

An Empirical Comparison of Power in the International Monetary Fund Before and After the 2008 Reforms

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List of Abbreviations

IMF:	International Monetary Fund, also Fund
AICs:	Advanced Industrialised Countries
LICs:	Low-Income Countries
BRICs:	Brazil, Russia, India, China
G-20:	Group of 20
G-7:	Group of 7
SDRs:	Special Drawing Rights
US:	United States

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The International Monetary Fund with its 187 member countries is one of the most important international organisations. On 3 March 2011, the biggest reforms in its history became effective. One of the main goals of these reforms was to “enhance the participation and voice of low-income countries” (IMF, 2008). As the IMF is said to be run by the advanced economies, mainly the United States, this study investigates in how far this goal has been reached, thus posing the following research question: **To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?** This is investigated through the application of the voting power approach and the calculation of the Absolute Banzhaf index, the Normalised Banzhaf index, and the Shapley-Shubik index. It is observed that the low-income countries and especially the four BRIC countries Brazil, Russia, India and China, profited from the 2008 reforms, both in terms of weight and in power. However, their actual power as a voting bloc remains smaller than their weight in votes would suggest. A striking finding is that through the reforms, the advanced economies faced a decrease in weight which is larger than their decrease in power. The advanced economies, especially, the United States, thus did not give away as much power as indicated through the changes in weights. The initial impression that the IMF is in the hand of the advanced economies, especially the United States, can be confirmed. The findings of the analysis imply that for further voice adjustments, voting power indices should be used to ensure that the changes in weights actually reflect what they should reflect.

1 Introduction

The governance structure of one of the most important financial international organisations, the International Monetary Fund (IMF or Fund), is subject to the biggest reforms in its history. This thesis investigates to what extent the 2008 reforms were able to reach what they intended to, namely enhancing the voice and participation of low-income countries (IMF, 2008).

The Fund was created at the Bretton Woods Conference in 1944, together with the World Bank. Both Bretton Woods Institutions are based on the liberal notion that economic stability and development are best achieved when trade and financial flows are possible with least possible restrictions. The initial mission of the Fund emphasizes finance; its original purpose was to lend money to countries to meet short-term fluctuations in currency exchange rates. This intended to enable free convertibility among the Fund's members' currencies. Members were supported with Balance-of-payments difficulties, by funds that were allocated every five years through quotas. The contributions were paid in gold and local currencies. Later, special drawing rights (SDRs) were added to the system to provide for more liquidity (Karns & Mingst, 2004). Members were allowed to withdraw funds according to the amount of their contributions. Besides these "standby lending arrangements", there are more lending initiatives today, for example the Heavily Indebted Poor Countries Initiative, and the Poverty Reduction and Growth Facility, introduced in 1999. Scholars agree that at least since 1999, the Fund has shifted its focus towards poverty reduction especially in poor countries, although its original role was not of an aid agency. Today, the Fund has 187 member countries and the top ten shareholders (as of 2011) are: the United States 17.77%, Japan 6.59%, Germany 6.14%, France 4.53%, the United Kingdom 4.53%, China 4.02%, Italy 3.32%, Saudi Arabia 2.95%, the Russian Federation 2.51%, and India 2.46%. This distribution of shares gives a first impression of how power is distributed in the Fund: the US are main player, followed by Japan, Germany, France, and the UK, all being advanced economies.

1.1 The Reforms and their Goal

The reforms are supposed to be pro-poor and pro-development, as the G-20 leaders stated about the IMF governance reforms that, "we [G-20 leaders] are committed to a shift in quota shares to dynamic emerging market and developing countries [...]. We are also committed to protecting the voting share of the poorest in the IMF" (G-20Leaders, 2009). This is a reaction to the academic critique by many; The IMF has been subject to severe critique with regard to accountability, country representation and composition of the Executive Board, Board effectiveness, and diversity of staff. They further argue that the IMF is a tool of the great powers, especially of the major shareholders United States and the richest European member countries. Several academics (see for example (Woods, 2006; Woods & Lombardi, 2006) criticize a strong underrepresentation of the poorest IMF members in the Executive Board, many of them being located in Africa. It is said that the Fund's governance structure is not capable of representing today's international political economy. For decades the Fund could easily separate its membership into two groups: the advanced / rich members and the developing / poor countries or net debtor and net receiving countries respectively. The first group of members, especially the United States,

used to run the Fund and set the conditions for the lending facilities the second group made use of. In recent years a third group of member countries emerged: the emerging economies¹, most impressively the so-called BRIC countries Brazil, Russia, India and China.

These are some of the reasons why the Fund is being reformed. The reforms have been agreed upon, after many years of negotiations, in Singapore in 2006 and consist of three parts: the 2006 ad hoc increase of quotas for several underrepresented member countries, the 2008 Quota and Voice reform, and further reforms as of 2010. The 2008 package forms the most important one and consists of these four elements:

- » The second round of ad hoc quota increases
- » A single and simpler quota formula
- » A trebling of basic votes
- » Additional resources for the two African Executive Directors.

On March 3, 2011 this part of the reforms entered into force, after the ratification of the Amendment on Voice and Participation to the Fund's Articles of Agreement by 117 members, equaling 85% of the Fund's total voting power. To further enhance the participation of low-income countries, the amendment will enable the two Executive Directors representing African constituencies to appoint a second Alternate Executive Director. The first three elements of the 2008 packages relate directly to voting power and will thus be investigated in depth in the following chapters.

The goal of the 2008 reform is “realigning quota shares with members’ relative weight and role in global economy” and to “enhance the participation and voice of low-income countries”, for which the Fund plays an important advisory and financing role (Report of the Executive Board to the Board of Governors March 28, 2008). The second goal is most interesting in the context of this research. Several questions with regard to the 2008 reforms arise.

1.2 Research Question, Sub-Questions and Structure of the Thesis

The main research question of the thesis is *To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?* .

To find an accurate answer to this question it has been split up into several sub-questions, each being answered in a separate chapter.

First, a theoretical overview of power in international politics will be given and the decisions about which strand in the literature is followed will be justified. Then, the chosen theory, voting power, will be explained in more detail. Formal modelling and game theory will be applied to analyse procedural power in the IMF. As votes have been a central issue of the 2008 reforms a voting power analysis will be carried out to compare the distribution of power before and after the reforms, or as of 2 and 3 March 2011. Voting power defines power as the ability to influence voting outcomes. The voting power approach also allows for an investigation of power beyond the surface nominal voting weights as it has been known that power is not weight since the famous article of John F. Banzhaf

¹ Based on the estimated relationship between per capita income and relative price levels and on current growth rates, about 40 of the most dynamic countries would be expected to converge to 80 percent of the US price level within 20 years.

in 1965. This chapter further discusses the voting power indices used: The Absolute Banzhaf index, the Normalised Banzhaf index, and the Shapley-Shubik index.

The methodological chapter clarifies the main choices on how this research in the form of a case study has been conducted and where the necessary data were taken from.

The empirical analysis chapter describes the 2008 reforms in more detail and shows the results that can be observed from the calculation of the voting power indices.

In order to be able to assess whether the goal of the reforms has been reached, first, the goal will be described in more detail, and second, an overview of what has been done with the 2008 reforms will be given.

The IMF is run by two governing bodies, the Board of Governors, and the Executive Board. Voting power of members differ in the two bodies which is why both Boards will be analysed in separate sections. In the Board of Governors, changes in power will be analysed first, for each country and second, for the three groups of countries, the advanced economies, BRICs, and the low-income countries. Afterwards, the changes per constituency in the Executive Board will be analysed per constituency of countries. Finally, the results from these parts will show which countries gained most from the reforms, both individually and as groups, so that the main research question can be answered.

Concluding remarks discuss the main results of this analysis and make suggestions for further research.

1.3 Why Studying the IMF Governance

The governance of the International Monetary Fund is an important research topic for several reasons. The first and most obvious one is the organisation's importance in the management of the world economy in times of globalisation and financial crisis. Global governance is an emerging topic and more relevant than ever. The IMF is an interesting case of global governance not only because nearly all countries in the world are a member (187 in total) but also because it is one of the few international organisations whose governance operates based on weighted voting power of its members. The World Bank and the European Council of Ministers are others operating with weighted voting systems as compared to one country- one vote organisations as the United Nations. Inequality of power amongst its members reflects their difference in contributions to the Fund and is one of the basic design features of the IMF governance. The findings of the power indices and members' actual voting behaviour cannot be tested, yet, because the new rules have just been implemented. This is why *a priori* voting power will be analysed. Through that it will be possible to comment on the criticisms made by several academics and developing countries that the distribution of voting power has been too heavily weighted towards advanced countries (Leech, 1998). It results from the design of the IMF that most voting power is in the hands of creditor nations who provide for the resources. This analysis should be able to show whether the "invisible weighting" of the United States and other major shareholders skews the power distribution even further away from the debtor countries and how the 2008 reforms changed the power distribution.

2 Theory: The Concept of Power and Voting Power Analysis

The concept power is central to the research question *To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?* The exact comparison of power of IMF member countries before and after the reforms, in which votes have been central, is at the heart of this analysis, so the voting power approach belonging to rational choice theory will be applied. Voting power and voting power indices are discussed in the second part of this chapter. Voting power is a common but also contested theory, which is why, first, the results of the literature review on power in global affairs will be presented in order to be able to locate the voting power approach.

2.1 Framing the Field: Power in Global Affairs

In international politics, power is seen as the ability to make others do what they otherwise do not wish to do (hard power) either through direct application (instrumental: Morgenthau) or indirect (structural power: Waltz); or soft power—the ability to get others to want to do what you wish them to do, even if it is not objectively in their interest to do so (Nye).

The pursuit of power is the principal human goal (Hague & Harrop, 2007). Hobbes puts it like that: The basic human urge is to ‘seek power after power’. Shively (2002) states that, “politics always involves the exercise of power”. Here, power should be distinguished from authority – the *right* to influence others, being built upon legitimate power. In this section, I will shed light on the contested nature of power: the relational and the national approach, ‘power to’ and ‘power over’, the three faces of power, and finally its measurement which will lead from this general conceptualisation of power to voting power and its application to the IMF.

Power as an Essentially Contested Concept

The notion of an “essentially contested concept” has been introduced by Gallie (Gallie, 1955), and Steven Lukes (1974) categorized power as such a concept. The introduction of the SAGE Handbook of Power clarifies this: “power is not a single entity but a cluster of concepts” (Haugaard, 2002, p. 3). Helpful and comprehensive literature reviews on this cluster of concepts can be found in Baldwin (2002) in Carlsnaes, Risse, Simmons, Handbook of International Relations, Hay, Nye (2011), and by Wenman (in Mackenzie, 2005). Reviewing the most relevant literature on power in social sciences, it seems that the conceptualization of power developed over time and became more and more contested.

National vs. Relational Power

The most recent work on power in global affairs has been published by Joseph Nye Jr. in 2011, *The Future of Power*. He distinguishes between the national power approach and the behavioural or relational approach to power. Baldwin (2002) also distinguishes the national power approach focusing on power as resources, and second, the relational power approach, which depicts power as an actual or potential relationship. The “first type makes power appear more concrete, measurable and predictable” and thus more useful to policy-makers.

'Power to' and 'Power over' Debate

This distinction relates closely to the 'power to' and 'power over' debate. These two concepts have been defined by Hanna Pitkin (1972, p. 277): "One may have power over another or others, and that sort of power is indeed relational (...) But he may have power to do or accomplish something all by himself, and that power is not relational at all; it may involve other people if what he has power to do is a social or political action, but it need not". 'Power to' consists of the ability of the actors themselves to carry out certain specific outcomes. Hague and Harrop (2000) define power as the ability to achieve a desired outcome, the 'power to' do something. After World War II, the rather consensual view of power prevailed as a capacity for action, as 'power to'. Göhler (in Clegg, 2009) argues that the 'power to' and 'power over' debate has its roots in Aristotle's distinction between legitimate and illegitimate power. Max Weber (1978) coined the terms *Macht* and *Herrschaft*, which he assumes to be related to authority and coercion respectively. Thus power can be legitimate or based on threat of violence. Morris (2002) makes the distinction between power as ableness and power as ability. Ability can be reduced to the resources agents have at their disposal.

The Three Faces of Relational Power

Power can be exerted in several ways, which lead to three dimensions, conceptions or 'faces' of power; commanding change, controlling agendas, and establishing preferences (Nye, 2011).

Commanding Change

Hunter conducted one of the first studies on power; he concludes that a small group of insiders runs the community. In response to Hunter, Robert Dahl (1961) stressed that all sorts of groups are involved in decision-making moving in and out of participation depending on which issue was up for decision. Dahl also introduced the first widely accepted definition of power in 1957 (Dahl, 1957) in his article "Concept of Power". His intuitive definition of power is the following: Power is one of many relations between people, Dahl calls them A and B, "A has power over B to the extent that A can get B do something that B would not otherwise do" (p. 203). From his definition of power, he derives a statement of power comparability, or the degree of power held by two or more persons. With this measure¹ he intends to rank persons according to their power. His definition of power includes the elements source or base of power, means or instruments used, amount or extent of one's power, and scope of one's power. The first dimension of power, basic decision-making power, is the most straightforward and also the most visible and observable of the three faces of power. This view can be linked to positivism and pluralism.

