

Jonathan A. Parker, Princeton University

Comment on

Malloy, Moskowitz and Vissing-Jorgensen

**“Long-Run Stockholder Consumption Risk and Asset Returns”**

NBER Summer Institute Asset Pricing Research Meeting

July 14 2005, Cambridge MA

## Aggregate consumption and long-run consumption risk

$$\begin{aligned}\gamma &= \frac{E[r_{t,t+1}] + \frac{1}{2}\text{Var}(r_{t,t+1})}{\text{Cov}[\Delta \ln C_{t+1}, r_{t,t+1}]} \\ &= \frac{0.0663}{0.00017} = 379\end{aligned}$$

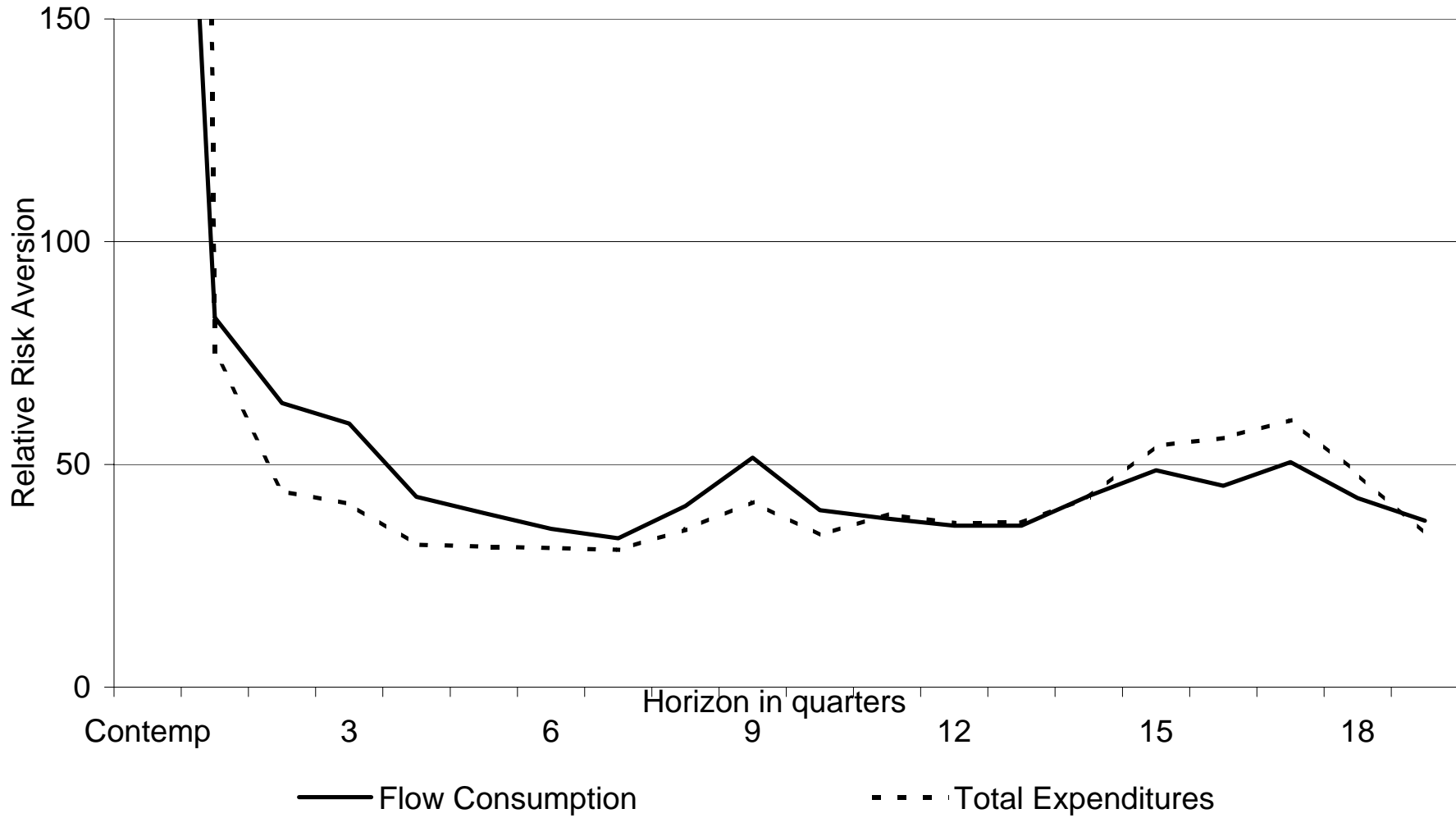
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$$\begin{aligned}\gamma &= \frac{E[r_{t,t+1}] + \frac{1}{2}\text{Var}(r_{t,t+1})}{\text{Cov}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right), r_{t,t+1}\right]} \\ &= \frac{0.0663}{0.00175} = 37.8 \quad S = 11\end{aligned}$$

