Short- and longer-term effects of rising interest rates on a bond fund

Thu Oct 21, 2021 8:26 am

Some investors are being overly spooked by a misunderstanding of a) the appropriate holding time for a bond fund, and b) the short-term versus long-term relationship of interest rates to bond fund behavior.

"Interest up, bonds down" is a short-term relationship. Vanguard says that the Vanguard Total Bond Market Index Fund, for example, "may be appropriate for investors with medium-term investment horizons (4 to 10 years)," so that is the kind of time frame we should be looking at. "Interest up, bonds down" is not true in the longer term.

There are other considerations for bonds but they should be considered separately. (e.g. "But inflation." "But TIPS.") The purpose of this posting is to address one single point: even interest rates were certain to rise, that **not** mean you are certain to lose money if you keep holding the bond fund. In fact, it is the opposite. You will likely make money if you keep holding the bond fund for the appropriate holding period, roughly equal to the duration; you will lose money if you *don't* keep holding, and sell the fund during the period after the interest rate rises.

Here are three computer simulations of a rolling bond portfolio with a duration roughly similar to that of the Vanguard Total Bond Market Index Fund. In the simulation it's about six years. The current rate on a 10-year Treasury is about 1.45%. Because bond funds are not bond ladders, and because there is variation for different terms in the yield curve, this is no sense an accurate simulation, but it is qualitatively right.

Simulation #1 assumes that the interest rate stays at 1.45%.
Simulation #2 assumes that it rises to 3.45% over the next two years and then levels off.
Simulation #3 assumes that it rises to 5.45% over the next two years and

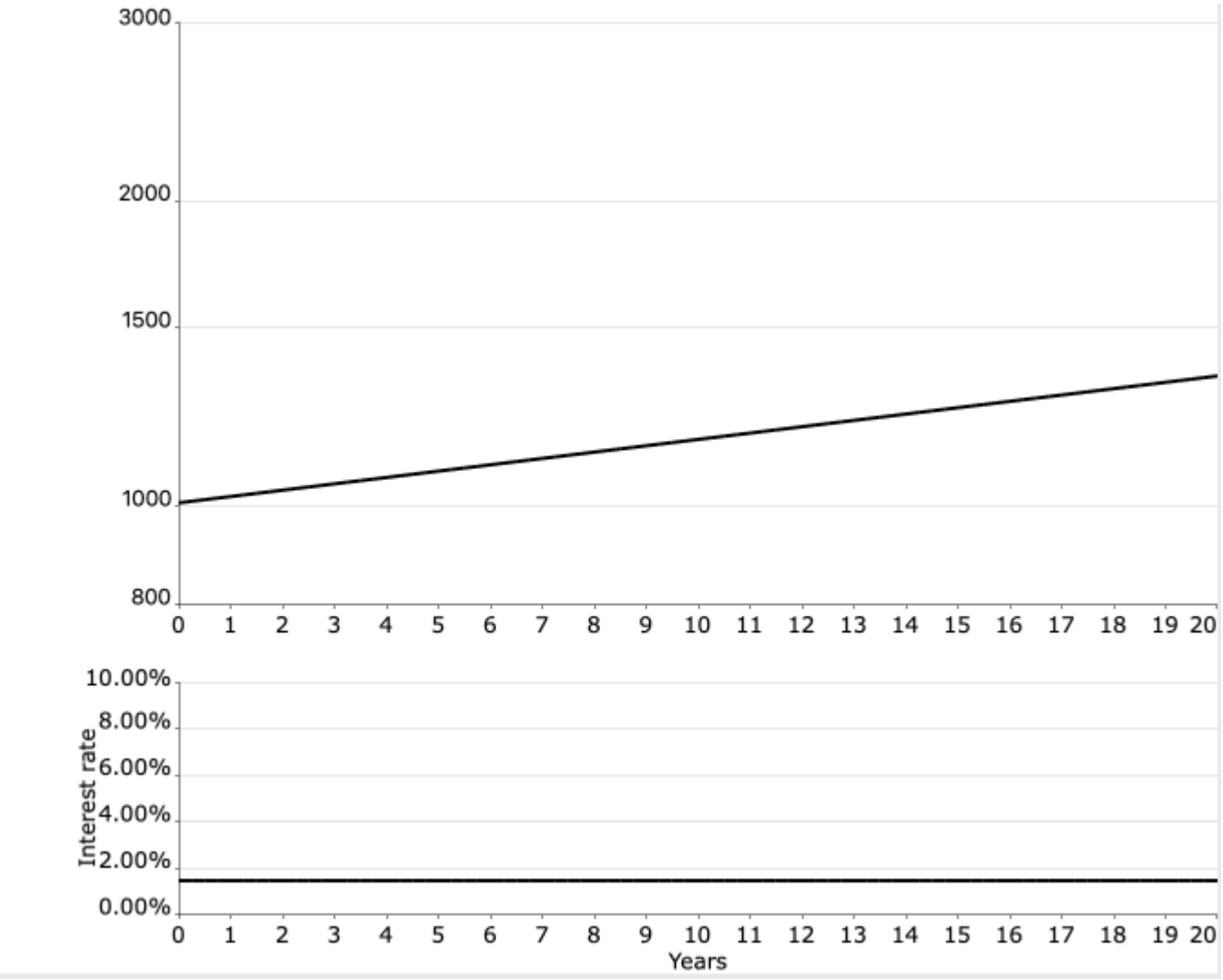
then levels off.