Agenda-Setting Power

Bachrach and Baratz (1962), in 'Two Faces of Power', criticized Dahl and asked why particular issues get raised in the first place. Critics thus added agenda setting power, the ability to prevent issues or proposals being aired, to the first dimension of power (Schattschneider, 1960). This approach focuses on the ability of an elite group and can thus be linked to elitism.

¹ Here, Dahl uses the letter M (for *Macht*) to denote the amount of power and defines A's power over a, with respect to the response x, by means of w. See "Concept of Power", p. 205

Establishing Preferences

Lukes' (1974) radical face of power established the three-dimensional view: Thought control, or the ability to influence the thoughts and desires of individuals so that they will want things that they would otherwise oppose. Focusing on the third dimension of power, Nye (2011) introduces 'smart power', the combination of what he calls "hard power" and "soft power". Hard power refers to the traditional notion of military force and is characterized by coercion and resources, whereas "soft" power relies on attraction and includes diplomatic power, cultural influence, cultural appeal, foreign aid, and persuasion. Smart power refers to converting resources into realized power in the sense of obtaining desired outcomes. If the first two dimensions of power can be linked to pluralism and elitism respectively, this third face highlights the impact of ideology and can be linked to Marxism.

Lukes claims that all faces of power consist in different applications of the same underlying concept of power, according to which "A exercises power over B when A affects B in a manner contrary to B's interests" (2005, p. 30).

The Remaining Debates on Power in International Politics

Knowing all this, the major debates evolving around the notion of power in international politics remain, each presenting its own valid definition of power. The remaining debates on power in global affairs are summarized in Dowding (2011). It remains contested "whether power is a property of agents—whether these are people or institutions—or a property of the relations between agents, the structure of society or groups". Power can thus be seen as personal or institutional or as agency-based or structural, national or relational. Given this debate, the "power over" versus "power to" debate remains unsolved, too. Another debate remains whether power is exclusively a descriptive or positive term, or whether it is normatively implicated, thus how far it is possible to produce theory-free or non-normative accounts of power is heatedly disputed. "Realists believe that power relations can be objectively defined in terms of the strategic concerns of nations, whereas constructivists believe that we construct the nature of the conflict, which determines actions, and different nations might construct the international system differently" (Clegg, 2009).

Haugaard concludes that the "idea that there is a single thing-in-the-world corresponding to power, as some kind of essence, has fallen out of favour" (Haugaard, 2002, p. 3).

Rational choice could still be seen as an attempt to synthesize the different approaches to power, for instance as done by Anthony Giddens (1984) and Keith Dowding (1996). Rational choice means when "decision-makers choose on the basis of what they perceive to be the best interest for themselves and their states, based on their expectations about the relative usefulness of alternative options for realizing goals" (Kegley Jr, 2007, p. 92). Dowding (in Clegg, 2009) argues that "rational choice methods allow us to analyse power, not simply in terms of monetary exchange but in the relative bargaining strengths of different actors". Relative strength of actors can be represented by the sets of resources they command.

Measuring Power in International Politics

From these views, different ideas about the measurement of power arise. Some argue that power is impossible to quantify. Others say that it can be quantified in terms of the resources.

Academic intentions to rank nations according to their power lead to the need of a “currency of politics” (Baldwin, 2002, p. 181). Most indices of overall national power rely primarily on GNP, but are sometimes supplemented with demographic and military measures. Dahl recommends to measure relational power by information, friendship, social standing, and the right to make laws in addition to threats of force and money. Values, attitudes, expectations, decision-making rules, structures and constitutions are used, too. Probably, the most optimal operationalisation of power would include the analysis of the following elements of power (Keohane & Nye, 2001; Nye Jr, 2011): Military strength, diplomatic power, cultural influence, cultural appeal, foreign aid, and persuasion, plus the relative size of a state’s economy, its population and territorial size, geographic position, raw materials, lack of dependence on foreign sources of materials, technological capacities, political culture and values, ideology, efficiency of governmental decision-making, industrial productivity, volume of trade, savings and investment, educational level, national morale, and internal solidarity. Obviously, this is not possible within the scope of this research, probably in no research at all, if one does not wish to sample only one or a few countries.

Most common attempts to quantify are game theoretic, mathematical and decision-theoretic formalizations of power. These have been applied most thoroughly to voting power so they are suited best to accurately answer the research question.

2.2 The Concept of Power Applied: Decision-Making Power, Raw Resources and ‘Power To’

In order to be able to answer the research question *To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?*, the following conceptualisation will be applied to the IMF. The decisions made concerning the conceptualisation are results from the nature of the research question and from practical limitations found when analysing the IMF.

Dahl’s definition of power and the first face of power as hard, decision-making power serve as the theoretical foundation for this thesis. The chosen definition of power is state-centric as the research question asks about changes in power for member states. National power approaches focus on state-owned resources and form the foundation to estimate countries’ ability or power to achieve an intended outcome. Resources in the context of the IMF mean quotas and votes, both the central elements of the 2008 reforms. The rational choice approach of voting power is chosen in order to find a descriptive or positive answer to the research question and to describe the relative bargaining strengths of the different members. Voting power analysis measures power with the help of mathematical and decision-theoretic formalizations of power. Here, preference-free a priori voting power will be applied. This approach is most commonly used by realists. The focus on the IMF as an institution can be justified by

the neoliberal assumption that institutions are important and actually limit countries' possibilities.

Decisions also had to be made which strand in the literature will not be applied. Social constructivism, forming the third main international relations theory next to realism and liberalism, will not be taken into account due to the scope of the thesis. The scope of this thesis does also not allow for an analysis of the second (Bachrach and Baratz) and third (Lukes) dimensions of power.

Measurement of Power in the IMF

With these decisions taken, measurement of power in the IMF is straight forward. As the IMF reforms are of institutional nature and quotas and votes were central, I chose to measure the dependent variable power in the IMF by the voting power of all its members: their voting power will be calculated using the Absolute Banzhaf / Penrose, the Normalised Banzhaf Index, and the Shapley-Shubik Index. The protection of the voice of low-income countries was one of the main goals of the reforms. This is why voting power of three voting blocs, the BRIC countries, the advanced countries, and the LICs will be calculated as well. Voting power, the three indices, and voting bloc implications are explained in the following part. The section on power in global affairs showed that there are fundamentally different ways to conceptualise power. After the explanation of voting power theory, a critical discussion of a priori voting power and its application to the IMF will follow. Note that, to understand the context in which voting of members takes place, the institutional design and its changes through reforms will have to be sketched. Through this kind of formal modelling based on game theory, one will be able to fully understand the institutional roots of procedural power in the IMF.

2.3 What is Voting Power and What are Voting Power Indices?

Dowding (2009) explains that voting power measures power of different actors in voting situations, which are simulated by weighted voting problems. Leech (2002b) and Felsenthal and Machover (1998 and 2004) give good and detailed overviews of voting power indices. In more recent years, voting power has been studied and created largely by European scholars simulating the Council of Ministers. The very idea behind voting power analysis is that the weight of a voter is not a good measure of a voter's power; or: voting weight is not power (Banzhaf III, 1965). Voting power theory analyses what countries can really do with their votes. Leech (2002b, p. 1) argues that "in an organisation whose system of governance involves weighted voting, a member's weight in terms of the number of votes and the formal power it represents differ".

N-Persons Games: Game Theory

International organisations are modelled by cooperation in N-Person games or cooperative games (see Leech, 2002a). Game theory models strategic situations, or games, in which an individual's success in making choices depends on the choices of others (Myerson, 1991). Each game has n players, or, relevant for this

case, voters¹. Voters cooperate by forming coalitions by simply casting their votes, that is, yes or no votes. The rules for decision-making in the game decide whether coalitions are winning or losing. A member's power is thus measured by its ability to influence the outcome by changing a losing coalition into a winning coalition, an effect called 'swing'². Leech (2005, p. 10) defines voting power of a member of a committee as its "ability to influence the result of a ballot". A member's (or a group's) voting power also relies on the voting power of other members (groups) and the majority threshold for decisions.

The Council of Ministers, when it consisted of the six founding members of the European Union, serves as the easiest example to understand the idea behind voting power. At that time, France, Germany, and Italy – had four voting units each, the Netherlands and Belgium had two, and Luxembourg one. So the total number of votes was 17. The required quota was 12. So one gets the impression that Luxembourg had half as much voting power as each of its two Benelux partners had. And that Luxembourg had one quarter of the voting power of each of the three big countries. However, arithmetic shows that Luxembourg, in fact, had no voting power at all, because either way it voted, its vote had no effect on the outcome. Whether Luxembourg voted yes or no in either combination, its vote would make no difference. So its voting power was zero, although its vote was weighted as one unit.

1 The set W includes all winning subsets i.e. subsets that can ensure acceptance of the proposal N . For W we put some restrictions (Straffin 1978):

[(i)] $\emptyset \notin W$, the empty set of members cannot ensure acceptance

[(ii)] $N \in W$, the entire set of voters can ensure acceptance

[(iii)] if S and T are subsets of N , with $S \in W$ and $S \subset T$ then $T \in W$. If S can ensure acceptance and T contains all the members of S then T can ensure acceptance.

The notion of a simple game was introduced by Von Neumann and Morgenstern in 1944. A simple game is an n -person game which can be defined as a pair (N, W) .

If the game is a simple game a coalition S can have a value 0 or 1. If S is winning it has a value of 1, otherwise S has a value of 0, i.e. all the winning coalitions have the same value and all losing ones as well. The characteristic function v for a coalition S indicates the value of S : $v(S)=1$, if S is winning, otherwise $v(S)=0$.

We denote N as $N = \{x_1, x_2, \dots, x_n\}$.

The corresponding voting weights for N with a specified vote threshold (quota) q are denoted as

$[q; w_1, w_2, \dots, w_n]$

$v(S)=1$ if and only if $S \in W \Leftrightarrow \sum_{i \in S} w_i \geq q$, otherwise $v(S)=0$ (see Pajala, 2002)

2 voter i has a negative swing in a coalition S if $v(S)=1$, but $v(S \setminus \{i\})=0$, i.e. by withdrawing her support i can turn (swing) a winning coalition into a losing one. A positive swing occurs when $v(S)=0$, but $v(S+\{i\})=1$, by adding her support i can turn a losing coalition into a winning one.

A dictator is a voter whose votes alone are sufficient to ensure a winning coalition and only coalitions in which the dictator is a member are winning. A dummy is a voter who does not have any swings in any coalitions. Any coalition that is winning with a dummy is also winning without the dummy, so $S \in W \Rightarrow S \setminus \{i\} \in W$.

(mainly repeated from Pajala, 2002, available online at <http://powerslave.val.utu.fi/>)

Voting Power Measurement

Approaches to voting power measurement can be divided into those who measure the probability of a vote being on the winning side (Penrose, 1946), and those who normalize the measure to make power zero sum that a gain in one voter's power entails a loss in at least one other voter's power (Shapley & Shubik, 1954). Most commonly used methods to measure voting power are three voting power indices: the Shapley-Shubik Index, the Absolute Banzhaf Index / Penrose Index and the Banzhaf Index.

Shapley-Shubik Index

Shapley and Shubik (1954) proposed a measurement of voting power for evaluating the distribution of power in a committee system based on the mathematical theory of cooperative games with transferable utility³. In these games, before voting, voters are expected to form coalitions and conclude on a binding act on how to vote, yes or no. They define power of an individual member of such a committee as “the chance he has of being critical to the success of a winning coalition” (p. 787). For this purpose they suggest to compute how often a member is ‘pivotal’ to a vote. Their proposed index “measures the number of times that the action of the individual actually changes the state of affairs” (p. 788).

Felsenthal et al., criticize the Shapley-Shubik index. They agree that the Shapley-Shubik index is mathematically robust. However, it suffers from structural defects. That is why they argue against the use of this index of any kind of a priori voting power (Felsenthal & Machover, 2004, p. 12).

Absolute Banzhaf Index / Penrose Index

The first measurement of a priori voting power has been proposed by L.S. Penrose in 1946 and 1952. His work lay unnoticed until it was “discovered” in the 1980s. Penrose's proposed measure of a's voting power ψ_i is the probability that the given voter can be decisive (or critical), or, the probability of occurrence of a division in which voter a can reverse the outcome by reversing his or her vote. The index⁴ is the sum of voter a's swings divided by the number 2. It firstly represents the number of coalitions (winning or losing) that a voter is in, and secondly, analyses in how many of the winning coalitions a is a critical voter. The index is an absolute measure. Consider a three voter weighted voting game where voter a has 50 votes, b 49 votes and c one vote with a quota of 51, i.e. [51; 50;49;1] (Pajala, 2002). There are $2^3=8$ possible combinations which are given in table 1.

