Note: All the calculation is in Excel

Preparation

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

Q1A graph on a white background

Description automatically generatedA graph on a white background

Description automatically generated

Due to the cumulative nature of financial calculations, omitting the first day of an adjusted price series can severely impact the results. As we can see from the figure, the difference in adjusted prices increases dramatically over time. In terms of the potential reasons, adjusted prices incorporate dividends and stock splits, and missing the first day can misrepresent the entire investment path. Without this step, the calculated investment return and the compounding effect of dividend reinvestment would start on an inaccurate footing, leading to potentially large differences over time, as each subsequent price relies on the correctness of the previous adjustment.

Q2

As we calculated in Excel, the return difference between the two series over the investment period, with and without the 3rd Jan 2000, is zero.

Then, we calculated the average annual cost of running the reinvestment strategy. To calculate that, first we find the difference between return using adjusted prices and return of reinvestment strategy. Then, we use the following formula to calculate the annual cost of running the reinvestment strategy:

Lastly, the average cost of running the reinvestment strategy is 1.198

Q3

A screenshot of a computer program

Description automatically generatedA computer screen shot of text

Description automatically generatedA graph with a line

Description automatically generated

Typically, the line that deviates the most from the baseline ('black' line) would indicate the factor causing the most slippage. Here we can see that both the red and green line are almost overlap with the black line, which imply that these two do not cause that much slippage. Especially for holding taxes, even though we assume a tax rate of 30% (which is quite high), it does not show a deviation between the baseline. However, we can clearly observe a deviation from blue line. Therefore, we conclude that the blue line shows the most significant and consistent deviation from the baseline, and holding cash balances are the primary source of slippage.