_{2004}	1.064***	1.065***	0.145	0.104***	0.104***	0.036
	(0.002)	(0.002)	(0.662)	(0.000)	(0.000)	(0.133)
D_{2008}	1.757**	1.766**	2.050**	0.302***	0.303***	0.320***
	(0.047)	(0.044)	(0.024)	(0.004)	(0.003)	(0.003)
$D_{Alternative}$	-2.371**	-2.376**	-2.584**	0.442***	0.444***	0.465***
	(0.044)	(0.043)	(0.016)	(0.002)	(0.001)	(0.002)
D_{Equity}	0.344	0.364	-0.379	-0.041	-0.039	-0.082***
	(0.593)	(0.568)	(0.451)	(0.169)	(0.183)	(0.003)
$D_{Fixed\ Income}$	-0.773	-0.758	0.565	0.117**	0.122**	0.301***
	(0.304)	(0.312)	(0.352)	(0.048)	(0.043)	(0.000)
$D_{Miscellaneous}$	-1.589	-1.561	-1.035	-0.004	0.001	0.057
	(0.185)	(0.197)	(0.450)	(0.956)	(0.987)	(0.538)
$D_{Money\ Market}$	-4.463***	-4.480***	-5.092***	-0.417***	-0.419***	-0.271***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Property}$	-0.857	0.497	-4.304***	0.333***	0.878***	-0.150***
	(0.275)	(0.500)	(0.000)	(0.000)	(0.000)	(0.005)
R^2adj	0.297	0.292	0.271	0.437	0.456	0.503
N	619	621	715	619	621	715

Table A4. Regression results summarised in Table 6 Panel D. Sample: pension funds that have PPBs common to both IPP and GPP schemes. Excess returns ($R-R_{TB}$) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R-R_{TB}$			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Const.	-1.934**	-1.906**	-0.348	-0.088	-0.084	-0.015
	(0.026)	(0.031)	(0.571)	(0.343)	(0.369)	(0.877)
$D_{individual}$	0.886***	0.911***	1.034***	0.067***	0.073***	0.091***
	(0.001)	(0.001)	(0.000)	(0.003)	(0.002)	(0.002)
$D_{external}$	1.141***	1.162***	0.672***	0.088***	0.088***	0.060**
	(0.000)	(0.001)	(0.004)	(0.001)	(0.002)	(0.011)
LnSize	0.180***	0.181***	0.142***	0.017***	0.017***	0.015***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
D_{UK}	0.511	0.508	0.321	0.029	0.030	0.022
	(0.114)	(0.126)	(0.372)	(0.429)	(0.441)	(0.582)
D_{nonUK}	-0.750	-0.766	0.079	-0.102	-0.103	-0.035
	(0.385)	(0.374)	(0.946)	(0.142)	(0.135)	(0.700)
D_{1995}	1.313***	1.247***	0.887***	0.115***	0.102***	0.093***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
D_{2004}	0.543*	0.541*	0.402	0.046**	0.046**	0.041***
	(0.088)	(0.090)	(0.111)	(0.046)	(0.049)	(0.007)
D_{2008}	1.998***	1.999***	1.934***	0.287***	0.288***	0.278***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
$D_{Alternative}$	-3.209***	-3.205***	-3.013***	-0.129**	-0.129**	-0.115**
	(0.000)	(0.000)	(0.000)	(0.016)	(0.017)	(0.033)
D_{Equity}	1.207***	1.210***	0.806*	-0.077*	-0.076*	-0.098**
	(0.001)	(0.001)	(0.062)	(0.055)	(0.060)	(0.026)
$D_{Fixed\ Income}$	-0.822**	-0.782*	0.192	0.073	0.080	0.193**
	(0.049)	(0.070)	(0.691)	(0.366)	(0.319)	(0.010)
$D_{Miscellaneous}$	-0.866	-0.855	-0.526	-0.064	-0.066	-0.032
	(0.254)	(0.270)	(0.568)	(0.379)	(0.374)	(0.691)
$D_{Money\ Market}$	-4.502***	-4.554***	-4.541***	-0.747***	-0.815***	-0.907***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Property}$	-1.964***	-1.808***	-3.278***	-0.086	-0.046	-0.333***
	(0.001)	(0.002)	(0.000)	(0.192)	(0.494)	(0.000)
$D_{Specialist}$	-2.845***	-2.830***	-2.318***	-0.238***	-0.249***	0.028
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.433)
R^2adj	0.194	0.194	0.188	0.295	0.302	0.347
N	5,328	5,352	6,048	5,314	5,352	6,048

Table A5. Regression results summarised in Table 6 Panel E. Sample: pension funds offered by providers who offer both IPP and GPP schemes and have PPBs common to both IPP and GPP schemes. Excess returns ($R\text{-}R_{TB}$) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R\text{-}R_{TB}$			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Const.	-1.039	-1.041	0.352	0.016	0.018	0.060
	(0.288)	(0.292)	(0.595)	(0.865)	(0.852)	(0.555)
$D_{individual}$	0.817***	0.819***	0.842***	0.056**	0.059**	0.075**
	(0.005)	(0.006)	(0.003)	(0.015)	(0.015)	(0.022)
$D_{external}$	1.086***	1.096***	0.567**	0.077***	0.076***	0.049**
	(0.002)	(0.002)	(0.020)	(0.007)	(0.008)	(0.040)
LnSize	0.128**	0.131**	0.097**	0.011**	0.012**	0.010**
	(0.012)	(0.011)	(0.015)	(0.018)	(0.014)	(0.028)
D_{UK}	0.523*	0.522*	0.286	0.030	0.030	0.018
	(0.068)	(0.077)	(0.393)	(0.378)	(0.401)	(0.644)
D_{nonUK}	-0.706	-0.723	0.224	-0.098	-0.099	-0.023
	(0.384)	(0.373)	(0.839)	(0.120)	(0.116)	(0.788)
D_{1995}	1.327***	1.262***	1.016***	0.118***	0.107***	0.107***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
D_{2004}	0.648**	0.648**	0.525**	0.050**	0.050**	0.046***
	(0.042)	(0.042)	(0.034)	(0.026)	(0.028)	(0.005)
D_{2008}	1.550***	1.551***	1.514***	0.244***	0.245***	0.235***
	(0.003)	(0.003)	(0.004)	(0.000)	(0.000)	(0.000)
$D_{Alternative}$	-2.683***	-2.671***	-2.450***	-0.044	-0.045	-0.031
	(0.000)	(0.000)	(0.000)	(0.352)	(0.349)	(0.541)
D_{Equity}	1.193***	1.208***	0.778*	-0.081*	-0.080*	-0.104**
	(0.002)	(0.002)	(0.078)	(0.068)	(0.074)	(0.039)
$D_{Fixed\ Income}$	-0.696*	-0.655	0.427	0.070	0.078	0.206***
	(0.095)	(0.127)	(0.387)	(0.362)	(0.314)	(0.007)
$D_{Miscellaneous}$	-0.482	-0.468	-0.102	-0.028	-0.031	0.007
	(0.559)	(0.574)	(0.918)	(0.717)	(0.704)	(0.936)
$D_{Money\ Market}$	-4.416***	-4.468***	-4.451***	-0.739***	-0.803***	-0.920***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Property}$	-2.025***	-1.858***	-3.363***	-0.107*	-0.066	-0.364***
	(0.000)	(0.000)	(0.000)	(0.061)	(0.243)	(0.000)
$D_{Specialist}$	-5.406***	-5.385***	-3.408***	-1.614***	-1.689***	-0.189***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
R^2adj	0.183	0.183	0.192	0.285	0.292	0.357
N	4,333	4,351	4,936	4,320	4,351	4,936

