Lifting the Veil of Mystery:

The Determinants of Quotas in the International Monetary Fund (IMF)

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Abstract:

Quotas constitute one of the most critical dimensions of the governance and functioning of the IMF: they determine members' financial contributions and thus their relative voting power within the institution and affect the size of loans members receive from the institution. Despite their ubiquity in policy discussions on the IMF, systematic studies of quotas remain scarce. Based on an original panel dataset, this paper analyzes members' quota adjustments in 1965-2010.   A set of well-defined procedures governs these quota shifts, which receive extensive member state scrutiny. Members jealously guard their own quotas and ranking. Given the transparent and procedural nature of quota shifts, the costs of US influence over them should be relatively high and hence unexpected (Stone 2011).   This paper, however, finds robust evidence of such influence, controlling for a host of variables. Yet, the paper also demonstrates that the costs associated with this influence affect the nature of US interference. Besides advancing the understanding of the IMF, the paper shows the institutional context's impact upon the exercise of US power.

1. Introduction

Member quotas in the IMF constitute one of the most critical dimensions of the institution's governance and functioning. Quotas determine members' financial contributions and thus their relative voting power within the institution.[1] They also provide a benchmark, albeit rough and inconsistent, for the volume of loans the members can receive from the institution. Moreover, quotas have affected the members' shares in the World Bank for the majority of the Bank's history.

Quotas, thus, hold great significance for IMF members. They determine a member's formal political power in the institution, and formal political power illustrates the "outer structural constraint" within which the institution works (Woods 2006, 4). States have "a keen awareness that any change in the quota structure might affect their proportionate influence over the Fund's decision-taking and their ranking vis-à-vis other members"

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[1] Voting in the IMF also includes "basic votes", which are distributed equally to member states and account currently for only about 5.5% of the member's total voting power.

(Lister 1984, 76).[2] As an example, Japan's efforts to enhance its position to the second largest quota-holder in the IMF in the 1990s was marked both by Japanese insistence on this ranking and the British and French sensitivity to being surpassed by Japan (Rapkin et al 1997). Due to a similar concern for rankings, since 1990, the UK and France have requested to tie their quotas in the IMF. Quotas also tend to be a source of "prestige among peers" or even national pride, which additionally explains member states' close attention to them (Boughton 2001, 857). As Pauly (1997, 112) expresses, quotas determine the "internal pecking order among Fund members". As the IMF emphasizes, "quotas represent not only relative economic position but also, to some extent, relative political positions" in international affairs (EBD/69/165 1969). Hence domestic ratification agencies that appropriate the funds to multilateral institutions, such as the US Congress, tend to closely oversee not just the financial dimension of quotas, but also their effects on relative standing (Broz 2005, 2008; Broz and Hawes 2006; Lavelle 2011; U.S. Senate 2010, 4).

Unsurprisingly, quotas have been central to policy discussions on the IMF. For instance, the G20's 2009 Pittsburgh summit noted that "the IMF should remain a quota-based organization and the distribution of quotas should reflect the relative weights of its members in the world economy".[3] In another example, a *Financial Times* editorial assessed the IMF's 2008-2010 reforms as essential in maintaining "the IMF's legitimacy – and firepower – in a volatile world" (*Financial Times* 2014). Quotas have also concerned domestic audiences. The Obama Administration's travails to get the US Congress to increase the USA's commitment to its IMF quota in 2013-2014 have made headlines in many news sources (e.g., Weisman 2014).

Despite the centrality of quotas in both the IMF's governance and policy discussions, there is scant academic work that systematically analyzes them. This point becomes even more unexpected when one considers that quotas also offer a window into the design of

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[2] The IMF's Executive Board tends to reach decisions by consensus, which indicates "a position supported by executive directors having sufficient votes to carry the question if a vote were taken" (Gold 1972, 198; also Pauly 1997, 113). And, "[a]t no time has the avoidance of voting connoted a dismissal of interest in voting power" (Gold 216; see also Boughton 2001, e.g., xxi).

[3] https://www.g20.org/sites/default/files/g20_resources/library/Toronto_Declaration_eng.pdf

the IMF, a key interest within International Relations literatures (Koremenos et al 2001).[4] Fundamental questions—what are the determinants of IMF quotas? How has the determination of quotas changed over time? What are the rules and conventions that govern quota shifts? Can the primary shareholders of the IMF exert influence over quota adjustments? – elude scholarly analyses. In a way, quota discussions and changes have occurred behind a veil of mystery.

This paper begins to lift that veil in a number of ways. It details how the IMF has determined and altered members' quotas. Moreover, the paper revisits the contentious nature of the distribution of quotas at the institution's inception in 1944. Here, relying on an original cross-sectional dataset, which I collated based on IMF archival documentation, the paper provides a snapshot of the relationship between the members' starting quotas at the IMF and members' economic size.

Further, based on an original panel dataset of members' quota changes in the IMF, the paper probes whether the USA exerts influence over IMF quota adjustments. The literature on the IMF and the World Bank has established US influence over these institutions' loan decisions, demonstrating political-economic and/or geostrategic proximity to the USA affects not just the size of loans, but also the conditionality members receive (Barro and Lee 2005; Copelovitch 2010; Fleck and Kilby 2006; Stone 2004; Thacker 1999).

Yet, the nature of quota adjustments should make US influence over quota shifts relatively (politically) costly and thus unexpected. Quota adjustments, in Stone's (2011) words, belong to formal governance. Under formal governance, "legitimate procedures that embody a broad consensus of the membership" reign as opposed to "informal rules, [which] allow exceptional access for powerful states to set the agenda and control particular outcomes" (ibid, 13). In the case of quota adjustments, these procedures involve extensive member state scrutiny and debate over the quota shift each member will receive. A set of well-defined rules and conventions determines how members will

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[4] Bird and Rowlands (2006) concur with this observation, and their study as well as Broz (2005); Broz and Hawes (2006); Blomberg and Broz (2006); Lister (1984); Pauly (1997) emphasize the importance of examining quotas, but do not analyze the determinants of quotas over time.

alter quotas, making quota adjustments highly constitutionalized. Further, these adjustments remain vested in the Board of Governors. Given quota adjustments are relatively more transparent, involve low levels of delegation (to the staff and the Executive Board), and receive a high level of member state oversight, the costs of a US exercise of influence during quota adjustments should be relatively high and hence relatively unexpected (Stone 2011, 52).

The presence of the US de facto veto power over quota adjustments does not alter this point. This veto power is of greater utility to the USA before and after the process of quota adjustments. Beforehand, the members tend to negotiate an increase to the IMF's total quota (i.e. the sum of all member quotas). Here, if the largest shareholders of the institution are unwilling to boost the IMF's quota, it is unlikely this increase will happen.[5] And, after the quota adjustment, the USA can utilize its veto as a vote of disapproval on the outcome.[6] Yet, given the importance of quotas, the process of quota adjustments is highly politically sensitive and receives each and every member's detailed attention. Thus, other members would frown upon US influence over this process, thereby making such an intervention particularly politically contentious (hence costly) for the USA.

Despites its high associated costs, US influence over quota adjustments cannot be ruled out and deserves analysis because the presence of extensive political negotiations over these quota shifts permits the opportunity for such influence.[7] The US also has potential gains to make through such interference, including ensuring that states with relatively strong ties to it receive greater quota increases and the institutional rankings of members meet US expectations. And, since quotas are so important to member states, the USA can curry favors with other members by facilitating higher quota increases for them.[8]

This paper's regression analyses on the panel dataset of all quota adjustments during 1965-2010 show that a member's political-economic proximity to the USA positively and

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[5] See Broz and Hawes (2006) on total quota increases and the US Congress.
[6] Studies have found the veto power to generally confer only negative power on the USA, and any small majority can also utilize it, which explains why minorities within the institution have preferred its retention (Abdelal et al 2007; Leech 2002; IMF 2010; Rapkin and Strand 2005).
[7] The statistical specifications in this paper account for the US de facto veto over quota adjustments, which has existed throughout the institution's history.
[8] "The USA", as shorthand, refers to the common position the US actors present at the IMF.

significantly affects the increases the member receives during quota shifts, controlling for a host of variables.   The evidence also suggests US influence over quota adjustments differs in nature than US interventions in the institution's loan decisions—the USA does not appear to pursue geostrategic interests, and it exercises its influence in ways that will be relatively discreet. This finding affirms the point about the USA facing relatively higher costs of influence over quota adjustments.

Directly below, I provide a brief historical overview of IMF quotas (Section 2), followed by a discussion of quota adjustments, which outlines some propositions (Section 3). The data analysis investigates those propositions and undertakes numerous robustness tests and extensions to the core regression analyses (Section 4). Section 5 emphasizes the paper's broad implications and outlines further research possibilities.

