Coordination in *n*-person Games

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Abstract

International may be approached as a coordination in *n*-person games. Examining the key IGOs we find several different kinds of coordination mechanisms. The basic aspect of international coordination is unanimity and the deviations from unanimity that make the games interesting from a strategic point of view. Quantitative voting only makes sense if the requirement unanimity derived from state sovereignty is relaxed.

Introduction

The problem of coordination in a 2-person game is well-known, including the risk of coordination failures. In a *n*-person games coordination is approached as a market phenomenon on the basis of a Walrasian mechanism for the successive achievement of one equilibrium. Such a coordination concept is only possible where the game has a core. Important and interesting interactions between a group of participants are made up of zero sum situations, which lack cores. How, then, can players in such choice situations coordinate? *n*-person coordination tends to occur in formal organisations such as e.g. the UN, the IMF and the WTO. The participants in these organisations would be interested in finding the best solutions and avoid coordination failures such as e.g. stalemate. Typically, international organisations or regional coordination mechanisms consist of *n* players who are interested in making common decisions. The logic of such *n*-person coordination may, however, be highly varied, reflecting the use of alternative institutions. Let us first look at a few existing examples of coordination and then proceed to a general analysis of the problem of coordination in *n*-person games.

We find in the present system of international organisations a whole range of coordination mechanisms based upon voting, which offers an interesting opportunity to analyze the variety of mechanism design. One finds both quantitative voting and qualitative voting as well as all kinds of aggregation rules from simple majority to unanimity. The implications of the use of alternative coordination mechanisms in *n*-person games may be spelled out by using a voting power index, which states the form of the game.

Form and Content of Voting in *n*-person Games

One coordination mechanism in *n*-person games is voting, which transform the problem of coordination to that of scoring a winner by means of a rule aggregating the preferences of each choice participant. A voting game is basically a zero sum game in a *n*-person game - a simple game. The advantage of voting is the capacity to arrive at a conclusion - the probability of decisiveness as well as the possibility of creating an aggregation rule which makes the final outcome dependent upon the preferences of the players. The drawback of the voting mechanism is that some players may not accept the final outcome but keep demanding new rounds of voting until they *'win'*. Voting schemes are in general not strategy proof meaning that players have an incentive to vote insincerely in order to make the link between outcomes and preferences less transparent.

The basic components of coordination in voting are the rules and the preferences. The rules give the form of the game according to a probability interpretation. When preferences are taken into account, then the game is strictly determined by the actual set up of preferences. However, this is purely accidental as the

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preferences of the players vary from issue to issue. Let us first concentrate upon the form of the game and then take preferences into account.

In an n-person game coordination may be done though voting. Voting in a group of choice participants constitutes a simple game where the outcomes are binary, either winning or loosing. Each choice participant targets voting power, or the capacity to be decisive for outcomes. And voting power depends upon the number of votes cast, the rule of aggregating the votes and preferences of the participants.

Voting power results from coalition strategies where each player maximizes his/her capacity to be decisive. Formally, a player's voting power is the same as 2 times the capacity of the group to decide times the individual blocking power of a player. This general solution of an n-person game was suggested by Banzhaf, and it fits political coordination well, as choice participants can always vote YES or NO as the basic strategy.

The Banzhaf power index contains much information about coordination in n-person games. Thus, one may calculate:

(a) the decisiveness of the entire group
(b) the individual capacity to be decisive
(c) the individual capacity to block

Let us evaluate some existing coordination mechanism which display a variety of characteristics according to the properties (a) - (c) above, reflecting alternative framing of the votes cast and the aggregation rule. We concentrate upon the form of the game, i.e. we first assume that the players have an equal probability of voting YES or NO. Later we will analyze how preferences matter for voting power.

