

Why are Governments needed?

15.014

Public Goods

- Characteristics
 - Non-rivalry: the marginal cost of production is zero.
 - Non-exclusion: It is impossible to exclude people from consumption.

Type of goods

	Rivalry	No Rivalry
Exclusion	Ice Cream	Cable TV
No Exclusion	Emergency Room	Defense

Public Goods

- Non-Rivalry and Non-Exclusion
 - Defense:
 - It is the same cost to defend 300 million people than 300 million and one.
 - We cannot exclude one of the US residents from national defense.
- Non-Rival but Exclusion
 - Cable TV:
 - Turning my TV to the channel does not increase the cost to the rest of the users or the firm
- Rival but No Exclusion
 - Emergency Room
 - Cost of producing is higher than zero, but it is impossible to exclude people.
 - Free Rider Problem: “I think you should pay, but not me”.

Public Good and Public Choice

- How much public good needs to be provided?
 - In the private sector if you buy, means that you want or need. That simple.
 - In the public good.... Nobody is paying! So, how do we know how much?
 - We need to know the willingness of each person to pay for the public good
- Aggregation of preferences
 - Arrow's Impossibility Theorem

Social Rules: “Good Characteristics”

- Transitivity
- Non-Dictatorial
- Independent of Irrelevant Alternatives
- Unrestricted Domain

Voting Paradox

- 1. Transitivity

	1 st choice	2 nd choice	3 rd choice
Voter 1	Soccer	Baseball	Hockey
Voter 2	Hockey	Soccer	Baseball
Voter 3	Baseball	Hockey	Soccer

- Choice
 - Soccer versus Baseball
 - Baseball versus Hockey
 - Soccer versus Hockey
- Agenda Matters!!!
- Sequential Voting

Voting Paradox

- 2. Non-Dictatorial
 - Decision should not reflect the preferences of a single individual

Voting Paradox

- 3. Independence of Irrelevant Alternatives

	1 st choice	2 nd choice	3 rd choice
Voter 1	Soccer	Baseball	Football
Voter 2	Soccer	Baseball	Football
Voter 3	Football	Soccer	Baseball
Voter 4	Football	Soccer	Baseball
Voter 5	Football	Soccer	Baseball

- This is transitive!
 - S>B (5-0), F>S (3-2), and F>B (3-2)!
 - Order or agenda does not matter
 - Sequential Voting always choose F

Voting Paradox

- 3. Independence of Irrelevant Alternatives

	1 st choice	2 nd choice	3 rd choice
Voter 1	Soccer	Baseball	Football
Voter 2	Soccer	Baseball	Football
Voter 3	Football	Soccer	Baseball
Voter 4	Football	Soccer	Baseball
Voter 5	Football	Soccer	Baseball

- Ranking system of voting:
 - 1st choice gets 1, 2nd gets 2, 3rd gets 3. Choose the smallest
 - Soccer: $1+1+2+2+2 = 8$
 - Baseball: $2+2+3+3+3 = 13$
 - Football: $1+1+1+3+3 = 9$
 - $S > F > B$

Voting Paradox

- Eliminating Baseball – which is dominated by soccer!

	1 st choice	2 nd choice
Voter 1	Soccer	Football
Voter 2	Soccer	Football
Voter 3	Football	Soccer
Voter 4	Football	Soccer
Voter 5	Football	Soccer

