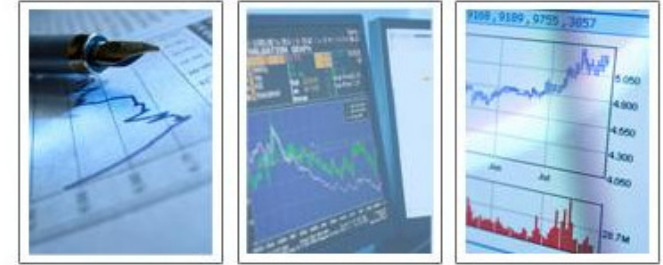


PORTFOLIO
EVALUATION
LIMITED

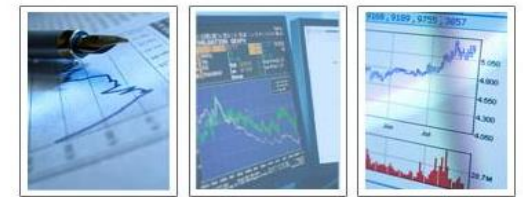


Specialists in Investment Risk and Return Evaluation

Quarterly Risk and Return Analysis
Total Fund

Worcestershire County Council Pension Fund

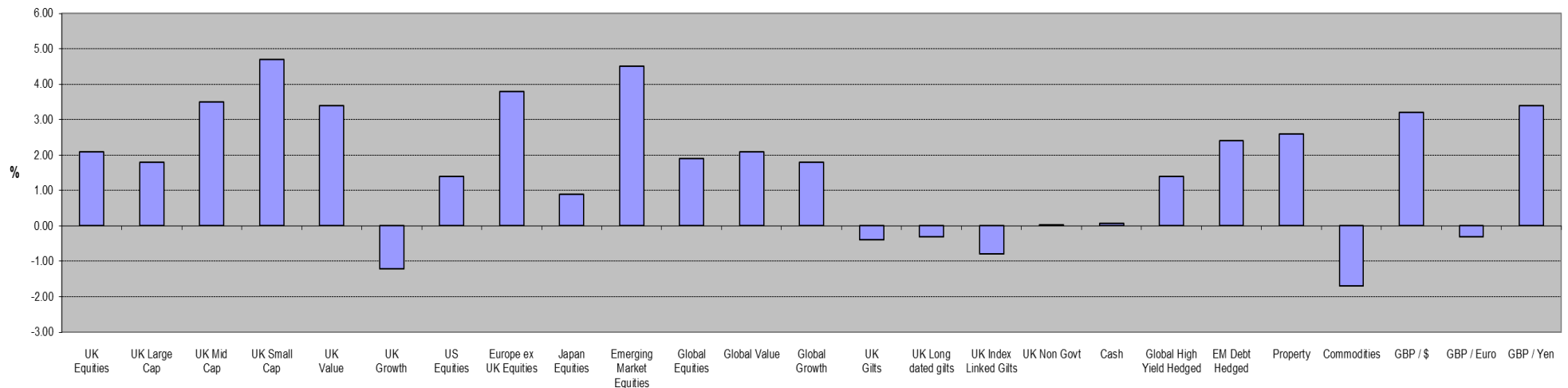
Period ending 30th September 2017

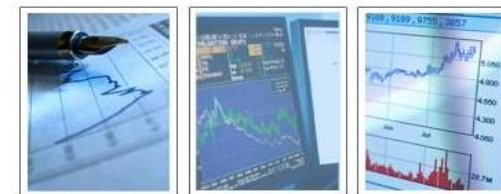


Portfolio Evaluation Ltd Market Commentary Q3 2017 (Sterling)

