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Voting Power in the Bretton Woods Institutions

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Abstract The weighted voting systems used by the Bretton Woods institutions create problems of democratic legitimacy since each member's influence or voting power is not in general equal to its weight. Using voting power analysis we show that they tend to enhance the power of the United States at the expense of all other members. Restoring 'basic' votes to their original 1946 level would not change this effect, although the representation of the poorest countries would be improved. We investigate the constituency system as a form of representative democracy, idealizing it as a compound voting game, and find that it gives disproportionately large power to some European countries, particularly Belgium and Netherlands. We also find that many countries are effectively disenfranchised. Voting power analysis provides evidence that the weighted voting system adds to the anti-democratic bias that already exists in the allocation of voting weight and produces some surprising anomalies.

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1. Introduction

Weighed voting is fundamental to the way in which the IMF and World Bank are governed. The principle that all member countries have the right to vote but cast different numbers of votes to reflect key differences between them was enshrined in the original Bretton Woods constitutions and has continued ever since. However, the operation of weighted voting in practice has been shown to have resulted in a severe democratic imbalance with a voting

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system massively biased against the developing and poor countries. The current calls for reform of the governance of the Bretton Woods institutions (BWIs) include proposals to change the weights in order to increase the voice of the poor in decisions that affect their interests.

Such proposals for reform are not the central concern of this paper and we will avoid discussing them in as much detail as they deserve, leaving it to others who have done so more ably and persuasively. Instead, this paper will argue that a *further* bias exists, resulting from the weighted voting system *itself*. It is possible to correct for this bias also by suitable choice of weights. However, in order to do so we must understand the characteristics of weighted voting systems in terms of their implications for voting power that derive, not directly from the weights, but from the system as a whole. It is first necessary to establish that a member country's voting *power* is not the same as its *weight*: its *power* is its ability to be decisive whenever a vote is taken – that is, to make a difference to the outcome – whereas its *weight* is just the number of votes it has the right to cast. Voting power is a fundamental property of the voting rules and the weights, that can only be revealed by suitable analysis, whereas voting weight is a superficial feature. Because this distinction is often ignored in practice, weighted voting often leads to undesired or unexpected properties. The voting weights in the BWIs are very unequal with the USA having more than two and a half times as many votes as the next-largest country, Japan. We use power indices to measure all members' voting power and find the system to be even more undemocratic than it is intended to be because the USA turns out to have much more voting power than its weight at the expense of the other members. This disproportionality between voting power and voting weight is another argument for reforming the weights. More generally the lack of a direct link between power and weight adds to the case for decoupling the allocation of votes from both the provision of and access to finance.

Defenders of the present voting system claim it embodies democratic accountability if one accepts the principle that voting rights should be attached to the supply of capital in the form of quota[1]. This means that rich industrial countries have the largest voting weights enabling them to dominate decision making. This argument has more force today than it had in the

[1] For example, 'I would also like to underline that still we are a financial institution, and a financial institution means you need also to have someone who provides capital, and I think there is a healthy element in the fact that the provision of capital and voting rights is, in a way, combined, because this is also an element of efficiency, of accountability'. Horst Köhler, Managing Director of the IMF, in evidence to the House of Commons Treasury Select Committee, 4 July 2002.

past with the decline in the so-called 'basic votes' and increase in the variable component of voting weight to virtual dominance. (See Buira, 2002, Van Houtven, 2002: When the BWIs were first established each member country was given both basic votes and votes based on quotas but now the basic votes have declined to virtual insignificance.) The distorting effect of weighted voting that we describe here makes this claim far from being true.

As a general principle weighted voting is an attractive idea because it offers the prospect of designing an intergovernmental decision-making body that could have a real claim to democratic legitimacy – for example, in an institution of world government where a country's voting power reflects its population. But it is important to be clear about what we mean by weighted voting. Systems based on the use of a *bloc vote* where a country (or group of countries acting together) casts all its voting weight as a single unit, as in the BWIs, cannot be relied on to work like that and in general they do not, as we will show. On the other hand, if the system is one where a country is represented by a *number of delegates* each with one vote that they are allowed to cast individually, rather than having to vote together as a unit, then this problem does not arise. The latter is simply a representative democracy and the number of votes or delegates is equivalent to the country's power. The argument we are advancing here is only relevant when the votes *cannot* be split.

We will use the method of voting power analysis to explore the relationships between the voting weights, the decision rule and the resulting voting powers of the members. This requires us to analyse all the voting outcomes that can occur, and investigate the ability of every member to be decisive, to be able to decide whether the vote leads to a decision or not. We will use voting power indices to compare the powers of different members. Our principal result is that the voting power of the USA turns out to be far greater than its voting weight. That is, its actual power over decision making far exceeds its nominal voting power as represented by its weight. We also use the method for two important analyses. First, the power implications of a redistribution of voting rights that is being seriously proposed and enjoys widespread support, the restoration of the basic votes to their original 1946 level. Secondly, we consider the Executive Board as a representative body in which the directors are elected by constituencies by majority voting. We find that the constituency system considerably enhances the power of the smaller European countries, especially Belgium and Netherlands.

We begin with an outline of the principles of voting power analysis in the next section. Then in section 3 the systems of governance of the IMF and World Bank is outlined, in section 4 we present the analysis of the Board of Governors, and in section 5 that of the Executive Board. In subsequent

sections we use voting power analysis to study the effects of structural changes that have been proposed: reweighting by restoring the basic votes to their original 1946 level of 11.3 percent of the votes, in section 6, and in section 7 we consider the voting power implications for making the constituency system of the Executive Board democratic by introducing formal voting within constituencies.

2. Weighted voting and voting power analysis

It is customary, in the language of the BWIs, to refer to the number of votes a member country has as its 'voting power'. No doubt this is what its voting power is *intended* to be, but it is certainly not its power in the true sense of the term, but its *weight*. A country's power is its capacity to be decisive in a decision taken by vote, measured by probability with which it can change a losing vote to a winning one. In general this has a rather imprecise relation with its weight. In reality its power depends on all the other members' weights as well as the voting rule by which decisions are taken.