Table A6. Regression results summarised in Table 7. Sample: all pension funds separated into seven most numerous GBCG investment styles (as indicated in bold headings). Excess returns ($R\text{-}R_{TB}$) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R\text{-}R_{TB}$			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Equity						
Const.	-3.728**	-3.903**	-1.572	-0.301***	-0.308***	-0.151**
	(0.013)	(0.011)	(0.159)	(0.001)	(0.001)	(0.020)
D_{GPP}	1.239***	1.269***	1.232***	0.080***	0.081***	0.074***
	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)
$D_{external}$	1.906***	1.937***	0.967***	0.134***	0.135***	0.073***
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.001)
LnSize	0.291***	0.292***	0.237**	0.022***	0.023***	0.018***
	(0.003)	(0.003)	(0.010)	(0.000)	(0.000)	(0.002)
D_{UK}	1.615*	1.599*	1.164	0.100	0.099	0.071
	(0.064)	(0.068)	(0.184)	(0.116)	(0.120)	(0.261)
D_{nonUK}	-0.546	-0.570	-0.007	-0.087	-0.088	-0.041
	(0.675)	(0.660)	(0.997)	(0.360)	(0.351)	(0.723)
D_{1995}	1.707***	1.844***	0.775***	0.115***	0.120***	0.043***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
D_{2004}	0.114	0.116	0.292	0.013	0.013	0.029
	(0.841)	(0.838)	(0.487)	(0.669)	(0.663)	(0.211)
D_{2008}	2.642***	2.644***	2.737***	0.304***	0.305***	0.312***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
R^2adj	0.115	0.119	0.094	0.220	0.224	0.200
N	5,143	5,167	5,728	5,129	5,167	5,728
Fixed income						
Const.	-0.917	-0.793	0.383	-0.147	-0.091	0.061
	(0.219)	(0.307)	(0.608)	(0.498)	(0.683)	(0.783)
D_{GPP}	0.166	0.134	0.893*	-0.020	-0.030	0.028
	(0.526)	(0.636)	(0.054)	(0.582)	(0.383)	(0.270)
$D_{external}$	-0.384	-0.385	-0.330	-0.030	-0.033	-0.039
	(0.185)	(0.184)	(0.295)	(0.639)	(0.601)	(0.576)
LnSize	0.133***	0.141***	0.159***	0.021*	0.022*	0.023*
	(0.007)	(0.003)	(0.002)	(0.084)	(0.062)	(0.063)
D_{UK}	0.800*	0.817*	0.526*	0.080	0.081	0.042
	(0.060)	(0.059)	(0.086)	(0.255)	(0.260)	(0.449)
D_{nonUK}	-1.451	-1.455	-1.481	0.004	-0.001	0.022
	(0.304)	(0.301)	(0.308)	(0.987)	(0.995)	(0.927)
D_{1995}	1.259***	0.999***	1.449***	0.193***	0.119**	0.167***
	(0.000)	(0.001)	(0.003)	(0.000)	(0.012)	(0.002)
D_{2004}	1.711***	1.723***	0.570**	0.165***	0.167***	0.051*
	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	(0.096)
D_{2008}	-0.288	-0.288	-0.776	0.180*	0.180*	0.123
	(0.551)	(0.548)	(0.130)	(0.059)	(0.060)	(0.177)
R^2adj	0.190	0.182	0.164	0.170	0.152	0.080
N	1,183	1,191	1,406	1,182	1,191	1,406
Money Market						
Const.	-1.400***	-2.181***	-0.827	-0.137	-0.285	-0.334
	(0.003)	(0.005)	(0.490)	(0.763)	(0.511)	(0.284)
D_{GPP}	0.392**	0.401	0.513**	0.432***	0.515***	0.658***
	(0.042)	(0.106)	(0.034)	(0.001)	(0.002)	(0.000)
$D_{external}$	-0.093*	-0.052	-0.194	-0.368**	-0.360**	-0.443**
	(0.068)	(0.465)	(0.493)	(0.012)	(0.013)	(0.043)
LnSize	-0.008	0.001	-0.037	-0.018	-0.018	-0.031
	(0.528)	(0.954)	(0.554)	(0.511)	(0.455)	(0.126)
D_{UK}	0.806***	1.242***	0.590**	0.043	-0.072	0.223*
	(0.008)	(0.005)	(0.039)	(0.349)	(0.148)	(0.057)
D_{1995}	0.354	0.552	0.585**	-0.119	0.088	0.184
	(0.232)	(0.226)	(0.047)	(0.144)	(0.398)	(0.102)
D_{2004}	0.229	0.214	0.194	0.410*	0.407*	0.202
	(0.176)	(0.143)	(0.515)	(0.052)	(0.099)	(0.402)
D_{2008}	0.052	0.050	0.042	0.275	0.304	0.285
	(0.619)	(0.644)	(0.591)	(0.345)	(0.359)	(0.381)
R^2adj	0.222	0.259	0.130	0.140	0.184	0.153
N	180	185	311	179	185	311

Allocation						
Const.	-0.951	-1.127	-1.154	-0.022	-0.036	-0.044
	(0.183)	(0.148)	(0.157)	(0.803)	(0.683)	(0.581)
D_{GPP}	1.706***	1.707***	2.301***	0.039	0.040	0.079**
	(0.004)	(0.004)	(0.000)	(0.219)	(0.211)	(0.049)
$D_{external}$	0.634	0.663	0.586	0.019	0.021	0.013
	(0.151)	(0.144)	(0.129)	(0.681)	(0.660)	(0.769)
LnSize	0.152***	0.151***	0.157***	0.011***	0.011***	0.011***
	(0.000)	(0.000)	(0.000)	(0.006)	(0.006)	(0.003)
D_{UK}	-0.335	-0.361	-0.626***	-0.032	-0.031	-0.060**
	(0.265)	(0.264)	(0.005)	(0.238)	(0.249)	(0.041)
D_{nonUK}	0.547	0.532	0.579	-0.061	-0.062	-0.052
	(0.664)	(0.678)	(0.660)	(0.695)	(0.694)	(0.752)
D_{1995}	0.842***	1.019**	1.344***	0.128***	0.142***	0.154***
	(0.007)	(0.042)	(0.004)	(0.001)	(0.002)	(0.002)
D_{2004}	1.046**	1.036**	0.741*	0.139***	0.138***	0.133***
	(0.021)	(0.022)	(0.069)	(0.002)	(0.002)	(0.001)
D_{2008}	1.453***	1.458***	1.468***	0.274***	0.275***	0.280***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2adj	0.175	0.180	0.203	0.277	0.281	0.310
N	828	830	909	826	830	909
Alternative						
Const.	-1.406	-1.406	-0.574	-0.061	-0.048	0.125
	(0.391)	(0.391)	(0.569)	(0.909)	(0.929)	(0.780)
D_{GPP}	3.358***	3.358***	3.397***	0.925***	0.932***	0.992***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
$D_{external}$	-0.846	-0.846	-0.773	-0.007	-0.004	0.020
	(0.370)	(0.370)	(0.424)	(0.980)	(0.987)	(0.945)
LnSize	0.415***	0.415***	0.407***	0.056**	0.055**	0.050**
	(0.000)	(0.000)	(0.000)	(0.010)	(0.012)	(0.024)
D_{UK}	-1.607**	-1.607**	-1.707***	-0.504**	-0.514**	-0.597***
	(0.014)	(0.014)	(0.004)	(0.019)	(0.018)	(0.008)
D_{nonUK}	-0.791	-0.791	-0.959*	-0.143	-0.147	-0.196
	(0.142)	(0.142)	(0.068)	(0.441)	(0.434)	(0.322)
D_{2004}	-1.846	-1.846	-2.366***	-0.282	-0.284	-0.334**
	(0.114)	(0.114)	(0.000)	(0.202)	(0.204)	(0.026)
D_{2008}	0.055	0.055	-0.163	0.117	0.113	0.044
	(0.910)	(0.910)	(0.729)	(0.258)	(0.277)	(0.685)
R^2adj	0.287	0.287	0.293	0.251	0.249	0.241
N	136	136	137	136	136	137
Miscellaneous						
Const.	5.282*	5.668*	7.084**	-0.018	0.032	-0.013
	(0.077)	(0.062)	(0.014)	(0.964)	(0.941)	(0.978)
D_{GPP}	-0.345	-0.335	1.432	0.064	0.073	0.214*
	(0.706)	(0.726)	(0.108)	(0.584)	(0.562)	(0.090)
$D_{external}$	-0.403	-0.419	0.642	0.150	0.155	0.318
	(0.807)	(0.799)	(0.662)	(0.568)	(0.562)	(0.303)
LnSize	-0.149	-0.155	-0.187	0.007	0.006	0.010
	(0.321)	(0.307)	(0.194)	(0.743)	(0.782)	(0.689)
D_{UK}	-0.233	-0.214	-0.004	0.093	0.090	0.111
	(0.781)	(0.794)	(0.997)	(0.382)	(0.402)	(0.379)
D_{nonUK}	-2.419	-2.423	-1.892	-0.302	-0.299	-0.192
	(0.437)	(0.436)	(0.588)	(0.314)	(0.327)	(0.605)
D_{1995}	1.278*	0.982	0.090	0.158**	0.119*	0.072
	(0.063)	(0.181)	(0.845)	(0.014)	(0.092)	(0.173)
D_{2004}	-0.216	-0.201	-1.288*	0.023	0.022	-0.061
	(0.735)	(0.751)	(0.056)	(0.783)	(0.800)	(0.561)
D_{2008}	1.031	1.025	1.204	0.191	0.190	0.148
	(0.451)	(0.454)	(0.349)	(0.181)	(0.192)	(0.350)
R^2adj	0.119	0.110	0.166	0.259	0.236	0.228
N	100	100	103	100	100	103
Property						
Const.	1.411	1.563	-1.721	0.290	0.340	-0.307
	(0.467)	(0.381)	(0.300)	(0.411)	(0.298)	(0.297)
D_{GPP}	1.305***	2.064***	2.353***	0.354***	0.743***	0.464***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
$D_{external}$	0.330	0.399	-0.309	-0.193*	-0.187*	-0.322**

	(0.461)	(0.349)	(0.458)	(0.071)	(0.067)	(0.018)
LnSize	-0.032	-0.004	-0.010	-0.005	0.001	0.000
	(0.723)	(0.965)	(0.893)	(0.779)	(0.930)	(0.989)
D_{UK}	1.187**	1.353**	1.697***	0.158**	0.189**	0.244***
	(0.023)	(0.012)	(0.005)	(0.043)	(0.021)	(0.007)
D_{nonUK}	-9.274***	-9.137***	-8.725***	-1.109***	-1.094***	-1.056**
	(0.001)	(0.001)	(0.001)	(0.007)	(0.008)	(0.015)
D_{1995}	1.462***	0.732***	1.252***	0.291***	0.123***	0.210***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
D_{2004}	-2.363***	-2.390***	0.878*	-0.278**	-0.277**	0.384**
	(0.007)	(0.006)	(0.095)	(0.039)	(0.039)	(0.027)
D_{2008}	5.594***	5.555***	5.452***	0.879**	0.885**	0.898**
	(0.007)	(0.007)	(0.009)	(0.020)	(0.020)	(0.035)
R^2adj	0.653	0.615	0.611	0.531	0.510	0.520
N	118	119	174	117	119	174