2. Historical Overview of IMF Quotas

While state representatives easily settled on the notion of weighted voting in the IMF at the 1944 Bretton Woods (BW) negotiations, which created the institution, the same cannot be said about the distribution of quotas (Gold 1981).   The US designers and other state representatives converged on the necessity for weighted voting in the IMF given that the institution required asymmetric financial contributions. For instance, Harry Dexter White, the chief US negotiator, in his plans for the BW institutions (known as the White Plan), referred to the linkage between voting and financial contributions explicitly: "If each member of the board were to be given an equal vote, then a small country that invested one million dollars would have as much power in making decisions as a country that has subscribed a hundred or a thousand times that amount" (Gold 1972, 19). The Joint Statement, which the American and British officials co-penned, reemphasized this principle (U.S. Treasury 1944).

This notion that asymmetric contribution justified asymmetric representation received widespread acceptance during the inter-state negotiations in BW. Delegations from not

just advanced economies, but also a group as diverse as Ecuador, China, Mexico, Greece, and Ethiopia supported it. The Mexican delegate's thoughts are representative: "It may appear inconsistent with [Mexico's] normal position as a debtor country, but has it not always been true that creditors have more to say about lending money than borrowers?...*we all thought it was a basic principle that, creditor nations should have proportionately more voting power than the debtor nations*" (Schuler and Rosenberg 2012, 481, emphasis added).[9] In short, weighted voting in the IMF was not a controversial issue, and hence there was little discussion on its appropriateness during the negotiations (Gold 1981).

The same cannot be said about the distribution of the quotas, which was debated so extensively that the negotiators at BW had to form the special Committee on Quotas to discuss the matter extensively (see also Lister 1984). Even within this fifteen-member committee, however, five of the members had dissenting views (Schuler and Rosenberg 2012).

The quotas of the IMF's original members, as would be the case in the rest of the institution's history, were determined in a highly political manner. Raymond Mikesell, the American economist who led the efforts to devise a formula for ascertaining the quotas, writes the following (1994, 22):

> In mid-April 1943…[Harry Dexter] White called me to his office and asked that I prepare a formula…He gave no instructions on the weights to be used, but I was to give the United States a quota of approximately $2.9 billion; the United Kingdom (including its colonies), about half the U.S. quota; the Soviet Union, an amount just under that of the United Kingdom; and China, somewhat less… White's major concern was that our military allies (President Roosevelt's Big Four) should have the largest quotas, with a ranking on which the president and the secretary of state had agreed…I went through dozens of trials, using different weights and combinations of trade data before reaching a formula that satisfied most of White's objectives…

While Mikesell's account would lead one to believe at least the USA's allies would be satisfied with their quotas, even France and China regarded the quotas the American team had generated not to reflect their self-assessed importance in the post-war world. China

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[9] The Schuler and Rosenberg book comprises original BW transcripts.

noted: "The present quota…for China, when published, would be received with general disappointment by the people of China" (Schuler and Rosenberg 2012, 214). Iran, Greece, India, and New Zealand expressed similar concerns. As one of the US officials emphasized: "[m]ost requests for larger quotas were a reflection of the desire of the countries to maintain their prestige…There were only a few cases in which countries wanted larger quotas because they believed it would give them greater opportunity to use the resources of the fund" (U.S. House of Representatives 1945, 168). Figure 1 below displays the quotas of the then largest shareholders of the IMF as a result of these negotiations.[10] Importantly, the contentious nature of the distribution of quotas demonstrated the member state sensitivity to the issue.

[Figure 1 here]

3. Institutional Determination of Quotas and Quota Shifts

Little has changed since the inception of the IMF in terms of member state sensitivity over quota adjustments and their political nature. On the surface, some kind of objective quota formula, which includes a number of core economic variables, is supposed to form a baseline for determining the member's initial quotas, as well as subsequent shifts. Although the calculation and combination of these variables in specific formulae has changed over time, the variables themselves have, more or less, stayed the same. These variables are: the member's GDP, its average imports and exports in a recent period, the variability of its exports, and the level of its reserves. Table 1 below summarizes the range of datasets and formulae used at different times.

 [Table 1 here]

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[10] Cognizant of the sensitivity to relative ranking, the US designers also included basic votes (footnote 1) to partially "[recognize] the doctrine of equality of states" (Gold 1972, 18) and partially to allow the smaller states to have large enough voice to reflect "their true interests in [the] organization" (Schuler and Rosenberg 2012, 468).

A member's original formula (i.e. at the time of joining) is based on one of the quota formulae as well as negotiations between the joining member and the existing members. These negotiations can involve a range of technical matters, such as which exchange rate to use for the economic variables, as well as political issues, such as ensuring that the joining member's quota is commensurate with members of comparable economic size. Given the difficulty of having a full set of historical data, which dates back to the immediate post-war period, on all the variables that the IMF considers in its quota formulae, carrying out a comprehensive study of the determinants of members' initial IMF quotas is not yet possible.

Nonetheless, I gathered all of these initial quotas through IMF archives, and the scatter plot in Figure 2 demonstrates the significant, strong correlation between initial quotas and members' real GDP at the time.[11] The figure also labels some of the outliers and indicates the USA's position. With greater data availability, it would be useful to control for a set of economic variables to examine political influences over these initial quota determinations – an exercise that I shortly undertake for quota shifts.

[Figure 2 here]

Once a member has joined the IMF, its subsequent quotas are determined through quota adjustments that tend to follow boosts to the IMF's total quota (sum of all member quotas). Table 2 below summarizes the IMF quota reviews since the institution's inception until 2010, noting whether the reviews resulted in the institution receiving a total quota increase. The IMF Articles of Agreement stipulates for quota reviews within a maximum of five years, though as Table 2 indicates the members can decide not to increase the total quota following these reviews.   With one exception, all IMF quota shifts have followed the total quota increases Table 2 lists. This exception occurred in 2008 when the members redistributed the existing total quota to give the developing members greater representation.[12]

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[11] I used the most extensive historical data on GDP, the Angus Madison Project, which provides real GDP figures: http://www.ggdc.net/maddison/maddison-project/home.htm. When I lagged the GDP variable by a year, the results were almost identical.
[12] The 2008 adjustment followed the same procedures as earlier quota shifts.

[Table 2 here]

Despite the presence of the quota formulae, shifts in IMF quotas have been shrouded in mystery for a number of reasons. It is not possible to ascertain which IMF quota formula has applied to which member state during the quota adjustments. Up until 2008, when the IMF quota formula was revised with a view to making it more transparent, the institution was utilizing five different formulae and two different datasets (EBD/69/165 1969). Even though the formulae with greater weight of exports and variability have been said to be generated for the developing members (given these variables would indicate their potential demand for IMF resources), in reality, "no particular pair of quota formula [has applie[d] exclusively to any particular group or type of members" (SM/81/91 1981; IMF 2000; Lister 1984 on the first point).

Additionally, one formula – the Bretton Woods Formula (BWF) – had an influence on all calculations (see Table 1 on BWF). Once the members were able to agree on the total quota increase for the IMF, the distribution of this total to each member would need to be determined. Because of the necessity of the sum of individual members' quota increases to equal the total negotiated increase, the formulae would have to be "normalized" (in IMF parlance).   And the various formulae used for each individual quota increase were traditionally normalized using the BWF (SM/81/91 1981).   Because of these various layers of manipulation in the formulae, Jacques Polak (1981), who served as the Director of Research at the IMF, once claimed there is "one single formula hidden somewhere in the computer, which…produces the quota for each individual country."

Further, the quota formulae have in many instances provided *ex post* justifications for members' existing quotas in the institution. For instance, in discussing why the original BWF was revised in the early 1960s, an IMF document states: "...the weights in the [BWF] were each reduced by 50 percent, thereby yielding a calculated set of quotas closer to the then existing size of quotas" (IMF 2005; Table 1). In other words, the

revisions to the formula aimed to match the technical calculations to the existing quotas rather than arrive at a new quota distribution (see also IMF 2000, 12).

Another major reason as to why a simple link between the quota formula and adjustments in member's quotas remains elusive has to do with the fact that quota changes remain subject to extensive political negotiations among IMF members (see also Bird and Rowland 2006). As one IMF document puts it, the rankings of members resulting from quota changes "represents a remarkable compromise among various economic and noneconomic considerations. This ranking can presumably not be reordered by reference to economic criteria" (SM/59/6 1959). Given member states regard quotas to reflect not just relative economic importance, but also "relative political positions" in international affairs, the "[p]olitical battles over quota increases" are not proportionate to the small economic sums that may be involved (EBD/69/165 1969; Boughton 2001 857). The extent to which quota formulae formed the basis for quota shifts versus political negotiations has not only varied across different quota reviews, but also remains unclear (SM/95/152 1995). Clearly, though, the formulae have not constituted the sole basis for quota changes; rather, negotiations among members have determined the bottom line in quota shifts (EBD/69/165 1969).

