

# Lecture 18: Hold-Up

Compensation in Organizations

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Discussion: Klein, Crawford, Alchian (1978)

(This reading was optional)

How much was Elijah Wood's base salary for all three LOTR movies?

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**\$250,000**

How much was Elijah Wood paid for *The Hobbit* trilogy?

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trilogy?

(Screen-time: less than 4 minutes)

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**\$1,000,000**



Discussion: Why this difference?

## Human Asset Specificity

- ▶ *The Fellowship of the Ring* (movie 1) was enormously successful.
- ▶ Frodo is the ring bearer (the closest to a main character)
- ▶ Elijah Wood essentially becomes Frodo after the first movie.
- ▶ Elijah Wood gets the specific asset of being Frodo.
- ▶ He cannot be replaced, and he is extremely valuable after the first movie.

## From Specificity to Holdup

- ▶ This alone is not a problem.
- ▶ It becomes a problem when:
  - ▶ There are things that must be done after Elijah Wood becomes merged with Frodo.
    - ▶ They needed to make *The Two Towers* and *Return of the King*.
  - ▶ This generates a problem called hold-up.

# The Model

- ▶ Players: Elijah Wood (EW), New Line Cinema (NLC)
- ▶ NLC decides whether or not to start LOTR, which entails simultaneously announcing EW as Frodo, and paying fixed cost of production  $c > 0$ .
- ▶ After this, EW proposes a wage  $w$  for all movies.
- ▶ If NLC rejects, EW gets outside option  $\bar{u}$  and NLC makes 0 box office revenue.
- ▶ If they accept, NLC receives box office revenue from LOTR  $b$ .
- ▶ Assume indifference is broken in favor of making LOTR.

## Diagram of the Model

See the board!

## Solving the Model

See the board!

# Hold-Up Solution

## Theorem 1

*For all values of fixed costs  $c$ , outside option  $\bar{u}$ , and box office revenue  $b$ , LOTR is never made.*

- ▶ Elijah Wood “holds up” NLC and gets all box office revenue.
- ▶ Therefore LOTR is never made!
- ▶ Whenever box office revenue exceeds the real costs ( $b \geq \bar{u} + c$ ) this is inefficient.
- ▶ *Fellowship* revenue was approx. \$900 million, and total budget of all 3 movies was less than \$300 million

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- ▶ Suppose you are deciding how to make the three LOTR movies.
- ▶ You have two options:
  1. Make all at once and then release.
  2. Make them sequentially, with releases in between.
- ▶ What are the main benefits of option 1?
  - ▶ No aging of actors between movies.
  - ▶ Conserve on fixed costs (setting up infrastructure, negotiating contracts, etc.)
- ▶ What are the main benefits of option 2?
  - ▶ Can see if the first does well before making the second.
  - ▶ Can learn from the first when making the second.

## Hold-Up with Back-to-Back Filming

- ▶ Let's modify the original game.
- ▶ Specifically: EW proposes a wage to NLC before production starts.
- ▶ After accepting the wage, NLC starts production and incurs the fixed cost.

New Diagram

See the board!

## Solving the Model

See the board!

## Fixing Hold-Up: Back-to-Back Filming

### Theorem 2

*Under back-to-back filming, LOTR is made whenever  $b \geq \bar{u} + c$ .*

- ▶ Now EW proposes an acceptable wage:  $w = b - c$
- ▶ Changing timing “fixes” hold-up!
- ▶ EW now internalizes the fixed cost of production.
- ▶ EW still gets all of the surplus, but...
- ▶ By changing NLC's outside option we can fix this to be more realistic.

## Discussion

Is this a realistic solution?

## Back-to-Back Has Drawbacks

- ▶ *Superman* and *Superman II* were shot back to back.
- ▶ Actors signed on to both upfront.
- ▶ However there was conflict between the producers and the original director.
- ▶ So the producers hired a new director.
- ▶ As a result, most “concurrent” footage was not used.



## Renegotiation/Slacking

- ▶ We ignored the fact that filming is a process.
- ▶ We also ignored that most employment in the US is at will.
- ▶ EW could potentially threaten to slack or quit part way through.
- ▶ EW could then propose a contract partway through when he has a lot of leverage.
- ▶ This means our solution is vulnerable in some sense.