Competition among Clubs: Do the Best Join the Best?

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Abstract

This paper analyzes the competition among clubs in which the status of club members is the crucial added value accruing to fellow club members through social interaction within the club (e.g. in professional sports clubs, academic faculties, country clubs, or internet communities). In the course of competition for new members, clubs trade off the effect of entry on average status of the club and candidates' monetary payment via an entrance fee. We show that competition for new members with different status levels leads to a perpetuation of differences in average status levels among the clubs: the best candidates join the best clubs. In addition, we show that potential new candidates with low status levels either cannot enter any club at all or are completely exploited. On the other hand, competition among clubs protects candidates with high status, allowing them to appropriate some of the surplus accruing from entry. We distinguish among various decision rules and organizational set-ups, including majority voting, unanimity, and meritocracy. We find that, from a welfare perspective, the unanimity rule leads to inefficient exclusion of some candidates, while meritocracy leads to inefficient inclusion. Majority voting can accomplish the second-best result under certain assumptions.

Keywords: competition among clubs, status organizations, design of decision making, collective action

JEL Classification: D71, L14, L21, L22

1 Introduction

Professional sports clubs, country clubs, academic faculties, social networks as well as internet clubs share one common characteristic: they are status organizations. The interaction among the members of these organizations increases the utility for the individual member. The value of interaction depends on the status of the individual member. The higher the status of an individual member (e.g. in a sports club, the ability to perform or in a country club, the social status) the more valuable this member is for others (see Hansmann (1986)). Status is a vertically differentiable and rival good. The more members interact with members of high social status, the less valuable this interaction becomes individually. We focus on this wide range of organizations and study the competition among them for new members.

Thereby, our focus is on the development rather than the formation of clubs (the two main strands of the economics of organizations and clubs). We will concentrate on two main questions. First, does the entry of new members lead to a convergence of the average status of clubs? Or to put it more succinctly: does the competition of Ivy League universities and second tier universities for professors of different academic standing (status) lead to convergence of academic reputation or the perpetuation of the differences in reputation? Second, we will examine the division of the surplus arising from the entry of new candidates into our clubs (status organizations).[1] Who will gain most from joining a new club: new candidates with low status or those ones with the highest status levels? From which of the new candidates can the existing members extract most, assuming they compete with another club?

It will be demonstrated that competition between clubs does in fact lead to a perpetuation of differences among clubs. New candidates with the high-

[1]Henceforth, we will use the terms *status organizations* and *clubs* interchangeably. For the sake of clarity, the term *clubs* will be used more frequently.

est status levels join the club with the highest average status. New potential candidates with low status levels either join the club with a low average status or are not accepted by any club at all. Furthermore, we will show that new entrants with low status levels are unable to appropriate any surplus from joining the club. In contrast, members with higher status are protected by competition among the clubs and therefore share the surplus with old club members.

We model competition among clubs for new candidates in a two-club-framework. The two clubs with a given number of old club members with given status levels differ in their average status levels. A high average status club (e.g. Harvard University) competes with a club with lower average status levels (e.g. State University X). Old and new members trade off the utility they receive via the average status levels of their companion club members against the fees they have to pay for covering the costs of the resources necessary to run the club (the research facilities of the university, the stadium in the case of a sports club, the club house of the golf club, the software platform of the internet club, etc.). The higher the average status of his fellows, the higher the utility for a club member. Due to the fact that status is a rival good in our model, entry of a new candidate with a lower than average status leads to a dilution of the status gains for the old members. This dilution effect can, however, be overcompensated for by the entrance fee the new candidate. The two clubs compete in entrance fees they charge to new candidates with different status levels.

We distinguish between various decision rules and organizational set-ups. In the main body of the paper we will focus on majority voting. In contrast, we will show that with unanimity, clubs are more reluctant to let new candidates join, and this hurts old members in the end. However, the decisions are made by some of the existing members of the clubs, so we will focus on a form of member-owned organization.

Obviously, our analysis forms part of the existing literature on club formation and competition, whereby we focus on the latter. The distinguishing feature between this large body of literature and our paper is that none of these papers on club competition has focused on the idea that (some) clubs can be interpreted as social status organizations in which non-monetary characteristics of particular club members (which can be ranked vertically) play a crucial role. Taking this often crucial, but neglected, aspect of clubs into account leads us to a different model and allows us to depict club competition in a completely new manner.