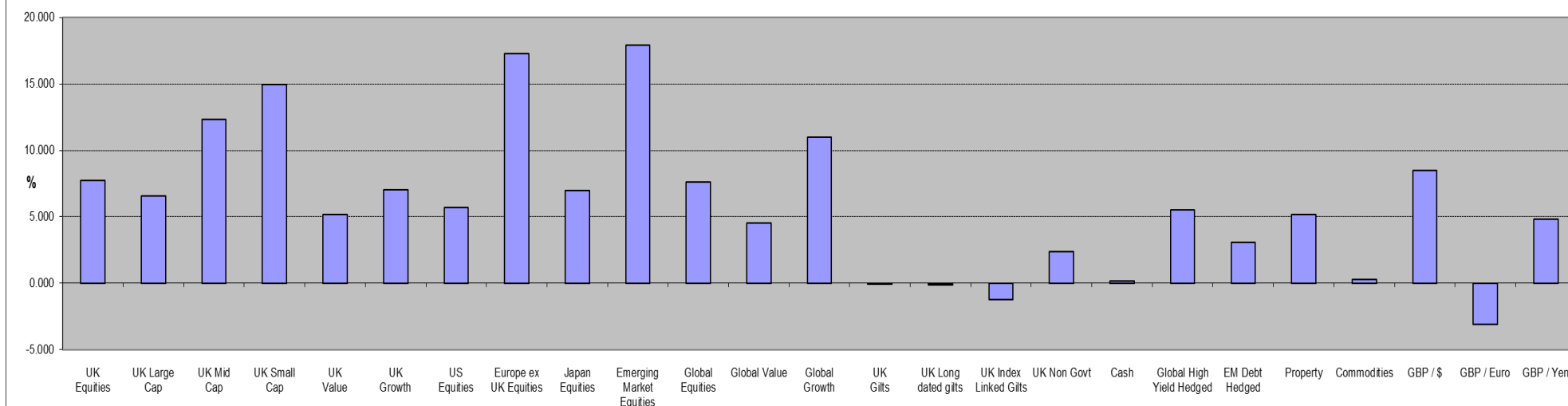
Global equity markets continued to rise in the third quarter of 2017. The increase in global equity markets over the year to date has been due to the world benefiting from continued sustained economic growth. It would appear that many equity indices are expected to increase further given the continued outlook for economic growth. The one exception to the global economic growth story is the UK that appears to be beginning to be influenced by Brexit. This is impacting in a number of areas, inflation reached 3% for the year ended 30th September 2017 (significantly due to currency depreciation) and will probably result in increased interest rates in October / November. Additionally consumer demand is being hindered by low salary growth whilst economic growth is hindered because of low productivity (a structural issue) and low investment activity (largely due to uncertainty caused by Brexit). Inflation in the U.S. appears to be inside market norms whilst the Eurozone continues to have low inflation pointing (when considered with everything else) to continuing economic growth possibilities. There are few pressures on interest rates outside of the UK although the U.S. is expected to raise rates over time as QE is unwound; interestingly Eurozone QE is still expected to continue as there is still room for considerable economic expansion. Within emerging markets, despite the negative returns of September, the outlook also remains positive according to many market commentators. Market volatility has continued to be low, as has macro volatility (e.g. unemployment etc.).

Quarterly Investment Returns for the period ended 30th September 2017





YTD Investment Returns for the period ended 30th September 2017



In Q3 2017 equity markets have risen with Europe being the stand out performer (particularly in mid and small cap stocks) together with emerging market equities, however the UK has also increased. Momentum style has outperformed for both the quarter and year to date. Bond yields have been largely flat resulting in low returns for this asset class. Surprisingly (to many commentators) bond yields have remained 'soft' and have not risen as expected.

With the exception of the UK (because of Brexit) the risks to the positive economic outlook appear benign in the current environment however geo political risk continues. In Europe the political risks have reduced with the re-election of Merkel. Globally the risks seem to be from China who may tighten monetary policy and become more nationalistic. The US government could also derail things as they may also become more nationalistic.

Given this backdrop our institutional clients seem to adopting more LDI based strategies, factor based equity investing and increasing exposure to alternative asset classes such as infrastructure and Private Debt.

For further information

If you would like further information about the topics contained in this newsletter or would like to discuss your investment performance requirements please contact Nick Kent or Deborah Barlow Tel: +44 (0)113 242 9381 (e-mail: nick.kent@portfolioevaluation.net) or visit our website at www.portfolioevaluation.net. Please note that all numbers, comments and ideas contained in this document are for information purposes only and as such are not investment advice in any form. Please remember that past performance is not a guide to future performance.

Worcestershire County Council Pension Fund - Commentary

Period ending 30th Sept 2017

QUARTERLY SUMMARY: **Worcestershire County Council Pension Fund** **Return: 2.6%** **Benchmark Return: 2.1%** **Excess Return: 0.5%**

- The Fund achieved a total return of 2.6%. Equity assets were the highest returning asset class (returning 2.9%), followed by Corporate Bonds and Infrastructure returning 1.3% and 1.1% respectively. Property assets were the lowest returning assets over the quarter at 0.9%.
- The Fund had a successful quarter, outperforming its benchmark by 0.5%. This was dominated by the successful active equity pool generating a total return of 4.6% and the three underlying managers all outperforming their respective benchmarks.
- Asset allocation proved a minor drag on excess performance as whilst the Fund is overweight the higher returning equity assets and underweight the lower returning bonds, within equities, the drag was caused by the Fund being overweight the Far East Developed which, versus all other equity index returns, was by far the lowest returning at 0.6%. Being underweight Europe also caused a drag as Europe over the quarter was a reasonably high returning region.
- All index funds tracked their benchmarks as expected.
- Please note that for Green Investment Bank and Walton Street returns are not available for the current quarter as data is lagged by the manager. The negative return generated by Walton is due to the USD movement.