The political negotiations over IMF quota shifts occur in multiple stages. Initially, as noted earlier, IMF members undertake negotiations to obtain convergence on the overall quota increase (Table 2). Here, the largest shareholders tend to prefer modest increases, compared to both the IMF staff, who have an inherent interest in expanding their role, and some developing countries, which see the quota increase as the basis for both greater voice within the institution as well as the ability to gain better access to institutional loans (see, e.g., Vaubel 1991; also EBM/89/154 1989; EBM/06/75-2 2006). Relatively larger quota increases tend to happen when the ongoing or projected demand on the IMF's resources is significant.

Once the members agree on a total increase, they then extensively negotiate the manner in which it will be distributed among them. Crucially, members need to concur on a list of recipients for the "special increases". Quota increases tend to have uniform and non-uniform components. The uniform part of the increase constitutes an increase on the

member's actual quotas, which have been traditionally a set percentage increase. The non-uniform part of the increase, prior to the 1980s, is referred to as a "special increase" and, after the 1980s, as a "selective" increase, namely an increase based on the member's calculated quota (using one of the formulae in Table 1). Table 3 below lists these special increases.

[Table 3 here]

Special or selective increases are politically contentious by design, as they benefit a small group of members and may disturb existing rankings. These special increases are justified with reference to statistics, which show the country is "under-represented" in the institution, though what constitutes under-representation remains open to negotiation. For instance, in 1959, the special increases were determined by a specific ratio of quotas to member's imports and exports (SM/59/6 1959). In 1978, many Executive Directors argued that only countries whose calculated quotas (based on one of the formulae) was four times more than their actual quotas should qualify for special increases, so that the number of special increases could be limited (SM/78/221 1978). Further, the members often decide on the economic criteria for determining selective increases in an *ex post* manner – following agreement on the recipients for the special increases (e.g., EBS/58/59 1958).[13] Generally, the IMF staff provides the members with different calculations to show which countries could qualify for selective increases under different criteria, and the members negotiate for the most mutually palatable outcome (Boughton 2001, 875; EBM/90/79 1990).

Implications

The presence of extensive political negotiations over IMF quotas shifts points to potential room for political interference with these adjustments. And, given the importance of quotas for ranking and prestige in the institution, it is apparent why the recipients would

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[13] This does not suggest these increases are void of economic rationale.

welcome relatively higher quota increases, which in turn suggests why the USA has something to gain by pursuing such influence.[14] Given the USA's influence over the IMF's (and the World Bank's) loan decisions has been extensively documented, it is reasonable to explore whether the USA exerts influence over quota adjustments. This literature, controlling for relevant variables, takes the significance of political-economic or geostrategic proximity to the USA on loan decisions as the indicator of US influence. Because of the importance of quotas for members, quota shifts are an important arena where there could be some benefits to the USA exerting influence, including dolling out favors to other states or ensuring that the quota shifts are to its liking. Hence:

Proposition 1: Political-economic proximity to the USA positively and significantly affects members' quota shifts.

Importantly, however, we would expect this kind of US influence over quota shifts predominantly for the non-advanced economies (developing economies, including both emerging and least developed).[15] The advanced economies in the IMF sit at the top of a formal hierarchy, which means they have relatively less at stake in these quota shifts in terms of enhanced voice in the institution. Presumably, given their advantageous formal position, these economies can also self-help in seeking relatively higher quota adjustments, if they wish. The other utility of quotas – benchmarks for loans taken from the institution – should also matter less for the advanced economies, since many of them do not rely on IMF loans.   Thus, not only would the advanced economies be less likely to seek US influence over quota shifts, the USA would also have less to gain by intervening on their behalf (the favor of a relatively higher quota means relatively less for these countries). In any case, most institutional discussions on quota shifts tend to refer to non-advanced economies. Therefore:

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[14] There is indeed anecdotal evidence of the USA using quota increases as enticements (e.g., Lipscy 2003).

[15] I categorized the countries following IMF classification: advanced economies, developing economies, and the poorest countries that qualify for concessional assistance from the IMF's Poverty Reduction and Growth Trust (PRGT). Quota discussions tend to refer to developing and PRGT sub-samples together, which are grouped as "non-advanced".

Proposition 1.1: Political-economic proximity to the USA positively and significantly affects members' quota shifts for the group of non-advanced economies.

Yet, the above discussions also suggest that the USA should face high costs in influencing IMF quota adjustments. As the contentiousness of quota adjustments itself suggests, the members pay close attention to these shifts, jealously guard their own increases, and try to limit unusual gains by others (such as by imposing strict criteria on special increases). At same time, a set of well-defined procedures governs quota shifts: members debate to converge on the most palatable set of calculations. In Stone (2011)'s terminology, IMF quota shifts represent formal governance, where playing by the established rules and procedures matters significantly more than in circumstances where transparency is lower, delegation to staff is higher, and rules or procedures may be unclear. For these reasons, while other members may need the USA's blessing for the total increase, given the USA is the largest shareholder and can veto quota adjustments, the USA intervening to ensure higher increases for certain states would not be "ordinary" (Stone 2011). Overall, US influence to ensure some members relatively higher quota increases face relatively high costs.

That US influence over quota adjustments incurs relatively high costs likely affects the nature of the US intervention. To begin with, the USA may be refraining from the general pattern of intervention attributed to it in its influence over IMF and World Bank loan decisions. Specifically, the literature has identified "geopolitical and financial interests" as the primary motivators of US influence in loan interventions (Chwieroth 2013, 266). Such geopolitical proximity to the USA can often be captured with reference to a member's bilateral aid ties to the USA or its voting affinity with the USA in the United Nations General Assembly (UNGA) (e.g., Thacker 1999; Stone 2004). In the case of quota shifts, the USA should face higher costs in the pursuit of geopolitical interests. Put differently, we would expect to find only certain types of closeness with the USA to positively and significantly affect *quotashift*.

Further, the US may face different motivations in "favor provision", i.e. intervening on behalf of states with strong political-economic ties to it. It may be sensitive to US commercial interests, pleasing countries from which the USA buys relatively more goods,

responding to countries' requests that are relatively more reliant on it, either in terms of aid or trade, or it may be motivated by a mixture of these rationales. While this study alone is not enough to unearth the exact US motivations, Table 4 below shows the evidence one would expect to find for each of these distinct motivations.[16]

Overall, finding that political-economic as opposed to geopolitical proximity motivates the US influence would go toward showing that the constitutionalized nature of quota shifts, nonetheless, constrains US behavior. This kind of favor provision would be relatively less visible and objectionable from the viewpoint of the membership. The favoring, nonetheless, serves US interests because it allows the USA to utilize institutional opportunities (the extensive political negotiations over quota shifts) to advantage its partners.

4. Quantitative Analysis of Quota Shifts

To probe the US influence over IMF quota adjustments, I have compiled a dataset of all quota shifts from 1965 to 2010 based primarily on IMF archives as well as more recent institutional documentation.[17] The dependent variable of interest, labeled as *quotashift*, is the percentage increase in the member's quota from one quota review to the next. The following years are covered in *quotashift*: 1965, 1970, 1976, 1978, 1983, 1990, 1998,

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[16] Why these different rationales are activated, i.e. why US officials pursue them, is an interesting question, but extends beyond the scope of this analysis. One reason could be interest group pressure, but quota changes remain highly member state-centered, and they are an issue area for which interest groups tend not to be activated (e.g., Lavelle 2011). Even without interest group pressure, US officials may be more sensitive to countries where US has relatively high commercial stakes. At the same time, all rationales also could point to "access" by the USA's trading partners to US officials.

[17] Boughton (2001) contains the data for Sixth-Eighth General Reviews. While the IMF's International Financial Statistics provides the members' quotas, this dataset was not suited to this study because it does not indicate the quota shifts the members decided on during general reviews (or any other time they adjusted the quotas). Further, the IMF dataset records the quota subscriptions over time as members place funds in the IMF (members can "subscribe" to the agreed quotas at different paces within a set subscription period), which again made it not possible to use the IMF dataset to analyze the agreed quota increases. I compiled members' original quotas from IMF documentation.

