

International Monetary Fund: An organization with global goals?

A theoretical thesis analyzing the link between the USA and
the IMF

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Abstract

Global financial crises and recessions are raising persistent skepticism about the activities of international financial institutions such as the IMF. Protests erupt against the IMF policies attached to loans it grants to borrowing countries. This thesis examines the impacts of IMF policies on developing countries and the connection between those policies and US interests. In doing this, the IMF's brief history and activity structure, especially lending, is discussed first. Then, cooperative game theory and Coleman-Banzhaf power indices are used to investigate the member countries' power relations. This thesis concludes that the IMF's policies mirror the economic interests of the USA.

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1 Introduction

Why are economists and researchers becoming increasingly critical of globalization and international institutions such as the IMF, World Bank, and WTO? Why do they oppose those organizations and claim that they operate for totally opposite targets than their objectives? Many believe that these international institutions are crippling poor countries and thus increasing global inequalities. For example, Stein (1992) suggested that “the World Bank/IMF model is likely to deindustrialize the existing manufacturing base without encouraging any significant replacement”. The IMF has no intention to support industrialization in developing countries such that they export primary goods which often have low values (Mueller, 2011).

Joseph Stiglitz, a Nobel Laureate economic scientist, is one of the fiercest critics of those institutions. Stiglitz (2014) referred to Russia’s 38% fall in GDP per capita between 1990 and 1999, and other declining factors including the fact that the country became merely a raw materials exporter were the deindustrialization effect of the Washington Consensus. Washington Consensus is an agreement on economic policies proposed by the IMF, World Bank, and the US Treasury for developing countries. In his view, there were more opportunities to improve than setbacks resulting from the inherited distortive economy under the Soviet Union. He also mentioned the contrast between the success of China and the failure of Russia.

“At least through the first decades of transition, the contrast in the policy bundles pursued by the two countries could not have been greater. Russia followed, though imperfectly, the Washington Consensus shock therapy policies; China followed an alternative course.” (Stiglitz, 2014)

On the other hand, many researchers, politicians, and economists praise the IMF and World Bank for their effort to maintain international financial stability and reduce world poverty. Yet, we have witnessed financial crises all over the world one after another. According to Stiglitz (2003), “there have been 100 crises in the past 35 years” and “the question is not whether there will be another crisis, but where it will be”.

Another argument made in favor of the IMF and World Bank is that global inequality has steadily declined. In Figure 1, between-country inequality had been increasing until

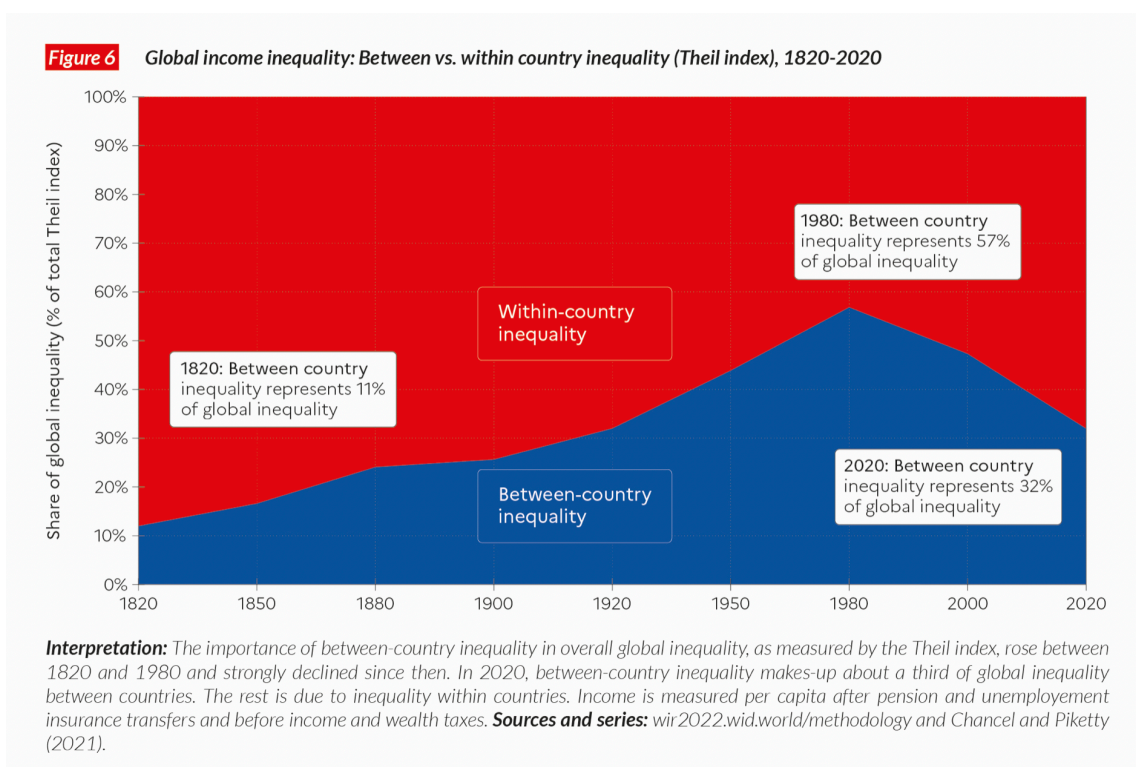


Figure 1: Global income inequality (World Inequality Report, 2022).

around 1980 and declining since then.

However, as shown by Kanbur et al. (2022), if we exclude China from the global Gini coefficient, then there has been no improvement in between-country inequality since 1980 (Figure 2).

The reason for excluding China is that the Chinese state policy played the main role in reducing poverty independent of the influence of international institutions. As stated before, China has taken a different course in developing the country (Stiglitz, 2014). In response to the World Bank's high estimate of the poverty rate in 1979, the Chinese government implemented a progressive plan to lift people from poverty (Li and Wu, 2022). According to the study by Deng et al. (2022), cooperation between government policies and the motivation of those who are subject to the policies was crucial for successful poverty reduction efforts.

As previously mentioned, the main aims of those international institutions are to ensure stable economies, sustainable developments, growth, and prosperity and to end extreme poverty. Do they succeed in fulfilling the aims since Bretton Woods?

In this thesis, I selected an important organization, namely, the International Monetary

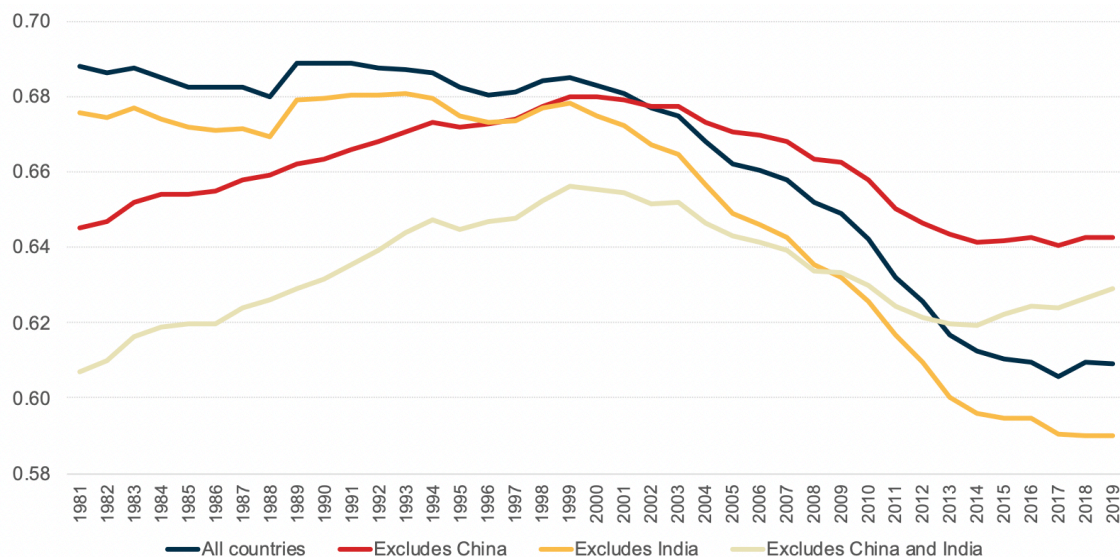


Figure 2: Global Gini coefficient (1981-2019) (Kanbur et al., 2022).

Fund (IMF), and did research on its history, policies, and structure to figure out if those critical claims could be consistent.

For the structure of this thesis, I discussed the IMF's history and the evolution of its role and ideology first. Then, I explained the IMF system with more emphasis on conditionalities. Afterward, I turned to the simple cooperative game theory to view the IMF voting system through the lens of this game theory. Finally, I changed the rules and analyzed the results.

2 Background

“The International Monetary Fund was set up in 1944 in a context of war, with the memories of hyperinflation, depression, and fluctuating exchange rates still fresh” (Lastra, 2000). The purposes of the IMF enshrined in its Article of Agreement (US Treasury, 1944) are originally stated as below:

1. To promote international monetary cooperation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems.
2. To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy.
3. To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.
4. To assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade.
5. To give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity.
6. In accordance with the above, to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.

To summarize these purposes, the IMF was supposed to guarantee an international monetary system, including international trade and payment system, a stable currency exchange system, and assistance for countries with balance of payments problems. “This broad enumeration has allowed the institution to survive over the years, adjusting and readjusting its role in response to diverse economic circumstances” (Lastra, 2000).

When establishing the IMF at the Bretton Woods Conference in 1944, two countries dominated the negotiations, more specifically two people: Harry Dexter White representing the USA and John Maynard Keynes representing the UK. But White's plan was eventually adopted at the conference. For example, Keynes suggested creating a currency called the "bancor" which was to be used in a multilateral clearing system for international trade. Nevertheless, the USD was adopted as a reserve currency, and the countries agreed to peg their currencies to the USD. Then, the dollar was backed by gold, creating the Bretton Woods monetary regime. "By 1947, the United States had accumulated 70% of the world's gold reserves" (The IMF, nd). In other words, the dollar became a key currency of the Bretton Woods system for maintaining foreign exchange reserves. An ounce of gold was set at a fixed rate of \$35 at the time. The IMF's role was to maintain a stable exchange rate system, and it did maintain it until the early 1970s.

However, countries started to emerge from the destructions of World War II and began to accumulate USD. On the other hand, the US started running balance of payments deficits due to the Vietnam War in the 1960s. The deficit means that the US overseas spending became more than its earning. Since USD was the reserve currency, the US can print money and buy real assets abroad. No other country could run a balance of payments deficit without facing economic problems. Naturally, there would be more paper dollars than gold unless the gold reserve increases on par with the printing of the USD. Worrying about the security of the USD, countries holding more of it as reserves started to convert it, and it became increasingly hard to maintain the dollar's convertibility into gold. In 1971, US President Richard Nixon set the dollar loose from the gold, ending the gold standard such that the USD became a fiat currency, diminishing the IMF's role in the international monetary system. Then, since the mid-1970s, the petrodollar system as well as the growing international trade has maintained the demand for the USD. The US continued to increase the printing of paper money (Figure 3).

At the same time, the necessary condition to enhance the opportunity to use the money for more investments and spending is that foreign markets must be open and deregulated. Otherwise, American multinational companies cannot buy tangible assets and make profitable short-term investments easily. As Kim and Milner (2019) found out, big multinational corporations are more likely to spend on lobbying than domestic companies

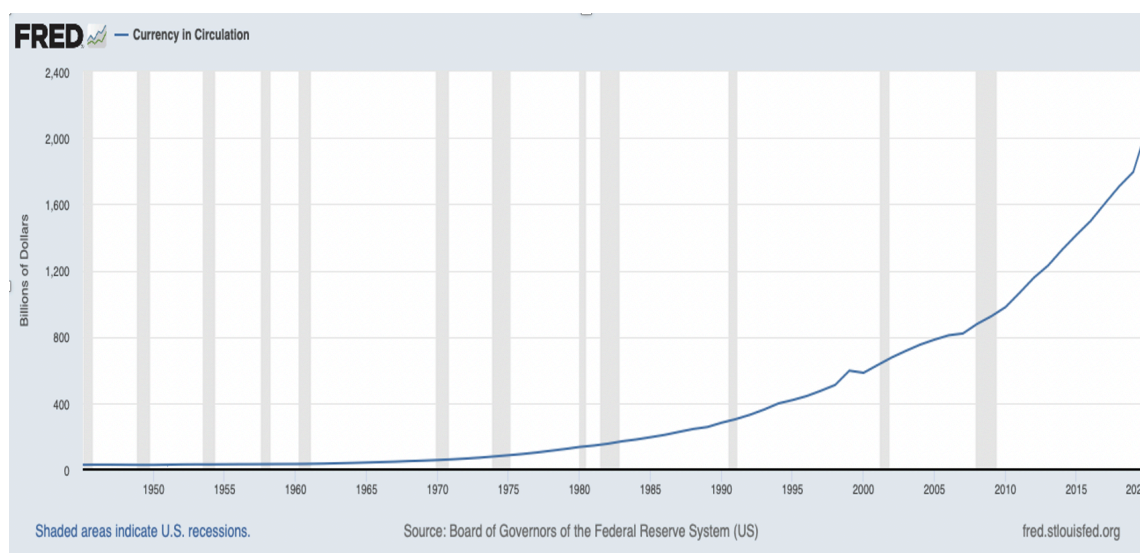


Figure 3: USD in circulation (1945-2020) (Board of Governors of the Federal Reserve System (US), nd).

because they are the ones who benefit from open and unregulated global market access.

“Major American financial institutions have direct access to US policymakers, who in turn exercise extraordinary influence over the International Monetary Fund (IMF).” “The Fund makes no secret of the fact that its objectives include liberalizing international capital markets, lowering barriers to entry for multinational financial firms, and dismantling capital controls, all measures that US financial institutions favor.” “US financial firms are among the strongest lobbies in Washington, so they are in a position to profit from US influence over the IMF.” (Dang and Stone, 2021).

Coincidentally, the oil crisis in the 1970s created a balance of payments deficit in many countries, and they sought help from the IMF. Readjusting its role, the IMF started to concentrate on the balance of payments assistance. The IMF ideology shifted to neoliberalism and started pushing for policies such as fiscal austerity, market liberalization, deregulation, and privatization to all the client countries despite being criticized for not considering country-specific circumstances.

At the same time, an important tool to validate the IMF’s policies has been in the intellectual field by promoting neoliberalism and supporting the research that justifies the ideology. “The IMF supports a particular research agenda that is dominated by neoliberalism.” (Mueller, 2011). Neoliberalism, inequality, powerless workers, and monopolies go

hand-in-hand. In this way, the IMF could continue to operate despite the controversies. On the other hand, one of the most extensive research about criticisms of IMF ideology was done by Julie L. Mueller. According to her study, scholars failed to question why the IMF promotes neoliberal policies that have little record of success. The promotion of democracy by Neoliberalism led to advanced economies with more freedom and few restraints from the IMF. Yet, it resulted in the IMF taking government control over the economies of developing countries. This facilitates the opening of new economies in favor of the advanced industrial states. The IMF programs serve the members who have the largest voting powers and have brought few of the benefits stated in the goal, to the developing countries. In fact, the Bretton Woods focused on the economic health of the industrialized nations, not the rest of the world (Mueller, 2011).

