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Alliance Formation in Standard Setting

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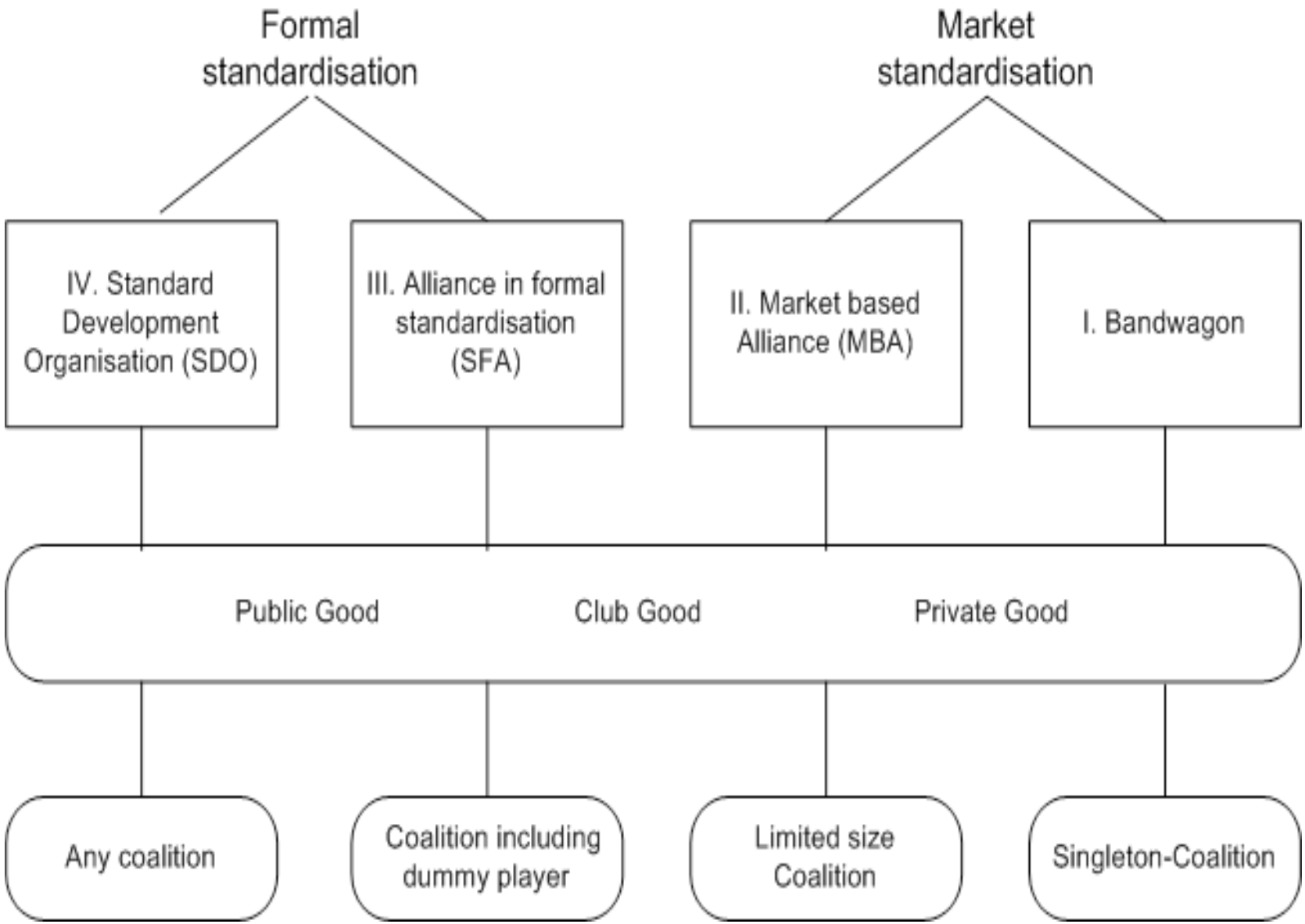
Introduction