Table A7. Regression results summarised in Table 8. Sample: pension funds with PPB returns separated into seven most numerous investment styles (as indicated in bold headings). Excess returns ($R\text{-}R_{TB}$) and Sharpe ratios (Sharpe) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	$R\text{-}R_{TB}$			Sharpe		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
Equity						
Const.	-3.055*	-3.204**	-1.125	-0.227**	-0.235**	-0.088
	(0.050)	(0.045)	(0.377)	(0.021)	(0.019)	(0.242)
D_{GPP}	1.280***	1.287***	1.111***	0.084***	0.083***	0.066***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.002)
$D_{external}$	1.919***	1.939***	0.907**	0.134***	0.135***	0.068***
	(0.000)	(0.000)	(0.011)	(0.000)	(0.000)	(0.003)
LnSize	0.249**	0.251***	0.205**	0.018***	0.018***	0.014**
	(0.010)	(0.009)	(0.032)	(0.007)	(0.006)	(0.020)
D_{UK}	1.653**	1.635*	1.164	0.102*	0.101*	0.070
	(0.049)	(0.052)	(0.179)	(0.090)	(0.095)	(0.253)
D_{nonUK}	-0.376	-0.397	0.250	-0.075	-0.076	-0.023
	(0.740)	(0.724)	(0.869)	(0.366)	(0.357)	(0.832)
D_{1995}	1.682***	1.787***	0.872***	0.111***	0.116***	0.046***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.006)
D_{2004}	0.241	0.244	0.399	0.020	0.020	0.034
	(0.679)	(0.676)	(0.347)	(0.526)	(0.518)	(0.170)
D_{2008}	2.246***	2.246***	2.341***	0.270***	0.270***	0.278***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
R^2adj	0.100	0.104	0.079	0.192	0.197	0.170
N	4,161	4,181	4,628	4,148	4,181	4,628
Fixed income						
Const.	0.011	0.026	1.029	0.044	0.081	0.215
	(0.988)	(0.968)	(0.223)	(0.822)	(0.675)	(0.296)
D_{GPP}	-0.008	-0.045	0.666	-0.059	-0.070*	-0.018
	(0.977)	(0.885)	(0.151)	(0.165)	(0.080)	(0.561)
$D_{external}$	-0.538*	-0.529*	-0.502	-0.072	-0.074	-0.081
	(0.091)	(0.097)	(0.116)	(0.267)	(0.253)	(0.264)
LnSize	0.087*	0.099**	0.126**	0.012	0.014	0.016
	(0.061)	(0.025)	(0.016)	(0.303)	(0.210)	(0.172)
D_{UK}	0.746*	0.760*	0.454	0.075	0.074	0.034
	(0.059)	(0.060)	(0.125)	(0.251)	(0.267)	(0.498)
D_{nonUK}	-0.965	-0.976	-0.965	0.049	0.046	0.080
	(0.413)	(0.407)	(0.444)	(0.783)	(0.797)	(0.690)
D_{1995}	1.257***	1.029***	1.525***	0.195***	0.129***	0.179***
	(0.000)	(0.001)	(0.002)	(0.000)	(0.007)	(0.002)
D_{2004}	1.709***	1.723***	0.599***	0.168***	0.170***	0.056*
	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	(0.073)
D_{2008}	-0.487	-0.489	-0.937*	0.127*	0.126	0.073
	(0.296)	(0.291)	(0.066)	(0.100)	(0.102)	(0.323)
R^2adj	0.181	0.171	0.147	0.146	0.129	0.059
N	962	967	1144	961	967	1144
Money Market						
Const.	-1.678***	-2.572***	-2.100	-0.241	-0.335	-0.420
	(0.004)	(0.002)	(0.138)	(0.754)	(0.662)	(0.388)
D_{GPP}	0.328**	0.322*	0.518***	0.406**	0.485**	0.668***
	(0.015)	(0.088)	(0.001)	(0.010)	(0.011)	(0.004)
$D_{external}$	0.014	0.084	0.138	-0.324**	-0.328**	-0.385**
	(0.870)	(0.517)	(0.526)	(0.028)	(0.028)	(0.013)
LnSize	0.005	0.021	0.030	-0.013	-0.016	-0.026
	(0.659)	(0.282)	(0.579)	(0.756)	(0.696)	(0.321)
D_{UK}	0.791**	1.222**	0.486**	0.045	-0.068	0.199*
	(0.015)	(0.010)	(0.044)	(0.158)	(0.102)	(0.080)
D_{1995}	0.404	0.619	0.539***	-0.093	0.106	0.159
	(0.210)	(0.217)	(0.003)	(0.421)	(0.512)	(0.139)
D_{2004}	0.196	0.182*	0.281	0.382*	0.376	0.218
	(0.125)	(0.080)	(0.227)	(0.065)	(0.126)	(0.260)
D_{2008}	0.046	0.037	0.055	0.285	0.320	0.305
	(0.202)	(0.338)	(0.390)	(0.249)	(0.269)	(0.232)
R^2adj	0.221	0.259	0.120	0.126	0.171	0.142
N	159	163	283	158	163	283

Allocation						
Const.	0.814*	0.516	0.524	0.180**	0.150**	0.148*
	(0.056)	(0.195)	(0.445)	(0.024)	(0.034)	(0.085)
D_{GPP}	1.382**	1.378**	1.961***	0.008	0.008	0.041
	(0.026)	(0.026)	(0.002)	(0.777)	(0.772)	(0.200)
$D_{external}$	0.507	0.517*	0.376	0.009	0.010	-0.005
	(0.106)	(0.099)	(0.164)	(0.785)	(0.761)	(0.880)
LnSize	0.072***	0.072***	0.075***	0.002	0.002	0.002
	(0.009)	(0.010)	(0.009)	(0.486)	(0.466)	(0.508)
D_{UK}	-1.034	-1.079	-1.281**	-0.108	-0.111	-0.136***
	(0.213)	(0.213)	(0.021)	(0.130)	(0.131)	(0.006)
D_{nonUK}	-0.373	-0.442	-0.443	-0.212	-0.216	-0.216
	(0.843)	(0.819)	(0.815)	(0.321)	(0.318)	(0.322)
D_{1995}	0.757**	1.041***	1.356**	0.118**	0.145***	0.159***
	(0.021)	(0.007)	(0.013)	(0.012)	(0.002)	(0.001)
D_{2004}	0.818*	0.817*	0.550	0.113**	0.112**	0.106***
	(0.096)	(0.095)	(0.130)	(0.022)	(0.022)	(0.003)
D_{2008}	1.060***	1.062***	1.126***	0.217***	0.217***	0.229***
	(0.005)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)
R^2adj	0.122	0.131	0.158	0.221	0.227	0.264
N	600	600	651	598	600	651
Alternative						
Const.	-2.331	-2.331	-1.353	-0.145	-0.123	0.129
	(0.274)	(0.274)	(0.409)	(0.814)	(0.844)	(0.814)
D_{GPP}	2.554***	2.554***	2.681***	0.899***	0.916***	1.056***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
$D_{external}$	-0.546	-0.546	-0.472	-0.019	-0.019	-0.009
	(0.638)	(0.638)	(0.691)	(0.951)	(0.952)	(0.976)
LnSize	0.452***	0.452***	0.436***	0.060***	0.059**	0.052**
	(0.002)	(0.002)	(0.002)	(0.010)	(0.011)	(0.026)
D_{UK}	-1.462**	-1.462**	-1.599***	-0.452**	-0.466**	-0.585***
	(0.025)	(0.025)	(0.010)	(0.015)	(0.015)	(0.005)
D_{nonUK}	-1.213	-1.213	-1.464*	-0.210	-0.217	-0.301
	(0.104)	(0.104)	(0.059)	(0.271)	(0.264)	(0.168)
D_{2004}	-1.753	-1.753	-2.273***	-0.256	-0.258	-0.312**
	(0.118)	(0.118)	(0.001)	(0.202)	(0.206)	(0.031)
D_{2008}	0.118	0.118	-0.100	0.142	0.136	0.052
	(0.790)	(0.790)	(0.819)	(0.202)	(0.227)	(0.679)
R^2adj	0.264	0.264	0.267	0.240	0.238	0.227
N	110	110	111	110	110	111
Miscellaneous						
Const.	5.354	5.822	8.639*	-0.382	-0.323	-0.396
	(0.220)	(0.201)	(0.084)	(0.487)	(0.590)	(0.578)
D_{GPP}	-0.916	-0.895	1.120	0.011	0.021	0.187
	(0.395)	(0.428)	(0.325)	(0.944)	(0.898)	(0.274)
$D_{external}$	0.018	-0.029	0.850	0.352	0.358	0.581
	(0.993)	(0.989)	(0.724)	(0.286)	(0.296)	(0.180)
LnSize	-0.125	-0.136	-0.246	0.030	0.028	0.033
	(0.618)	(0.597)	(0.375)	(0.324)	(0.377)	(0.381)
D_{UK}	-1.001	-0.972	-0.609	-0.011	-0.014	0.009
	(0.396)	(0.403)	(0.598)	(0.939)	(0.925)	(0.954)
D_{1995}	1.632***	1.339**	0.156	0.221***	0.179**	0.119
	(0.006)	(0.026)	(0.713)	(0.003)	(0.022)	(0.129)
D_{2004}	-0.307	-0.270	-1.219	-0.073	-0.075	-0.176
	(0.767)	(0.796)	(0.259)	(0.629)	(0.638)	(0.358)
D_{2008}	0.907	0.906	1.174	0.125	0.123	0.064
	(0.468)	(0.472)	(0.389)	(0.421)	(0.446)	(0.745)
R^2adj	0.245	0.230	0.196	0.283	0.253	0.245
N	82	82	84	82	82	84
Property						
Const.	0.861	0.417	-3.908	-0.030	-0.103	-0.806*
	(0.764)	(0.862)	(0.137)	(0.946)	(0.774)	(0.084)
D_{GPP}	2.102***	3.011***	3.839***	0.536***	0.974***	0.725***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{external}$	0.504	0.616	-0.208	-0.019	0.001	-0.161
	(0.478)	(0.346)	(0.706)	(0.857)	(0.994)	(0.158)
LnSize	-0.014	0.044	0.094	0.011	0.023	0.025