In general, the 1970s was the period that characterizes the shift both in the ideology and in the role of the IMF.

“Neoliberalism began to emerge as early as the mid-1970s, but gained political traction in the 1980s and became firmly entrenched after the fall of the Soviet Union in the 1990s.” “Intellectuals play a key role in supporting ruling-class ideology by publishing academic works that are later cited by political elites to justify their policy choices.” “The IMF legitimates these norms through research, surveillance, and advising states, and by being a key player in a transnational civil society.” (Mueller, 2011).

Yet, the contractionary policies the IMF forces on developing countries and the stimulus policies in the US during the recession contradicts each other. The US can easily borrow money for economic stimulus because of the dollar’s status as a global reserve, and the IMF should also be providing funds for expansionary policies (Stiglitz, 2003).

To investigate further if the IMF functions for its purposes for the common good of all members as enshrined in the Article of Agreement or if it functions for the special interests of the USA, I looked for the structure of the IMF.

3 The IMF

This section explains the general structure and activities of the IMF as well as its ideology. The majority of the information on the structure is taken from the Fund's own website, however, when I used another source, this is properly attributed.

3.1 The financial source of the IMF

190 countries out of 195 sovereign states in the world are a member of the IMF. Through its different programs, the Fund provides loans to countries that face a balance of payments deficit, and its resources come from 3 different sources: Quota, New Arrangements to Borrow (NAB), and Bilateral Borrowing Agreements (BBA).

3.1.1 Quota

When a country becomes a member, it is assigned a quota that reflects the country's economic position in the world economy. The quota is estimated, using the variables GDP, openness, economic variability, and reserves, and determined by the following formula:

$$(0.5 \cdot \text{GDP} + 0.3 \cdot \text{Openness} + 0.15 \cdot \text{economic variability} + 0.05 \cdot \text{reserves})^{\text{Compression factor}}$$

This formula is expressed in Special Drawing Rights (SDR), and the countries pay the quota amount to the IMF. SDR is the basket of five currencies: USD, Euro, Japanese Yen, Chinese RMB, and Pound Sterling. 25% of the quota is paid in SDR, and the remaining portion is paid in the country's own currency. The quota payments from the member countries go into General Resources Account (GRA) and are crucial in determining how much a country can receive as a loan and determining the voting power of the country. Moreover, it is important in determining the maximum amount a country can contribute to the Fund.

3.1.2 New Arrangements to Borrow (NAB)

When the General Resources Account falls short, the IMF uses New Arrangements to Borrow as its next resort. Through this arrangement, 38 countries (mainly developed) or central banks provide loans to the IMF. Two more countries (Greece and Ireland)

are about to be added as of May 2023. Figure 4 shows the countries and their size of borrowings through NAB.

3.1.3 Bilateral Borrowing Agreements (BBA)

When the GRA and NAB fall short, Bilateral Borrowing Agreements come as the last resort, and there are 42 creditors that lend to the Fund through this arrangement. Most creditors are both NAB and BBA creditors. Moreover, there is a maximum amount a country can lend to the IMF, and the amount a country can contribute is on par with its quota size. The countries and their size of borrowings through BBA are illustrated in Figure 5.

3.2 Lending by the IMF to the member countries

In the first decade after the IMF's establishment, there were no lending programs thanks to the Marshall Plan. Marshall Plan was proposed and implemented by the US government to help war-torn European countries. From the early 1950s, then-member countries, mostly Western advanced economies, started to take loans. Gradually, they became independent of the IMF loans. However, in the 1960s, former colonies, mostly African countries, started to get their independence and become members of the IMF. The same wave happened in the early 1990s when the former Soviet Union countries joined in bulk (Figure 6).

The clients changed accordingly, and the IMF became an institution that lends to developing countries using funds from the advanced economies (Reinhart and Trebesch, 2016). Therefore, the member countries are divided into creditors and debtors. Most creditors have not borrowed from the Fund since the 1970s even if they needed financing. Some countries such as Ireland, Iceland, and Greece received loans after 2000, nevertheless, none of them have a debt to the IMF as of now.

3.2.1 Conditionalities and politics behind them

The countries can borrow 145 percent of their quota. This limit is temporarily increased to 245% during the Covid-19 pandemic. This limit was temporarily increased to 245% during the Covid-19 pandemic. However, there is exceptional access in which the IMF

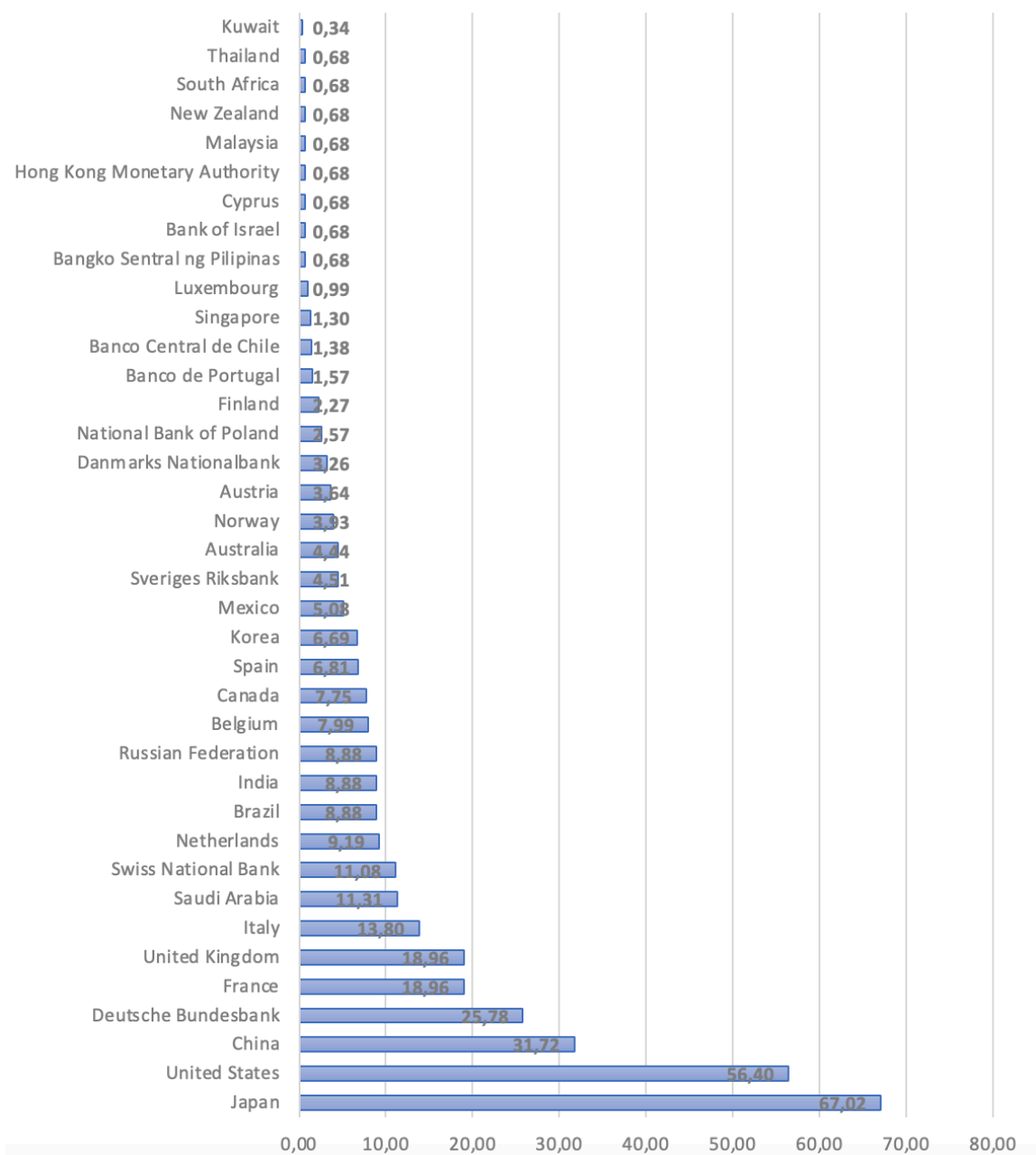


Figure 4: New Arrangements to Borrow: Amounts by Creditor (In SDR billion) (The IMF., 2021).

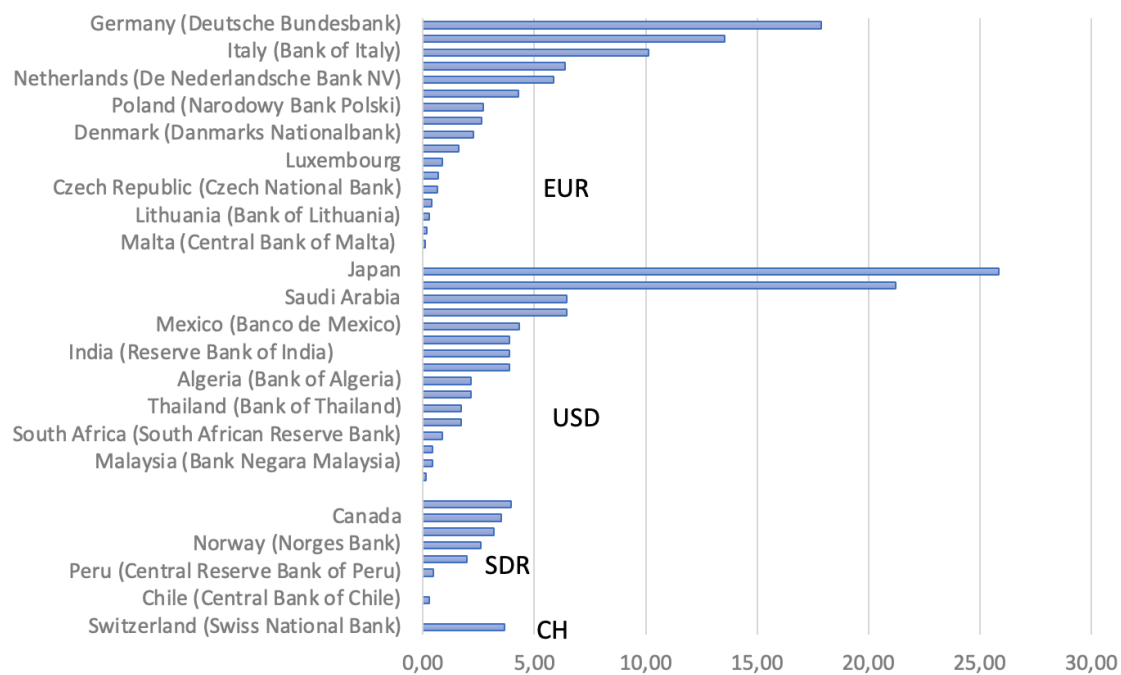


Figure 5: 2020 Bilateral Borrowing Agreements: Amounts by Creditor (in billions) (The IMF., 2021).

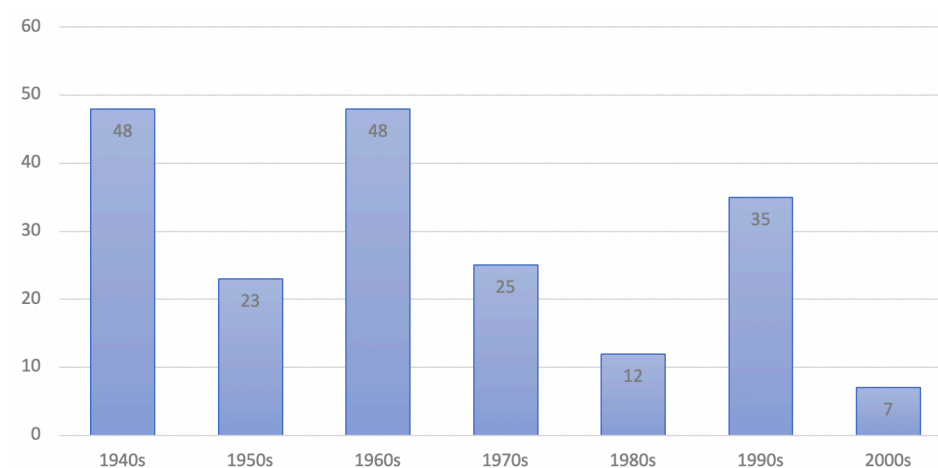


Figure 6: The number of new members of the IMF by decade (The IMF., nda).

evaluates case by case and can lend more. For example, Argentina received a bit over 1000% of its quota as a loan in 2022.

Those loans come with conditions that force liberalization of capital markets, opening to multinational financial firms, removal or reduction of trade restrictions, devaluation of the currency, privatization, and protection of private properties among other policy changes. “Conditionality became explicitly enshrined in the Articles only in 1969, twenty-four years after the Fund’s inauguration, although it had been applied for many years before” (Spraos, 1986). As many political and economic scientists echo each other, the number and nature of conditions grew and evolved over time. This development has been subject to controversies throughout the last decades.

The liberalization of capital markets of developing economies leads to hot money speculation. It does not attract stable long-term investment. With very low US interest rates, investors flood their money to countries with higher interest rates, and the IMF forces developing countries to raise interest rates to attract foreign investments and fight inflation. Yet, the hot money inflates asset prices in the country. The bubble blows when the investors flood their money out with the slightest sign of bad news, leaving the country in a devastating crisis. For example, the financial liberalization and deregulation in Nigeria increased the number of banks and non-bank financial institutions. As a result, physical and human capital fled to this sector. When the speculative bubble burst and the investments drained out, it left behind a disastrous effect on the economy (Lewis and Stein, 1997).

As for the import and export policies, countries can reduce their balance of payment deficit by decreasing imports and increasing exports. It is even helpful if the imports are less-value products, and exports are high-value products. The consequences of the IMF policies are the exact opposite which does not comply with its intention to get paid back. One of the purposes of the IMF as stated in the Background section is to provide with opportunity to correct maladjustments in the balance of payments without resorting to measures destructive of national or international prosperity. If one country runs a balance of payments deficit, then another country must be running a balance of payments surplus. Yet, what the IMF concentrates on is only the deficit countries without taking into account surplus countries, all at the cost of national and international prosperity. The findings

from the study on unbalanced trade by Dekle et al. (2007) were consistent with the implication of the bilateral trade balance.

Devaluation of currency is another condition the IMF pushes forward. When the domestic industry is fragile and when the market is forcefully opened to goods from already industrialized nations, the obvious consequence of weak currency is de-industrialization. The country is stripped of its vital protection until its industries develop enough to compete with foreign goods. Hence, the inevitable exports are natural resources or low-value products. In other words, it requires the export of massive natural resources and low-value products using more cheap labor to pay for small amounts of high-value products from developed countries. “In many cases, devaluation has an inflationary impact with little effect on balance of payments deficits, as due to structural reasons, total export supply cannot be stepped up while demand for import goods remains price inelastic” (Sarkar, 1991).