2008, and 2010. The dataset comprises panel data (pooled cross-sectional data) and starts with the 1965 quota adjustment because the variables that one needs to control for in analyzing US influence over quota shifts, such as the economic factors in the IMF quota formulae, is available for most countries consistently only after 1960. If the member had joined the IMF in between the quota adjustments, then the member's starting quota is also taken into account in calculating an increase. Hypothetically, if the member joined in 1973, then the member's joining date falls between the 1970 and the 1976 quota shifts, and *quotashift* includes the percentage change from 1973 to 1976. Given member states have joined the IMF at different times, not every *quotashift* contains all the countries in the sample, making the dataset unbalanced. The full sample contains 159 countries for which data on the key variables of interest, including the economic variables in the formula and the political-economic proximity variables discussed below, were available. These countries cover over 85 percent of the IMF membership.[18]

Quotashift captures the differential boosting of quotas across different members during quota adjustments that affect the entire (if not, a large portion of) membership because it includes both the uniform and the special increases the members receive. As discussed, since giving some members higher percentage increases on their actual or calculated quotas is politically contentious, it becomes particularly important to assess uneven increases across members. In international relations terminology, *quotashift* allows the examination of US influence over some members' relative gains in quota adjustments.[19]

Following earlier studies on US influence on IMF/World Bank loans, I examine whether proximity to the USA significantly affects *quotashift*.   Here, the two key explanatory variables of interest are: the logarithm of the volume of bilateral trade between the USA and the member state, and the logarithm of bilateral economic aid from the USA to the member. The volume of bilateral trade is a key indicator of political-economic

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[18] See Appendix A for more detail.

[19] The analysis answers a different question when the level of member's quota is taken as the dependent variable. Nonetheless, political-economic proximity to the USA (specifically, the volume of bilateral trade with the USA) was still a significant explanatory factor for the level of the member's quota.

proximity.[20] Higher levels of economic interaction between two sides can generate closer relations, and bilateral trade ties can help one explain the extent to which the two economies are vested in one another.   Similarly, bilateral economic aid from the USA to the member could also indicate political-economic proximity to the USA. A rich literature extrapolates the political motivations in foreign aid, in general, and US foreign aid, in specific (see, e.g., Dreher et al 2009; Lancaster 2007).[21] The trade and aid variables, plausibly, capture different kinds of proximity, with the latter one closer to approximating geopolitical closeness. In robustness tests, I include additional variables that could capture proximity to the USA, such as voting affinity with the USA at the UNGA, which as mentioned can better capture geopolitical/strategic ties.[22]

The specifications control for the economic criteria contained in the IMF quota formulae (Table 1). The aim here is not to replicate the IMF formulae; rather, the goal is to assess, whether even after controlling for some key economic indicators the IMF considers, political-economic proximity to the USA significantly affects *quotashift*.   Because the IMF indicates relying on nominal values in the quota formulae, including nominal GDP and reserves, the economic variables are in nominal form. And, because *quotashift* is a growth variable (the percent change in members' quotas), following standard practice, I also include all economic variables in the equation as growth variables. Specifically, for GDP, imports, exports, and reserves, I include the three-year average of the annual growth rates and the standard deviation of the trade balance of the member over the ten-year period preceding *quotashift*.[23]

The estimations also have to control for "ad hoc" increases.[24] IMF designates shifts in members' quotas that happen outside of a general quota review as ad hoc. As in special

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[20] See, e.g., see Barro and Lee (2005); Morrow, Siverson, and Tabares (1998); Kastner (2007); Kilby (2011); Mansfield and Pevehouse (2000).

[21] Throughout, I ran the regressions substituting bilateral economic aid with bilateral military aid, but the military aid variable was consistently insignificant.

[22] Relevant studies that use this variable include Barro and Lee (2005); Kilby (2010); Thacker (1999).

[23] These three years begin with the year prior to the quota shift. Qualitatively and quantitatively very similar results are obtained when five-year averages are utilized.

[24] While the IMF labeled the 2008 shift in members' quotas "ad hoc" because it occurred outside of a general review, the dataset here measures the 2008 shifts as any other quota adjustment

increases, members frown upon these ad hoc increases given the selective benefits such increases deliver, which makes them infrequent. For instance, in 2006 only China, Mexico, South Korea, and Turkey received increases to their quotas based on the justification that they were the only members under-represented (the difference between their actual and calculated quotas) by more than 60 percent, and they were also under-represented by all the variables the formulae included. Based on IMF documentation, the panel dataset includes a dummy variable, which is coded as 1 if the member received an ad hoc increase prior to *quotashift*. The specifications additionally control for the member's population, as possibly larger countries might be advantaged in negotiations over quota adjustments. Appendix A lists all the variables as well as their descriptions and sources.

The estimation model is based on a fixed effects model, which includes fixed effects for both year and country and is specified as:[25]

$$y_{it} = x_{it}\beta + c_i + d_t + u_{it} \qquad\qquad t = 1, 2, 3 \dots T$$

Here, y denotes *quotashift*; x_{it} is the vector of the aforementioned explanatory variables; t stands for the time periods; i stands for country (i.e. member state); c_i designates the unobserved time invariant country effects; d_t captures the common time effects; and u_{it} stands for "idiosyncratic errors", namely unobserved country effects that vary across time (Woolridge 2002).[26]

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because unlike other ad hoc increases, the 2008 quota changes extended to almost the entire membership, with 166 countries receiving a quota change. Coding the 2008 shift as ad hoc did not alter the fundamental results presented here.

[25] The fixed effects model assumes that time invariant unobserved heterogeneity, c_i, is correlated with one or more of x_{it}, and it controls for this correlation. Hence, scholars prefer the fixed effects model for cross-country analysis (e.g., Woolridge 2002). I confirmed the usage of fixed effects through a Heckman Selection Model.

[26] d_t also accounts for the US de facto veto power which all members face and have faced since the institution's inception.

The results

Table 5, column (1) displays a baseline model that explores the impact of the control variables, including the economic variables, ad hoc increases, and population on the dependent variable, *quotashift*. Column 1 shows that growth in *reserves* and *ad hoc increases* significantly and positively relate to *quotashift*. The higher the average growth in the member state's reserves over the three years preceding the quota adjustment, the greater the member's *quotashift*. From a needs-based perspective, countries that have slower growth in reserves likely need relatively higher quota shifts, which are benchmarked against quotas, since they have a relatively lower ability for self-insurance against crises. Table 5 Column (1) also shows that receiving an ad hoc quota increase prior to the member state experiencing a quota adjustment significantly and positively relates to *quotashift*. The precise interpretation of this finding exceeds the scope here, but once members converge on some members getting out-of-the-ordinary increases (which ad hoc increases are) before quota adjustments, then it becomes easier for those same members to get relatively higher increases during quota adjustments as well.

[Table 5 here]

Table 5 Column (2) demonstrates that the member's volume of bilateral trade with the USA positively and significantly affects *quotashift*. In other words, as the member's volume of bilateral trade with the USA increases, the quota increase the member receives during quota reviews also goes up. Quantitatively, if bilateral trade between the USA and a member country increases by 10 percent, the country's quota would increase by 0.59 percentage points. Given the average *quotashift* is 0.5 percentage points, the impact of the volume of bilateral trade on *quotashift* is quantitatively and qualitatively important. Table 5 Column (3) includes the "Full Model" results, which additionally includes the volume of US bilateral economic aid to the member, which does not significantly relate

to *quotashift*.[27] As discussed previously, one would expect US influence over quota shifts specifically for the non-advanced countries. Table 5 Columns (4) and (5) display those results: although the results for the small sample of advanced economies are insignificant, for the group of non-advanced economies trade with the US retains its significance with a similar coefficient to the previous estimations.

Overall, the specifications reported in Table 5 demonstrate that political-economic proximity to the USA, measured as the member's volume of bilateral trade with the USA, enhances the increases a member receives to its quota.[28] This finding provides a significant step toward demonstrating US influence over quota adjustments where it is relatively less expected.

Robustness

This section tests the robustness of the results in Table 5.[29]

First, Table 6 below adds another control variable to Table 5 Column (3) – the member's trade with the rest of the world (log form). While the specifications in Table 5 contain a number of trade variables, adding a variable directly comparable to the US trade variable further enhances the results because it controls for the member's entire trade in a number of ways, allowing to further highlight the special role of trade with the USA. Table 6 Column (1) displays those results for the whole sample, while Columns (2) and (3), respectively, examine the advanced and non-advanced samples. Where we would expect

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[27] When the bilateral trade variable is excluded and only the aid variable is added to the baseline model, this aid variable still does not significantly affect *quotashift*. As noted earlier, military aid was consistently insignificant.

[28] The trade and aid variables are included in logarithmic form because the intent is to capture how the level of trade or aid ties with the USA affects *quotashift*. For the aid variable, in order to avoid the "log of zero" problem, I applied a common technique and added one to each observation before converting them to log (e.g., Kilby 2013). The conclusions reached in this paper do not change without this technique.

[29] I ran the full model (Table 5 Column (3)) with the average growth rate of the three (level) variables (calculated using the growth rate for the previous three years), and qualitatively and quantitatively very similar results to what I report here were obtained. I also obtained similar results when the log variables were lagged by one year.

to find US influence over quotashifts – the non-advanced sample—even with the inclusion of this additional trade variable, bilateral trade with the USA retains its significance (Column (3)).[30] Importantly, bilateral trade with the rest of the world does not affect *quotashift* for the non-advanced economies. Similar to previous results, ad hoc increases and variability in the trade balance are significant.