We can identify four different branches of literature related to our work. First, one has to mention the seminal works on the economic theory of clubs which were published in the 1960s. Most notably, Buchanan (1965) and Olson (1965) initiated a major wave of research on the economic theory of clubs and club goods which was to be further developed in the decades following. Sandler and Tschirhart (1980) have prepared a survey of the first half of this, while Cornes and Sandler (1996, ch.11) provide an overview of the more recent literature. Therein, a club good has three major characteristics distinguishing it both from private and public goods. First of all, clubs are voluntary organizations. Hence, each and every member has to obtain a net benefit from joining a club. Second, clubs are subject to a congestion function, i.e. their optimal size is finite, since a club's resources are limited. Third, the feasibility of clubs depends on the existence of an exclusion mechanism to prevent unlimited dilution of the club's resources by unbounded access of new candidates.[2] Our paper is in line with this definition dealing specifically with various aspects. As in Ellickson et al. (1999), we deal with the individual characteristics of new and incumbent club members and the interrelation of a club's aggregate characteristics and its competition for new candidates. In contrast to them, we do not explicitly calculate the optimal size of clubs but equilibrium levels of admittance fees for one new candidate.

[2]Therefore, Cornes and Sandler (1996, p.353 and p.347) also call club goods "impure public goods" or "excludable (rivalrous) public goods".

Helsley and Strange (1991) too, compare discriminating pricing schemes, but our paper, furthermore, endogenizes clubs' governance structure.[3]

The second branch of literature we refer to analyzes the optimal size and structure of political jurisdictions, which could be regarded as clubs on a macroeconomic or political level. While Bolton and Roland (1997) model the basic trade-off in terms of the breakup or unification of nations, Casella (2001) focuses on the relationship between jurisdictions and overall market size. Wacziarg et al. (2003) include growth in their model, which is empirically tested by Alesina et al. (2004). Casella and Frey (1992) discuss the issue of overlapping political jurisdictions in a European context. From a formal perspective, these models either distinguish between individuals horizontally, e.g. concerning preferences, or vertically, e.g. with regard to income. But in contrast to our analysis, which looks into the interplay between the change of the social status situation in the club that can be attributed to new entry and monetary transfer, the interchange between new members and old members just takes place via monetary transfers.

This is also the main difference between our model and the third strand of related literature, which comprises Tiebout models in the strict sense (see e.g. Wildasin (1986) or Wellisch (2000) for an overview). Those models study the competition of jurisdictions in the presence of mobile households and/or capital.[4] The main policy areas thereby are either of an allocative nature (public provision of goods) or of a distributive nature (redistribution among different members of a jurisdiction) (see e.g. Pauly (1974)). One part of this literature analyzes competition for mobile households in a system of jurisdictions (see e.g. Epple/Sieg (1999), Benabou (1996) and Epple/Romer (2001)). These articles ask for potential sorting of households along house-

[3] For more details on collective choice schemes, see Zusman (1992).

[4] The second and third branches of our literature review are somehow interlinked. But whereas the second branch investigates the question of optimal club size and club formation, the Tiebout type literature is more concerned with competition of existing jurisdictions and therefore closer related to our main theme.

hold income. There, however, vertical differentiation of households takes place only in income levels. The potential trade off between vertically structured non-monetary contributions to the well-being of club members (such as social status) and monetary payoffs, which is in the center of our paper, is not a topic there.

Finally, and most closely connected to our paper is Hansmann (1986, 1996) who introduced the idea of clubs as *status organizations*.[5] His notion is built on the observation that in many organizations the value an individual draws from membership is a function of the other members' characteristics (i.e. their average *status*), and that status is differentiated vertically and not horizontally. Hence, a general and unique ranking of such organizations is feasible. Hansmann (1986), however, regards the formation of a club system while we assume that clubs already exist. In contrast to Hansmann, we focus explicitly on the strategic competition between two existing clubs and the decision making process behind it. Thereby, we extend Hansmann (1986) by analyzing the further development of clubs beyond their initial formation. In addition, our analysis is based upon the crucial notion that entrants make a significant difference to the utility levels of individual old club members—a notion absent in Hansmann's continuous population framework.[6]

Two other papers, which are rather closely related to the present one, are De Serpa (1977) and Baku (1989). Both are related to the basic notion of clubs as social status organizations with, however, a focus that is significantly different from ours. De Serpa (1977), by explicitly modelling the role of social interactions in clubs, analyzes potential sources for inefficiency associated

[5]Hansmann (1986, p.122) explains that "clubs" are a "prototypical example of status organizations".