	(0.918)	(0.713)	(0.376)	(0.641)	(0.282)	(0.191)
D_{UK}	1.358*	1.564**	1.901**	0.191*	0.230**	0.272**
	(0.054)	(0.032)	(0.017)	(0.065)	(0.032)	(0.019)
D_{nonUK}	-8.946***	-8.795***	-8.400***	-0.975***	-0.956***	-0.941***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
D_{1995}	2.072***	1.371***	1.692***	0.393***	0.232***	0.273***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
D_{2004}	-2.833***	-2.871***	0.713**	-0.473***	-0.479***	0.244***
	(0.001)	(0.001)	(0.033)	(0.001)	(0.001)	(0.007)
D_{2008}	5.232***	5.188***	5.210***	0.736***	0.738***	0.784***
	(0.007)	(0.005)	(0.009)	(0.008)	(0.006)	(0.009)
R^2adj	0.729	0.667	0.618	0.602	0.569	0.542
N	100	101	149	99	101	149

Table A8. Regression results summarised in Table 9. Sample: all pension funds with PPB returns and seven most numerous GBCG investment styles (indicated in bold headings). The downside risk (DR) is the dependent variable. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
	All funds			**Equity**		
Const.	1.653***	1.658***	1.695***	1.647***	1.649***	1.657***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{GPP}	-0.018	-0.019	-0.026	0.000	-0.000	0.002
	(0.317)	(0.292)	(0.316)	(0.985)	(0.926)	(0.565)
$D_{external}$	-0.010	-0.009	-0.011	-0.008**	-0.008**	-0.003
	(0.177)	(0.190)	(0.390)	(0.019)	(0.016)	(0.350)
LnSize	-0.000	-0.000	0.001	-0.001**	-0.001**	-0.000
	(0.780)	(0.952)	(0.468)	(0.020)	(0.025)	(0.635)
D_{UK}	-0.016	-0.015	-0.037	-0.006	-0.006	-0.002
	(0.206)	(0.216)	(0.247)	(0.339)	(0.356)	(0.748)
D_{nonUK}	0.012**	0.012**	-0.001	0.013**	0.014**	0.007
	(0.044)	(0.041)	(0.941)	(0.028)	(0.026)	(0.268)
D_{1995}	-0.007	-0.015	-0.029**	-0.002	-0.004*	-0.005*
	(0.419)	(0.254)	(0.029)	(0.459)	(0.053)	(0.059)
D_{2004}	0.014***	0.015***	-0.010**	0.015***	0.015***	-0.003**
	(0.001)	(0.000)	(0.024)	(0.000)	(0.000)	(0.040)
D_{2008}	-0.008	-0.009	-0.010	0.005	0.005	0.002
	(0.364)	(0.354)	(0.281)	(0.260)	(0.265)	(0.535)
$D_{Alternative}$	0.026***	0.026***	0.027**			
	(0.005)	(0.005)	(0.045)			
$D_{Commodities}$	0.022**	0.022**	0.034**			
	(0.026)	(0.027)	(0.037)			
$D_{Convertibles}$	-0.018**	-0.018**	-0.018*			
	(0.019)	(0.029)	(0.080)			
D_{Equity}	-0.007	-0.007	-0.006			
	(0.156)	(0.131)	(0.377)			
$D_{Fixed\ Income}$	0.012	0.012	0.012			
	(0.421)	(0.428)	(0.525)			
$D_{Miscellaneous}$	-0.020	-0.021	-0.015			
	(0.531)	(0.521)	(0.658)			
$D_{Money\ Market}$	-0.869***	-0.852***	-0.596***			
	(0.000)	(0.000)	(0.000)			
$D_{Property}$	-0.290***	-0.301***	-0.177***			
	(0.000)	(0.000)	(0.000)			
$D_{Specialist}$	0.013**	0.013*	-0.061***			
	(0.043)	(0.050)	(0.000)			
R^2adj	0.610	0.586	0.415	0.089	0.089	0.019
N	7,718	7,758	8,800	5,143	5,167	5,728
	Fixed income			**Money Market**		
Const.	1.634***	1.645***	1.676***	0.478	0.260	0.436*
	(0.000)	(0.000)	(0.000)	(0.272)	(0.500)	(0.070)
D_{GPP}	0.021*	0.019*	0.009	-0.489***	-0.495***	-0.501***
	(0.074)	(0.085)	(0.322)	(0.000)	(0.000)	(0.003)
$D_{external}$	-0.009	-0.010	-0.008	0.110**	0.145***	0.099
	(0.548)	(0.520)	(0.520)	(0.024)	(0.008)	(0.387)
LnSize	0.000	-0.000	0.000	0.032	0.043	0.049**
	(0.972)	(0.996)	(0.903)	(0.189)	(0.110)	(0.016)
D_{UK}	-0.004	-0.004	-0.003	-0.237*	-0.143	-0.276*
	(0.793)	(0.795)	(0.840)	(0.063)	(0.196)	(0.069)
D_{nonUK}	-0.037	-0.037	-0.040			
	(0.370)	(0.369)	(0.309)			
D_{1995}	0.019**	0.010	-0.020***	0.063	-0.030	0.064
	(0.017)	(0.148)	(0.006)	(0.674)	(0.863)	(0.728)
D_{2004}	-0.001	-0.001	-0.012**	-0.021	0.001	-0.211**
	(0.818)	(0.835)	(0.033)	(0.809)	(0.994)	(0.041)
D_{2008}	0.003	0.003	0.009	-0.419***	-0.425***	-0.429***
	(0.712)	(0.723)	(0.325)	(0.003)	(0.004)	(0.004)
R^2adj	0.029	0.026	0.070	0.163	0.158	0.264
N	1,183	1,191	1,406	180	185	311

	Allocation			**Alternative**		
Const.	1.580***	1.589***	1.616***	1.765***	1.765***	1.797***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{GPP}	-0.009	-0.009	-0.005	-0.091**	-0.091**	-0.092**
	(0.255)	(0.248)	(0.551)	(0.023)	(0.023)	(0.023)
$D_{external}$	0.002	0.001	0.003	-0.071***	-0.071***	-0.071**
	(0.770)	(0.843)	(0.685)	(0.010)	(0.010)	(0.012)
LnSize	0.002**	0.002**	0.003***	-0.006***	-0.006***	-0.006***
	(0.015)	(0.011)	(0.000)	(0.001)	(0.001)	(0.002)
D_{UK}	0.000	0.001	-0.001	0.023	0.023	0.024
	(0.995)	(0.947)	(0.955)	(0.106)	(0.106)	(0.114)
D_{nonUK}	0.022	0.022	0.018	0.027*	0.027*	0.028*
	(0.191)	(0.196)	(0.295)	(0.062)	(0.062)	(0.067)
D_{1995}	0.016**	0.007	-0.008*			
	(0.017)	(0.244)	(0.079)			
D_{2004}	0.015***	0.015***	-0.006	0.039	0.039	0.003
	(0.004)	(0.004)	(0.163)	(0.271)	(0.271)	(0.942)
D_{2008}	0.014***	0.014***	0.009**	0.022*	0.022*	0.028**
	(0.001)	(0.001)	(0.017)	(0.051)	(0.051)	(0.035)
R^2adj	0.085	0.078	0.053	0.163	0.163	0.167
N	828	830	909	136	136	137
	Miscellaneous			**Property**		
Const.	1.298***	1.296***	1.245***	1.125***	1.169**	1.312***
	(0.005)	(0.005)	(0.005)	(0.010)	(0.011)	(0.001)
D_{GPP}	-0.030	-0.029	-0.037	-0.126***	-0.173***	-0.056**
	(0.471)	(0.478)	(0.351)	(0.001)	(0.001)	(0.025)
$D_{external}$	0.183	0.183	0.186	-0.008	-0.021	0.020
	(0.421)	(0.421)	(0.407)	(0.868)	(0.691)	(0.547)
LnSize	0.019	0.019	0.023	0.014	0.009	0.016*
	(0.414)	(0.413)	(0.323)	(0.235)	(0.430)	(0.062)
D_{UK}	-0.039	-0.038	-0.051	-0.121**	-0.129**	-0.088**
	(0.694)	(0.700)	(0.594)	(0.034)	(0.032)	(0.016)
D_{nonUK}	0.225	0.226	0.225	0.567***	0.560***	0.590***
	(0.255)	(0.254)	(0.245)	(0.007)	(0.008)	(0.005)
D_{1995}	0.004	0.005	0.022	-0.018***	0.027***	-0.032**
	(0.882)	(0.876)	(0.408)	(0.007)	(0.005)	(0.012)
D_{2004}	-0.060	-0.060	-0.067	0.208**	0.211**	-0.020
	(0.521)	(0.522)	(0.451)	(0.016)	(0.017)	(0.636)
D_{2008}	-0.130	-0.130	-0.145	-0.411**	-0.411**	-0.441**
	(0.387)	(0.387)	(0.333)	(0.029)	(0.031)	(0.020)
R^2adj	0.138	0.138	0.165	0.484	0.479	0.570
N	100	100	103	118	119	174

