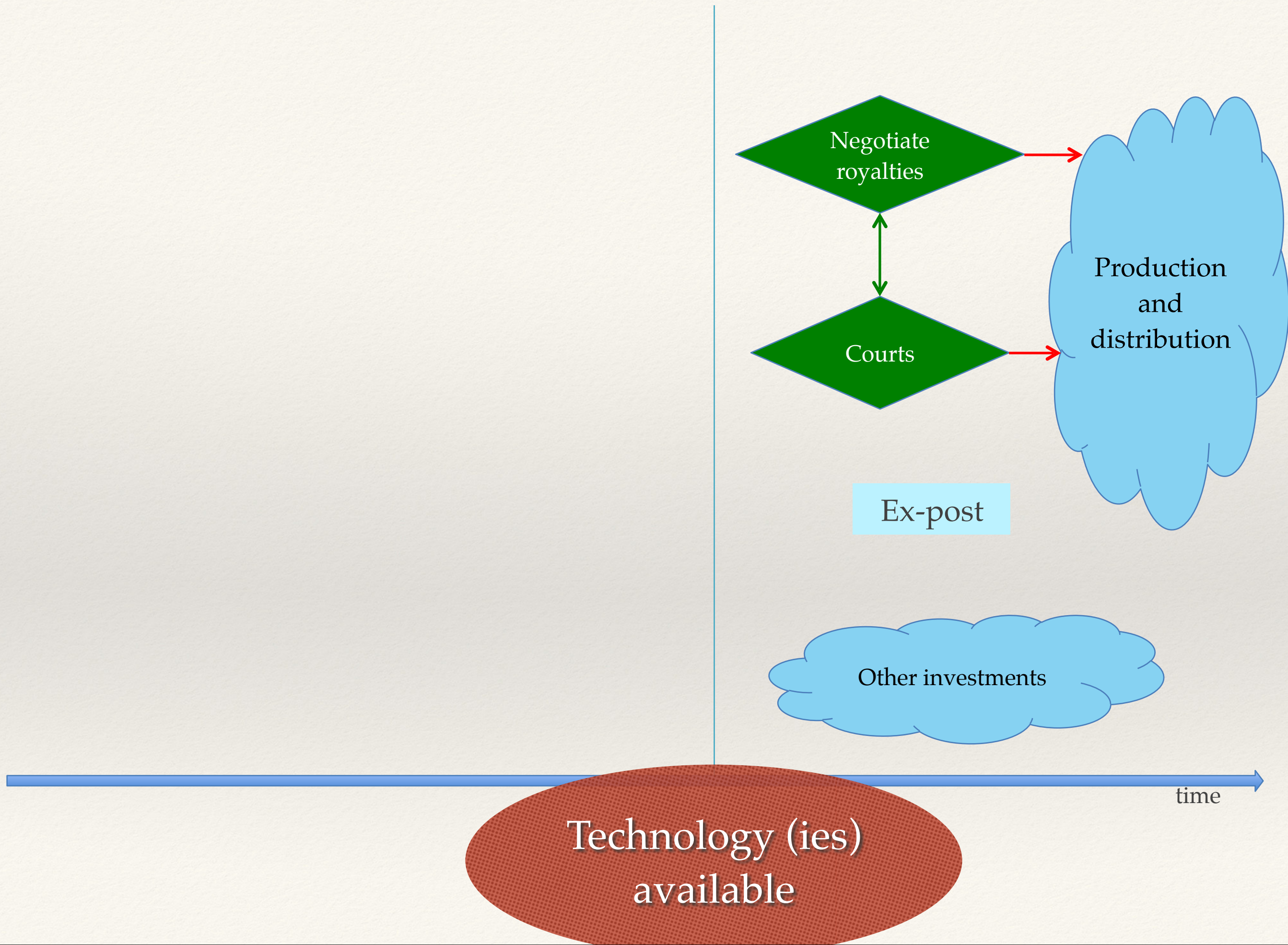

Commitment in Standard Setting Organizations

Patrick Legros
ULB (ECARES)