3 Formally voter i's Shapley-Shubik index value is calculated as

$$\phi_i = \sum_{S \subseteq N} \frac{(s-1)!(n-s)!}{n!} [v(S) - v(S \setminus \{i\})].$$

4 Formally voter i's absolute Banzhaf index is calculated as

$$\beta_i = \frac{\sum_{S \subseteq N} [v(S) - v(S \setminus \{i\})]}{2^{n-1}}.$$

Table 1: Example Absolute Banzhaf Index

Combination	Weight	Status	Critical voters
a	50	losing	-
ab	99	winning	a,b
ac	51	winning	a,c
abc	100	winning	a
b	49	losing	-
bc	50	losing	-
c	1	losing	-
\emptyset	0	losing	-

Next, the winning coalitions which meet the threshold need to be found; ab, ac and abc. The critical voters (swings) of these winning coalitions are found by withdrawing a voter and checking whether the remaining coalition is still winning. In total there are five swings, a has three of, b and c one swing. Through this we find the absolute Banzhaf values for each voter:

$$a = \frac{3}{4}, b = \frac{1}{4}, c = \frac{1}{4}.$$

Normalised Banzhaf Index

The standardized Banzhaf index, normalized Banzhaf index or just Banzhaf Index was introduced by John F. Banzhaf in 1965 (Banzhaf III, 1965, 1966, 1967, 1968) to measure the ratio of one voter's voting power to another's. It first calculates a's swings while concentrating on voter combinations. It is expressed by the Greek beta and can be derived from the Penrose Index by dividing the value of psi for that voter by the sum of the values of psi of all voters in the assembly. The Banzhaf index is thus the normalized Penrose index; it always adds up to 1. It is a relative measure giving a's proportion of all swings¹.

Comparison of the Indices

Overall, power indices share common properties and are in many cases closely connected to each other. One major similarity among the indices are the swing sets. Two strands of theories exist in the field of a priori voting power. This has to do with the historical event that the first work in this academic field has been done by L.S. Penrose in 1946 (Penrose, 1946). His work has been forgotten though, so that other scholars "reinvented" his findings meanwhile and slightly differently. Felsenthal and Machover (1998) state that there are merely two power indices, the Shapley-Shubik index representing the idea of P-power and the absolute Banzhaf measure representing I-power, all other power indices lead to these two fundamental ideas (Pajala, 2002). I-power is the influence of a voter might wield over an outcome, P-power is a voter's relative share in some fixed prize available to the winning coalition in any voting game

The performance of indices has been compared in the literature, for instance

¹ Formally voter i's Normalised Banzhaf index is calculated as

$$\bar{\beta}_i = \frac{\sum_{S \subseteq N} [v(S) - v(S \setminus \{i\})]}{\sum_{j \in N} \sum_{S \subseteq N} [v(S) - v(S \setminus \{j\})]}.$$

by Leech (Leech, 2002a). The Absolute Banzhaf index is an absolute measure and hence lacks information on the comparison of countries. Leech's results are also unfavourable for the Shapley-Shubik index as "the Banzhaf index much better reflects the variations in the power of shareholders". This is why the observations are focused on the results from the Normalised Banzhaf index calculations.

Before voting power is calculated, a critical discussion of this theory is needed as it is commonly used but not uncontested.

A Priori Voting Power vs. A Posteriori Voting Power - A Critical Discussion

A priori voting power of a voter under a given decision rule, is the amount of potential influence over the possible outcome of divisions which the voter possesses 'by virtue of the rule'. 'By virtue of the rule' serves to distinguish a priori from actual or a posteriori voting power (Leech 2005, p. 3), or *de facto* voting power (Hosli & Machover, 2002, pp. 501-502 + 505). However, some scholars criticise a priori measures of being incomplete.

When focusing on votes as resources for decision-making power, preferences in voting are either assumed to be heterogeneous, or as in chaos models, preference-free. Here, voters can have any preference that is logically possible. A preference-free approach leads to power as ability. A priori voting power indices are preference-free chaos models assuming that all coalitions have the same probability of being formed, thus dismiss knowledge on existing patterns in international relations. The lack of preferences in a priori voting power has been discussed in Garrett and Tsebelis (1999 & 2001), Moberg (2002); and Albert (2003). Garrett and Tsebelis (1996) made the extreme claim that "[the method of power indices] generated no analytic leverage over decision-making in the contemporary EU". They argued that, because it ignores preferences, it cannot have anything to say about behaviour. However, a priori voting power does not intend to predict behaviour but should better be seen as a tool for the design of institutions; also see Lane and Berg (1999).

Geoffrey Garrett and George Tsebelis (Garrett & Tsebelis, 1996) describe a power approach for games with different probabilities of coalitions, procedural spatial models, assuming that only connected coalitions are acceptable. In a connected coalition, only adjacent voters (voters next to each other in a one-dimensional political space) can form a coalition. Procedural spatial models intend to predict likely changes in political outcomes due to changes in voting rules and focus on changes in preferences of actors. They rely on two central concepts: veto power and agenda setting power. Agenda setting power and a critique of voting power has been dealt with by George Tsebelis in 1994 (Tsebelis, 1994).

Other criticism include the issue of abstention (Felsenthal & Machover 1998, p. 280), several modes of voting (see Warntjen, 2009; Hagemann & de Clerck-Sachsse, 2007), and the idea that actors form rather stable coalitions (see Moberg, 2002, p. 261; Hosli & Machover, 2002, p. 506). In the used model of voting power, abstention is assumed not to be allowed.

By some scholars voting power is not even recognized as scientific theory, but rather as branch of probability theory or political philosophy, which should both be ignored by political scientists (Albert 2003, pp. 354, 358-360).

However, the general advantage of voting power is as Lane and Maeland

(2006) put it that direct voting power leads to indirect voting power used in negotiations. So it can be seen as the foundation from which one can further analyse the bargaining process that translates formal, or a priori power of an actor into actual influence over the outcome.

Votes as power resources are the raw materials or vehicles that underlie power relationships. A priori voting power forms the foundation from which one can further analyse the bargaining process that translates formal, or a priori power of an actor into actual influence over the outcome.

Application of Voting Power to the IMF

Despite all this criticism on voting power, it is relevant and useful in the case of the IMF. If one recaps that this thesis intends to measure the distribution of power in the International Monetary Fund and show how the power distribution changed due to 2008 reforms, it becomes clear why voting power is chosen as the theoretical framework of this analysis. In order to minimize conceptual shortcomings of voting power, Nye (2011) suggests to clarify the specific context to tell us who gets what, how, where and when. He adds that to analyze whether a given set of resources produces preferred outcomes depends on behaviour in context. This however is not possible in an application to the IMF, in which great parts of actual behaviour is subject to secrecy. A priori voting power in the Executive Board is calculated due to the fact that in the IMF archives special lists might exist, in which the secretary writes down the positions of the respective constituencies of the issue under discussion. Although these data would be very useful for this analysis, it seems impossible so far to obtain them (Aleskerov et al., 2009, p. 2).

The application of voting power to the IMF could be questioned, as actual votes are deliberately avoided, especially in the Executive Board, where decisions are taken only after discussion leading to a consensus whenever possible. However, it has to be noted that the distribution of voting power provides a framework within which bargaining takes place between countries before a decision is taken (Leech, 2000).

The application of voting power to the IMF contributes to the literature, since there „have been few previous voting power studies of the IMF” (Leech & Leech, 2005). Only a few other studies have adopted a similar approach to the analysis of power in the IMF to the one employed here. Leech (several years), and Dreyer and Schotter (1980) and Strand et.al. (1997). Leech and Leech (2002 & 2004a) analyse voting power in the IMF before and after the 2006 reforms. Leech and Leech (2005) study voting power implications of a unified European representation in the IMF. These studies were helpful when calculating voting power before and after the 2008 reforms of the IMF.

2.4 Preliminary Conclusions on Power in Global Affairs and Voting Power

Before turning to the next section which explains the methodological choices of this thesis, ‘power in global affairs’ and voting power should be summarized. Power in international politics is a contested concept. In this thesis, mostly due to practical limitations, the realist strand of the literature focusing on raw resources of nations is chosen. Rational choice and game theory are applied by the calculation of voting power indices. Here, power is seen as power in a

weighted voting game as influence over decision making. A member's power is defined as its ability to join coalitions of other members and change them from losing to winning the vote, or, equivalently, to change coalitions from winning to losing by defecting (Leech, 2002). Generally, a member's power is measured by the number of times it can do that.

Despite of several weaknesses and the realisation that the application of a relational approach would lead to a more complete picture of power in the IMF, voting power serves well to answer the research question of this thesis. To that end, the Absolute Banzhaf index, the Normalised Banzhaf index, and the Shapley-Shubik index are applied in this thesis. Voting power theory applied to the IMF reforms suggests the indicated changes in weight will differ from the changes in power. Through this it is likely that the reforms were not able to reach its goal.

When conceptualizing power, related concepts like authority, domination, influence, coercion and legitimacy are equally important to understand. The scope of this paper allows for one mere comment on legitimacy. Although the view on power applied in this paper is descriptive and non-normative itself, the underlying premise of this work remains that power should always be exerted in the legitimate form of authority.

3 Research Design and Methodological Choices

The research design to answer the descriptive research question *To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?*, was non-experimental and unobtrusive. This has to do, amongst other reasons, with the fact that the IMF acts, especially when it comes to voting in the two governing Boards, mainly in secrecy, and research is limited to publicly accessible documents.

Furthermore, I decided to analyse the changes resulting from the 2008 reforms, neglecting the effects the 2006 have had and the further 2010 reforms might have on the distribution of power in the IMF. Although even more reforms can be expected, only the 2006 and the 2008 parts entered into force, so far. Additionally, this paper focuses on the 2008 reform package which forms the core of the IMF governance reforms. The 2006 package only affected very few countries, and the 2010 reforms mainly include changes for composition of the Executive Board.

3.1 Case Study

A case study has been conducted; a comparison of the power of the IMF members at two moments in time, before and after the 2008 reforms. This design was thus also longitudinal. Case studies aim at contingent generalizations to model complex relationships such as path dependency and multiple interactions effects and equifinality. Case studies have a theory building purpose to generate new knowledge/hypotheses following the “logic of discovery”. An important limitation of case studies is that findings are often not generalisable beyond the case (Bennet, 2005). The research design of this thesis shall especially enhance internal validity. Internal validity of the case study is seen as being more important than external validity, as the aim is to understand the chosen case in-depth without making distinct generalisations from the IMF to other international organisations.

3.2 Units of Analysis

The 2008 reforms could be seen as the treatment of the units of analysis, the IMF member countries.

Roughly, three groups of countries are compared: the advanced economies, the low-income economies, and the BRIC countries. As advanced economies I chose to focus on the major advanced economies, that is the Group of 7, as used in various IMF working documents, too. These seven countries are in alphabetical order: Canada, France, Germany, Italy, Japan, United Kingdom and the United States. The four BRIC countries are Brazil, Russia, India and China. 47 low-income countries are categorised as such as based on the criteria used by IMF publications on changes in voting weights. Eligibility is limited to Poverty Reduction & Growth Trust (PRGT) eligible countries with annual per capita income below the prevailing operational International Development Association (IDA) cut-off in 2008 (US\$1,135) or below twice IDA's cut-off (US\$2,270) for countries meeting the definition of a “small country” under the PRGT eligibility criteria. The World Bank defines the GNI as the indicator for its cut-off: GNI per capita (formerly GNP per capita) is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population. GNI is the sum of value added by all resident producers

plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. A member will be considered a “small country” if it has a population below 1 million (IMF, 2010, Eligibility to Use the Fund’s Facilities for Concessional Financing).

3.3 Data Collection

Desk research has been conducted to answer the proposed research question. Secondary literature is used to locate the study and its findings. Academic Journals are the main sources for secondary literature on background information on the IMF and its institutional development, as well as on power and voting power more specifically. Important examples are *Comparative Politics*, *International Organization*, *Political Analysis*, and *Political Research Quarterly*. Several books helped to better understand power in international relations. A voting power analysis of the IMF using these indices has been done by Leech (2001) for the voting changes of 2006. His work seems to offer a well-suited, pre-developed conceptual and methodological framework for this study. The topic of the study is so recent that it has not been covered much in the academic literature, yet. This is why primary literature such as newspaper articles, official documents of the IMF and statements of governments are important sources for data. The access to information of the IMF can be rather difficult because of secrecy issues. Consequently, this study is based on publicly accessible information as agreed by the member governments and made public online. The main source of information is the IMF’s Articles of Agreements and the amendments as agreed under the 2008 reforms. A list of public accessible IMF documents for the relevant period can be obtained online at <http://www.imf.org/external/np/fin/quotas/pubs/index.htm>. Quota and voting shares in the Executive Board before and after the implementation of the reforms is also available online: http://www.imf.org/external/np/sec/pr/2011/pdfs/quota_tbl.pdf.

The list of low-income countries as used by the IMF is taken from the World Bank database for the GNI indicator for 2008 (World Bank, 2011).