# Risk Aversion at Different Horizons

## Unconditional Risk



# Risk Aversion at Different Horizons

## Conditional Risk

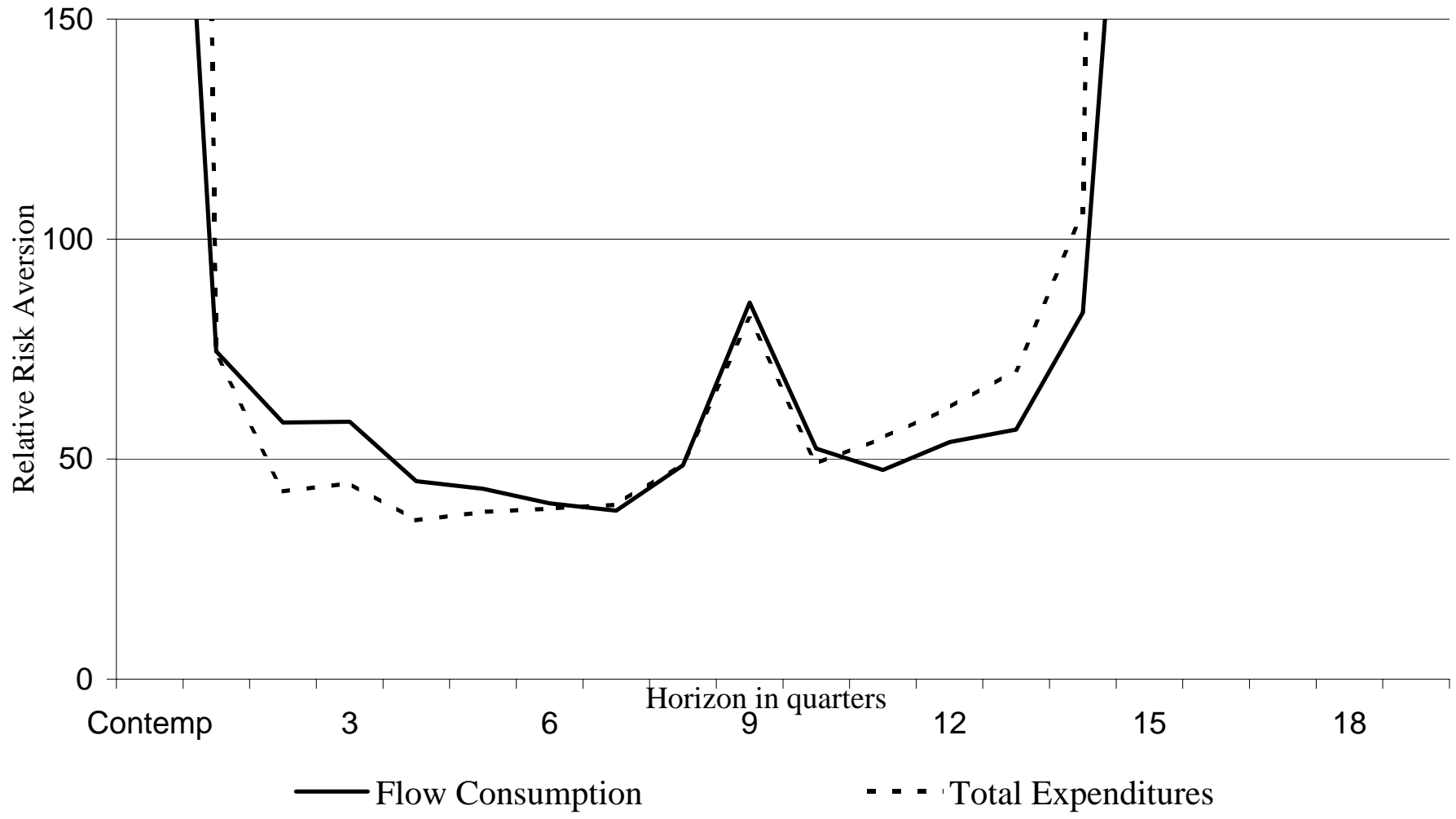
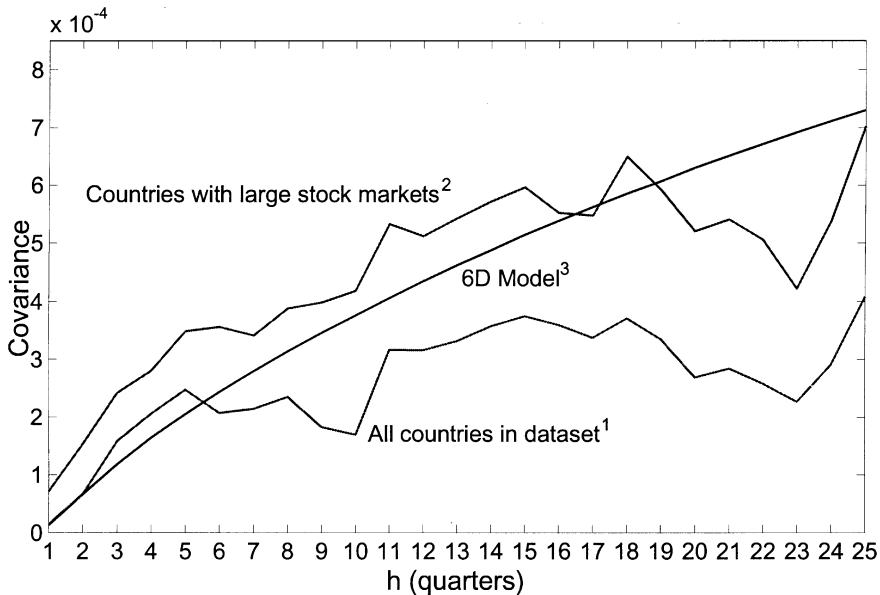