- Background
- Incentives for Participation
- Goods' Character and Types of Alliances
- Game Theoretic Measures for Stability
- Model and Application of the Model
- Preliminary Results

Incentives for Participation

- Alliances only form if participants gain from it directly or indirectly
  - Network effects, economies of scale etc.
  - Influencing decison making of SDOs: Dissatisfaction with SDOs
  - Stakeholders protecting their own interests
  - Reputation and signalling
  - Gaining of information on rivals

Types of Alliances and Goods' Character



Coalitions, Stability and the Core 1

- *The game _=(N,v) is described by the set of players N and the characteristic function v(K) which determines the coalition value by attributing a real number to each coalition K. The cardinalities of N and K are n and k, respectively.*

$$v(K) = b(r_1, r_2, \ldots, r_{i-1}, r_i, r_{i+1}, \ldots, r_k)$$

Coalitions, Stability and the Core 2

- ***The Core***
  - ***Individual rationality***
  - ***Group rationality***
  - ***Coalition rationality***

$$v(T) \geq v(T \setminus \{i\}) + v(\{i\})$$

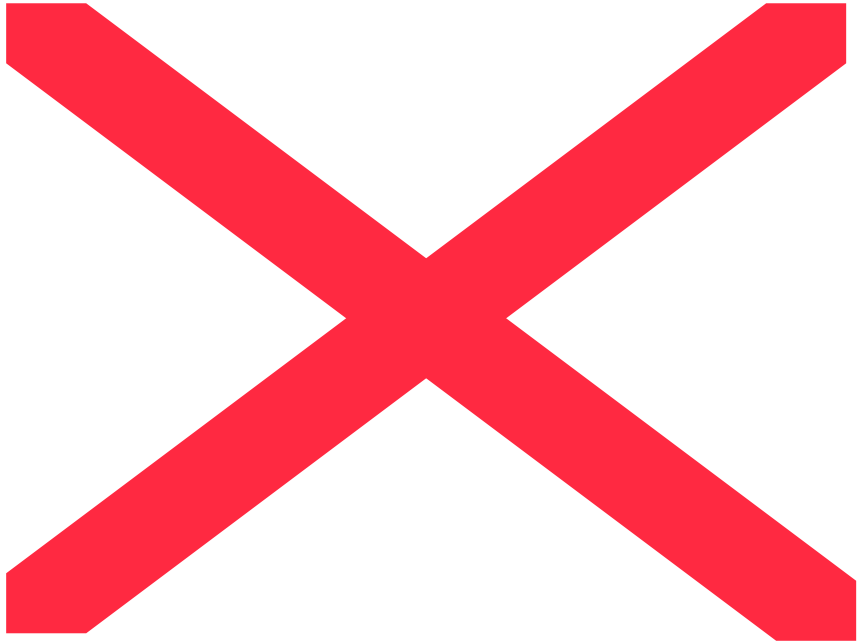
  - ***Test for Stability of the Grand Coalition***