Privatizations are also pushed up by IMF conditionalities. Accompanied by the opening of the financial market, it often means multinational companies buying state enterprises. “. . . the IMF stresses sound regulation and supervision of banks, bank consolidation, improving capital adequacy requirements, and privatization with the participation of foreign institutions.” (Martinez-Vazquez et al., 2001). Moreover, there are many cases where the poor people in Africa are paying for water consumption provided by privatized water companies which are bought by multinational corporations.

Raising interest rates has a serious effect on small and medium businesses since it raises their costs. This means that the money flows to the big corporations with international ties (Mueller, 2011). Yet, those big multinational corporations get the protection, and the small and medium businesses are left behind. Khwaja and Mian (2008) traced the effect of liquidity shock in Pakistan and finds out that the big firms are not affected even though they get 90% of lending. The reason is that they were well protected and compensated. Meanwhile, small firms were hit hard, and they made up 70% of the total firms in terms of number.

I summarized the key issues and their consequences that had been repeatedly mentioned by many critics and illustrated them in Figure 7.

A classic example all the critics routinely bring up is the Argentinian debt crisis. Argentina turned to the IMF for the first time in the 1950s and has never been able to escape the vicious cycle depicted in Figure 7. Conklin and Davidson (1986) mapped out the IMF loans to Argentina year by year, the conditions of each loan, and the consequences on the economy, society, and human rights. The important political events and the changing governments were included in the analysis, and this work shows how the conditionalities and their consequences unfold in the country as depicted in Figure 7. Eventually, Argentina defaulted on its external debt in 2001. Similarly, most Latin-American countries are trapped in this vicious cycle.

“Countries struggling to meet their obligations cut their already low levels of education and healthcare spending, but often to no avail. Eventually, they are forced into default. This occurred in Latin America during the early 1980s, when the US Federal Reserve Board’s unprecedented high interest levels suddenly rendered their debt unsustainable. Latin America’s problems were not caused by a change in their own policy, but by a change in US policy, yet Latin American states were left to bear the costs” (Stiglitz, 2003).

Another event that raised questions was the aftermath of the breakdown of the Soviet Union. Critics are convinced that the IMF loans to Russia were not invested for the good of the society but for the benefit of American profiteers and gave rise to a few Russian oligarchs. Yet, the people had to pay the debt. As Wedel (2000) mentioned, the employed people worked without pay for months while the IMF bailout was supposed to help the financial crisis. Given the devastating result of the prior aid money, the IMF bailout proposal in 1998 was strongly opposed. The former Soviet Union had maintained an inclusive social welfare system. The IMF’s demands shortly after the collapse were to reduce social insurance, restructure industries (which consequently led to mass layoffs) and reduce workers’ rights. As a result, large protests erupted (Pleines, 2022).

The main implication of these policies is that the conditionalities are highly intrusive to the debtor countries’ sovereignty and stretch far beyond the Fund’s intention to get the money back. Meanwhile, critics too often focus on the consequences of the conditions and fail to question the validity of the IMF conditions in the first place (Mueller, 2011)

Do the IMF policies reflect only the USA’s interest in line with the USD reserve system

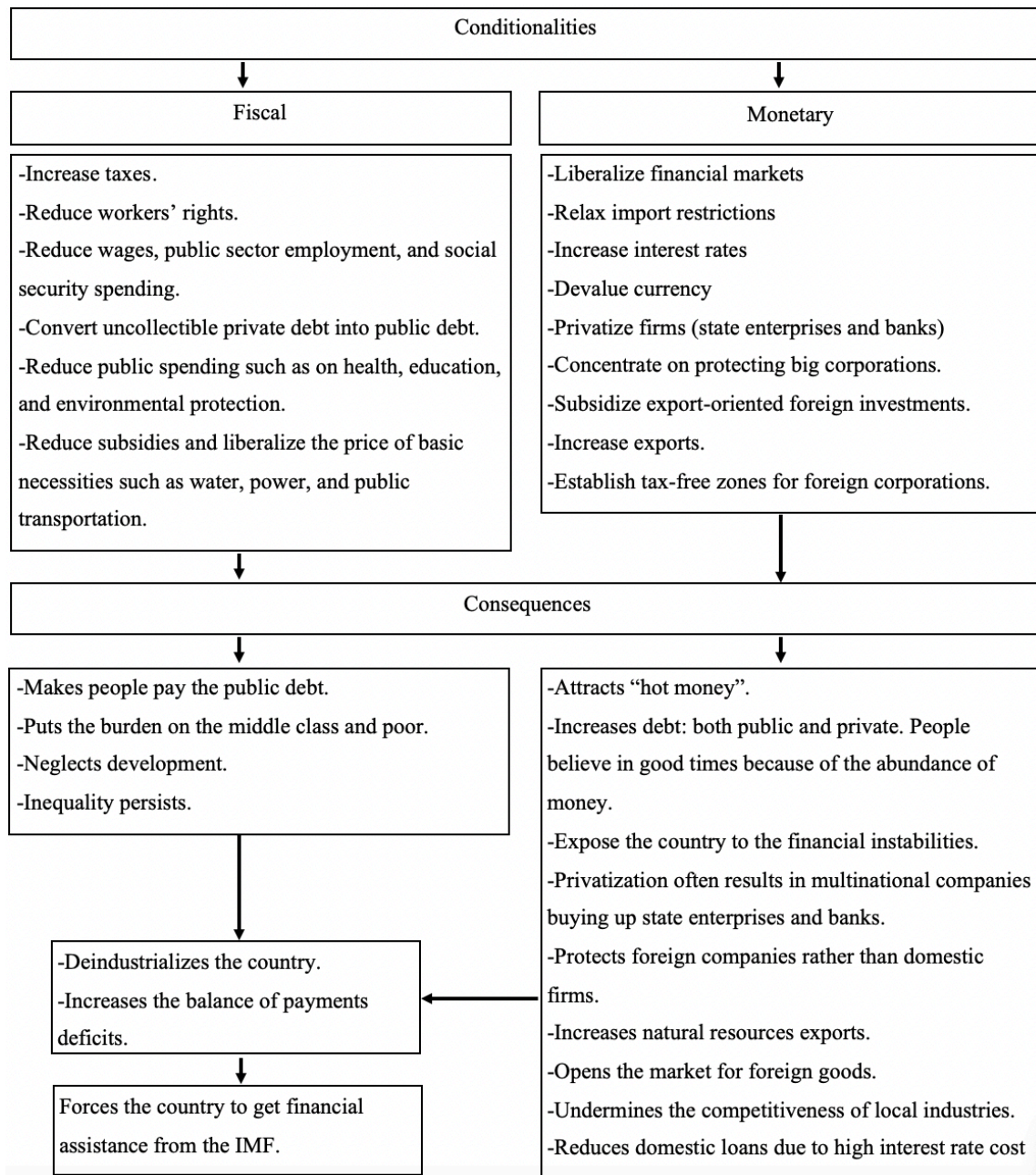


Figure 7: The IMF conditionalities and their consequences.

or is it international enough to reflect the representation of every single member?

3.3 The voting power within the fund

Two main bodies, the Board of Governors and the Executive Board, inside the IMF use voting systems for decision-making. The Board of Governors is the highest decision-making body and constitutes governors who represent each member country. Those governors are appointed by the respective countries. The chairman of the board of governors is selected by the governors themselves. The governors meet once a year, and all types of important decisions require a special majority of either 70% or 85% of the total voting power. As of May 2023, each country has 1459 voting rights which are called basic voting rights. In addition, they receive 1 vote per 100,000 SDR of the assigned quota. The richer the country is, the more voting power it gets (Table 22).

The Board of Governors or the countries make alliances and form constituencies. Currently, there are 24 constituencies. The governors in a constituency elect one of them as Executive Director and delegate all their voting powers to the elected director. Those 24 Executive Directors constitute the Executive Board, the second decision-making body. Fair representation in this body is important because it oversees the daily business of the IMF, and the directors can exercise voting power when there is a non-consensus. Before the quota reform in 2010, 5 of them were directly appointed by the countries with the largest quotas (United States, Japan, Germany, France, and the United Kingdom), and only 6 of the 24 members represented developing countries. Following the reform, all 24 Directors are elected members and there are more directors from developing countries. However, their voting power is still unbalanced. The countries with the largest quotas are delegating themselves to the Executive Board without forming any coalition, as seen in Table 1. All the other constituencies consist of 4–23 members. Even after the coalitions, the United States solely has the strongest voting power at 16.5% of the total votes, followed by Japan and China at 6.14% and 6.08% respectively. At the same time, the coalition with the largest number of countries has a collective voting power of 1.62%.

	Constituencies	Numbers of countries in the constituency	Number of votes	Percentage
1	United States	1	831 401	16,50
2	Japan	1	309 664	6,14
3	China	1	306 288	6,08
4	Andorra, Armenia, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Israel, Luxemburg, Moldova, Montenegro, Netherlands, North Macedonia, Romania, Ukraine	16	275 252	5,46
5	Germany	1	267 803	5,31
6	Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Spain	7	228 490	4,53
7	Brunei, Cambodia, Fiji, Indonesia, Laos, Malaysia, Nepal, Philippines, Singapore, Thailand, Tonga, Vietnam	12	211 840	4,20
8	Albania, Greece, Italy, Malta, Portugal, San Marino	6	207 912	4,13
9	France	1	203 010	4,03
10	United Kingdom	1	203 010	4,03
11	Australia, Kribati, Korea, Marshall Islands, Micronesia, Mongolia, Nauru, New Zealand, Palau, Papua New Guinea, Samoa, Seychelles, Solomon Islands, Tuvalu, Vanuatu	15	190 484	3,78
12	Antigua and Barbuda, Bahamas, Barbados, Belize, Canada, Dominica, Grenada, Ireland, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines	12	170 046	3,37
13	Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, Sweden	8	165 412	3,28
14	Austria, Belarus, Czech Republic, Hungary, Kosovo, Slovak Republic, Slovenia, Turkey	8	162 296	3,22

15	Brazil, Cabo Verde, Dominican Republic, Ecuador, Guyana, Haiti, Nicaragua, Panama, Suriname, Timor-Leste, Trinidad and Tobago	11	154 524	3,07
16	Bangladesh, Bhutan, India, Sri Lanka	4	153 638	3,05
17	Angola, Botswana, Burundi, Eritrea, Eswatini, Ethiopia, Gambia, Kenya, Lesotho, Liberia, Malawi, Mozambique, Namibia, Nigeria, Sierra Leone, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe	22	152 196	3,02
18	Azerbaijan, Kazakhstan, Kyrgyz, Poland, Serbia, Switzerland, Tajikistan, Turkmenistan, Uzbekistan	9	145 259	2,88
19	Russian Federation, Syria	2	134 891	2,68
20	Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Maldives, Oman, Qatar, Somalia, UAE, Yemen	12	130 191	2,58
21	Algeria, Ghana, Iran, Libya, Morocco, Pakistan, Tunisia	7	123 301	2,45
22	Saudi Arabia	1	101 385	2,01
23	Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, D.R.Congo, Congo, Cote d'ivore, Djibouti, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Mauritius, Niger, Rwanda, Sao Tome and Principe, Senegal, Togo	23	81 506	1,62
24	Argentina, Bolivia, Chile, Paraguay, Peru, Uruguay	6	80 121	1,59
	Total	187	4 989 920	99,01

Table 1: Executive Board and the voting power of each constituency (The IMF., 2023).

The total number of countries on the Executive Board is 187, not the total number of members which is 190. Venezuela, Afghanistan, and Myanmar are not represented altogether because of the political situations in these countries.

4 The IMF system as a cooperative game

This section will discuss the features of cooperative games and possible coalitional tendencies in the IMF before changing the rules of the game. As can be seen from the previous section, it may be tempting to focus on the coalitional tendencies in the Executive Board constituencies. However, I focused on the Board of Governors, the highest decision-making body of the IMF, since it defines the functioning and important policies of the organization.

Assume that developing countries together put forward a proposal to change the nature of the conditionalities in return for loans. There is a zero probability that they could get the proposal approved even if all the other developed countries take their side. The US alone can veto. This is an ideal example of a simple cooperative game with a veto player.

4.1 Cooperative games

In non-cooperative games, the players try to predict their opponents' moves using the available information in order to maximize utility. They do not need to play in coalitions. On the other hand, in cooperative games, the players compete alone or in coalitions for collective interest and resulting payoffs. Therefore, the necessary conditions for any cooperative game are a finite set of players N , coalitions formed within N , and the values of the coalitions. These are expressed in set theory symbols as follows.

Cooperative game: (N, v) where

$N = \{1, 2, \dots, n\}$ - a finite set of players

v - value function

$S \subseteq N$ - coalition S within N

$v(S)$ - the value of coalition S or payoff for being in the coalition

4.1.1 Simple Games

“Simple games can be viewed as models of voting systems in which a single alternative, such as a bill or an amendment, is pitted against the status quo” (Freixas and Molinero, 2009). Freixas (1997) formulated simple games as follows.

A simple game is a cooperative game (N, v) whose characteristic function satisfies the following conditions:

1. $v(S) = 0$ or 1 for all $S \subseteq N$.
2. $v(S) \leq v(T)$ if $S \subset T$.
3. $v(N) = 1$.

A player $i \in N$ is *null* in (N, v) if $v(S) = v(S - \{i\})$ for all $S \subseteq N$, a player i has veto if $v(S) = 1$ implies $i \in S$. A coalition $S \subseteq N$ is winning if $v(S) = 1$, and losing whenever $v(S) = 0$. A swing of player i is defined as a coalition $S \subseteq N$ such that when $i \in S$, S wins, and $S - \{i\}$ loses.

“A simple game provides a model of a voting system in which some coalitions can pass a bill, whereas other groups of players cannot pass it.” (Freixas, 1997). With the presence of quota $q > 0$ and weights $w_i \geq 0$ for all $i \in N$, the simple game becomes a weighted majority game. The coalition $S \subseteq N$ is winning if $w(S) \geq q$. Hence,

$$v(S) = \begin{cases} 1, & \text{if } w(S) \geq q \\ 0, & \text{if } w(S) < q \end{cases}$$

4.2 Application to the IMF case

For simplification, I rounded down the voting powers to make them integers. However, 153 countries would have 0 voting powers because of rounding. Yet together, they make up around 14% of the total voting power. Therefore, I specified them as having voting power less than 0,5 as can be seen in Table 2.

If the US is excluded, then the remaining 189 countries cannot pass the majority given the 85% majority rule. Any proposal submitted by any coalition can be vetoed by the US only. For example, in 2019, the US vetoed a plan to change quotas to prevent China to gain the second most powerful share instead of Japan.