FIGURE 7 COVARIANCE OF  $R_{t+1}$  AND  $\ln(C_{t+h}/C_t)$



Notes:

## Stockholder consumption and long-run consumption risk

$$\begin{aligned}\gamma &= \frac{E[r_{t,t+1}] + \frac{1}{2}\text{Var}(r_{t,t+1})}{\text{Cov}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right), r_{t,t+1}\right]} \\ &= \frac{0.0663}{0.00072} = 92 \quad S = 0\end{aligned}$$

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Problem: noise in the data and short panel

## Cross-sectional asset pricing of the FF 25

$$E[R^i] = \alpha_S + \beta_{i,S}\lambda_S$$
$$\alpha_S = R^f, \beta_{i,S} = \frac{\text{Cov}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right), R_{i,t+1}\right]}{\text{Var}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right)\right]}, \lambda_S = \frac{\gamma \text{Var}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right)\right]}{E\left[\left(1 - \gamma \ln\left(\frac{C_{t+1+S}}{C_t}\right)\right)\right]}$$

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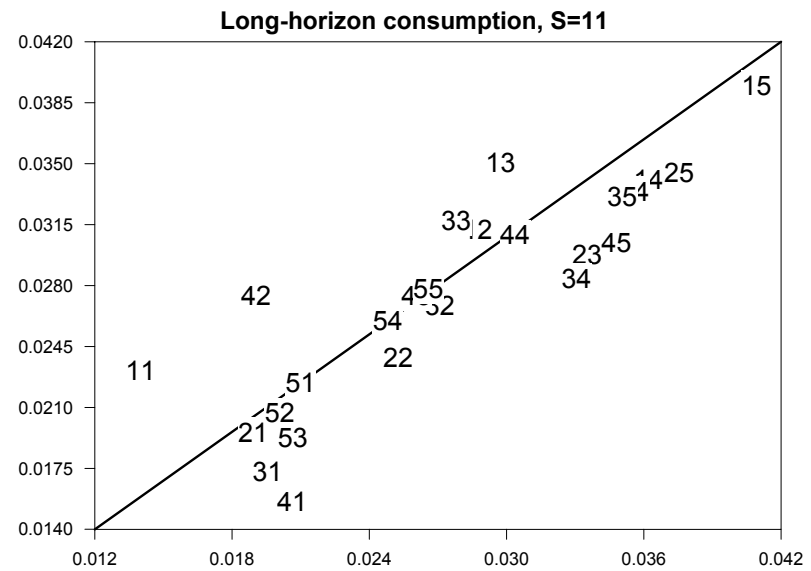
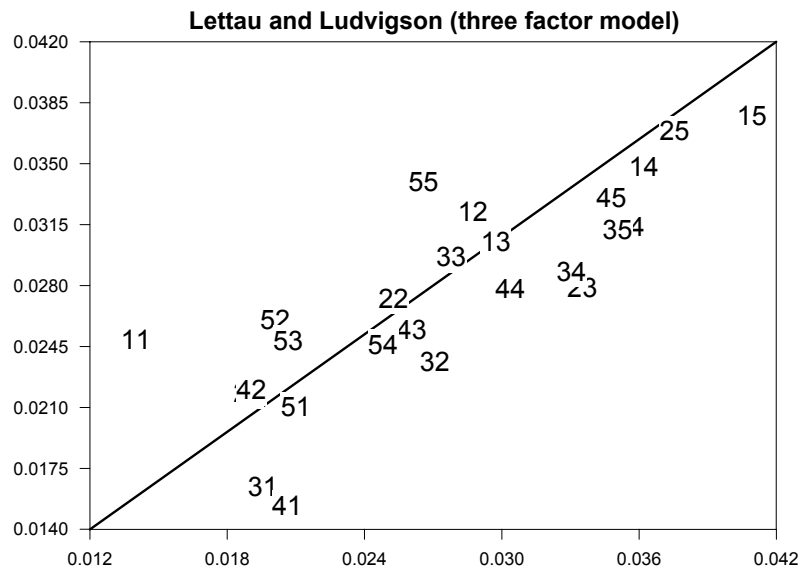
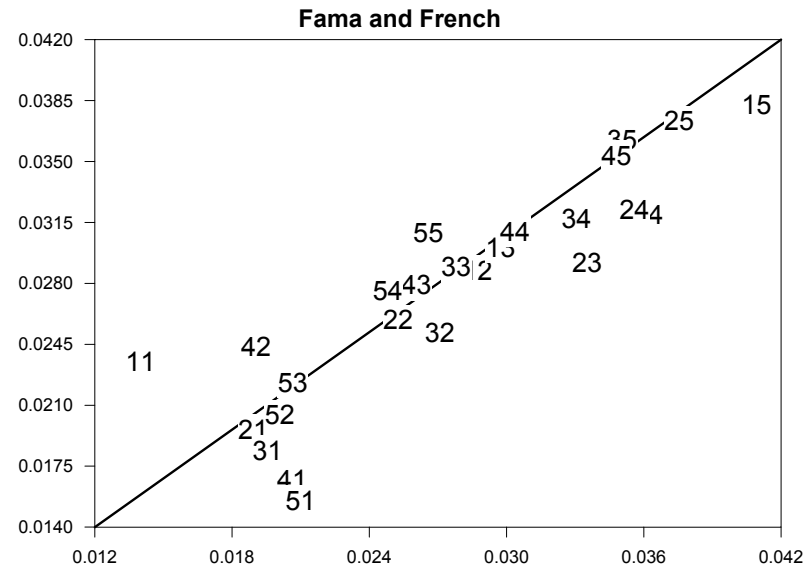
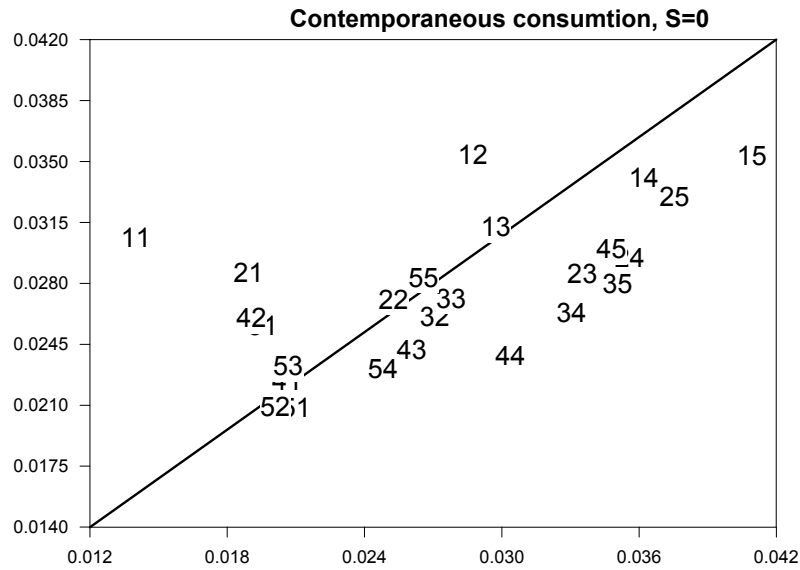
$$\alpha_S = R^f, \beta_{i,S} = \frac{\text{Cov}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right), R_{i,t+1}\right]}{\text{Var}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right)\right]}, \lambda_S = \frac{\gamma \text{Var}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right)\right]}{E\left[\left(1 - \gamma \ln\left(\frac{C_{t+1+S}}{C_t}\right)\right)\right]}$$

