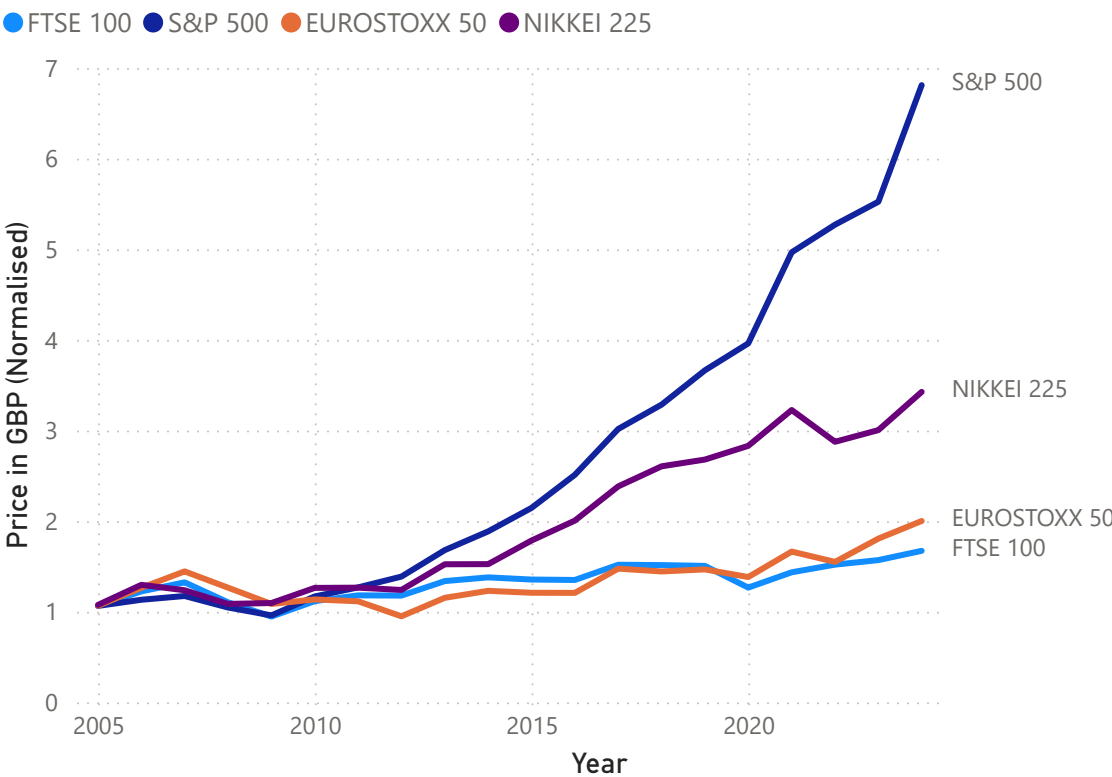


# Investigating Investment Frequency

To explore the influence of investment frequency, we used leant on data from 4 Major World Indices: FTSE 100, S&P 500, EUROSTOXX 50, and NIKKEI 225.

To model investing, we assumed an investment of £100 per month (or £300 per quarter/£1200 per year) over the course of 20 years from the start of 2005 to the end of 2024.

Monthly investments were made on the 1st of every month, Quarterly on the 1st day of each quarter (Jan 1st, April 1st, etc.) and Yearly on the 1st of July to more evenly spread the investment over the calendar year.



## World Indices Equal Split

Investment Frequency	Total Value	FTSE100 Value	S&P500 Value	EUROSTOXX50 Value	Nikkei225 Value
Monthly	70,797.31	2,078.92	53,485.55	11,076.12	4,156.72
Quarterly	71,286.28	2,078.12	53,937.78	11,078.50	4,191.88
Yearly	70,671.70	2,057.40	53,450.72	11,015.79	4,147.80

## World Indices GDP Proportion

Investment Frequency	Total Value	FTSE100 Value	S&P500 Value	EUROSTOXX50 Value	Nikkei225 Value
Monthly	70,797.31	2,078.92	53,485.55	11,076.12	4,156.72
Quarterly	71,286.28	2,078.12	53,937.78	11,078.50	4,191.88
Yearly	70,671.70	2,057.40	53,450.72	11,015.79	4,147.80

Two portfolio splits were considered: Firstly a 25% equal investment split across the 4 indices. Secondly, a country/region GDP weighted investment split to roughly reflect the coverage of each index. The GDP weighted splits were as follows: FTSE 100 (UK) 6.7%, S&P 500 (USA) 54.4%, EUROSTOXX 50 (EU) 30.6%, NIKKEI 225 (Japan) 8.3%.

As reflected in the tables above, over the course of 20 years the frequency of investment makes an insignificant difference to the final total value. Statistically this makes sense, and the longer the time course, the closer these values should become.

The quarterly investments come through with a slim lead, yet, this is expected for a simple reason: All the money for a quarter is invested at the start of the quarter, and assuming gains are made on average, this will result in a higher return over the long term. This effect is not observed yearly since the investment was made at the start of July, the reason a mid quarter date was not selected is since all tables are indexed by 1st of each month and thus investing the middle of February for example would not pass through the program.