Coalition value and payoff vectors

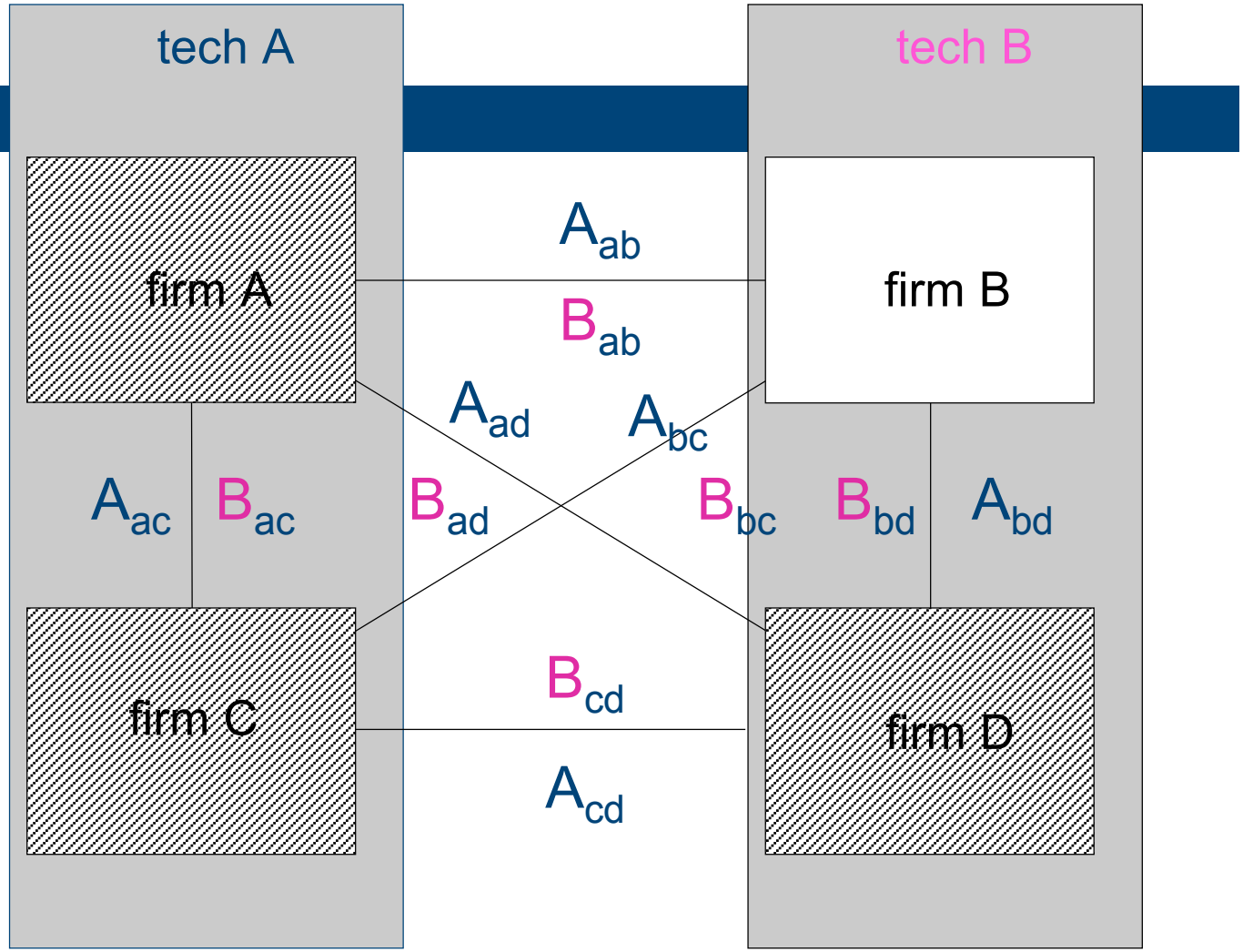
- Shapley value: privat good perspective
- $$\varphi_i(v) = \sum_{K \subset N, K \ni i} \frac{(n-k)!(k-1)!}{n!}\left(v(K) - v(K - \{i\})\right)$$
- Applied Holler value: public good perspective