3.4 Data Analysis

This section explains how the voting power of each IMF member country has been calculated. To calculate the voting power indices for each country it is important to have the exact quotas and votes for each country for two moments in time, here 02 and 03 March 2011, thus as of one day prior to the reforms taking effect and as of the day of becoming effective. In the subsequent analysis, the attributes ‘before the reforms’ and ‘after the reforms’ or short ‘before’ and ‘after’ are used. ‘Before’ includes the shares prior to the entry in effect of the Voice and Participation amendment. It further includes Kosovo and Tuvalu which became members on June 29, 2009 and June 24, 2010, respectively. For comparison with after the reforms, the 11th Review proposed quotas are used for two countries that have not yet consented to, and paid for, their quota increases. The Total of countries is thus 187 for 02 and 03 March 2011. The voting shares of each country are based on their quota and on the amount of basic votes equalling 250 votes. ‘After the reforms’ uses the shares which reflect ad hoc quota increases for 54 members agreed as part of the 2008 quota and voice

reform. Basic votes are calculated as a fixed percentage (5.502 percent) of total votes (provided there are no fractional votes) as per the Voice and Participation amendment.

The voting power indices are calculated using the simple majority threshold for ordinary decisions: $q=50.1$. For some decisions in the IMF, a special majority with $q=85.1$ is needed. However, a larger majority requirement leads to an equalization of votes which is why the smaller threshold is chosen for analysis as results are expected to be more significant. Also compare Leech (Leech, 1998, p. 36) for how the size of quota matters in the IMF decision-making.

For the actual calculation of the indices the online accessible Java Applets 'ipmmle' and 'ssmmle', provided by Dennis Leech from the University of Warwick and Robert Leech from Birkbeck, University of London, have been used. The first computes the Banzhaf and the Penrose indices by Leech's modification of Owen's multilinear approximation method. This algorithm can handle bodies that are large both in terms of number of members and number of votes, with good approximation, for which the other, exact methods are not suitable. The programs both employ a combination of direct enumeration and approximation based on a probabilistic voting model. The algorithm uses the modification of the approximation method of multilinear extensions of Guillermo Owen (see 1995) described in Leech (2003). It is necessary to divide the players into two groups: "major" and "minor". The "major" players are a small number including the largest and the "minor" ones are the remainder. The algorithm trades off speed against accuracy: the larger the number of "major" players, the slower but more accurate the algorithm. As 'major countries', the five countries with the largest quota and their own appointed Executive Director are chosen. The program ssmml computes the Shapley-Shubik and can be applied to voting bodies of any size both in terms of number of players and in terms of votes.

4 Data and Empirical Analysis

This section will first sketch the initial institutional design of the IMF, then answer the sub-questions of this research and finally the main research question *To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?* in subsequent steps.

IMF Governance Structure and Decision-Making Before and After the Reforms

Karns et al. (2011) introduce the Fund and its original structure, Van Wouten (2002) gives a detailed description of the governance structure of the Fund, details can also be found on the official website of the Fund www.imf.org. The Articles of Agreement (IMF, 2011) form the legal basis for the governance of the IMF. An amendment to the IMF's Articles of Agreement enters into force for all members on the date that three-fifths of IMF members representing 85% of the total voting power have accepted the amendment. Article XII sets out the Organization and Management of the Fund; with Section 1 stating that, “[T]he Fund shall have a Board of Governors, an Executive Board, a Managing Director, and a staff (...)”.

Board of Governors

The Board of Governors, the highest decision-making body of the IMF, consists of one Governor and one Alternate Governor for each member country. The governor is appointed by the member country, usually the minister of finance or the Governor of the central bank. All powers of the IMF are vested in the Board of Governors. The Board of Governors may delegate to the Executive Board all except certain tasks that are conferred directly by the Articles of Agreement. These include the right to approve quota changes, special drawing right (SDR) allocations, the admittance of new members, compulsory withdrawal of members, and amendments to the Articles of Agreement and By-Laws. The Board of Governors also elects or appoints Executive Directors. The Boards of Governors of the IMF and the World Bank Group normally meet once a year, decisions are taken in the form of Resolutions.

The Executive Board

Every two years, the Governors of the Fund elect Executive Directors to its Executive Board. The 24 Directors, the Managing Director together with Alternate Directors form the main staff of the Executive Board. The Managing Director serves as its Chairman. The 24 Directors are appointed or elected by member countries or by groups of countries. The IMF's 24-member Executive Board takes care of the daily business of the IMF, thus its maintenance and administration. It carries out its work largely on the basis of papers prepared by IMF management and staff. Negotiations in the Executive Board include daily decisions, surveillance, program approvals, and the implementation of policy decisions, thus, “everything from the IMF staff's annual health checks of member countries' economies to economic policy issues relevant to the global economy” (IMF, 2011). The Board usually meets several times each week. At the end of most formal discussions, the Board summarizes its views and issues these summaries. The board normally makes decisions based on consensus but sometimes formal votes are taken. In their power analysis of the IMF of 2009, Aleskerov et al. find out that “members usually never vote formally and

all decisions are reached by consensus”. However, in practical terms this means accepting the decision when the informal agreement of the majority required is met (van Houtven, 2002). Therefore, we can assume that voting in the Executive Board, either explicit or not, takes place in any ballot.

4.1 What Was the Main Goal of the Reforms?

The key objective of the 2008 reform was to enhance the participation and voice of low-income countries. For the LICs an increase in weights of 0,6% has been indicated, for the BRICs an increase of 0,64%. To be able to assess to what extent this goal could actually be reached by the agreed 2008 reforms, the remaining sub-questions are answered in the following parts. What has been done with the 2008 Quota and Voice Reforms? To what extent did the distribution of power change in the Board of Governors per country? To what extent did the distribution of power change in the Board of Governors per group of countries? To what extent did the distribution of power change in the Executive Board? Who gained most from the 2008 reforms?

4.2 What Has Been Done with the 2008 Quota and Voice Reforms?

In the following section, the governance structure of the Fund before the reforms will be sketched first. Afterwards, the changes in voting power will be analysed with the use of the Absolute Banzhaf index, the Normalized Banzhaf index, and the Shapley-Shubik index for the Board of Governors and the Executive Board respectively. The analysis of the Board of Governors includes the comparison of the LICs, BRICs and the advanced economies. The analysis of the Executive Board is done for all constituencies, whereas a focus is laid on the two African and poorest constituencies. This chapter ends with a summary of the main results and sub-conclusions of this research. Note that in many IMF documents the term ‘voting power’ is used to indicate the share of votes in total votes. In this analysis, however, ‘voting power’ or mere ‘power’ is mainly used in the sense of John F. Banzhaf (1964).

The 2008 Quota and Voice Reforms include these three elements that are relevant to a priori voting power: The second round of ad hoc quota increases, a single quota formula, and a tripling of basic votes.

Country Representation and Constituencies

In the Board of Governors all members are represented by one Governor. In the Executive Board, 24 board members represent all 187 countries. The United States, Japan, Germany, France and the United Kingdom, the five countries with the largest quotas, have their own seat. The remaining 19 Executive Directors are elected by those members of the Board of Governors not having their own seat. All countries not having their own seat are grouped in constituencies representing 4 or more countries. The largest constituency includes 24 countries. The two African constituencies represent together 43 mostly developing countries. The composition of the Board has been changed in 1992 from 20 to 24 due to the influx of new members from former Soviet Union. The only change through the reform in this system of country representation is that the two African Executive Directors may nominate a second Alternate each. This

system of country representation with the five largest shareholders having their own seats and most African countries being represented by 2 Executive Directors seems to be skewed in favour of the advanced countries. This impression needs to be checked through the calculation of indices per country and per group of countries. Before that is done, the voting system, basic votes and quotas are compared before and after the reforms.

Voting

The voting system is based on the IMF's original design when it was set up in 1944. Generally, voting mechanisms in international organisations consist of two basic elements (Lane et al. 2006, p.188). The assignment of votes to the choice participants in the IMF is quantitative. The aggregation rule means which majority is needed to arrive at a yes vote. The choice is between simple majority, qualified majority, and unanimity. As seen above, aggregation rules differ in IMF; ordinary decisions require a 50%+1 vote majority, qualified majority, or for most important decisions, a 85% majority. This has not been changed through the reforms.

Voting by the Board of Governors usually takes place by mail-in ballot. Section 2 (e) states that, "[E]ach Governor shall be entitled to cast the number of votes allotted under Section 5 of this Article to the member appointing him". In the Executive Board, "[E]ach appointed Executive Director shall be entitled to cast the number of votes allotted under Section 5 of this Article to the member appointing him" (Section 3 (i)). All votes an Executive Director is allowed to cast, shall be casted as a unit. Section 5 (a) of the Articles of Agreement states that, "[E]ach member shall have two hundred fifty votes plus one additional vote for each part of its quota equivalent to one hundred thousand special drawing rights".

These fundamental voting arrangements have been changed through the reforms as the amount of basic votes changed from 250 votes per country to 750 per country.

Basic Votes

Basic votes reflect the principle of equality of states in the design of the IMF and shall give the smallest members (many of which are low-income countries) a greater voice in decision-making [...]. It is worth noticing that basic votes as the percentage of total votes have declined over time. Quotas have been increased in various reviews, basic votes have not. Through that decline for many members their basic votes have become insignificant (see table below and Leech 1998 for a detailed analysis of this phenomenon).

Before the reforms, each country had 250 basic votes. The 2008 reforms endorsed a tripling of basic votes, 750 per country, the first such increase since the IMF was established. Additionally, the Articles of Agreement are amended so that the share of basic votes in total voting power does not decline in the event of future quota increases. Resolution 63-2, sets out the following amendments to the Articles of Agreement. The text of Article XII, Section 5(a) shall be amended to read as follows:

"The total votes of each member shall be equal to the sum of its basic votes and its quota-based votes.

(i) The basic votes of each member shall be the number of votes that results from the equal distribution among all the members of 5.502 percent of the aggregate sum of the total voting power of all the members, provided that there shall be no fractional basic votes.

(ii) The quota-based votes of each member shall be the number of votes that results from the allocation of one vote for each part of its quota equivalent to one hundred thousand special drawing rights”.

This boost intends to compensate many low-income countries that would have otherwise seen their voting shares diminished. The change in basic votes was indeed highly necessary. The tripling of basic votes was necessary if the IMF is serious about including low-income countries in its decision-making. Hence, the low-income countries gained most through the change in basic votes.

Table 2: Share of basic votes (source: Leech, 1998, newer dates calculated)

	Number of members	Total basic votes	Total votes	% basic votes
1946	39	9750	84475	11,54
1956	58	14500	10128	14,32
1966	103	25750	217657	11,83
1976	128	32000	324114	9,87
1986	149	37250	930300	4,00
1996	179	44750	1493331	3,00
2 March 2011	187	46750		2,00
3 March 2011	187	126551	2300934	5,50

Quota System

The voting power of a member of the IMF is determined by its quota, together with the equal number of basic votes each member has. A quota broadly reflects the size of a member's economy: the larger a country's economy in terms of output and the larger and more variable its trade, the larger its quota tends to be. Originally, five different quota formulas are calculated on the basis of the following variables:

Y = GDP at current market prices for a recent year;

R = twelve-month average of gold, foreign exchange reserves, SDR holdings and reserve positions in the IMF, for a recent year;

P = annual average of current payments (goods, services, income, and private transfers) for a recent five-year period;

C = annual average of current receipts (goods, services, income, and private transfers) for a recent five-year period; and

VC = variability of current receipts, defined as one standard deviation from the centered five-year moving average, for a recent 13-year period.

Quotas define four aspects of a member's relationship with the IMF:

- » The amount of financial resources that a member contributes to the IMF;
- » The member's voting power in institutional decision making (along with basic votes);
- » The level of access of the member to IMF financing; and
- » The members' share of general Special Drawing Rights (SDR) allocations (IMF, 2008).

Total quotas at end-March 2008 were SDR 217.4 billion (about US\$354.3 billion, IMF 2008). The Board of Governors conducts general quota reviews at regular intervals, usually every five years. In a general quota review the size of an overall increase and the distribution of the increase among the members are reviewed. A “general quota review allows the IMF to assess the adequacy of quotas both in terms of members’ balance of payments financing needs and in terms of its own ability to help meet those needs” (IMF, 2011). A general review also allows for increases in members’ quotas to reflect changes in their relative positions in the world economy.

As from 3 March 2011, a new, single quota formula replaces the old, complex ones and includes four quota variables, expressed in shares of global totals, with the variables assigned weights totalling to 1.0. The formula also includes a compression factor that reduces dispersion in calculated quota shares. The new formula is: $CQS = (0.5*Y + 0.3*O + 0.15*V + 0.05*R) k$

The GDP variable is a blend of 60 percent of GDP at market exchange rates and 40 percent of GDP at Purchasing Parity Power (PPP) rates. The introduction of the blended GDP variable intends to capture the Fund’s non-financial activities, where PPP GDP can be viewed as a relevant way to capture the relative volume of goods and services produced by economies. This is to give additional recognition to dynamism, so the dynamic and emerging economies will gain most from this change. Openness means the annual average of the sum of current payments and current receipts (goods, services, income, and transfers) for a five year period. Variability in the sense of current receipts and net capital flows (measured as a standard deviation from the centred three-year trend over a thirteen year period). Reserves is the twelve month average over a year of official reserves (foreign exchange, SDR holdings, reserve position in the Fund, and monetary gold). This changed formula was thus most beneficial for the emerging economies. It further leads to a new distribution of quotas among the IMF members.