YEAR SUMMARY AND LONGER: **Worcestershire County Council Pension Fund** **Return: 13.8%** **Benchmark Return: 12.6%** **Excess Return: 1.2%**

- Over the year the Fund has generated a return of 13.8% outperforming the benchmark by 1.2%. The total return was dominated by higher returning equity assets (+15.2% return). This was followed by Infrastructure assets generating 9.8%, and then Property assets at 5.8%. Bonds were the lowest return generators at 2.1%.
- Stock selection was the dominant contributor and primarily due to the successful outperforming active equity managers. The outperformance generated by JPM Emerging Markets Fund was quite considerable at +5.8% excess.
- Asset allocation over the year was also positive due to being underweight the low returning bond asset class; although similarly to the quarter, European equities were a drag on asset allocation again due to the Fund being underweight in this highest returning asset class over the year.
- Over the one, three and five year periods the Fund has outperformed. The Fund over the past thirty six monthly return observations (3 year period) has outperformed its benchmark for 21 monthly observations (versus 15 of underperformance). It has also generated a higher average excess return when outperforming (+0.22% excess versus -0.15%). It has notably performed better when markets are positive; outperforming for more observations than underperforming and also returning a higher average excess return when outperforming. This pattern is also repeated over the five year period.
- The Total Risk of the Fund is consistent with that of a typical multi asset class Fund. Active risk is also consistent with a typical multi asset class Fund that uses both passive and active strategies.

Client: Worcestershire County Council Pension Fund
 Manager: Multi-manager
 Mandate: Total Fund
 Asset Class: Combined Assets
 Benchmark: Worcestershire Total Fund Index
 Inception: 31-Mar-1987
 Mkt Val: £2.7bn

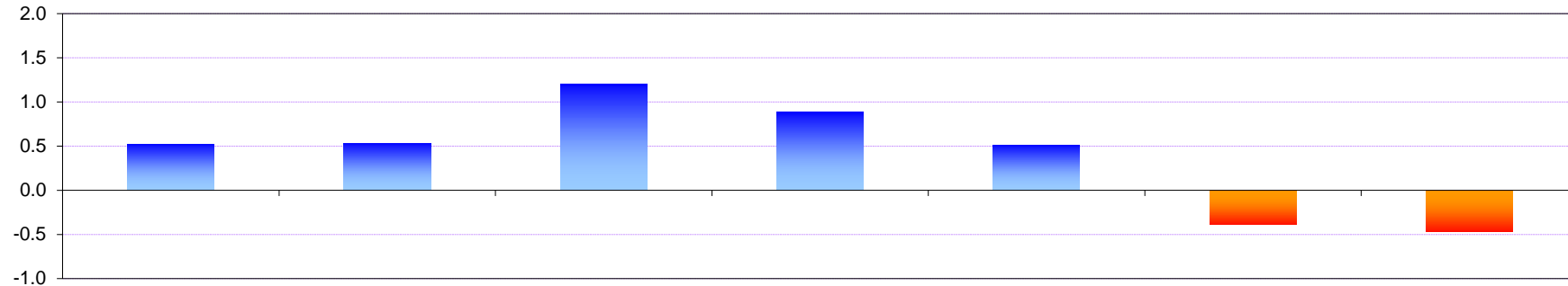
Total Fund Overview

Total Fund

Report Period: Quarter Ending September 2017



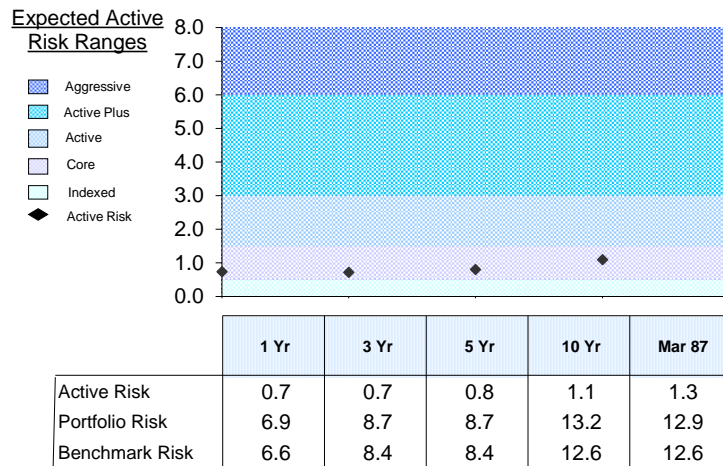
Excess Return Analysis (%)