Table A9. Regression results summarised in Table 10. Sample: all pension funds with PPB returns and seven most numerous GBCG investment styles (as indicated in bold headings). The excess return on PPBs (R_{PPB}-R_{TB}) and the Sharpe ratios for the PPBs ($Sharpe_{PPB}$) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R_{PPB}-R_{TB}			$Sharpe_{PPB}$		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
All funds						
Const.	1.914*	1.815	3.448***	0.825**	0.825**	0.956***
	(0.081)	(0.104)	(0.000)	(0.015)	(0.014)	(0.004)
D_{GPP}	0.433*	0.443*	0.495**	0.145	0.146	0.111
	(0.060)	(0.055)	(0.023)	(0.139)	(0.133)	(0.296)
$D_{external}$	0.859***	0.870***	0.363	0.016	0.017	-0.041
	(0.001)	(0.001)	(0.111)	(0.582)	(0.555)	(0.329)
LnSize	0.054	0.054	0.048	-0.005	-0.004	-0.001
	(0.383)	(0.380)	(0.362)	(0.767)	(0.789)	(0.966)
D_{UK}	0.811*	0.805*	0.454	0.071	0.069	-0.005
	(0.084)	(0.086)	(0.362)	(0.449)	(0.461)	(0.959)
D_{nonUK}	0.246	0.223	0.657	-0.068	-0.071	0.027
	(0.857)	(0.869)	(0.708)	(0.609)	(0.591)	(0.890)
D_{1995}	0.537	0.633**	-0.255	-0.007	-0.015	-0.144**
	(0.116)	(0.045)	(0.184)	(0.875)	(0.751)	(0.031)
D_{2004}	0.236	0.236	0.057	0.112	0.112	0.108
	(0.522)	(0.520)	(0.831)	(0.107)	(0.105)	(0.107)
D_{2008}	1.361**	1.360**	1.309***	0.320***	0.319***	0.300***
	(0.011)	(0.011)	(0.009)	(0.000)	(0.000)	(0.001)
$D_{Alternative}$	-4.193***	-4.200***	-4.107***	3.546***	3.548***	3.588***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Commodities}$	-3.235**	-3.221**	-3.594*	-0.785***	-0.779***	-0.839***
	(0.044)	(0.044)	(0.066)	(0.000)	(0.000)	(0.001)
$D_{Convertibles}$	1.590***	1.581***	1.631***	-0.241	-0.237	-0.192
	(0.009)	(0.010)	(0.007)	(0.192)	(0.196)	(0.337)
D_{Equity}	0.268	0.254	-0.047	-0.551***	-0.551***	-0.562***
	(0.682)	(0.697)	(0.947)	(0.000)	(0.000)	(0.001)
$D_{Fixed\ Income}$	-1.051**	-1.036**	-0.009	-0.354**	-0.351**	-0.224
	(0.012)	(0.014)	(0.985)	(0.016)	(0.017)	(0.154)
$D_{Miscellaneous}$	-0.508	-0.513	-0.363	0.498	0.497	0.677
	(0.341)	(0.340)	(0.530)	(0.539)	(0.539)	(0.472)
$D_{Money\ Market}$	-4.623***	-4.563***	-4.516***	-0.753***	-0.761***	-0.465**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)
$D_{Property}$	-1.711***	-1.492**	-2.385***	-0.340**	-0.291**	-0.536***
	(0.004)	(0.011)	(0.000)	(0.017)	(0.040)	(0.001)
$D_{Specialist}$	-2.137***	-2.137***	-1.408***	1.873***	1.875***	1.767***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2adj	0.088	0.090	0.082	0.368	0.367	0.319
N	7,718	7,758	8,800	7,718	7,758	8,800
Equity						
Const.	0.257	0.007	1.940	-0.023	-0.039	0.123
	(0.840)	(0.996)	(0.108)	(0.824)	(0.712)	(0.175)
D_{GPP}	0.361	0.369	0.172	0.039**	0.039**	-0.028
	(0.287)	(0.270)	(0.522)	(0.022)	(0.015)	(0.621)
$D_{external}$	1.333***	1.351***	0.586**	0.067*	0.068**	-0.031
	(0.000)	(0.000)	(0.032)	(0.054)	(0.044)	(0.652)
LnSize	0.126	0.126	0.102	0.011	0.011	0.015
	(0.118)	(0.119)	(0.160)	(0.114)	(0.113)	(0.197)
D_{UK}	0.723	0.721	0.152	0.042	0.043	0.001
	(0.315)	(0.314)	(0.860)	(0.482)	(0.476)	(0.992)
D_{nonUK}	0.397	0.379	0.808	0.003	0.001	0.106
	(0.791)	(0.799)	(0.675)	(0.981)	(0.992)	(0.595)
D_{1995}	1.012*	1.254**	0.124	0.085**	0.099***	-0.067
	(0.072)	(0.012)	(0.571)	(0.012)	(0.004)	(0.357)
D_{2004}	0.107	0.108	0.121	0.028	0.029	0.031
	(0.832)	(0.831)	(0.736)	(0.491)	(0.487)	(0.151)
D_{2008}	1.532*	1.531*	1.666**	0.254***	0.253***	0.258***
	(0.059)	(0.059)	(0.024)	(0.002)	(0.002)	(0.001)
R^2adj	0.048	0.052	0.039	0.093	0.095	0.050
N	5,143	5,167	5,728	5,143	5,167	5,728

Fixed income						
Const.	1.420*	1.433*	3.400***	0.506*	0.519*	0.700***
	(0.056)	(0.056)	(0.000)	(0.062)	(0.064)	(0.009)
D_{GPP}	0.056	0.037	0.499*	-0.041	-0.046	-0.017
	(0.828)	(0.883)	(0.079)	(0.411)	(0.356)	(0.709)
$D_{external}$	-0.123	-0.124	-0.513	-0.013	-0.012	-0.043
	(0.671)	(0.667)	(0.149)	(0.830)	(0.837)	(0.414)
LnSize	0.075*	0.078**	0.099**	-0.002	-0.001	0.001
	(0.057)	(0.042)	(0.028)	(0.853)	(0.910)	(0.935)
D_{UK}	0.809	0.817	0.819*	0.033	0.035	0.027
	(0.133)	(0.130)	(0.091)	(0.759)	(0.745)	(0.793)
D_{nonUK}	-2.511*	-2.530*	-2.444*	-0.594	-0.606	-0.589
	(0.075)	(0.072)	(0.092)	(0.121)	(0.117)	(0.125)
D_{1995}	0.189	0.125	-0.272	-0.001	-0.027	-0.048
	(0.335)	(0.566)	(0.301)	(0.977)	(0.393)	(0.191)
D_{2004}	1.299***	1.304***	0.359**	0.165***	0.165***	0.079*
	(0.000)	(0.000)	(0.046)	(0.000)	(0.000)	(0.072)
D_{2008}	-0.013	-0.012	-0.527	0.214**	0.213**	0.148*
	(0.972)	(0.973)	(0.140)	(0.018)	(0.019)	(0.059)
R^2adj	0.154	0.156	0.201	0.098	0.097	0.052
N	1,183	1,191	1,406	1,183	1,191	1,406
Money Market						
Const.	-0.854	-0.910	0.120	-1.213**	-1.290*	-0.371
	(0.382)	(0.330)	(0.834)	(0.040)	(0.060)	(0.544)
D_{GPP}	0.078	0.090	0.001	-0.051*	-0.032***	-0.051
	(0.217)	(0.190)	(0.972)	(0.058)	(0.007)	(0.129)
$D_{external}$	0.287**	0.298**	0.139*	0.191*	0.230*	0.131
	(0.045)	(0.035)	(0.058)	(0.098)	(0.085)	(0.394)
LnSize	0.064	0.066	0.026	0.086**	0.094**	0.070
	(0.264)	(0.229)	(0.432)	(0.031)	(0.043)	(0.128)
D_{UK}	-0.393*	-0.390*	-0.543***	-0.322*	-0.422*	-0.788***
	(0.080)	(0.073)	(0.002)	(0.066)	(0.050)	(0.000)
D_{1995}	-0.097	-0.110	-0.038	-0.079	-0.097	-0.025
	(0.308)	(0.201)	(0.250)	(0.468)	(0.352)	(0.523)
D_{2004}	0.096	0.113	-0.042	0.127	0.139	0.005
	(0.640)	(0.595)	(0.751)	(0.569)	(0.588)	(0.981)
D_{2008}	-0.043	-0.042	-0.071	0.336	0.336	0.319
	(0.618)	(0.637)	(0.290)	(0.479)	(0.490)	(0.482)
R^2adj	0.232	0.270	0.598	0.153	0.181	0.396
N	180	185	311	180	185	311
Allocation						
Const.	6.881**	6.965***	7.287***	2.481***	2.470***	2.405***
	(0.012)	(0.009)	(0.003)	(0.004)	(0.004)	(0.001)
D_{GPP}	3.633***	3.631***	3.840***	-0.037	-0.037	-0.021
	(0.000)	(0.000)	(0.000)	(0.707)	(0.705)	(0.845)
$D_{external}$	0.492	0.504	0.584	0.136	0.135	0.219**
	(0.336)	(0.323)	(0.170)	(0.383)	(0.383)	(0.036)
LnSize	-0.255*	-0.256*	-0.209	-0.120***	-0.120***	-0.108***
	(0.083)	(0.081)	(0.116)	(0.005)	(0.005)	(0.005)
D_{UK}	1.829	1.809	1.608	1.505***	1.507***	1.334***
	(0.324)	(0.332)	(0.319)	(0.000)	(0.000)	(0.000)
D_{nonUK}	-0.528	-0.551	-0.659	-0.530*	-0.532*	-0.547*
	(0.687)	(0.682)	(0.619)	(0.073)	(0.073)	(0.057)
D_{1995}	-0.127	-0.208	-0.590***	-0.112	-0.104	-0.243
	(0.521)	(0.428)	(0.002)	(0.425)	(0.456)	(0.121)
D_{2004}	0.535	0.530	-0.169	0.116	0.117	0.106
	(0.109)	(0.113)	(0.591)	(0.637)	(0.634)	(0.641)
D_{2008}	2.274***	2.276***	2.326***	0.441*	0.440*	0.446
	(0.000)	(0.000)	(0.000)	(0.096)	(0.096)	(0.105)
R^2adj	0.119	0.118	0.102	0.171	0.171	0.160
N	828	830	909	828	830	909
Alternative						
Const.	1.620	1.620	0.879	1.910	1.910	2.005
	(0.426)	(0.426)	(0.589)	(0.238)	(0.238)	(0.213)
D_{GPP}	-0.059	-0.059	-0.020	-0.350	-0.350	-0.348
	(0.865)	(0.865)	(0.950)	(0.783)	(0.783)	(0.787)
$D_{external}$	1.402**	1.402**	1.424***	-2.114	-2.114	-2.115