On the other hand, coalitions with the USA as a member can pass the special majority threshold. Even though the US is a veto player, the coalition is still important because if the US wants to put forward an agenda, then it needs other countries to pass the special

Voting power %	Number of countries	Total voting power %
(1)	(2)	(1)*(2)
< 0.5	153	14
1	21	21
2	7	14
3	3	9
4	2	8
5	1	5
6	2	12
17	1	17
Total	190	100

Table 2: The voting power of the members (rounded to integer).

majority. Thus, recruiting countries that have more voting power than others should be easier. It turns out all countries with at least 1 voting power together can pass the 85% majority even though they are a minority of 37 countries out of all 190.

$$17\% + 6\% \cdot 2 + 5\% + 4\% \cdot 2 + 3\% \cdot 3 + 2\% \cdot 7 + 1\% \cdot 21 = 86\%$$

I assume the cooperative game (N, v) as (IMF, v) . Coalitions that pass the 85% majority get 1 as payoff and those which cannot get 0. If I describe the coalition as S , and the payoff of the coalition as $v(S)$, I get:

$$v(S) = \begin{cases} 1, & \Sigma_{i \in S} x_i \geq 85 \\ 0, & \text{otherwise} \end{cases}$$

This situation satisfies the characteristic function conditions:

1. $v(S) = 0$ or 1 for all $S \subseteq IMF$: Any coalition that passes the 85% majority has the payoff of 1, and any coalition that fails to pass it has 0 payoff.
2. $v(S) \leq v(T)$ if $S \subset T$. For example, any two countries can strike a coalition, but their payoff will always be 0. If these two countries together strike a coalition with a bigger coalition that includes the US, the payoff is 1, which is bigger than 0.
3. $v(N) = 1$. If all the countries agree, the payoff is 1.

Thus, the game (IMF, v) where there is $n = 190$ players is a simple cooperative game

with 1 veto player because $v(S) = 1$ implies $The\ US \in S$. Any coalition without the US is not winning, $v(S - \{The\ US\}) = 0$.

4.3 Forming of Coalitions

A countless number of winning coalitions or combinations of countries can be formed in this game. I could have figured out the current coalitional tendencies by looking at the voting results on the issues that require an 85% majority. Unfortunately, it turned out the IMF does not publish the tallies of votes by the voting countries. Although my attempts to obtain the documents left me with empty hands, I can speculate possible coalitions using the arguments on the loan recipients. There are at least two possible coalitional tendencies I can speculate and analyze: Creditors vs Debtors and IMF vs NDB.

4.3.1 Creditors vs Debtors

This tendency is briefly discussed in the previous section. In fact, the division between creditors and debtors is often discussed by the critics.

I extracted the list of creditor and debtor countries, as of 9 March 2023, from the IMF website. This list was not changed in May 2023. Some countries are neither creditors nor debtors, and one country is both creditor and debtor. Of the 48 creditor countries, 31 lend to the IMF through both the New Arrangements to Borrow (NAB) and the Bilateral Agreements to Borrow (BAB). Seven countries lend through only NAB and 10 lend through only BAB. The total voting power of those 48 member countries becomes 81,36% while the total voting power of all the 94 debtor countries is 10,57% (Table 3). This means that the creditors also lend through quota payments since voting power reflects the quota size. South Africa is the only country that is both creditor and debtor, and I listed it in debtors on the assumption that a debtor country would still want to reject the conditionalities. Hong Kong is also excluded from the creditor states because it is not an independent country that has its own membership and voting power.

All the creditors together cannot pass the 85% majority according to this data. They need another 3,64% of the voting power. On the other hand, there are 48 lands that are neither creditors nor debtors. Their status is not static, and the total voting power assigned to them is 8,01%. This means the all-creditor coalition can recruit a few more

	Creditors	Debtors	Neither	Total
Total number of countries	48	94	48	190
Total voting power	81,36%	10,57%	8,01%	99,94% ¹

Table 3: Voting powers of Creditors, Debtors, and others (The IMF., 2022).

countries to reach the special majority, using other political and economic leverages.

$$v(S) = 1 \text{ for all } S_{\text{Creditors}} \subseteq IMF, \quad \sum_{i \in S_{\text{Creditors}}} x_i \geq 85.$$

$$v(S) = 0 \text{ for all } S_{\text{Debtors}} \subseteq IMF.$$

Clearly, different versions of $S_{\text{Creditors}}$ depending on new recruitments are winning coalitions. Also, the creditors win because the conditionalities they impose on the debtors are meant to serve their interests as discussed in the Background section. The debtors lose because they have to endure the consequences of the conditionalities without being able to put accountability on the creditors.

4.3.2 IMF vs NDB

NDB stands for New Development Bank, a bank which was established by the BRICS countries “to provide an alternative to the Western-dominated international financial institutions of the World Bank and the International Monetary Fund (IMF)” (Hooijmaaijers, 2022). I speculated on this tendency despite the NDB being a new organization and having too few members because it splits the voting power of the creditors. This doesn’t mean that the members of the NDB suspended their memberships from the IMF, but they oppose agendas from the US and Western states and support competing agendas within the IMF.

Bangladesh, United Arab Emirates, and Egypt are members other than the BRICS states. Uruguay is a prospective member. Their total voting power in the IMF reaches 15,42% (Table 4). Together they can veto. However, I am speculating on possible coalitions in the past, and I do not have information about the last time the members voted for an issue that requires an 85% majority. Therefore, I excluded Uruguay, a prospective member, and Egypt who joined NDB this year. Thus, the voting power of the remaining members

¹Not 100% because of rounding on the IMF’s website.

	Members of NDB	Voting Power (%) in the IMF
1	China	6,08
2	India	2,63
3	Russian Federation	2,59
4	Brazil	2,22
5	South Africa	0,63
6	United Arab Emirates	0,49
7	Bangladesh	0,24
	Subtotal	14,88
8	Egypt	0,43
9	Uruguay	0,11
	Subtotal	0,54
	Total	15,42

Table 4: Voting power NDB members within the IMF

of the NDB constitutes 14,88% of the IMF total.

Then the NDB coalition gets a payoff of 0 while all the other versions of IMF coalitions get 1.

$$v(S) = 1 \text{ for all } S_{The\ IMF} \subseteq IMF, \quad \sum_{i \in S_{Creditors}} x_i \geq 85.$$

$$v(S) = 0 \text{ for all } S_{NDB} \subseteq IMF.$$

The NDB can gain veto power and further strengthen its power in the near future by recruiting the remaining debtors which collectively accounts for the voting power of 9,7%. It will still lack the power to push forward its own agenda. However, it will be more difficult to push forward an agenda for the IMF coalition too.

5 Change of rules

In this section, I discuss an alternative system first. Then, I continue to change the rules of the two coalitional tendencies I speculated in the previous section.

5.1 An alternative system

What are the alternative forms to the governance of the IMF? As part of One World Trust and Bretton Woods Project, Chowla et al. (2007) heavily criticized the current special majority system within the IMF and suggested instead a double majority system that resembles the voting system used by the European Union. The IMF's current system has only one majority generally based on the size of the economy. In light of this lopsidedness, Chowla et al. (2007) suggested a requirement of another majority based on the "one country–one vote" system besides the majority based on quota. In this way, the powerless countries can gain some voice. The European Parliament, in fact, has a third majority, the population of all the member states. When there is a non–consensus for a special agenda, an election among the whole population can be called. However, this never happened.

Taking the above proposal, the IMF could separate the current voting system into two different systems: one using basic voting rights of 1459 for each member and the other using quota–based voting rights. As an example, I draw a country that has the fewest voting rights, Tuvalu. It has 1484 quota–based rights, which is barely more than the 1459 basic voting rights, compared to the USA's 829 942 quota–based rights. However, with a double majority system, it can exercise some power, together with the other developing countries, in the Basic Voting Rights Poll. The result of this poll can jeopardize the results in the Weighted Voting Rights Poll. However, the possibility of non-consensus arises in this case. As in the EU case, the poll among the whole population could be used in such cases. Yet, it is a rather impractical approach given the world's population, costs, and bureaucracy of running the election. In any case, this system of double majority will force the nations to compromise and cooperate.

In fact, the balance between these two different voting rights was originally recognized (Woods, 2000). The basic voting rights were to ensure the universality of the

Number of countries	Basic voting rights of each member	Total basic voting rights	Quota based Voting rights	Total voting rights	Proportion of basic to total votes
(1)	(2)	(3)	(4)	(5)	(6)
		(1)*(2)		(3)+(4)	(3)/(5)*100
190	1 459	277 210	4 762 720	5 039 930	5,5%

Table 5: The proportion of basic to total votes. (The IMF., 2022).

organization, and the weighted voting rights were to ensure the representation of the members' contributions. In 1955, a small-quota policy set minimum quotas by doubling the quotas of countries with too few voting rights. Also, the total basic voting rights consisted of 14% of the total voting rights, and this proportion dropped to approximately 3% after 40 years (Woods, 2000). Today, basic voting rights constitute 5,5% of the total voting rights (Table 5). The quota reforms were made in 2010 thanks to much pressure from the international community. However, it turned out that the allocation of more quotas to middle-income countries was the result of the US Treasury's intention to decrease the power of EU members (Mueller, 2011).

“Historically, the policy focus of the Fund has changed only when the current policies began to disadvantage the United States, while new policies have been crafted to enhance the global power of the United States.” (Mueller, 2011).

In other words, claiming that the IMF is an international organization is hard since it has lost its universality feature.

Further, I used two approaches when changing the rules: reducing the special majority to a certain level and allocating an equal number of votes for each member state.

5.2 Reducing the special majority requirement

According to the Article of Agreements of the IMF, two main sets of issues require 85% and 70% of the total voting power, respectively. There are also some other issues that require a much smaller majority. According to Woods (2000), originally there were not many issues that required a special majority. After two amendments, the number dramatically increased to 64 from only 9, strengthening the veto power of the US. Despite the majority in number, other countries, especially emerging markets, and developing

	Creditors	Debtors	Neither	Total
Total number of countries	48	94	48	190
Total voting power (original)	81,36%	10,57%	8,01%	99,94%
Total voting power (rounded for simplification)	82%	11%	7%	100% ²

Table 6: Voting powers of Creditors, Debtors, and others.

countries, cannot initiate action.

Then, what is the preferable majority requirement when the USA has sole veto power? From now on, I will refer to the 85% majority as the special majority. In addition, when changing the rules, I will continue within the two different possibilities of coalitional tendencies discussed before.

5.2.1 Reducing the majority requirement in the Creditor vs Debtors Case

Given all creditors' collective voting power of 82% (Table 6) and the USA's veto power of 17%, reducing the majority requirement turned out to be quite problematic.

If I reduce the special majority to, for example, 70%, it gives the creditors a decisive power to initiate action even though it strips off the veto power of the US. Hence, 83% is the only level that does not give veto power to the US and a special majority to the creditors.

To analyze different powers, I estimated the three indices by Coleman as described by Leech (2002). The first one is the Power of the Body to Act (PTA). This indicates the effectiveness of the whole body when making decisions and the effectiveness depends on the quota. In other words, this index shows how difficult it is for the whole voting body to get an issue approved. The formula for the PTA is as follows:

$$PTA = \frac{w}{2^n}$$

¹Table 5 is the extension of Table 3 in section 4.3.1. As reflected in section 4.2, I rounded the voting powers of every country to whole numbers. Because of this rounding, the assigned percentages of voting power differ. However, these differences are insignificant for the purpose of my analysis.

	Voting power>0		Voting Power=0			Total	
	Number of Mem- bers	Voting Power	Number of Mem- bers	Percentage in the total	Allocation	Number of Mem- bers	Voting Power
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(3)/153*100	(4)*14	(1)+(3)	(2)+(5)
Creditors	31	80%	17	0,11	2	48	82%
Debtors	3	3%	91	0,59	8	94	11%
Neither	3	3%	45	0,29	4	48	7%
Total	37	86%	153	1,00	14	190	100%

Table 7: The allocation of 14% of the voting power of 153 members with respect to the number of countries in groups: creditors, debtors, and none.

where w is the number of winning coalitions and 2^n is the number of all subsets of N or IMF in my case. Before calculating all the indices, I made several simplifications and assumptions. There are also some assumptions deriving from the simplification I already made. I rounded the voting powers of the member countries to whole numbers and got 153 countries with zero voting power. Together they make up 14% of the total voting power. This 14% has to be allocated to three different groups Creditors, Debtors, and Neither (Table 7).

The creditors' problem is recruiting those 48 members in group "Neither". Three of them have one voting power each such that there is no problem recruiting them one by one. On the other hand, the remaining 45 jointly have four voting powers such that it becomes too tedious and unnecessary to calculate the contribution of every new recruit. Therefore, I divided the 45 countries by their four voting powers and made an assumption that the creditors can recruit them only 11 at a time (the last batch being 12). Another assumption is that the creditors and debtors cannot break apart except the USA because I am analyzing its veto power. This means all the other creditors are counted as one participant with a voting power of 65%, and debtors are one with 11%. Likewise, those 4 batches of 11 countries are also assumed to be four different participants. Hence, we have 10 participants in total when calculating the coalition outcomes (Table 8).

The participants N-1 and N-11 refer to those who are neither creditors nor debtors, of which N-1 consists of one country and N-11 consists of 11 countries.

I assumed the simple game (N, v) as (CD, v) where CD stands for Creditor vs Debtor. In this game:

	Participants	Voting Power (%)	Can act independently
1	The USA	17	Yes
2	Creditor	65	No
3	Debtor	11	No
4	N-1	1	Yes
5	N-1	1	Yes
6	N-1	1	Yes
7	N-11	1	No
8	N-11	1	No
9	N-11	1	No
10	N-11	1	No

Table 8: The characteristics of the participants.

Number of countries per winning coalition	Number of outcomes that have winning coalitions	
	q=85%	q=83%
10	1	1
9	8	9
8	28	28
7	56	56
6	70	70
5	56	56
4	7	35
3	1	1
Total winning outcomes	227	256

Table 9: The number of winning coalitions when quota q is 85% and 83%.

$$n = 10$$

$$v(C) = 1, \text{ if } w(C) \geq 85$$

$$v(D) = 0, \text{ if } w(D) < 85$$

After making those simplifications and assumptions, the number of possible winning coalitions w is estimated, and the result is illustrated in Table 9.

Then, the power of the body to act (PTA) in the case of a special 85% majority becomes:

$$PTA = \frac{w}{2^n} = \frac{227}{2^{10}} = 0.22$$

In the case of 83% majority:

$$PTA = \frac{w}{2^n} = \frac{256}{2^{10}} = 0.25$$

The power to act of the voting body as a whole increased by 0,03 points with the lowering of the special majority by 2%. If $q = 1$, then $w = 1$, and therefore $PTA \approx 0$. This means all parties should agree. On the other hand, as Leech (2002) described, $w = 2^{n-1}$ if $q = 0.5$, and therefore $PTA = 0.5$. Since there should be a majority requirement, there is no need to consider the cases where q is less than 0.5. Hence,

$$0 < PTA < 0.5$$

The effectivity in this context only expresses the chances of getting a decision made, not the quality of the decision.