[6]Only if the number of incumbent members in a club follows a discrete distribution, a marginal member has a non-zero effect on the incumbents' utility levels. For a related approach see Johnson (2002) who does not focus on the formation of a system of organizations—the Open Source Software Community—but takes its existence for granted and studies behavior of individual software developers.

with club formation and competition. Baku's (1989) main focus is on an excess-demand equilibrium. He basically argues that if club members value social status, it pays for a profit-maximizing club owner to ration access to clubs in order to avoid dilution.

The paper is organized as follows: in the next section we outline the basic model and look into the competition of two clubs in the presence of majority voting. In section 3 we characterize the equilibrium in this set-up. In section 4 we turn to alternative voting schemes, for which we investigate the emerging allocation after club competition for new candidates. Section 5 is devoted to welfare implications of the model. In section 6 we discuss robustness of our main assumptions, while in section 7 we derive testable hypotheses from our analysis and conclude.

2 The Model

2.1 Status, utility and entry

We model two clubs which compete for a new candidate. The total population of old club members consists of $N + 1 \in \mathbb{N}_+$ individuals which are distributed across the two clubs, whereby N is assumed to be an odd number. Individuals are, with the exception of their status position, identical. The status position describes their relative value for fellows in social exchange processes and can be attributed to a wide set of characteristics such as income, wealth, abilities, skills and network relations.

Status positions of old members are assumed to be uniformly distributed on a vertical line ranging from $\underline{s}$ to $\bar{s}$. The endpoints of the lines are populated by one individual each. We rank individuals along the status line, i.e. a lower number n_i of an individual indicates a higher status position. The first individual (with $n_i = 0$) has the highest status level, $\bar{s}$, whereas the individual at the other endpoint of the vertical line with $n_i = N$ has the lowest status, $\underline{s}$. All individuals with higher status positions are members of the more exclusive club A which has $n_A + 1$ members, whereas the remaining individuals $(N - n_A)$ are members of club B, the less exclusive club. Figure 1 summarizes the distributional assumptions.

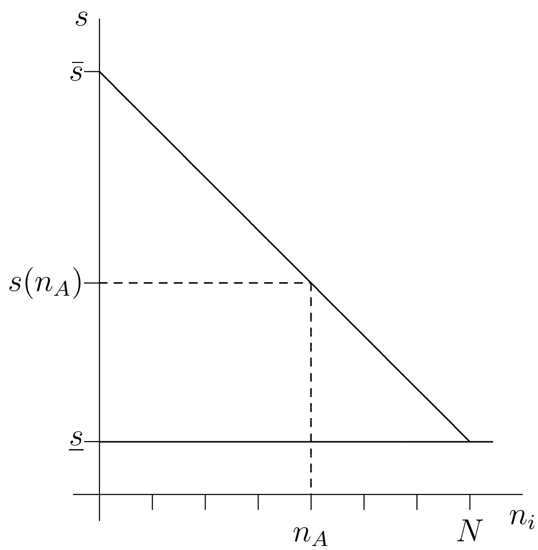

Figure 1: Status distribution (for $n_A = 4$ and $N = 7$)

A functioning club, which allows for active cooperation and social exchange among the club members, requires financial resources (we will refer to them as operating costs), which are borne by all club members.[7] By means of cooperation and social exchange club members can increase their well-being. This effect hinges on the average social status of the other club members, where status is a rival, non-tradeable good, meaning that each member dedicates a fixed amount of resources to supporting the aggregate of his fellows. Support follows a random exchange among club members.

[7]We assume these operating costs to be so large that it is prohibitive for a subset of members (or new candidates) to form a third club. Without this assumption we would shift our focus from competition of clubs to club formation. The latter, though, has been already researched (e.g. by Hansmann (1986)) and is not of our primary concern.