[Table 6 here]

The specifications below elaborate upon Table 6 Column (3). Table 7 further tests the robustness of the results by excluding the 2010 quota changes from the estimations. The quota adjustments in 2010 occurred during highly unusual circumstances, namely following the greatest economic downturn since the Great Depression.[31] The question is whether the unusual increase the member states provided to the IMF in 2010 could be affecting the results. Table 7 below shows that the results from the previous table carry over. Particularly, the volume of bilateral trade with the USA significantly affects *quotashift* both for the non-advanced economies (Columns (1)).[32]

[Table 7 here]

Table 7 below also includes the estimation results when a number of other variables that can potentially affect *quotashift* are included. Table 7 Column (2) incorporates a dummy variable that records whether or not the member belongs to a club of lenders to the IMF (*nab* and *gab*). In addition to quotas, member states can provide funds to the IMF

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[30] While the significance level is lower, this could be explained by the increased noise in the data.
[31] According to NBER, which is the official US business cycle dating agency, the 2008 recession ended in June 2009. National parliaments are still in the process of implementing the 2010 decisions at the time of writing.
[32] I also ran all the variables in real form, despite the IMF's reliance on nominal values, finding that real bilateral trade with the USA significantly affects *quotashift*.

through credit lines, which function effectively as loans when the IMF draws from them (Kaya 2012; Woods 2011). The General and New Arrangements to Borrow provide two separate mechanisms through which the IMF can borrow from its members. The General Arrangements to Borrow (GAB) was established in 1964 with funds from the ten main industrial countries. Since 1998, with the establishment of New Arrangements to Borrow (NAB), NAB has become the main borrowing resource for the IMF. Anecdotal evidence suggests lending to the IMF might confer advantages during quota shifts, but this issue has not been subjected to systematic analysis (Boughton 2001, 898-890). Column (2) shows the insignificant effects of NAB and GAB membership on *quotashift*. Future studies could more fully explore why this is the case, though plausibly other variables in the equation pick up the potential effects of NAB and GAB. More importantly, the bilateral trade volume with the USA remains significant with the inclusion of "nab" and "gab" variables.[33]

Table 7 also examines the impact of a number of other political variables. One of these is voting similarity with the USA at the UNGA (column (3)). This kind of proximity, however, does not appear to have a significant effect on *quotashift*, although bilateral trade with the USA is highly significant in that estimation. Further, the member's level of democracy, based on Polity IV categorizations (polity 2), does not affect *quotashift* (Column (4)). This is the only case in Table 7, where bilateral trade with the USA is not significant. Column (5) incorporates another UN-related variable to the full model – temporary membership on the UN Security Council (UNSC).[34] In all of but one of the cases in Table 7 (where over ten percent of the countries are lost), the volume of bilateral trade with the USA significantly and positively affects the member's shift in quota.

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[33] Instead of "nab" and "gab", I also ran the estimation with the amount of the credit line (potential loan) the member provided, but this variable was similarly insignificant.
[34] For studies that draw a linkage between UNSC membership and bilateral/multilateral aid, see Kuziemo and Werker (2006) and Dreher et al (2009a). The UNSC membership dataset comes from Dreher et al (2009b).

Having confirmed the positive, significant relationship between the member's volume of bilateral trade with the USA and *quotashift*, I extend Table 6 (Column (3)) with a view to primarily testing the motivations for US influence over quota adjustments of non-advanced IMF members (Section 3; Table 4).

Table 8 first examines the member's trade and aid as, respectively, fractions of total US trade and aid (Column (1)).[35] These results are insignificant. It may, however, be not about how important the member is to total US trade and aid, but how important these economic linkages are for the US GDP. Column (3) probes this possibility, showing that the USA's bilateral trade with the member country indeed positively and significantly affects the member's *quotashift*. This result suggests that the USA provides the favor of higher quotas for member countries with significance for the US economy. Column (4) excludes the economies with which the USA trades the most, China and Mexico. Column (4) demonstrates that the positive significance of bilateral trade as a fraction of US GDP withstands the exclusion of these economies.

Is this significance due to US commercial interests vested in the country, or is it about the USA's relative openness to the country's imports? Table 8 Column (5) investigates this question by examining US economic aid to/exports to/imports from the member as fractions of US GDP. These variables do not appear significant. Column (6) repeats the same estimation as Column (5), but excludes the USA's main trading partners within this sample (China and Mexico). Column (6) shows that, when the USA's main partners are excluded, US exports to the country as a fraction of US GDP significantly and positively affect *quotashift*. These significant results in Column (6) when China and Mexico are excluded may seem counter-intuitive without the contextual understanding of IMF quota adjustments. If the USA were dolling out higher quota adjustments to its largest partners, such favoring would not be discreet and would be easily detectable and objectionable by

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[35] For all specifications in Tables 8 and 9, I use the members' openness to trade (trade as a fraction of GDP) as a control variable, given I examine the other trade and aid variables as fractions also.

the IMF members that monitor quota adjustments carefully. Hence, Table 8 points to the USA dolling out the favor of relatively higher quota increases to members where non-negligible US commercial interests are at stake in a way that is relatively less objectionable for the rest of the membership. Another consistent interpretation here is that when the USA commercial interests are at stake, the USA would like the member to have a relatively higher quota, thereby a relatively higher ability to borrow from the IMF, which would ensure the US exporters are paid. [36]

 [Table 8 here]

Another motivation for the US favoring certain countries during quota adjustments could be about that country's dependence on the USA (Table 4). Table 9 explores this possibility. In that Table, Column (1) examines the member's bilateral aid from and trade with the USA, respectively, as fractions of the member's GDP. Column (2) repeats the same exercise, but again excluding Mexico and China. The results are insignificant for trade, but significant for aid. For members that are more dependent on it for aid, the USA provides the favor of higher quota adjustments. Columns (3) and (4) in Table 9 expand upon these findings – splitting trade into imports (from the USA) and exports (to the USA) as a fraction of the member's GDP. Differently from Column (3), Column (4) excludes Mexico and China. Again, the greater the member's economic dependence on aid from the USA, the higher the *quotashift* that member receives; whereas, the member's trade dependence on the USA does not appear to matter. Considering the volume of aid the USA provides is insignificant for *quotashift*, but the reliance of the member on US aid is, the USA appears to refrain from influencing quota adjustments on behalf of its key geopolitical partners (which receive relatively larger volumes of aid). Such an intervention would likely be too easily detectable and thus too costly in the constitutionalized setting of quota adjustments.[37]

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[36] I also ran Table 6(3) with the log of bilateral trade differentiated imports and exports components – US imports from the member and US exports to the member in log form. These results are insignificant, therefore not reported for space.

[37] While one cannot rule out that the USA intervention serves to ensure that through a relatively higher quota, the member has access to a greater pool of money from the IMF and therefore a

[Table 9 here]

5. Conclusions

The paper finds strong evidence for US influence over IMF quota adjustments: the member's extent of bilateral trade ties with the USA positively and significantly affects the quota shifts the member receives in the IMF. This finding advances our understanding of US influence within the IMF. In fact, this kind of influence should be less expected than the US effect on the IMF's loan decisions, which the literature has already established. Member states watch carefully over the quota changes, discuss them extensively, and follow a set of determined procedures, which makes the process highly transparent; whereas loan decisions are marked by greater delegation by members and less transparency (Stone 2011). Although the political negotiations over quota adjustments provide an opening for US influence, the procedural and the closely scrutinized nature of quota shifts means that the USA should face relatively high costs in exerting such influence. While even such constitutional interactions do not seem to completely stifle US influence, the nature of quota adjustments nonetheless is not irrelevant. For instance, there is little evidence of US pursuing geopolitical considerations, which would be relatively more costly – voting like the USA in the UN (a key indicator of geopolitical proximity) and the volume of aid relations with the USA (which again signals geopolitical proximity to the USA) does not affect quota adjustments. Nor does other indicators of political status, such as non-permanent membership on the UN Security Council. And, US export interests significantly affect US quota adjustments but not for the countries where US businesses have the most at stake (Mexico and China).

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greater potential to pay the non-grant portion of its aid back to the USA, this possibility does not alter the overall point about the nature of US intervention.