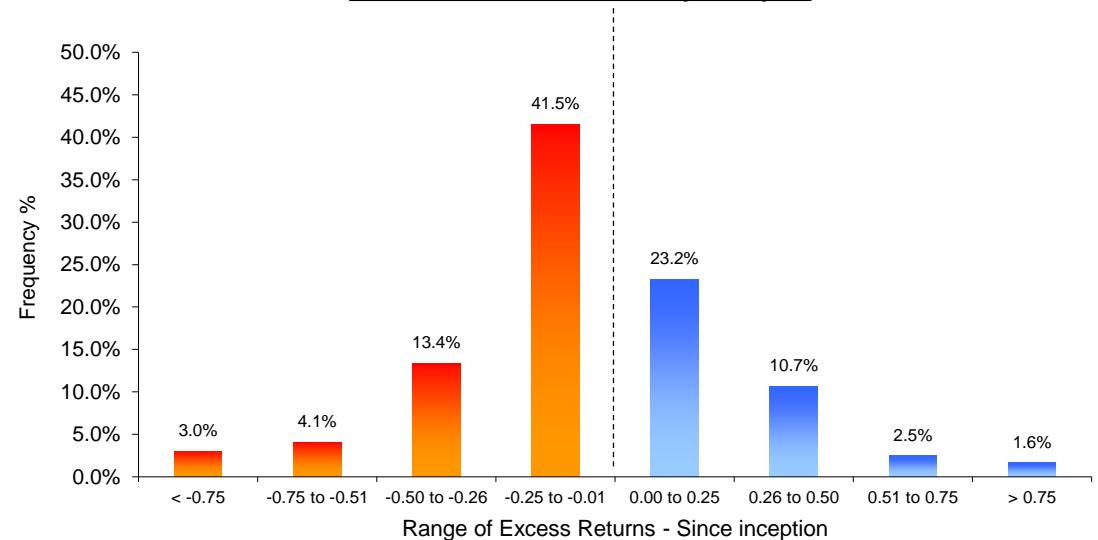
	QTR	YTD	1 Yr	3 Yr	5 Yr	10Yr	Since Mar 87 (p.a.)
Portfolio Return	2.6	3.9	13.8	12.2	12.0	6.7	8.2
Benchmark Return	2.1	3.4	12.6	11.4	11.5	7.1	8.7
Excess Return	0.5	0.5	1.2	0.9	0.5	-0.4	-0.5

All returns for periods in excess of 1 year are annualised.

Ex-Post Active Risk Analysis (%)



