Ec 234A, Macroeconomic Finance: Lecture 9

March 15, 2011

Outline for today

1. Limited participation/diversification

2. Incomplete markets and labor income risk

3. Habit formation

1. Limited participation

- Euler equation only holds for participants
$$\mathsf{EP} = \gamma \mathsf{cov}\left(r_{t+1}, \Delta c^{\mathsf{PART}}\right)$$

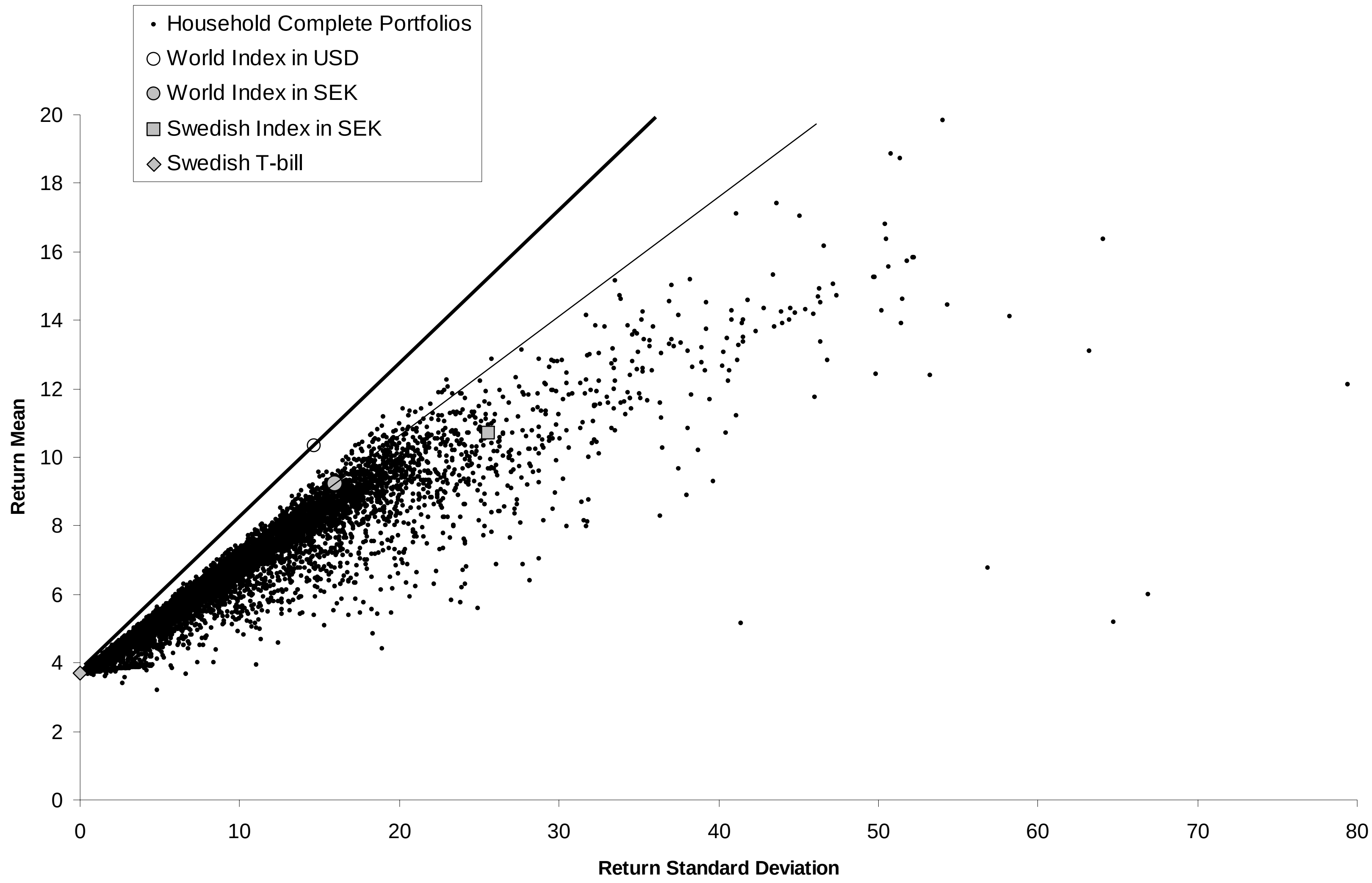
- Empirically, $\sigma(\Delta c^{\mathsf{AGGR}}) \approx 1\%$, but Mankiw and Zeldes (1991) find $\sigma(\Delta c^{\mathsf{PART}}) \approx 3\%$.
  - Puzzle persists even with s. d. of 3%.

- Evidence that participants behave differently:
  1. Vissing-Jorgensen (2002) different EIS for stockholders vs non-stockholders.
  2. Ait-Sahalia, Parker and Yogo (2004) luxury goods consumed by rich.

Limited diversification

- Evidence:
  1. Home/regional bias in portfolios: French- Poterba (1991), Coval-Moskowitz
  2. Default effects, Choi et al (2004)
  3. Holding stocks of the company you work for.
  4. "Naive diversification" Benartzi and Thaler (2001), Huberman and Jiang (2004)
- Asset pricing vs welfare consequences
  - Calvet, Campbell and Sodini (2007): investments in Sweden.

b. Complete Portfolios



2. Incomplete markets and heterogenous risk

- Constantinides-Duffie (1996): labor income risk can affect asset prices.