Future research can expand upon the points this paper yields. Different types of political-economic proximity seem to matter in different contexts: while voting affinity with the USA emerges as a significant variable in some studies that center on IMF loan decisions, in this case, it does not capture the kind of proximity that matters. Studies should integrate a variety of proximity measures, not settling on one *a priori*. By extension, future research can further illustrate the motivations underlying US influence over quota adjustments – with more longitudinal data on US financial exposure in a member, examining the influence of US financial interests as differentiated from commercial interests would be helpful.[38] Future studies can also explore *quotashift* as an independent variable, exploring whether others return the US favor provision in different institutional contexts. Finally, future studies can explore whether there is US exceptionalism, or whether other dominant shareholders also influence quota shifts. Although not reported for space reasons, I explored the impact of member's bilateral trade with G4 countries (UK, France, Germany, and Japan) and aid from G4 countries on quota adjustments, and found such G4 influence insignificant on *quotashift* (with or without the inclusion of US trade, which retained its significance in those specifications). Nonetheless, a thorough examination of other great power influence, including the range of proximity variables this study considers, over quota adjustments would be interesting.

The paper offers some policy implications. For a number of years, the presence of multiple quota formulae in the institution (Table 1 above) had been a widespread concern to IMF membership for its lack of simplicity and clarity, which motivated the membership's move to a single formula in 2008 (see Bird and Rowland 2006 for reform discussions). Although the 2008 change provides greater technical transparency, there are still ongoing discussions about quota formula reform within the IMF. This paper

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[38] Data such as the Bank for International Settlements (BIS), which examines the US banks' foreign claims in the member country leads to the number of observations to drop significantly, since the BIS dataset goes back only to 1983. While the Lane and Milesi-Ferretti (2007) data on foreign assets and liabilities does not include US bilateral data, I nonetheless assessed whether the member's "external debt liabilities" and "external debt assets" had any impact on *quotashift*, but the results were insignificant. I also did not get significant results when I included the member's credit usage from the IMF. Similarly, US direct investment in the country based on the US Bureau of Economic Analysis data (available from 1990 onwards) did not significantly affect *quotashift*.

implies that quota reform discussions that focus too excessively on the formula may miss the mark, as the formula is just one dimension of the process. The nature and extent of political negotiations over quota adjustments should be integral to any discussion on quota reform. An additional policy implication concerns the unpopularity of the IMF with a contingency within the US Congress. While this contingency looks with skepticism over IMF quota increases and adjustments, given the US influence over quota adjustments, these fears seem misplaced.

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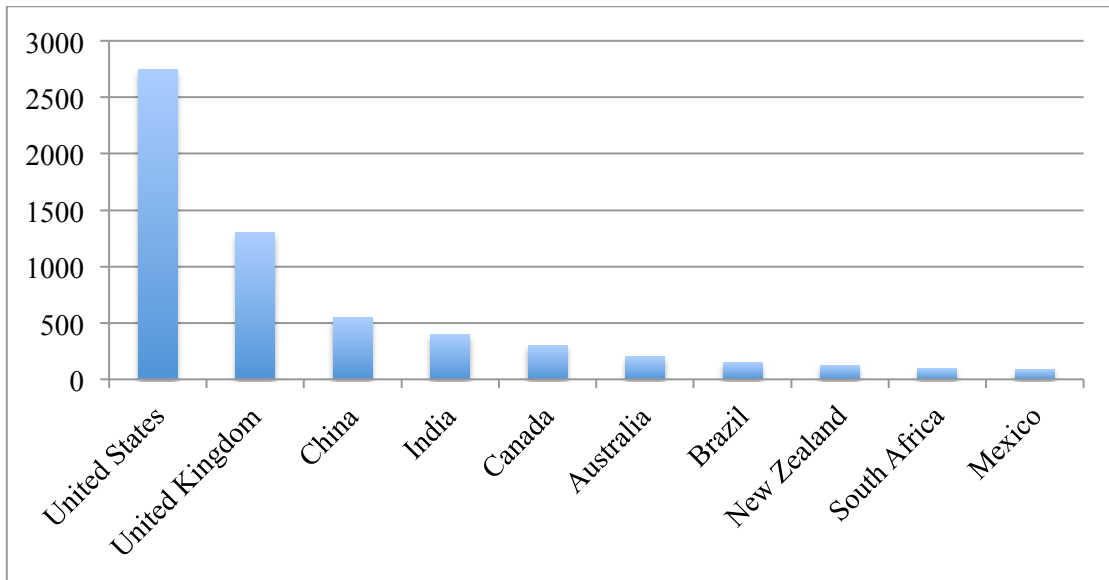
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Figure 1: Initial Quotas in 1945 (in current USD, millions)

Source: Authors' own compilation from IMF documents.

Table 1: IMF Quota Formulae

Original Bretton Woods Formula (BWF)	$Q = (0.2Y + 0.5R + 0.1M + 0.1V)(1+X/Y)$ Y = national income R = gold and foreign exchange reserves M = Average annual imports (five-year average) X = Average annual exports (five-year average) V = Maximum fluctuation in exports defined as the highest and the lowest value of exports during a five-year period
Reduced BWF (early 1960s)	$Q_1 = (0.01Y + 0.025R + 0.05M + 0.2276V)(1+X/Y)$ $$V = \left[\frac{\sum_{t=3}^{11}(x_t - \bar{x}_t)}{9} \right]^{1/2}$$ x_t = value of current receipts in year t $\bar{x}_t$ = five-year moving average of exports, calculated over a thirteen year period Q was also calculated with a second dataset where: M was replaced with C = average annual current payments (five-year average) X was replaced with Y = average annual current receipts (five-year average) VC = Variability of current receipts
Derivative BWF (early 1980s)	Formulae for Dataset 1, using imports and exports: $Q_2 = (0.0065Y + 0.078M + 0.5065V)(1+X/Y)$ $Q_3 = (0.0045Y + 0.070M + 0.9622V)(1+X/Y)$ $Q_4 = (0.005Y + 0.044M + 0.044X + 1.044V)$ $Q_5 = (0.0045Y + 0.039M + 0.039X + 1.304V)$ Formulae for Dataset 2, using current receipts and payments: $Q_2^* = (0.0065Y + 0.078P + 0.5065VC)(1+C/Y)$ $Q_3^* = (0.0045Y + 0.070P + 0.9622VC)(1+C/Y)$ $Q_4^* = (0.005Y + 0.044P + 0.044C + 1.044VC)$ $Q_5^* = (0.0045Y + 0.039P + 0.039C + 1.304VC)$
Changes to BWF (1990-1995	Reduced BWF = $(0.01Y + 0.025R + 0.05P + 0.2276VC)(1 + C/Y)$ Derivative BWF = $(0.0065Y + 0.0205125R + 0.078P + 0.5065VC)(1+C/Y)$
2008 Single Quota Formula	$CQS = (0.5*Y + 0.3*O + 0.15*V + 0.05*R)^k$ CQS = calculated quota share Y = a blend of GDP converted at market rates and PPP exchange rates averaged over a three year period. O = the annual average of the sum of current payments and current receipts (goods, services, income, and transfers) for a five year period V = variability of current receipts and net capital flows (measured as a standard deviation from the centered three-year trend over a thirteen year period) R = twelve month average over a year of official reserves (foreign exchange, SDR holdings, reserve position in the Fund, and monetary gold) k = a compression factor of 0.95. The compression factor is applied to the uncompressed calculated quota shares, which are then rescaled to sum to 100.

Source: IMF documents.

Figure 2: Initial Quota and GDP
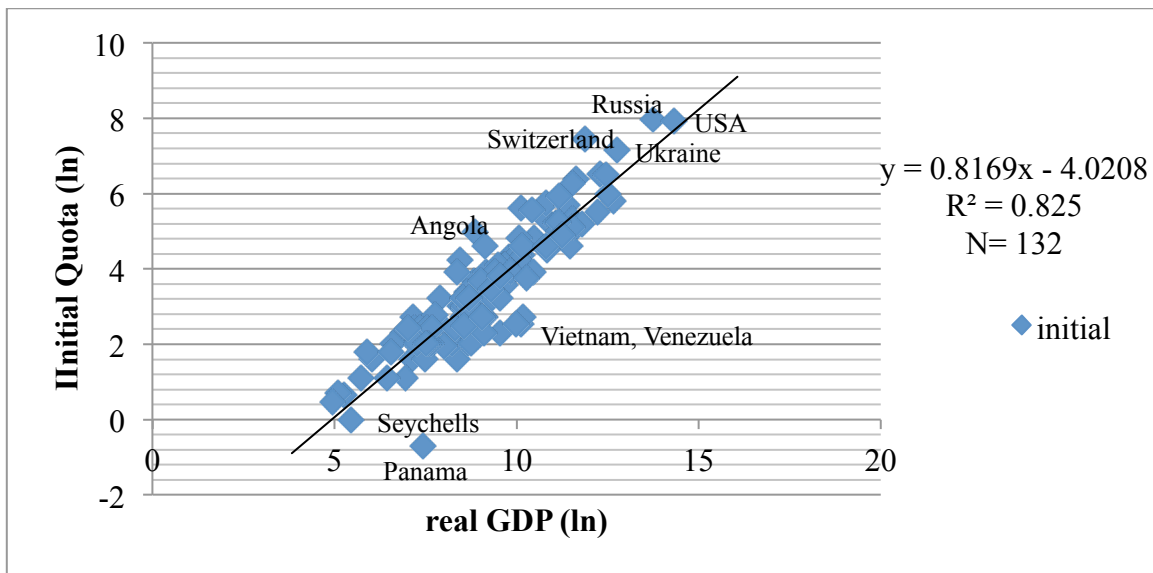
Source: Author's own dataset.