Excess Return Consistency Analysis

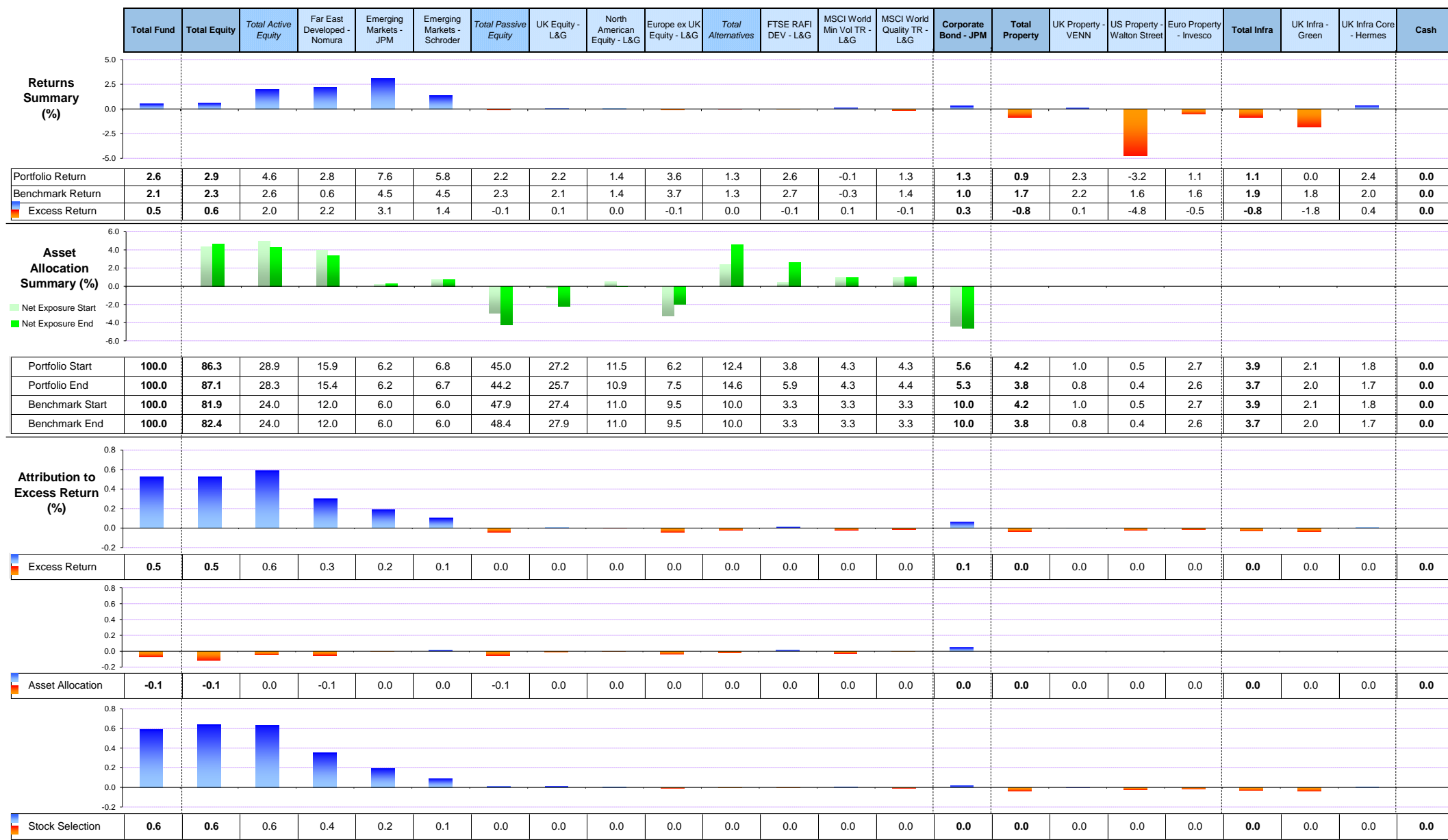


Ex-Post Active Risk measures the volatility of the actual excess returns achieved by the Portfolio/Fund.

Excess Return Consistency Analysis measures the frequency of the Portfolio/Fund's outperformance (Blue) and underperformance (Red) versus its benchmark, calculated using monthly (or quarterly if indicated) returns since inception.

**Attribution to Total Fund Excess Return Analysis
Worcestershire County Council Pension Fund
for Quarter Ended 30th September 2017**

