How Fast Do Investors Learn?
Asset Management Investors and Bayesian Learning

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Big Picture

- Question: How fast do investors learn?

- Standard Theoretical Framework: Bayesian Learning

    - Investors can start with different priors about managerial skill.

    - With enough data, beliefs *should* converge.

- Contribution: Novel measure of disagreement - IDAS.

- Findings: Different Speeds of learning

    - Mutual fund investors learn slowly

    - Hedge fund investors learn quickly

Outline

1. Some possible empirical issues.

2. Simplified theoretical setting.

3. Three Comments

4. One alternative story with a shameless self-plug.

Possible Empirical Issues

- Can't identify investors.

- Management of funds changes over time.

- Managerial skill is undefined?

- Investment changes aren't completely free (lockups, etc).

- Secular decline in the IDAS measure.

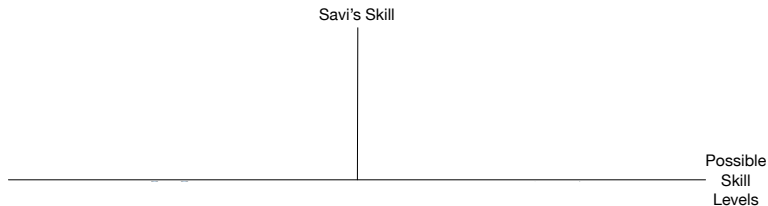- Assumption that all information is commonly available.

Simplified Theoretical Exercise

- There are only two investors.

- Investors have identical preferences and different beliefs.

- There is one fund with an un-changing manager.

- Investors can freely adjust their investments with the fund.

- No secular trends. All variables are stationary.

- Returns are noisy but unbiased signals about skill.

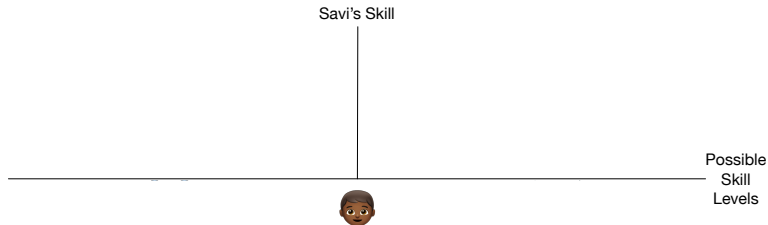- Signals are public, and are the only sources of information.
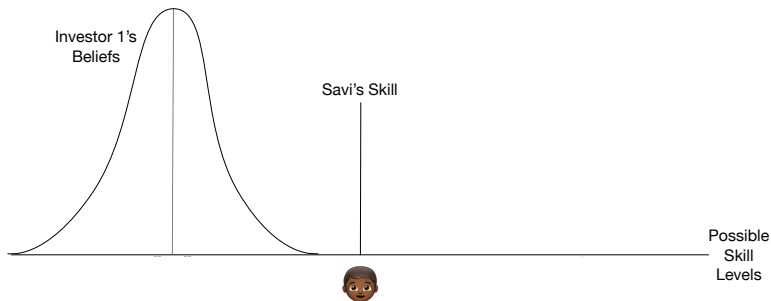
Possible
Skill
Levels

Skill is one-dimensional

Illustration

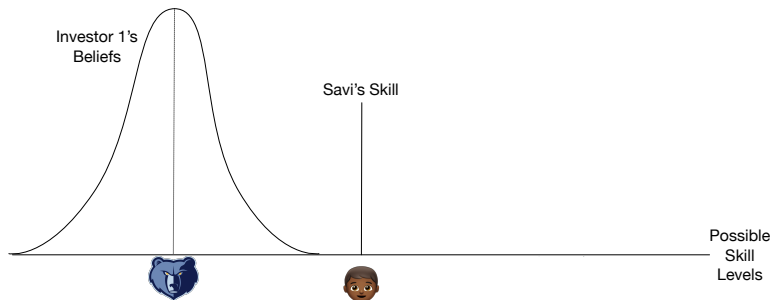A manager's skill is a point-mass, not a distribution

Savi's Skill

Possible
Skill
Levels

A manager's skill is a point-mass, not a distribution

Investor 1's Beliefs

Savi's Skill

Possible Skill Levels

One investor is pessimistic about the manager's skill.