The second index is the Power of a Member to Prevent Action (PPA_i). This measures player i 's ability to make a winning coalition to a losing one so that an unfavorable decision cannot be made. The formula for PPA is as follows:

$$PPA_i = \frac{\eta_i}{w}$$

where η_i equals the number of swings of player i . As defined in section 4.1.1, a swing of player i is a coalition $S \subseteq N$ such that when $i \in S$, S wins, and $S - \{i\}$ loses. Thus, the swing revolves around the quota q and the player's voting power.

The third index is the Power of a Member to Initiate Action (PIA_i). This measures player i 's ability to make a losing coalition into a winning one so that a decision can be made. The formula is:

$$PIA_i = \frac{\eta_i}{2^n - w}$$

The value of both PPA and PIA must be between zero and one. The fewer times a player can swing a game, the closer the two indices get to zero. If a player can swing every game, then its indices are one. The estimated number of swings of the individual player i in my case of Creditors vs Debtors is shown in Tables 10 and 11 when the special majority requirement is 85% and 83% respectively.

When there are five participants in the winning coalitions, those with a voting power of

Number of countries per winning coalition	Number of swings									
	USA	Creditors	Debtors	N-1	N-1	N-1	N-11	N-11	N-11	N-11
10	1	1	0	0	0	0	0	0	0	0
9	8	8	0	0	0	0	0	0	0	0
8	28	28	0	0	0	0	0	0	0	0
7	56	56	0	0	0	0	0	0	0	0
6	70	70	0	0	0	0	0	0	0	0
5	56	56	21	15	15	15	15	15	15	15
4	7	7	7	0	0	0	0	0	0	0
3	1	1	1	0	0	0	0	0	0	0
Total	227	227	29	15	15	15	15	15	15	15

Table 10: The number of swings of the participants when quota $q = 85\%$.

Number of countries per winning coalition	Number of swings									
	USA	Creditors	Debtors	N-1	N-1	N-1	N-11	N-11	N-11	N-11
10	0	1	0	0	0	0	0	0	0	0
9	8	9	1	0	0	0	0	0	0	0
8	28	28	0	0	0	0	0	0	0	0
7	56	56	0	0	0	0	0	0	0	0
6	70	70	0	0	0	0	0	0	0	0
5	56	56	0	1	1	1	1	1	1	1
4	35	35	0	0	0	0	0	0	0	0
3	1	1	1	1	1	1	1	1	1	1
Total	254	256	2	2	2	2	2	2	2	2

Table 11: The number of swings of the participants when quota $q = 83\%$.

1%, can swing games individually when $q=85\%$.

The lowering of quota q takes away the ability to swing from the participants with 1% voting power in 5-member coalitions. Instead, they can swing 3-member coalitions with only one chance to do it.

Now I have the number of swings for each player and thus can calculate both indices, the power to prevent action and the power to initiate action. Table 12 shows PPA and PIA for each player in both cases of special majority requirements of 85% and 83%.

The USA alone, and also as an ally with the creditors, has full power to prevent action with the 85% special majority, and this power is slightly reduced when lowering the quota q to 83%. Given that $0 < PPA < 1$, the reduction of 0,0078 is quite insignificant. On the other hand, PPA to Debtors decreased by 0,1199, which looks like a considerable loss.

Participants	Voting Power	Number of swings		PPA			PIA		
		q=85%	q=83%	q=85%	q=83%	Diff	q=85%	q=83%	Diff
USA	17	227	254	1,0000	0,9922	-0,0078	0,2848	0,3307	0,0459
Creditors	65	227	256	1,0000	1,0000	0,0000	0,2848	0,3333	0,0485
Debtors	11	29	2	0,1278	0,0078	-0,1199	0,0364	0,0026	-0,0338
N-1	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162
N-1	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162
N-1	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162
N-11	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162
N-11	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162
N-11	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162
N-11	1	15	2	0,0661	0,0078	-0,0583	0,0188	0,0026	-0,0162

Table 12: PPA and PIA of all players (Creditors vs Debtors).

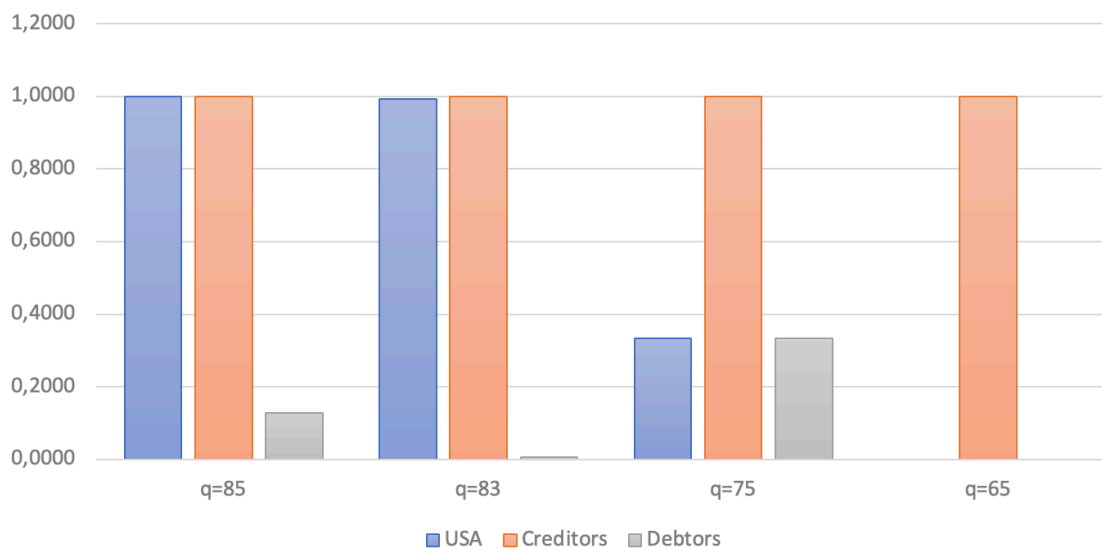


Figure 8: Power to Prevent Action for different majority requirements (Creditors vs Debtors).

The lower q did not strengthen the power to initiate action for players with smaller voting powers including debtors whilst strengthening the USA and Creditors. The reason is that those with larger voting powers need fewer other supporters to reach the required majority. The changes are marginal given that $0 < PIA < 1$. Moreover, for those with voting power of 1%, any change that is lower than 100% is insignificant because their share of power is too small in the first place. Especially those in the group Debtors and N-11 can hardly exercise any power with their individual voting powers less than 0.5%.

Figures 8 and 9 are the corresponding bar chart illustrations of PPA and PIA in Table 12. But I chose the three main participants and added cases when $q = 75\%$ and 65% . Values of all the powers of the remaining participants are zero in the last two cases. When $q = 55\%$, the values of all powers of all participants are either null or zero.

In Figure 8, the USA's power to prevent action decreases with the reduction in quota q .

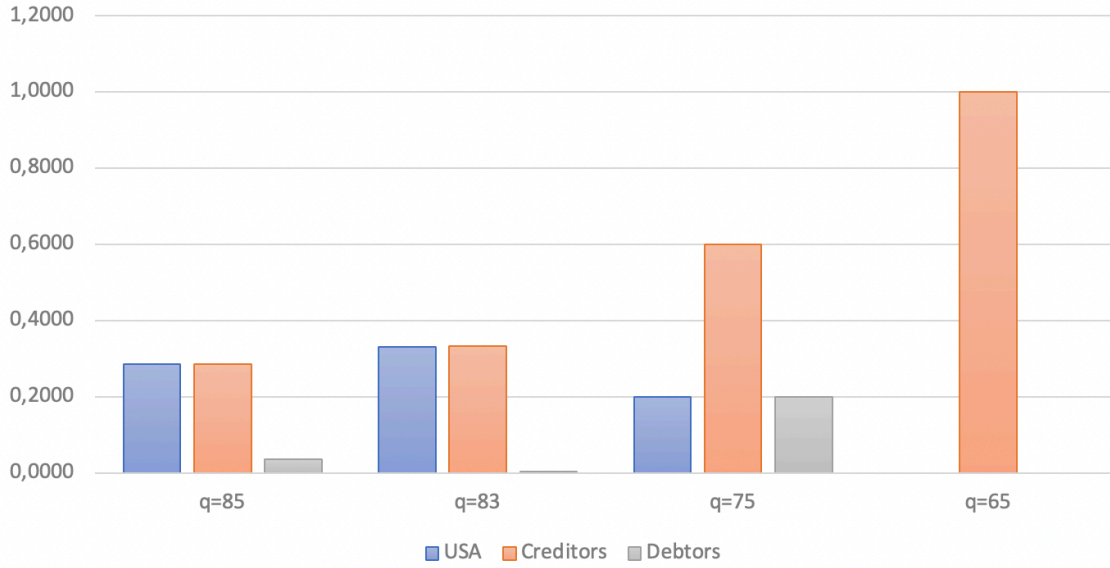


Figure 9: Power to Initiate Action for different majority requirements (Creditors vs Debtors).

On the contrary, even the countries with 0.03% voting power can veto when $q = 100\%$. Then, it will jeopardize the efficiency of the voting body as a whole. Successful decision-making will rarely be made.

In Figure 9, the USA's power to initiate action improves with the lower quota q . But it decreases in further reductions because of the improvement in the power of Creditors. In the real world, this means that the USA's power to initiate action will persistently improve with the reduction of majority requirements since it has the highest voting power. On the other hand, the higher quota q equalizes the power of the players.

The absolute power by means of swing for each player is measured by the Banzhaf index. There are two kinds of Banzhaf index: non-normalized and normalized. "The non-normalized Banzhaf index for player i is the proportion of votes which are swings for player" (Leech, 2002).

$$\beta_i = \frac{\eta_i}{2^{\bar{n}-1}}$$

On the other hand, the normalized Banzhaf index is the ratio of the number of swings of player i and the total number of swings of all players.

$$\beta_i = \frac{\eta_i}{\bar{\eta}}$$

where $\bar{\eta}$ is the total number of swings of all the players. It shows the power distribution of each player. The normalized Banzhaf Index of all the players is shown in Table 13.

Participants	Voting Power	Number of swings		Non-normalized Banzhaf Index			Normalized Banzhaf Index	
		q=85%	q=83%	q=85%	q=83%	Diff	q=85%	q=83%
USA	17	227	254	0,4434	0,4961	0,0527	0,3861	0,4829
Creditors	65	227	256	0,4434	0,5000	0,0566	0,3861	0,4867
Debtors	11	29	2	0,0566	0,0039	-0,0527	0,0493	0,0038
N-1	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
N-1	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
N-1	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
N-11	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
N-11	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
N-11	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
N-11	1	15	2	0,0293	0,0039	-0,0254	0,0255	0,0038
Total		588	526				1,00	1,00

Table 13: Banzhaf Index for all participants (Creditors vs Debtors).

The non-normalized Banzhaf index increases and decreases as a result of the changes in the number of swings for each player. It “combines the individual player’s power either to prevent action or to initiate action with the power of the body as a whole to act” (Leech, 2002). The reduction of quota q benefits the USA and creditors by increasing their number of swings. On the other hand, it negatively affects the debtors and those who are neither creditors nor debtors. Again, the volatility of the changes is small. The non-normalized Banzhaf index for the three main participants is shown in Figure 10.

Theoretically, it is impossible to compare the normalized Banzhaf index because the total number of swings is changed as seen in Table 13. However, the unequal distribution of power can be seen in both cases. When $q=85\%$, the USA alone has the same power as all the other creditor nations despite them having 47 powerful members including Germany, the UK, France, China, and Russia. When $q = 83\%$, the power of the USA is slightly lower than the creditors. As for the debtors, they have only 4,93% and 0,38% of power in both cases respectively even though there are 94 countries in this group. The remaining countries also have insignificant power. Clearly, the system gives the creditors

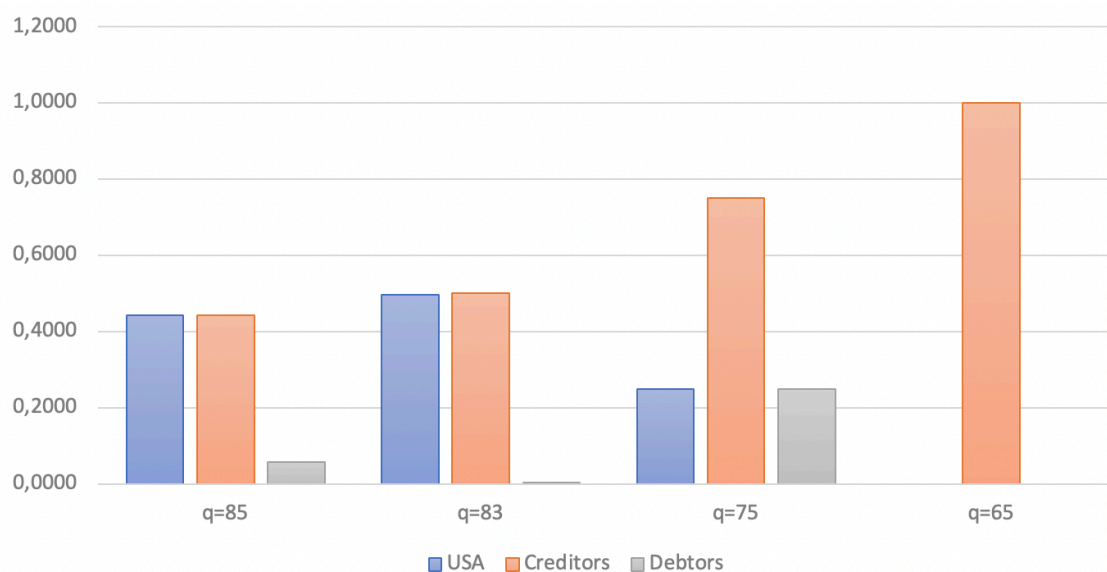


Figure 10: Banzhaf Index for all participants (Creditors vs Debtors).

	IMF	NDB	Debtors	Neither	Total
Total number of countries	44	7	92	47	190
Total voting power (original)	67,84%	14,88%	9,70%	7,52%	99,94%
Total voting power (rounded for simplification)	68%	15%	10%	7%	100%

Table 14: Distribution of voting power among the assumed coalitions.

overwhelming power as a whole, and an even larger share of power to the USA only.

As in the case of the power to initiate action, the higher majority requirements weaken the stronger players at the expense of overall efficiency in decision-making.

5.2.2 Reducing the majority requirement in IMF vs NDB Case

Reducing the special majority, in this case, is less problematic than the former because the NDB coalition divides the collective power of the creditor nations, especially China with its 6,08% of the voting power. Table 14 shows the distribution of power among the coalitions by assumption under this case.

The creditors are divided into IMF and NDB. The NDB includes two debtors and one “Neither”. Now, there is a broader interval for the reasonable level of majority requirement.

$$68\% < q \leq 83\%$$

Quota q must be over 68% in order that the IMF coalition not gain absolute power to initiate action. It must be equal to or lower than 83% so that the USA cannot have veto power. I chose 80% in my case because it should be harder to reach the special majority.

As discussed in the former case, 14% of voting power assigned to the 153 states has to be allocated among the coalitions. Table 15 shows how the difference arose from the rounding, is allocated.