$$\begin{aligned} \gamma_S &= \frac{\lambda_S}{E\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right)\right] \lambda_S + \text{Var}\left[\ln\left(\frac{C_{t+1+S}}{C_t}\right)\right]} \\ &= 40.8 [87.2, 35.7], R^2 = 12\% \quad S = 0 \\ &= 12.5 [15.7, 3.5], R^2 = 52\% \quad S = 11 \end{aligned}$$

# Fitted Returns and Average Returns for Different Models

Quarterly rates, 1963:3 - 1998:3

Fitted returns



Average realized returns

How about for Stockholders?

$$E[R^i] = \alpha_S + (\gamma_S - 1) \beta_{i,S}$$
$$\beta_{i,S} = Cov \left[ \ln \left( \frac{C_{t+1+S}}{C_t} \right), \ln R_{i,t+1} \right]$$

Note MMV actually use EZKPWHHL version:

$$Cov \left[ \sum_{s=0}^{11} \beta^s \ln \left( \frac{C_{t+1+s}}{C_{t+s}} \right), r_{i,t+1} \right], \beta = 0.987$$

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$$\gamma_S = 20, R^2 = 59\% \text{ CEX stockholders, } S = 11$$

$$\gamma_S = 11, R^2 = 54\% \text{ top 1/3 CEX stockholders, } S = 11$$

but...

$$\gamma_S = 23, R^2 = 5\% \text{ CEX nonstockholders, } S = 11$$

So MMV use factor mimicing portfolio

$$\ln \left( \frac{C_{t+1+S}}{C_t} \right) = \alpha + \beta' \mathbf{F}_t + \varepsilon_t$$

With Factors: Intersection of small and value; large and value, small and growth, large and growth.

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$$CGF := \hat{\alpha} + \hat{\beta}' \mathbf{F}_t$$

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## Long-horizon consumption growth for stockholders . .

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$$\gamma_S = 10, R^2 = 80\% \text{ } CGF \text{ stockholders, } S = 11$$

$$\gamma_S = 6.4, R^2 = 83\% \text{ } \textit{top 1/3 stockholders, } S = 11$$

## Long-horizon consumption growth for stockholders . .

Succeeds!

$$\gamma_S = 10, R^2 = 80\% \text{ CGF stockholders, } S = 11$$

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$$\gamma_S = 18, R^2 = 48\% \text{ nonstockholders, } S = 11$$

