Discussion of Activism, Strategic Trading and Liquidity by K. Back, P. Collin-Dufresne, V. Fos and A. Ljungqvist

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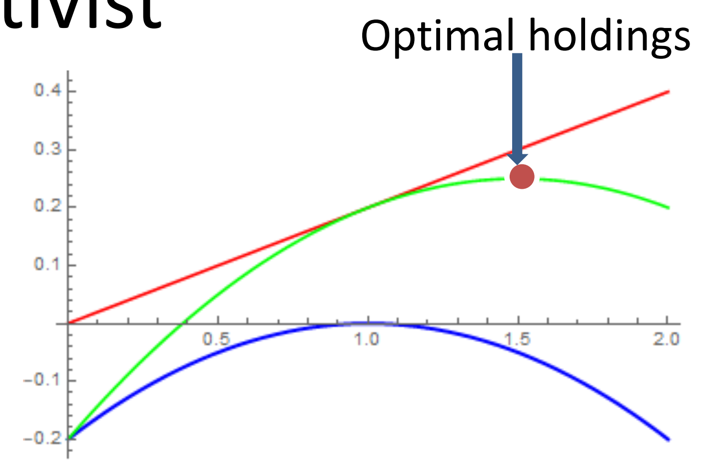
The Model

- C(v) – the cost of achieving price v
  - Remove overpaid managers – then Δv, not v
  - True value – then v is not a choice variable
  - Conduct trade that will bring the price to v
- Optimal holdings by the activist

$$G(x) = \max_v \left(vx - C(v) \right)$$

$$V(x) = \arg\max_v \left(vx - C(v) \right)$$



It is not clear how to unwind the position.

Initially the activist has X_0 shares, while others know that this amount is distributed $N(\mu_x, \sigma_x)$.

With time the number of shares changes as X_t.

Denote the cumulative number of shares purchased by time t by noise traders by Z_t, distributed $N(0, \sigma)$.

Aggregated purchases are $Y_t = Z_t + X_t - X_0$.

Denote $P(t, Y_t)$ the share price at time t.

Not clear why the price P is path independent if we consider liquidity effects.

Activist choses to maximize

$$\mathsf{E}\left[G(X_T) - \int_0^T P(t, Y_t)\theta_t \,\mathrm{d}t \mid X_0\right]$$

Applying this dynamically the activist's value function at time t is

$$J(t,x,y) \stackrel{\text{def}}{=} \sup_{\theta} \mathsf{E}\left[G(X_T) - \int_t^T P(u, Y_u)\theta_u \,\mathrm{d}u \,\middle|\, X_t = x, Y_t = y\right]$$

Eventually this leads to the following equations:

$$-P + J_x + J_y = 0\,,$$
$$J_t + \frac{1}{2}\sigma^2 J_{yy} = 0\,.$$

Optimal trading strategy:

$$\theta_t = \frac{1}{T-t}\left(\frac{X_t - \mu_x - \Lambda Y_t}{\Lambda - 2}\right)$$

If you are close to T and still do not have the required amount, you will have to trade a lot, since (T-t) is close to zero!

A more realistic (and more difficult) task is to chose T dynamically.