Investor 1's
Beliefs

Savi's Skill

Possible
Skill
Levels

One investor is pessimistic about the manager's skill.
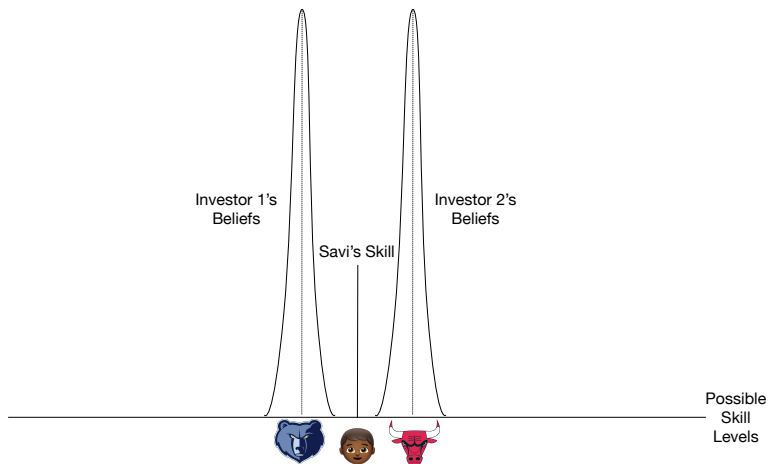
One investor is optimistic about the manager's skill.

Investor 1's
Beliefs

Savi's Skill

Investor 2's
Beliefs

Possible
Skill
Levels
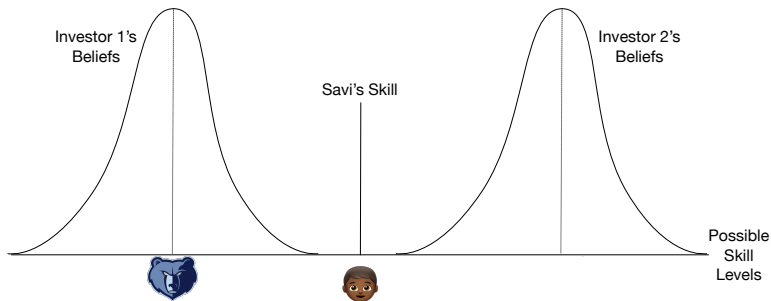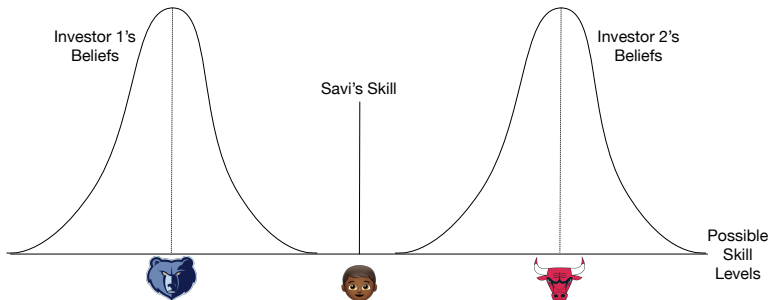
One investor is optimistic about the manager's skill.
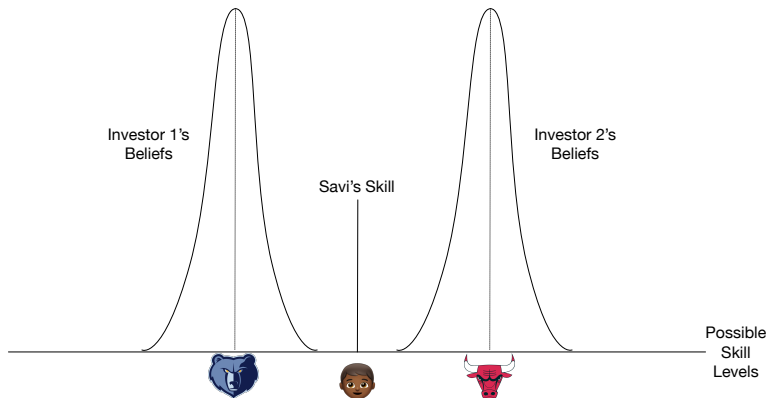
When they see a common signal, their beliefs converge...