An important real-world example makes the point clearly and is worth considering here, even though it does not come from the BWIs. Between 1958 and 1972 the European Economic Community comprised six countries: Belgium, France, Italy, Luxembourg, the Netherlands and West Germany. Although most decisions then were taken by unanimity, some were taken by qualified majority voting, a form of weighted voting, wherein France, Italy and West Germany had four votes each, Belgium and the Netherlands two, and Luxembourg one. Thus it was said that Belgium possessed half, and Luxembourg one quarter, as much voting power as West Germany, although their relative populations were only 16.7 percent and 0.6 percent respectively of that of West Germany. It has often been said that the smaller countries were overrepresented in the voting system relative to their population sizes but that this was not a problem because they were sovereign states and voting power should reflect that as well as population sizes. But this was false as voting power analysis reveals.

Considering all possible voting outcomes shows that Luxembourg in fact had no voting power whatever. The threshold number of votes for a decision to be taken by qualified majority voting had been fixed at 12. This decision rule meant that Luxembourg could only be decisive if the combined total of the 'yes' votes cast by the other five members came to precisely 11, which was impossible since the voting weights were all even numbers. Therefore the power of Luxembourg in any vote taken under qualified voting was precisely zero. We therefore have the significant finding that one of the six sovereign

Power analysis for Belgium

countries	#votes	countries	#votes	countries	#votes	countries	#votes
none	0	FL	5	*FGI*	*12*	GLN	7
F	4	FN	6	FGL	9	ILN	7
G	4	GI	8	**FGN**	**10**	*FGIL*	*13*
I	4	GL	5	FIL	9	*FGIN*	*14*
L	1	GN	6	**FIN**	**10**	**FGLN**	**11**
N	2	IL	5	FLN	7	**FILN**	**11**
FG	8	IN	6	GIL	9	**GILN**	**11**
FI	8	LN	3	**GIN**	**10**	*FGILN*	*15*

Table shows the countries voting 'yes' for all 32 possible outcomes among the five countries France (F), West Germany (G), Italy (I), Luxembourg (L), Netherlands (N). In 26 cases the matter is decided without Belgium needing to vote: in 22 cases the motion is lost and in 4 cases it is won (in italics). In the 6 cases highlighted in bold the decision depends on the votes of Belgium.

states that made up the EEC was in fact powerless in qualified majority voting as a matter of simple arithmetic. This finding should be more widely known than it is. It is important also because it illustrates the usefulness of voting power analysis in a real example. Moreover the results are simple arithmetical facts and do not depend on use of models or assumptions which might be open to question (see Leech, 2003b, on the relevance of voting power analysis).

By contrast, the same analysis shows that the other members had some voting power. This can be measured by means of a power index. We now consider how this is constructed in the example. Out of all the voting outcomes that could theoretically occur it turns out that Belgium (equivalently Netherlands) could be decisive in 6 cases, while West Germany (equivalently France or Italy) could be decisive in 10 cases. We illustrate the calculations for Belgium.

The table below lists all 32 possibilities that exist for the combinations of the 'yes' votes of the other five countries; the countries voting 'yes' are identified by their initial letter. The six cases in which the votes of Belgium can determine the decision are highlighted. In 22 cases where the number of votes is less than 10, there is no qualified majority, with our without Belgium, and in 4 cases, where the votes are 12 or more, a majority without Belgium: in all these cases Belgium cannot affect the result and has no power. In six cases, where the vote total is 10 or 11, the votes of Belgium are decisive. These are all the cases where the Netherlands and precisely two of France, Germany and Italy, with or without Luxembourg vote together. Then the power index of Belgium is 6/32= 0.1875.

The power index of the Netherlands is the same as that of Belgium. By a similar analysis we can show that those of West Germany, France and Italy are all equal to 10/32=0.3125. Then we can say, for example, that Belgium has

sixty percent of the power of West Germany (that is, its relative decisiveness, equal to 6/10 = 0.1875/0.3125). This supports the idea that Belgium was over-represented compared with West Germany since in 1950 it had only 17.2 percent of its population.

We use the voting power approach and power indices to study the BWIs in the next section. By considering all possible voting outcomes the method is technically that of *a priori* voting power: each member's power index is its decisiveness as a fraction of the possible outcomes. The method can be thought of as an analysis of the implications for power of the rules of decision making, as giving what can be called constitutional power[2]. Probability calculus is used as a tool for calculating the power indices. Technically these are Penrose indices (equivalently known as absolute Banzhaf indices). Other power indices could be used here but we take the view that the superiority of the Penrose/Banzhaf indices is established on both theoretical and empirical grounds (see Felsenthal and Machover, 1998, and Leech, 2002c).

The methodology of voting power analysis will be used in two ways in this study. First it will be used to analyse power relations in the existing governance systems of the IMF and World Bank. We will also consider the effects of restoring basic votes to their original level, aimed at increasing the power of poor countries. These will be the main empirical results of the paper.

Secondly, voting power analysis can also be used to study the properties of indirect or two-level voting procedures where there is first a vote in each of a series of groups, each containing a number of members, and then each group casts all its members' votes as a bloc in the second stage. The Penrose index described above provides a simple methodology for doing such analysis, since any member's power index is simply obtained as the product of the two relevant power indices in the two stages. The theory is described in Leech and Leech (2004); the underlying game theory is presented in Owen (1995).

This approach follows that proposed by Coleman (1973) to address the question of why social actors give up power to join groups. By joining with others in a group, an actor gives up his power as an independent voter but may gain by becoming a member of the group which possesses the power of combined forces. The use of power indices permits results to be obtained very easily since it allows us to combine the power of the actor within the group and the power of the group. Analytically this is equivalent to a com-

[2] No consideration is given here for the members' preferences, which would determine the likelihood of particular members voting in the same way as each other, which would produce an analysis of empirical voting power. Some coalitions look less likely than others from a game-theoretic point of view. Such an analysis is beyond the scope of the present study and remains for future work.

pound voting game. This approach lends itself naturally to the analysis of intergovernmental weighted voting with accountability to a lower body, such as a country's electorate, parliament or a regional intergovernmental grouping. It can easily be generalized to compound voting games with three or more levels. It is a useful tool for the analysis of voting power implications of changes to the architecture of voting in the international institutions.

The second use of voting power analysis in this paper is an application of this approach to the constituency system, idealized as a compound game. This is more methodological and speculative. The intention is to illustrate the approach, which has not been widely applied (see Leech and Leech, 2005, for another application). We will analyse the Executive boards of the BWIs treating them formally as constituent, representative bodies based on the existing constituencies and weights. We emphasise that such scenarios are very stylized and open to criticism for their realism.