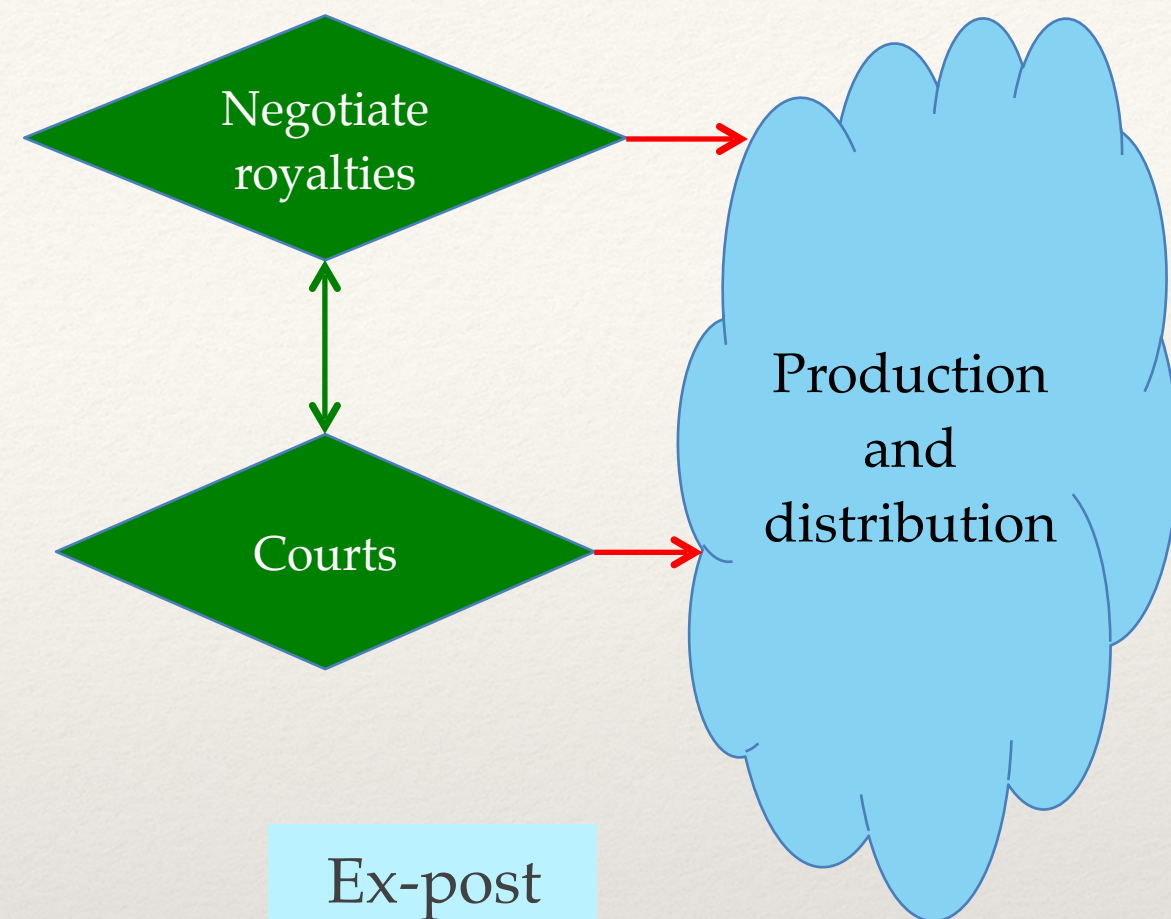
EAGCP workshop
March 2014

Incomplete Contracting: SSOs vs Patent Pools

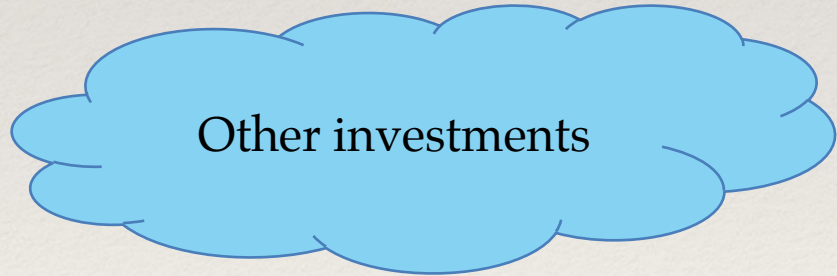


Legal incompleteness

- Validity of IPRs
- Cost of infringement



Ex-post

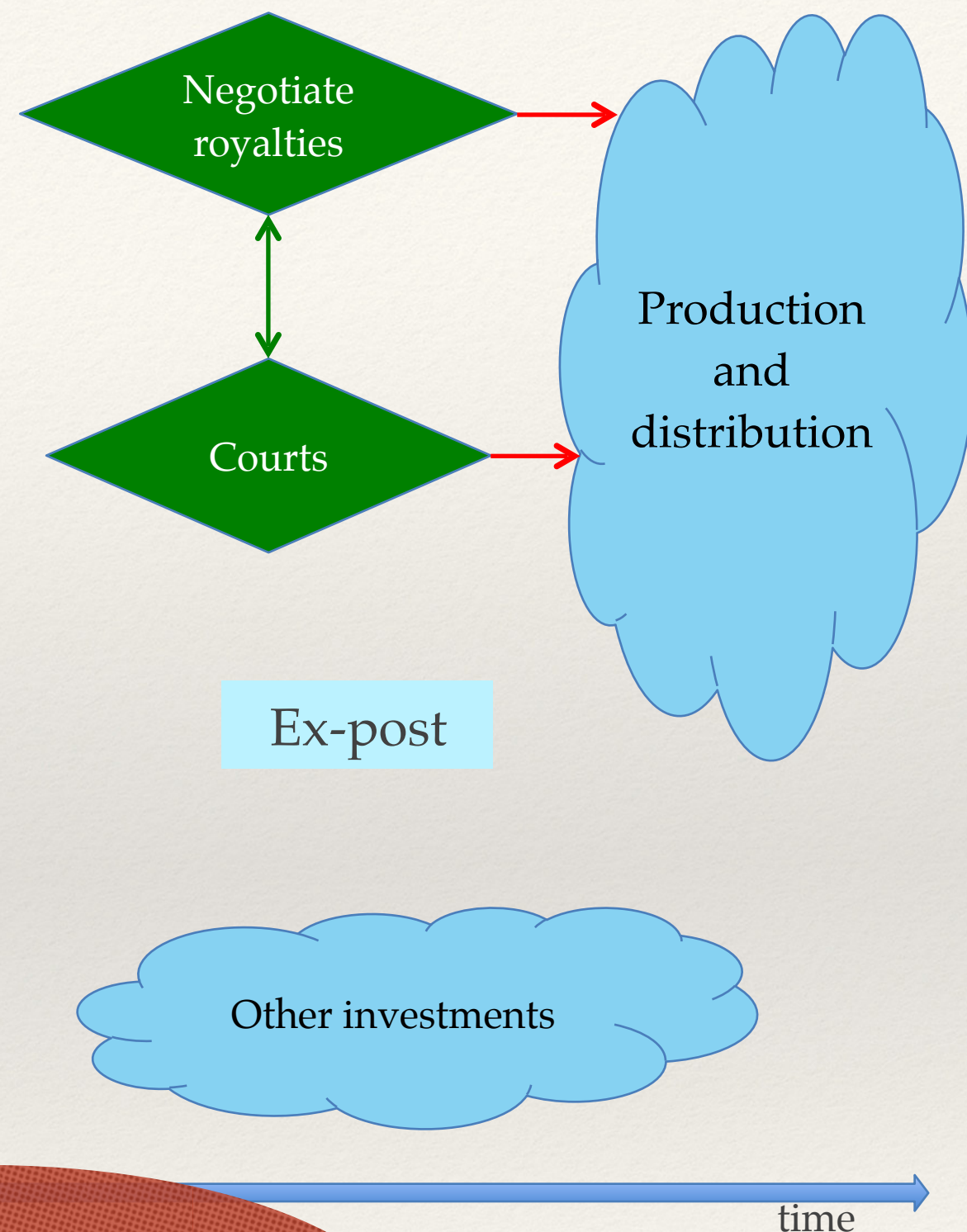


