

Normalized Calmar and Sterling Ratio

R Project for Statistical Computing

September 1, 2013

Abstract

Both the Calmar and the Sterling ratio are the ratio of annualized return over the absolute value of the maximum drawdown of an investment. The Sterling ratio adds an excess risk measure to the maximum drawdown, traditionally and defaulting to 10%. It is also traditional to use a three year return series for these calculations, although the functions included here make no effort to determine the length of your series. However, Malik Magdon-Ismael devised a scaling law in which can be used to compare Calmar/Sterling ratio's with different μ , σ and T.

1 Background

Given a sample of historical returns (R_1, R_2, \dots, R_T) , the Calmar and Sterling Ratio's are defined as :

$$CalmarRatio = \frac{Return[0, T]}{maxDrawdown[0, T]} \quad (1)$$

$$SterlingRatio = \frac{Return[0, T]}{maxDrawdown[0, T] - 10\%} \quad (2)$$

2 Scaling Law

Malik Magdon-Ismael implemented a scaling law for different μ , σ and T. Defined as :

$$Calmar_{\tau} = \gamma(\tau, Sharpe_1) Calmar_{T_1} \quad (3)$$

Where :

$$\gamma(\tau, Sharpe_1) = \frac{\frac{Q_p(T_1/2Sharpe_1^2)}{T_1}}{\frac{Q_p(T_2/2Sharpe_1^2)}{\tau}} \quad (4)$$

And , when T tends to Infinity

$$Q_p(T/2Sharpe^2) = .63519 + \log(Sharpe) + 0.5\log T \quad (5)$$

Same methodology goes to Sterling Ratio.

3 Usage

In this example we use edhec database, to compute Calmar and Sterling Ratio.

```
> library(PerformanceAnalytics)
> data(edhec)
> CalmarRatio.Norm(edhec,1)
```

	Convertible Arbitrage	CTA	Global	Distressed Securities
Normalized Calmar Ratio	0.05538467	0.1779411		0.07219164
	Emerging Markets	Equity Market	Neutral	Event Driven
Normalized Calmar Ratio	0.1118862		0.09525316	0.08067917
	Fixed Income	Arbitrage	Global Macro	Long/Short Equity
Normalized Calmar Ratio	0.06372551		0.1977305	0.08391112
	Merger Arbitrage	Relative Value	Short	Selling
Normalized Calmar Ratio	0.2184794		0.0813596	-0.0006817146
	Funds of Funds			
Normalized Calmar Ratio	0.07172177			

```
> SterlingRatio.Norm(edhec,1)
```

	Convertible Arbitrage	CTA	Global
Normalized Sterling Ratio (Excess = 10%)	0.0412807	0.09585286	
	Distressed Securities	Emerging Markets	
Normalized Sterling Ratio (Excess = 10%)	0.05026439		0.08755194
	Equity Market	Neutral	Event Driven
Normalized Sterling Ratio (Excess = 10%)	0.05007166		0.05385919
	Fixed Income	Arbitrage	Global Macro
Normalized Sterling Ratio (Excess = 10%)	0.04086785		0.08740785
	Long/Short Equity	Merger Arbitrage	
Normalized Sterling Ratio (Excess = 10%)	0.05754033		0.0787349
	Relative Value	Short	Selling
Normalized Sterling Ratio (Excess = 10%)	0.04999597		-0.0005672599
	Funds of Funds		
Normalized Sterling Ratio (Excess = 10%)	0.04827673		

We can see as we shrunk the period the Ratio's decrease because the Max Drawdown does not change much over reduction of time period, but returns are approximately scaled according to the time length.