...and converge towards the truth.
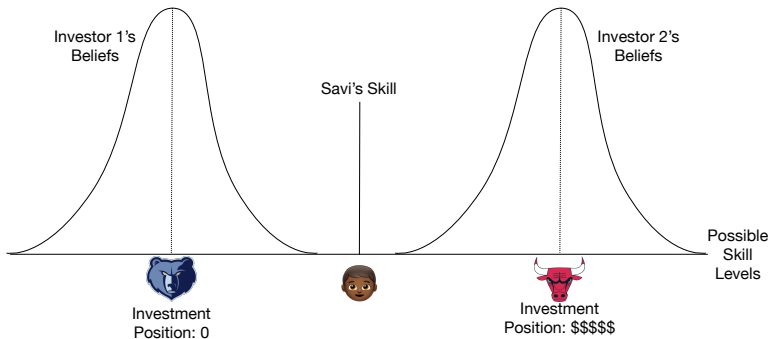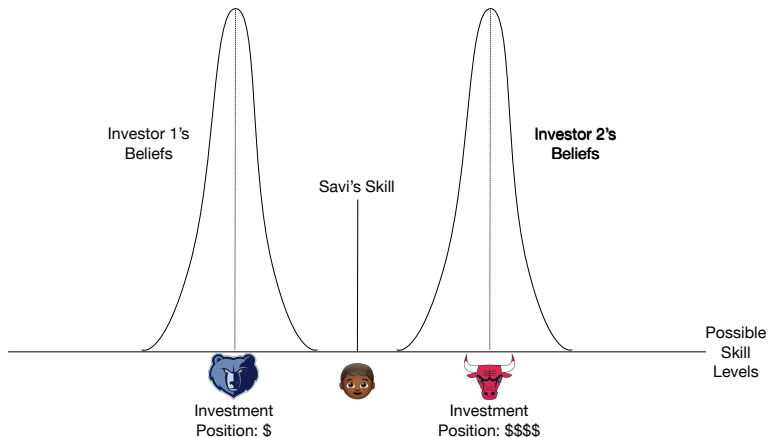
- As agents' beliefs converge, portfolios should converge.

- Therefore measured disagreement declines.

- Speed of decline can be compared to a Bayesian learner.

Bear doesn't invest; Bull does. (Measured disagreement $= 0$)

Coordinating signal increases bear's position, reduces bull's.
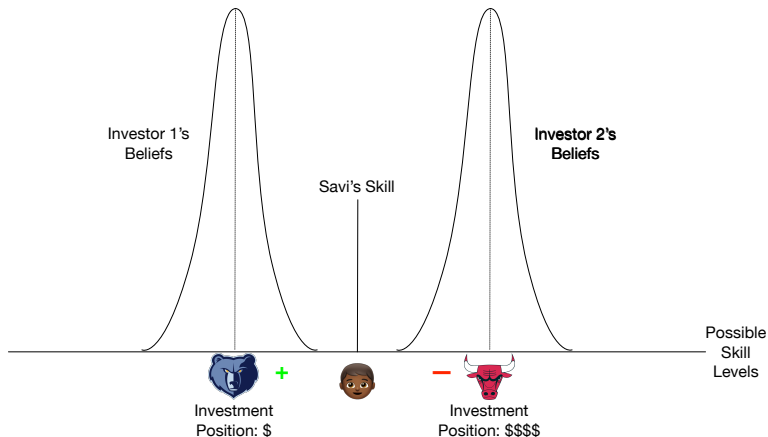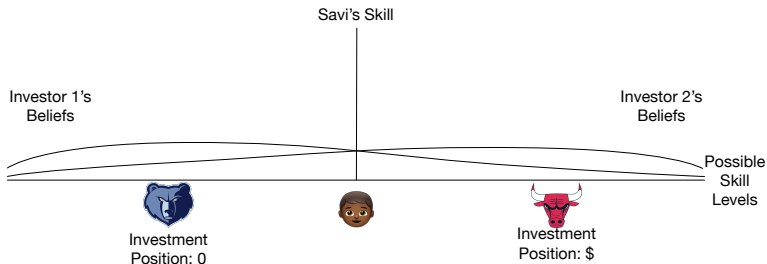
Looks like MORE disagreement, but is actually LESS.
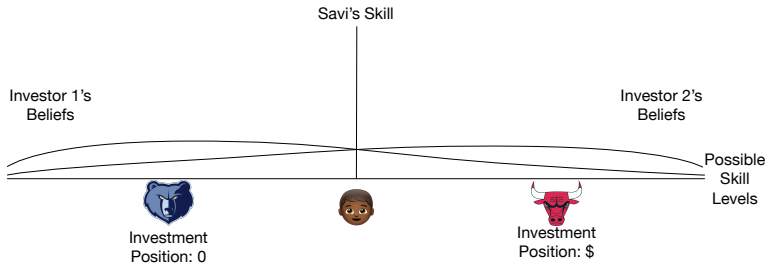
Comment 1: In Words

- Assume *lots* of initial disagreement.