4.3 To What Extent did the Distribution of Power Change in the Board of Governors?

The following section shows the observations that can be derived from the calculations of the indices.

Data and Procedure

The Absolute Banzhaf, the Normalised Banzhaf index and the Shapley-Shubik index are given for all countries (see Appendix). In the following parts the results of the calculations of the indices are shown. Note, that ‘weight’ is used for share in total votes, and ‘power’ is used in terms of the Normalised Banzhaf index. When interpreting the data, the focus is laid upon the Normalised Banzhaf index because of performance reasons discussed earlier.

To What Extent did the Distribution of Power Change in the Board of Governors Per Country?

The results for a comparison of weight and power for all countries before the reforms reveal several things.

Before the reforms:

The US with an absolute Banzhaf index of 74,87%, possessed much more power than other countries, for example Japan with absolute power of 16,92%, and Germany of 16,57%. Additionally, the US clearly had more power than weight: the Normalised Banzhaf index of 23,80% compared to a weight of 16,72% equals a difference of 7,08%. All other countries have less power than weight. Their differences between weight and power, however, are rather small. The Shapley-Shubik index confirms this observation: 19,49% power compared to 16,72% weight. But this difference is smaller than with the Normalised Banzhaf index. Japan and Germany have slightly more power compared to the Shapley-Shubik index. This observation differs from the results of the Normalised Banzhaf index. Still, the other results confirm that all other countries possess less power than weight.

After the reforms:

The US has a 16,73% weight compared to a 24,32% Banzhaf index making a difference of 7,6%. The difference thus increases after the reforms. The Shapley-Shubik index of 19,52% confirms this finding. Although the US gave away 0,01% of their share in total votes, their power increased by 0,522%.

The second biggest shareholder Japan has a weight of 6,23% compared to a Normalised Banzhaf index of 5,47%, thus having less power than weight with a difference of -0,75%. This can also be observed for all other members: their power is smaller than their weight in votes indicates in the first place.

Top 5: positive change in weights from pre-reform

India 0,46%
 Brazil 0,34%
 Spain 0,24%
 Japan 0,23%
 Singapore 0,19%

Top 5: positive change in power from pre-reform

United States 0,52%
 India 0,40%
 Brazil 0,30%
 Spain 0,21%
 Singapore 0,17%

Top 5: negative change in weights from pre-reform

France - 0,56%
 United Kingdom - 0,56%
 Saudi Arabia - 0,23%
 Canada - 0,32%
 Russian Federation - 0,30%

Top 5: negative change in power from pre-reform

France - 0,52%

United Kingdom- 0,52%

Saudi Arabia - 0,34%

Canada - 0,31%

Russian Federation - 0,29%

To what extent did the distribution of power change in the Board of Governors per group of countries?

In the following, the changes in power are investigated per voting bloc, G-7, LICs, and BRICs.

Data and Procedure: Voting Blocs

The voting weights for each member before and after the reforms have been published by the IMF (2008). Based on this publication the voting power indices could be calculated for each member (see Annex). For the Group of 7 and the LICs, the combined weights have been published, for the BRICs, the combined weights had to be calculated. For the power of each group it was assumed that each group of countries forms one voting bloc. In the calculations of the indices, they have been seen as one voting bloc having the combined weight of the single members of that group. The members of each group were thus seen to conclude a pact binding them to vote always together, as a bloc, hence changing the total of countries (Felsenthal & Machover, 2004).

The Changes in Power in the Board of Governors, Per Country Groups

The results for the comparison of weights and power (Normalised Banzhaf Index) per group show the following.

The BRIC countries and the LICs gained through that shift both in terms of weights and in terms of power:

The LICs' power before the reforms was 3,66%, and after the reforms 4,13%, which is an increase of 0,47%.

Before the reforms the BRICs had a Normalised Banzhaf index of 8,81% compared to their weight of 9,60%. After the reforms, the BRICs had a power index of 9,34% compared to a combined weight of 10,24%. Their increase in weight was thus 0,64% compared to an increase of power of 0,53%. The BRICs remain to have less power than weight after the reforms.

The BRIC countries and the LICs both gained some power through the 2008 reforms. The BRICs gained slightly more power as indicated by a small increase of their respective relative power index, the LICs gain 0,47% power instead of the indicated 0,6% increase in weight and the BRICs gain 0,53% instead of the indicated increase of 0,64%.

The Group of 7 have more power than weights before and also after the reforms. A power decrease of 0,9%, compared to a weight decrease of 1,30% can be observed. This is a striking finding since the goal that the G-7 gave away some of their power has been central in all IMF publications on the reforms. However, the most striking finding of this analysis is that the G-7 as a voting bloc has Banzhaf index of close to 1, this means a power of nearly 100%.

Table 3: Mean weights of groups compared, before and after the reforms

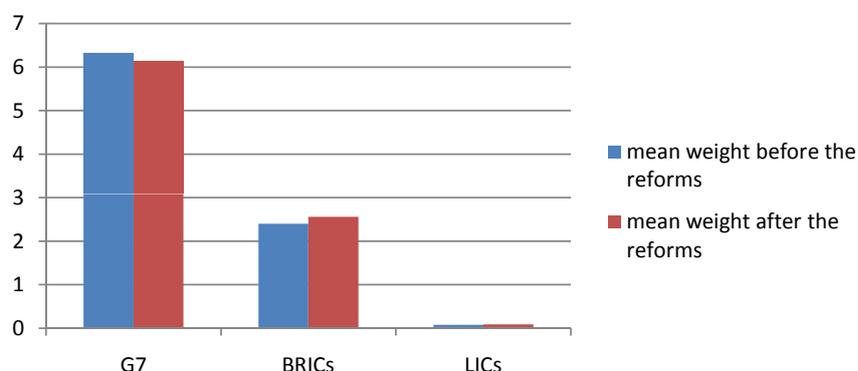


Table 4: Quotas, weights and indices of groups, before and after the reforms

	G-7	BRICs	LICs	G-7	BRICs	LICs
	2 March	2 March	2 March	3 March	3 March	3 March
Quotas	45,200	9,756	3,400	45,300	10,715	3,200
Combined weight	44,33	9,60	4,0	43,03	10,24	4,50
Change in combined weight after reforms	-	-	-	- 1,30	+ 0,64	+ 0,47
Mean weight	6,33	2,4	0,08	6,15	2,56	0,09
Standard deviation of weight as % of mean	74,79	41,42	100,99	78,81	34,55	79,96
Penrose index as voting bloc	-	0.28	0.115	-	0,30	0,13
Banzhaf index as voting bloc	1,0	0.09	0.037	1,0	0.09	0,041

Preliminary Conclusions

The results for the comparison of weights and power (Normalised Banzhaf Index) in the Board of Governors per group show the following.

Although the US gave away 0,01% of their share in total votes, their power increased by 0,522%, which is the biggest increase in power from all members.

Other Top 5 winners in terms of power are, in this order, India, Brazil, Spain, and Singapore. The Top 5 losers in terms of power are France, United Kingdom, Saudi Arabia, Canada, and the Russian Federation.

For all other members except the US, it can be observed that their power remains smaller than their weight in votes.

The BRIC countries and the LICs actually gained through the reforms both in terms of weights and in terms of power, whereas the BRICs gained more than the LICs. However, these two groups remain to have less power than weight. The Group of 7 has more power than weights before and also after the reforms. This becomes highly relevant when seeing that the G7 has a voting power of close to 100%, both before and after the reforms. Although the Group of 7 gave away 1,30% of their votes, their decrease in power is only 0,90%. Hence, the reforms did not achieve the intended shift in power.

4.4 To What Extent did the Distribution of Power Change in the Executive Board?

Data and Procedure

For the analysis of the constituencies it needed to be assumed that all countries within that group vote 'yes' as data on actual voting behaviour of countries within their constituencies is not available. The amount of total votes of 2,220,817 (in the General Department and the Special Drawing Rights Department) is used for the calculations. This total does not include the votes of Kosovo, Mauritania, Somalia, and Zimbabwe, which did not participate in the 2008 Regular Election of Executive Directors. A focus is laid on the two African constituencies, as most of their members are LICs. A two-way voting power analysis, which looks at the countries' power within their constituency first, was not in the scope of this thesis.

The Changes in Power in the Executive Board per Constituency

The results for all constituencies show the same means for Banzhaf and Shapley-Shubik indices, so there is no change in the mean power from before and after reforms.

Overall, a smaller difference between weight and power than before reforms is observed.

The US weight before reforms of 16,74% is compared to a much higher Banzhaf index of 21,01%. After the reforms the US weight is 16,80% and the Banzhaf index 21,15%. The US thus gained through the reforms, both in terms of weights and in power, also in the Executive Board.

The five biggest constituencies US, Japan, Germany, France and UK appointing their own Executive Director directly have a combined share of 38,32% of the total votes, and a Normalised Banzhaf index of 41,57%. After the reforms, these constituencies remain to have the largest share of votes, 37,48% of total votes together. This is less than their power, which is indicated by a Banzhaf index of 40,82%. The results thus show that the five biggest constituencies gave away 0,84% of their votes but only 0,75% of their power.

The two African constituencies represent 43 African countries. Before the reforms, they had a combined share of votes of 4,35% compared to the Normalised Banzhaf index of 4,13%. This means their power is not only tiny in terms of nominal votes but even smaller in terms of power. After the reforms, their weight is 4,78% compared to the Normalised Banzhaf index of 4,54%. Although the African votes increased by 0,43% and their power by 0,41%, they remain to have less power than weight.

Table 5: Voting weights in the Executive Board before the reforms, per constituency

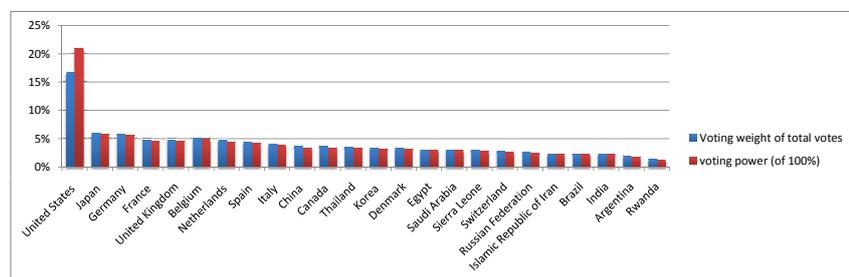
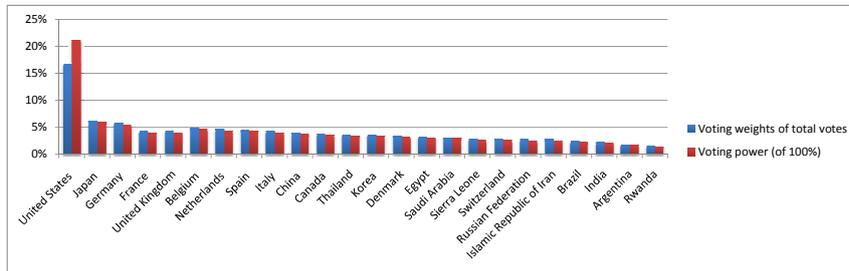


Table 6: Voting weights in the Executive Board after the reforms, per constituency



Preliminary Conclusions

In the Executive Board, the US gained through the reforms, both in terms of weights and in power. The results also show that the five biggest constituencies gave away 0,84% of their votes but only 0,75% of their power.

For the African constituencies representing 43 countries it can be observed that their votes increased by 0,43% and their power by 0,41%, still, they remain to have less power than weight.

5 Conclusions

The thesis at hand applied the voting approach to the International Monetary Fund answering the research question ‘To what extent were the 2008 reforms able to reach their goal with regard to changes in the distribution of power?’. In order to do so, the question of power in global has been discussed first. The conclusion from the literature review was that power is an essentially contested concept and that several equally valid approaches exist. Debates about power include whether power is relational or not, relating to the distinction of ‘power to’ and ‘power over’. The three faces of power add up to a rather comprehensive view on power. However, not all dimensions can be operationalised when applied to the IMF, which is why the priori voting power approach has been chosen. The Absolute Banzhaf index, the Normalized Banzhaf index and the Shapley-Shubik index have been calculated in order to be able to compare the changes in the distribution of power in the IMF before and after the 2008 reforms.

5.1 Who Gained Most From the 2008 Reforms?

Overall, the results show only small changes. This observation confirms the finding of the *The Financial Times*, which issued in 2009 that, ‘even after the worst financial and economic shock since the Depression, and much grand talk of a new Bretton Woods, little reform has happened [...] The crisis has not produced a new world order. The ‘Bretton Woods test’, it seems, has been failed” (“Still lost in the old Bretton Woods,” 2009).

Although the US gave away 0,01% of their share in total votes, their power increased by 0,522%, which is the biggest in increase in power from all members. Other Top 5 winners in terms of power are, in this order, India, Brazil, Spain, and Singapore. The Top 5 losers in terms of power are France, United Kingdom, Saudi Arabia, Canada, and the Russian Federation.