Some Coordination Mechanisms

Interestingly, international organisations offer a menu of coordination mechanisms where all kinds of alternatives exist. Thus, there is the veto mechanism of the Security Council on the one hand and the simple majority mechanism in European Parliament on the other hand. In the WTO each player counts for one whereas in other international organisation such as the IMF and the EU there is quantitative voting. The ECB employs still another alternative where a subgroup of players - the experts - may prevail. Let us look at each mechanism before we do a comparative assessment. One may actually in the world of international organisations find examples of almost all the kinds of coordination mechanisms conceivable.

One-man One-vote International Governmental Organisations. When an organisation employs unanimity, then it is well known that transaction costs will sooner or later start souring. The capacity to block will be 1 for each player meaning that any positive decision must bring all of them onboard. But each player then has an incentive to withhold his/her support as long as possible in order to extract maximum benefits in the last round of negotiations leading up to all players saying YES. Thus, with a large group of players, the probability of decisiveness will be extremely low, as there will only be one winning coalition in the entire set of coalitions.

Table 1: One-Man One-Vote International Inter-Governmental Organisations

International Inter-Governmental Organization (IGO)	Members n	Decision Rule	Banzhaf Index	Capacity to Block	Probability of Decisiveness
World Trade	146	2/3	0.000015	0.35	0.000021
Organisation (WTO)	146	3/4	0.00000000034	0.51	0.00000000033
International Labor Organisation (ILO)	174	2/3	0.0000045	0.34	0.0000065
International Whaling Commission (IWC)	49	3/4	0.00025	0.52	0.00024

WTO: The World Trade Organisation. The probability of decisiveness is so low one must ask how the WTO can deliver any decisions at all. The blocking power of each player is at its maximum, i.e. 1, but the capacity to decide is still extremely due to the small capacity of the group to be decisive. How, the, does the WTO deliver its important coordination of world trade and its regulation and harmonisation? The answer is to be found with the preferences of the players, i.e. the content of the game. Although the content of the games varies with the particular constellations of preferences at one time or another, one may conclude that the players participating in the coordination of world trade issues have thus far has a rather strong consensus to deliver a body of rules common to all which each and everyone could accept. This may change though as the WTO takes on more controversial issues where the players have more divergent views.

ILO: The International Labor Organisation. ILO has 174 member states and its organisation consists of the General Conferenc of representatives of the Member States, the Governing Body , and the International Labor Office which is controllrd by the Governing Body. The General Conferenc of representative is the decisive body of ILO and employs a decision rule of a qualitative majority of 2/3 of the votes cast by the delegates. The number of votes cast must be at least half of the delegates present at the conference.

Table 1 has the Banzhaf power index measured under the assumtion of 100% attendece at the conference ($n = 174$), and we observe a low power index as well as an almost equally low probability of decisivenessm. Consequently, we observe a relatively high capacity to block.

IWC: The International Whaling Commission. The International Whaling Commission (IWC) organizes the states which adheres to the International Convention for the Regulation of Whaling of 1946. Currently IWC has 49 member nations, each represented by a commissioner. Decisions within IWC is normally done by annual meetings on a one-man one-vote basis and with decision rule of 3/4 qualified majority. Again in Table 1, we find that even in this rather small organisation, $n = 49$, the three-quarters majority results in low Banzhaf and low decisiveness measures while blocking capability is more than 50%.

Let us contrast these international inter-governmental organisations - WTO, ILO and IWC - with a mechanism which uses the simple majority scheme, the European Parliament.

Table 2: The EU Parliament of 2003

Political Groups	National Political Parties	Votes	Banzhaf Index/ Capacity to Block
EUL/NGL		49	0.1769
Green/EFA		45	0.1481
PES		175	0.2731
EDD		18	0.0705
ELDR		53	0.1981
EPP-DE		232	0.7269
UEN		23	0.1163
Non-Attached:	EH (es)	1	0.0046
	LEB (it)	7	0.0336
	VLD (nl)	1	0.0046
	MPF (fr)	5	0.0232
	sans étiquette (fr)	1	0.0046
	parteilos (a)	2	0.0092
	DUP (uk)	1	0.0046
	VB (nl)	2	0.0092
	LN (it)	3	0.0138
	FPÖ (a)	3	0.0138
	FN (fr)	5	0.0232
Sum		626	
Decisiveness			0.5000