	(0.010)	(0.010)	(0.009)	(0.113)	(0.113)	(0.118)
LnSize	0.051	0.051	0.040	0.073	0.073	0.066
	(0.648)	(0.648)	(0.708)	(0.195)	(0.195)	(0.259)
D_{UK}	-1.104**	-1.104**	-1.144**	-0.720**	-0.720**	-0.725*
	(0.045)	(0.045)	(0.030)	(0.042)	(0.042)	(0.050)
D_{nonUK}	0.485	0.485	0.663	-2.135***	-2.135***	-2.151***
	(0.400)	(0.400)	(0.259)	(0.003)	(0.003)	(0.005)
D_{2004}	-1.433	-1.433	-0.564	1.365	1.365	1.381
	(0.471)	(0.471)	(0.701)	(0.109)	(0.109)	(0.101)
D_{2008}	-0.747*	-0.747*	-0.738*	3.101***	3.101***	3.121***
	(0.056)	(0.056)	(0.066)	(0.006)	(0.006)	(0.009)
R^2adj	0.091	0.091	0.088	0.276	0.276	0.277
N	136	136	137	136	136	137
Miscellaneous						
Const.	1.471	1.434	1.841	-7.197***	-7.199***	-8.441***
	(0.540)	(0.551)	(0.491)	(0.005)	(0.004)	(0.006)
D_{GPP}	-0.569	-0.530	0.795	1.052	1.054	1.309
	(0.548)	(0.577)	(0.493)	(0.137)	(0.136)	(0.102)
$D_{external}$	-1.016	-1.006	0.457	0.433	0.434	0.639
	(0.452)	(0.457)	(0.760)	(0.411)	(0.411)	(0.275)
LnSize	0.084	0.079	0.110	0.384***	0.384***	0.449***
	(0.543)	(0.564)	(0.454)	(0.006)	(0.006)	(0.007)
D_{UK}	0.205	0.171	0.476	-0.288	-0.289	-0.402
	(0.764)	(0.803)	(0.481)	(0.562)	(0.561)	(0.474)
D_{nonUK}	-2.456	-2.474	-1.675	0.030	0.030	0.154
	(0.440)	(0.438)	(0.646)	(0.932)	(0.933)	(0.707)
D_{1995}	1.595**	1.703**	0.559	0.347	0.351	0.343
	(0.036)	(0.021)	(0.399)	(0.144)	(0.139)	(0.114)
D_{2004}	0.076	0.062	-0.917	2.565***	2.565***	3.038***
	(0.898)	(0.917)	(0.194)	(0.001)	(0.001)	(0.001)
D_{2008}	0.687	0.711	0.673	-1.640**	-1.639**	-2.060***
	(0.479)	(0.465)	(0.416)	(0.015)	(0.015)	(0.010)
R^2adj	0.149	0.152	0.136	0.740	0.740	0.747
N	100	100	103	100	100	103
Property						
Const.	4.706	5.670*	5.279	0.622	0.804	0.505
	(0.150)	(0.096)	(0.117)	(0.205)	(0.114)	(0.289)
D_{GPP}	0.503**	0.887**	0.453	0.116**	0.219***	0.079
	(0.046)	(0.013)	(0.228)	(0.015)	(0.003)	(0.213)
$D_{external}$	-0.236	-0.209	-0.300	-1.161***	-1.146***	-1.031***
	(0.677)	(0.704)	(0.646)	(0.001)	(0.001)	(0.002)
LnSize	-0.114	-0.103	-0.169	0.004	0.009	-0.008
	(0.420)	(0.449)	(0.278)	(0.862)	(0.647)	(0.736)
D_{UK}	1.364**	1.405**	0.468	0.303**	0.306**	0.103
	(0.022)	(0.019)	(0.238)	(0.013)	(0.011)	(0.169)
D_{nonUK}	-8.612***	-8.578***	-9.272***	-1.031***	-1.025***	-1.204***
	(0.001)	(0.001)	(0.001)	(0.007)	(0.008)	(0.004)
D_{1995}	1.339***	0.203**	-0.360*	0.065***	-0.214***	-0.089**
	(0.000)	(0.040)	(0.069)	(0.002)	(0.000)	(0.026)
D_{2004}	-3.630***	-3.671***	-1.210*	0.340**	0.331**	0.752***
	(0.002)	(0.002)	(0.076)	(0.023)	(0.025)	(0.004)
D_{2008}	5.911***	5.903***	6.184***	0.956**	0.955**	1.030**
	(0.007)	(0.007)	(0.009)	(0.015)	(0.015)	(0.017)
R^2adj	0.646	0.660	0.557	0.576	0.602	0.494
N	118	119	174	118	119	174

Table A10. TE Regression results summarised in Table 11. Sample: all pension funds with PPB returns and seven most numerous GBCG investment styles (as indicated in bold headings). The tracking error (TE) is the dependent variable. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2009-2015
	All funds			**Equity**		
Const.	8.106***	7.820***	7.539***	10.628***	10.367***	9.678***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{GPP}	-0.944***	-0.922***	-0.818***	-1.321***	-1.285***	-1.116***
	(0.000)	(0.001)	(0.004)	(0.000)	(0.001)	(0.004)
$D_{external}$	0.728***	0.770***	0.761***	0.870***	0.924***	0.934***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.003)	(0.002)
LnSize	-0.167***	-0.166***	-0.177***	-0.195***	-0.195***	-0.202***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{UK}	-0.155	-0.158	-0.009	-0.215	-0.233	-0.173
	(0.390)	(0.374)	(0.959)	(0.417)	(0.386)	(0.532)
D_{nonUK}	1.062**	1.084**	1.264**	1.029**	1.049**	1.233**
	(0.013)	(0.013)	(0.014)	(0.030)	(0.031)	(0.030)
D_{1995}	-0.997***	-0.756***	-0.220	-1.304***	-1.088***	-0.220
	(0.000)	(0.002)	(0.496)	(0.000)	(0.004)	(0.609)
D_{2004}	0.356**	0.350**	0.275	0.301	0.290	0.262
	(0.032)	(0.035)	(0.111)	(0.123)	(0.135)	(0.208)
D_{2008}	-1.274***	-1.271***	-1.391***	-1.386***	-1.383***	-1.475***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Alternative}$	-0.038	-0.041	0.043			
	(0.935)	(0.929)	(0.928)			
$D_{Commodities}$	5.032***	5.007***	4.898***			
	(0.000)	(0.000)	(0.000)			
$D_{Convertibles}$	1.242***	1.241***	1.293***			
	(0.000)	(0.000)	(0.000)			
D_{Equity}	1.797***	1.793***	1.782***			
	(0.000)	(0.000)	(0.000)			
$D_{Fixed\ Income}$	-1.245***	-1.245***	-0.949***			
	(0.001)	(0.001)	(0.004)			
$D_{Miscellaneous}$	0.769	0.799	0.820			
	(0.191)	(0.175)	(0.179)			
$D_{Money\ Market}$	-3.514***	-3.455***	-3.379***			
	(0.000)	(0.000)	(0.000)			
$D_{Property}$	2.723***	2.618***	2.204***			
	(0.000)	(0.000)	(0.000)			
$D_{Specialist}$	0.324	0.347	1.038***			
	(0.321)	(0.285)	(0.003)			
R^2adj	0.378	0.378	0.380	0.182	0.182	0.189
N	7,718	7,758	8,800	5,143	5,167	5,728
Fixed income				**Money Market**		
Const.	5.837***	5.542***	6.768***	5.618***	5.181**	4.696**
	(0.000)	(0.000)	(0.000)	(0.010)	(0.011)	(0.024)
D_{GPP}	-0.260	-0.255	-0.573	-0.237	-0.236	-0.616**
	(0.361)	(0.370)	(0.231)	(0.404)	(0.317)	(0.048)
$D_{external}$	0.459	0.450	0.330	-1.007	-1.004	-1.265*
	(0.300)	(0.296)	(0.522)	(0.106)	(0.113)	(0.092)
LnSize	-0.133***	-0.133***	-0.147***	-0.146**	-0.145**	-0.198**
	(0.001)	(0.001)	(0.000)	(0.019)	(0.022)	(0.042)
D_{UK}	0.059	0.060	0.357	-2.250***	-1.883***	-0.670**
	(0.838)	(0.828)	(0.271)	(0.005)	(0.005)	(0.038)
D_{nonUK}	-0.280	-0.325	-0.186			
	(0.224)	(0.156)	(0.541)			
D_{1995}	-0.555	-0.272	-0.967*	-0.205	-0.107	0.842
	(0.104)	(0.327)	(0.074)	(0.376)	(0.383)	(0.122)
D_{2004}	0.464	0.474	0.235	0.446	0.443	-0.078
	(0.163)	(0.144)	(0.461)	(0.448)	(0.427)	(0.796)
D_{2008}	-1.185***	-1.181***	-1.304***	-0.505	-0.515	-0.556*
	(0.000)	(0.000)	(0.000)	(0.146)	(0.135)	(0.063)
R^2adj	0.087	0.088	0.098	0.205	0.152	0.081
N	1,183	1,191	1,406	180	185	311