3. Weighted voting in the IMF and World Bank

The IMF and World Bank have broadly similar constitutions, the main differences between them being relatively minor. All countries have direct representation at the highest level, as members of the Board of Governors, but the management is done by the Executive Directors who are members of the Executive Board. Directors are either appointed directly or elected by constituencies. In the Board of Governors and in the election of Executive Directors the voting weight of each country is made up of two components: a fixed component of 250 'basic' votes which is the same for each country, and a variable component that depends on the country's quota (IMF) or shareholding (WB)[3]. When the BWIs were created, this arrangement for determining voting weight was intended as a compromise between two principles: the equal representation of member countries (via the basic votes) and voting power based on contributions in the manner of a joint stock company. Over time the basic element has become severely eroded and the quota- or share-based votes have become dominant. This is an important factor behind the disempowerment of the poor countries and the restoration of the basic votes to their original level is a main aim of the reform movement.

There are currently 184 members. The USA has by far the largest voting

[3] In the case of the World Bank we use the IBRD shareholdings, although it actually consists of four different bodies that have different voting weights. Studying the implications of these differences will be left for later work.

weight, with 371,743 votes, 17.11 percent, in the IMF (and 16.41 in the WB). This is followed by Japan with 6.14 percent (7.87), Germany 6.00 percent (4.49), France and UK with 4.95 percent (4.31) and so on. The smallest member is Palau with 281 votes, representing 0.01 percent (0.02).

The Executive Board consists of 24 members some of whom are appointed by their governments and some of whom are elected by member states. Five directors are appointed by the members with the largest quotas or shareholdings: USA, Japan, Germany, France and Britain. Three other members are appointed by Saudi Arabia, China and Russia. The remaining 16 directors are elected by the members. Executive directors use weighted voting exactly like the governors, the appointed directors exercising the number of votes of the member that appointed them, and the elected directors casting the combined number of votes of the countries that voted for them. There are elections for directors every two years. The rules for electing directors lay down strict limits on the sizes of the weighted votes that they can control in order to prevent any elected director becoming too powerful. The result is a pattern of voting power generally similar to that of the governors.

There are a variety of decision rules that are used for different types of decisions. Ordinary decisions are made by simple (weighted) majority of the votes cast (the quorum for meetings of the Board of Governors being a majority of members having not less than two-thirds of the voting weight; that for the Executive Board being a majority of directors having not less than one-half of the total voting weight). A number of matters require decisions to be taken by a supermajority of 85 percent. This supermajority, taken in conjunction with the weight of the USA, 17.11 percent in the IMF and 16.41 in the World Bank, mean that the USA is the only single member that possesses a veto.

It is should be mentioned at this point that it is customary among official spokesmen for the BWIs to say that decisions in the executive are normally taken by consensus and formal votes are avoided. However, this claim is not universally accepted. Many writers point out that the absence of formal voting is not the same thing as consensus decision making. In practice decision making during a debate where there is contention involves the secretary informally keeping a tally of the weighted votes held by the executive directors who speak on each side according to the sense of their contribution, a 'consensus' being deemed to have been found when the required majority has been reached. Thus although a formal vote is avoided, the system may be closer to weighted majority voting than consensus building (see Woods, 2001).

It is well known that the American veto has always been an important aspect of the governance of the institutions, and continues to be so, the arti-

cles having been amended to increase the supermajority threshold for special decisions from 80 to 85 percent when the USA wanted to reduce its contribution. The existence of this veto power does not mean that the USA can be said to *control* the institutions, however. On the contrary, although it gives it absolute unilateral blocking power, at the same time it also limits that country's power because it equally ensures a veto for small groups of other countries. Formally, in terms of Coleman's terminology, (defined in Coleman, 1971), while the supermajority rule gives the United States complete *power to prevent action*, it also limits its *power to initiate action*. Therefore its power – and its power index (which is an average of these two) – is limited. The existence of the 85 percent supermajority can be seen to give a veto power to three other countries acting together (for example, Japan, Germany and France). The developing countries, if they acted as a bloc, or the EU countries, or many other similar small groups, obviously have a veto[4]. The 85 percent rule effectively tends to equalize power to a considerable extent. Taking the argument to its limit, the case of a unanimity rule (i.e. a supermajority requirement of 100 percent) would give every member a veto and equalise power, making voting weight irrelevant. For these reasons the power analysis in this study considers only ordinary decisions that require a simple majority vote. Analysis of power under supermajorities (for the IMF) has been made in Leech (2002a).

4. Power in the Board of Governors

Table 1 presents the results for the Boards of Governors of both the BWIs. The countries are arranged in order of their voting weight (and voting power) in the IMF. The table shows, for each of the main countries, in the respective columns, for the IMF, (1) its relative voting weight, (2) its power index[5], (3) its power index normalized such that it is expressed as a share of the total power; the equivalents for the World Bank are in columns (4), (5) and (6). The remaining three columns contain the shares of world GDP in

[4] This point about the difference between veto power and the power of control was made very clearly by Keynes in opposition to the proposed American veto based on supermajorities in his maiden speech to the House of Lords in 1943 at the time when the Bretton Woods institutions were being planned. See Moggridge (1980), p. 278; also his Letter to J. Viner, p. 328. Keynes advocated simple majority voting.

[5] These power indices have been calculated using the computer program *ipmmle*, which implements the algorithm for computing power indices for voting bodies which are large both in having many members and where the voting weights are large, described in Leech (2003a). For an overview of computing power indices see Leech (2002b).