Would a long-term investor rather have interest rates stay the same or rise?

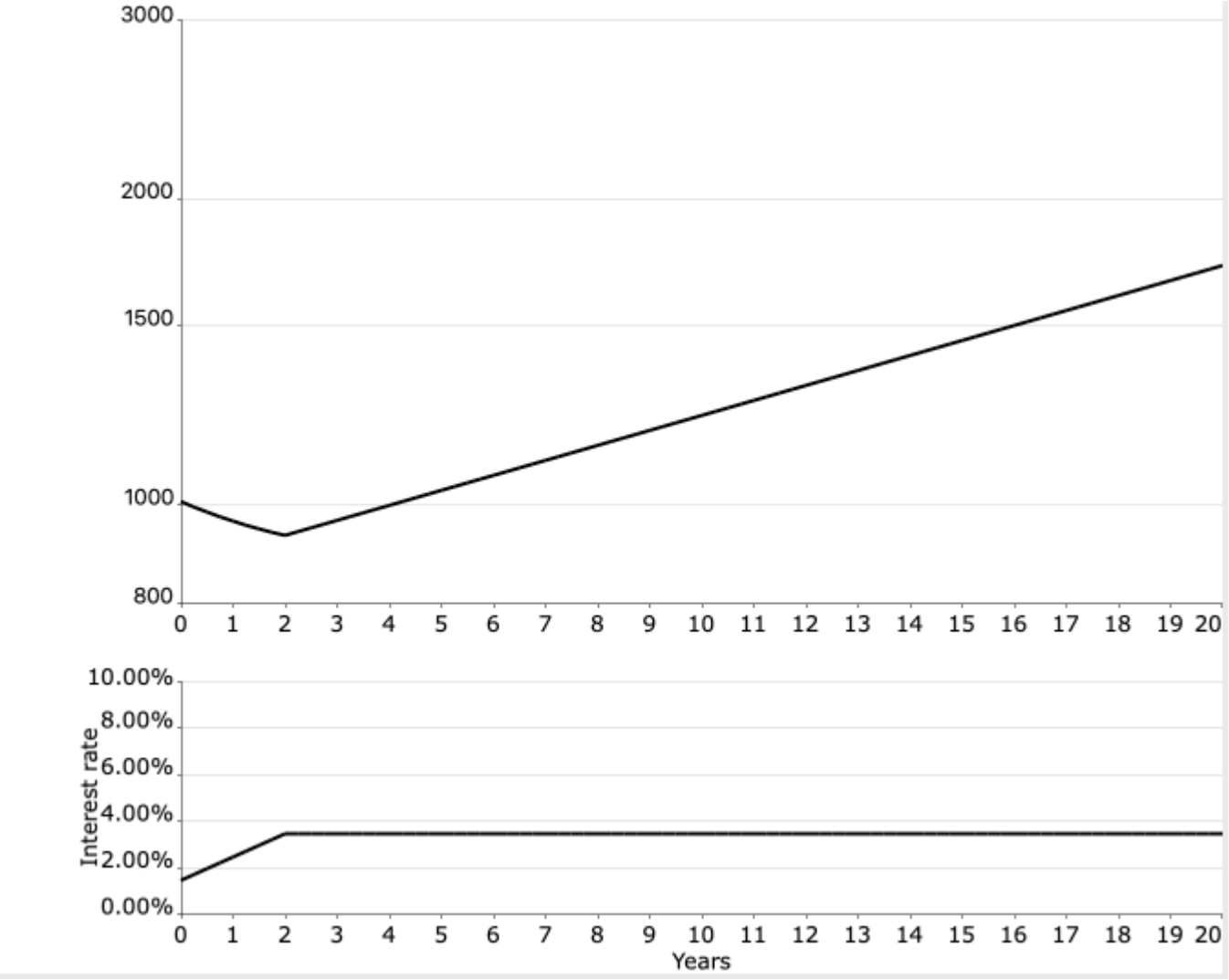
There is a rule of thumb--for a bond, it is exact, but for a bond fund it is only a rule of thumb. It is: the "duration" of the bond fund is the period of time over which short- and long-term effects of an interest rate increase balance out. An interest rate increase is bad for an investor who holds for less than the duration, good an investor who holds for longer than that. Does the rule of thumb roughly hold in these simulations?