	Voting power>0		Voting Power=0			Total	
	Number of members	Voting power	Number of members	Percentage in the total	Percentage in 14	Number of members	Voting power
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(3)/153	(4)*14	(1)+(3)	(2)+(5)
USA	1	17%				1	17%
IMF	26	49%	17	0,11	2	43	51%
NDB	5	15%	2	0,01	0	7	15%
Debtors	2	2%	90	0,59	8	92	10%
Neither	3	3%	44	0,29	4	47	7%
Total	37	86%	153	1,00	14	190	100%

Table 15: The allocation of 14% of the voting power of 153 members with respect to the number of countries in the participant groups.

In this case, both IMF and NDBs problem is to compete in recruiting Debtors, and Neither. Therefore, I divided the debtors and those who are neither creditors nor debtors into 17 groups. Two debtors and three “Neither” have 1% voting power each as can be seen from columns (1) and (2) in Table 15. Those five are assumed as independent participants so that coalitions IMF and NDB can compete for their allegiance one by one. On the other hand, 90 debtors have collective voting power of 8% as can be seen from columns (3) and (5). I divided the number of countries by the collective voting power so that the NDB can recruit them 11 at a time. The last two groups have 12 each because of rounding. The same procedure is applied to “Neither” from the last row of columns (3) and (5). Table 16 shows the grouping of the countries into 20 different participants.

	Participants	Voting Power (%)	Can act independently
1	USA	17	Yes
2	IMF	51	No
3	NDB	15	No
4	Debtor-1	1	Yes
5	Debtor-1	1	Yes
6	Debtor-11	1	No
7	Debtor-11	1	No
8	Debtor-11	1	No
9	Debtor-11	1	No
10	Debtor-11	1	No
11	Debtor-11	1	No
12	Debtor-11	1	No
13	Debtor-11	1	No
14	N-1	1	Yes
15	N-1	1	Yes
16	N-1	1	Yes
17	N-11	1	No
18	N-11	1	No
19	N-11	1	No
20	N-11	1	No

Table 16: The characteristics of the participants.

As in the Creditors vs Debtors case, the USA is singled out for its veto power. One underlying assumption is that the NDB is not trying to recruit members of the IMF group, all of whom are creditors. In reality, it is possible that they can be recruited too.

This time, the simple game (N, ν) becomes (IN, ν) where IN stands for IMF vs NDB. In this game:

$$n = 20$$

$$\nu(I) = 1, \text{ if } w(I) \geq 85$$

$$\nu(N) = 0, \text{ if } w(N) < 85$$

Here are the calculations of the power of the body to initiate action when the special

Participants	Voting Power	Number of swings		PPA			PIA		
		q=85%	q=80%	q=85%	q=80%	Diff	q=85%	q=80%	Diff
USA	17	131 055	139 640	1,00000	0,98820	-0,01180	0,14284	0,15391	0,01108
IMF	51	131 055	141 308	1,00000	1,00000	0,00000	0,14284	0,15575	0,01292
NDB	15	131 053	122 504	0,99999	0,86693	-0,13306	0,14283	0,13503	-0,00781
Debtor-1	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-1	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Debtor-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541
Neither-11	1	17	4 928	0,00013	0,03487	0,03474	0,00002	0,00543	0,00541

Table 17: PPA and PIA of all players (IMF vs NDB).

majority is 85% and 80%.

$$PTA_{q=85\%} = \frac{w}{2^n} = \frac{131055}{2^{20}} = 0.2$$

and

$$PTA_{q=80\%} = \frac{w}{2^n} = \frac{141308}{2^{20}} = 0.13$$

There is a tiny difference between the two cases of majority requirements. The estimations of powers to prevent action and to initiate action are shown in Table 17.

Both the number of swings and the possible subsets are much more in the IMF vs DNB case than in the Creditors vs Debtors case because the number of participants is doubled. The USA and IMF have absolute power to prevent action and the NDB almost has the same power when $q = 85\%$. The IMF preserves its power when is reduced to 80%, while the power of the USA is decreased by 1.18%. But the NDBs PPA is reduced by 13.31%, which is not marginal.

The power to initiate action increases for all the players but the NDB. However, the changes are small. The PPA and PIA for the three biggest participants in terms of voting power are illustrated in Figures 11 and 12 respectively. As the quota q becomes

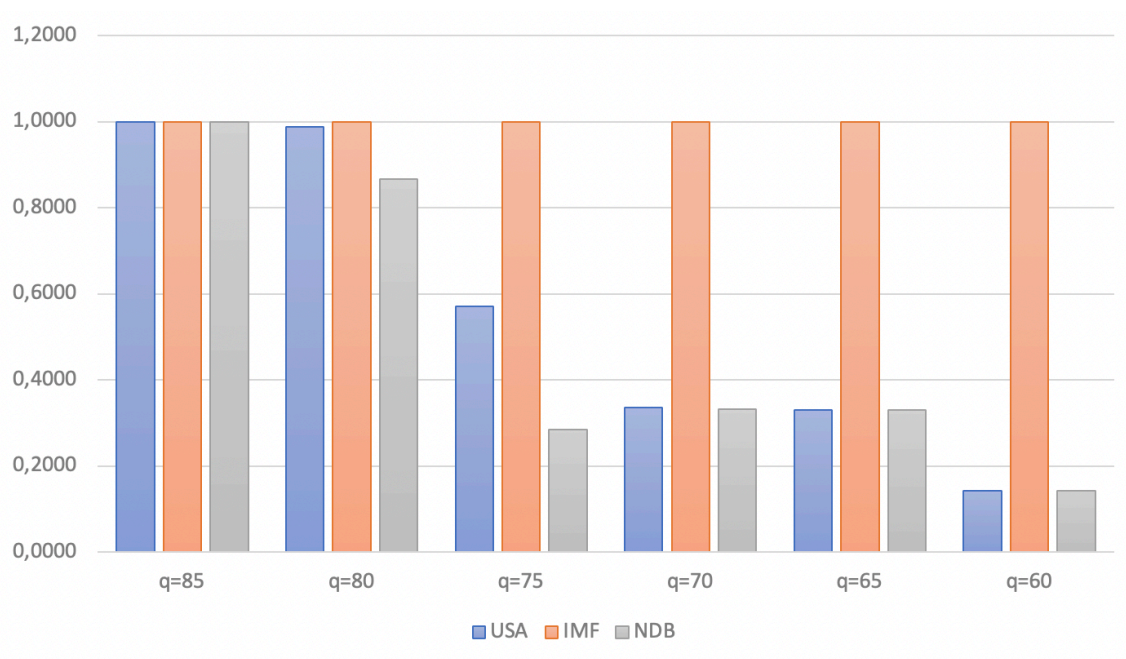


Figure 11: Power to Prevent Action for different majority requirements (IMF vs NDB).

higher, the two powers are evened out between the three participants.

The Non-normalized and normalized Banzhaf indices are shown in Table 18.

The number of swings for the NDB significantly drops with the reduction of q . Meanwhile, those with 1% voting power gain more swings. The normalized Banzhaf Index shows the unequal power distribution as in the case of Creditors vs Debtors. The three largest participants in Table 18 are shown in Figure 13. As in the Creditors vs Debtors case, the powers are equal when $q = 85\%$. The reduction of quota q to 80% resulted in strengthening the USA and IMF while weakening NDB although the volatility of the changes is small.

5.3 Equal votes for each member

In this section, I assume that the weighted voting system is abolished altogether, and each member is granted one voting power. Then, I apply this assumption to the two cases: Creditors vs Debtors and IMF vs NDB.

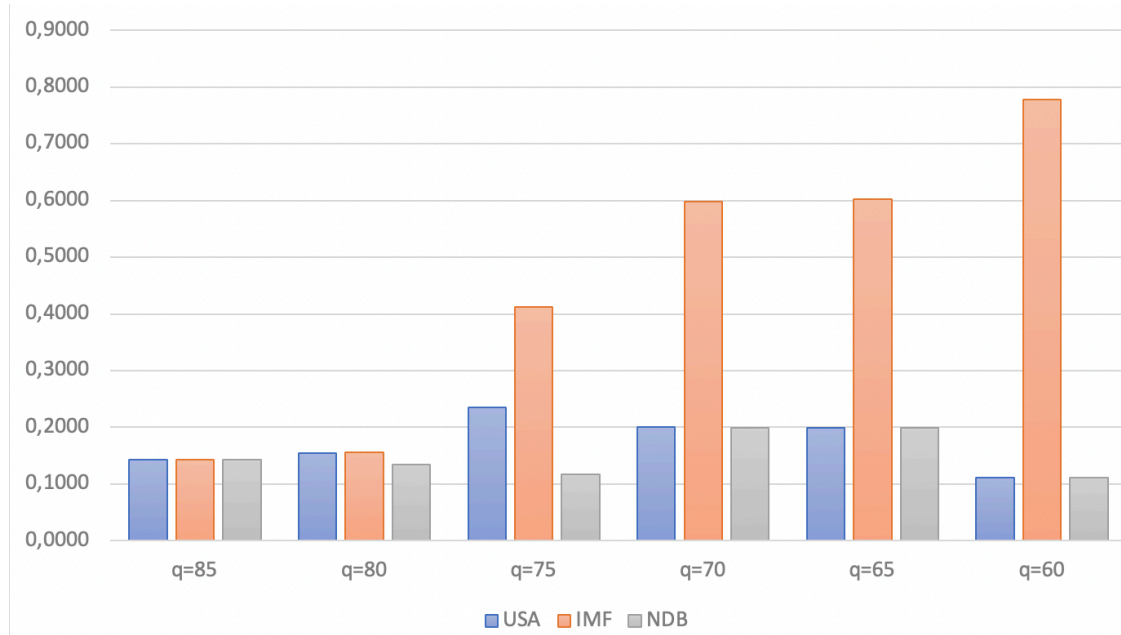


Figure 12: Power to Initiate Action for different majority requirements (IMF vs NDB).

Participants	Voting Power	The number countries in the group	Number of swings		Non-normalized Banzhaf Index			Normalized Banzhaf Index	
			q=85%	q=80%	q=85%	q=80%	Diff	q=85%	q=80%
USA	17	1	131 055	139 640	0,24997	0,26634	0,01637	0,33309	0,28660
IMF	65	43	131 055	141 308	0,24997	0,26952	0,01956	0,33309	0,29002
NDB	11	7	131 053	122 504	0,24996	0,23366	-0,01631	0,33309	0,25143
Debtor-1	1	1	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-1	1	1	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	12	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Debtor-11	1	12	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-1	1	1	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-1	1	1	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-1	1	1	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Neither-11	1	11	17	4 928	0,00003	0,00940	0,00937	0,00004	0,01011
Total		190	393 452	487 228				1,00	1,00

Table 18: Banzhaf Index for all participants (IMF vs NDB).

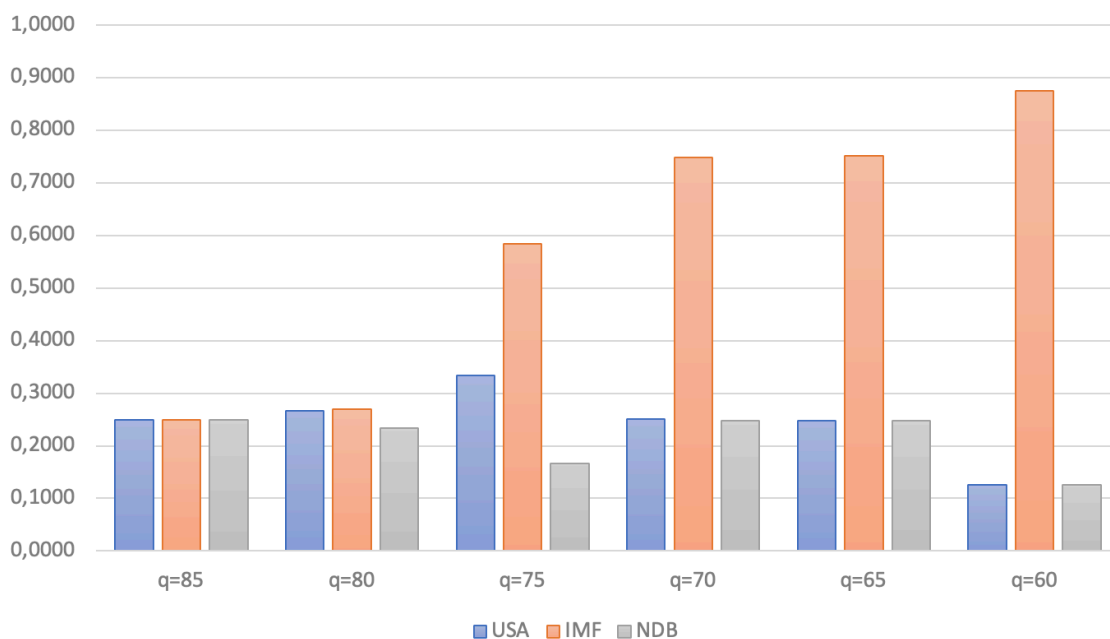


Figure 13: Banzhaf Index for all participants (IMF vs NDB).

	Creditors	Debtors	Neither	Total	Winning coalition
	(1)	(2)	(3)	(4)	(4)*0,85
Number of countries in the group	48	94	48	190	162
Voting power	25,26%	49,47%	25,26%	100%	85%

Table 19: Voting powers of the possible coalitions.

5.3.1 Equal votes for each member in the Creditors vs Debtors case

Since one vote is assigned to each country, the voting power of one player becomes its percentage in the whole set of players. Table 19 shows the voting power of all members in groups Creditors, Debtors, and Neither.

It requires 162 members to reach an agreement achieving the special 85% majority. In this case, forming a winning coalition becomes hard for both creditors and debtors. It is even harder for the creditors since their voting power is twice fewer than that of the debtors. However, the debtors cannot win even if they manage to recruit all the others. The predictable result of this system is more compromise and cooperation than division. However, it becomes questionable if countries with large quotas would be willing to contribute as much as their quota size. The possible solution would be a relatively

	IMF	NDB	Debtors	Neither	Total	Winning coalition
	(1)	(2)	(3)	(4)	(5)	(5)*0,85
Creditors	44	4	92	47	187	
Debtors		2			2	
Neither		1			1	
Number of countries in the group	44	7	92	47	190	162
Voting power	23,16%	3,68%	48,42%	24,73%	100%	85%

Table 20: Voting powers of the possible coalitions.

similar contribution despite the economic size. This will result in too little contributions to the General Resources Account (GRA), which also means more lending through New Arrangements to Borrow NAB and Bilateral Borrowing Agreements (BBA). In this case, the disagreements might revolve around interest rates rather than the weighted voting powers.

5.3.2 Equal votes for each member in the IMF vs DNB case

The voting powers are allocated as in Table 20.

There is not much difference from the Creditors vs Debtors case. Creditors are divided into IMF and NDB, with NDB recruiting two Debtors and one Neither. Therefore, the problems and arguments are the same as in the former case.