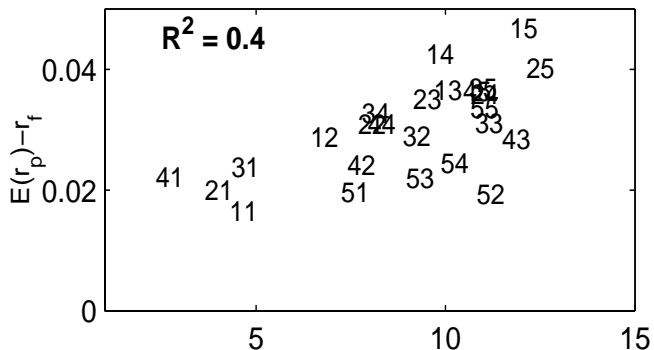
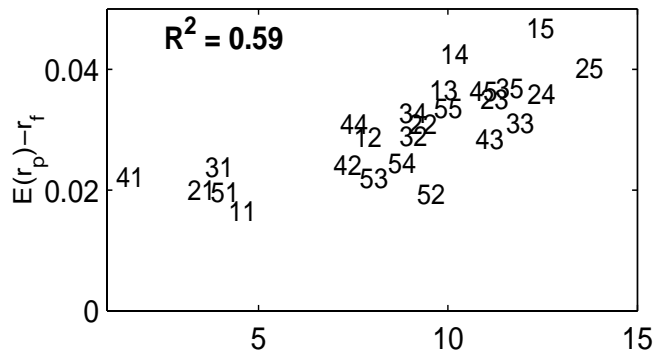
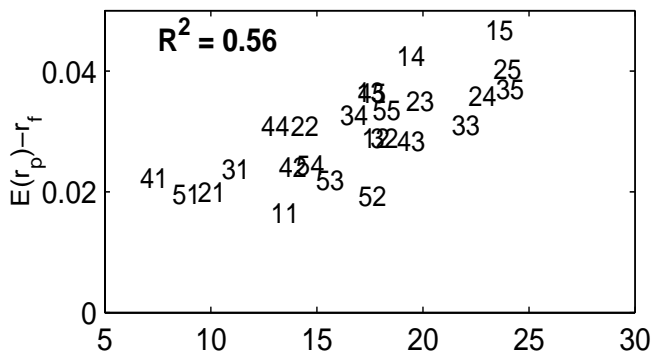
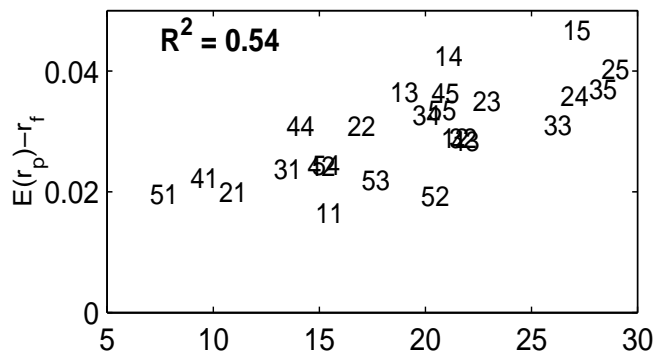
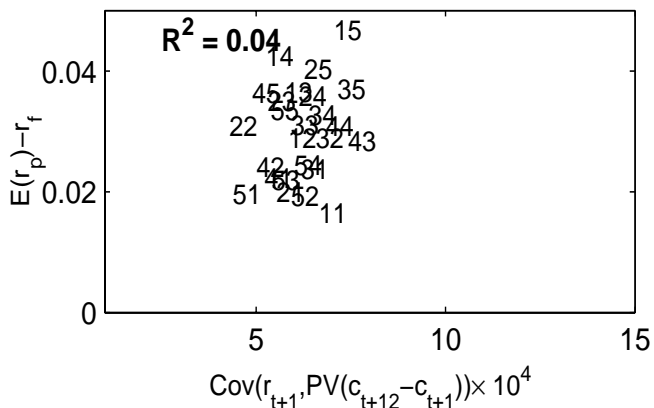
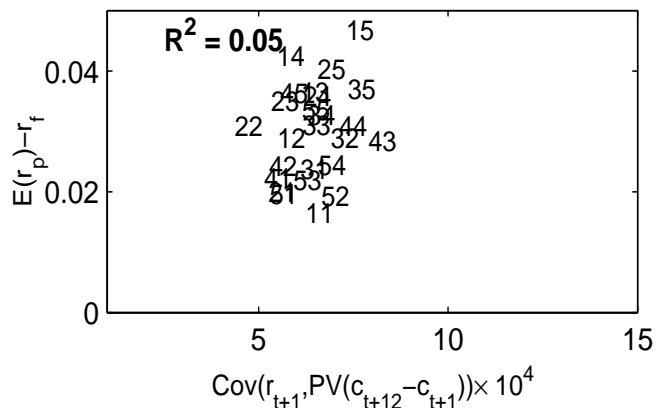
$$\gamma_S = 49, R^2 = 68\% \text{ NIPA, } S = 11$$