Table 1 Voting weights and voting powers in the Governors (selected countries)

	IMF			World Bank			Shares of World:		
	Weight (%)	Power Index	Power Share (%)	Weight (%)	Power Index	Power Share (%)	GDP (%)	GDP(PPP) (%)	Population (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
USA	17.11	0.7631	20.43	16.41	0.7471	19.49	32.90	21.88	4.71
Japan	6.14	0.2243	6.00	7.87	0.3014	7.86	13.54	7.13	2.10
Germany	6.00	0.2189	5.86	4.49	0.1669	4.35	6.04	4.66	1.36
France	4.95	0.1794	4.80	4.31	0.1598	4.17	4.28	3.17	0.98
UK	4.95	0.1794	4.80	4.31	0.1598	4.17	4.66	3.17	0.97
Italy	3.26	0.1169	3.13	2.79	0.1026	2.68	3.56	3.19	0.96
Saudi Arabia	3.23	0.1157	3.10	2.79	0.1026	2.68	0.61	0.64	0.35
Canada	2.94	0.1054	2.82	2.79	0.1026	2.68	2.27	1.88	0.51
China	2.94	0.1054	2.82	2.79	0.1026	2.68	3.79	11.42	21.00
Russia	2.75	0.0983	2.63	2.79	0.1026	2.68	1.01	2.30	2.39
Netherlands	2.39	0.0853	2.28	2.21	0.0812	2.12	1.24	0.97	0.26
Belgium	2.13	0.0761	2.04	1.81	0.0663	1.73	0.75	0.59	0.17
India	1.93	0.0687	1.84	2.79	0.1026	2.68	1.56	6.55	17.05
Switzerland	1.60	0.0572	1.53	1.66	0.0609	1.59	0.81	0.45	0.12
Australia	1.50	0.0535	1.43	1.53	0.0561	1.46	1.21	1.10	0.32
Spain	1.42	0.0504	1.35	1.75	0.0641	1.67	1.90	1.85	0.68
Brazil	1.41	0.0502	1.34	2.07	0.0762	1.99	1.64	2.83	2.85
Venezuela	1.24	0.044	1.18	1.27	0.0467	1.22	0.41	0.31	0.41
Mexico	1.20	0.0428	1.15	1.18	0.0432	1.13	2.02	1.87	1.64
Sweden	1.11	0.0397	1.06	0.94	0.0345	0.90	0.69	0.48	0.15
Argentina	0.99	0.0351	0.94	1.12	0.0412	1.07	0.88	0.95	0.62
Indonesia	0.97	0.0345	0.92	0.94	0.0345	0.90	0.48	1.37	3.45
Austria	0.87	0.0311	0.83	0.70	0.0256	0.67	0.62	0.49	0.13
South Africa	0.87	0.031	0.83	0.85	0.0311	0.81	0.37	1.09	0.71
Nigeria	0.82	0.0292	0.78	0.80	0.0292	0.76	0.14	0.25	2.14
Norway	0.78	0.0278	0.74	0.63	0.0232	0.60	0.54	0.30	0.07
Denmark	0.77	0.0273	0.73	0.85	0.031	0.81	0.53	0.35	0.09
Korea	0.76	0.0272	0.73	0.99	0.0364	0.95	1.38	1.60	0.78
Iran	0.70	0.025	0.67	1.48	0.0543	1.42	0.37	0.87	1.07
Malaysia	0.70	0.0248	0.66	0.53	0.0192	0.50	0.29	0.47	0.39
…	…	…	…	…	…	…	…	…	…

Power indices calculations done using the program *ipmmle* available from the website www.warwick.ac.uk/~ecaae.

terms of nominal dollars and purchasing power parity (PPP), and finally shares of world population, for comparison.

The table shows that the voting power of the United States is considerably more than its weight in both institutions. This result is a property of the weighted voting system with the given weights. All other members have less power than their weight. Thus, we can say that the weighted voting system, as it is presently constituted, has a hidden tendency to enhance the power of the USA at the expense of all other countries.

The table brings out some of the inconsistencies that exist in the allocation of voting weights as well as voting power in the BWIs. The USA has a much smaller share of voting weight than its share of world GDP, over 32 percent, would warrant; on the other hand, it seems about right if its voting power is

compared with its share of GDP in Purchasing Power Parity terms, and way too much compared with its population.

It also brings out a number of glaring anomalies. Canada and China have the same number of votes, and voting power, but on each of the three criteria, China is much bigger than Canada. This bias against developing countries is seen also, particularly in the IMF, in the comparison of the voting weight of countries like Belgium, Netherlands and Spain with India, Brazil and Mexico. A particularly glaring juxtaposition is that between Denmark and South Korea in the IMF, the former having more voting weight than the latter.

5. Power in the Executive Board

Table 2 shows the equivalent analysis for the Executive Board. All twenty four countries whose representatives are directors are listed. In the main these are the same for both institutions but, where they differ, as in the case of some elected directors, both countries are named. The directors of the first five countries listed are appointed and the rest are elected. For the latter countries, the number of members in the constituencies that elect them are given in column (1); apart from the three one-country constituencies which effectively appoint rather than elect, these vary from 4 to 20 and 24. As before the table shows the voting weight, power index and power share for both BWIs.

In so far as direct comparisons are meaningful, results are very similar to those for the Governors. Direct comparisons of power indices for the directly appointed directors are possible, but for some of the elected directors they are not so straightforward because it is necessary to take account of the power distribution within the constituency. We provide a fuller analysis of the Executive Board in section 7 below.

The results show the same effect as before: a strong tendency for weighted voting to enhance the voting power of the United States at the expense of the other directors.

6. Restoring the 'basic' votes to their original level

One of the key proposals to improve the democratic legitimacy of the BWIs that has been made by the developing countries, that has gained widespread support among industrial countries as well, has been to restore the basic votes to their level at the time of the foundation of the institutions in 1946 (see Buira, 2002, Woods, 2001.) Then each country was allocated 250 basic votes, which did not depend on its quota or shareholding. However, although these

basic votes have remained unchanged and the number of member countries has increased more than fourfold, IMF quotas and World Bank shareholdings have grown more than 37-fold. The result has been that the basic votes, which represent such a large fraction of the voting weight of the poor countries, have been eroded dramatically limiting the voice of these countries in decision making. The basic votes in the IMF have declined from their original level of 11.3 percent (and their maximum level of 14 percent in 1956) to 0.5 percent now, and a similar pattern has occurred in the World Bank.

Table 3 reports the effect on voting power of restoring the basic votes to 11.3 percent. We have assumed the basic votes of each member country of the IMF to become 1480, and in the World Bank to be 1088, instead of 250. The number of quota- or shareholding- based votes remains the same for each country but now these represent in total a smaller fraction than currently, 88.7 percent. The effect is substantially to increase the voting weight of the poor countries and reduce the weight of the large industrial countries, but has little effect on the larger developing countries, some of whose weight shares fall.

The overall effect of the proposed reallocation of voting weights considered here is small. The vote allocation is still unfair even after reallocation of shares and it would be surprising if this produced a fairer distribution of voting power. Changing basic votes back to their 1946 level increases the weights of small poor countries. However, developing countries are still disadvantaged: India has lower weight than Belgium, Korea than Denmark, etc. Secondly, the power distribution that results from this is unfair, giving the US more voting power than weight at the expense of all other countries as before. The proposed vote reallocation simply reduces the power (and weights) of all countries with an initial share of 0.7 % or more.