- If no new info -

    - Still lots of disagreement.

    - No need to change investments (low IDAS)

- If lots of info -

    - Very little disagreement.

    - Need to change investments a lot (high IDAS).

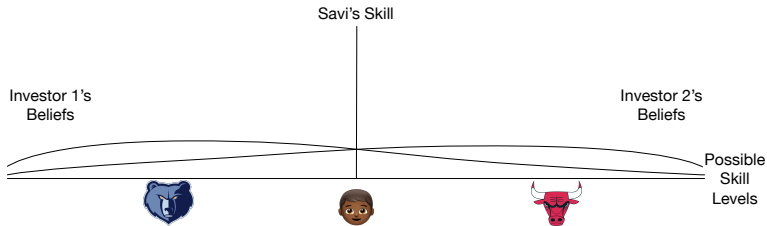"High disagreement should [follow]... funds [with] high return uncertainty."

Savi's Skill

Investor 1's
Beliefs

Investor 2's
Beliefs

Possible
Skill
Levels

Investment
Position: 0

Investment
Position: $

But high uncertainty leads to mutually low investment by risk-averse agents.

Is this disagreement?

Investor 1's Beliefs

Investor 2's Beliefs

Savi's Skill

Possible Skill Levels

Is this?

Comment 3: What Does Disagreement Mean?

Zanardo (2017) axiomatically defines disagreement $D(p, q)$:

1. $D(p, q) = 0$ iff $p = q$.
2. (Technical assumption about the state-space)
3. D is quasi-convex.
4. Disagreement cannot increase when two states are merged.
5. If agents agree that two states are independent, then the disagreement on the product space is the sum of disagreement across issues.
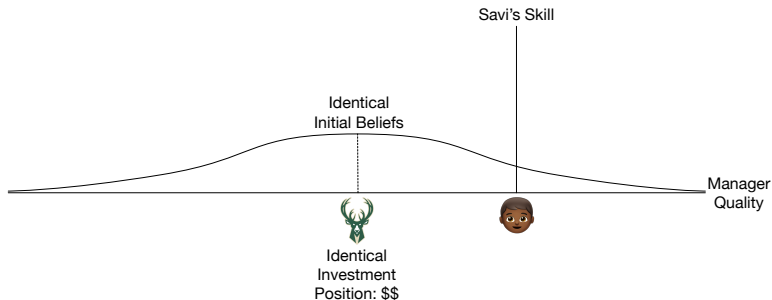6. Disagreement on a subset of states is not affected by beliefs on an independent subset.

Houses canonical measures of disagreement such as Renyi, Kullback-Leibler, and Bhattacharyya.
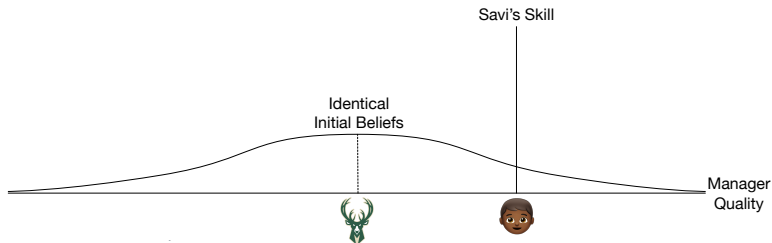
Nimark and Sundaresan (2018)!

Quality is complicated, and it costly to process information about it.
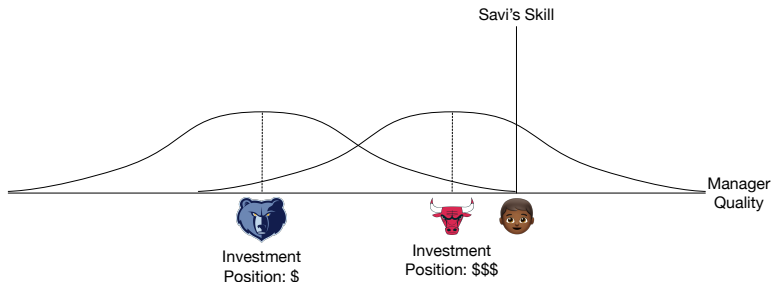
Agents might make an initial mistake after one period. (IDAS = $)
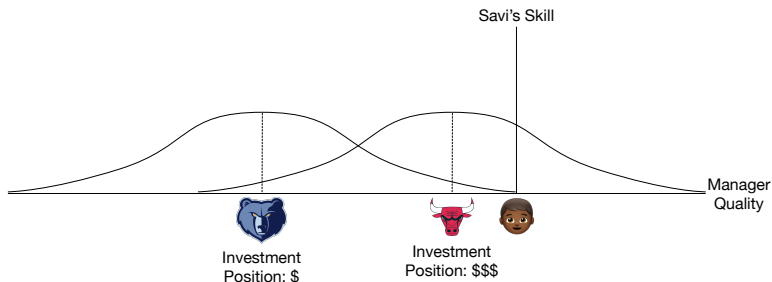
Changing beliefs changes incentives for information collection.