The main results for power in the Board of Governors show that the US has gained in terms of power although they gave away a little share of their votes. Before as well as after the reforms it can be observed that for all other members except the US, their power is smaller than their weight in votes. So the first impression of an ‘invisible’, skewed distribution of power in favour of the US can be confirmed. For the comparison of the three groups of countries it can be observed that the Group of 7 has more power than weights before and also after the reforms. Additionally, although the Group of 7 gave away 1,30% of their votes, their decrease in power is only 0,90%. The BRIC countries and the LICs both gained some power in the Board of Governors through the 2008 reforms, whereas the BRICs gained slightly more power. The LICs gained only 0,47% power instead of the officially indicated 0,6% increase in weight. The BRICs gained 0,53% power instead of the indicated increase of 0,64% in weight. For the Board of Governors, it can be concluded that the 2008 reforms were indeed favourable for the LICs and especially for BRIC countries, the advanced economies gave away less power than indicated by their decrease in weight. In the Executive Board, the US gained through the reforms, both in terms of weights and in power. The results also show that the five biggest constituencies gave away a larger share of their votes than of their power. For the African constituencies representing 47 countries it can be observed that their votes increased by 0,43% and their power by 0,41%, still, they remain to have less power than weight and to have a tiny voice relative to the advanced economies.

All in all, the results show that the BRICs are the confirmed biggest winner of the 2008 reforms; however, one could call the advanced economies, and the US especially, the “secret winners” of this reform.

To conclude whether the 2008 reforms were able to “protect the voice of the poorest members” one does not find a straight forward answer. First, the reforms evoked only small and no fundamental changes in the distribution of power. Second, the increase of basic votes was most beneficial for the LICs in terms of power. However, the change in quota formula can be seen as most beneficial for the BRIC countries. The change in weights was most beneficial for the BRICs, too. Still, the LICs gained some weight and their power as a voting bloc increased. Their power however, increased to a smaller amount than one would think of by just looking at their changed votes. They remain thus underrepresented in the decision-making in the Board of Governors and in the Executive Board. Instead, the advanced economies and especially the United States can be called the secret winner of the 2008 reforms because they managed to give away less power than one would think of when just seeing their decrease in weight. The most striking finding of this analysis is that the G7 as a voting bloc has Banzhaf index of close to 1, this means a power of nearly 100%. These findings confirm the impression that the IMF is in the “invisible” hand of the major shareholders.

5.2 Policy Implications

The fundamental design of the decision-making in the International Monetary Fund reflects the differences in its members’ contributions to the Fund. The findings of this research on the 2008 reforms suggest however, that changes in voting power differ from the changes in weight. For a thorough redistribution of votes, voting power indices should be taken into account to ensure that the changes in votes have exactly the effects they intent to have.

5.3 Further Outlook

In November 2010, the IMF’s Executive Board approved another reform package with the completion of the 14th General Review of Quotas and an amendment of the IMF’s Articles of Agreement on the reform of the Executive Board. A doubling of IMF quotas shall result in a 6% shift to dynamic emerging market and developing countries. All BRIC countries will be top 10 shareholders, thus the top 10 countries will be the United States, Japan, France, Germany, Italy, United Kingdom, and the four BRICs. 80% of the shift in quotas will come from advanced economies and some oil producing countries. In total, 110 countries, of which 102 are emerging market and developing countries, will gain or maintain quota share. Voting shares for the poorest members shall be maintained. With regards to the Executive Board, the 2010 reforms suggest that advanced European economies will hold two fewer seats, giving them to emerging market economies. All Executive Directors shall be elected.

As of end March 2011, the Board of Governors still needs to ratify this part of the reforms by an 85% majority of votes. A comprehensive review of the quota formula will be completed by January 2013 and the 15th General Review of Quotas will be brought forward to January 2014 (IMF, Press Release No. 11/64). It remains to seen whether these reforms will have a real impact on the balance of power in the IMF.

6 Discussion of the Findings and Suggestions for Further Research

Most importantly, the findings of this research should be compared to actual empirical data that might be available in the future. It has to be stated again that these conclusions are not founded on empirical evidence and only analyze the formal voting rules while neglecting other influencing factors for voting behavior. In the future, the changes in power could be tested against new policy outcomes, to check whether reality confirms the results. One policy area for which should reveal relevant outcomes is macroeconomic policies in which the positions of the United States and China differ strongly. Another major issue, dominant in the literature on the IMF, is conditionality and its effectiveness; compare for example Goldstein (2003), Woods (2006), Molina and Pereira (2008), IEO (2007) or Edwards (2009). The 2008 reforms also changed conditionality policy and new outcomes in this field should surely be further investigated. This study only investigated one of the two reform goals. The second one, realigning quota shares with members' relative weight and role in global economy, should be assessed as well. In this study, the amount of quotas has been accepted as "fair", but this could be investigated in further research. This analysis could serve as a basis for further research on legitimacy of the IMF governance. Additionally, the effects of the 2010 reforms should be analysed in further research.

In terms of voting power, the possibility of voting blocs has to be investigated in more detail. In this study, three voting blocs have been assumed for analytical matters. In reality, voting blocs are much more complicated than it seems as countries forming a voting bloc will need to make binding agreements to vote en bloc. The possibility for all members of the three groups of countries analysed to actually do so must be left for further research. A possible single European Union seat with a combined voting weight (Leech, 1998, p. 56, Figure 14) should be analysed in the context of the 2008 reforms.

In general, the research design of a case study does not allow for broader generalizations of the findings, for example to other international organisations like the United Nations or the World Trade Organisation, which use one-country-one-vote systems. In order to gain a broader idea of distribution of power amongst nations in international organisations, a suggestion for further research is to compare the findings for the IMF to the distribution of power within the World Bank, which is currently being subject to reforms, too. Furthermore, the question arises whether the agreed reforms are appropriate to answer all challenges of the Fund.

These and many more questions arise when studying the IMF. Not all of them could be tackled in this study. Still it serves as a good foundation for further research in this field confirming the impression that the 2008 reforms did not change the balance of power at the IMF.

Table 7: Weights and power before the reforms, per country, Board of Governors

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index	countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
United States *	16,723	74,87	23,80%	19,49%	Libya	0,517	1,50	0,48%	0,49%
Japan *	6,000	16,92	5,38%	6,00%	Greece *	0,381	1,10	0,35%	0,36%
Germany *	5,863	16,57	5,27%	5,86%	Israel *	0,429	1,24	0,39%	0,41%
France	4,842	13,85	4,40%	4,79%	Hungary	0,478	1,38	0,44%	0,45%
United Kingdom	4,842	13,85	4,40%	4,79%	Pakistan	0,476	1,38	0,44%	0,45%
China * (vi)	3,651	10,52	3,35%	3,57%	Romania	0,475	1,37	0,44%	0,45%
Italy *	3,185	9,19	2,92%	3,10%	Portugal *	0,401	1,16	0,37%	0,38%
Saudi Arabia	3,154	9,10	2,89%	3,07%	Philippines *	0,407	1,18	0,37%	0,39%
Canada	2,876	8,30	2,64%	2,79%	Czech Republic *	0,38	1,10	0,35%	0,36%
Russian Federation	2,686	7,76	2,47%	2,60%	Egypt	0,436	1,26	0,40%	0,41%
India *	1,882	5,44	1,73%	1,81%	New Zealand	0,414	1,20	0,38%	0,39%
Netherlands	2,334	6,75	2,14%	2,25%	Chile	0,396	1,15	0,36%	0,38%
Belgium	2,083	6,02	1,91%	2,01%	Colombia	0,359	1,04	0,33%	0,34%
Brazil *	1,377	3,98	1,27%	1,32%	United Arab Emirates *	0,286	0,83	0,26%	0,27%
Spain *	1,383	4,00	1,27%	1,32%	Bulgaria	0,299	0,87	0,28%	0,28%
Mexico *	1,430	4,14	1,32%	1,37%	Peru	0,298	0,86	0,27%	0,28%
Switzerland	1,567	4,53	1,44%	1,50%	Morocco	0,276	0,80	0,25%	0,26%
Korea, Republic of *	1,328	3,84	1,22%	1,27%	Bangladesh	0,251	0,73	0,23%	0,24%
Australia	1,467	4,24	1,35%	1,40%	Congo, Democratic Republic of the	0,251	0,73	0,23%	0,24%
Venezuela, R,B, de	1,207	3,49	1,11%	1,15%	Zambia	0,231	0,67	0,21%	0,22%
Sweden	1,089	3,15	1,00%	1,04%	Serbia	0,222	0,64	0,20%	0,21%
Argentina	0,964	2,79	0,89%	0,92%	Vietnam *	0,159	0,46	0,15%	0,15%
Austria *	0,854	2,47	0,79%	0,81%	Kazakhstan *	0,176	0,51	0,16%	0,17%
Indonesia	0,947	2,74	0,87%	0,90%	Slovak Republic *	0,172	0,50	0,16%	0,16%
Denmark *	0,75	2,17	0,69%	0,71%	Luxembourg *	0,137	0,40	0,13%	0,13%
Norway *	0,763	2,21	0,70%	0,73%	Sri Lanka	0,197	0,57	0,18%	0,19%
South Africa	0,852	2,47	0,78%	0,81%	Belarus	0,185	0,54	0,17%	0,18%
Malaysia *	0,68	1,97	0,63%	0,65%	Ghana	0,177	0,51	0,16%	0,17%
Nigeria	0,8	2,32	0,74%	0,76%	Croatia	0,175	0,51	0,16%	0,17%
Poland *	0,627	1,81	0,58%	0,60%	Zimbabwe	0,17	0,49	0,16%	0,16%
Iran, Islamic Republic of	0,685	1,98	0,63%	0,65%	Ecuador *	0,147	0,43	0,14%	0,14%
Turkey *	0,547	1,58	0,50%	0,52%	Syrian Arab Republic *	0,143	0,41	0,13%	0,14%
Thailand *	0,498	1,44	0,46%	0,47%	Trinidad and Tobago	0,162	0,47	0,15%	0,15%
Singapore *	0,399	1,15	0,37%	0,38%	Côte d'Ivoire	0,158	0,46	0,15%	0,15%
Kuwait	0,633	1,83	0,58%	0,60%	Sudan	0,153	0,44	0,14%	0,14%
Ukraine	0,628	1,82	0,58%	0,60%	Uruguay	0,149	0,43	0,14%	0,14%
Finland	0,58	1,68	0,53%	0,55%	Qatar *	0,13	0,38	0,12%	0,12%
Ireland *	0,388	1,12	0,36%	0,37%	Tunisia	0,14	0,41	0,13%	0,13%
Algeria	0,576	1,67	0,53%	0,55%	Angola	0,14	0,41	0,13%	0,13%
Iraq	0,546	1,58	0,50%	0,52%					

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
Uzbekistan	0,135	0,39	0,12%	0,13%
Slovenia *	0,115	0,33	0,11%	0,11%
Jamaica	0,134	0,39	0,12%	0,13%
Kenya	0,133	0,39	0,12%	0,13%
Lebanon *	0,103	0,30	0,09%	0,10%
Myanmar	0,127	0,37	0,12%	0,12%
Yemen, Republic of	0,121	0,35	0,11%	0,11%
Oman *	0,099	0,29	0,09%	0,09%
Dominican Republic	0,11	0,32	0,10%	0,10%
Brunei Darussalam	0,108	0,31	0,10%	0,10%
Guatemala	0,106	0,31	0,10%	0,10%
Panama	0,104	0,30	0,10%	0,10%
Tanzania	0,101	0,29	0,09%	0,10%
Costa Rica *	0,085	0,25	0,08%	0,08%
Cameroon	0,095	0,28	0,09%	0,09%
Lithuania *	0,076	0,22	0,07%	0,07%
Uganda	0,092	0,27	0,08%	0,09%
Bahrain *	0,072	0,21	0,07%	0,07%
Bolivia	0,088	0,25	0,08%	0,08%
El Salvador	0,088	0,25	0,08%	0,08%
Jordan	0,088	0,25	0,08%	0,08%
Bosnia and Herzegovina	0,087	0,25	0,08%	0,08%
Afghanistan, Islamic Republic of	0,084	0,24	0,08%	0,08%
Senegal	0,084	0,24	0,08%	0,08%
Azerbaijan	0,084	0,24	0,08%	0,08%
Cyprus *	0,074	0,21	0,07%	0,07%
Gabon	0,081	0,23	0,07%	0,08%
Georgia	0,079	0,23	0,07%	0,07%
Latvia *	0,068	0,20	0,06%	0,06%
Namibia	0,073	0,21	0,07%	0,07%
Ethiopia	0,071	0,21	0,07%	0,07%
Papua New Guinea	0,07	0,20	0,06%	0,07%
Bahamas, The	0,07	0,20	0,06%	0,07%
Nicaragua	0,07	0,20	0,06%	0,07%
Honduras	0,07	0,20	0,06%	0,07%
Liberia	0,069	0,20	0,06%	0,07%
Moldova	0,067	0,19	0,06%	0,06%
Madagascar	0,066	0,19	0,06%	0,06%
Iceland	0,064	0,19	0,06%	0,06%