Therefore, in expectation, each member gains an equal share of a fellow's support. Social exchange and/or cooperation is the more productive and valuable the higher the social status of the counterpart. Hence, we depict the utility function of a particular member k in club j as:

$$U_j^k = \theta \hat{s}_j^k - c_j \tag{1}$$

whereby $\hat{s}_j^k$ denotes the average status of all the other members in club j from the point of view of club member k, c_j denotes the per-head operating cost of club j and $\theta \in (0, 1]$ denotes the relative preference of status versus money in the economy.[8] Our linearity assumption does not put any particular weight on either of the two arguments of the utility function, besides θ: average status and monetary effects (the membership fee) are perfect substitutes. The marginal rate of substitution between status and money is constant for all players and hence independent of own status.

For member k in the more exclusive club A the average status of all *other* club members is:

$$\hat{s}_A^k = \frac{\sum_{i=0}^{n_A} s^i - s^k}{n_A} \tag{2}$$

whereas for the less exclusive club B we have:

$$\hat{s}_B^k = \frac{\sum_{n_A+1}^{N} s^i - s^k}{N - n_A - 1} \tag{3}$$

with s^i denoting the status of the $i - th$ member.

A candidate who is accepted as new member of the club[9] affects both arguments of the utility function of the old club members. First, the new

[8]Subscripts denote clubs, superscripts denote individuals.

[9]As customary in many Tiebout type models, we assume all old members to be immobile because of switching costs. The new candidates, however, are mobile and, hence, can choose to apply at any of the two clubs. Candidates could be young researchers who have to relocate after obtaining a Ph.D. degree, while old members are settled professors for whom switching clubs/faculties is prohibitively costly.

candidate changes the average status value of the remaining club members for old member k to:

$$\hat{s}_A^k = \frac{\sum_{i=0,i\neq k}^{n_A} s^i + s^C}{n_A + 1} \tag{4}$$

in club A, with s^C denoting the status of the candidate. The corresponding expression for club B is:

$$\hat{s}_B^k = \frac{\sum_{n_A+1}^{N} s^i - s^k + s^C}{N - n_A} \tag{5}$$

Second, with his entrance fee in club j, $f_j \geq 0$, the candidate contributes partially to covering the financial burden.[10] We assume that the old members benefit only partially from the new entrant, i.e. the membership fee of the new entrant reduces the financial burden of the old members in club j by αf_j. The fact that $\alpha < 1$ depicts the notion that the services of the club are not a purely public good but rather increase less than proportionally with additional club members. Alternatively, we can interpret this as frictions in the transfer of money between old and new club members which might be due to the fact that, for example, the additional resources can only be consumed in the form of perks (better club services) rather than as a reduction of membership fees.[11]

[10] We assume that clubs face some budget constraint. $f_j \geq 0$ meets this assumption without loss of generality. In the model interpretation where clubs actually pay entrants, e.g. young Ph.D. researchers, to enter the club, $f_j = 0$ characterizes the maximum salary a club can offer and $f_j > 0$ refers to lower salaries.

[11] Moreover, the introduction of α relaxes our assumptions of status and money being perfect substitutes. Any friction in the model that could be reached by assuming concave utility of status or convex operating costs (with respect to the number of members of a club) can be reinterpreted with reference to $\alpha < 1$ but with significantly less calculus and, therefore, more straightforward arguments.

2.2 Majority voting in clubs

We focus in our main analysis on the case in which majority voting in clubs prevails. Later on, we will address other rules of decision making in the clubs as well. Given the distribution of status positions, this implies that the median club member is the one who actually determines the decisions of the club. The fact, that the median along the status line is the median voter, stems from the strict monotonicity of the utility gains from the new member. This characteristic can be shown as follows.[12] The utility differential (i.e. the utility after entry occurred minus the utility level before entry took place) of the k-th individual in club A is:

$$\begin{aligned} \Delta_A^k &= \theta \frac{\sum_0^{n_A} s^i - s^k + s^C}{n_A + 1} + \alpha \frac{f_A}{n_A + 1} - \theta \frac{\sum_0^{n_A} s^i - s^k}{n_A} \\ &= \theta \frac{s^k - \sum_0^{n_A} s^i}{n_A(n_A+1)} + \frac{\alpha f_A + \theta s^C}{n_A + 1} \end{aligned} \tag{6}$$

which is strictly increasing in s^k and s^C. Therefore, by implicitly differentiating equation (6) we obtain