7. The Executive Board as a representative democratic body

Executive directors have two sets of roles; on the one hand, they are professional members of the executive, working in a more or less continual session in a collegial relationship with their colleagues, as experts charged with implementing policies that are technically objective and politically neutral, and, on the other, they are appointed or elected representatives of the members who chose them and therefore political representatives. We are going to be concerned in this section with the latter set of roles, in particular those of the elected directors.

Table 2 Voting weights and voting powers in the Executive Directors

			IMF			World Bank		
Seat	Country of Director*	No. of Members	Voting Weight (%)	Power Share (%)	Power Index	Voting Weight (%)	Power Share (%)	Power Index (%)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	USA		17.11	21.50	0.64586	16.41	20.18	0.62311
2	Japan		6.14	5.83	0.17511	7.87	7.55	0.23323
3	Germany		6.00	5.69	0.17105	4.49	4.27	0.13198
4	France		4.95	4.70	0.14117	4.31	4.12	0.12716
5	UK		4.95	4.70	0.14117	4.31	4.12	0.12716
6	Belgium, Austria*	10	5.14	4.88	0.14651	4.80	4.60	0.14196
7	Netherlands	12	4.85	4.60	0.13823	4.47	4.27	0.1319
8	Spain, Venezuela*	8	4.28	4.06	0.12187	4.50	4.31	0.13294
9	Italy	7	4.19	3.97	0.11922	3.51	3.35	0.10337
10	Canada	12	3.71	3.52	0.10559	3.85	3.68	0.11351
11	Iceland, Denmark*	8	3.51	3.33	0.09988	3.34	3.19	0.09851
12	Australia	14	3.33	3.16	0.09481	3.45	3.30	0.10176
13	Saudi Arabia	1	3.23	3.06	0.09179	2.79	2.66	0.08206
14	Indonesia, Thailand*	12	3.18	3.01	0.0903	2.54	2.42	0.07487
15	Nigeria, Uganda*	20	3.18	3.01	0.09029	3.41	3.26	0.10061
16	Egypt, Kuwait*	13	2.95	2.79	0.08375	2.72	2.59	0.08011
17	China	1	2.94	2.79	0.08368	2.79	2.66	0.08207
18	Switzerland	8	2.85	2.69	0.08091	2.97	2.83	0.08739
19	Russia	1	2.75	2.60	0.07814	2.79	2.66	0.08206
20	Brazil	9	2.46	2.33	0.0699	3.60	3.43	0.10605
21	Iran, Pakistan*	7	2.45	2.32	0.06969	3.38	3.22	0.09956
22	India	4	2.40	2.27	0.06814	3.40	3.24	0.10018
23	Chile, Argentina	6	2.00	1.89	0.05674	2.32	2.21	0.06817
24	Equatorial Guinea, Guinea-Bissau*	24	1.41	1.34	0.04024	2.00	1.90	0.05861
	Total	182	100	100	3.00404	100	100	3.08833

* If the directors of a constituency on the two bodies are from different countries, that for the IMF is listed first. Power indices have been calculated using the method of generating functions using the program *ipgenf* on the website www.warwick.ac.uk/~ecaae.

Table 3 The effect of increasing basic votes in the Board of Governors: weights and voting powers (selected countries)

	IMF				World Bank			
	Unchanged Weights (%)	Power Share (%)	Adjusted Weights (%)	Power Share (%)	Unchanged Weights (%)	Power Share (%)	Adjusted Weights (%)	Power Share (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
USA	17.11	20.43	15.56	18.59	16.40	19.49	15.02	17.86
Japan	6.14	6.00	5.61	5.52	7.87	7.86	7.23	7.25
Germany	6.00	5.86	5.49	5.39	4.49	4.35	4.15	4.04
France	4.95	4.80	4.54	4.42	4.31	4.17	3.98	3.87
UK	4.95	4.80	4.54	4.42	4.31	4.17	3.98	3.87
Italy	3.26	3.13	3.00	2.90	2.79	2.68	2.59	2.50
Saudi Arabia	3.23	3.10	2.98	2.87	2.79	2.68	2.59	2.50
Canada	2.94	2.82	2.72	2.62	2.79	2.68	2.59	2.50
China	2.94	2.82	2.72	2.62	2.79	2.68	2.59	2.50
Russia	2.75	2.63	2.54	2.45	2.79	2.68	2.59	2.50
Netherlands	2.39	2.28	2.22	2.13	2.21	2.12	2.07	1.99
Belgium	2.13	2.04	1.98	1.90	1.81	1.73	1.70	1.63
India	1.93	1.84	1.80	1.72	2.79	2.68	2.59	2.50
Switzerland	1.60	1.53	1.50	1.44	1.66	1.59	1.56	1.50
Australia	1.50	1.43	1.41	1.35	1.53	1.46	1.44	1.39
Spain	1.42	1.35	1.33	1.28	1.75	1.67	1.64	1.58
Brazil	1.41	1.34	1.33	1.27	2.07	1.99	1.94	1.87
Venezuela	1.24	1.18	1.17	1.12	1.27	1.22	1.21	1.16
Mexico	1.20	1.15	1.14	1.09	1.18	1.13	1.12	1.08
Sweden	1.11	1.06	1.06	1.02	0.94	0.90	0.91	0.87
Argentina	0.99	0.94	0.94	0.91	1.12	1.07	1.07	1.03
Indonesia	0.97	0.92	0.93	0.89	0.94	0.90	0.91	0.87
Austria	0.87	0.83	0.84	0.81	0.70	0.67	0.69	0.66
South Africa	0.87	0.83	0.84	0.81	0.85	0.81	0.82	0.79
Nigeria	0.82	0.78	0.79	0.76	0.80	0.76	0.78	0.74
Norway	0.78	0.74	0.76	0.73	0.63	0.60	0.62	0.60
Denmark	0.77	0.73	0.75	0.72	0.85	0.81	0.82	0.79
Korea	0.76	0.73	0.74	0.71	0.99	0.95	0.95	0.92
Iran	0.70	0.67	0.69	0.66	1.48	1.42	1.40	1.34
Malaysia	0.70	0.66	0.68	0.65	0.53	0.50	0.53	0.51
Bangladesh	0.26	0.24	0.28	0.27	0.32	0.30	0.34	0.32
Jamaica	0.14	0.13	0.18	0.17	0.17	0.17	0.21	0.20
Guatemala	0.11	0.10	0.15	0.14	0.14	0.13	0.17	0.17
Ethiopia	0.07	0.07	0.12	0.11	0.08	0.07	0.12	0.11
…	…	…	…	…	…	…	…	…

Power indices calculations done using the program *ipmmle*.

