



## Actual voting power of the IMF members based on their political-economic integration<sup>☆</sup>

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### ABSTRACT

A voting power analysis was made to estimate the power of IMF members within the Executive Board and the Fund in general through the existing constituency system.

For this purpose we introduced two absolute power indices extending the classical Penrose (non-normalized Banzhaf) and Coleman ("the power of the body to act") indices by taking into account the members' preferences to coalesce, based on their membership in the currently functioning political-economic blocs with varying degrees of economic integration and members' regional proximity as well.

We considered an indirect voting system where countries are contending for power at two levels: within their constituencies and within the Executive Board. Accordingly, each of the proposed power indices determines a member's power at the appropriate level. The total power of a country is then defined by a compound power index, which is the product of the above-mentioned indices. Experiments displayed the robustness of the indices to small variations in the weight coefficients assigned to the preferences considered.

Using our approach, we analysed countries' voting power within the Executive Board under the three cases of majority voting adopted by the IMF, namely, a simple majority and qualified majorities of 70% and 85% of the total votes. The power indices for all members (except those with voting rights suspended) and their constituencies were calculated and compared with the Penrose and Banzhaf indices.

The results show that members' absolute voting power as measured by our indices produces a power distribution different from that of Penrose and Banzhaf power in both directions. The constituencies' relative voting power is rather close to their IMF voting weights for the case of the simple majority voting and tends to redistribute between constituencies as the threshold number of votes for a decision to be taken increases; thus, for the 85% supermajority, the maximum power share is that of the Netherlands's constituency and not that of the US's, as the Banzhaf power index suggests.

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### 1. Introduction

Consider a voting body where decisions are taken by voting with a certain quota.<sup>1</sup> It is natural to define the power of its member as this member's ability to change a voting outcome.<sup>2</sup>

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<sup>1</sup> Note that *quota* here means a number of votes required for a decision to be taken; it is not related to a country's quota (the term adopted by the IMF), which has several functions (see Section 2); in particular, it defines a country's number of votes. The difference between these two notions can be easily seen from the context, however, we will specifically emphasise it where appropriate.

<sup>2</sup> I.e., change the division of the voting body into those voting 'aye' and 'no' that has occurred, in a way a member wants by use of its own votes.

A member's voting power is commonly viewed as a share of the total votes belonging to them. However, such an intuitive statement is often inconsistent with the factual situation. Let us look at a real-world example.

**Example 1** ([6]). Between 1958 and 1972 the European Economic Community comprised six countries: Belgium, France, Italy, Luxembourg, the Netherlands and West Germany.

Although most decisions were taken by unanimity, some were taken by qualified majority voting wherein France, Italy and West Germany had 4 votes each, Belgium and the Netherlands 2, and Luxembourg 1. According to this, it was said that Belgium possessed 50% – and Luxembourg 25% – as much voting power as West Germany, although their relative populations were only 16.7% and 0.6% respectively of that of West Germany. It was therefore often said that the smaller countries were overrepresented in the voting system relative to their population sizes.

Considering all possible voting outcomes shows that Luxembourg, for example, had no voting power at all. Indeed, as the threshold number of votes for a decision to be taken by qualified majority voting had been fixed at 12, Luxembourg could only be decisive if the combined total of the votes cast by the other five members came to 11, which was impossible since they were all even numbers.

This example shows the importance of voting power analysis in the functioning organisations.

The classical power indices characterising the member's influence over the decision making process in voting power theory are the *Banzhaf* and *Shapley–Shubik* ones. It should be noted that sometimes they produce different results, though we agree to the explanation of this difference, based on I-Power and P-Power, given in [4].

According to it, I-Power (power as influence) varies from P-Power (power as prize) mainly in the results of a ballot: in case of I-Power the passage or failure of a bill is regarded as a public good, which affects all voters, irrespective of how they have voted on that bill; whereas for P-Power the spoils are divided only among the winners and therefore cannot be a public good in the true sense. Henceforth we adopt the concept of I-Power while referring to voting power in general.

The distribution of I-Power is conventionally measured by the Banzhaf power index.<sup>3</sup> To evaluate the absolute I-Power of a member, the non-normalised variant of the Banzhaf index, also known as the *Penrose power index*, is used.

Generally speaking, voting power analysis may be divided into *a priori* and *actual* or *empirical*. Carrying out the former, the goal is to estimate a priori voting power that a voter possesses by virtue of the rule, not giving account of the voter's individual preferences.

Doing empirical analysis, the goal is to evaluate the actual power of voters. To achieve it, voters' preferences to coalesce, their opinions on the decision taken, etc. are introduced. We would like to note, however, that such analysis is still not empirical in its true sense: the actual voting power can hardly ever be observed. It is a model that explicitly considers additional information, which, under assumptions used, leads to the obtained results.

While there have been some publications on a priori voting power analysis, empirical voting power analysis has been much less studied. This situation is mostly due to the inner complexity of the subject related to a definition of voters' real preferences. However, some active work has recently been done in this field [1,2].

There exist several papers on the voting power in the IMF. For instance, the participants of the 'Voting power and procedures' project of London School of Economics have published a series of papers [5–7], dedicated to the voting power analysis in the IMF under some modifications in structure and rules of governance of the Fund.<sup>4</sup>

In the publications on voting power in the IMF the absolute Penrose index was used, which does not give account of members' preferences to coalesce. In this paper we are following the approach to power indices derived from [2], allowing for estimation of the members' actual voting power.

The remainder of this paper is organised as follows. Section 2 describes the IMF governance structures, in Section 3 the main notions are presented, Section 4 deals with the voting power analysis in the Fund and its results; finally, Section 5 concludes. Appendix contains the power indices for the IMF members.

## 2. The International Monetary Fund: Organisation and government

### 2.1. Brief description<sup>5</sup>

The history of the Fund dates back to 1944 when the Articles of Agreement of the IMF were adopted at the United Nations Monetary and Financial Conference in Bretton Woods. The Fund's primary goal was to create monetary reserves from which the governments of the IMF members could borrow to overcome temporary problems with their balance of payments and avert disproportions in the World economy.

<sup>3</sup> The definitions of the Banzhaf and Penrose power indices are given later in Section 3. The Shapley–Shubik power index is not considered in this paper. An interested reader is referred to [10], where among all there are some conclusions made about the nature of these indices pre-postulating the idea of I-Power and P-Power.

<sup>4</sup> In particular, the changes of power of the IMF members were analysed for the case of replacement of EU countries by a single unified state under different ways of determining the external position of the Union; increase in the countries' basic votes; an a priori voting power distribution analysis in the main governing structures of the Fund was carried out.

<sup>5</sup> More detailed information is available on the official website of the IMF: [www.imf.org](http://www.imf.org). The full text of the Articles of Agreement [3] is given on [www.imf.org/external/pubs/ft/aa/index.htm](http://www.imf.org/external/pubs/ft/aa/index.htm).

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