



# Cui bono?

Analysis of conflict in multi-agent systems

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# The Challenge

- Change in the strategic environment
  - Less warfighting, more COIN/PE/PK
  - UK desire to promote stability of friendly powers
- Legacy defence models not *necessarily* well adapted for all challenges
- Need to predict *and* model instability



# Defence modelling evolves...

Legacy models
Two sided
Static relationships between factions (“war”)
Military dimension
Civil population generally absent
Days or Weeks durations
Symmetrical combat
Physical focus – quantity

Requirements
Many sided
Dynamic relationships (“War” and “Peace” plus others)
Military, social, political, economic dimensions
Civil population represented
Months and years durations
Asymmetrical combat
Cognitive focus – beliefs, values

# Existing literature

- Two corresponding bodies of literature
  - Conflict Research
    - Singer & Small etc.
    - Political Instability Task Force (PITF)
  - Economics & Public Choice literature
    - Collier & Hoeffler
    - Tullock / Rent-seeking behaviour

# Known risk factors

- “The usual suspects...” *and*
  - Partial Autocracies / Democracies
    - Powerful executives, partially open to competition
  - Factionalism
    - Politics conducted by relatively immutable social groups with few shared values
- Models of regime type give *much* better fit than any single specific cause
  - i.e. instability is structural rather than factor-specific
  - Factions fight because they are incentivised to fight

# Factions, Rents, Stability

- Factions
  - *Self-identified* social groups, with *cohesive values* and *organisation*, and *structured capacity* to extract rents
- Rents
  - Set of behaviours enforced on the population
  - Can be non-monetary; reflecting social/political preferences
- What is stability?
  - absence of political violence (between elites)
  - *de facto* monopoly of violence

# Coalitions of Force

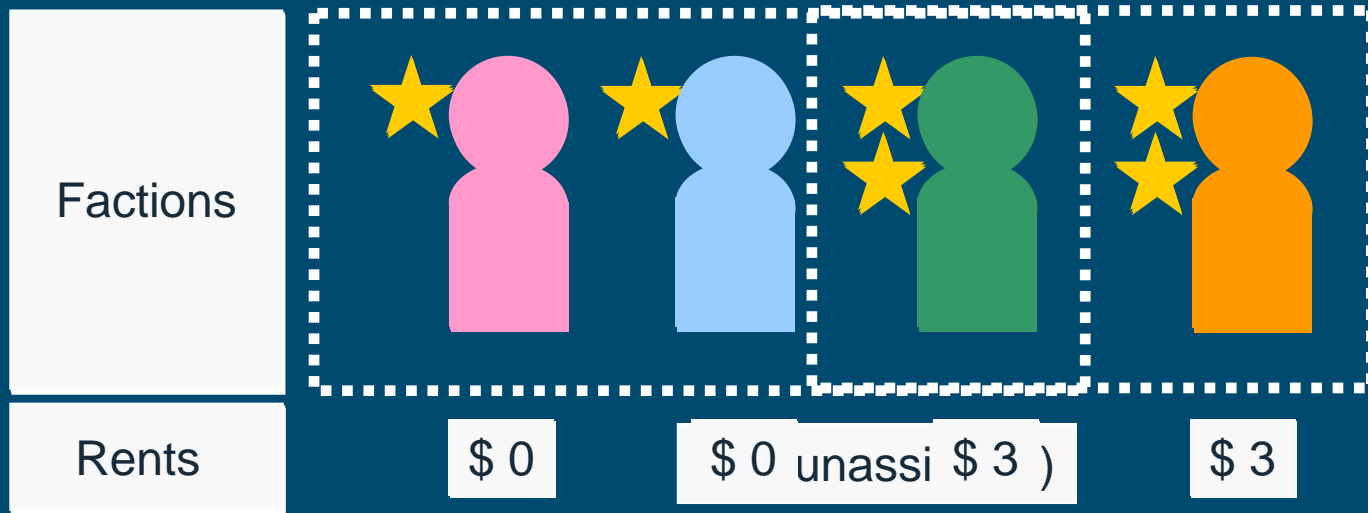
- Coalition of Force
  - A set of factions which commands a sufficient monopoly of violence to impose its will on all others and the general population
  - Co-determines the set of rents
  - Equivalent to a *de facto* stable state
- N-player co-ordination game
  - Which coalitions form?
  - What rents do they impose
  - How stable (or otherwise) is the relationship?



