## General Announcements

- Module 5B: Quiz: Thursday, 14 Nov. 2024, 8:30h!
  - Please bring your laptop or fully Moodle/Open.UP compatible device with you!
  - The instructor will handle the quiz remotely.
- Module 6, Thursday, 14 Nov. 2024, will be taught on site by Ms. Karoline Puest.



# Modeling Political Decisions for Sustainability

## Module 4: The Predictioneer's Game: Output Data

*07 Nov. 2024, 8:45-10:15h*

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## Goals

- Detailed Conceptual Understanding of the Output Data
- Calculate Whether the Veto Player Exerts Her or His Right to Veto



## Output Data

- Round-by-Round Player Positions
  - → position scale
  - Round ≡ ”exchange of views/proposals between players”
- Round-by-Round Forecasts
  - model uses *mean* voter theorem
  - forecast matrix
    - smoothed mean forecast *(preferred):* mean of previous, current round, and next round
      - when game ends, the smoothed mean forecast is the best prediction of the negotiation outcome
    - round forecast: weighted mean forecast of all players in the particular round
    - security forecast: weighted median forecast of all players in the particular round
  - utility gain
    - utility gain: utility gain for *veto* players. Decline triggers end rule.
    - utility gain 2: utility gain for *all* players. Decline triggers end rule.
    - veto min, veto max: minimum and maximum positions of extreme veto players in each round

## Output Data

- end rule
  - whether game has ended
  - rule of thumb: look at round in which ("1") appears in the "end-rule" row of the forecast matrix
  - kicks in ("1") if *change* in utility gain of veto player *or* average of all players ("utility gain 2") from one round to the next becomes negative
  - Bueno de Mesquita gives more weight to the veto player than average of all players
  - see "1" in output, esp. series of adjacent "1"s, e.g., two or three "1" next to each other
  - judgement advisable



## Output Data

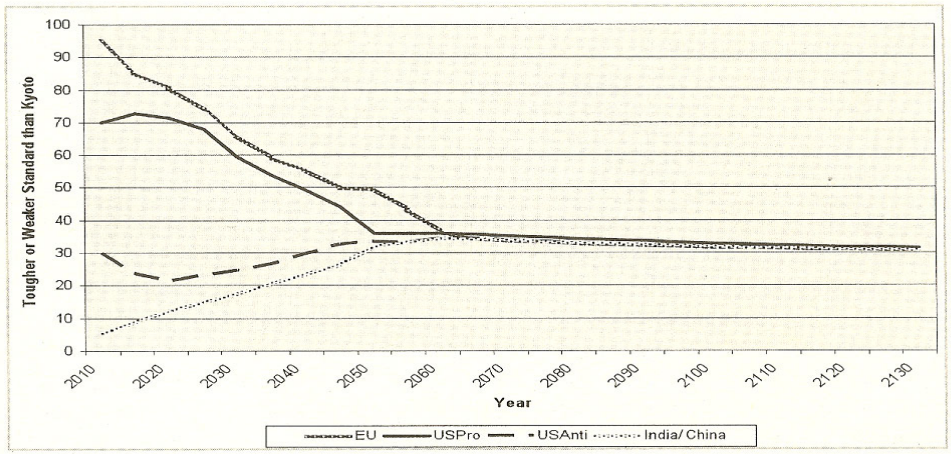
- Round by Round Summary of Actor Relationships
  - no dispute: "percentage of pairs of players who share the same position"
  - status quo: "percentage of players whose relationship with each other is to leave each other alone"
  - compromise: "percentage of player interactions in the round that are predicted to involve their compromising on an intermediate position somewhere between their current stances?
  - coerce: row player unilaterally imposes *costly* action on column, with column player giving in
  - clash: coercion (costly action) exerted by both sides on each other
- Round by Round Salience
- Round by Round Influence
- Round by Round Power (combination of influence & salience)
- Round by Round Flexibility
- Round by Round Costs
  - "impact on their influence that the player incurs in the round"
  - "Costs are used to estimate the non-policy consequences of coercive and retaliatory actions and to calculate changed influence from round to round. Their scalp nag is relative so bigger values indicate a higher cost imposed by row player on column player. Costs are computed in a complex, weighted way that is not critical to know in detail other than that costs inflicted by higher influence players are larger than by smaller influence players" (Email exchange with Bueno de Mesquita, 06 May 2020, edited).

## Output Data

- Equilibrium (by round): descriptors (e.g., bargains, silent, coerces, provokes)
- Credible Proposals from row to column player for a new position that is listened to by column player (by round)
  - "Credible proposals are ones that the recipient (column player) takes seriously in that they are weighed into calculating that player's position at the end of the round and they are credible from the row player (the proposer) in that they advance the row player's interests and would not be reneged on" (Bueno de Mesquita, private communication, 21 Nov. 2014).
  - entry is a weighted average of credible proposals from row to column player
  - NA = no credible proposal (out of acceptable range)
- Explore XLM file (downloadable from PG)
  - read text under "Intro" tab very carefully
  - import Output File 1 and Output File 2
  - then run procedures as mentioned in tab "Intro"
- Format Output File: ".csv"



FIG. 11.3. What Will the Biggest Polluters Do About Greenhouse Gas Emissions?