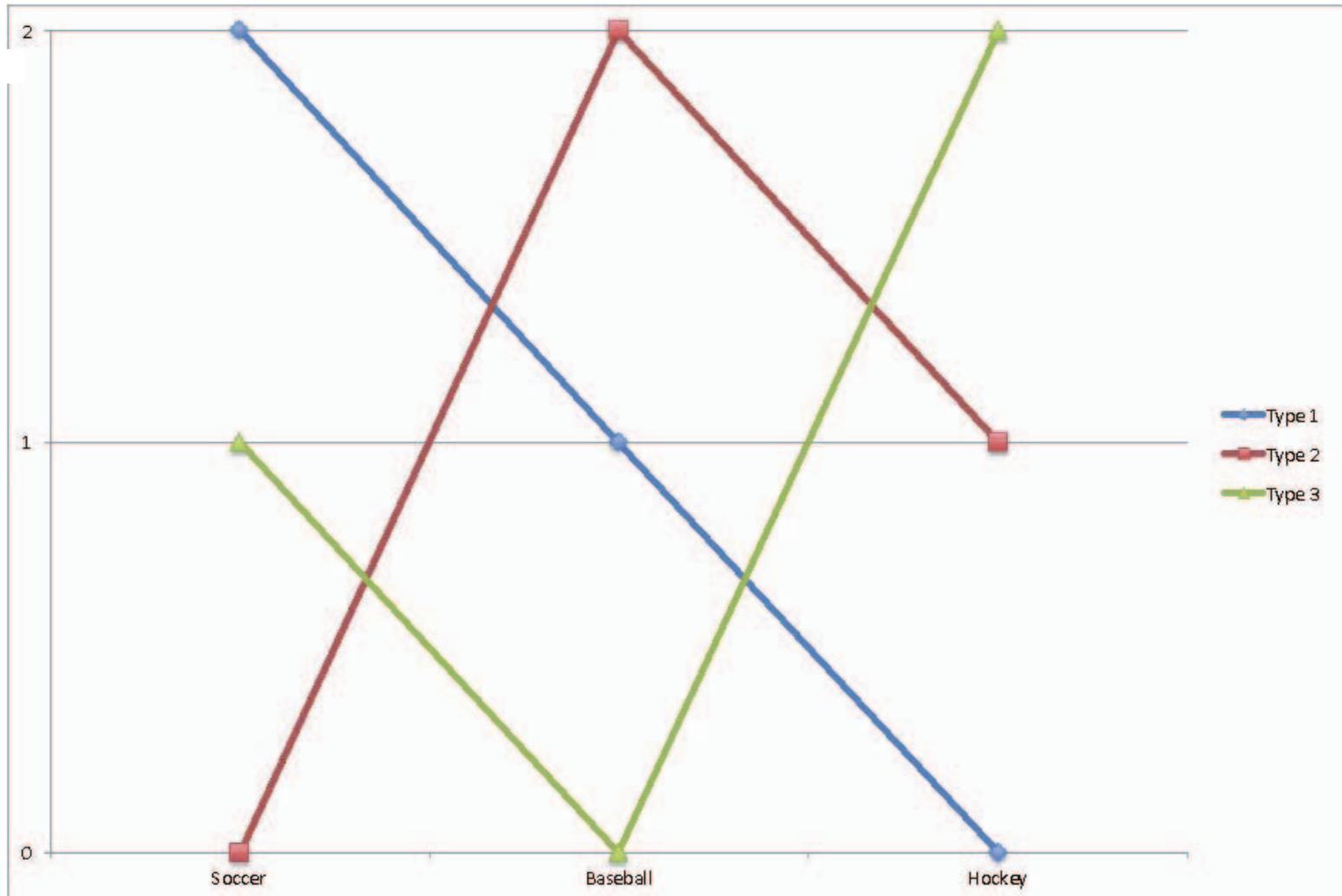
- Ranking:
 - 1st choice gets 1, 2nd gets 2. Choose the smallest
 - Soccer: $1+1+2+2+2 = 8$
 - Football: $1+1+1+2+2 = 7$
 - $F > S!$