Although the Articles prescribe a set of formal rules for electing directors, in practice there is a constituency system in which the constituencies and their operation are said to be outside the scope of the BWIs, such that there are no formally laid down rules governing the relationships between directors and their electors that we can study. According to this those members who do not have the right to appoint their own director are arranged into rough geographical groupings. It is possible and natural to consider these constituencies as groups of electors which have a relationship with their elected representative director as any constituency does with its representative or delegate. The constituencies have no formal existence in the institutions and their workings are invariably referred to as being outside the institutions. However, it seems natural to treat them for the purposes of understanding the power relations as electoral bodies.

Constitutionally constituencies are created simultaneously with the election of directors every two years. A director's constituency comprises all the member countries that voted for him or her and the director gets the combined voting weight of all constituency members. The rules limit the number of votes that can be cast for any director and therefore the size of constituencies and each director's voting weight in Executive Board meetings. The constituencies are not defined formally but in practice they do tend to be strongly regional. This geographical grouping was not so important in the early days but it has become much more pronounced over time.

The manner in which constituencies are formed in the process of electing directors does not mean that there is general unanimity among member countries however and there are naturally differences of view, particularly in those constituencies containing both developing and industrial countries. Several commentators have pointed out that although directors are supposed to represent all their constituents equally, in fact they tend to give priority to the interests of their own country, and to regard attempts by other countries to become involved in decision making as 'interference'. The suggestion has been made that, in the interests of greater transparency, the informal constituency consensus system be replaced with one of open voting with ordinary decisions taken by simple majority (Wood, 2001).

Many of the constituencies have a powerful dominant member whose director is invariably elected and so in effect these have become permanent board members. In some cases this member has an absolute majority in the constituency and therefore the other members would have no voting power if a vote were taken. This dominance means that the representatives of Australia, Belgium, Brazil, Canada, India, Italy, the Netherlands and Switzerland invariably chair their constituencies and are effectively permanent members of the board. Where the constituencies are mixed with both industrial and

developing countries the chair is invariably the director from the industrial country. The other eight constituencies have no single dominant member and the chair rotates or changes otherwise.

As the institutions have grown with the addition of new members over the years, the size of the board has also grown but less than proportionately, with the result that the sizes of the constituencies have increased. Now there are an average of eleven members in each of the constituencies that elects its director. The size of constituencies varies enormously: from the 'Indian' constituency with only four members to the two enormous African constituencies, 'Anglophone Africa' which has 20 members and 'Francophone Africa' which is the largest with 24 members. The large size of these latter two constituencies representing many of the poorest countries, many involved with IMF/World Bank programmes, which have only one director each, is a major factor limiting the development and implementation of meaningful poverty reduction strategies. There is an urgent need to increase the representation of the African countries which has been widely acknowledged.

In the discussion of the BWIs it is customary to refer to the constituencies as if they operated just like any other in a representative democracy. Spokesmen for the IMF and World Bank often refer to constituencies in these terms. Directors meet their constituencies at the annual IMF/World Bank meetings. However, there appears to be an issue of democratic legitimacy when one reads in the authoritative work on the governance of the IMF: 'When members belonging to a given constituency hold different views on a subject, the executive director can put differing views on record but cannot split his or her vote. The resolution of such conflicts is for each director to decide and any director remains free to record an abstention or an objection to a particular decision. The system has a tempering impact and evidence shows that the decisions that finally result may well be the best that could be taken under the circumstances' (Van Houtven, 2002).

We take the view that it would be appropriate, in the interests of greater transparency and democratic legitimacy that decisions be taken in constituencies by majority vote. This argument gains particular force in view of the fact that IMF and World Bank conditionalities imposed on poor countries include 'good governance' and democratization requirements, and it seems not unreasonable that the same should apply to the BWIs themselves.

We can distinguish two types of constituencies in terms of their composition by types of countries that make them up. Seven are mixed industrial, middle income and developing or transitional countries and nine are developing countries. Many of them, especially the mixed groups, have a member with a very large weight, usually an industrial country, which is dominant within the group and whose representative is invariably elected. Some con-

stituencies have different arrangements for selecting their director and the office rotates; this may be the case where there is no one member who is dominant in terms of weight, such as the Nordic-Baltic constituency and also the two African constituencies; alternatively there may be two or three relatively dominant members among whom the office rotates but excluding the smaller members, for example the Mexican-Venezuelan-Spanish group where there are three dominant members.

The Articles do contain one explicit provision for majority voting within constituencies: the procedure for a by-election for an executive director. The members of the relevant constituency elect the replacement director, if there is a casual vacancy, by a simple majority of the votes cast.[6] There has been at least one case where a constituency has actually elected its director by open voting. The Middle Eastern constituency in the IMF, which includes Egypt, Iraq, Kuwait and ten other Arab countries, has selected its executive director by open election between candidates from different countries. We therefore consider it is of interest and appropriate to investigate the voting power of the member countries using voting power analysis on the stylized model of representative democracy suggested by the constituency structure.

The first result is that because five members have weights which give them a majority within their constituency they are formally dictators and all the other members are powerless. This applies to Italy, Canada, Switzerland, Brazil and India. In effect this means just an increase in the voting weight for each one and a consequent big enhancement of its power: thus, Italy's IMF voting weight becomes 4.19 percent, instead of 3.26, Canada's becomes 3.71 instead of 2.94, and so on. The country that benefits most from this effect is Switzerland whose voting weight goes up by 1.25 percent of the votes, to 2.85 percent.