Legal incompleteness

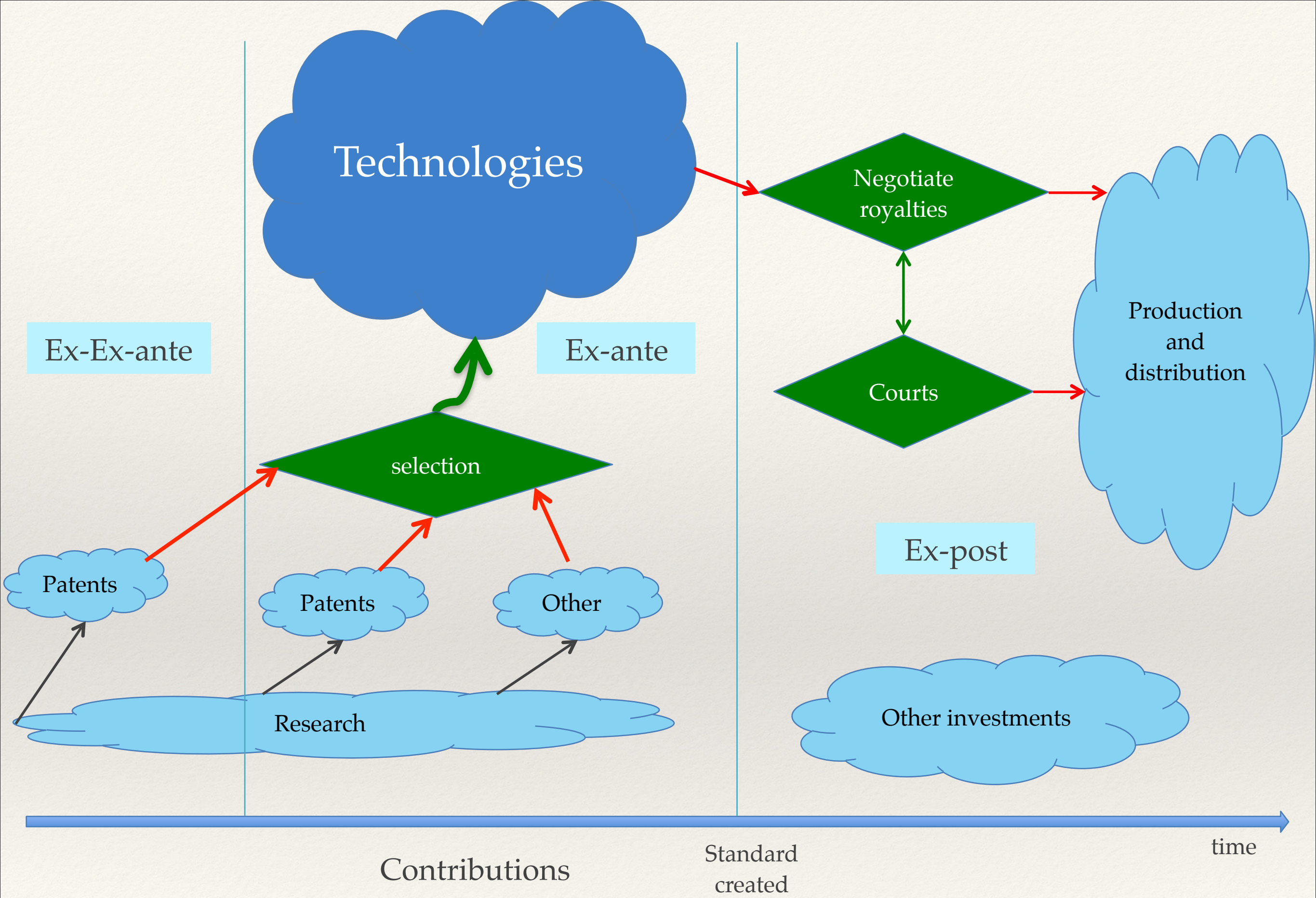
- Validity of IPRs
- Cost of infringement

Patent pools

- Double marginalisation versus oligopolistic dominance
- Independent licensing and caps (Lerner-Tirole, Rey-Tirole, Boutin, Quint)