Table 3: The EU Parliament by States: 2003 and 2005

States	Members	Banzhaf Indices/ Capacity to Block 2003	2005
Germany	99	0.405	0.385
United Kingdom	87	0.351	0.331
France	87	0.351	0.331
Italy	87	0.351	0.331
Spain	64	0.259	0.237
Netherlands	31	0.108	0.113
Portugal	25	0.090	0.091
Greece	25	0.090	0.091
Belgium	25	0.090	0.091
Sweden	22	0.079	0.080
Austria	21	0.075	0.076
Finland	16	0.058	0.058
Denmark	16	0.058	0.058
Ireland	15	0.053	0.054
Luxembourg	6	0.021	0.022
Poland	54		0.196
Czech Republic	24		0.087
Hungary	24		0.087
Slovakia	14		0.051
Lithuania	13		0.047
Latvia	9		0.032
Slovenia	7		0.025
Estonia	6		0.022
Cyprus	6		0.022
Malta	5		0.018
Sum	(2003) 626 (2005) 788		
Decisiveness (approx)		0.5000	0.5000

The European Parliament; Simple Majority. The European Parliament has a coordination mechanism similar to most legislative assemblies. Like national assemblies it employs two classical rules in representation theory, namely

- one-man one-vote, and,
- simple majority voting.

The use of these two institutions guarantees a high probability of decisiveness in the Parliament. With simple majority voting and qualitative voting, the probability of decisiveness is 0.5, as one half of all the possible coalitions will reach 50%. All members have the same Banzhaf number as well as the same blocking power which are equal under simple majority rule. That is, when the assembly has an even number of voters, simple majority results in a decision rule slightly above 50% which again causes a asyymetrical slight reduction in decisiveness. For large assemblies like the Europena Parliament there is no loss of information in approximating decisiveness to its theoretical value of 0.5. Hence, by definition, Banzhaf index and capacity to block are equal. For the current Parliament with 626 members this measure equals 0.032, while in the future Parliament of 2005 with 788 members this combined Banzhaf/capacity to block measure reduces to 0.029. The reduction is minor, which shows the relative robustness of simole majority decision rule compared to the IGOs above who employ much stricter decision rules.

When the new Parliament meets in the enlarged Union with 25 member states, these basic scores will change somewhat reflecting the increase in members. In general. The more members, the lower the voting power scores, as more members share voting power. For the enlarged Union we will get in 2005 the following numbers:

The content of the game will be decided by the coalitions that the individual members may wish to join. All kinds of coalitions are of course conceivable, depending upon preferences and strategy. Here we will model the situation where the Parliamentarians decide to vote in coherent blocks as groups of players. Two examples are give below, party families in Table 2 and state players in 3 respectively.

It pays to enter a coalition, at least when players share the same preferences. We see that the main party families have very different voting power reflecting their size. It must be pointed out though that the individual voting within such a block, i.e. the voting power of the block divided by the number of members, will always be smaller than the general voting power of a member that is fully independent. A block will have more voting power than individual members, which is attractive from a strategic point of view, especially if the players share the same preferences in the block.

One may construct these groups differently. Table 2 shows the voting power of parliamentary groups, voting according to national preferences.

Let us now move to the analysis of the special voting mechanism in the European Union, namely double qualified majority.

The EU Council: Qualified Majority. The evolution of coordination in the chief decision-making body of the Union - the Council - is truly interesting from the point of view adopted here, namely the tension between group decisiveness and the individual capacity to block. Let us first look at how things stand before the enlargement in 2004. The EU employ a mechanism which combines quantitative voting with qualified majority.