Savi's Skill

Manager Quality

Investment Position: $

Investment Position: $$$
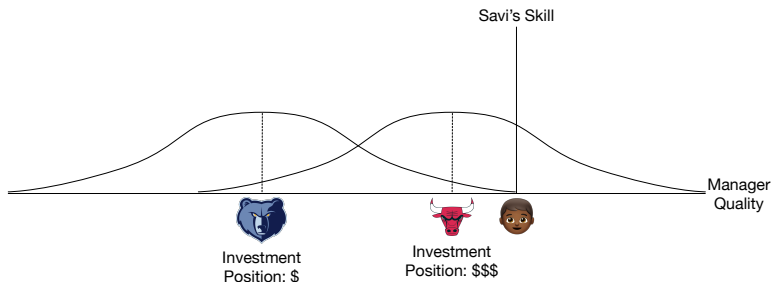
Bear expends less effort, gets noisier signals, more likely make mistakes.
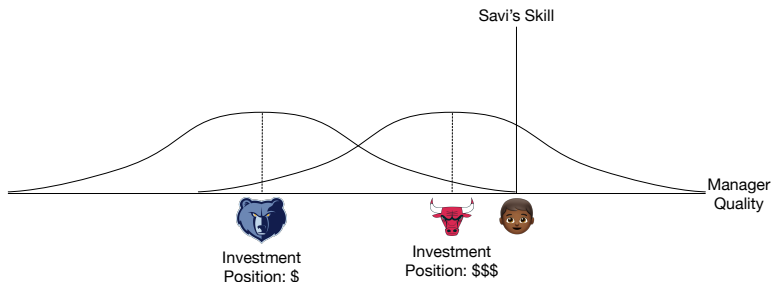
Bull expends more effort, gets better signals, less likely to make mistakes.
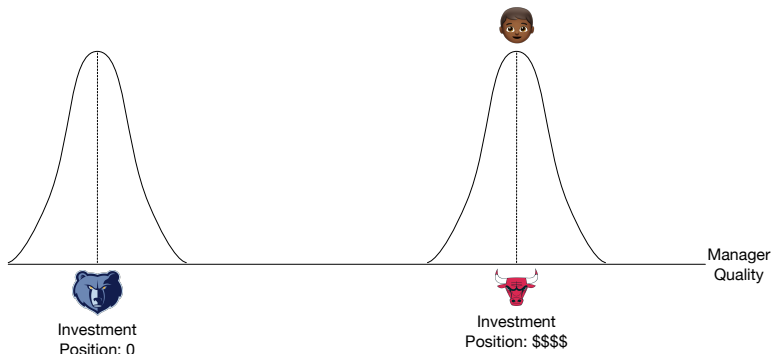
Further adjustments as confirmation effect takes hold (IDAS = $).
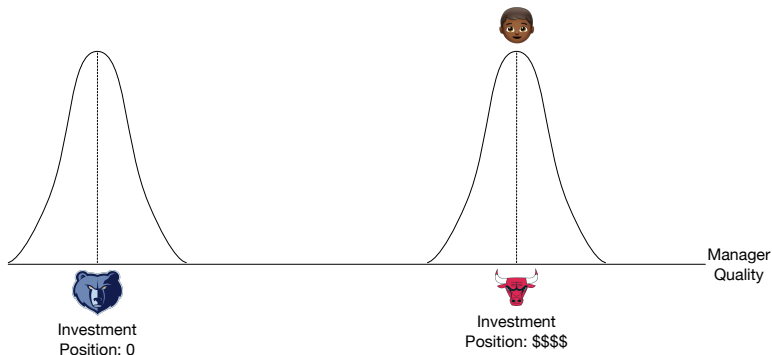
Eventually stop expending effort, positions are permanent. (IDAS = 0).

- The IDAS measure starts higher and then declines.

- Beliefs start at concordance and then diverge.

- Opposite conclusion!

- Unclear what this measure is telling us.

- *Something* is converging. But what?

- Perhaps a measure of confidence?