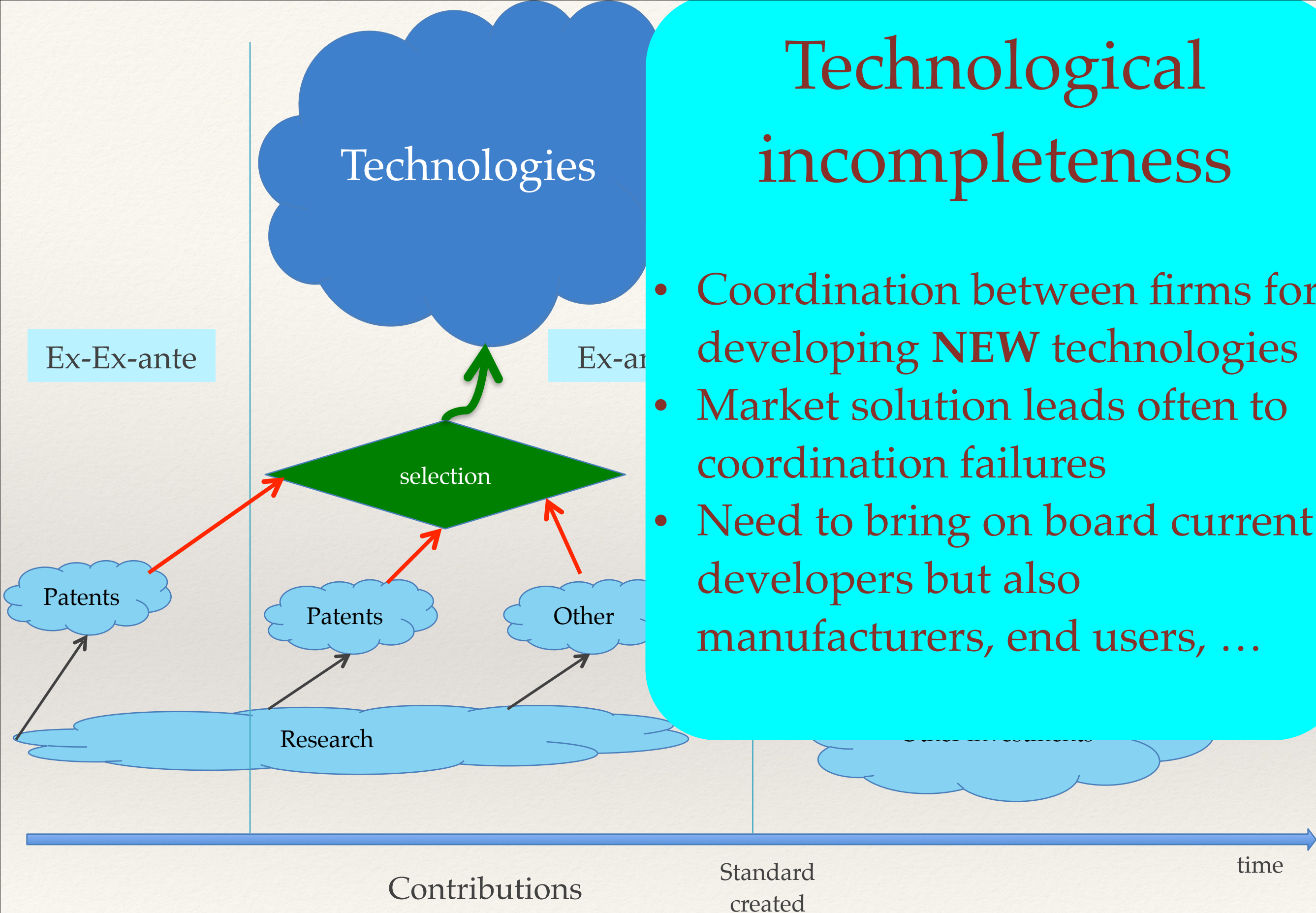


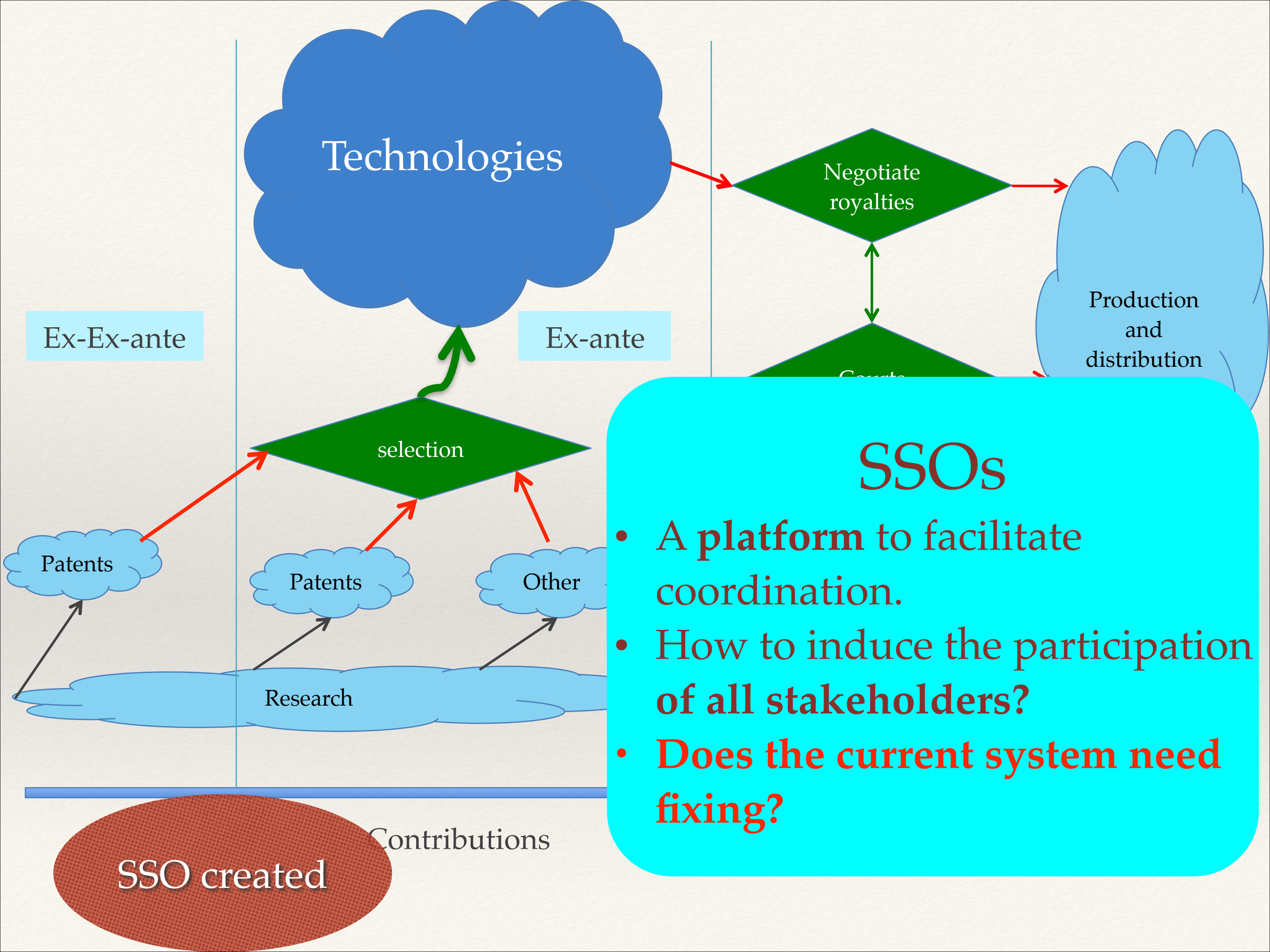
Technology (ies)
available



Technological incompleteness

- Coordination between firms for developing **NEW** technologies
- Market solution leads often to coordination failures
- Need to bring on board current developers but also manufacturers, end users, ...





Ex-Ex-ante

Ex-ante

Technologies

selection

Courts

Negotiate royalties

Production and distribution

Patents

Patents

Other

Research

SSO created

Contributions

SSOs

- A platform to facilitate coordination.
- How to induce the participation of all stakeholders?
- Does the current system need fixing?

Incomplete Contracting Teachings from the Literature

- ❖ Who has ownership, who has bargaining power, matters for ex-post outcomes.
- ❖ What happens ex-post also affects incentives to invest ex-ante.
- ❖ Participation may be discouraged ex-ante if there is the “wrong” ownership allocation, or the “wrong” bargaining power allocation.
- ❖ Use of instruments, like ex-ante and ex-post commitment, *may* help.

Remark 1:

Ex-ante commitments and the sequential nature
of investment incentives

In practice

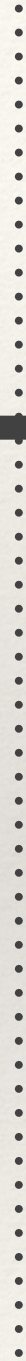
- ❖ Examples of SSOs requiring ex-ante commitment on royalties (VITA proposal)
- ❖ But plenty of other SSOs without this requirement
- ❖ Are those SSOs not requiring commitment choosing an “inefficient contract”?
- ❖ Not so.

**Standard
developed
and SEPs defined**

**Royalties
negotiated**

**Developers choose
to participate in SSO
s.t. internal rules**

**Manufacturers
adopt and invest**



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“Create” S at cost $c(S)$

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Benefit $B(S)$

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Manufacturers
adopt and invest