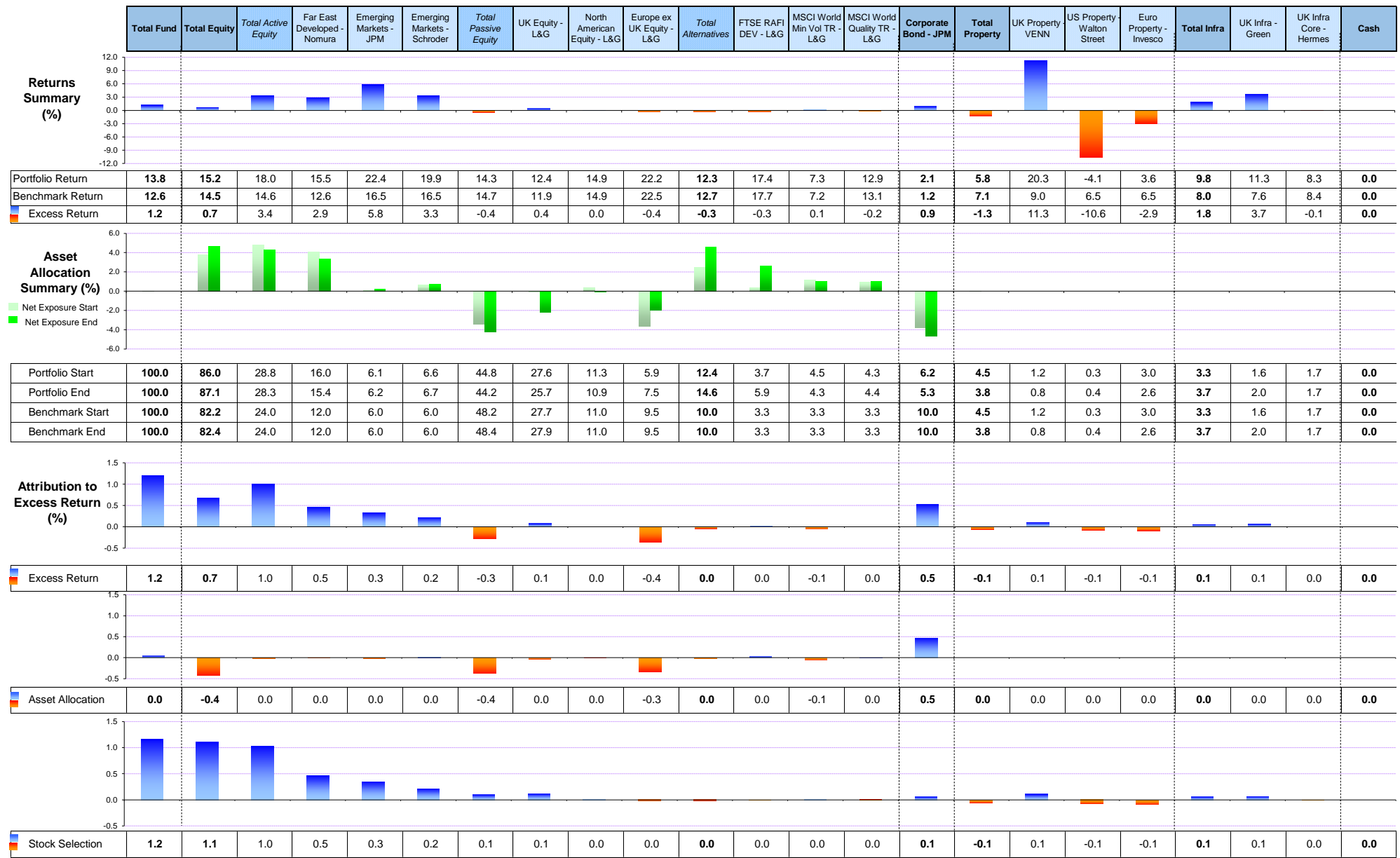
Market Value: £2.7bn



The **Returns Summary** details the Portfolio, Benchmark and Excess Returns. The Excess Returns are plotted. The **Asset Allocation Summary** details the weights held by the portfolio and benchmark in each asset class/manager. The green plots are the over/underweight exposures of the Fund (v Fund benchmark) at the beginning and end of the period. The **Attribution to Excess Return**, identifies how each asset class/manager has contributed to the overall excess return of the Total Fund. It is broken down into **Asset Allocation** (how successful the decision to over/underweight each asset class was) and then into **Stock Selection** (how well each manager/s decisions have performed). The **Asset Allocation** plus the **Stock Selection** excess returns are all additive and equal the **Total Excess Return** of the Fund.

**Attribution to Total Fund Excess Return Analysis
Worcestershire County Council Pension Fund
for Year Ended 30th September 2017**

Market Value: £2.7bn



The **Returns Summary** details the Portfolio, Benchmark and Excess Returns. The Excess Returns are plotted. The **Asset Allocation Summary** details the weights held by the portfolio and benchmark in each asset class/manager. The green plots are the over/underweight exposures of the Fund (v Fund benchmark) at the beginning and end of the period. The **Attribution to Excess Return**, identifies how each asset class/manager has contributed to the overall excess return of the Total Fund. It is broken down into **Asset Allocation** (how successful the decision to over/underweight each asset class was) and then into **Stock Selection** (how well each manager/s decisions have performed). The **Asset Allocation** plus the **Stock Selection** excess returns are all additive and equal the **Total Excess Return** of the Fund.

