Recitation II

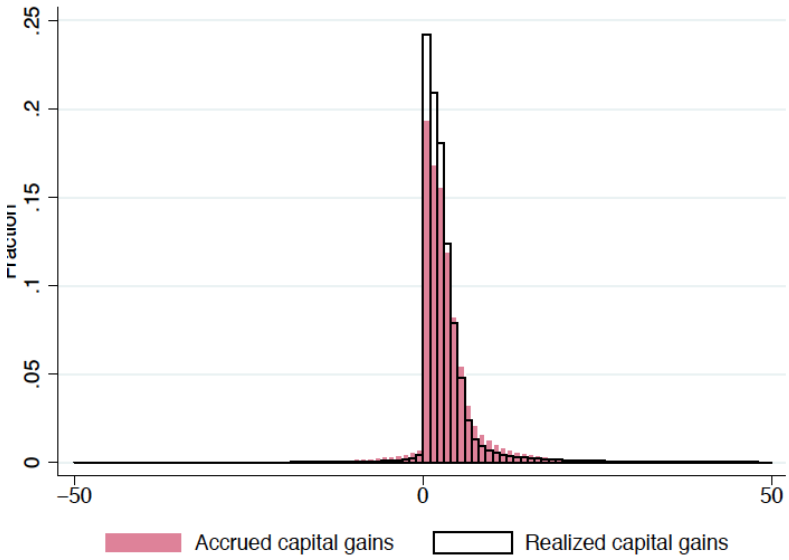
Understanding Heterogeneity in Returns to the Financial Portfolio

In this recitation we try to understand possible determinants of heterogeneity in returns to wealth across individuals. You are expected to work on the text and be ready to answer in class the questions raised below.

The figure below document three empirical features of household financial portfolio returns. The figures are drawn using population data from Norway which contain both information on assets owned by each single household and the returns obtained on that assets. The data cover returns over 10 years, from 2005 to 2010.

Figure 1 shows that returns on financial wealth (using two measure of capital gains) differ markedly across individuals, that is they are markedly heterogeneous

Figure 1: Cross sectional distribution of individual returns to financial wealth



Q1: think of the Merton portfolio model we studies in class (week 2). Can this model rationalize the heterogeneity that is documented in this figure? What would be the main driver of this heterogeneity?

The second figure below, Figure 2, documents one additional fact. For each individual it computes the portfolio share invested in risky assets and then computes the heterogeneity in returns, measured by the standard deviation of returns among all those households with the same share invested in risky assets. It then plots the relation between the share invested in risky and the heterogeneity in returns for each level of the risky asset share. It shows two features:

a. returns are heterogeneous (i.e. different) among individuals that allocate the wealth between risky and safe assets in the same way;
b. the heterogeneity increases with the level of the share invested in risky assets

Q2: think again of the Merton portfolio model. Is this model able to rationalize these features of the data?

We now document three additional facts. Figure 3 shows the relation between the position in the wealth distribution and the average return on wealth. It documents a strong positive correlation: wealthier people earn higher returns on average on their wealth.

Figure 4 shows the cross section distribution of the Sharpe ratio of the portfolio of the population of Norwegians. For each household, this is computed by first computing the average return on wealth in excess of the return on treasury bills (taken as the safe asset) over the years (10) the returns of these households are observed, and then dividing by the standard deviation the returns on wealth: that is

Sharpe ratio(i)=$\frac{\sum_t (r_{it} - r_f)}{\sigma_{ir}}$ where i identifies the household, r_{it} is the return on wealth at t for household i, r_f the risk free rate and σ_{ir} the standard deviation of the return on wealth. The figure shows that the Sharpe ratio is very heterogeneous across investors.

Finally Figure 5 shows our last fact: the Sharpe ratio correlates positively with the level of wealth.

Q3: show that these facts are not jointly consistent with the standard Merton model and discuss possible explanations that can account for them.

Figure 3. Returns on wealth are correlated with the level of wealth

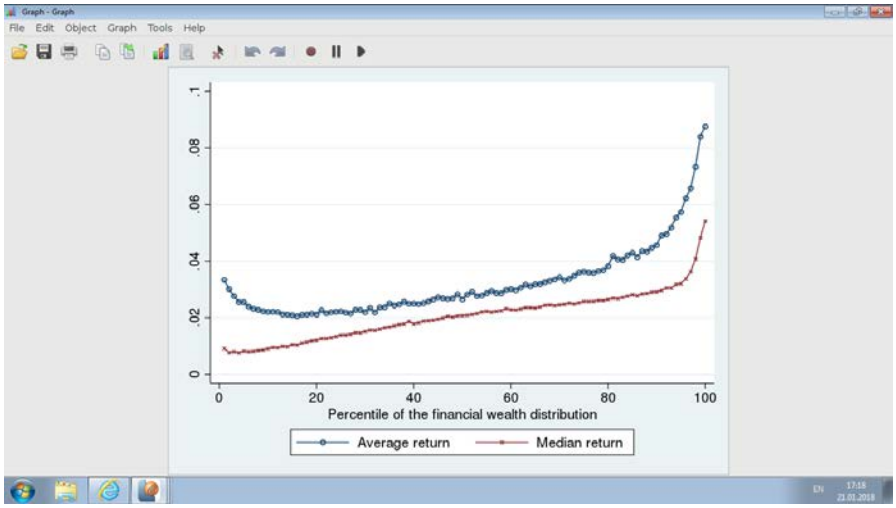


Figure 4. Heterogeneity is return Sharpe ratio

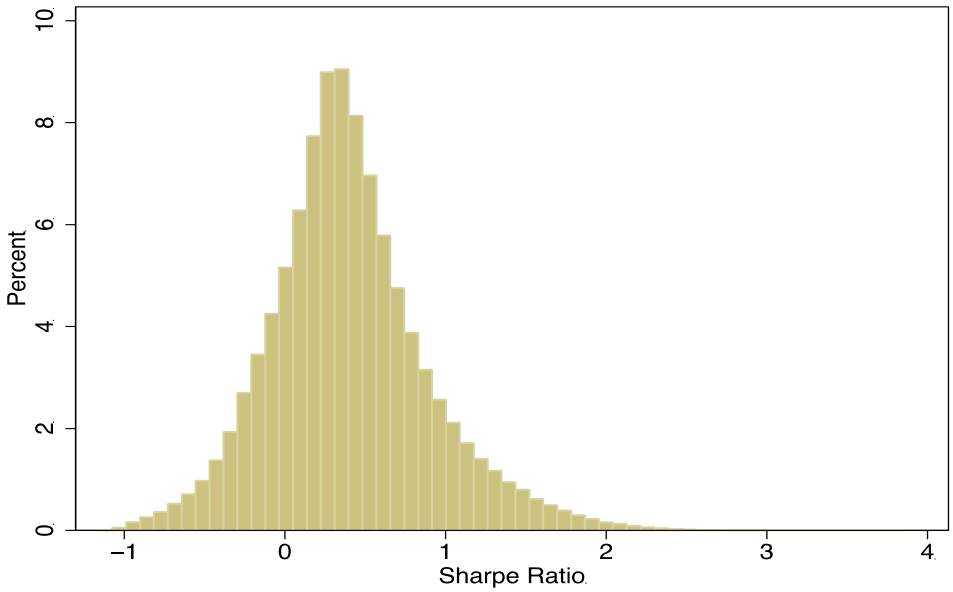


Figure 5. Correlation between the Sharpe ratio and the level of wealth