# Resource Allocation and Transfer Pricing

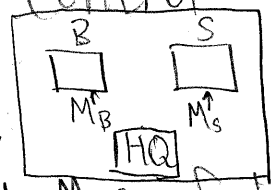
- authority
- hierarchy
- transfer pricing

} within the firm

## Holmström - Tirole

1] Previous literature: mechanism design
- says nothing about firm boundaries

2] H-T relate instead to theory of the firm literature: incomplete contracts and control
- GHM-type of model

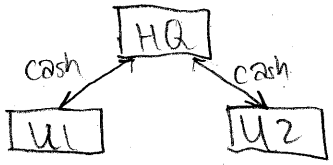



Consider: (will merge these two)
1] NI
2] "Genuine M form" - $M_B$, $M_S$ can freely negotiate p, q, including going to outside market
3] "Corrupted M form" - same, except HQ prohibits external trade
4] "Command (C) form" - HQ mandates trade.

Can think of 2], 3] and 4] in terms of a standard property rights model, where 2] corresponds to NI, 3] corresponds to joint ownership (exclusive dealing), to some extent, 4] corresponds to, perhaps, a contract?

4] would work well with self-investments
2] would work well with cross-investments
3] works well if rent-seeking is a problem. 4] works as well

## Stein: Internal Capital Markets



- can imagine U1 and U2 being different firms and just going to the capital markets
- HQ has more information than outside markets - why?

Stein '97 + '02: adds the idea that HQ may be an empire builder (everyone wants to invest more than they should) (ie private benefits ∝ gross profitability
- it still wants to allocate capital relatively efficiently. (they still look at the big picture)

- U1, U2 know that if they do well, some of the cash might go to the other unit. (will be expropriated)
- political pressure (socialism) within company

- the idea that the HQ has a "big picture" is something Oliver likes.
- soft information vs. hard information:
  - soft: not convincing to headquarters
  - hard: verifiable
- is it ever the case that HQ wants coordination but individuals don't really care? (ie "big picture" is only seen by the top.)

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Go back to transfer pricing alternative model:

HQ?

B S

- even ex post
- noncontractible decision/button in each unit (I or N)
- trade iff both buttons are I (I, I)
- trade is verifiable, but outsiders cannot distinguish between (I, N), (N, I), (N, N).

- B's revenue $= \begin{cases} r & \text{if trade} \\ 0 & \text{if no trade + private benefit } b_1 \end{cases}$
- S's cost $= \begin{cases} c & \text{if trade} \\ 0 & \text{if no trade + private benefit } b_2 \end{cases}$
- because trade is contractible, you can have a transfer price
- Let $p$ be transfer price (B pays $p$ to S if $q=1$)
- assume $r, c, b_1, b_2$ are ex ante uncertain. Learned ex post by B, S, and HQ
- assume non-Coasian bargaining ex post
  - a price range causes disagreement
- owner can divert all the profit ($c$ but not private benefits)
- NI: $q=1 \Leftrightarrow (I, I)$
  $\Leftrightarrow \begin{cases} r-p \geq b_1 \\ p-c \geq b_2 \end{cases} \Rightarrow r-b_1 \geq p \geq c+b_2$
  - if we have a range of prices, will always get efficient here.
- cf FB: $q=1$ iff $r-c \geq b_1+b_2$
- if $p$ is chosen before realization of uncertainty, too little trade under NI.
- Integration: HQ chooses the noncontractible actions
  - like an employment contract: $M_i$ gets $p_i$ if $q=1$
  - Then, $q=1 \Leftrightarrow r-c-p_1-p_2-\theta A_1 \geq -\theta A_2$,
    where $A_1 = \max\{b_1-p_1, 0\} + \max\{b_2-p_2, 0\}$
    $A_2 = \max\{p_1-b_1, 0\} + \max\{p_2-b_2, 0\}$
    - if $p_1 > b_1$, I wishes they had pressed the button

    $\Leftrightarrow r-c \geq p_1+p_2+\theta(A_1-A_2)$

- If $q=0$ always optimal, then NI is optimal
- If $r, c, b_1 \approx$ constant and $b_2$ varies
  (or $b_2$ constant, $b_1$ varies or if $b_1, b_2$ vary)

Integration is good if $b_1, b_2 \approx$ constant and $r, c$ vary
- set $p_1 = b_1$, $p_2 = b_2$

What does this do that H-T doesn't do? It gives "a slightly more interesting" view of integration.

Wednesday: Cases