6 Analysis

Table 21 summarizes the change of rules in the speculated coalitional tendencies discussed in Section 5 as a whole.

	Creditors vs Debtors	IMF vs NDB
Reducing the majority requirement	<ul style="list-style-type: none"> – Possible to reduce q to only 83%. – The USAs veto power stands in the way 	<ul style="list-style-type: none"> – Broader interval for reducing quota. $68\% < q < 84\%$ <ul style="list-style-type: none"> – NDB can gain veto power soon. – NDB splits the power of creditor countries.
One vote for one country	<ul style="list-style-type: none"> – All countries have equal power. – Hard to reach agreements. 	<ul style="list-style-type: none"> – All countries have equal power. – NDB splits the power of creditor countries. – Hard to reach agreements

Table 21: Change of rules in the two coalitional speculations summarized.

Reducing the majority requirement to 83% in the Creditors vs Debtors case, resulted in significantly decreased power to prevent action for Debtors. It did not weaken Creditors and the reduction of this power for the USA was almost invisible. As for the power to initiate action and Banzhaf power, the USA and Creditors were strengthened. In contrast, those indices were decreased for Debtors. The implication of this result is that as long as all the creditor countries are united together, reducing the majority requirement will not improve power imbalance, quite the opposite.

Reducing the majority requirement to 80% in the IMF vs NDB case also gave a disappointing result. Obviously, this did not affect the power to prevent action for the IMF coalition. At the same time, it weakened the USA only slightly, while weakening the NDB coalition significantly. The changes in the power to initiate action and Banzhaf power were the same as in the former case. The power of the USA and IMF increased, and that of NDB decreased. The deduction from this result is that reducing the quota q worsened the power imbalance too.

Overall, the USA's veto power, together with the creditor countries, not only prevents

others to oppose their policies but also prevents an effort to reform the system to achieve a better power balance in the weighted majority system. The current majority requirement level of 85% is perfect for the USA only. It has the highest power to initiate action and Banzhaf power while retaining full veto power.

As for the one-country one-vote system, the debtors possess nearly twice the power of the creditors. Yet, the debtors cannot reach the majority requirement of 85% even if they manage to recruit all the remaining members who are not creditors. In this case, a lower majority requirement will improve the efficiency of decision-making. However, it seems an unrealistic solution given the interest of the creditors.

The underlying assumption for all these cases was that the two changes are made separately. In general, it can be concluded that creditors are more powerful when there is weighted voting, and debtors are stronger when there is equal voting power. Hence, the double majority system is the most reasonable option for balancing the power. As discussed in section 5.2. the IMF could implement such reform by separating basic voting rights and quota-based voting rights and by imposing the right level of majority requirement for each poll. For now, such an abrupt change is unlikely given the USA's position in the organization and its interests. However, the creation of the New Development Bank by the BRICS countries is the first small step to dividing power and increasing competition.

Although I could not obtain the required data from the IMF, the speculation on the coalitional tendencies can still be valid. Any other forms of coalitions would give similar results on power relations within the Fund. The reason is the veto power of the USA. The BRICS countries, together with a few other recruits, can gain veto power too. But this requires solid union and a better or equal payoff. Any friction within the group will jeopardize this power. The same applies to any other forms of coalitions that can veto.

7 Conclusion

This thesis was motivated by the critics of international organizations such as the IMF, including one of the most renowned economists Joseph Stiglitz. The main criticism was that the policies work for the benefit of the developed economies and put the developing world at a disadvantage. Through a closer look at the brief history, policies, and the current system, it can be concluded that these criticisms might be valid.

The current system of the IMF grants too much power to developed countries and less to developing countries. The large imbalance of power puts the countries in atrocious relations: in which the developed countries, with the US in the front, have the power to use the system to their advantage at the cost of the developing ones. Consequential reforms like erasing the veto power of the USA or a double majority system seem highly unlikely.

Given the sole veto power of the US in the current system, the IMF looks like an American organization rather than an international organization. Also, representation that is proportional to the contribution is practiced in business entities. Therefore, the weighted voting power system in the IMF makes it more similar to a business entity with the US as a major shareholder rather than an international organization that has a universal goal. This contrasts with the main goal stated on the IMF's website: "The International Monetary Fund works to achieve sustainable growth and prosperity for all of its 190 member countries." (The IMF., ndb).

Even though the stated purposes of the Fund stress the common good, the historical development from its establishment to its evolving roles in accordance with the changing interest of the US shows a different picture. The USD as a global reserve currency, the advantages it gives to the US spending beyond its means, and the general economic and political power of the US are in harmony with the neoliberal policies of the IMF. As Mueller (2011) complained, the critics are not digging deep enough to reach this bottom. They are only going around the distractive impact of the conditionalities.

Future works should focus on alternative systems that ensure a balance of power everyone rightfully agrees. For now, the most reasonable system looks like a double-majority system. However, estimating the right majority requirements for each poll is also important.

References

- Board of Governors of the Federal Reserve System (US). (n.d.). Currency in Circulation (CURRCIR). Retrieved from: <https://fred.stlouisfed.org/series/CURRCIR>.
- Chowla, P., Oatham, J., and Wren, C. (2007). *Bridging the democratic deficit: Double majority decision making and the IMF*. One World Trust. Retrieved from https://www.brettonwoodsproject.org/doc/wbimfgov/DoubleMajority_IMF.pdf.
- Conklin, M. and Davidson, D. (1986). The imf and economic and social human rights: a case study of argentina, 1958-1985. *Hum. Rts. Q.*, 8:227–269.
- Dang, T. A. and Stone, R. W. (2021). Multinational banks and imf conditionality. *International Studies Quarterly*, 65(2):375–386.
- Dekle, R., Eaton, J., and Kortum, S. (2007). Unbalanced trade. *American Economic Review*, 97(2):351–355.
- Deng, Q., Li, E., and Yang, Y. (2022). Politics, policies and rural poverty alleviation outcomes: Evidence from lankao county, china. *Habitat International*, 127:102631.
- Freixas, J. (1997). Different ways to represent weighted majority games. *TOP: An Official Journal of the Spanish Society of Statistics and Operations Research*, 5(2):201–211.
- Freixas, J. and Molinero, X. (2009). Simple games and weighted games: a theoretical and computational viewpoint. *Discrete Applied Mathematics*, 157(7):1496–1508.
- Hooijmaaijers, B. (2022). The internal and external institutionalization of the brics countries: The case of the new development bank. *International Political Science Review*, 43(4):481–494.
- Kanbur, R., Ortiz-Juarez, E., and Sumner, A. (2022). The global inequality boomerang.
- Khwaja, A. I. and Mian, A. (2008). Tracing the impact of bank liquidity shocks: Evidence from an emerging market. *American Economic Review*, 98(4):1413–1442.
- Kim, I. S. and Milner, H. V. (2019). Multinational corporations and their influence through lobbying on foreign policy. *Multinational Corporations in a Changing Global Economy*, pages 497–536.

- Lastra, R. M. (2000). The international monetary fund in historical perspective. *Journal of International Economic Law*, 3(3):507–523.
- Leech, D. (2002). Voting power in the governance of the international monetary fund. *Annals of Operations Research*, 109:375–397.
- Lewis, P. and Stein, H. (1997). Shifting fortunes: The political economy of financial liberalization in Nigeria. *World Development*, 25(1):5–22.
- Li, M. and Wu, Z. (2022). Power and poverty in china: Why some counties perform better in poverty alleviation? *Journal of Chinese Political Science*, 27(2):319–340.
- Martinez-Vazquez, J., Rioja, F., Skogstad, S., and Valev, N. (2001). Imf conditionality and objections: the russian case. *American Journal of Economics and Sociology*, 60(2):501–517.
- Mueller, J. (2011). The imf, neoliberalism and hegemony. *Global Society*, 25:377–402.
- Pleines, H. (2022). Opposition to the washington consensus: The imf and social policy reforms in post-soviet russia. In *International Impacts on Social Policy: Short Histories in Global Perspective*, pages 275–285. Springer International Publishing Cham.
- Reinhart, C. and Trebesch, C. (2016). The international monetary fund: 70 years of reinvention. *Journal of Economic Perspectives*, 30(1):3–28.
- Sarkar, P. (1991). Imf/world bank stabilisation programmes: A critical assessment. *Economic and Political Weekly*, pages 2307–2310.
- Spraos, J. (1986). *IMF conditionality: Ineffectual, inefficient, mistargeted*. International Finance Section, Department of Economics, Princeton University.
- Stein, H. (1992). Deindustrialization, adjustment, the world bank and the imf in africa. *World Development*, 20(1):83–95.
- Stiglitz, J. (2003). Dealing with debt. *Harvard International Review*, 25(1):54–59.
- Stiglitz, J. E. (2014). Transition to a market economy: Explaining the successes and failures. In *The Oxford Companion to the Economics of China*. Oxford University Press.
- The IMF. (2021). IMF Concludes Steps to Maintain its Lending Capac-

- ity. Retrieved from: <https://www.imf.org/en/News/Articles/2021/01/08/pr214-imf-concludes-steps-to-maintain-its-lending-capacity>.
- The IMF. (2022). IMF Members' Quotas and Voting Power, and IMF Board of Governors. Retrieved from: <https://www.imf.org/en/About/executive-board/members-quotas>.
- The IMF. (2023). IMF Executive Directors and Voting Power. Retrieved from: <https://www.imf.org/en/About/executive-board/eds-voting-power>.
- The IMF (n.d.). Destruction and Reconstruction (1945-1958). Retrieved from https://www.imf.org/external/np/exr/center/mm/eng/mm_dr_01.htm.
- The IMF. (n.d.a). List of Members. Retrieved from <https://www.imf.org/external/np/sec/memdir/memdate.htm>.
- The IMF. (n.d.b). What is the IMF? Retrieved from: <https://www.imf.org/en/About/Factsheets/IMF-at-a-Glance>.
- Wedel, J. R. (2000). Us assistance for market reforms: Foreign aid failures in russia and the former soviet bloc. *The Independent Review*, 4(3):393–418.
- Woods, N. (2000). The challenge of good governance for the imf and the world bank themselves. *World development*, 28(5):823–841.
- World Inequality Report (2022). World Inequality Lab. Executive Summary. Retrieved from <https://wir2022.wid.world/executive-summary/>.

Appendix

	Member	Quota (Million SDR)	Quota in per- centage	Basic Voting rights	Quota based Vot- ing rights	Total votes	Voting rights in per- centage
		(1)	(2)	(3)	(4)	(5)	(6)
					(1)/100000	(3)+(4)	
1	United States	82 994,20	17,43	1 459	829 942	831 401	16,50
2	Japan	30 820,50	6,47	1 459	308 205	309 664	6,14
3	China	30 482,90	6,40	1 459	304 829	306 288	6,08
4	Germany	26 634,40	5,59	1 459	266 344	267 803	5,31
5	France	20 155,10	4,23	1 459	201 551	203 010	4,03
6	United King- dom	20 155,10	4,23	1 459	201 551	203 010	4,03
7	Italy	15 070,00	3,16	1 459	150 700	152 159	3,02
8	India	13 114,40	2,75	1 459	131 144	132 603	2,63
9	Russian Federa- tion	12 903,70	2,71	1 459	129 037	130 496	2,59
10	Brazil	11 042,00	2,32	1 459	110 420	111 879	2,22
11	Canada	11 023,90	2,31	1 459	110 239	111 698	2,22
12	Saudi Arabia	9 992,60	2,10	1 459	99 926	101 385	2,01
13	Spain	9 535,50	2,00	1 459	95 355	96 814	1,92
14	Mexico	8 912,70	1,87	1 459	89 127	90 586	1,80
15	Netherlands	8 736,50	1,83	1 459	87 365	88 824	1,76
16	Korea	8 582,70	1,80	1 459	85 827	87 286	1,73
17	Australia	6 572,40	1,38	1 459	65 724	67 183	1,33
18	Belgium	6 410,70	1,35	1 459	64 107	65 566	1,30
19	Switzerland	5 771,10	1,21	1 459	57 711	59 170	1,17
20	Türkiye	4 658,60	0,98	1 459	46 586	48 045	0,95
21	Indonesia	4 648,40	0,98	1 459	46 484	47 943	0,95
22	Sweden	4 430,00	0,93	1 459	44 300	45 759	0,91
23	Poland	4 095,40	0,86	1 459	40 954	42 413	0,84
24	Austria	3 932,00	0,83	1 459	39 320	40 779	0,81
25	Singapore	3 891,90	0,82	1 459	38 919	40 378	0,80
26	Norway	3 754,70	0,79	1 459	37 547	39 006	0,77
27	Venezuela	3 722,70	0,78	1 459	37 227	38 686	0,77

28	Malaysia	3 633,80	0,76	1 459	36 338	37 797	0,75
29	Iran	3 567,10	0,75	1 459	35 671	37 130	0,74
30	Ireland	3 449,90	0,72	1 459	34 499	35 958	0,71
31	Denmark	3 439,40	0,72	1 459	34 394	35 853	0,71
32	Thailand	3 211,90	0,67	1 459	32 119	33 578	0,67
33	Argentina	3 187,30	0,67	1 459	31 873	33 332	0,66
34	South Africa	3 051,20	0,64	1 459	30 512	31 971	0,63
35	Nigeria	2 454,50	0,52	1 459	24 545	26 004	0,52
36	Greece	2 428,90	0,51	1 459	24 289	25 748	0,51
37	Finland	2 410,60	0,51	1 459	24 106	25 565	0,51
38	United Arab Emirates	2 311,20	0,49	1 459	23 112	24 571	0,49
39	Czech Republic	2 180,20	0,46	1 459	21 802	23 261	0,46
40	Portugal	2 060,10	0,43	1 459	20 601	22 060	0,44
41	Colombia	2 044,50	0,43	1 459	20 445	21 904	0,43
42	Philippines	2 042,90	0,43	1 459	20 429	21 888	0,43
43	Egypt	2 037,10	0,43	1 459	20 371	21 830	0,43
44	Pakistan	2 031,00	0,43	1 459	20 310	21 769	0,43
45	Ukraine	2 011,80	0,42	1 459	20 118	21 577	0,43
46	Algeria	1 959,90	0,41	1 459	19 599	21 058	0,42
47	Hungary	1 940,00	0,41	1 459	19 400	20 859	0,41
48	Kuwait	1 933,50	0,41	1 459	19 335	20 794	0,41
49	Israel	1 920,90	0,40	1 459	19 209	20 668	0,41
50	Romania	1 811,40	0,38	1 459	18 114	19 573	0,39
51	Chile	1 744,30	0,37	1 459	17 443	18 902	0,38
52	Iraq	1 663,80	0,35	1 459	16 638	18 097	0,36
53	Libya	1 573,20	0,33	1 459	15 732	17 191	0,34
54	Peru	1 334,50	0,28	1 459	13 345	14 804	0,29
55	Luxembourg	1 321,80	0,28	1 459	13 218	14 677	0,29
56	New Zealand	1 252,10	0,26	1 459	12 521	13 980	0,28
57	Kazakhstan	1 158,40	0,24	1 459	11 584	13 043	0,26
58	Vietnam	1 153,10	0,24	1 459	11 531	12 990	0,26
59	Bangladesh	1 066,60	0,22	1 459	10 666	12 125	0,24
60	Congo D.R.	1 066,00	0,22	1 459	10 660	12 119	0,24
61	Slovak Republic	1 001,00	0,21	1 459	10 010	11 469	0,23
62	Zambia	978,20	0,21	1 459	9 782	11 241	0,22
63	Bulgaria	896,30	0,19	1 459	8 963	10 422	0,21