The details are in Table 4 which also shows those countries whose weight does not make them 'dictators' but which are dominant in their constituencies: Belgium, Netherlands, Australia and Argentina. The table shows the relevant power shares as well as the voting weights of the countries and constituencies. The increases in voting weights are much larger for this group: Belgium's weight increases by over 3 percent, the Netherlands by well over 2 percent and Australia and Argentina gain almost 2 percent. The power shares of these countries in their constituencies are less than 100 percent but they are dominant and would tend to win an election, thereby acquiring the right

[6] Article XII, Section 3 (f): '…If the office of an elected Executive Director becomes vacant more than ninety days before the end of his term, another Executive Director shall be elected for the remainder of the term by the members that elected the former Executive Director. A majority of the votes cast shall be required for election. …'

Table 4 Countries which are dominant in their constituency

	IMF			World Bank		
	Weigl	Constituency Weight (%)	Power Share (%)		Constituency Weight (%)	Power Share (%)
	(1)	(2)	(3)	(4)	(5)	(6)
Countries with an absolute majority in their constituency: 'Dictators'						
Italy	3.26	4.19	100	2.79	3.51	100
Canada	2.94	3.71	100	2.79	3.85	100
Switzerland	1.60	2.85	100	1.66	2.97	100
Brazil	1.41	2.46	100	2.07	3.60	100
India	1.93	2.40	100	2.79	3.40	100
Countries dominant within their constituency but without an absolute majority						
Belgium	2.13	5.14	68.89	1.81	4.80*	59.79
Netherlands	2.39	4.85	98.94	2.21	4.47	98.94
Australia	1.50	3.33	49.97	1.53	3.45	48.63
Argentina	0.99	2.00	75.00	1.12	2.32	75.00

Columns (1) and (4) are the countries' weight shares in the institution; columns (2) and (5) the constituency shares; (3) and (6) are the power shares within the constituency. * Votes cast by Austria.

to cast the whole voting weight of the whole constituency. For example Netherlands has a power share of over 98 percent, Belgium over 68 percent, Argentina 75 percent and Australia 49 percent. Thus the weight and power of these countries in the executive is enhanced substantially by the constituency system.

The second set of results is the list of those countries that are powerless. These include, not only all the remaining members of the five constituencies which have a dictator, but also the results of the voting power analysis reveal another six countries which have zero voting power although their constituencies do not have a dictator (analogous to the Luxembourg EEC example described in section 2 above). These are Estonia in the IMF, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

The case of Estonia is shown in the analysis of the Nordic-Baltic constituency in Table 5. This is illustrative of the value of the voting power approach because it has the interesting property that although it has no member so powerful as to be a dictator, there is one member, which has some votes but which is still powerless in the IMF. The voting weights of the eight members are such that Estonia, with its 902 votes, could never cast the decisive vote, and therefore its voting power is zero. On the other hand, it should be noted that this is just a property of the voting weights used by the IMF, and does not apply in the World Bank where the weights are different. In that body Estonia could be decisive in 2 out of 128 voting outcomes and therefore has

Table 5 Voting power analysis of the Nordic-Baltic constituency

IMF

Country	Votes	IMF Weight %	Weight in Constituency %	Decisive	Power Index	Power Share %
Denmark	16,678	0.77	21.93	36	0.28125	17.64
Estonia	902	0.04	1.14	0	0	0
Finland	12,888	0.59	16.81	28	0.21875	13.72
Iceland	1,426	0.07	1.87	4	0.03125	01.96
Latvia	1,518	0.07	1.99	4	0.03125	01.96
Lithuania	1,692	0.08	2.22	4	0.03125	01.96
Norway	16,967	0.78	22.24	36	0.28125	17.64
Sweden	24,205	1.11	31.73	92	0.71875	45.09
Sum	76,276	3.51	100			100

World Bank

Country	Votes	IMF Weight %	Weight in Constituency %	Decisive	Power Index	Power Share %
Denmark	13,701	0.85	25.35	54	0.42188	23.28
Estonia	1,173	0.07	2.17	2	0.01562	0.86
Finland	8,810	0.54	16.30	22	0.17188	9.48
Iceland	1,508	0.09	2.79	10	0.07812	4.31
Latvia	1,634	0.1	3.02	14	0.10938	6.03
Lithuania	1,757	0.11	3.25	14	0.10938	6.03
Norway	10,232	0.63	18.93	42	0.32812	18.10
Sweden	15,224	0.94	28.17	74	0.57812	31.90
Sum	54,039	3.33	100			100

some power.

A second example of a constituency that does not have a dictator but does have a number of powerless members is the one that contains Spain, Venezuela, Mexico, and most of Central America. There are three large members which share the power equally among them and all the five small members have no power at all. The analysis is presented in Table 6. Each of the three big countries has a power index of one half, and their power shares are all one third. The results are the same for the World Bank, although the voting weights are slightly different. This result is perhaps the reason behind the practice of rotating the executive director seat among the three empowered countries mentioned above.

Therefore there are in total 41 member countries (22 percent of the membership), in possession of some 4.3 percent of the votes of the IMF (5.5 percent of the World Bank) that would be powerless. They include some industrial countries but in the main they are developing countries. They are listed in Table 7.

Now we can find the voting power of every member by considering a two-level voting system. Each member's power is the product of voting power in

Table 6 Voting power analysis of the Spanish-Mexican-Venezuelan-Central American constituency in the IMP

Country	Votes	Weight in Constituency %	Decisive	Power Index	Power Share %
Costa Rica	1891	2.03	0	0	0
El Salvador	1963	2.11	0	0	0
Guatemala	2352	2.52	0	0	0
Honduras	1545	1.66	0	0	0
Mexico	26108	28.08	64	0.5	33.33
Nicaragua	1550	1.67	0	0	0
Spain	30739	33.06	64	0.5	33.33
Venezuela	26841	28.86	64	0.5	33.33
Sum		100			100

two voting bodies: its power with respect to decisions taken by simple majority voting among constituency members, and the power of the constituency in the Executive under simple majority voting. The member's power index is the product of these two Penrose indices. It is of interest to use this technique to investigate which members gain and which lose power in the Executive Board as a result of the way the constituency system is supposed to work, compared with their power in the Board of Governors. This comparison assumes away the differences in competence of the two bodies and focuses only the structural effects of the constituency groupings on formal voting power. Obviously the 41 members who have been shown to be powerless in their constituencies are losers. However, it is not clear that the countries that dominate their constituencies, including the dictators listed in Table 4, necessarily gain since their power depends on the power of their constituency. Table 8 gives some results of this analysis for both institutions. Only the results for the countries that gain or lose most are presented. The power indices for the Governors, from Table 1, have been repeated, and these are used as the basis of comparison with the indices for the two-level voting structure we have assumed.