The recovery of a bond fund after an interest rate rise is strongly influenced by bond math, not on loose "mean reversion" effect. Assuming a high-quality bond that does not default, an individual bond's market value has a *known* value at one point in its future: it returns to face value at maturity. So what goes down not only must come up, but it does so *on schedule*.

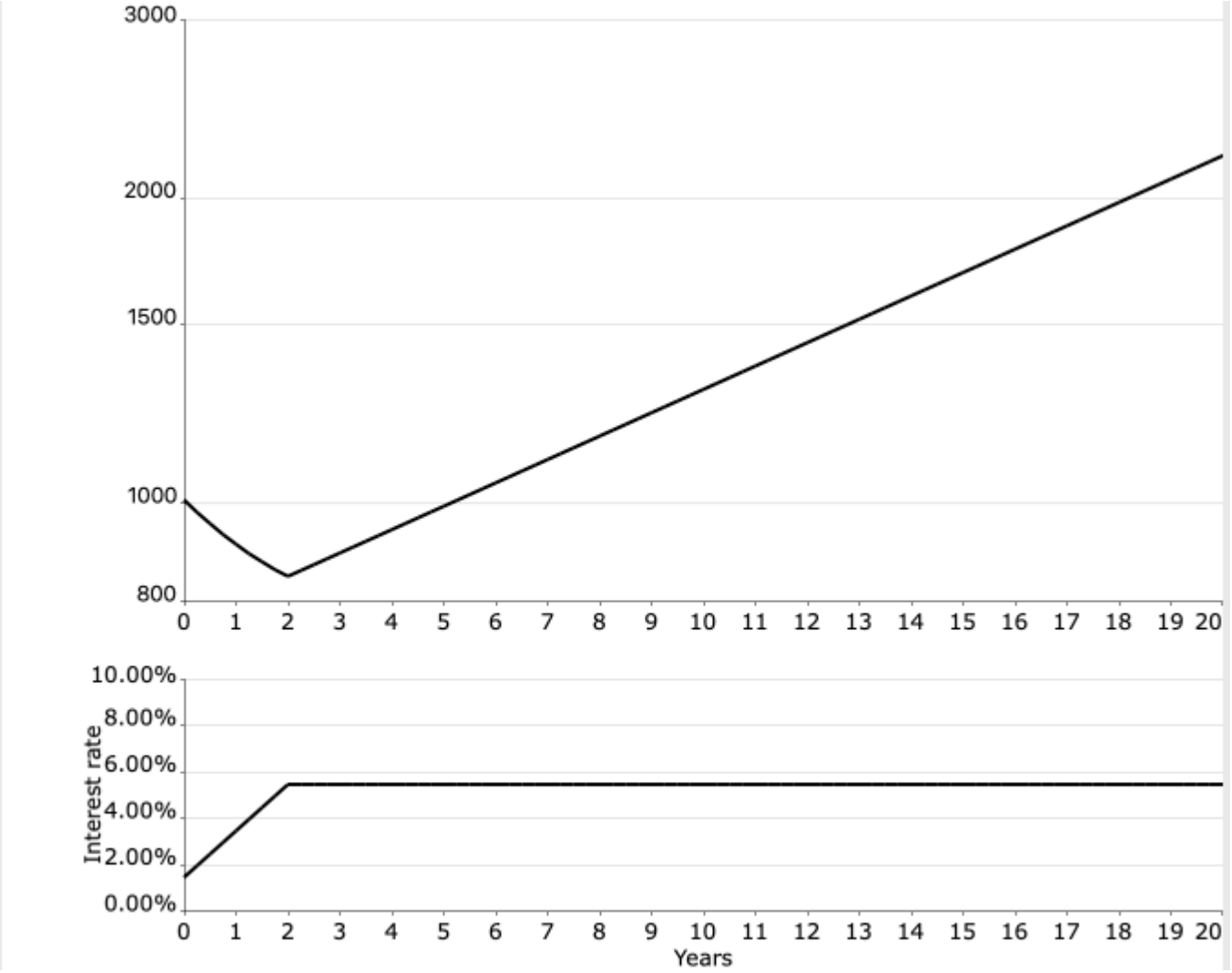
#1, interest rate remains constant at 1.45%.