Voting Paradox

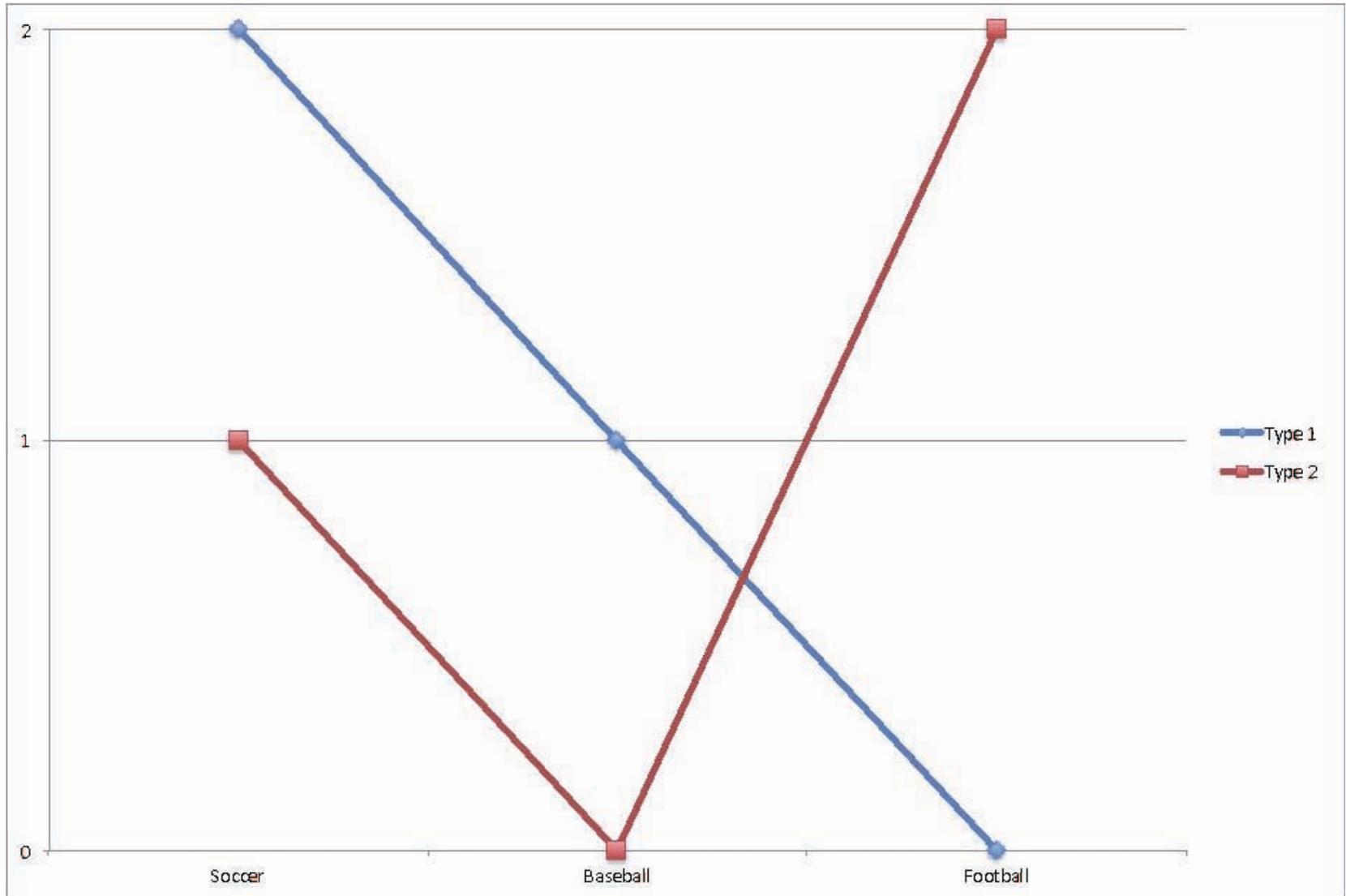
- 4. Unrestricted Domain
 - The decision rule that has been chosen should work in many circumstances
 - Meaning it needs to be transitive, non dictatorial and independent of irrelevant alternatives – for all possible preferences
 - The only way to make “democracy” exhibit good characteristics is to restrict the preferences!

When democracy sucks?

- Preferences are NOT singled-peak



When democracy sucks?



Arrow Impossibility Theorem

- There is NO voting rule that would satisfy the four criteria
 - Implications to Government
 - Lack of transitivity implies agenda matters
 - Lack of independence implies inconsistency
 - If individual rationality is desired, then one individual in the government has to be the “dictator”.

When democracy works?

- When preferences are singled-peak!
 - The median voter is the pivotal voter
 - Preferences have the first three properties
- In a single issue, preferences might be singled peak. For example, total expenditures.
 - Here the majority voting does produce a single equilibrium which might or not be efficient.
- We need to vote on each issue separately

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