Cost p of participation

“Create” S at cost $c(S)$

Cost k of adoption
Benefit $B(S)$

Negotiated royalties: $r(S)$

Second-Best

No commitment

$$\text{Max}_S r(S) - c(S)$$

$$\text{s.t. } B(S) - r(S) \geq k$$

Second-Best

No commitment

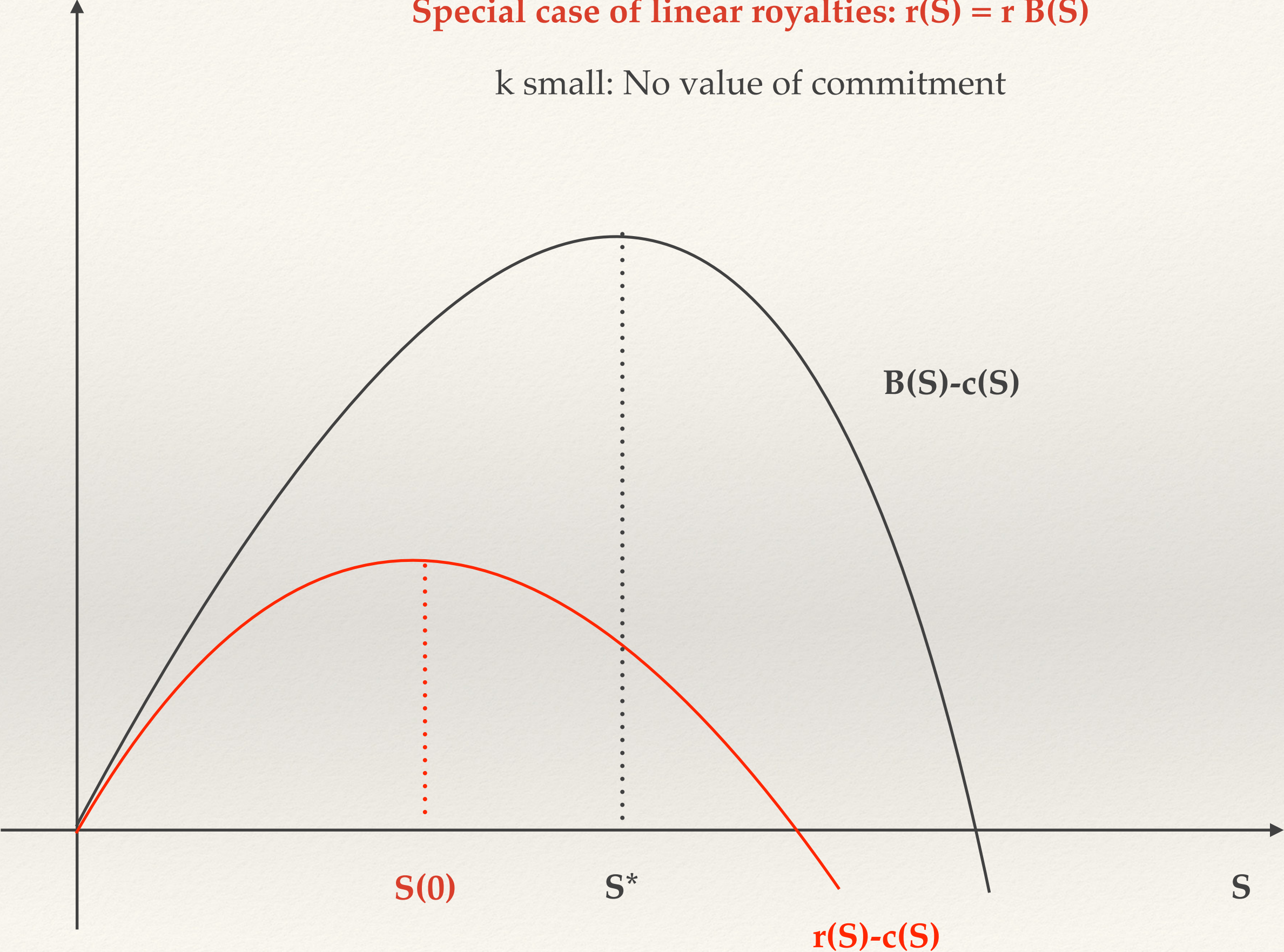
$$\begin{aligned} & \text{Max}_S r(S) - c(S) \\ & \text{s.t. } B(S) - r(S) \geq k \end{aligned}$$

Commitment

$$\begin{aligned} & \text{Max}_S \min(r^*, r(S)) - c(S) \\ & \text{s.t. } B(S) - \min(r^*, r(S)) \geq k \end{aligned}$$

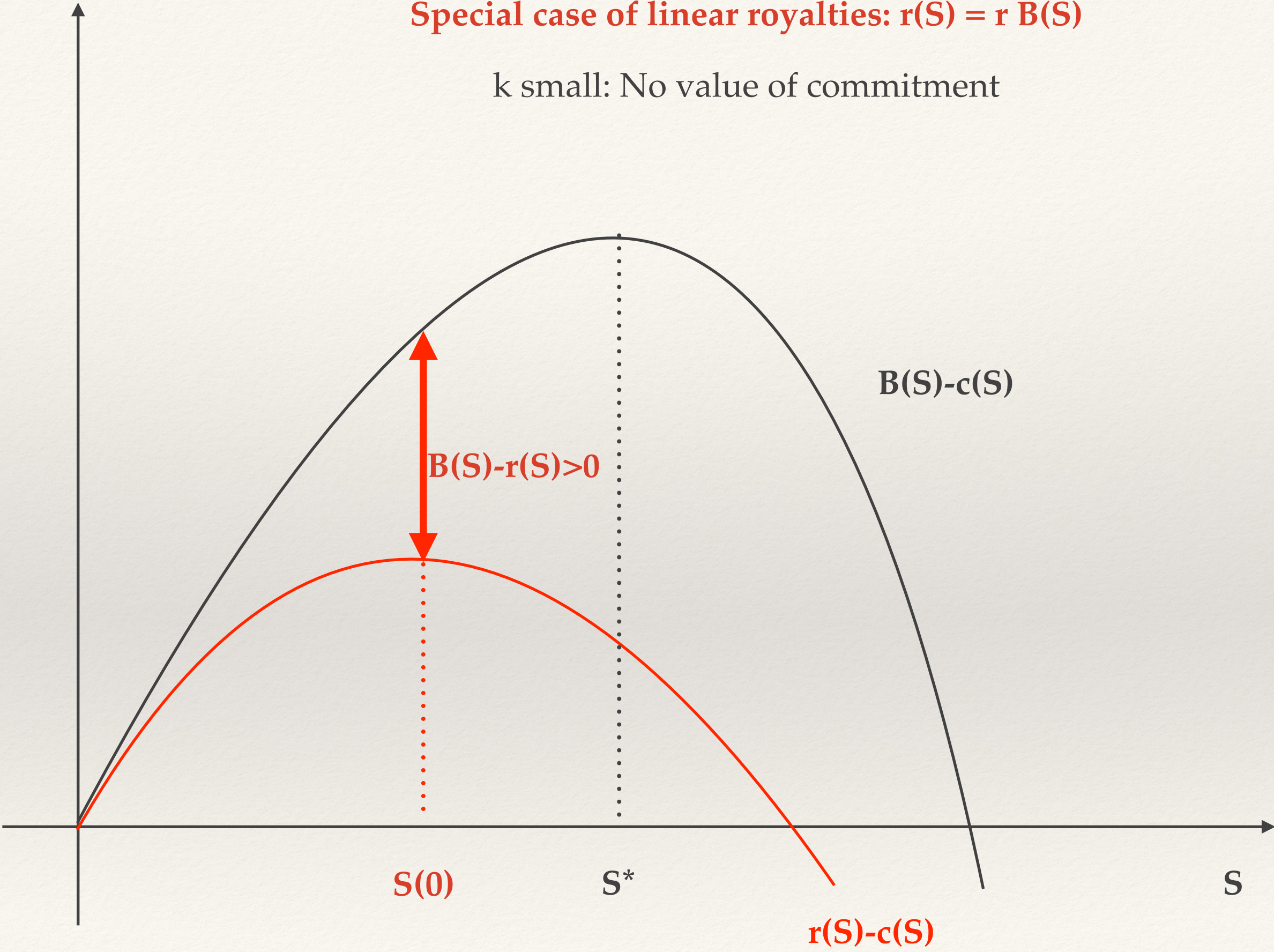
Special case of linear royalties: $r(S) = r B(S)$