Lemma 1 *Old club members with lower status gain less (or lose more) from a candidate's entry than members with higher status. The minimal status level $s_{j,min}(s^k)$ required by an individual old member k is lower, the higher the status level of this old member, i.e. $\partial s_{j,min}/\partial s^k < 0$.*

All this is due to our assumption that members profit only from their fellows' status levels, not from their own.[13] Hence, the lowest ranking old member of club A, n_A, without entry enjoys a gross utility of $\theta \frac{\sum_{i=0}^{n_A} s^i - s^{n_A}}{n_A}$ which is strictly *larger* than the highest ranking member's, 0's utility, $\theta \frac{\sum_{i=0}^{n_A} s^i - \bar{s}}{n_A}$. Upon entry of any new member, this advantage is diluted. Hence, n_A suffers more than proportional from entry, which is expressed by (6). As for

[12]We derive this characteristic for club A only. The same procedure applies to club B and is straightforward.

[13]We underline this because monotonicity of $s_{j,min}(s^k)$ in s^k already is a non-trivial result following from other assumptions and not a mere assumption itself.

increasing N (or n_A) this difference diminishes, our analysis is best suited for smaller numbers of old members.

The median voter in the more exclusive club A is located at $m_A = n_A/2$ and in club B at $m_B = (N + n_A + 1)/2$. The average status of the remaining club members perceived by the two median club members before new candidates are affiliated can be expressed as:

$$\hat{s}_A^{m_A,old} = \frac{\sum_{i=0}^{n_A} s^i - s^{m_A}}{n_A} \tag{7}$$

for club A, whereas for club B we get:

$$\hat{s}_B^{m_B,old} = \frac{\sum_{i=n_A+1}^{N} s^i - s^{m_B}}{N - n_A - 1}. \tag{8}$$

We model the competition among the two clubs for new entrants as a two-stage game. In the first stage, both clubs A and B simultaneously decide on the entrance fee demanded by the new entrant, f_j, and whether they are willing to allow the entrant to enter at all (i.e. they choose a minimum status level, $s_{j,min}$, for the entrant). In the second stage, the new entrant chooses the club which provides him with the highest utility and accepts his entry. In both stages of the game, complete information prevails. We solve this game by backward induction for a subgame perfect solution.

3 Equilibria

3.1 The candidate's decisions

In the final stage of the game the entrant has to decide between two issues: Should he join a club at all and, if so, which one? The candidate will join a club j if the utility this option offers is positive:

$$\theta \hat{s}_j^C - f_j \geq 0, \tag{9}$$

with $\hat{s}_j^C$ denoting the average status of the old members of club j from the perspective of the new club member, C. We will refer to this inequality as the *participation constraint* of the entrant in club j, (PC_j). It implies that entry will take place if, and only if, the expected gains from interaction with the other club members are not lower than the costs associated with the entrance fee.

Given that the entrant will join any club at all, he will choose the one which offers him the highest net utility, meaning that he will choose the more exclusive club A if

$$\theta \hat{s}_A^C - f_A \geq \theta \hat{s}_B^C - f_B. \tag{10}$$

If this inequality holds for the equality sign, we will call this the *indifference condition* (IC) of the entrant. Assuming the anticipated behavior of the entrant, we will now address the optimal behavior of the clubs.

3.2 The choices of the clubs

In the first stage of the game, clubs A and B can perfectly predict the candidate's behavior. They compete by simultaneously choosing a tuple, $(s_{j,min}, f_j)$, drawn from the action space $[\underline{s}, \bar{s}] \times \mathbb{R}_0^+$. We proceed by first letting the pivotal members of the clubs, m_A and m_B respectively, determine the minimum status requirement, $s_{j,min}$. This takes into account the participation constraint of the candidate and, in the case of club A, the indifference condition. Only if $s^C \geq s_{j,min}$, the second variable, f_j, becomes relevant and the final measure of competition between clubs.

