Regression Hedge

变化守恒原理

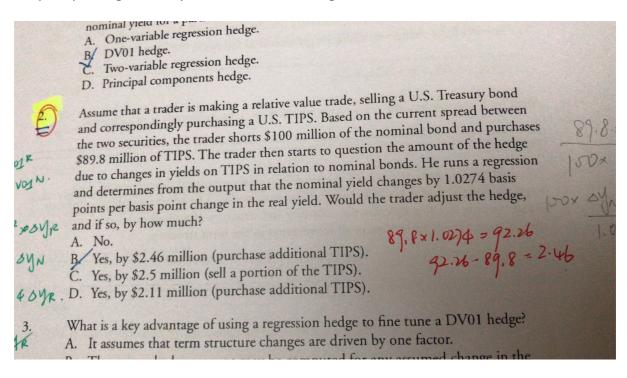
- TIPS: real interest, T-Bond: nominal interest
- DV01 Neutral hedge

$$\circ \quad \mathbf{F_r} \times \mathbf{DV01}_r = \mathbf{F_n} \times \mathbf{DV01}_n$$

Regression Hedge

Question

Short 100 million nominal bond, purchase 89.8 TIPS. Nominal yield change by 1.0274bp per bp change In real yield, find the new hedge?



Solution

把 face value, DV01 和 change in yield 按照产品分类

Items	Nominal	TIPS	Nominal/TIPS	Note
F	100m	89.8m		Based on DV01
				hedge
DV01	DV01 _n	DV01 _r	89.8/100=0.898	$\frac{\text{DV01}_{\text{n}}}{\text{DV01}_{\text{n}}} = 0.898$
				$\frac{\overline{DV01_r}}{DV01_r} = 0.898$
Δy	Δy_n	Δy_r	1.0274	$\frac{\Delta y_n}{\Delta} = 1.0274$
				$\frac{\Delta_r}{\Delta_r}$ – 1.0274
New Face	100m	X=100*(0.898*1.0274)		Based on
Value	(fixed)			regression hedge

计算 DV01, 用第一个等式

$$\circ F_n \times DV01_n = F_r \times DV01_r$$

$$\circ = 100 \times DV01_n = 89.8 \times DV01_r$$

$$0 => 100 \times DV01_n = 89.8 \times DV01_r$$

$$0 => \frac{DV01_n}{DV01_r} = 0.898$$

• 算 change in yield, 题目已知

$$\circ \quad \frac{\Delta y_n}{\Delta_r} = 1.0274$$

- 计算新的 TIPS(因为 TIPS 这是用来 hedge 的,考虑 regression 后需要调整)
 - 用第2个等式

•
$$F_r \times DV01_r \times \Delta y_r = F_n \times DV01_n \times \Delta y_n$$

$$F_r \times \frac{DV01_r}{\Delta y_r} \times \frac{\Delta y_r}{P_r} = F_n \times \frac{DV01_n}{P_r} \times \frac{\Delta y_n}{P_r}$$

$$> F_r = F_n \times \frac{DV01_n}{P_r} \times \frac{\Delta y_n}{\Delta y_r} = 100 \times 0.898 \times 1.0274 = 92.26$$

● 因此还需要买 92.26-89.8=2.46 的 TIPS