Problem statement – 10 year Rolling return distribution analysis of Simple Systematic Withdrawal Plan (SSWP) and Disciplined Systematic Withdrawal Plan (DSWP)

Input Files provided – Nifty daily series and PE Ratio of Nifty

Simple Systematic Withdrawal Plan explained – One investor invests say 1crore (principal, can be input variable) for 10 year horizon in 1 June 2000. Each month she receives some inflow from the fund based on SWP rate (another variable, for eg 6% annualized means on a monthly basis she gets .5% of principal amount). The fund invests in Nifty, and basis the ups and downs of Nifty, the investor has a residual exposure in the fund. At the end of 10 year horizon, IRR of the investor is computed, along with month end value of total cash inflows received by investor till date and residual corpus. The IRR for 10 year period and month end cumulative cash flows and residual corpus are outputs for one investor. Similarly, another investor may invest in 2 June 2000, and his 10 year IRR and cumulative cash flows and residual corpus for each month end may vary depending on Nifty movement. So rolling returns is a series of each investors IRR profile and cumulative corpus during 120 months in between.

Disciplined Systematic Withdrawal Plan explained – The input variables are similar, principal is invested on a day for 10 year horizon. Each month she receives some inflow basis not only the SWP yield (6% in above example), but also PE ratio. If the PE Ratio of Nifty on the date of monthly outgo is below 18, the amount of cash outflow is 0.5 times the SWP yield (so in this case 3% annualized), if the PE ratio of Nifty is between 18 to 24, the amount of cash outflow is same as SWP yield (so 6% annualized in this case), and if PE ratio is greater than 24, the SWP yield moves to 1.5x normal SWP yield (so in this case 9%). Basis this, one needs to calculate the investor IRR and cumulative investor inflow and residual corpus as on each month end.

For each investor investing on date, a comparision of IRR on SSWP and DSWP along with percent of times residual corpus + cash inflows of DSWP scores over SSWP is to be plotted.

Expectations from candidate –

- Rolling return profile of SSWP – IRR returns of different investors
- Rolling return profile of DSWP – IRR returns of different investors
- Comparision visualization of DSWP over SSWP – both in term of IRR as well as distribution curve of when (residual corpus + total cash inflow to investor) is higher for DSWP over SSWP.
- Source code