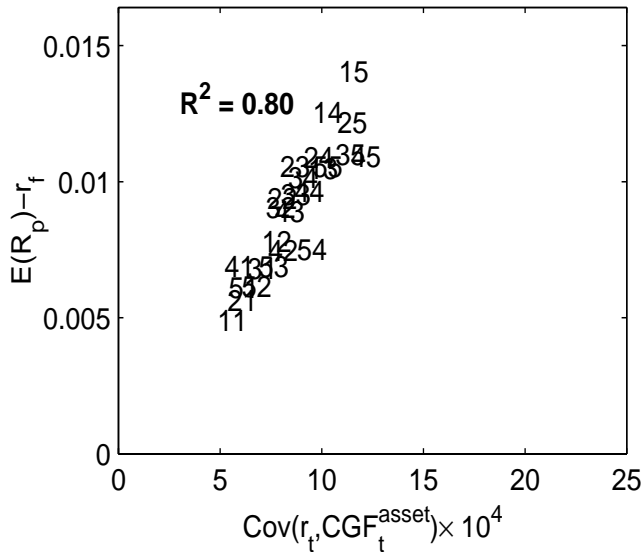
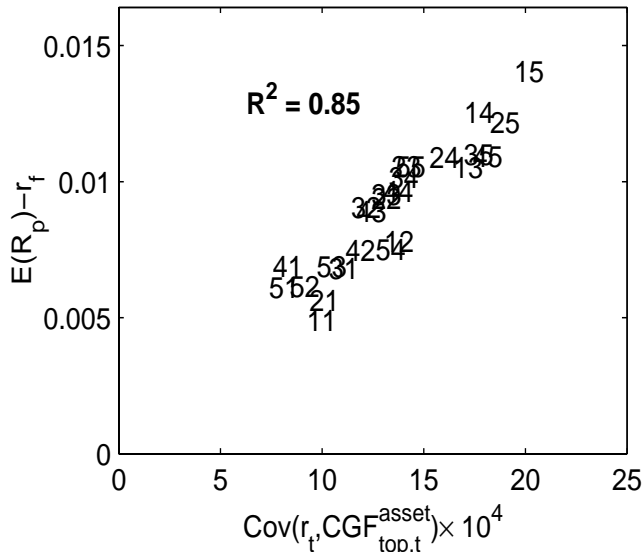
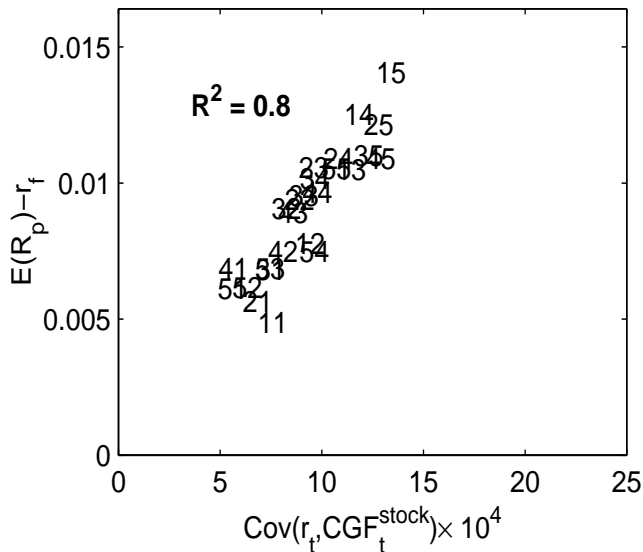
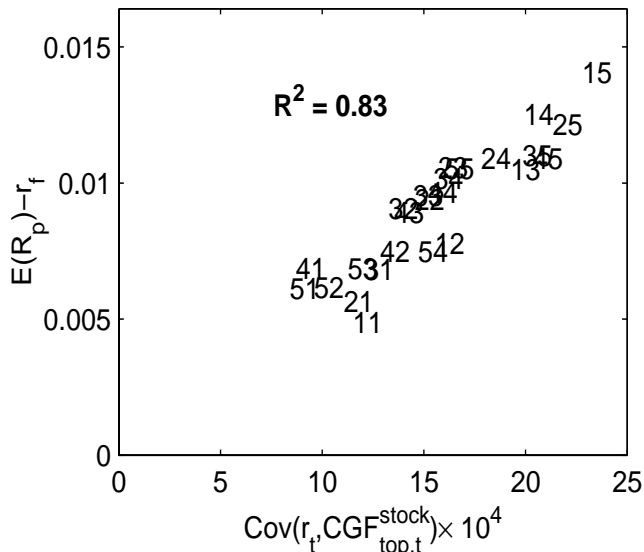
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4. CGF is not stockholder consumption in 1930 . . .
  - ◇ Sampling error in  $\hat{\beta}$ 
    - 80's, 90's not typical, time of low covariance)
  - ◇ Stockholder population changed. A lot.