Source: Bueno de Mesquita (2009)

## Additional Information

- Build-in discounting of the future
- Data quality is very important
  - actor paper (→Assignment #1)
  - simulation paper (→Assignment #2)



## Veto

- Veto Player
  - seeks to avoid a decrease in utility of the outcome
  - exercising vetoes or not?
    - check end rule and determine in which round (#) this takes place
    - look at remaining range of positions (maximum-minimum) across all actors when end rule stops the game
    - check if predicted outcomes (smoothed mean forecast) falls *into* the interval of

      {Veto Player's Position$_i$ in round #} ±
      {(flexibility of veto player$_i$ in round #/100) * remaining range$_{\text{all players in round \#}}$}

    - if interval does *not* include the predicted outcome: player will exercise veto, i.e., the predicted collective outcome reverts to the status quo ante

## Veto (cont.)

- use "end rule" to determine relevant round (#) for assessment of potential veto
- smoothed mean position of *all* the actors: *reference value* for exercising the veto or not
- pick potential veto player$_i$ position in round (#)
  - Note: There may be multiple veto players
- remaining range (as above): Max minus Min position across *all* actors in round (#)
- formula

  {Veto Player's Position$_i$ in round #} ±
  {(flexibility of veto player$_i$ in round #/100) * remaining range$_{\text{all players in round \#}}$}
- If smoothed mean falls *within* the range derived in previous step, then *no* veto is exercised; otherwise, it is exercised
- human judgment is warranted



## Veto (cont.)

- Use example from the input file in Module 3
- Modify "veto" for Player "USA" from "0" to "1"
- Rerun the Predictioneer's Game
- Check for End Rule: Game ends in round 3
  - smoothed mean = 54.86
  - remaining range across all players (in round #3: (96.98-2.83) = 94.15
  - veto player's position in round 3: 4.09
  - veto player's flexibility in round 3: 8.62
  - Formula
    - 4.09 ± {(8.62/100) * 94.15} = 4.09 ± 8.12
    - [-4.03, 12.21]
    - to be compared to 54.86
    - Does the veto player exercise the veto? Why or why not?

## Example: Two Output Files

- Pertains to the input file at the end of →Module 3
- Two Output files
  - go to →Moodle →Module 4
  - download the two Excel files (alternatively, you can open them with OpenOffice or LibreOffice)



## Additional Information

- Continuous Scales
  - use full range!
- Common Errors
  - overestimate salience, overestimate failures
  - flexibility is normally quite low (look for historical guidance)
  - *(potential)* influence
  - impose your own judgment
  - Potential influence, position, flexibility, and veto are all ***independent*** of each other!
- Endogenous Changes of
  - positions
  - influence
  - salience
  - flexibility
- Number of Rounds Per Unit of Time
  - define the temporal duration of what constitutes a "round".
  - practical approach: How many rounds are normally undertaken per year?

## Additional Information

- Options on How to Represent a Long-Term Policy Forecast
  - fixed position
  - use low flexibility score
  - lengthen time horizon (number of rounds)



## Additional Information

- File Formats
  - input file: ".txt"
    - make sure the inputs are tab-delimited
  - output file: ".csv"
    - if necessary, import data in a spreadsheet
  - consider the use of
    - LibreOffice
    - OpenOffice
    - MS Excel
    - Notepad
    - other software

## Additional Information

- Second Output File: Relationship Between Actors
  - (email correspondence with Bruce Bueno de Mesquita, 30 Oct. 2018, slightly edited)
  - "Silent" indicates they are not exchanging proposals.
  - "Bargains" = negotiate
  - "Provokes" means row player *initiates* coercion that column player responds to with costly action against row player.
  - "Retaliates" means row player *responds* to column players coercive action by imposing costs on column player as his or her response.
  - "Coerce" reflects row player imposing costs on column player to which column player gives in. If column player initiates coercion it will show up in that players row against the relevant column player.



## Questions & Remarks

- Q1: End rule: change in utility & utility 2
- Q2: Excel .xmsl file (comes with software license)
- Q3: first moves: please elaborate
- Q4: Computation of new values for position, salience, flexibility, and potential influence
- Q5: Security forecast: median rather than mean value
- Q6: Excel and formats: Make sure to set regional settings to "USA"
- Quiz →Moodle (on 14 Nov. 2024)
  - watch ALL videos, prepare
  - bring Laptop or other Open.UP compatible device