Manager Return Analysis
Worcestershire County Council Pension Fund
for Quarter Ended 30th September 2017



Market Value: £2.7bn

	Benchmark	Incep Date	Market Value (£m)	Weight	QTR			Year To Date			1 Year			3 Year			5 Year			10 Year			Since Inception		
					PF	BM	ER	PF	BM	ER	PF	BM	ER	PF	BM	ER	PF	BM	ER	PF	BM	ER	PF	BM	ER
Total Equity Fund	Client Specific Weighted Index	Mar-16	2,317.2	87.1	2.9	2.3	0.6	4.0	3.4	0.6	15.2	14.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.6	21.4	1.1
Total Active Equity Fund	Client Specific Weighted Index	Mar-16	752.9	28.3	4.6	2.6	2.0	5.9	3.2	2.7	18.0	14.6	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.8	24.9	3.8
Far East Developed Fund - Nomura	FTSE Developed Asia Pacific Index	Feb-03	408.4	15.4	2.8	0.6	2.2	3.7	1.6	2.1	15.5	12.6	2.9	16.1	14.5	1.7	13.3	12.0	1.3	7.1	7.1	0.0	11.2	11.0	0.2
Emerging Markets Fund - JPM	FTSE All World Emerging Market Index	Dec-11	166.2	6.2	7.6	4.5	3.1	8.3	4.7	3.5	22.4	16.5	5.8	14.2	11.6	2.6	9.7	8.3	1.5	0.0	0.0	0.0	9.5	8.4	1.1
Emerging Markets Fund- Schroder	FTSE All World Emerging Market Index	Oct-11	178.3	6.7	5.8	4.5	1.4	9.1	4.7	4.4	19.9	16.5	3.3	14.0	11.6	2.4	10.3	8.3	2.0	0.0	0.0	0.0	9.8	7.5	2.3
Total Passive Equity Fund	Client Specific Weighted Index	Mar-16	1,176.1	44.2	2.2	2.3	-0.1	3.5	3.9	-0.4	14.3	14.7	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	19.8	0.2
UK Equity Fund - L&G	FTSE All Share Index	Dec-15	684.4	25.7	2.2	2.1	0.1	3.7	3.6	0.1	12.4	11.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2	15.9	0.3
North American Equity Fund- L&G	FTSE All World North American Index	Dec-15	291.1	10.9	1.4	1.4	0.0	0.6	0.5	0.0	14.9	14.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.7	22.8	0.0
Europe ex UK Equity Fund- L&G	FTSE Developed Europe Ex. UK Index	Dec-15	200.7	7.5	3.6	3.7	-0.1	8.6	8.8	-0.3	22.2	22.5	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.4	22.7	-0.4
Total Alternatives Fund	Client Specific Weighted Index	Mar-16	388.2	14.6	1.3	1.3	0.0	1.5	1.6	-0.1	12.3	12.7	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.6	19.9	-0.3
FTSE RAFI DEV Fund - L&G	FTSE RAFI Developed 1000 QSR Net Index	Dec-15	157.8	5.9	2.6	2.7	-0.1	2.1	2.3	-0.2	17.4	17.7	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.4	23.6	-0.2
MSCI World Min Vol TR Fund - L&G	MSCI World Minimum Volatility Net Index	Dec-15	114.7	4.3	-0.1	-0.3	0.1	0.7	0.5	0.1	7.3	7.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5	20.4	0.1
MSCI World Quality TR Fund - L&G	MSCI World Quality Total Return Net Index	Dec-15	115.8	4.4	1.3	1.4	-0.1	1.7	1.9	-0.2	12.9	13.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.5	-0.1
Corporate Bond Fund- JPM	Barclays Capital Global Aggregate - Ex Treasury, Ex Government Related 100% Hedged to GBP	Mar-03	142.2	5.3	1.3	1.0	0.3	3.2	2.6	0.6	2.1	1.2	0.9	4.3	3.8	0.5	4.3	4.0	0.3	6.3	6.5	-0.2	5.4	5.6	-0.2
Total Property Fund	Client Specific Weighted Index	Mar-16	102.3	3.8	0.9	1.7	-0.8	2.8	3.5	-0.6	5.8	7.1	-1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	7.1	2.0
UK Property Fund - VENN	Absolute Return +9%	Jul-15	22.2	0.8	2.3	2.2	0.1	4.3	4.4	-0.1	20.3	9.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	9.3	3.5
US Property Fund- Walton Street	Absolute Return + 6.5%	Jan-16	11.0	0.4	-3.2	1.6	-4.8	-4.8	3.2	-8.0	-4.1	6.5	-10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.8	-4.6
Euro Property Fund- Invesco	Absolute Return + 6.5%	Feb-16	69.1	2.6	1.1	1.6	-0.5	3.7	3.2	0.5	3.6	6.5	-2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	6.1	3.8
Total Infrastructure Fund	Client Specific Weighted Index	Mar-16	98.7	3.7	1.1	1.9	-0.8	3.6	3.9	-0.3	9.8	8.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	8.0	1.1
UK Infrastructure Fund - Green	Absolute Return +7.6%	Apr-15	52.4	2.0	0.0	1.8	-1.8	3.7	3.7	0.0	11.3	7.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	7.6	-1.5
UK Infrastructure Core Fund - Hermes	Absolute Return +8.4%	May-15	46.2	1.7	2.4	2.0	0.4	3.4	4.1	-0.7	8.3	8.4	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	8.4	0.0
Worcestershire CC Total Fund		Mar-87	2660.4	100.0	2.6	2.1	0.5	3.9	3.4	0.5	13.8	12.6	1.2	12.2	11.4	0.9	12.0	11.5	0.5	6.7	7.1	-0.4	8.2	8.7	-0.5