- Assume that $C_{k,t}$ lognormally distributed in cross-section, and

$$\text{cov}^* \left(\Delta c_{k,t+1}, c_{k,t} \right) = 0.$$

  - Cross-sectional distribution of cons does not have a steady state.

- IMRS $M_{k,t+1} = \delta \left(C_{k,t+1}/C_{k,t} \right)^{-\gamma}$ of each investor k is a valid SDF

$$1 = \mathsf{E}_t \left[(1 + R_{i,t+1}) M_{k,t+1} \right].$$

- Denoting population average by E^*, let M^* be average SDF:

$$M^*_{t+1} = \mathsf{E}^* M_{k,t+1} = (1/K) \sum M_{k,t+1}.$$

- By lognormality in the cross-section,

$$M^*_{t+1} = \mathsf{E}^* \delta \left(\frac{C_{k,t+1}}{C_{k,t}} \right)^{-\gamma}$$

can be calculated as expectation of lognormal:

$$m^*_{t+1} = \log \delta - \gamma \mathsf{E}^* \Delta c_{k,t+1} + \frac{\gamma^2}{2} \mathsf{var}^* \left(\Delta c_{k,t+1} \right).$$

- Econometrician trying to estimate model w/ aggregate cons:

$$M^{\mathsf{RA}}_{t+1} = \delta \left(\frac{\mathsf{E}^* C_{k,t+1}}{\mathsf{E}^* C_{k,t}} \right)^{-\gamma}.$$

- To calculate this, first note

$$\log \mathsf{E}^* C_{k,t+1} = \mathsf{E}^* c_{k,t+1} + (1/2)\, \mathsf{var}^* \left(c_{k,t+1} \right).$$

- Hence, using $\text{cov}^*\left(\Delta c_{k,t+1}, c_{k,t}\right) = 0$

$$
\begin{aligned}
m_{t+1}^{\text{RA}} &= \log\delta - \gamma \mathsf{E}^* \Delta c_{k,t+1} - \frac{\gamma}{2}\left[\text{var}^*\left(c_{k,t+1}\right) - \text{var}^*\left(c_{k,t}\right)\right] \\
&= \log\delta - \gamma \mathsf{E}^* \Delta c_{k,t+1} - \frac{\gamma}{2}\text{var}^*\left(\Delta c_{k,t+1}\right)
\end{aligned}
$$

- Now compare m_{t+1}^* and m_{t+1}^{RA}

$$
m_{t+1}^* - m_{t+1}^{\text{RA}} = \frac{\gamma(\gamma+1)}{2}\text{var}^*\left(\Delta c_{k,t+1}\right).
$$

- Basic point: because $x^{-\gamma}$ is a convex function, we have

$$
\mathsf{E}^*\left(C_{k,t+1}/C_{k,t}\right)^{-\gamma} > \left(\mathsf{E}^* C_{k,t+1}/\mathsf{E}^* C_{k,t}\right)^{-\gamma}
$$

- To get mispricing in excess returns, need $\text{cov}\Big(var^*\left(\Delta c_{k,t+1}\right), R\Big) \neq 0$.

3. Habit formation

- Repetition of stimulus diminishes perception of stimulus and responses to it. Difference model of habit preferences:

$$\max \mathsf{E}_t \sum_{j=0}^{\infty} \delta^j \frac{\left(C_{t+j} - X_{t+j}\right)^{1-\gamma}}{1-\gamma}.$$

  habit is X_t, and utility increases in *surplus consumption* $C_t - X_t$.

- X_t depends on past consumption:

$$X_t = f\left(C_t, C_{t-1}, ..., C_{t-T}\right).$$

  - Internal vs external habit: C is agent's own past cons or aggregate cons
  - With representative agent: impose habit rule before or after FOC.

Implications of habit models

1. Sluggish consumption adjustment.

   - X_t responds slowly to shocks because it depends on past consumption levels.

2. Magnified risk aversion.

   - Define the surplus consumption ratio $S_t = (C_t - X_t)/C_t$, then curvature of period utility
   $$\frac{-Cu_{CC}}{u_C} = \gamma \frac{C_t}{C_t - X_t} = \frac{\gamma}{S}.$$
   - To compute risk aversion, we need to calculate the curvature of $V(W)$.

3. Time-variation in risk aversion.

Long term risk

- Assume cons/wealth ratio is stationary.
  - Over long horizons, volatility of cons and wealth must be equal.
- In short term, stocks are more volatile. If stocks proxy for wealth then either
  1. Consumption risk should rise with horizon; or
  2. Wealth risk should fall with horizon.
- Indirect evidence:
  1. Real US consumption growth is not well forecast by its own history.
  2. Stock returns are predictable.

The volatility puzzle

- If the world is safe, why are stock prices so volatile?

- Recall the decomposition

$$p_t - d_t = \text{const.} + \mathsf{E}_t \sum_{j=0}^{\infty} \rho^j (\Delta d_{t+j+1} - r_{t+j+1}).$$

- Evidence suggests volatility comes from time-variation in returns.

- Source of time-variation in returns?

$$\text{excess return} = \text{quantity of risk} \times \text{ price of risk}$$