k small: No value of commitment

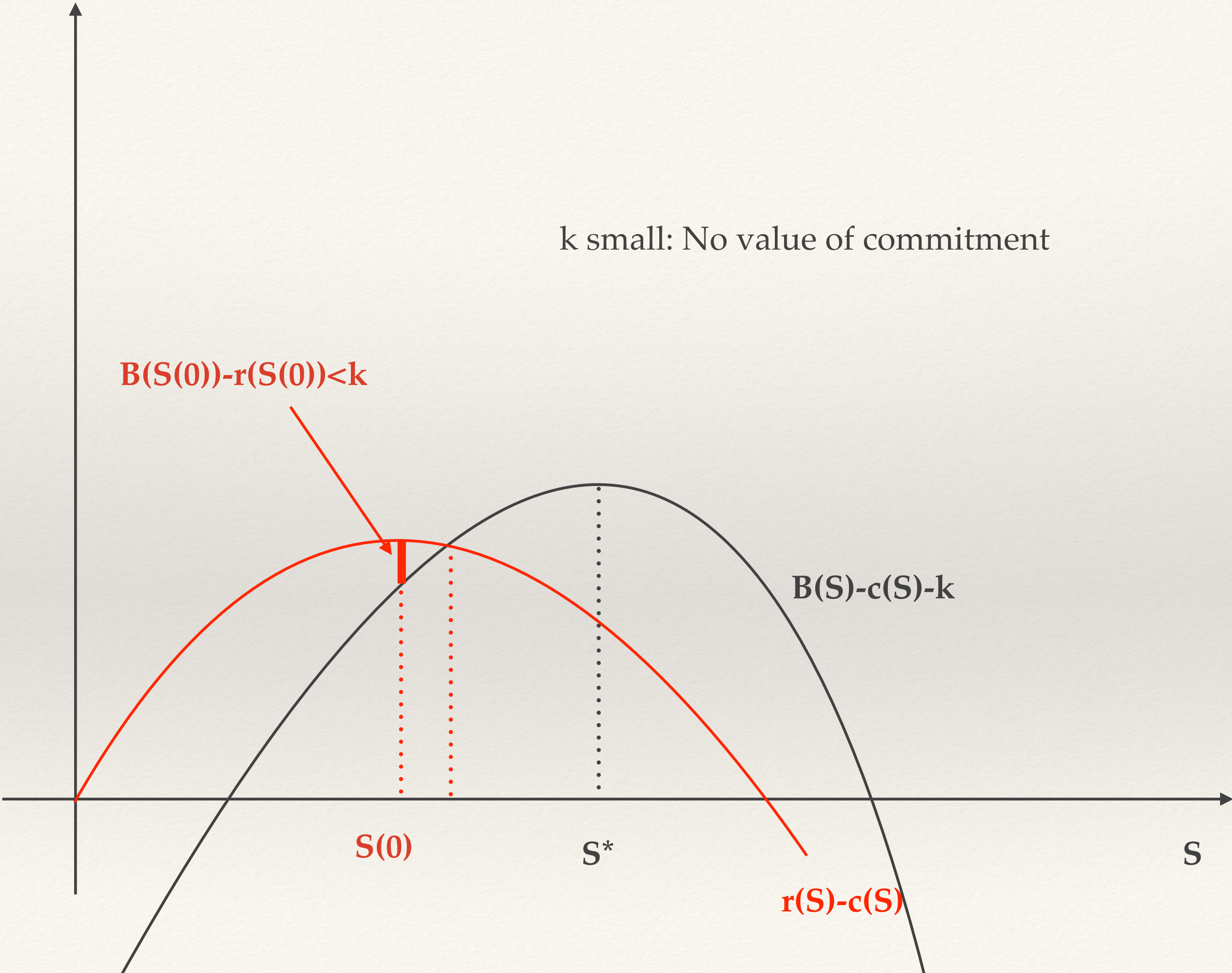


Special case of linear royalties: $r(S) = r B(S)$

k small: No value of commitment



k small: No value of commitment



$B(S(0))-r(S(0))<k$

$B(S)-c(S)-k$

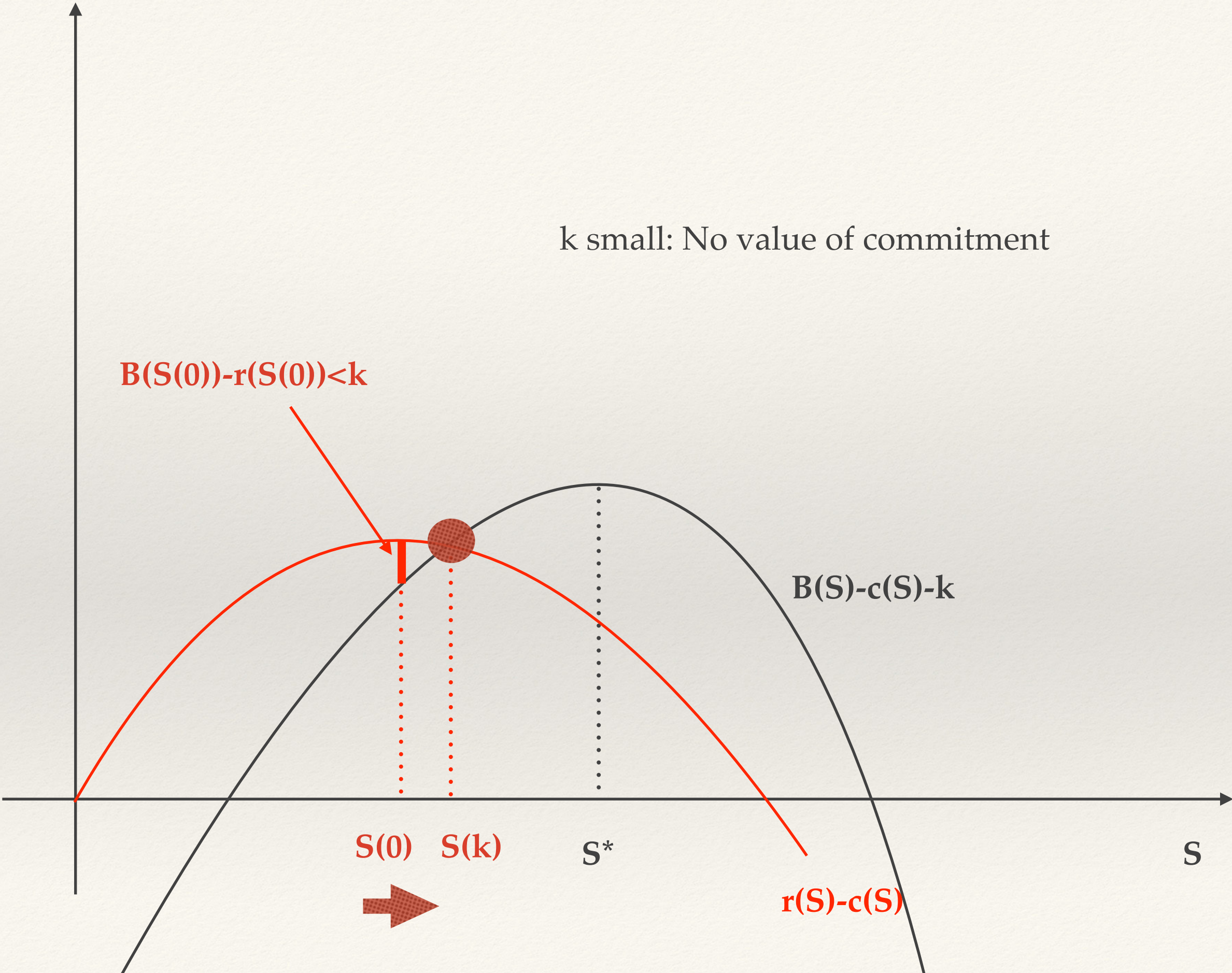
$r(S)-c(S)$

$S(0)$

S^*

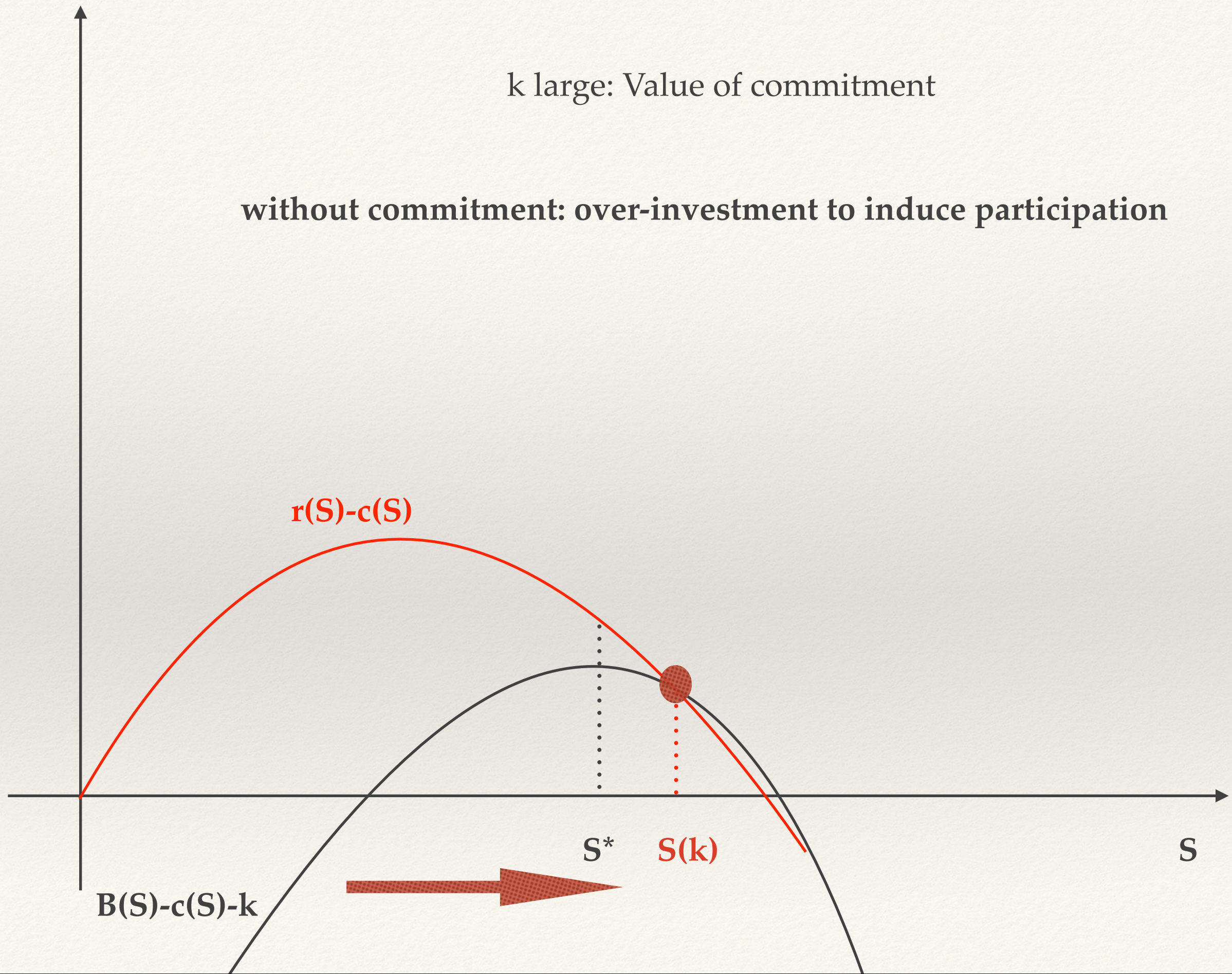
S

k small: No value of commitment



k large: Value of commitment

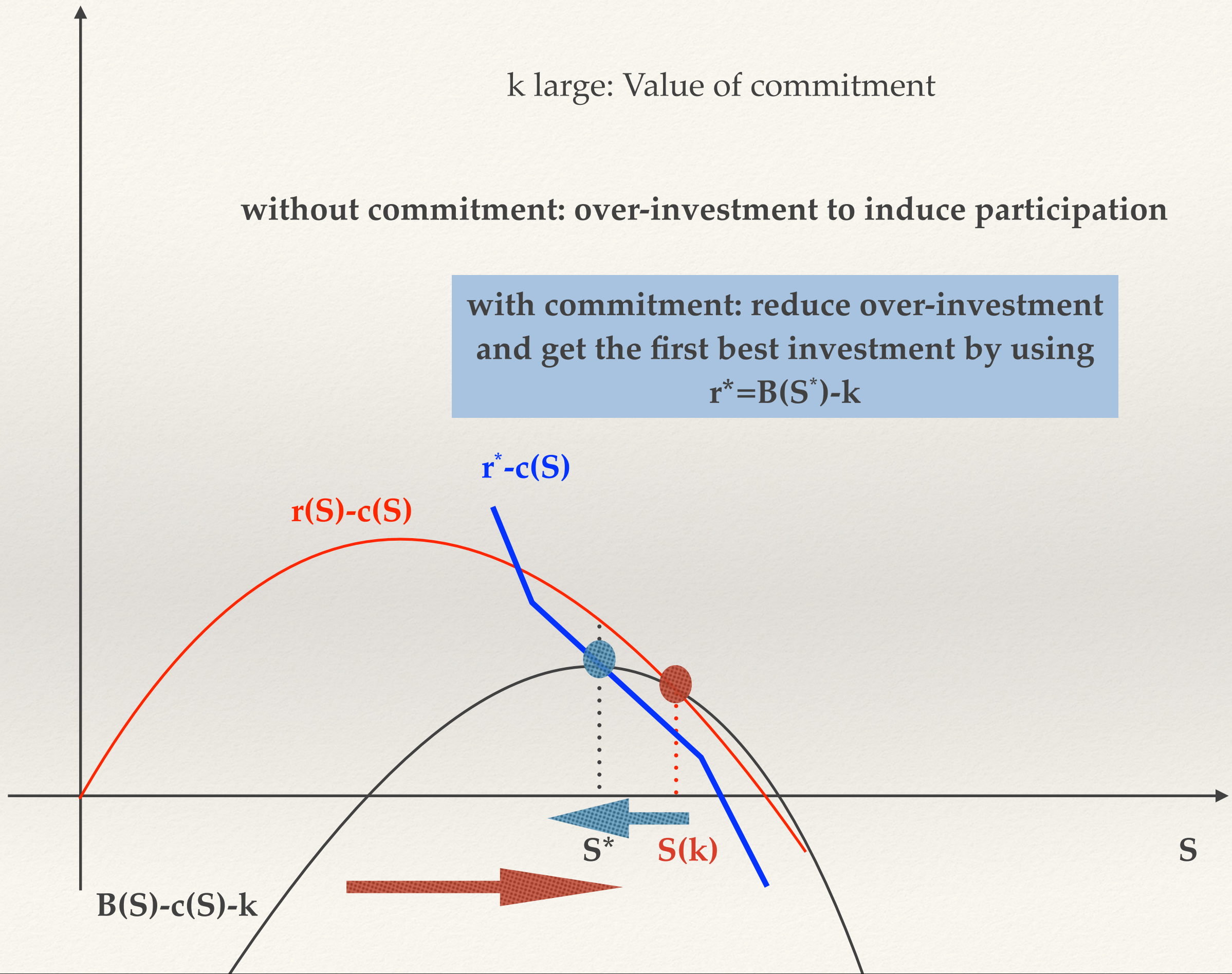
without commitment: over-investment to induce participation



k large: Value of commitment

without commitment: over-investment to induce participation

with commitment: reduce over-investment
and get the first best investment by using
 $r^* = B(S^*) - k$



Value of ex-ante Commitment?

- ❖ If S is variable and k is fixed:
 - ❖ Commitment has value if and only if the first-best S^* is not consistent with investment by the manufacturer ($B(r^*) - r(S^*) < k$). In this case, ex-ante commitment leads to the first best.
 - ❖ Commitment has value for the “upstream” participants only if the investment of “downstream” participants is important enough.
- ❖ Caveat: one IPR and one manufacturer.

Remark 2:

Hold-Up Among IPR holders

Heterogeneity and Commitment

Heterogeneity: value of IPRs for end users; type of IPR holders (vertically integrated or mainly downstream producer)