The pivotal (median) member of club A determines the decision, whether to offer membership to the candidate or not, on the basis of the utility differential that the he will receive from entry of the candidate. This utility differential

$$\Delta_A^{m_A} = \theta \frac{\sum_0^{n_A} s^i - s^{m_A} + s^C}{n_A + 1} + \alpha \frac{f_A}{n_A + 1} - \theta \frac{\sum_{i=0}^{n_A} s^i - s^{m_A}}{n_A} \tag{11}$$

will be maximized subject to the fact that it has to be non-negative. Additionally, equations (10) and (9) have to hold.

For those entrants who, when joining club A, increase the utility of the median member of the more exclusive club, equation (10) always holds with strict equality. This can be seen as follows: Suppose the RHS of (10) is larger than the LHS, then, club A has an incentive to reduce f_A in order to attract the potential new member. If the reverse held true, club A would demand too low a fee and, therefore, the median member would have a strict incentive to increase f_A in order to participate in the higher financial resources which are then available to all old club members. Against this background, we can replace f_A in (11) by making use of the indifference condition. Hence, we get:

$$\Delta_A^{m_A} = \theta \frac{\sum_0^{n_A} s^i - s^{m_A} + s^C}{n_A + 1} + \frac{\alpha}{n_A + 1} \left(\theta \frac{\sum_0^{n_A} s^i}{n_A + 1} - \theta \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} + f_B \right) - \theta \frac{\sum_0^{n_A} s^i - s^{m_A}}{n_A} \geq 0 \quad (12)$$

Solving for the status level of the new entrant, which implies only zero additional utility for the median of club A, results in:[14]

$$s_{A,min} = \frac{\sum_0^{n_A} s^i}{n_A + 1} - \alpha \cdot \left(\frac{\sum_0^{n_A} s^i}{n_A + 1} - \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} \right) - \frac{\alpha}{\theta} f_B < \bar{s} \quad (13)$$

The latter inequality applies, since by construction, the first term on the RHS is smaller than $\bar{s}$ and the second term is negative by definition of the clubs (the average status is larger in A than in B). Since $\Delta_A^{m_A}$ is strictly increasing in s^C, this implies that club A will not make any offer to candidates with $s^C < s_{A,min}$. As long as $s^C \geq s_{A,min}$, club A will offer new candidates entry while asking for a level of f_A (for given f_B) such that either (10) just binds with equality (an offer, which then will be accepted by the entrant) or an

[14]Henceforth, when writing $s_{j,min}$ we implicitly refer to $s_{j,min}(s^k)$, where k is the decisive old club member in the specific decision making process.

offer for which the participation constraint (9) strictly holds. Whichever one of the two situations emerges will be discussed later on, after having analyzed club B's decision making.

As with club A, the decision making process of the less exclusive club B hinges on the gains of B's median member via a new member. His utility differential is:

$$\Delta_B^{m_B} = \theta \frac{\sum_{n_A+1}^{N} s^i - s^{m_B} + s^C}{N - n_A} + \alpha \frac{f_B}{N - n_A} - \theta \frac{\sum_{n_A+1}^{N} s^i - s^{m_B}}{N - n_A - 1} \tag{14}$$

The optimization problem of club B's median voter implies the maximization of (14) subject to the participation constraint of the entrant (see (9)), $\Delta_B^{m_B} \geq 0$, and the fact that club B is indeed able to make sure that the entrant does not strictly prefer club A, i.e. $s^C < s_{A,min}$.

Since $\partial \Delta_B^{m_B} / \partial s^C > 0$, there may exist a lower bound for which new entrants are not profitable for club B, i.e. they may lead to a negative $\Delta_B^{m_B}$.

Using (14) we can compute the corresponding minimum status for club B, which does not depend on f_A as club B does not have to incur the (IC):

$$s_{B,min} = \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} - \frac{\alpha}{\theta} f_B. \tag{15}$$

Comparing the minimum status position determined by the two clubs we find:

$$s_{A,min} - s_{B,min} = (1 - \alpha) \left(\frac{\sum_{0}^{n_A} s^i}{n_A + 1} - \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} \right) > 0$$

The strict inequality sign holds by definition, i.e. due to the fact that the average status of the more exclusive club A is higher than the one of club B. Thus, we can state:

Lemma 2 *The more exclusive club A makes offers to entrants with a relatively higher status level. The required minimum status position of club B is strictly lower than the one of club A (i.e.* $s_{A,min} > s_{B,min} \forall f_B$.*)*

Both $s_{A,min}$ and $s_{B,min}$ depend on f_B. This makes f_B a strategic tool in the hands of club B: by reducing f_B and thus raising $s_{A,min}$, under certain circumstances club B can prevent club A from making an offer to the candidate that is attractive for both parties. Because of lemma 2, however, its is still possible that the specific level of f_B makes entry of the candidate into club B a win-win situation.