Table 4: The EU Council of 1995

		Simple Majority	Qulified Majority		Double Qulified Majority	
Members	Votes	Banzhaf Index/ Capacity to Block	Banzhaf Index	Capacity to Block	Banzhaf Index	Capacity to Block
Germany	10	0.3260	0.1129	0.7254	0.0982	0.6980
United Kingdom	10	0.3260	0.1129	0.7254	0.0982	0.6980
France	10	0.3260	0.1129	0.7254	0.0982	0.6980
Italy	10	0.3260	0.1129	0.7254	0.0982	0.6980
Spain	8	0.2543	0.0934	0.6006	0.0827	0.5879
Netherlands	5	0.1561	0.0594	0.3817	0.0590	0.4195
Greece	5	0.1561	0.0594	0.3817	0.0590	0.4195
Belgium	5	0.1561	0.0594	0.3817	0.0590	0.4195
Portugal	5	0.1561	0.0594	0.3817	0.0590	0.4195
Sweden	4	0.1302	0.0484	0.3111	0.0506	0.3597
Austria	4	0.1302	0.0484	0.3111	0.0506	0.3597
Denmark	3	0.0924	0.0363	0.2334	0.0418	0.2972
Finland	3	0.0924	0.0363	0.2334	0.0418	0.2972
Ireland	3	0.0924	0.0363	0.2334	0.0418	0.2972
Luxembourg	2	0.0612	0.0229	0.1471	0.0301	0.2139
Sum	87					
Decisiveness		0.5000		0.0778		0.0703

Table 4 shows the distribution of votes onto the member states, which ranges from 10 for the largest members to 2 for the smallest members. The weight to be given each member has been a major issue in each reform of the structure of decision-making, where each member state tries to get as much votes as possible, because it affects their voting power scores. The member states can maximise their general Banzhaf score or they can target their blocking power. If they opt for the first, then they would choose simple majority - Table 4.

The coordination mechanism outlined in Table 4 is not employed in the Union, however. The reason is that

the individual blocking power is considered as too low, opening up for too many possibilities of having too put up with a negative decision in the Council. Under simple majority rule, the Banzhaf voting power score is equal to the individual capacity block, as simple majority is neutral in relation to the status quo. The probability is the same that there will be a decision which changes the status quo as that it will confirm the status quo. The EU has never accepted this neutrality between the power to change and the power to block. Thus, it has favoured various schemes that give the players more blocking power than Banzhaf voting power.

Table 4 shows one such coordination mechanism used by the EU once it moved away from unanimity. Qualified majority means in the Union 71 per cent of the votes in quantitative voting, which reduces Banzhaf voting power and group decisiveness but increases the individual power to block quite substantially.

Table 5: The EU Council of 2005

			Simple Majority	Qulified Majority		Double Qulified Majority	
Members	Population	Votes	Banzhaf Index/ Capacity to Block	Banzhaf Index	Capacity to Block	Banzhaf Index	Capacity to Block
Germany	82.2	29	0.2986	0.0551	0.7674	0.0317	0.7152
United Kingdom	59.8	29	0.2986	0.0551	0.7674	0.0317	0.7152
France	59.5	29	0.2986	0.0551	0.7674	0.0317	0.7152
Italy	57.8	29	0.2986	0.0551	0.7674	0.0317	0.7152
Spain	49.5	27	0.2761	0.0523	0.7281	0.0303	0.6834
Poland	38.6	27	0.2761	0.0523	0.7281	0.0303	0.6834
Netherlands	16.0	13	0.1293	0.0272	0.3790	0.0190	0.4290
Greece	10.6	12	0.1188	0.0252	0.3505	0.0184	0.4160
Czech Republic	10.3	12	0.1188	0.0252	0.3505	0.0184	0.4160
Belgium	10.3	12	0.1188	0.0252	0.3505	0.0184	0.4160
Hungary	10.2	12	0.1188	0.0252	0.3505	0.0184	0.4160
Portugal	10.0	12	0.1188	0.0252	0.3505	0.0184	0.4160
Sweden	8.9	10	0.0989	0.0210	0.2931	0.0170	0.3830
Austria	8.1	10	0.0989	0.0210	0.2931	0.0170	0.3830
Slovakia	5.4	7	0.0690	0.0148	0.2066	0.0149	0.3356
Denmark	5.3	7	0.0690	0.0148	0.2066	0.0149	0.3356
Finland	5.2	7	0.0690	0.0148	0.2066	0.0149	0.3356
Ireland	3.8	7	0.0690	0.0148	0.2066	0.0149	0.3356
Lithuania	3.7	7	0.0690	0.0148	0.2066	0.0149	0.3356
Latvia	2.4	4	0.0393	0.0085	0.1186	0.0128	0.2885
Slovenia	2.0	4	0.0393	0.0085	0.1186	0.0128	0.2885
Estonia	1.4	4	0.0393	0.0085	0.1186	0.0128	0.2885
Cyprus	0.8	4	0.0393	0.0085	0.1186	0.0128	0.2885
Luxembourg	0.5	4	0.0393	0.0085	0.1186	0.0128	0.2885
Malta	0.4	3	0.0296	0.0064	0.0885	0.0121	0.2723
Sum	462.7	321					
Decisiveness			0.5000		0.0359		0.0222

