QUESTION: What is the interaction between the stock market and aggregate investment?

ANSWER:

1. Aggregate investment increases with future stock prices (“high-return” effect)

2. Stock prices increase with previous aggregate investment (“good-news” effect).

3. These effects create a complementarity in investment decisions and an inefficient use of information, as too much weight is given to common (relative to private) pieces of information.
THE MODEL

Rate of return to investment: $\theta \sim N(\mu, \pi^{-1}_\theta)$

Entrepreneurs (“Silicon Valley”): Observe a common signal $\epsilon = \theta + \epsilon$ with $\epsilon \sim N(0, \pi^{-1}_\epsilon)$; and a private signal $x_i = \theta + \xi_i$ with $\xi_i \sim N(0, \pi^{-1}_x)$. Maximization leads to:

$$k_i = (1 - \lambda) \cdot E_i(\theta / x_i, y) + \lambda \cdot E_i(p / x_i, y) \quad \text{for all } i \in E$$

Traders (“Wall Street”): Observe aggregate investment, $K \equiv \int k_i$, that is:

$$K = (1 - \lambda) \cdot \int E_i(\theta / x_i, y) + \lambda \cdot \int E_i(p / x_i, y)$$

Maximization and competition lead to:

$$p = E(\theta / K)$$
Let \( \overline{E}(\theta, \varepsilon) = \int_i E_i(\theta / x_i, y) \). Then, we have this fixed-point problem:

\[
K = (1 - \lambda) \cdot \overline{E}(\theta, \varepsilon) + \lambda \cdot \int_i E_i(p / x_i, y)
\]

\[
p = E(\theta / K)
\]

1. Assume investment incorporates all useful information, i.e. \( E(\theta / K) = E_i(\theta / x_i, y, K) \) for all \( i \in E \). Then,

\[
E_i(p / x_i, y) = E_i(E(\theta / K) / x_i, y) = E_i(E_i(\theta / x_i, y, K) / x_i, y) = E_i(\theta / x_i, y)
\]

Therefore, \( K = \int_i E_i(\theta / x_i, y) \) and “Wall Street” has no effect on “Silicon Valley”: \( \frac{\partial K}{\partial \lambda} = 0 \).

2. The problem is that, in general, forecasting prices is not the same as forecasting returns. Entrepreneurs know this and start guessing what others will do. The standard result is that too much weight is given to public information.
EXTENSIONS:

1. Timing of actions and the role of asset prices as aggregators of information:

   - Financing investments instead of liquidity shocks (present vs. future asset prices).
   - Many periods and dynamics of prices and investment in the absence of shocks.

2. Other sources of aggregate information or disinformation

   - Use of additional aggregate variables to help infer information
   - Shocks in asset markets (noise traders) and spurious correlations

3. The role of pecuniary and non-pecuniary externalities (“Wall Street” and “Silicon Valley”)

   - Downward-sloping demand for assets (problems even if prices incorporate all information).
   - Variable returns to scale, risk aversion and virtually anything that eliminates corners.
EVALUATION:

1. Very elegant and potentially relevant application of existing theory developed by the authors (and others in this conference)

2. Empirical predictions.

3. This project is at a crossroads:
   
   - Is this paper just an illustration of how the theory works for non-specialists? GREAT SUCCESS, PACK AND GO. Well written, clear mechanisms, ….

   - Is this paper a serious attempt at capturing interactions between real investment and stock markets? A LOT OF WORK AND CONVINCING TO DO. Asset prices also affect credit constraints, have important allocational roles, ….