- ❖ **If only individual commitments, whose commitment is “more valuable”?**
- ❖ Hold-up is not necessarily on the end-users, but also among SSO participants (consistent with Simcoe AER 2013 findings).
- ❖ Commitment by “small” firms may be more valuable than those by “big” firms.

An Example

- ❖ Three technologies A,B,C
- ❖ Consumers value any standard combining technologies *AC or BC* but no other combination.
- ❖ Standard increases the quality of products embedding technologies

No SSO vs SSO

No SSO

- Demand is $1 - R$
- A, B, C compete and equilibrium is
- $r_A = r_B = 0, r_C = 1/2$
- Hence C makes (monopoly) profit of
 $\text{Profit}(C \mid \text{no SSO}) = 1/4$

SSO

- Demand is $S - R, S > 1$
- Participation in the SSO involves a cost p
- Probability $1/2$ of being selected for A or B
- C participates if his profit is greater than $1/4 + p$

Using Pool in SSO

Using Pool in SSO

No Pool

- AC standard used only if $1 - r_B - r_C < S - r_A - r_C$
- If $S < 3/2$:
 $r_B = 0$, $r_A = S - 1$, $r_C = 1/2$
- Then $\text{Profit}(c | \text{SSO}) = 1/4 - p$
- No SSO !

Using Pool in SSO

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Pool

- $R^* \max R(S - R) : R^* = S/2$
- A claims $(S - 1)/2$
- C gets at most $1/4 + (S - 1)^2/4 - p$
- No participation if $p > (S - 1)^2/4$

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No Pool

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Pool

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- C gets at most $1/4 + (S - 1)^2/4 - p$
- No participation if $p > (S - 1)^2/4$

In both cases ex-ante commitment by A generates participation

Conclusion (1): Distribution is Key for Creation of the Standard

- ❖ Natural hold up problem among contributors to the standard.
- ❖ *Self-imposed* ex-ante or ex-post caps are most likely pro-competitive in an *open-access* environment.
- ❖ Cap on *total royalty* helps for ex-post investment, but *distribution* of royalties helps for participation ex-ante.
- ❖ Beware of piece-meal policies:

Constraints that facilitate adoption ex-post may prevent the creation of the standard.

Conclusion (2): Pools and SSOs
“Insider-Outsider” Effects

- ❖ Impose *full* participation in pools ex-post?
 - ❖ Plus: prevents free riding
 - ❖ Minus: gives veto rights to some players who may leverage this during pool negotiations, with eventual effect on ex-ante participation.

Conclusion (3): Pools and SSOs
Where are the End Users, the Other Contributors?

- ❖ Pools are currently the only instrument used for committing ex-post to a total royalty, but involve SEPs only:
- ❖ Should firms who do not have SEPs but who contributed to the technology (without patents) be part of the negotiation?
- ❖ Who “owns” the standard?