The EU also employs another decision rule, namely qualified qualified majority, which entails that in addition to receiving the 71 majority the winning coalition must also include 2/3rds of the member states. This additional clause is employed in relation certain decisions, and it strengthens the blocking power of the medium large or small member states. However, it also reduces group decisiveness further - see Table 4.

Actually, the double qualified majority rule does not favour the large member states. It hinders them from making a coalition and thus dominating the Union, since 10 states must approve a positive decision. Under qualified majority the biggest 8 states could prevail with one more member state coming in. But with qualified qualified majority there must be 10 states for.

At the Nice meeting, where the new decision rules for the Union were discussed, a new rule was introduced

which qualified the qualified majority principle with a population requirement. Thus, it was required that a positive decision be supported by 62 per cent of the EU population. Recalculated for the new Union after 2004 this requirement entails a qualified decision rule of 72.27 of the votes. Table 5 shows the new Union with simple majority, qualified majority and qualified qualified majority.

It should be pointed out that the EU does nor use the simple majority mechanism outlined in Table 5. In procedural matters the Union votes according to simple majority with one state - one vote. and double qualified rule. However, with the new population rule is implicit in the qualified majority rule.

Table 5 shows that the probability of decisiveness will be sharply down in the new Union, andhow restrictive the qualified qualified majority rule will be upon the future Union, as the probability of decisiveness is even lower.

When there are so few winning coalitions in the future EU, then positive decision-making will have to be based upon common preferences. Only 2.2 percent of the possible coalitions would be winning, meaning that commonalities in the preferences would have to lead the players towards the making of any of these few winning coalitions.

The EU employs quantitative voting on a minor scale. Let us look at the unanimity voting in the Security Council of the United Nations as well as the IMF which employs quantitative voting on a major scale.

Table 6: The UN Security Council.

	Procedural		Substantive	
Members	Banzhaf Index	Capacity to Block	Banzhaf Index	Capacity to Block
China, France, Russian Federation, United Kingdom, United States	0.183	0.302	0.052	1.000
Angola, Bulgaria, Cameroon, Chile, Germany, Guinea, Mexico, Pakistan, Spain, Syria	0.183	0.302	0.005	0.099
Decisiveness		0.304		0.026

The UN Security Council: The Veto Principle. Coordination in one and the same international organisation can be done in different ways, as an international body may change its decision rule depending upon the matters to be decided upon. The basic principle when linking voting rule with issues is that coordination in n-person games require more of qualified majority the more sensitive the issues tend to be - the Wicksell idea.

Table 6 exemplifies the Wicksell idea applied onto the 15 members Security Council. In the not so important procedural matter the Council employs qualitative voting with a qualified majority decision rule. However, in the issues concerning war and peace in the world the Council operates its well-known VETO rule under which the five permanent members can block any action or decision. Any VETO rule reduces the probability of decisiveness, as Table 6 shows.