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
Mozambique	0,062	0,18	0,06%	0,06%
Guinea	0,059	0,17	0,05%	0,06%
Sierra Leone	0,058	0,17	0,05%	0,05%
Malta	0,057	0,17	0,05%	0,05%
Mauritius	0,057	0,17	0,05%	0,05%
Paraguay	0,056	0,16	0,05%	0,05%
Turkmenistan *	0,045	0,13	0,04%	0,04%
Estonia *	0,041	0,12	0,04%	0,04%
Mali	0,053	0,15	0,05%	0,05%
Suriname	0,053	0,15	0,05%	0,05%
Armenia	0,053	0,15	0,05%	0,05%
Guyana	0,052	0,15	0,05%	0,05%
Kyrgyz Republic	0,051	0,15	0,05%	0,05%
Botswana *	0,04	0,12	0,04%	0,04%
Cambodia	0,051	0,15	0,05%	0,05%
Tajikistan	0,05	0,14	0,05%	0,05%
Congo, Republic of	0,049	0,14	0,05%	0,05%
Haiti	0,048	0,14	0,04%	0,05%
Somalia	0,048	0,14	0,04%	0,05%
Rwanda	0,047	0,14	0,04%	0,04%
Burundi	0,046	0,13	0,04%	0,04%
Togo	0,044	0,13	0,04%	0,04%
Nepal	0,043	0,12	0,04%	0,04%
Fiji	0,043	0,12	0,04%	0,04%
Malawi	0,042	0,12	0,04%	0,04%
Macedonia, Former Yugoslav Republic of	0,042	0,12	0,04%	0,04%
Barbados	0,042	0,12	0,04%	0,04%
Chad *	0,036	0,10	0,03%	0,03%
Niger	0,041	0,12	0,04%	0,04%
Mauritania	0,04	0,12	0,04%	0,04%
Benin	0,039	0,11	0,04%	0,04%
Burkina Faso	0,038	0,11	0,04%	0,04%
Albania *	0,033	0,10	0,03%	0,03%
Kosovo	0,038	0,11	0,04%	0,04%
Central African Republic	0,036	0,10	0,03%	0,03%
Lao People's Dem, Republic	0,035	0,10	0,03%	0,03%
Equatorial Guinea *	0,026	0,08	0,02%	0,02%
Mongolia	0,034	0,10	0,03%	0,03%

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
Swaziland	0,034	0,10	0,03%	0,03%
Lesotho	0,027	0,08	0,02%	0,03%
Gambia, The	0,025	0,07	0,02%	0,02%
Montenegro	0,024	0,07	0,02%	0,02%
San Marino *	0,019	0,06	0,02%	0,02%
Belize	0,02	0,06	0,02%	0,02%
Eritrea *	0,018	0,05	0,02%	0,02%
Vanuatu	0,019	0,06	0,02%	0,02%
Djibouti	0,018	0,05	0,02%	0,02%
St, Lucia	0,018	0,05	0,02%	0,02%
Guinea-Bissau	0,018	0,05	0,02%	0,02%
Antigua and Barbuda	0,017	0,05	0,02%	0,02%
Grenada	0,017	0,05	0,02%	0,02%
Samoa	0,016	0,05	0,01%	0,02%
Cape Verde *	0,016	0,05	0,01%	0,02%
Seychelles *	0,015	0,04	0,01%	0,01%
Timor-Leste *	0,015	0,04	0,01%	0,01%
Solomon Islands	0,016	0,05	0,01%	0,02%
Maldives *	0,015	0,04	0,01%	0,01%
Comoros	0,0153	0,04	0,01%	0,01%
St, Kitts and Nevis	0,0153	0,04	0,01%	0,01%
Bhutan *	0,0141	0,04	0,01%	0,01%
St, Vincent and the Grenadines	0,015	0,04	0,01%	0,01%
Dominica	0,0149	0,04	0,01%	0,01%
São Tomé and Príncipe	0,0146	0,04	0,01%	0,01%
Tonga	0,0144	0,04	0,01%	0,01%
Kiribati	0,0138	0,04	0,01%	0,01%
Micronesia, Federated States of	0,0135	0,04	0,01%	0,01%
Marshall Islands	0,0128	0,04	0,01%	0,01%
Palau *	0,0126	0,04	0,01%	0,01%
Tuvalu	0,0121	0,04	0,01%	0,01%
	99,993	314,53	100,00	100,03

Table 8: Weights and power after the reforms, per country, Board of Governors

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index	countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
United States *	16,73	0,76	24,32%	19,52%	Libya	0,48	0,01	0,43%	0,45%
Japan *	6,23	0,17	5,47%	6,25%	Greece *	0,47	0,01	0,43%	0,44%
Germany *	5,80	0,16	5,16%	5,80%	Israel *	0,45	0,01	0,41%	0,43%
France	4,29	0,12	3,88%	4,22%	Hungary	0,44	0,01	0,40%	0,42%
United Kingdom	4,29	0,12	3,88%	4,22%	Pakistan	0,44	0,01	0,40%	0,42%
China * (vi)	3,81	0,11	3,46%	3,73%	Romania	0,44	0,01	0,40%	0,42%
Italy *	3,15	0,09	2,87%	3,07%	Portugal *	0,44	0,01	0,40%	0,42%
Saudi Arabia	2,80	0,08	2,55%	2,72%	Philippines *	0,43	0,01	0,40%	0,41%
Canada	2,55	0,07	2,33%	2,47%	Czech Republic *	0,43	0,01	0,39%	0,41%
Russian Federation	2,39	0,07	2,18%	2,31%	Egypt	0,40	0,01	0,37%	0,38%
India *	2,34	0,07	2,13%	2,26%	New Zealand	0,38	0,01	0,35%	0,36%
Netherlands	2,08	0,06	1,90%	2,00%	Chile	0,37	0,01	0,34%	0,35%
Belgium	1,86	0,05	1,70%	1,78%	Colombia	0,34	0,01	0,31%	0,32%
Brazil *	1,71	0,05	1,57%	1,65%	United Arab Emirates *	0,33	0,01	0,30%	0,31%
Spain *	1,62	0,05	1,48%	1,56%	Bulgaria	0,28	0,01	0,26%	0,27%
Mexico *	1,47	0,04	1,34%	1,41%	Peru	0,28	0,01	0,26%	0,27%
Switzerland	1,40	0,04	1,28%	1,34%	Morocco	0,26	0,01	0,24%	0,25%
Korea, Republic of *	1,36	0,04	1,25%	1,31%	Bangladesh	0,24	0,01	0,22%	0,23%
Australia	1,31	0,04	1,20%	1,26%	Congo, Democratic Republic of the	0,24	0,01	0,22%	0,23%
Venezuela, R.B. de	1,08	0,03	0,99%	1,04%	Zambia	0,22	0,01	0,20%	0,21%
Sweden	0,98	0,03	0,90%	0,93%	Serbia	0,22	0,01	0,20%	0,20%
Argentina	0,87	0,02	0,80%	0,83%	Vietnam *	0,21	0,01	0,19%	0,20%
Austria *	0,87	0,02	0,79%	0,83%	Kazakhstan *	0,20	0,01	0,18%	0,19%
Indonesia	0,85	0,02	0,78%	0,81%	Slovak Republic *	0,20	0,01	0,18%	0,19%
Denmark *	0,78	0,02	0,71%	0,74%	Luxembourg *	0,20	0,01	0,18%	0,18%
Norway *	0,78	0,02	0,71%	0,74%	Sri Lanka	0,19	0,01	0,18%	0,18%
South Africa	0,77	0,02	0,70%	0,73%	Belarus	0,18	0,01	0,17%	0,17%
Malaysia *	0,73	0,02	0,67%	0,70%	Ghana	0,18	0,01	0,16%	0,17%
Nigeria	0,72	0,02	0,66%	0,69%	Croatia	0,17	0,00	0,16%	0,16%
Poland *	0,70	0,02	0,64%	0,67%	Zimbabwe	0,17	0,00	0,16%	0,16%
Iran, Islamic Republic of	0,62	0,02	0,57%	0,59%	Ecuador *	0,17	0,00	0,15%	0,16%
Turkey *	0,61	0,02	0,56%	0,58%	Syrian Arab Republic *	0,17	0,00	0,15%	0,16%
Thailand *	0,60	0,02	0,55%	0,57%	Trinidad and Tobago	0,16	0,00	0,15%	0,15%
Singapore *	0,59	0,02	0,54%	0,56%	Côte d'Ivoire	0,16	0,00	0,14%	0,15%
Kuwait	0,58	0,02	0,53%	0,55%	Sudan	0,15	0,00	0,14%	0,15%
Ukraine	0,57	0,02	0,52%	0,54%	Uruguay	0,15	0,00	0,14%	0,14%
Finland	0,53	0,02	0,49%	0,50%	Qatar *	0,15	0,00	0,14%	0,14%
Ireland *	0,53	0,02	0,48%	0,50%	Tunisia	0,14	0,00	0,13%	0,14%
Algeria	0,53	0,02	0,48%	0,50%	Angola	0,14	0,00	0,13%	0,14%
Iraq	0,50	0,01	0,46%	0,48%					

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
Uzbekistan	0,14	0,00	0,13%	0,13%
Slovenia *	0,14	0,00	0,13%	0,13%
Jamaica	0,14	0,00	0,13%	0,13%
Kenya	0,14	0,00	0,13%	0,13%
Lebanon *	0,14	0,00	0,12%	0,13%
Myanmar	0,13	0,00	0,12%	0,13%
Yemen, Republic of	0,13	0,00	0,12%	0,12%
Oman *	0,12	0,00	0,11%	0,12%
Dominican Republic	0,12	0,00	0,11%	0,11%
Brunei Darussalam	0,12	0,00	0,11%	0,11%
Guatemala	0,11	0,00	0,10%	0,11%
Panama	0,11	0,00	0,10%	0,11%
Tanzania	0,11	0,00	0,10%	0,10%
Costa Rica *	0,10	0,00	0,10%	0,10%
Cameroon	0,10	0,00	0,09%	0,10%
Lithuania *	0,10	0,00	0,09%	0,10%
Uganda	0,10	0,00	0,09%	0,10%
Bahrain *	0,10	0,00	0,09%	0,09%
Bolivia	0,10	0,00	0,09%	0,09%
El Salvador	0,10	0,00	0,09%	0,09%
Jordan	0,10	0,00	0,09%	0,09%
Bosnia and Herzegovina	0,10	0,00	0,09%	0,09%
Afghanistan, Islamic Republic of	0,09	0,00	0,09%	0,09%
Senegal	0,09	0,00	0,09%	0,09%
Azerbaijan	0,09	0,00	0,09%	0,09%
Cyprus *	0,09	0,00	0,08%	0,09%
Gabon	0,09	0,00	0,08%	0,09%
Georgia	0,09	0,00	0,08%	0,08%
Latvia *	0,09	0,00	0,08%	0,08%
Namibia	0,08	0,00	0,08%	0,08%
Ethiopia	0,08	0,00	0,08%	0,08%
Papua New Guinea	0,08	0,00	0,08%	0,08%
Bahamas, The	0,08	0,00	0,07%	0,08%
Nicaragua	0,08	0,00	0,07%	0,08%
Honduras	0,08	0,00	0,07%	0,08%
Liberia	0,08	0,00	0,07%	0,08%
Moldova	0,08	0,00	0,07%	0,07%
Madagascar	0,08	0,00	0,07%	0,07%
Iceland	0,08	0,00	0,07%	0,07%