	Allocation			**Alternative**		
Const.	8.233***	7.901***	7.105***	9.025***	9.025***	10.138***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
D_{GPP}	1.215***	1.222***	1.947***	-0.037	-0.037	-0.040
	(0.009)	(0.010)	(0.000)	(0.893)	(0.893)	(0.884)
$D_{external}$	0.114	0.150	0.381	-0.533	-0.533	-0.506
	(0.587)	(0.496)	(0.143)	(0.488)	(0.488)	(0.508)
LnSize	-0.180**	-0.178**	-0.193**	0.052	0.052	0.041
	(0.010)	(0.011)	(0.015)	(0.583)	(0.583)	(0.667)
D_{UK}	0.558**	0.553**	0.555**	-0.599	-0.599	-0.595
	(0.041)	(0.046)	(0.012)	(0.226)	(0.226)	(0.252)
D_{nonUK}	3.021**	3.043**	3.194**	0.083	0.083	-0.012
	(0.032)	(0.031)	(0.028)	(0.915)	(0.915)	(0.988)
D_{1995}	-0.601	-0.325	0.599			
	(0.363)	(0.661)	(0.248)			
D_{2004}	0.119	0.119	0.047	-2.745	-2.745	-3.756*
	(0.685)	(0.684)	(0.879)	(0.192)	(0.192)	(0.079)
D_{2008}	-0.943***	-0.938***	-0.945***	-2.208***	-2.208***	-2.170***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)
R^2adj	0.106	0.105	0.137	0.286	0.286	0.322
N	828	830	909	136	136	137
	Miscellaneous			**Property**		
Const.	1.184	1.191	2.859	13.643**	12.404**	12.393***
	(0.659)	(0.657)	(0.331)	(0.019)	(0.025)	(0.009)
D_{GPP}	-0.069	-0.058	0.569	-2.256***	-2.554***	-2.290***
	(0.953)	(0.961)	(0.637)	(0.001)	(0.001)	(0.004)
$D_{external}$	1.597	1.598	1.319	5.503**	5.543**	4.972***
	(0.288)	(0.288)	(0.345)	(0.011)	(0.011)	(0.009)
LnSize	0.221*	0.219*	0.125	-0.391*	-0.375*	-0.389**
	(0.086)	(0.087)	(0.362)	(0.068)	(0.078)	(0.035)
D_{UK}	-2.294**	-2.309**	-2.291**	-1.265	-1.150	-0.746
	(0.024)	(0.022)	(0.028)	(0.198)	(0.232)	(0.285)
D_{nonUK}	-1.312	-1.321	-1.524	-4.203***	-4.110***	-3.802***
	(0.517)	(0.514)	(0.438)	(0.006)	(0.007)	(0.009)
D_{1995}	-0.284	-0.256	-0.600	-0.790***	0.024	0.199
	(0.797)	(0.813)	(0.575)	(0.003)	(0.774)	(0.192)
D_{2004}	0.499	0.494	0.813*	-2.489***	-2.429***	-1.763**
	(0.191)	(0.195)	(0.088)	(0.005)	(0.005)	(0.013)
D_{2008}	-0.562	-0.553	-0.445	1.660	1.631	1.292
	(0.549)	(0.554)	(0.645)	(0.123)	(0.131)	(0.200)
R^2adj	0.327	0.329	0.314	0.362	0.376	0.351
N	100	100	103	118	119	174

Table A11. Regression results summarised in Table 12. Sample: all pension funds with PPB returns and seven most numerous GBCG investment styles (indicated in bold headings). The excess returns above the returns earned by PPBs (R-R_{PPB}) and Modigliani-Modigliani measure (M^2) are the dependent variables. Standard errors are clustered by the ABI PC investment style classification. P-values are reported in the parenthesis. ***-1% significance, **-5% significance and *-10% significance.

	R-R_{PPB}			M^2		
	1986-2015	1996-2015	2007-2015	1986-2015	1996-2015	2007-2015
All funds						
Const.	-5.220***	-5.229***	-5.500***	-3.750***	-3.765***	-4.077***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{GPP}	0.540**	0.555**	0.798***	0.475**	0.496**	0.730***
	(0.024)	(0.020)	(0.001)	(0.041)	(0.033)	(0.001)
$D_{external}$	0.467**	0.475**	0.423**	0.436**	0.445**	0.413**
	(0.013)	(0.012)	(0.045)	(0.013)	(0.013)	(0.042)
LnSize	0.208***	0.208***	0.186***	0.141***	0.142***	0.124***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_{UK}	0.262	0.266	0.279	0.286	0.292	0.346
	(0.386)	(0.380)	(0.351)	(0.419)	(0.412)	(0.336)
D_{nonUK}	-0.784*	-0.769	-0.686	-0.724	-0.710	-0.635
	(0.096)	(0.102)	(0.160)	(0.206)	(0.214)	(0.294)
D_{1995}	0.718***	0.705***	1.163***	0.643**	0.629***	1.017***
	(0.009)	(0.003)	(0.000)	(0.011)	(0.004)	(0.000)
D_{2004}	0.105	0.103	0.266**	0.044	0.042	0.185*
	(0.341)	(0.350)	(0.016)	(0.732)	(0.741)	(0.075)
D_{2008}	0.570**	0.573**	0.551**	0.471**	0.473**	0.456**
	(0.015)	(0.015)	(0.012)	(0.029)	(0.029)	(0.022)
$D_{Alternative}$	0.745**	0.752**	0.882***	-1.312***	-1.303***	-1.203***
	(0.021)	(0.019)	(0.006)	(0.000)	(0.000)	(0.000)
$D_{Commodities}$	-9.284***	-9.289***	-9.385***	-6.714***	-6.776***	-6.782***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{Convertibles}$	-1.691***	-1.681***	-1.734***	-0.556**	-0.542**	-0.535*
	(0.000)	(0.000)	(0.000)	(0.044)	(0.049)	(0.093)
D_{Equity}	0.902**	0.913**	0.934**	0.472	0.484	0.545
	(0.050)	(0.046)	(0.033)	(0.310)	(0.297)	(0.235)
$D_{Fixed\ Income}$	0.113	0.109	0.082	-0.035	-0.038	0.027
	(0.734)	(0.740)	(0.805)	(0.883)	(0.875)	(0.915)
$D_{Miscellaneous}$	-0.466	-0.441	-0.129	-0.956*	-0.934*	-0.684
	(0.204)	(0.238)	(0.723)	(0.082)	(0.093)	(0.255)
$D_{Money\ Market}$	-0.126	-0.176	0.021	-0.208	-0.284	-0.131
	(0.764)	(0.671)	(0.956)	(0.595)	(0.459)	(0.672)
$D_{Property}$	-0.296	-0.358	-0.810***	0.037	-0.003	-0.620***
	(0.348)	(0.248)	(0.008)	(0.882)	(0.991)	(0.007)
$D_{Specialist}$	0.893***	0.904***	0.707**	-0.813***	-0.801***	-0.551**
	(0.007)	(0.006)	(0.020)	(0.000)	(0.001)	(0.014)
R^2adj	0.057	0.058	0.074	0.053	0.053	0.068
N	7,718	7,758	8,800	7,718	7,758	8,800
Equity						
Const.	-4.580***	-4.443***	-4.410***	-4.184***	-4.051***	-4.042***
	(0.000)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)
D_{GPP}	1.022***	1.039***	1.232***	0.896***	0.916***	1.109***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
$D_{external}$	0.809***	0.813***	0.651**	0.817***	0.820***	0.735***
	(0.002)	(0.002)	(0.035)	(0.000)	(0.000)	(0.005)
LnSize	0.200***	0.201***	0.178***	0.173***	0.174***	0.153***
	(0.001)	(0.001)	(0.005)	(0.000)	(0.000)	(0.000)
D_{UK}	0.772	0.756	0.770	0.556	0.543	0.592
	(0.176)	(0.184)	(0.216)	(0.427)	(0.438)	(0.430)
D_{nonUK}	-0.840	-0.831	-0.744	-0.803	-0.796	-0.724
	(0.119)	(0.124)	(0.186)	(0.217)	(0.223)	(0.296)
D_{1995}	0.680	0.524	0.786***	0.642	0.491	0.716***
	(0.110)	(0.127)	(0.000)	(0.117)	(0.145)	(0.004)
D_{2004}	-0.015	-0.015	0.159	0.016	0.017	0.174
	(0.913)	(0.914)	(0.245)	(0.912)	(0.911)	(0.130)
D_{2008}	1.022***	1.024***	0.977***	0.727**	0.728**	0.681**
	(0.002)	(0.002)	(0.002)	(0.026)	(0.026)	(0.026)
R^2adj	0.079	0.077	0.078	0.064	0.063	0.065
N	5,143	5,167	5,728	5,143	5,167	5,728