# (Simple) Example

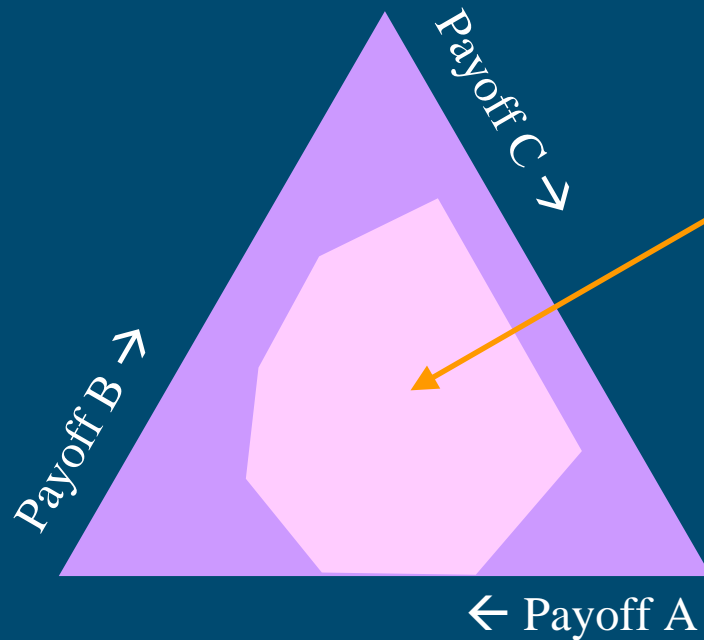
- In a given country there are 4 warlords
  - Two have 10,000 men under arms
  - Two have 20,000 men under arms
- There is only one source of income in the country, a copper mine which produces \$6m dollars profit a year
- Any coalition of warlords which have >50% of all forces control the mine, and split the profits
- What will happen?