Table 2: IMF Quota Increases

	Date the Board of Governors Adopted the Resolution	IMF's Total Quota Increase
First Quinquennial Review	8-Mar-51	0
Second Quinquennial Review	19-Jan-56	0
1958/1959	2-Feb-59; 6-Apr-59	60.7
Third Quiquennial Review	16-Dec-60	0
Fourth Quinquennial Review	31-Mar-65	30.7
Fifth General Review	9-Feb-70	35.4
Sixth General Review	22-Mar-76	33.6
Seventh General Review	11-Dec-78	50.9
Eighth General Review	31-Mar-83	47.5
Ninth General Review	28-Jun-90	50
Tenth General Review	17-Jan-95	0
Eleventh General Review	30-Jan-98	45
Twelfth General Review	30-Jan-03	0
Thirteenth General Review	28-Jan-08	0
Fourteenth General Review	Dec-10	100

Source: IMF documents.

Table 3: Distribution of IMF Quota Increases

	Date of Adoption	Total Quota Increase	Share of Equiproportional Element	Share of Selective Elements
1958/1959	2-Feb-59; 6-Apr-59	60.7	82.4	17.6
Fourth GR	31-Mar-65	30.7	81.4	18.6
Fifth GR	9-Feb-70	35.4	70.6	29.4
Sixth GR	22-Mar-76	33.6	0	0
Seventh GR	11-Dec-78	50.9	98.2	1.8
Eighth GR	31-Mar-83	47.5	40	60
Ninth GR	28-Jun-90	50	60	40
Eleventh GR	30-Jan-98	45	75	25
Fourteenth GR	16-Dec-10	100	0	100*

Source: IMF documents. GR= General Review; *100 = 60 percent selective (based on calculated quota shares) and 40 percent "ad hoc" based on specific criteria.

Table 4: Different Rationales in US Influence over Quota Shifts

	Rationale	Plausible Evidence
1	US commercial interests	extent of US exports to the member significantly affect quotashift
2	US economy is relatively more open to the member economy	extent of US imports to the member significantly affect quotashift
3	member relatively more reliant on the USA	extent of US aid or trade to the member significantly affect quotashift

Table 5: Effects of Political-Economic Proximity to the USA on Quota Shifts

Dependent variable (DV): *quotashift*

VARIABLES	(1) Baseline	(2) US trade	(3) Full Model (Aid, Trade)	(4) Full Model/Advanced	(5) Full Model/Non- Advanced
average growth in GDP	0.568	0.519	0.498	4.169	0.398
	(0.569)	(0.572)	(0.561)	(5.229)	(0.350)
average growth in reserves	0.125*	0.120*	0.126*	0.285	0.079
	(0.073)	(0.073)	(0.073)	(0.315)	(0.059)
average growth in imports	-0.208	-0.202	-0.205	-5.993	0.139
	(0.443)	(0.444)	(0.447)	(5.960)	(0.160)
average growth in exports	0.265	0.271	0.287	1.525	0.242
	(0.237)	(0.234)	(0.241)	(1.525)	(0.203)
variability in trade balance	0.0003	0.0003*	0.0003*	-0.0092	0.0006***
	(0.0002)	(0.0002)	(0.0002)	(0.00001)	(0.0001)
ad hoc increases	0.421***	0.402***	0.402***	0.103	0.553***
	(0.097)	(0.097)	(0.097)	(0.341)	(0.112)
population (ln)	0.063	0.088	0.082	-0.088	0.167
	(0.241)	(0.240)	(0.241)	(0.655)	(0.200)
economic aid from the USA (ln)			-0.004	-0.011	0.001
			(0.005)	(0.011)	(0.005)
bilateral trade with the USA (ln)		0.059**	0.058**	-0.026	0.054**
		(0.024)	(0.025)	(0.198)	(0.027)
Observations	892	892	892	196	696
R-squared	0.148	0.150	0.151	0.093	0.522
Number of countries	159	159	159	28	131

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05, * p<0.1

Table 6: Additional Control Variable, Sub-Sample

DV: *quotashift*

VARIABLES	(1) Full Model/Trade with World	(2) Full Model/Trade with World/Advanced	(3) Full Model/Trade with World/Non-Advanced
average growth in GDP	0.488	4.719	0.382
	(0.565)	(5.523)	(0.352)
average growth in reserves	0.140*	0.340	0.085
	(0.073)	(0.322)	(0.059)
average growth in imports	-0.303	-6.540	0.121
	(0.481)	(6.161)	(0.175)
average growth in exports	0.249	0.773	0.228
	(0.242)	(1.245)	(0.206)
variability in trade balance	0.0003*	-0.00001	0.0006***
	(0.0002)	(0.00001)	(0.0001)
ad hoc increases	0.385***	-0.042	0.574***
	(0.101)	(0.405)	(0.116)
population (ln)	0.122	-0.559	0.205
	(0.251)	(0.694)	(0.208)
economic aid from the USA (ln)	-0.003	-0.007	0.001
	(0.005)	(0.010)	(0.005)
bilateral trade with the USA (ln)	0.033	-0.174	0.048*
	(0.026)	(0.164)	(0.027)
bilateral trade with the world (ln)	0.093*	0.702*	0.022
	(0.048)	(0.390)	(0.038)
Observations	886	196	690
R-squared	0.149	0.099	0.518
Number of countries	159	28	131

See Notes for Table 5. Robust standard errors in parentheses. ***$p<0.01$, **$p<0.05$, * $p<0.1$

Table 7: Pre-2010, Other Proximity Variables

DV: *quotashift*

VARIABLES	(1) Pre-2010	(2) IMF Lenders	(3) UNGA Voting Affinity	(4) Polity2	(5) UNSC
average growth in GDP	0.402	0.368	0.440	0.359	0.339
	(0.333)	(0.343)	(0.363)	(0.351)	(0.354)
average growth in reserves	0.091*	0.081	0.104*	0.071	0.111*
	(0.053)	(0.059)	(0.054)	(0.057)	(0.056)
average growth in imports	-0.084	0.099	0.033	0.007	0.163
	(0.173)	(0.181)	(0.169)	(0.183)	(0.180)
average growth in exports	0.209	0.224	0.201	0.330	0.231
	(0.201)	(0.203)	(0.209)	(0.224)	(0.210)
variability in trade balance	0.0007***	0.0006***	0.0006***	0.0006***	0.0005***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
ad hoc increases	1.454***	0.603***	0.492***	0.579***	0.570***
	(0.348)	(0.132)	(0.103)	(0.123)	(0.119)
population (ln)	-0.084	0.198	0.211	0.214	0.216
	(0.215)	(0.210)	(0.211)	(0.232)	(0.208)
economic aid from the USA (ln)	0.003	0.001	-0.001	0.002	-0.001
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
bilateral trade with the USA (ln)	0.042*	0.050*	0.055**	0.046	0.045*
	(0.024)	(0.026)	(0.027)	(0.028)	(0.026)
bilateral trade with the world (ln)	0.015	0.029	0.051	0.029	0.011
	(0.037)	(0.038)	(0.035)	(0.041)	(0.037)
nab (lending facility)		-0.141			
		(0.127)			
gab (lending facility)		-0.009			
		(0.066)			
voting similarity with the USA at the UNGA			0.036		
			(0.282)		
level of democracy (Polity2)				0.001	
				(0.005)	
membership on the UNSC					-0.052
					(0.053)
Observations	570	690	671	628	677
R-squared	0.398	0.520	0.527	0.524	0.514
Number of countries	131	131	128	115	127

See Notes for Table 6.