We can distinguish two restrictions that club B has to take into account. First, for $s^C \in [s_{B,min}(f_B^E), s_{A,min}(f_B^E))$ whereby f_B^E denotes the entrance fee for which the participation constraint of the entrant just holds with equality. In this first range of status positions of the candidate, club A is not able to make a membership offer to the candidate, which satisfies both parties. Therefore, club B is able to exploit the candidate completely. The participation constraint of the candidate holds with equality:

$$f_B^E = \theta \hat{s}_B^E = \theta \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} \tag{16}$$

Second, for $s^C \geq s_{A,min}(f_B^E)$, demanding f_B^E has the consequence that club A has an incentive to match the offer of club B. The candidate would then join club A. In the range $s^C \in [s_{A,min}(f_B^E), s_{A,min}(f_B = 0))$, however, club B has an incentive to reduce f_B subsequently in order to make sure that the entrant actually joins club B. The fact that entrants are still increasing the utility of the median of club B if $s^C < s_{A,min}(f_B = 0)$ emerges from the observation that a reduction in the entrance fee reduces $s_{A,min}$ and $s_{B,min}$ by the same factor, $\frac{\alpha}{\theta}$ (see (13) and (15)). Using (13) for the range $s^C \in [s_{A,min}(f_B^E), s_{A,min}(f_B = 0))$, we find for the resulting f_B^+:

$$f_B^+ = \theta \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} + \frac{(1-\alpha)\theta}{\alpha} \cdot \frac{\sum_{i=0}^{n_A} s^i}{n_A + 1} - \theta \frac{s^C + \epsilon}{\alpha}, \tag{17}$$

whereby ϵ denotes a very small number. A glance at (17) reveals that the higher s^C is, the lower f_B^+ becomes, before it ends up being zero. Hence, entrants with s^C very close to $s_{A,min}(f_B = 0)$ do literally have to pay no entrance fees and therefore realize the highest possible utility increases of candidates finally joining club B. The intuition for this is straightforward. The higher s^C is the closer we get to the *competitive frontier*, at which club B competes fiercely with club A by setting a very low entrance fee. At the extreme, $s^C = s_{A,min}(f_B = 0)$. This intense competitive situation between the clubs leads club B to charge $f_B = 0$. Therefore, we have:

Lemma 3 *i) Candidates with very low status positions i.e.* $s^C < s_{B,min}(f_B^E)$ *will not receive any offer from either club.*
ii) Candidates with intermediate status levels will join club B. Candidates will be completely exploited for $s^C \in [s_{B,min}(f_B^E), s_{A,min}(f_B^E))$.
iii) Candidates with $s^C \in [s_{A,min}(f_B^E), s_{A,min}(f_B = 0))$ *will join club B. These entrants face lower fees* f_B^+ *and therefore gain strictly positive utility increases by joining club B. The higher* s^C *is the higher is the utility realized by the entrant and the lower is the entrance fee.*

Candidates with $s^C \geq s_{A,min}(f_B = 0)$ will join club A. Since $\partial\Delta_A^{m_A}/\partial f_A > 0$ (see (11)), club A will always choose the highest fee feasible. There are two potential restrictions which determine the optimal entrance fee of club A: the participation constraint and the indifference condition. In equilibrium, club B will ask for an entrance fee of $f_B = 0$. This will not convince candidates to join club B, but it disciplines club A in setting f_A. Hence, comparing (9) and (10) for this focal equilibrium reveals that, from the point of view of club A, (10) is always more restrictive, implying that we do not have to take (9) into account. If club A sets an entrance fee for which the indifference condition holds, the participation constraint is always fulfilled. Thus, club A demands an entrance fee which is equal to the difference of the average status levels of the two clubs from the point of view of the entrant:

$$\tilde{f}_A = \theta\hat{s}_A^n - \theta\hat{s}_B^n = \theta\frac{\sum_0^{n_A} s^i}{n_A + 1} - \theta\frac{\sum_{n_A+1}^{N} s^i}{N - n_A} \tag{18}$$

