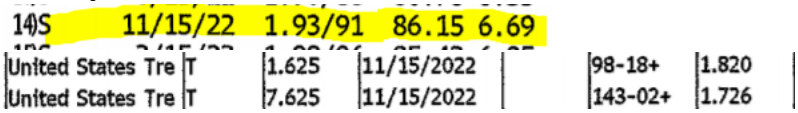
Fixed Income Homework 1
Case Studies
Cohort 2: Sajel Bharati, Huanyu Liu, Tongsu Peng, Justin Tan

Case 1:

Given the data on the Treasury zero-coupon and coupon bonds, we can construct a relative value trade opportunity. For example, as shown in below, the zero-coupon matures on 11/15/22 has a bid/ask yield around 1.93/91 whereas the coupon bonds with the same maturity date have slightly lower yields at 1.829 and 1.726.



14)S		11/15/22	1.93/91	86.15	6.69	
United States Tre	T	1.625	11/15/2022		98-18+	1.820
United States Tre	T	7.625	11/15/2022		143-02+	1.726

To exploit this spread, we can construct a relative value trade where we long the less expensive zero-coupon STRIPS (high yield) **[a]** and short the more expansive coupon bonds (low yield) **[b]**. To offset the coupon payments, we long the 7.625% coupon bond **[c]**. The exact number of bonds traded are as follows.

Using the mid-quote of the bid/ask yield on zero-coupon bond and the quoted price of 86.15, we can calculate its time-to-maturity to be about 7.8 years, which means there are about 15 semiannual coupon payments left for the coupon bond. For simplicity, I assume there is no accrued interest and there are only 15 coupon payments left.

Assuming a face value of $100, the 1.625% coupon bond would have a semiannual coupon payment of $0.8125. To offset this coupon payment, we need to long $21.31 of 7.625% coupon bond with the same maturity.

(a)	Zero Coupon bond yield	1.92%		
(b)	Coupon Bond rate	1.625%		
(b)	Semiannual coupon	0.8125	12.188	
(c)	Coupon bond rate	7.625%		

		T = 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(a)	Long the zero-coupon 11/15/22 bond	-77.27															89.689
(b)	Short the 1.625% coupon 11/15/22 bond	98.58	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-100.813
(c)	Long the 7.625% coupon11/15/22 bond	-21.31	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	0.813	15.707
	Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.584

From the graph above, we can see that profits are about $4.584. We can scale this trade and make same type of trades on bonds of other maturities as well.

Case 2:

Given the background information given in the case, we can see there would be "aggressively selling inventories of principal STRIPS" by the bond dealers and aggressively buying of coupon STRIPS from the Asian sovereign wealth funds.

Therefore, we would expect the price of principal STRIP would be depressed due to the over-supply and its yield would be high whereas coupon STRIP would be expensive due to the strong demand and its yield would be down, which creates a spread in yield. We would expect the spread to narrow in the future as the abnormal buying/selling fades away. Therefore, to exploit this opportunity, we would long the principal STRIP and short the coupon STRIP.

Given the price data, we would long 1.366 (=$100/73.184) principal STRIP and short 1.363 (=$100/73.380) coupon STRIP on Jan 2, 2014, which would create a $100 long/short position. Then we would hold the two securities and mark to market each day. Given the $5 initial capital we hold, the capital and return on capital each day would be as follows.