Table 8: Member's Importance to US Economy

DV: *quotashift*

VARIABLES	(1) Fractions of US Aid/Trade	(2) Fractions of US GDP	(3) Fractions of US GDP without Mexico and China	(4) Imports Exports as Fractions of US GDP	(5) Imports Exports as Fractions of US GDP, Excluding Main Partners
average growth in GDP	0.411	0.355	0.284	0.366	0.279
	(0.373)	(0.358)	(0.360)	(0.366)	(0.354)
average growth in reserves	0.086	0.091	0.105**	0.089	0.097*
	(0.058)	(0.056)	(0.053)	(0.054)	(0.051)
average growth in imports	0.148	0.142	0.141	0.135	0.087
	(0.174)	(0.173)	(0.181)	(0.177)	(0.191)
average growth in exports	0.235	0.279	0.287	0.282	0.325
	(0.203)	(0.205)	(0.207)	(0.208)	(0.210)
variability in trade balance	0.0006***	0.0004***	0.0004***	0.0004***	0.0003***
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
ad hoc increases	0.598***	0.554***	0.540***	0.550***	0.494***
	(0.120)	(0.116)	(0.119)	(0.114)	(0.112)
population (ln)	0.158	0.234	0.268	0.238	0.325*
	(0.215)	(0.208)	(0.199)	(0.204)	(0.185)
country openness to trade	-0.011	-0.044	-0.086	-0.044	-0.079
	(0.095)	(0.096)	(0.097)	(0.096)	(0.100)
US bilateral aid to member as a fraction of total US aid	0.133				
	(0.382)				
US bilateral trade with member as a fraction of total US trade	0.868				
	(0.845)				
fraction of US bilateral aid to member as a fraction of US GDP		-146.995	16.315	-150.393	-30.972
		(390.838)	(447.139)	(394.843)	(496.147)
US bilateral trade with member as a fraction of US GDP		32.919***	121.151*		
		(7.956)	(65.423)		
US imports from member as a fraction of US GDP				24.486	-2.254
				(18.735)	(59.221)
US exports from member as a fraction of US GDP				55.563	393.074***
				(69.909)	(139.179)
Observations		691	678	691	678
R-squared		0.527	0.521	0.527	0.530
Number of countries		131	129	131	129

See Notes for Table 6.

Table 9: Importance of Economic Ties with the USA for the Member

DV: *quotashift*

VARIABLES	(1) Aid/Trade as Fractions of Member GDP	(2) Aid/Trade as Fractions of Member GDP/Excluding Main Partners	(3) Aid/Imports Exports as Fractions of Member GDP	(4) Aid/Imports Exports as Fractions of Member GDP/Excluding Main Partners
average growth in GDP	0.446	0.390	0.440	0.392
	(0.362)	(0.370)	(0.376)	(0.371)
average growth in reserves	0.081	0.105*	0.088	0.106*
	(0.058)	(0.056)	(0.059)	(0.057)
average growth in imports	0.149	0.162	0.153	0.160
	(0.174)	(0.176)	(0.176)	(0.176)
average growth in exports	0.235	0.247	0.248	0.246
	(0.203)	(0.201)	(0.205)	(0.201)
variability in trade balance	0.0005***	0.0004***	0.0006***	0.0004***
	(0.0002)	(0.0008)	(0.0002)	(0.0001)
ad hoc increases	0.616***	0.587***	0.615***	0.000***
	(0.118)	(0.122)	(0.120)	(0.000)
population (ln)	0.151	0.187	0.152	0.189
	(0.214)	(0.216)	(0.214)	(0.215)
openness	-0.032	-0.042	-0.035	-0.042
	(0.103)	(0.104)	(0.107)	(0.104)
bilateral trade with the USA as a fraction of member GDP	0.129	0.078		
	(0.123)	(0.115)		
bilateral aid from the USA as a fraction of member GDP	1.147*	1.113*	1.132*	1.107*
	(0.600)	(0.603)	(0.611)	(0.602)
imports from the USA as a fraction of member GDP			0.170	0.136
			(0.186)	(0.171)
exports to the USA as a fraction of member GDP			0.063	0.045
			(0.200)	(0.184)
Observations	691	678	675	678
R-squared	0.513	0.511	0.515	0.511
Number of countries	131	129	130	129

See Notes for Table 6.

Appendix A: Summary Statistics and Variable Descriptions*

Variable	Source	mean	sd	min	max
quotashift	author's own dataset compiled from IMF documer	0.5315	0.7727	-0.848	14.0021
average growth in GDP (n)	World Development Indicators (WDI)	0.1012	0.0794	-0.1654	0.581
average growth in reserves (n)	IMF	0.1004	0.2356	-1.2133	1.0024
average growth in imports (n)	WDI	0.1126	0.1056	-0.4387	0.6301
average growth in exports (n)	WDI	0.1011	0.1055	-0.4177	0.6545
variability in trade balance (n)	calculated based as the standard deviation of the previous 10-year trade balance, which was obtained from WDI	4.0284752	42.8750498	0.0025166	1260.98
adhoc increases	author's own dataset	0.0538	0.2258	0	1
population, logarithm	WDI	15.7661	1.8019	11.0334	21.0142
bilateral aid with the USA, logarithm (n)	IMF	20.383	2.5051	14.2855	27.1212
US exports to member	IMF	4.28E+09	1.74E+10	300000	2.61E+11
US imports from member	IMF	6.46E+09	2.86E+10	100000	3.83E+11
bilateral economic aid from the USA, logarithm (n)	US Overseas Loans and Grants (Greenbook)	12.8274	6.9275	0	21.4148
trade with the world (ln)	IMF	22.8534	2.2372	17.1881	28.7647
nab	author's own dataset	0.065	0.2467	0	1
gab	author's own dataset	0.0314	0.1745	0	1
Voting Affinity at the UNGA	"agree3un" variable from Strezhnev and Voeten (2013)	0.4005	0.1805	0	0.9478
temporary membership on the UNSC	Dreher et al (2009b)	0.0745	0.2627	0	1
polity2	The Polity IV project, http://www.systemicpeace.org/polity/polity4.htm	2.1966	7.3055	-10	10
Exports as a fraction of US GDP		0.0006	0.0017	0	0.0183
Imports as a fraction of US GDP		0.0008	0.0025	0	0.0266
bilateral trade with member as a fraction of US GDP		0.0013	0.0041	0	0.0422
aid as a fraction of total US aid		0.0277	0.0521	0	0.7027
trade as a fraction of total US trade		0.0362	0.0372	0.0004	0.3035
member's openness to trade	member's toal trade divided by its GDP	0.7679	0.4625	0.1034	4.441
bilateral trade with the USA as a fraction of member GDP		0.0901	0.1186	0.0009	1.2681
bilateral aid from the USA as a fraction of member GDP		0.0063	0.0183	0	0.2396
member's imports from the USA as a fraction of member GDP		0.0427	0.0643	0.0004	0.908
member's exports to the USA as a fraction of member GDP		0.0474	0.0751	0	1.0074
N		892			

* The descriptive statistics for the sample in the "Full Model" (Table 5(3)) are reported here.

Countries in the Sample

Advanced Economies: Australia; Austria; Belgium; Canada; Switzerland; Cyprus; Czech Republic; Germany; Denmark; Spain; Finland; France; United Kingdom; Greece; Ireland; Iceland; Israel; Italy; Japan; Malta; Netherlands; Norway; New Zealand; Portugal; Singapore; Slovak Republic; Slovenia; Sweden.

Non-Advanced Economies: Afghanistan; Angola; Albania; Argentina; Antigua and Barbuda; Burundi; Benin; Burkina Faso; Bangladesh; Bulgaria; Bahrain; The Bahamas; Bosnia and Herzegovina; Belarus; Belize; Bolivia; Brazil; Barbados; Brunei; Bhutan; Botswana; Central African Republic; Chile; China; Côte d'Ivoire; Cameroon; Congo, Republic of; Colombia; Cape Verde; Costa Rica; Dominica; Dominican Republic; Ecuador; Egypt; Eritrea; Estonia; Ethiopia; Fiji; Gabon; Georgia; Ghana; Gambia; Equatorial Guinea; Grenada; Guatemala; Guyana; Honduras; Croatia; Haiti; Hungary; Indonesia; India; Iran; Jamaica; Jordan; Kazakhstan; Kenya; Kyrgyzstan; Cambodia; Republic of Korea; Kuwait; Laos; Lebanon; Liberia; Libya; Saint Lucia; Sri Lanka; Lesotho; Lithuania; Latvia; Morocco; Moldova; Madagascar; Maldives; Mexico; Macedonia; Mali; Montenegro; Mongolia; Mozambique; Mauritania; Mauritius; Malawi; Malaysia; Namibia; Niger; Nigeria; Nicaragua; Nepal; Oman; Pakistan; Panama; Peru; Philippines; Papua New Guinea; Poland; Paraguay; Qatar; Russia; Rwanda; Saudi Arabia; Sudan; Senegal; Solomon Islands; Sierra Leone; El Salvador; Serbia; Sao Tome and Principe; Suriname; Swaziland; Seychelles; Syria; Chad; Togo; Thailand; Tajikistan; Tonga; Trinidad and Tobago; Tunisia; Turkey; Tanzania; Uganda; Ukraine; Uruguay; Saint Vincent and the Grenadines; Venezuela; Vanuatu; Samoa; South Africa; Zambia; Zimbabwe.