64	Morocco	894,40	0,19	1 459	8 944	10 403	0,21
65	Angola	740,10	0,16	1 459	7 401	8 860	0,18
66	Ghana	738,00	0,15	1 459	7 380	8 839	0,18
67	Qatar	735,10	0,15	1 459	7 351	8 810	0,17
68	Croatia	717,40	0,15	1 459	7 174	8 633	0,17
69	Zimbabwe	706,80	0,15	1 459	7 068	8 527	0,17
70	Ecuador	697,70	0,15	1 459	6 977	8 436	0,17
71	Belarus	681,50	0,14	1 459	6 815	8 274	0,16
72	Serbia	654,80	0,14	1 459	6 548	8 007	0,16
73	Côte d'Ivoire	650,40	0,14	1 459	6 504	7 963	0,16
74	Lebanon	633,50	0,13	1 459	6 335	7 794	0,15
75	Sudan	630,20	0,13	1 459	6 302	7 761	0,15
76	Slovenia	586,50	0,12	1 459	5 865	7 324	0,15
77	Sri Lanka	578,80	0,12	1 459	5 788	7 247	0,14
78	Uzbekistan	551,20	0,12	1 459	5 512	6 971	0,14
79	Tunisia	545,20	0,11	1 459	5 452	6 911	0,14
80	Oman	544,40	0,11	1 459	5 444	6 903	0,14
81	Kenya	542,80	0,11	1 459	5 428	6 887	0,14
82	Myanmar	516,80	0,11	1 459	5 168	6 627	0,13
83	Yemen Republic of	487,00	0,10	1 459	4 870	6 329	0,13
84	Dominican Re- public	477,40	0,10	1 459	4 774	6 233	0,12
85	Trinidad and Tobago	469,80	0,10	1 459	4 698	6 157	0,12
86	Lithuania	441,60	0,09	1 459	4 416	5 875	0,12
87	Uruguay	429,10	0,09	1 459	4 291	5 750	0,11
88	Guatemala	428,60	0,09	1 459	4 286	5 745	0,11
89	Tanzania	397,80	0,08	1 459	3 978	5 437	0,11
90	Bahrain	395,00	0,08	1 459	3 950	5 409	0,11
91	Azerbaijan	391,70	0,08	1 459	3 917	5 376	0,11
92	Jamaica	382,90	0,08	1 459	3 829	5 288	0,10
93	Panama	376,80	0,08	1 459	3 768	5 227	0,10
94	Costa Rica	369,40	0,08	1 459	3 694	5 153	0,10
95	Uganda	361,00	0,08	1 459	3 610	5 069	0,10
96	Jordan	343,10	0,07	1 459	3 431	4 890	0,10
97	Latvia	332,30	0,07	1 459	3 323	4 782	0,09

98	Afghanistan	323,80	0,07	1 459	3 238	4 697	0,09
99	Senegal	323,60	0,07	1 459	3 236	4 695	0,09
100	Iceland	321,80	0,07	1 459	3 218	4 677	0,09
101	Cyprus	303,80	0,06	1 459	3 038	4 497	0,09
102	Brunei Darus-salam	301,30	0,06	1 459	3 013	4 472	0,09
103	Ethiopia	300,70	0,06	1 459	3 007	4 466	0,09
104	Syrian Arab Republic	293,60	0,06	1 459	2 936	4 395	0,09
105	El Salvador	287,20	0,06	1 459	2 872	4 331	0,09
106	Cameroon	276,00	0,06	1 459	2 760	4 219	0,08
107	Bosnia and Herzegovina	265,20	0,06	1 459	2 652	4 111	0,08
108	Papua New Guinea	263,20	0,06	1 459	2 632	4 091	0,08
109	Nicaragua	260,00	0,05	1 459	2 600	4 059	0,08
110	Liberia	258,40	0,05	1 459	2 584	4 043	0,08
111	Honduras	249,80	0,05	1 459	2 498	3 957	0,08
112	South Sudan	246,00	0,05	1 459	2 460	3 919	0,08
113	Madagascar	244,40	0,05	1 459	2 444	3 903	0,08
114	Estonia	243,60	0,05	1 459	2 436	3 895	0,08
115	Bolivia	240,10	0,05	1 459	2 401	3 860	0,08
116	Turkmenistan	238,60	0,05	1 459	2 386	3 845	0,08
117	Mozambique	227,20	0,05	1 459	2 272	3 731	0,07
118	Gabon	216,00	0,05	1 459	2 160	3 619	0,07
119	Guinea	214,20	0,04	1 459	2 142	3 601	0,07
120	Georgia	210,40	0,04	1 459	2 104	3 563	0,07
121	Sierra Leone	207,40	0,04	1 459	2 074	3 533	0,07
122	Paraguay	201,40	0,04	1 459	2 014	3 473	0,07
123	Botswana	197,20	0,04	1 459	1 972	3 431	0,07
124	Namibia	191,10	0,04	1 459	1 911	3 370	0,07
125	Mali	186,60	0,04	1 459	1 866	3 325	0,07
126	Bahamas The	182,40	0,04	1 459	1 824	3 283	0,07
127	Guyana	181,80	0,04	1 459	1 818	3 277	0,07
128	Kyrgyz Republic	177,60	0,04	1 459	1 776	3 235	0,06
129	Cambodia	175,00	0,04	1 459	1 750	3 209	0,06

130	Tajikistan	174,00	0,04	1 459	1 740	3 199	0,06
131	Moldova	172,50	0,04	1 459	1 725	3 184	0,06
132	Malta	168,30	0,04	1 459	1 683	3 142	0,06
133	Haiti	163,80	0,03	1 459	1 638	3 097	0,06
134	Somalia	163,40	0,03	1 459	1 634	3 093	0,06
135	Congo Republic of	162,00	0,03	1 459	1 620	3 079	0,06
136	Rwanda	160,20	0,03	1 459	1 602	3 061	0,06
137	Equatorial Guinea	157,50	0,03	1 459	1 575	3 034	0,06
138	Nepal	156,90	0,03	1 459	1 569	3 028	0,06
139	Burundi	154,00	0,03	1 459	1 540	2 999	0,06
140	Togo	146,80	0,03	1 459	1 468	2 927	0,06
141	Mauritius	142,20	0,03	1 459	1 422	2 881	0,06
142	North Macedo- nia	140,30	0,03	1 459	1 403	2 862	0,06
143	Chad	140,20	0,03	1 459	1 402	2 861	0,06
144	Albania	139,30	0,03	1 459	1 393	2 852	0,06
145	Malawi	138,80	0,03	1 459	1 388	2 847	0,06
146	Niger	131,60	0,03	1 459	1 316	2 775	0,06
147	Suriname	128,90	0,03	1 459	1 289	2 748	0,05
148	Armenia	128,80	0,03	1 459	1 288	2 747	0,05
149	Mauritania	128,80	0,03	1 459	1 288	2 747	0,05
150	Benin	123,80	0,03	1 459	1 238	2 697	0,05
151	Burkina Faso	120,40	0,03	1 459	1 204	2 663	0,05
152	Central African Republic	111,40	0,02	1 459	1 114	2 573	0,05
153	Lao People's D.R.	105,80	0,02	1 459	1 058	2 517	0,05
154	Fiji Republic of	98,40	0,02	1 459	984	2 443	0,05
155	Barbados	94,50	0,02	1 459	945	2 404	0,05
156	Kosovo	82,60	0,02	1 459	826	2 285	0,05
157	Andorra	82,50	0,02	1 459	825	2 284	0,05
158	Eswatini	78,50	0,02	1 459	785	2 244	0,04
159	Mongolia	72,30	0,02	1 459	723	2 182	0,04
160	Lesotho	69,80	0,01	1 459	698	2 157	0,04
161	Gambia The	62,20	0,01	1 459	622	2 081	0,04

162	Montenegro	60,50	0,01	1 459	605	2 064	0,04
163	San Marino	49,20	0,01	1 459	492	1 951	0,04
164	Djibouti	31,80	0,01	1 459	318	1 777	0,04
165	Guinea-Bissau	28,40	0,01	1 459	284	1 743	0,03
166	Belize	26,70	0,01	1 459	267	1 726	0,03
167	Timor-Leste	25,60	0,01	1 459	256	1 715	0,03
168	Vanuatu	23,80	0,01	1 459	238	1 697	0,03
169	Cabo Verde	23,70	0,01	1 459	237	1 696	0,03
170	Seychelles	22,90	0,01	1 459	229	1 688	0,03
171	St, Lucia	21,40	0,00	1 459	214	1 673	0,03
172	Maldives	21,20	0,00	1 459	212	1 671	0,03
173	Solomon Islands	20,80	0,00	1 459	208	1 667	0,03
174	Bhutan	20,40	0,00	1 459	204	1 663	0,03
175	Antigua and Barbuda	20,00	0,00	1 459	200	1 659	0,03
176	Comoros	17,80	0,00	1 459	178	1 637	0,03
177	Grenada	16,40	0,00	1 459	164	1 623	0,03
178	Samoa	16,20	0,00	1 459	162	1 621	0,03
179	Eritrea	15,90	0,00	1 459	159	1 618	0,03
180	São Tomé and Príncipe	14,80	0,00	1 459	148	1 607	0,03
181	Tonga	13,80	0,00	1 459	138	1 597	0,03
182	St, Kitts and Nevis	12,50	0,00	1 459	125	1 584	0,03
183	St, Vincent and the Grenadines	11,70	0,00	1 459	117	1 576	0,03
184	Dominica	11,50	0,00	1 459	115	1 574	0,03
185	Kiribati	11,20	0,00	1 459	112	1 571	0,03
186	Micronesia	7,20	0,00	1 459	72	1 531	0,03
187	Marshall Islands	4,90	0,00	1 459	49	1 508	0,03
188	Palau	4,90	0,00	1 459	49	1 508	0,03
189	Nauru	2,80	0,00	1 459	28	1 487	0,03
190	Tuvalu	2,50	0,00	1 459	25	1 484	0,03
	Total	476 272,00	99,95	277 210	4 762 720	5 039 930	99,94

Table 22: Quota and Voting powers

	Member	Total IMF Credit Outstanding as of 03/09/2023)	Voting Power
1	Argentina	32 240 927 500	0,66
2	Egypt	13 419 696 671	0,43
3	Ukraine	7 509 785 838	0,43
4	Ecuador	6 096 350 000	0,17
5	Pakistan	5 692 166 668	0,43
6	Colombia	3 750 000 000	0,43
7	Angola	3 213 400 000	0,18
8	South Africa	3 051 200 000	0,63
9	Nigeria	2 454 500 000	0,52
10	Kenya	1 766 686 300	0,14
11	Cote d'Ivoire	1 547 694 336	0,16
12	Tunisia	1 525 921 643	0,14
13	Morocco	1 499 800 000	0,21
14	Jordan	1 464 952 000	0,10
15	Ghana	1 262 718 000	0,18
16	D.R. Congo	1 142 200 000	0,24
17	Bangladesh	1 050 210 800	0,24
18	Sudan	991 551 000	0,15
19	Costa Rica	988 200 000	0,10
20	Cameroon	953 580 000	0,08
21	Senegal	906 040 000	0,09
22	Uganda	812 250 000	0,10
23	Sri Lanka	787 892 508	0,14
24	Serbia	785 760 000	0,16
25	Gabon	752 445 000	0,07
26	Madagascar	653 458 800	0,08
27	Jamaica	558 400 873	0,10
28	Chad	556 101 000	0,06
29	Benin	530 485 300	0,05
30	Ethiopia	524 550 000	0,09
31	Myanmar	516 800 000	0,13
32	Tanzania	513 160 000	0,11
33	Moldova	494 765 003	0,06
34	Dominican Republic	477 400 000	0,12

35	Georgia	469 000 000	0,07
36	Mozambique	444 933 331	0,07
37	Honduras	424 660 000	0,08
38	Mali	388 402 600	0,07
39	Afghanistan	377 046 000	0,09
40	Panama	376 800 000	0,10
41	Sierra Leone	363 311 400	0,07
42	Niger	362 169 000	0,06
43	Armenia	356 896 677	0,05
44	Bosnia and Herzegovina	355 034 375	0,08
45	Guinea	348 458 000	0,07
46	Barbados	336 175 000	0,05
47	Malawi	327 917 000	0,06
48	El Salvador	287 200 000	0,09
49	Albania	279 300 008	0,06
50	Somalia	278 429 780	0,06
51	Uzbekistan	275 600 000	0,14
52	Papua New Guinea	263 200 000	0,08
53	Nepal	253 225 000	0,06
54	Mauritania	249 044 000	0,05
55	South Sudan	246 000 000	0,08
56	Togo	245 133 000	0,06
57	Kyrgyz Republic	227 073 400	0,06
58	Burkina Faso	226 995 500	0,05
59	Congo	226 800 000	0,06
60	North Macedonia	224 480 000	0,06
61	Rwanda	222 277 500	0,06
62	Mongolia	209 307 020	0,04
63	Central African Republic	200 210 000	0,05
64	Haiti	193 681 800	0,06
65	Liberia	192 790 400	0,08
66	Namibia	191 100 000	0,07
67	Bahamas	182 400 000	0,07
68	Zambia	139 880 000	0,22
69	Tajikistan	139 200 000	0,06
70	Nicaragua	130 000 000	0,08
71	Gambia	95 639 250	0,04

72	Seychelles	90 583 750	0,03
73	Suriname	78 800 000	0,05
74	Eswatini	78 500 000	0,04
75	Equatorial Guinea	76 537 000	0,06
76	Montenegro	60 500 000	0,04
77	Burundi	60 400 000	0,06
78	Cabo Verde	46 220 000	0,03
79	Kosovo	41 300 000	0,05
80	Lesotho	36 604 000	0,04
81	Guinea-Bissau	32 284 600	0,03
82	Djibouti	31 800 000	0,04
83	Sao Tome & Principe	25 207 573	0,03
84	Grenada	24 812 000	0,03
85	St. Lucia	21 400 000	0,03
86	Maldives	21 200 000	0,03
87	Solomon Islands	21 171 434	0,03
88	St. Vincent and the Grenadines	20 494 950	0,03
89	Comoros	16 785 400	0,03
90	Samoa	16 780 000	0,03
91	Yemen	14 625 000	0,13
92	Dominica	13 970 000	0,03
93	Tonga	13 800 000	0,03
94	Vanuatu	4 250 000	0,03
	Total	111 448 844 988	10,57

Table 23: Debtors (Amount of Debt and voting power)