The Europesn System of Central Banks. The Europesn System of Central Banks (ESCB) consists of the Europen Central Bank (ECB) and the national central banks of the EU member states (NCBs). The Eurosystem is ECB together with the NCBs of states which have adopted the Euro. The European System of Central Banks is responsible for monetary policy to maintain its primary objective of price stability in the Union, that is, in the so called eurozone part of the Union.

ESCB is governed by the three decision-making bodies of the ECB: The Governing Council, The Executive Board and The General Council. The Governing Council consists of the eurozone Central Bank governors

Table 7: The European Central Bank.

	Governing Council		Executive Board	
Members	Votes	Banzhaf Index	Votes	Banzhaf Index
President†	1	0.371	1	0.625
Vice President, Executive Board Members (4)	1	0.175	1	0.250
National Central Bank Reprentatives (12)	1	0.175		
Sum	18		6	
Decisiveness		0.500		0.500

†The Presiden has casting vote

(12), Tables 7 and 8, and the Executive Board which consists of a president, a vice president and four other elected members, see Table 7. The General Council (the Extended Governing Council) consiats of ECB President and ECB Vice President and the governors of all member states' Central Banks.

Naturally, the responsibilities of these three decision-making bodies vary a great deal from the mere advisory and consultative functions of the Genral Council to actual monetary policy-making of the Governing Council. More specific, the Governing Council (the Eurosystem) shall be responsible for the definition and implemnetation of the monetary policy of the euro area, that is, decisions relating to intermediate monetary objectives, interst rates and the supply of reserves in the ESCB. It also shares some of the advisory responsibilities with the General Council. The Executive Board is responsible for the day to day management of the ECB which is to implement monetary policy according to decisions and guidelines made buy the Governing Council and to execute powers delegated to it by the Governing Council. Hence, the most prominent decision body of the ESCB is the Governing Council.

The general mode of decision-making is one-man one-vote and simple majority as shown in Table 7. The president has tie-breaking (casting) vote. The same mode of decision-making adopts to the Executive Board also in shown in Table 7.

Table 8: ECB: The Governing Council.

National Central Banks (NCBs)	NCB Shares	Banzhaf Index	Capacity to Block
Germany	24.494	0.2202	0.9002
France	16.834	0.1431	0.5848
Italy	14.895	0.1313	0.5369
Spain	8.893	0.1206	0.4930
Netherlands	4.278	0.0972	0.3972
Greece	2.056	0.0854	0.3493
Belgium	2.866	0.0923	0.3772
Portugal	1.923	0.0845	0.3453
Austria	2.359	0.0894	0.3653
Finland	1.397	0.0815	0.3333
Ireland	0.850	0.0776	0.3174
Luxembourg	0.149	0.0737	0.3014
Sum	80.994		
Decisiveness			0.1223

A different mode of decision-making is relevant for certain decisions relating to the capital of the ECB, the key for capital subscribtion and foreign reserve assets to the ECB. For such decisions the votes of the Governing Council is weghted according to NCBs' shares in the subscribed capital of the ECB. The Executive Board has no votes (zero weights) in such decisions. Furthermore. decision rule in these decisions is double qualified majority with 2/3 of the subscribed capital as well as ? of shareholders, see Table 8.

Summing up, via their central bank governers, the member states decide on capital size and alloctaion of money income and net profit/losses, while the Governing Council proper decides on the monetary policy of the Eurozone, Table 8 and Table 7 respectively. From Table 7 it is obvious that the ECB president and the Executive Board members have great influence on this monetary policy.

Table 9: The IMF Executive Board.

