

Do households appreciate the benefits of diversification when adding stocks to their portfolios?

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Abstract

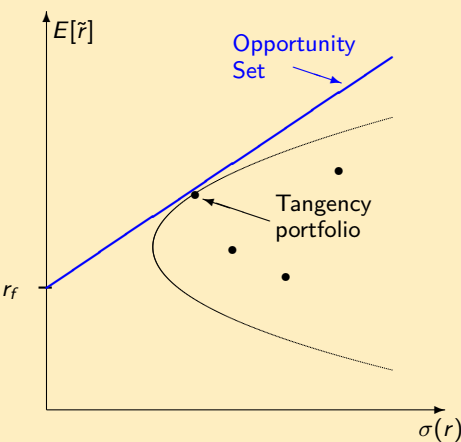
We investigate households understanding of diversification by investigating their decisions to add one stock to their existing equity portfolio. This is a situation where households have already decided to participate in the stock market. This decision is more likely to accurately reflect understanding of diversification. We use data for the equity portfolios of all Norwegian households. We find that when households add a stock to their portfolio, the chosen stock has high correlation with the household's current portfolio, higher than would be achieved by choosing a stock at random.

Empirical investigation

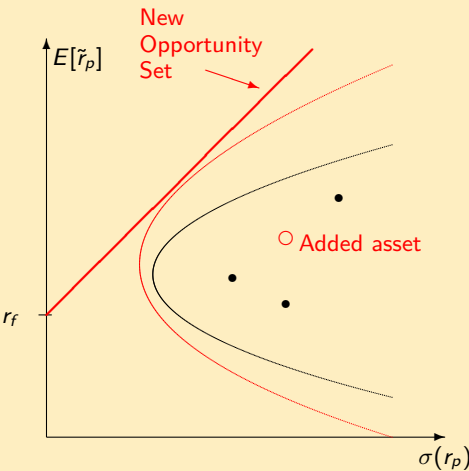
When (Norwegian) households add stocks to their portfolio, do they appreciate diversification properties of the stocks?

Household portfolio decision

Decision problem: Investors's current portfolio



How to best add one more stock



Pick stock that most improves opportunity set

Asking whether chosen stock improves opportunity set

Two heuristics:

- Pick a stock with low correlation with current portfolio.
- Pick a stock in different industries than stocks in current portfolio.

Data

Portfolios of all Norwegian Households 1992–2007.

Hypothesis: Low correlation

- To test: Do stocks added to portfolios have low correlation with the portfolio?
- Implemented as: Does the chosen stock have lower correlation than you would get by choosing randomly?

Test Statistic

Crosssection

- \mathcal{M} – Set of all available stocks (the crosssection).
- r_i the return of stock i
- $|\mathcal{M}| = m$

Household portfolio

- Household portfolio p is a set of stocks $\mathcal{P} \subset \mathcal{M}$.
- The household portfolio is characterized by the weights ω_i of the assets in the portfolio. $r_p = \sum_{i \in \mathcal{P}} \omega_i r_i$
- $|\mathcal{P}| = n$.

Stocks not in households portfolio

- \mathcal{R} – the set of stocks *not* in the households portfolio, i.e. $\mathcal{R} = \mathcal{M} \setminus \mathcal{P}$.

Correlation of "new" stock $j \notin \mathcal{P}$ with household portfolio p

$$\begin{aligned} \rho(r_j, r_p) &= \rho\left(r_j, \sum_{i \in \mathcal{P}} \omega_i r_i\right) \\ &= \sum_{i \in \mathcal{P}} \omega_i \rho(r_j, r_i) \end{aligned}$$

New stock j chosen randomly among all possible stocks $j \in \mathcal{R}$:

$$\begin{aligned} E[\rho(r_j, r_p)] &= \frac{1}{m-n} \sum_{j \in \mathcal{R}} \rho(r_j, r_p) \\ &= \frac{1}{m-n} \sum_{j \in \mathcal{R}} \sum_{i \in \mathcal{P}} \omega_i \rho(r_j, r_i) \end{aligned}$$

Does a chosen stock j have lower correlation than random stock?

$$D = \rho(r_j, r_p) - E[\rho(r_j, r_p)]$$

Under a null that the household do not take into account the specified diversification proxies, $E[D] = 0$.

Results

Estimate: Mean $D = 0.06$.

→ Correlation of chosen stock with portfolio 6% higher than if it was chosen randomly.

Hypothesis: Add "new" industry

- To test: Do households tend to expand on industry sectors when adding stocks.
- Implemented as: Is the probability of choosing a stock in a "new" industry higher than what you would get by choosing randomly.

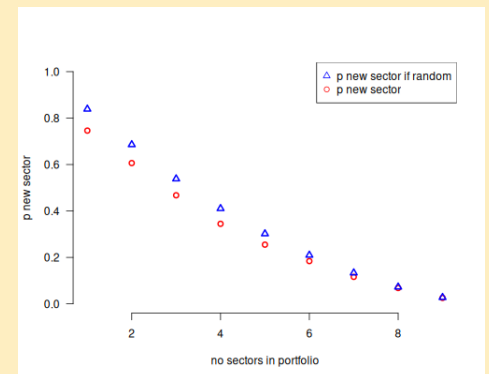
Results

For whole sample:

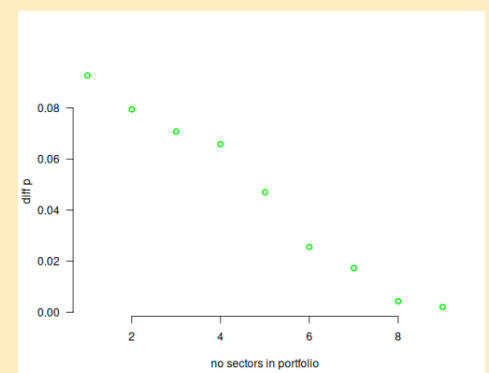
- Probability of households adding one more industry to their portfolio: 56%.
- Corresponding probability if choice made randomly: 63%.

Probability of adding new sector depending on number of sectors in current portfolio

Probabilities



Differences in probability



Probability of household adding a "new" sector lower than the case if choice was random.

Conclusion

We find that we can not support the hypothesis that households consider the diversification properties of a stock that is added to the household's existing portfolio.