Fixed income						
Const.	-2.085***	-2.307***	-3.146***	-1.807*	-2.023**	-2.551**
	(0.010)	(0.004)	(0.001)	(0.056)	(0.031)	(0.013)
D_{GPP}	0.051	0.093	0.410	0.127	0.170	0.425*
	(0.759)	(0.564)	(0.180)	(0.397)	(0.267)	(0.075)
$D_{external}$	-0.295	-0.273	0.037	-0.305	-0.281	-0.081
	(0.267)	(0.306)	(0.906)	(0.333)	(0.372)	(0.811)
LnSize	0.067*	0.069**	0.060*	0.065	0.068	0.058
	(0.060)	(0.048)	(0.051)	(0.160)	(0.132)	(0.187)
D_{UK}	0.131	0.108	-0.087	0.065	0.041	-0.084
	(0.486)	(0.584)	(0.784)	(0.608)	(0.760)	(0.716)
D_{nonUK}	1.089	1.087	1.044	0.411	0.410	0.599
	(0.427)	(0.429)	(0.431)	(0.302)	(0.304)	(0.307)
D_{1995}	0.573**	0.757***	1.615***	0.542***	0.705***	1.398***
	(0.013)	(0.004)	(0.002)	(0.001)	(0.000)	(0.000)
D_{2004}	0.375**	0.375**	0.310	0.061	0.062	-0.123
	(0.012)	(0.012)	(0.101)	(0.653)	(0.650)	(0.626)
D_{2008}	-0.181*	-0.179*	-0.130	0.286*	0.288*	0.367**
	(0.053)	(0.059)	(0.242)	(0.063)	(0.062)	(0.042)
R^2adj	0.054	0.058	0.155	0.037	0.040	0.084
N	1,183	1,191	1,406	1,183	1,191	1,406
Money Market						
Const.	-0.607	-1.269	-0.947	1.325	0.454	0.075
	(0.556)	(0.270)	(0.355)	(0.155)	(0.543)	(0.785)
D_{GPP}	0.328	0.315	0.511**	0.283*	0.268	0.383*
	(0.117)	(0.242)	(0.026)	(0.065)	(0.271)	(0.099)
$D_{external}$	-0.366**	-0.350*	-0.333	-0.352*	-0.351*	-0.306**
	(0.047)	(0.067)	(0.235)	(0.054)	(0.096)	(0.015)
LnSize	-0.070	-0.065	-0.064	-0.129*	-0.129*	-0.111**
	(0.331)	(0.367)	(0.277)	(0.075)	(0.099)	(0.016)
D_{UK}	1.171***	1.639***	1.133***	0.547**	1.297***	1.118***
	(0.001)	(0.000)	(0.007)	(0.035)	(0.005)	(0.000)
D_{1995}	0.485*	0.651	0.623**	0.303***	0.520*	0.610***
	(0.069)	(0.132)	(0.046)	(0.003)	(0.086)	(0.001)
D_{2004}	0.127	0.102	0.236	-0.093***	-0.121	-0.009
	(0.127)	(0.367)	(0.251)	(0.009)	(0.229)	(0.729)
D_{2008}	0.105*	0.093*	0.113*	0.067	0.047	0.051
	(0.076)	(0.058)	(0.071)	(0.715)	(0.815)	(0.793)
R^2adj	0.290	0.314	0.235	0.193	0.234	0.276
N	180	185	311	180	185	311
Allocation						
Const.	-7.859***	-8.114***	-8.441***	-4.527***	-4.759***	-5.048***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
D_{GPP}	-1.924***	-1.924***	-1.539***	-0.984***	-0.983***	-0.355**
	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	(0.045)
$D_{external}$	0.154	0.155	0.002	0.020	0.020	-0.158
	(0.426)	(0.416)	(0.995)	(0.902)	(0.903)	(0.583)
LnSize	0.406***	0.407***	0.366***	0.207***	0.209***	0.179***
	(0.003)	(0.003)	(0.005)	(0.000)	(0.000)	(0.000)
D_{UK}	-2.158	-2.168	-2.234	-0.466	-0.489	-0.781
	(0.198)	(0.193)	(0.171)	(0.308)	(0.279)	(0.156)
D_{nonUK}	1.084	1.081	1.238	1.747***	1.748***	1.938***
	(0.236)	(0.237)	(0.204)	(0.000)	(0.000)	(0.000)
D_{1995}	1.001***	1.246***	1.934***	0.898***	1.103***	1.510***
	(0.007)	(0.001)	(0.000)	(0.002)	(0.000)	(0.000)
D_{2004}	0.508	0.509	0.910***	0.533	0.536	1.013***
	(0.128)	(0.125)	(0.003)	(0.104)	(0.101)	(0.001)
D_{2008}	-0.820***	-0.818***	-0.858***	-0.818***	-0.819***	-0.815**
	(0.000)	(0.000)	(0.000)	(0.008)	(0.008)	(0.017)
R^2adj	0.082	0.083	0.079	0.140	0.142	0.137
N	828	830	909	828	830	909
Alternative						
Const.	-3.026***	-3.026***	-1.453	1.145	1.145	1.945
	(0.009)	(0.009)	(0.280)	(0.354)	(0.354)	(0.196)
D_{GPP}	3.417***	3.417***	3.417***	-0.163	-0.163	-0.227
	(0.001)	(0.001)	(0.001)	(0.295)	(0.295)	(0.158)
$D_{external}$	-2.248*	-2.248*	-2.197*	-1.673***	-1.673***	-1.697***

	(0.070)	(0.070)	(0.082)	(0.007)	(0.007)	(0.006)
LnSize	0.364***	0.364***	0.367***	0.019	0.019	0.024
	(0.003)	(0.003)	(0.003)	(0.848)	(0.848)	(0.807)
D_{UK}	-0.503	-0.503	-0.563	1.627***	1.627***	1.714***
	(0.226)	(0.226)	(0.182)	(0.005)	(0.005)	(0.004)
D_{nonUK}	-1.276*	-1.276*	-1.622**	-0.996	-0.996	-1.260*
	(0.077)	(0.077)	(0.035)	(0.117)	(0.117)	(0.065)
D_{2004}	-0.413	-0.413	-1.802	-2.047***	-2.047***	-2.737***
	(0.709)	(0.709)	(0.314)	(0.000)	(0.000)	(0.001)
D_{2008}	0.802	0.802	0.575	0.561*	0.561*	0.397
	(0.297)	(0.297)	(0.430)	(0.089)	(0.089)	(0.245)
R^2adj	0.209	0.209	0.208	0.158	0.158	0.183
N	136	136	137	136	136	137
Miscellaneous						
Const.	3.091	3.211	5.243*	5.032***	5.147***	7.175***
	(0.131)	(0.121)	(0.057)	(0.003)	(0.003)	(0.002)
D_{GPP}	0.155	0.061	0.638	-0.151	-0.234	0.296
	(0.914)	(0.966)	(0.614)	(0.905)	(0.854)	(0.797)
$D_{external}$	0.553	0.527	0.185	0.379	0.358	0.063
	(0.687)	(0.704)	(0.911)	(0.705)	(0.724)	(0.961)
LnSize	-0.239**	-0.230**	-0.296**	-0.339***	-0.330***	-0.402***
	(0.019)	(0.023)	(0.027)	(0.000)	(0.000)	(0.000)
D_{UK}	-0.307	-0.235	-0.480	-0.216	-0.148	-0.385
	(0.562)	(0.659)	(0.236)	(0.738)	(0.820)	(0.507)
	0.069	0.104	-0.218	-0.023	0.012	-0.297
	(0.940)	(0.909)	(0.830)	(0.976)	(0.987)	(0.724)
D_{1995}	0.462	0.197	-0.470	0.323	0.068	-0.547
	(0.448)	(0.774)	(0.470)	(0.596)	(0.920)	(0.424)
D_{2004}	-0.180	-0.149	-0.371	-1.052	-1.028	-1.368*
	(0.832)	(0.861)	(0.637)	(0.183)	(0.192)	(0.054)
D_{2008}	0.262	0.207	0.530	1.185	1.138	1.580**
	(0.754)	(0.807)	(0.485)	(0.141)	(0.163)	(0.041)
R^2adj	0.194	0.182	0.187	0.396	0.389	0.393
N	100	100	103	100	100	103
Property						
Const.	-3.178**	-4.107**	-7.000***	0.393	-0.083	-3.568**
	(0.044)	(0.029)	(0.009)	(0.566)	(0.904)	(0.039)
D_{GPP}	0.905***	1.177***	1.900***	0.818***	1.758***	2.258***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
$D_{external}$	0.561*	0.609*	-0.008	2.245***	2.242***	1.415**
	(0.055)	(0.061)	(0.978)	(0.001)	(0.001)	(0.017)
LnSize	0.080	0.100	0.158*	-0.096*	-0.096*	-0.014
	(0.210)	(0.168)	(0.085)	(0.055)	(0.061)	(0.815)
D_{UK}	-0.168**	-0.052	1.229***	-0.755***	-0.679***	1.057***
	(0.046)	(0.467)	(0.001)	(0.001)	(0.002)	(0.004)
D_{nonUK}	-0.654***	-0.559***	0.547***	-2.889***	-2.829***	-1.340***
	(0.000)	(0.001)	(0.004)	(0.000)	(0.000)	(0.002)
D_{1995}	0.028	0.529***	1.612***	0.778***	1.206***	1.863***
	(0.460)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
D_{2004}	1.267***	1.281***	2.088***	-1.310***	-1.307***	0.026
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.818)
D_{2008}	-0.321**	-0.349**	-0.733**	1.697***	1.672***	1.244***
	(0.012)	(0.018)	(0.028)	(0.001)	(0.001)	(0.010)
R^2adj	0.121	0.133	0.354	0.203	0.200	0.351
N	118	119	174	118	119	174