$$h_i^!(v) = \frac{h_i(v)}{\sum_{i \in N} h_i(v)} v(N)$$

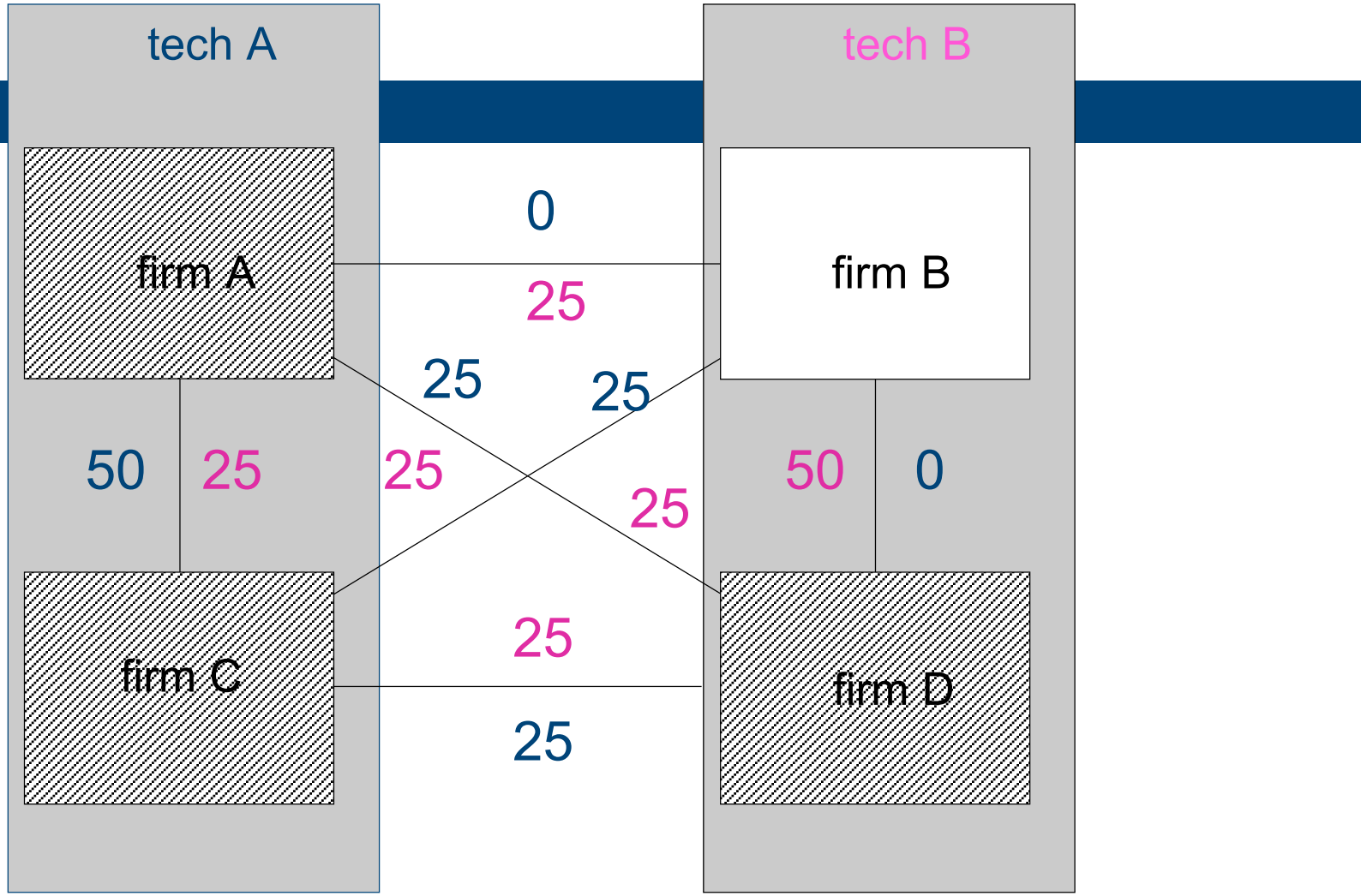
Application: four firm game



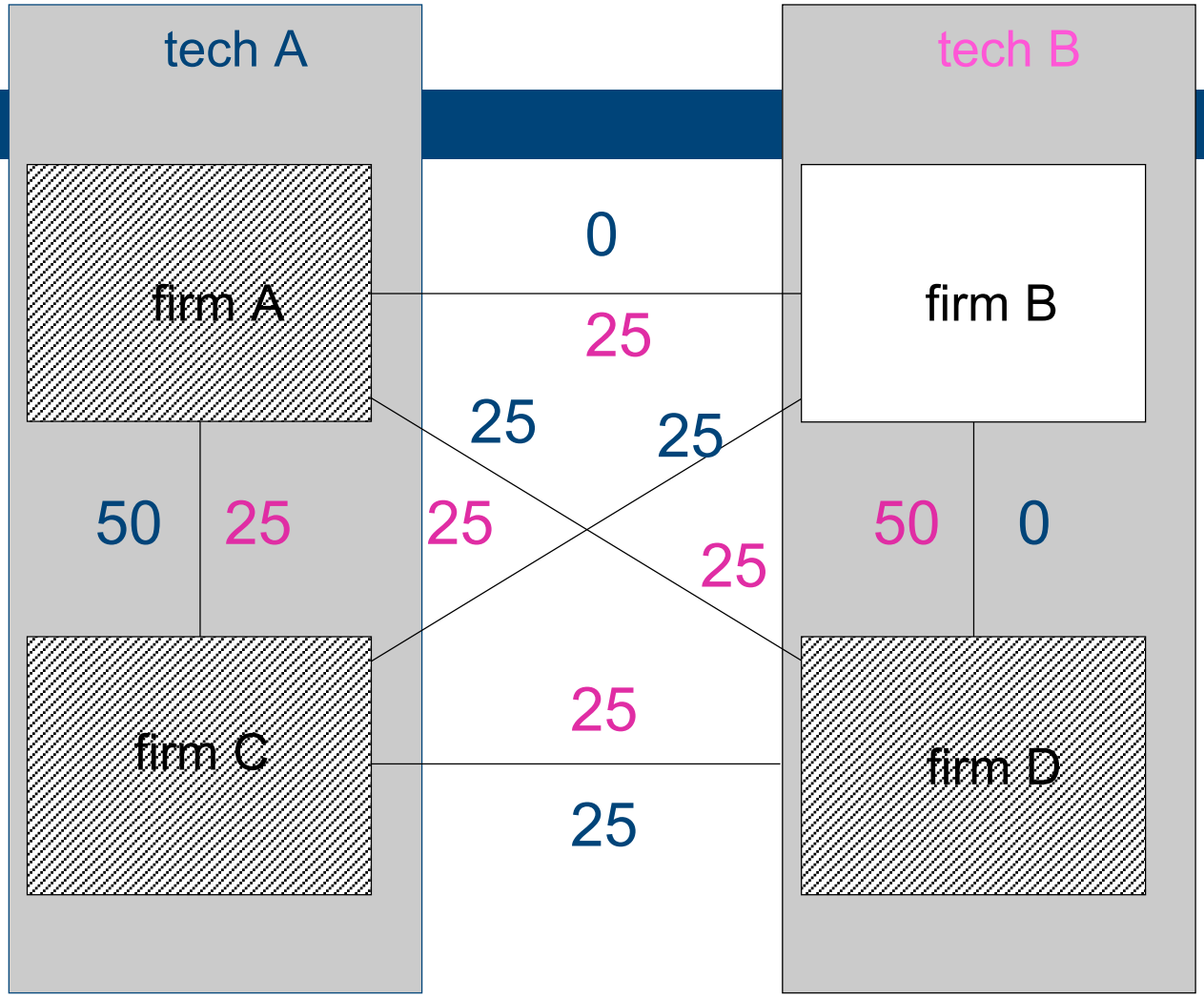
Application: two technology blocks



Application: example



Application: example



$\_A = \_B = \_C = 41.67$,

$\_D = 50$

$h'_A = h'_B = h'_C = 43.26$,

$h'_D = 45.22$

Preliminary findings

- ***Being strongly biased towards one technology (due to specialised resources, e.g. 'sunk' human capital, IPR, or patents, etc.) increases the probability of the (sunk) technology being used.***
- ***Forming an alliance with a "biased" firm may make one more successfull (A,B,C one one level, D on another)***
- ***So far we have not found convincing differences in the two power values for this application, but future work on the values themselves (purely game-theoretic)***