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$$\frac{E[r_{t,t+1}] + \frac{1}{2}Var(r_{t,t+1})}{Std[r_{t,t+1}]} = \frac{1}{2} \leq \gamma Stdv [\Delta \ln (C_{t+1})]$$

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So is it more plausible for stockholders?

$$\frac{1}{2} \leq \gamma \text{Stdv} \left[ \Delta \ln \left( C_{t+1}^{\text{Stockholders}} \right) \right] ?$$

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Not really. But . . .

$$\frac{1}{2} \leq \gamma \text{Stdv} \left[ \ln \left( C_{t+1+S}^{\text{Stockholders}} \right) - \ln \left( C_t^{\text{Stockholders}} \right) \right]$$

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But correlation drops as  $S$  increases, so need a **large** rise in volatility

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1. Consumption share of stockholders predicts returns, correlated with  $cay$  and  $caylr$ 
  - ◇ Big finding for models like Guvenen
  - ◇ How does this solve volatility of consumption problem?
2. Consumption of stockholders moves 3x more with Aggregate C than non stockholders

## A complete markets calculation

$$\Delta \ln C_{h,t+1} = \gamma_h^{-1} \bar{\gamma} \Delta \ln C_{t+1} + \zeta_h$$

where  $\bar{\gamma} := (\overline{\gamma^{-1}})^{-1}$

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$$\begin{aligned} \Delta \ln C_{t+1}^{Stockholder} &= \bar{\zeta}_h + \beta^{Stock} \Delta \ln C_{t+1} + \epsilon_{t+1} \\ \Delta \ln C_{t+1}^{NonStock} &= \bar{\zeta}_h + \beta^{NonSt} \Delta \ln C_{t+1} + \epsilon_{t+1} \end{aligned}$$

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$$\frac{\beta^{Stock}}{\beta^{NonSt}} = \frac{Avg_{Stock}(\gamma_h^{-1})}{Avg_{NonSt}(\gamma_h^{-1})}; \quad \frac{\hat{\beta}^{Stock}}{\hat{\beta}^{NonSt}} = 3$$

Returning to the EZKPWHHL theoretical model . . .

## Returning to the EZKPWHHL theoretical model . . .

1. The role of anticipatory utility
2. Low IES, high risk aversion

## 1. Anticipatory utility

Choice 1:

- ◇ at  $t = 1$   $C$
- ◇ at  $t = 2$  fair coin flipped and get  $C^H$  or  $C^L < C^H$

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The SAME outcomes, only anticipation differs; increased importance of studying conditional moments

## 2. Low IES, high risk aversion

Choice 1:

- ◇ at  $t = 1$   $C = \frac{1}{2}(C^H + C^L)$
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Proof: as IES goes to zero,  $V_t \rightarrow \text{Min}[C_t, E_t[C_{t+1}^{1-\gamma}]^{\frac{1}{1-\gamma}}]$