# (Simple) Example



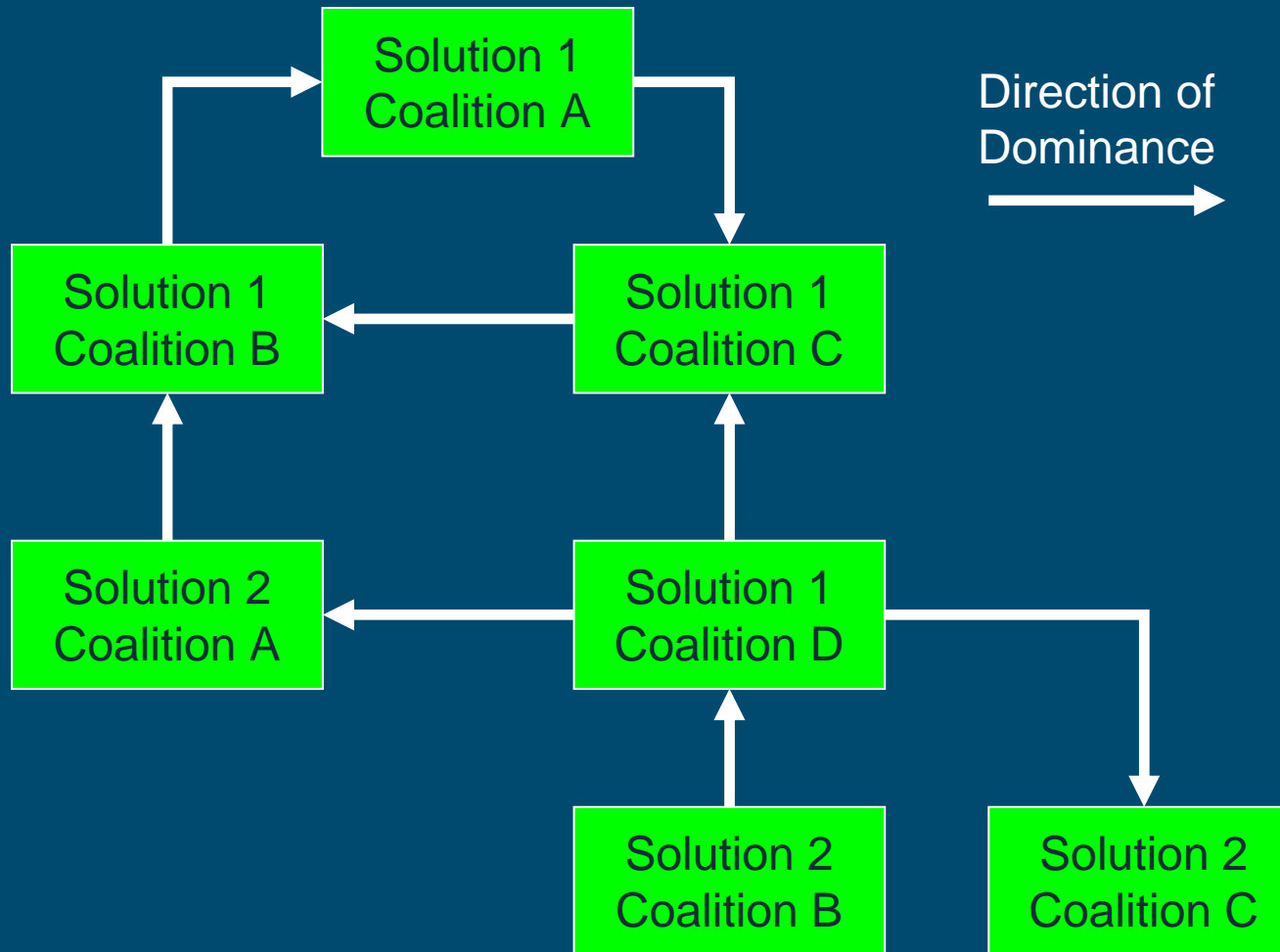
# Putative solutions

- Unfortunately, coalitions can “divide the spoils” in many ways; yielding many possible configurations of rents



Putative region established by all combinations of rents

# Graphing feasible coalitions



# Analysing stability

- Main outputs / indicators of stability
  - Number and “proximity” of feasible coalitions
    - measures of centrality, transition costs
  - Set of likely coalition members
  - Set of likely rents





# PSOM in Iraq

- Peace Operations Support Model
  - Computer supported wargame
  - Operational level
- Demonstration / familiarisation Game
  - MoD Main Building, April 2008
  - ~30 participants; military, civil service, stakeholders, NGO's, allies playing all factions
  - “Iraq 2004” scenario

# PSOM in Iraq – High Level Game

- Designing the High Level Game
  - Set of factions
    - votes in both Iraqi & International forums
    - variable voting strengths
    - Iraqi government *built* from factions, not a faction in its own right
  - Set of Rents (“Policy Cards”)
    - Each specified *coalition requirements and payoff*
    - Large set (~80), lots of resolution!

# PSOM in Iraq – Example of rents

VIP 01 Position Card	<b>Prime Minister</b>   <p>The Prime Minister is the chief executive of the Iraqi Government and architect of policy. All other ministers serve at his pleasure.</p>
	<b>Requirements</b> This office requires... The following conditions...
VIP 01	<b>Independent Kurdistan</b>  <p>This policy represents a unilateral declaration of independence by Kurdish factions.</p>
VIP 01	<b>Requirements</b> This KURDISH policy requires... Activation requires KDP/PUK... REVERSIBLE. Inactivated when... Kurdish control of both Sulaymaniyah and Irbil is lost. It may also be inactivated by... KDP/PUK, of course. When activated, this policy... policy IRQ 13 "Regional... already active.
INT 05	<b>UN: Agency operations in Iraq</b>  <p>This policy authorises and inserts UN agencies such as WHO, WFP, UNESCO, UNHCR etc into Iraq. It includes associated agencies such as the World Bank.</p>
INT 05	<b>Requirements</b> This policy is INTERNATIONAL. It requires:
	<ul style="list-style-type: none"> <li>• A Majority of International votes</li> <li>• No opposing vote from USA</li> <li>• No opposing vote from UK</li> <li>• No opposing vote from France/Germany</li> </ul>
	<b>Victory Points</b> Awarded <u>each turn</u> , whilst activated - 1 <b>USA</b> +1 <b>UK</b> +2 <b>France/Germany</b>
	<b>Special</b> UN reconstruction units are deployed. Consult Game Control for details



# PSOM in Iraq - Outcomes

~~Term 3~~

~~By the end of this session you should be able to:~~

~~1. Explain the concept of PSOM~~

I'll make it worth your while to support the status quo... but don't tell anyone

I do X then you do Y then he does Z...agreed?

Only if you support me on A and B first!

Sucker!

“Out of the crooked timber of man, no straight thing was ever made”

~ Kant



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