PF = Portfolio Return BM = Benchmark Return ER = Excess Return

Total Fund Benchmark	CLIENT SPECIFIC BM AS AT JUNE 2017:	Notes:
	27.4% FTSE All Share 9.5% FTSE Developed Europe Ex UK 12% FTSE All World Emerging Markets 10% 1/3 FTSE RAFI DEV 1000 QSR Total Return NET & 1/3 MSCI World Minimum Vol Total Return NET & 1/3 MSCI World Quality Total Return NET Corp Bonds: 10% Barclays Global Agg Corporate Bond HEDGED into GBP Property: 4.2% Client Specific Index Infrastructure: 3.9% Client Specific Index	For the Total Fund benchmark the weightings for the Infrastructure and Property will match the actual drawdowns/market values of the funds, then the remainder will be put into UK Passive Equities . Total Infrastructure and Total Property are measured against a weighted index of the funds underlying benchmarks. Historic data up to and including 31.03.2016 has been provided by the WM Co and L&G.

Total Fund Reconciliation Analysis
Worcestershire County Council Pension Fund
for Quarter Ended 30th September 2017

Market Value: £2.7bn

	30th June 2017		Net Investment (£000s)	Total Income (£000s)	Total Gain/Loss (£000s)	30th Sept 2017	
	Market Val (£000s)	Exposure (%)				Market Val (£000s)	Exposure (%)
Total Equity Fund	2,148,571	86.3	106,000	0	62,605	2,317,176	87.1
<i>Total Active Equity Fund</i>	719,976	28.9	0	0	32,893	752,869	28.3
Far East Developed Fund - Nomura	397,092	15.9	0	0	11,317	408,408	15.4
Emerging Markets Fund - JPM	154,425	6.2	0	0	11,726	166,151	6.2
Emerging Markets Fund- Schroder	168,459	6.8	0	0	9,850	178,310	6.7
<i>Total Passive Equity Fund</i>	1,119,855	45.0	31,000	0	25,242	1,176,097	44.2
UK Equity Fund - L&G	678,512	27.2	-9,000	0	14,869	684,381	25.7
North American Equity Fund- L&G	286,959	11.5	0	0	4,094	291,053	10.9
Europe ex UK Equity Fund- L&G	154,385	6.2	40,000	0	6,278	200,663	7.5
<i>Total Alternatives Fund</i>	308,740	12.4	75,000	0	4,470	388,210	14.6
FTSE RAFI DEV Fund - L&G	94,566	3.8	60,000	0	3,190	157,756	5.9
MSCI World Min Vol TR Fund - L&G	107,383	4.3	7,500	0	-189	114,694	4.3
MSCI World Quality TR Fund - L&G	106,791	4.3	7,500	0	1,469	115,760	4.4
Corporate Bond Fund- JPM	140,424	5.6	0	0	1,803	142,227	5.3
Total Property Fund	104,055	4.2	-2,152	0	910	102,322	3.8
UK Property Fund - VENN	23,820	1.0	-2,152	0	544	22,212	0.8
US Property Fund- Walton Street	11,822	0.5	0	0	-360	10,972	0.4
Euro Property Fund- Invesco	68,413	2.7	0	0	725	69,138	2.6
Total Infrastructure Fund	97,105	3.9	-276	0	1,080	98,661	3.7
UK Infrastructure Fund - Green	51,688	2.1	0	0	0	52,441	2.0
UK Infrastructure Core Fund - Hermes	45,416	1.8	-276	0	1,080	46,220	1.7
Cash Fund	0	0.0	0	0	0	0	0.0
Worcestershire CC Total Fund	2,490,155	100.0	103,572	0	66,397	2,660,386	100.0

Note: Cashflow into cash reflects sum of portfolio contributions minus net investments. It is assumed that Cash for the Fund is held outside of the invested assets and is therefore withdrawn from the Total Fund