		70% Majority		85% Majority	
Members	Country Votes	Banzhaf Index	Capacity to Block	Banzhaf Index	Capacity to Block
United States	371743	0.1064	0.9899	0.001371	1.0000
Japan	133378	0.0616	0.5729	0.001237	0.9023
Germany	130332	0.0602	0.5604	0.001227	0.8953
France	107635	0.0502	0.4675	0.001120	0.8174
United Kingdom	107635	0.0502	0.4675	0.001120	0.8174
Belgium	111696	0.0520	0.4843	0.001143	0.8339
Netherlands	105412	0.0492	0.4583	0.001109	0.8087
Spain	92989	0.0436	0.4057	0.001029	0.7509
Italy	90968	0.0427	0.3971	0.001013	0.7389
Canada	80636	0.0379	0.3528	0.000926	0.6758
Iceland	76276	0.0359	0.3342	0.000888	0.6478
Australia	72423	0.0341	0.3176	0.000854	0.6229
Saudi Arabia	70105	0.0330	0.3076	0.000831	0.6064
Indonesia	69019	0.0326	0.3030	0.000819	0.5977
Nigeria	69005	0.0326	0.3030	0.000819	0.5977
Egypt	64008	0.0302	0.2812	0.000772	0.5633
China	63942	0.0302	0.2809	0.000771	0.5626
Switzerland	61827	0.0292	0.2716	0.000751	0.5478
Russia	59704	0.0282	0.2623	0.000733	0.5344
Brazil	53422	0.0253	0.2351	0.000660	0.4817
Iran	53247	0.0252	0.2341	0.000656	0.4789
India	52112	0.0247	0.2294	0.000644	0.4695
Chile	43395	0.0205	0.1911	0.000549	0.4003
Equatorial Guinea	30749	0.0146	0.1356	0.000401	0.2928
Sum	2171658				
Decisiveness		0.0537		0.000685	

The IMF: Quantitative Voting. As responsible for the stability of the currencies of the world, the IMF is an extremely powerful international organisation. To whom is it accountable? The IMF Board votes according to two schemes, both combining quantitative voting with qualified majority. Table 9 shows the voting power scores for the key member states under the two schemes.

Voting power in the IMF is linked with financial contribution to the organisation. It is the managers of the IMF who lends this money to governments in member states. Coordination in IMF secures complete control to the member states that take the risks involved in the IMF lending through a highly skewed distribution of voting power in combination with an emphasis upon blocking power. How, then, can IMF can anything done, given that the capacity to act is so low - look at the probability of decisiveness?

The Impact of Preferences on Voting Power

The role of prefences has been much discussued in the literature on voting power. When players coordinate

in an n-person game, then they pursue their interests of course. This entails that they will in general not be neutral towards voting YES or NO. If one issue dominates the coordination of the n-person committe, then some players will tend to vote YES consistently and other players NO. What are the implications for voting power? Or if all players have the same interests, meaning that all will vote YES or NO, then can any player exercise power?

When preferences are taken into account, then they change the logic of n-person coordination. When there is one dimension - left and right, integrattion and non-integration - then the majority will have all voting power. When there is perfect interest agreement. then there is no voting power at all when simple majority is employed.

However, analysing coordination in n-person games, one cannot assume a certain preference configuration. One must try so solve the game for all situation. Players shift their preferences from issue to issue. And they may vote insincerely.

Assuming that preferences are not distributed randomly changes the coordination games, as each coalition is no longer equally likely. The players have a certain tendency to vote YES or NO, reflecting their preferences. Thus, when there is one single policy dimension, then the players will vote in a determinant fashion in accordance with their sincere preferences. However, the aggregation rule still matters. If there is a unanimity requirement, then the abive analysis is not changed. If the aggregation rule is simple majority, then the existence of one single dimension will result in a so-called Condorcet Winner.

Assuming that the players vote insincerely or that there are more than one policy dimension leads to the reopening of Pandoras' Box, meaning that it is again equally likely that the players vote YES and NO. Thus, the only solution to the games is the power index numbers.

Conclusion

Coordination in n-person games may be done through voting, as in IGO:s. The logic of such coordination may be spelled out by means of an analysis with the power indices. The structure of the game is determined by the aggregation rule and the assignment of voting rights. One may wish to add the preferences of the players to the solution of the game, but any such attribution of preferences is ad hoc. And one cannot take fron granted that the players vore sincerely and in relation to one single dimension. Coordination in an n-person game occurs in the global governance of IGO:s. The key question is the place of the unanimity requirement, derived from the principle of state sovereignty. When it is relaxed, then interesting games ensue.

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