Whilst this seems to debunk the commonly held view that small regular investments trump over larger yet infrequent ones, the crux of the theory is shown via the quarterly advantage effect. Investing as soon as possible is the best practice, and since most receive income monthly, such advice is sound. Over time the consequences of holding onto cash will also only increase as further gains are made on the marginal gains.

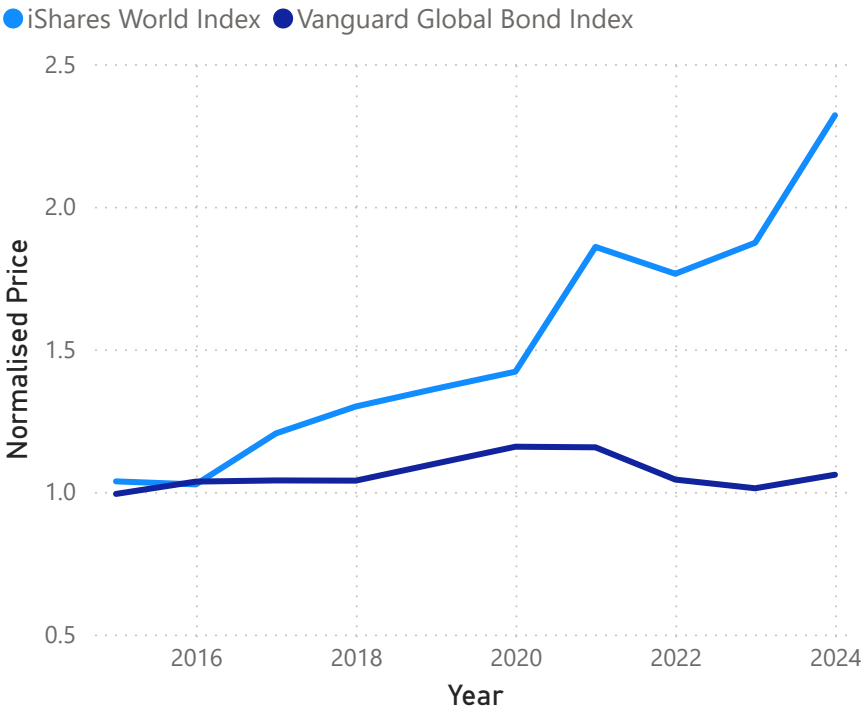
Compound interest is always king.

# Comparing Portfolios and Yearly Rebalancing

To explore portfolio allocations and rebalancing, we split out portfolios across three assets: iShares MSCI World Index (GBP Hedged Acc), Vanguard Global Bond Index (GBP Hedged Acc) and Cash. Interest rates on Cash were assumed equal to the Bank of England base rate at the respective dates.

We simulated £100 per month of investment over 10 years from the start of 2015 to the end of 2024. We selected four options for allocation weights, ranging from equally splitting equity and bonds, to equity heavy holdings. All portfolios had a cash weight of 0.1 (10%).

We further analysed with and without yearly rebalancing. Meaning, at the start of every year, the portfolio was reset to match the original weights for equity, bonds and cash.



## Without Yearly Rebalancing

iShares World Weight	Vanguard Global Bond Weight	Cash Weight	iShares World Value	Vanguard Global Bond Value	Cash Value	Total Value
0.45	0.45	0.10	9,484.78	5,472.22	1,334.62	16,291.62
0.60	0.30	0.10	12,646.37	3,648.15	1,334.62	17,629.14
0.70	0.20	0.10	14,754.10	2,432.10	1,334.62	18,520.82
0.80	0.10	0.10	16,861.83	1,216.05	1,334.62	19,412.50

## With Yearly Rebalancing

iShares World Weight	Vanguard Global Bond Weight	Cash Weight	iShares World Value	Vanguard Global Bond Value	Cash Value	Total Value
0.45	0.45	0.10	7,409.47	6,441.31	1,461.86	15,312.65
0.60	0.30	0.10	10,443.70	4,537.74	1,544.86	16,526.31
0.70	0.20	0.10	12,640.09	3,137.54	1,602.31	17,379.94
0.80	0.10	0.10	14,982.18	1,626.63	1,661.47	18,270.27

First discussing the various portfolio weightings: As shown on the left graph, our equity index has considerably outperformed our bond index. Consequently, from a long term perspective, portfolios weighted further towards the iShares World Index will perform stronger. Over our 10 year timeline, at almost no moment would it have been beneficial to hold the bond index over equity. Perhaps combining a longer time frame with a particularly poor period for equities, more insights could be gleamed about the advantages of bonds in a portfolio.

Moving on to yearly rebalancing, where at the start of every year the portfolio is rebalanced to the original asset weights: For all four portfolios, without rebalancing saw stronger results. This occurs because over the 10 year period, our equity world index was so strong that any rebalancing would likely result in trading out equity for bonds or cash, both of which grew at a considerably slower rate.

Looking to the right at rebalancing applied to our World Indices, we see a similar trend: Rebalancing takes funds away from the strongest performer (S&P 500) and weakens the portfolio as a whole.

## World Indices Rebalancing