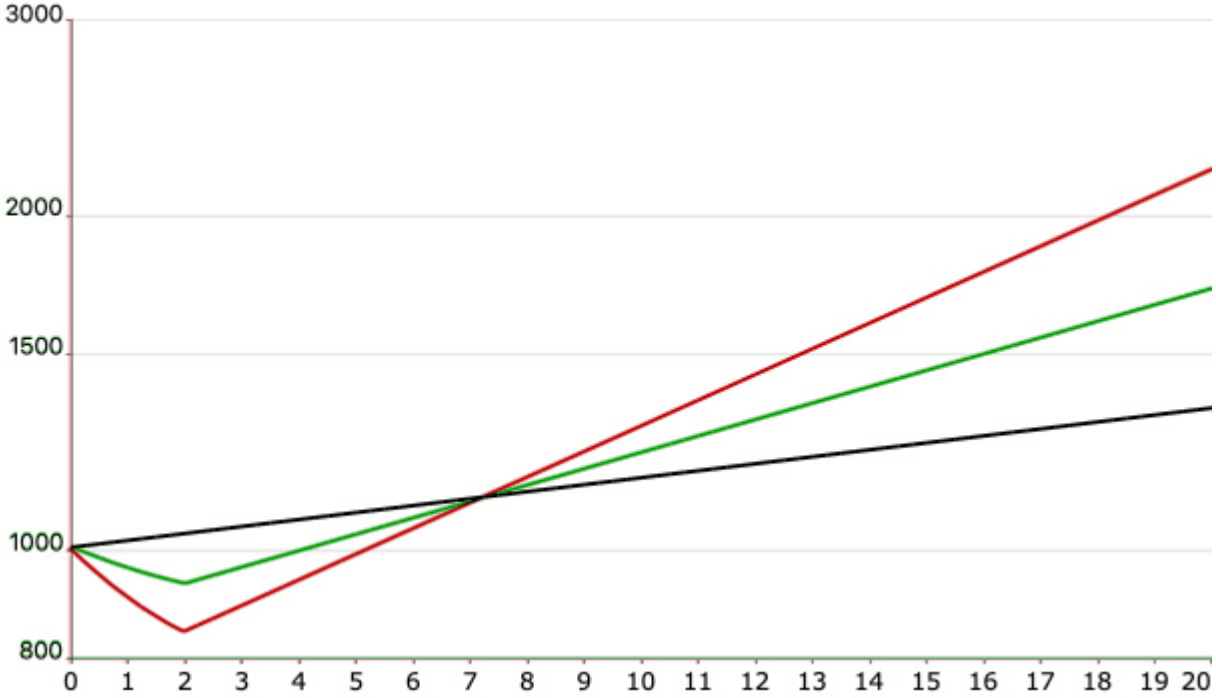
#2, interest rate rises to 3.45% over the next two years.



#3, interest rate rises to 5.45% over the next four years.



Comparison: black, no rise; green, 2% rise in rates; red, 4% rise in rates.



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Annual income twenty pounds, annual expenditure nineteen nineteen and six, result happiness; Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery.