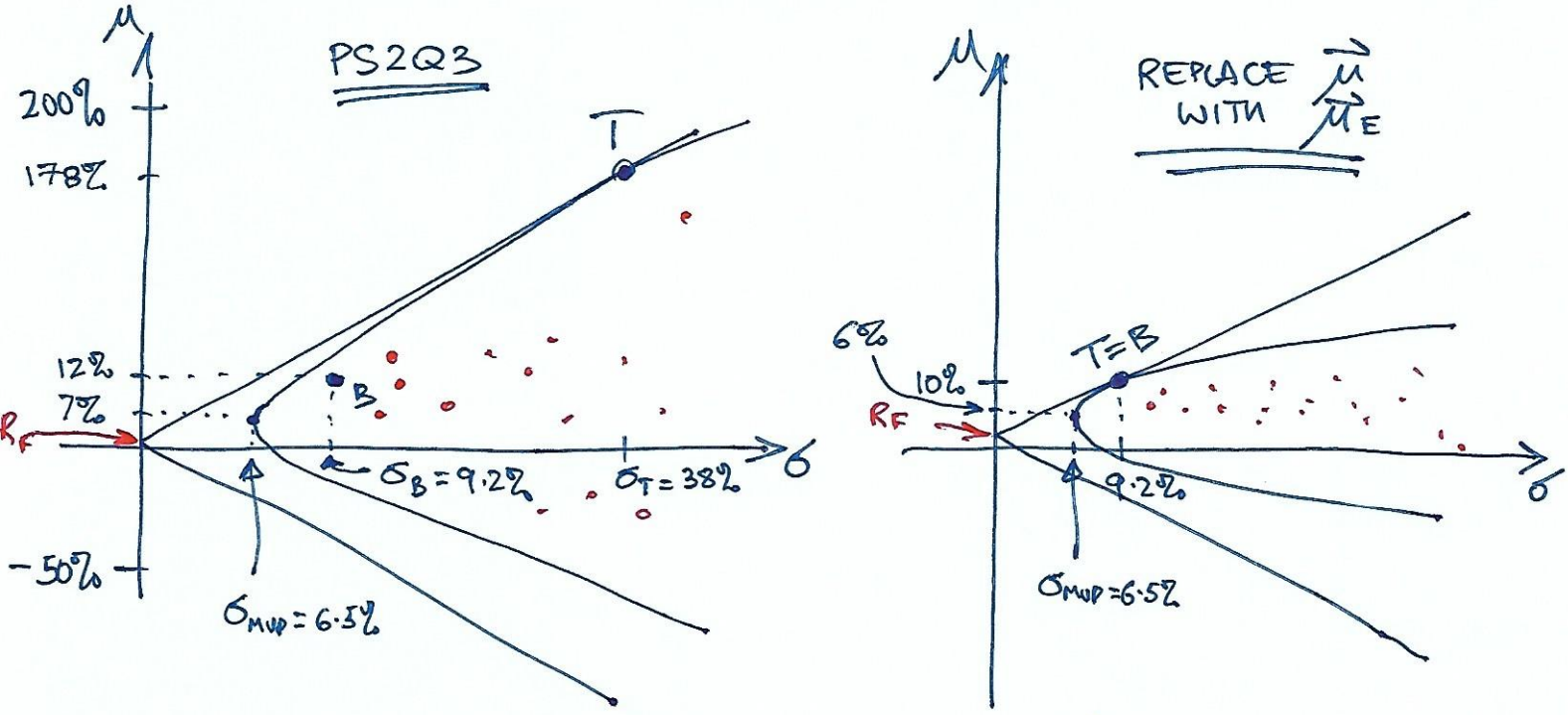
BLACK-LITTERMAN INTUITION

- MUCH OF FINANCE IS ABOUT RETURNS μ_i OR $\vec{\mu}$.
- THERE IS MONEY TO BE MADE IF YOU CAN PREDICT RETURNS.
- MEAN RETURNS ARE NOTORIOUSLY DIFFICULT TO PREDICT BECAUSE VOLATILITY OF RETURNS IS SO HIGH RELATIVE TO MEANS. MEANS GET LOST IN THE BLUR OF VOLATILITY. WE CALL THIS "MEAN BLUR".
- IF YOU TAKE YOUR PS2Q3 (MARKOWITZ) SPREADSHEET AND REPLACE MY CAREFULLY CALCULATED $\vec{\mu}$ IN CELLS: D31:D51 OF "MEANS & VCV" TAB WITH SOMETHING LIKE $\begin{pmatrix} 0.10 \\ 0.11 \\ 0.12 \\ \vdots \\ 2.00 \\ 2.10 \end{pmatrix}$ YOU WILL SEE THAT THE MARKOWITZ & TOBIN FRONTIERS & THE TWO SML's WILL JUMP TO NEW POSITIONS. ALL OF THE BASIC PROPERTIES REMAIN: TOBIN FRONTIER TANGENT TO MARKOWITZ, SML USING BETAS RELATIVE TO T LINEAR, ETC.
- FISCHER BLACK KNEW THAT WE HAVE VERY LITTLE CONFIDENCE IN MY CAREFULLY CALCULATED $\vec{\mu}$, BECAUSE OF MEAN BLUR. HE DID, HOWEVER, HAVE CONFIDENCE IN THE CAPM.
- BLACK LOOKED AT THE TWO PREVIOUS BULLET POINTS AND SAID "WHY DON'T I DEDUCE AN EQUILIBRIUM SET OF $\vec{\mu}_E$ VALUES THAT FORCES YOUR PS2Q3 PICTURE TO CHANGE SO THAT IT LOOKS MORE LIKE THE CAPM?" ... "IN WHICH I DO HAVE CONFIDENCE"

- I DID THE MATH AND FIGURED OUT THAT GIVEN $\mu_B = 10\%$ SAY, R_F, $\vec{h}_B$ AND V, IT MUST BE

$$\vec{\mu}_E = R_F \vec{\iota} + \left(\frac{\mu_B - R_F}{\vec{h}_B' V \vec{h}_B} \right) V \vec{h}_B . \qquad (2.82)$$

- IF I REPLACE MY CAREFULLY CALCULATED $\vec{\mu}$ ON PS2Q3 WITH EQUATION 2.82, THIS HAPPENS



- APPLY BLACK-LITTERMAN
- VARIANCES OF MVP, B, STOCKS 1 TO 21 DO NOT CHANGE, BUT MEANS DO.
- AND NOW B=T AT YOUR CHOSEN LEVEL $\mu_B = 10\%$. LOOKS LIKE CAPM

- NEXT STEP (PS3Q3). WE WILL USE SKILL TO ADJUST $\vec{\mu}_E$ SLIGHTLY. THIS WILL MOVE $\vec{h}_B$ TO $\vec{h}_{p^*}$ WHERE p^* IS OUR OPTIMAL RISKY PORTFOLIO INCORPORTING SKILL

—TFC APRIL 17, 2020