Table 8 gives the results for the top ten gainers and the top ten losers, comparing the country's power in the two-level constituency voting procedure with its power in the Board of Governors. The countries are ordered in terms of the changes in the IMF powers. The results show that the countries which gain most (in some cases very substantially) tend to be dominant in their constituencies: Belgium, Netherlands, Switzerland, Australia and Brazil. It is not a universal effect, however, and notably neither Canada, Italy nor India are on this list. However, it does tend to indicate another hidden source of bias towards the medium sized European countries. The biggest losers are all the members who are appointed.

Table 7 Countries with no voting power

Country	IMF Weight %	WB Weight %	Country	IMF Weight %	WB Weight %
Poland	0.64	0.69	Suriname	0.05	0.04
Philippines	*	0.44	Guyana	0.05	0.08
Portugal	0.41	0.35	Kyrgyz	0.05	0.08
Ireland	0.40	0.34	Tajikistan	0.05	0.08
Greece	0.39	0.12	Turkmenistan	0.05	0.05
Colombia	0.37	0.41	Barbados	0.04	0.07
Bangladesh	0.26	0.32	Estonia	0.04	*
Serbia	0.23	0.11	Haiti	0.04	0.08
Sri Lanka	0.20	0.25	Albania	0.03	0.07
Trinidad Tobago	0.17	0.18	Belize	0.02	0.05
Ecuador	0.15	0.19	San Marino	0.02	0.05
Uzbekistan	0.14	0.17	St. Lucia	0.02	0.05
Jamaica	0.14	0.17	Antigua	0.02	0.05
Dominican Rep.	0.11	0.14	Grenada	0.02	0.05
Guatemala	0.11	0.14	St. Kitts	0.02	0.03
Panama	0.11	0.14	St. Vincent	0.02	0.03
El Salvador	0.09	0.02	Dominica	0.02	0.05
Costa Rica	0.09	0.03	East Timor	0.02	0.05
Azerbaijan	0.09	0.12	Bhutan	0.01	0.05
Bahamas	0.07	0.08			
Nicaragua	0.07	0.05	*Total Votes*	4,35	5,51
Honduras	0.07	0.06	Percentage of Member		
Malta	0.06	0.08	Countries	22,28%	22,28%

* Philippines has positive power in the IMF and Estonia has positive power in the WB.

Table 8 Voting power for the Executive Board as a democratic representative body

	IMF			World Bank		
	Governors	Two- Stage Voting	Difference	Governors	Two-Stage Voting	Difference
Biggest Gainers:						
Belgium	0.0761	0.1356	0.0595	0.0663	0.1253	0.0590
Netherlands	0.0853	0.1381	0.0528	0.0812	0.1318	0.0505
Sweden	0.0397	0.0718	0.0321	0.0345	0.0570	0.0225
Indonesia	0.0345	0.0600	0.0255	0.0345	0.0563	0.0218
Switzerland	0.0572	0.0809	0.0237	0.0609	0.0874	0.0265
Kuwait	0.0231	0.0445	0.0214	0.0307	0.0547	0.0240
Australia	0.0535	0.0749	0.0214	0.0561	0.0846	0.0285
Brazil	0.0502	0.0699	0.0197	0.0762	0.1061	0.0299
South Africa	0.0310	0.0494	0.0184	0.0311	0.0545	0.0234
Mexico	0.0428	0.0609	0.0181	0.0432	0.0665	0.0233
Biggest Losers:						
Austria	0.0311	0.0109	-0.0202	0.0256	0.0166	-0.0090
China	0.1054	0.0837	-0.0217	0.1026	0.0821	-0.0205
Ukraine	0.0229	0.0001	-0.0228	0.0253	0.0001	-0.0251
Poland	0.0229	0.0000	-0.0229	0.0253	0.0000	-0.0253
Saudi Arabia	0.1157	0.0918	-0.0239	0.1026	0.0821	-0.0205
France	0.1794	0.1412	-0.0382	0.1598	0.1272	-0.0326
UK	0.1794	0.1412	-0.0382	0.1598	0.1272	-0.0326
Germany	0.2189	0.1711	-0.0478	0.1669	0.1320	-0.0349
Japan	0.2243	0.1751	-0.0492	0.3014	0.2332	-0.0682
USA	0.7631	0.6459	-0.1172	0.7471	0.6231	-0.1240

8. Concluding remarks

In this paper we have analysed the voting system that governs the IMF and World Bank using the method of voting power analysis and power indices. We argue, and hopefully have demonstrated, that this approach provides valuable insights into understanding weighted voting systems such as this. We have applied the approach in three ways: first in an analysis of power relations in the existing decision-making system, taking into account the present allocation of voting weights and voting rules in an idealized Board of Governors in which all 184 member countries have a seat; second, the hypothetical scenario in which the basic votes allocated to each country independently of the quota element are increased back to their original level as proposed as a means of increasing the voice of the poor; and third to investigate voting power within the Executive Board regarding it formally as a delegate body in which executive directors are bound by majority decisions within their constituencies. The principal finding, from the first analysis, is that the power share of the United States is always substantially much more than its voting weight, while for all other members, their power shares are slightly lower than their weight. Not only is the allocation of voting weight very unfair, with many large developing countries and emerging markets seriously under-represented, but there is an additional bias in favour of the USA in the BWIs due to the inequality in the distribution of weights and the voting rules. The result of the second analysis is that his bias would remain even after a redistribution of votes to restore the basic votes to their original 1945 level.

That there is such a pronounced difference between voting weight and voting power, as we have found, gives added support to arguments for breaking the link between the quotas or shareholdings and votes. If one wishes to argue that voting power should be based on the payment of financial contributions, then these ought to be related to voting power rather than only the weighted vote.

The results for the idealized two-level voting system we have assumed for the Executive Board and its constituencies suggest that – with the current weights and constituency structure – such a system tends strongly to benefit the smaller European countries, especially Belgium and the Netherlands. The large developed countries have less power in the two-level voting system, and almost a quarter of all members, mostly small developing countries, are completely powerless.

The analysis in this paper is positive in the sense that we have taken the existing voting rules and weights as given and evaluate the resulting voting powers. When the results are that the powers are not proportional to the weights, this prompts the next question of what the weights should be. This

normative question, which requires us first to specify what the relative voting powers should be and then devise the allocation of weights that would bring it about, is not addressed here. (However see Leech, 2002a.)

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