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
Mozambique	0,07	0,00	0,07%	0,07%
Guinea	0,07	0,00	0,07%	0,07%
Sierra Leone	0,07	0,00	0,07%	0,07%
Malta	0,07	0,00	0,06%	0,07%
Mauritius	0,07	0,00	0,06%	0,07%
Paraguay	0,07	0,00	0,06%	0,07%
Turkmenistan *	0,07	0,00	0,06%	0,06%
Estonia *	0,07	0,00	0,06%	0,06%
Mali	0,07	0,00	0,06%	0,06%
Suriname	0,07	0,00	0,06%	0,06%
Armenia	0,07	0,00	0,06%	0,06%
Guyana	0,07	0,00	0,06%	0,06%
Kyrgyz Republic	0,07	0,00	0,06%	0,06%
Botswana *	0,06	0,00	0,06%	0,06%
Cambodia	0,06	0,00	0,06%	0,06%
Tajikistan	0,06	0,00	0,06%	0,06%
Congo, Republic of	0,06	0,00	0,06%	0,06%
Haiti	0,06	0,00	0,06%	0,06%
Somalia	0,06	0,00	0,06%	0,06%
Rwanda	0,06	0,00	0,06%	0,06%
Burundi	0,06	0,00	0,05%	0,06%
Togo	0,06	0,00	0,05%	0,06%
Nepal	0,06	0,00	0,05%	0,05%
Fiji	0,06	0,00	0,05%	0,05%
Malawi	0,06	0,00	0,05%	0,05%
Macedonia, Former Yugoslav Republic of	0,06	0,00	0,05%	0,05%
Barbados	0,06	0,00	0,05%	0,05%
Chad *	0,06	0,00	0,05%	0,05%
Niger	0,06	0,00	0,05%	0,05%
Mauritania	0,06	0,00	0,05%	0,05%
Benin	0,05	0,00	0,05%	0,05%
Burkina Faso	0,05	0,00	0,05%	0,05%
Albania *	0,05	0,00	0,05%	0,05%
Kosovo	0,05	0,00	0,05%	0,05%
Central African Republic	0,05	0,00	0,05%	0,05%
Lao People's Dem. Republic	0,05	0,00	0,05%	0,05%
Equatorial Guinea *	0,05	0,00	0,05%	0,05%
Mongolia	0,05	0,00	0,05%	0,05%

countries sorted by quota as of 3 March	Weight (share of total votes)	Absolute Banzhaf Index	Normalised Banzhaf Index (% of 1)	Shapley-Shubik Index
Swaziland	0,05	0,00	0,05%	0,05%
Lesotho	0,04	0,00	0,04%	0,04%
Gambia, The	0,04	0,00	0,04%	0,04%
Montenegro	0,04	0,00	0,04%	0,04%
San Marino *	0,04	0,00	0,03%	0,04%
Belize	0,04	0,00	0,03%	0,04%
Eritrea *	0,04	0,00	0,03%	0,04%
Vanuatu	0,04	0,00	0,03%	0,03%
Djibouti	0,04	0,00	0,03%	0,03%
St. Lucia	0,04	0,00	0,03%	0,03%
Guinea-Bissau	0,04	0,00	0,03%	0,03%
Antigua and Barbuda	0,04	0,00	0,03%	0,03%
Grenada	0,03	0,00	0,03%	0,03%
Samoa	0,03	0,00	0,03%	0,03%
Cape Verde *	0,03	0,00	0,03%	0,03%
Seychelles *	0,03	0,00	0,03%	0,03%
Timor-Leste *	0,03	0,00	0,03%	0,03%
Solomon Islands	0,03	0,00	0,03%	0,03%
Maldives *	0,03	0,00	0,03%	0,03%
Comoros	0,03	0,00	0,03%	0,03%
St. Kitts and Nevis	0,03	0,00	0,03%	0,03%
Bhutan *	0,03	0,00	0,03%	0,03%
St. Vincent and the Grenadines	0,03	0,00	0,03%	0,03%
Dominica	0,03	0,00	0,03%	0,03%
São Tomé and Príncipe	0,03	0,00	0,03%	0,03%
Tonga	0,03	0,00	0,03%	0,03%
Kiribati	0,03	0,00	0,03%	0,03%
Micronesia, Federated States of	0,03	0,00	0,03%	0,03%
Marshall Islands	0,03	0,00	0,03%	0,03%
Palau *	0,03	0,00	0,03%	0,03%
Tuvalu	0,03	0,00	0,03%	0,03%
Total 187	100,00	3,14	100,00	100,03

Table 9: Weights Executive Board before the reforms: See IMF Annual Report 2008, p. 75

2 March 2011							
constituency	size constitu ency	% of total votes	Absolute Banzhaf	Normalised Shapley- Banzhaf (% Shubik of 1)	difference Banzhaf - weights	difference S-S - weights	
United States	1	16,74%	63,81	21,01%	19,27%	4,27	2,53
Japan	1	6,01%	17,40	5,73%	5,97%	-0,28	-0,04
Germany	1	5,87%	17,00	5,60%	5,82%	-0,27	-0,05
France	1	4,85%	14,03	4,62%	4,76%	-0,23	-0,09
United Kingdom	1	4,85%	14,03	4,62%	4,76%	-0,23	-0,09
Belgium	10	5,13%	14,86	4,89%	5,05%	-0,24	-0,08
Netherlands	13	4,77%	13,81	4,55%	4,68%	-0,22	-0,09
Spain	8	4,44%	12,85	4,23%	4,34%	-0,21	-0,10
Italy	7	4,10%	11,86	3,90%	4,00%	-0,20	-0,10
China	1	3,65%	10,55	3,47%	3,54%	-0,18	-0,11
Canada	12	3,63%	10,49	3,45%	3,52%	-0,18	-0,11
Thailand	13	3,52%	10,17	3,35%	3,41%	-0,17	-0,11
Korea	13	3,44%	9,94	3,27%	3,33%	-0,17	-0,11
Denmark	8	3,43%	9,91	3,26%	3,32%	-0,17	-0,11
Egypt	13	3,19%	9,21	3,03%	3,08%	-0,16	-0,11
Saudi Arabia	1	3,16%	9,13	3,00%	3,05%	-0,16	-0,11
Sierra Leone	20	3,01%	8,69	2,86%	2,90%	-0,15	-0,11
Switzerland	8	2,78%	8,03	2,64%	2,68%	-0,14	-0,10
Russian Federation	1	2,69%	7,77	2,56%	2,59%	-0,13	-0,10
Islamic Republic of Iran	7	2,42%	6,98	2,30%	2,32%	-0,12	-0,10
Brazil	9	2,42%	6,98	2,30%	2,32%	-0,12	-0,10
India	4	2,35%	6,78	2,23%	2,25%	-0,12	-0,10
Argentina	6	1,95%	5,63	1,85%	1,86%	-0,10	-0,09
Rwanda	23	1,34%	3,86	1,27%	1,27%	-0,07	-0,07
	182	99,74%		100,00%	100,11%	0,26	0,37
Mean		4,16%	12,66	4,17%	4,17%	0,02	0,03
Standard deviation		2,94%	11,44	3,77%	3,44%	0,89	0,53

Table 10: Weights Executive Board after the reforms (see www.imf.org)

3 March 2011 constituency	size constituency	% of total votes	Absolute Banzhaf	Normalised Shapley-Banzhaf (% of 1)	Shubik	difference Banzhaf - weights	difference S-S - weights
United States	1	16,80%	64,19	21,15%	19,35%	4,35	2,55
Japan	1	6,25%	18,04	5,95%	6,22%	-0,30	-0,03
Germany	1	5,83%	16,83	5,55%	5,78%	-0,28	-0,05
France	1	4,30%	12,40	4,09%	4,20%	-0,21	-0,10
United Kingdom	1	4,30%	12,40	4,09%	4,20%	-0,21	-0,10
Belgium	10	4,88%	14,09	4,64%	4,79%	-0,24	-0,09
Mexico	13	4,66%	13,45	4,43%	4,56%	-0,23	-0,10
Netherlands	8	4,53%	13,07	4,31%	4,43%	-0,22	-0,10
Italy	7	4,26%	12,29	4,05%	4,16%	-0,21	-0,10
Singapore	1	3,89%	11,22	3,70%	3,78%	-0,19	-0,11
China	12	3,82%	11,01	3,63%	3,71%	-0,19	-0,11
Australia	13	3,64%	10,49	3,46%	3,53%	-0,18	-0,11
Canada	13	3,61%	10,41	3,43%	3,50%	-0,18	-0,11
Denmark	8	3,40%	9,80	3,23%	3,29%	-0,17	-0,11
Lesotho	13	3,23%	9,31	3,07%	3,12%	-0,16	-0,11
Egypt	1	3,13%	9,02	2,97%	3,02%	-0,16	-0,11
India	20	2,81%	8,09	2,67%	2,70%	-0,14	-0,11
Saudi Arabia	8	2,81%	8,09	2,67%	2,70%	-0,14	-0,11
Brazil	1	2,79%	8,04	2,65%	2,68%	-0,14	-0,11
Switzerland	7	2,78%	8,01	2,64%	2,67%	-0,14	-0,11
Russian Federation	9	2,40%	6,91	2,28%	2,30%	-0,12	-0,10
Iran	4	2,27%	6,53	2,15%	2,17%	-0,12	-0,10
Argentina	6	1,84%	5,30	1,74%	1,75%	-0,10	-0,09
Togo	23	1,55%	4,46	1,47%	1,47%	-0,08	-0,08
Total	182	99,78%		100,00%	100,11%	0,22	0,33
Mean		4,16%	12,64	4,17%	4,17%	0,01	0,01
Standard deviation		2,93%	11,48	3,78%	3,44%	0,93	0,54

8 References

- Bachrach, P., & Baratz, M. S. (1962). Two faces of power. *The American Political Science Review*, 56(4), 947-952.
- Banzhaf III, J. F. (1965). Multi-Member Electoral Districts--Do They Violate the One Man, One Vote Principle. *Yale LJ*, 75, 1309.
- Banzhaf III, J. F. (1966). Mathematics, Voting, and the Law: The Quest for Equal Representation. *Jurimetrics J.*, 8, 69.
- Banzhaf III, J. F. (1967). One Man,? Votes: Mathematical Analysis of Voting Power and Effective Representation. *Geo. Wash. L. Rev.*, 36, 808.
- Banzhaf III, J. F. (1968). One man, 3-312 votes: a mathematical analysis of the Electoral College. *Vill. L. Rev.*, 13, 304.
- Bennet, S. (2005), *Case study methods*.
- Carlsnaes, W., & Simmons, B. A. (2002). *Handbook of international relations*: Sage Publications Ltd.
- Clegg, S. (2009). *The SAGE handbook of power*: Sage Publications Ltd.
- Dahl, R. A. (1957). The concept of power. *Behavioral science*, 2(3), 201-215.
- Dahl, R. A. (1961). *Who governs? Power and democracy in an American city*: New Haven: Yale University Press.
- Edwards, S. (2009). A New Debt Crisis? Assessing the impact of the financial crisis on developing countries. *Working Papers*.
- Felsenthal, D. S., & Machover, M. (2004). A priori voting power: what is it all about? *Political Studies Review*, 2(1), 1-23.
- Felsenthal, D. S., Machover, M., & Zwicker, W. (1998). The bicameral postulates and indices of a priori voting power. *Theory and Decision*, 44(1), 83-116.
- Gallie, W. B. (1955). *Essentially contested concepts*.
- Garrett, G., & Tsebelis, G. (1996). An institutional critique of intergovernmentalism. *International Organization*, 50(02), 269-299.
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*: Univ of California Press.
- Goldstein, M., Geithner, T. F., Keating, P., & Park, Y. C. (2003). *IMF structural programs*: University of Chicago Press.
- Hague, R., & Harrop, M. (2007). *Comparative government and politics: an introduction*: Palgrave Macmillan.
- Haugaard, M. (2002). *Power: A reader*: Manchester Univ Pr.
- Hay, C. (2002). *Political analysis: A critical introduction*: Palgrave.
- Hunter, F. (1953). *Community power structure: a study of decision makers*: University of North Carolina Press.
- IMF. (2008). *Reform of Quota and Voice in the International Monetary Fund—Report of the Executive Board to the Board of Governors*. Retrieved from Articles of Agreement (2011).
- Kegley Jr, C. W. (2007). *World politics: trend and transformation*: Thomson Learning.
- Keohane, R. O., & Nye, J. S. (2001). *Power and independence*: Longman.
- Leech, D. (1998). Power relations in the International Monetary Fund: a study of the political economy of a priori voting power using the Theory of Simple Games.
- Leech, D. (2002a). An empirical comparison of the performance of classical power indices. *Political Studies*, 50(1), 1-22.

- Leech, D. (2002b). Voting power in the governance of the International Monetary Fund. *Annals of Operations Research*, 109(1), 375-397.
- Leech, D., & Leech, R. (2005). Voting power implications of a unified European representation at the International Monetary Fund. *Warwick Economic Research Papers*.
- Lukes, S. (2005). *Power: A Radical View*, 2nd edn (Basingstoke and New York: Palgrave Macmillan).
- Mackenzie, I. M. (2005). *Political concepts: a reader and guide*: Edinburgh university press.
- Molina, N., & Pereira, J. (2008). Critical conditions.
- Myerson, R. B., Economics, N. U. C. f. M. S. i., & Science, M. (1991). *Effectiveness of electoral systems for reducing government corruption: A game-theoretic analysis*: Center for Mathematical Studies in Economics and Management Science, Northwestern University.
- Nye Jr, J. (2011). *The Future of Power*.
- Pajala, A. (2002). Voting Power and Power Index Website: a Voting Power WWW-Resource Including POWERSLAVE Voting Body Analyser. *online*], University of Turku, <http://powerslave.val.utu.fi>.
- Penrose, L. S. (1946). The elementary statistics of majority voting. *Journal of the Royal Statistical Society*, 109(1), 53-57.
- Pitkin, H. F. (1972). *The concept of representation*: Univ of California Pr.
- Schattschneider, E. E. (1960). *The semisovereign people: a realist's view of democracy in America*: Holt, Rinehart and Winston.
- Shapley, L. S., & Shubik, M. (1954). A method for evaluating the distribution of power in a committee system. *The American Political Science Review*, 48(3), 787-792.
- Still lost in the old Bretton Woods. (2009, December 27 2009). *The Financial Times Ltd*.
- Tsebelis, G. (1994). The power of the European Parliament as a conditional agenda setter. *The American Political Science Review*, 88(1), 128-142.
- Wartjen, A. (2009), *Mode(l)s of Decision-Making in the Council of the European Union*, UCD Dublin European Institute Working Paper 09-06, May 2009.
- Weber, M. (1978). *Economy and society: An outline of interpretive sociology*.
- Woods, N. (2006). *The globalizers: the IMF, the World Bank, and their borrowers*: Cornell Univ Pr.

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