Since this expression is independent of s^C, the entrance fee is the same for all entrants into club A implying the same utility gain for all of them. As $\Delta_A^{m_A}$ increases with s^C, however, the median of club A gains more the higher s^C is. Therefore, we have:

Lemma 4 *Entrants with high status levels, $s^C \in [s_{A,min}(f_B = 0), \bar{s}]$, join club A. They have to pay an entrance fee of $\tilde{f}_A$ which leaves them a utility gain when joining club A. The higher s^C is, the higher the gains of the club.*

Henceforth, we limit our analysis to cases where the following conditions apply:

Condition 1: $\alpha \leq \frac{s^{m_B} - \underline{s}}{s^{m_B}}$

Condition 2: $\alpha \leq \frac{s^{m_A} - \underline{s}}{s^{m_A}}$

If one or both of these conditions are violated, the lower boundary of the status support, $\underline{s}$, is larger than one or both upper boundaries of regions IV and III (see Proposition 1). Hence, those regions could not exist. The existence of regions II and I is not affected by realizations of α. This means that, only if the inefficiency of the money transfer $(1-\alpha)$ among the candidate and the old club members is sufficiently large, there are candidates who are not allowed to enter any club (or are allowed to enter but completely exploited). If the exogenous efficiency exceeds the threshold of condition 1, all candidates are accepted in some club). We summarize our Lemmas in:

Proposition 1 *We can divide our status line into four different segments:*
(i) Region IV: Potential entrants with very low status, $s^C < s_{B,min}(f_B^E)$, do not get an offer from either club.
(ii) Region III: Entrants with low status levels, $s^C \in [s_{B,min}(f_B^E), s_{A,min}(f_B^E))$, join club B. The non-existence of competition for these entrants leads to the complete elimination of all surplus for these entrants.
(iii) Region II: Entrants with intermediate status levels, $s^C \in [s_{A,min}(f_B^E), s_{A,min}(f_B = 0))$, join club B as well but gain by the fact that there is competition for them between the clubs. The surplus associated with entry into the club is split

between club B and the entrant.

(iv) Region I: Entrants with high status levels, $s^C \in [s_{A,min}(f_B = 0), \bar{s}]$ *join club A. All entrants in this range realize the same positive utility gain when joining club A.*

(v) The club losing the competition for the new candidate will price entry as competitive as possible (such that $\Delta_j^{m_j} = 0$ *for that club).*

Figure 2 illustrates Proposition 1: in equilibrium, clubs divide candidates in line with their own average status.

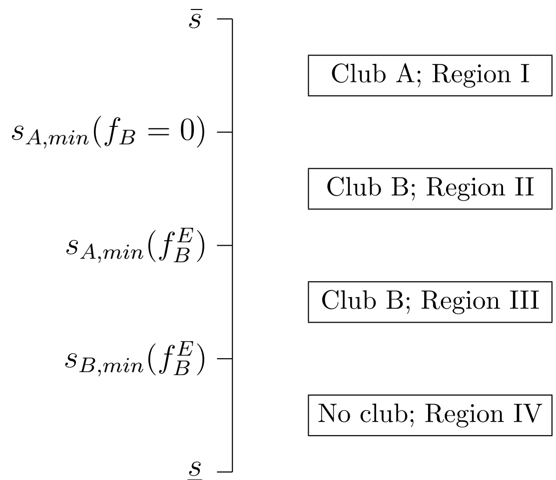

Figure 2: Segmentation of new candidates in clubs A and B

In equilibrium it is ex ante clear which club, if at all, the candidate will join. In region IV, it is obvious that candidates with very low status would not be willing to pay an entrance fee that satisfies m_B (let alone m_A). Hence Proposition 1.*(i)* follows. For candidates in region III, club B is protected from competition of club A since m_A would only want to compete for the candidate if being remunerated extensively—which would violate (PC_A). This lets club B yield all surplus generated by entry of the candidate. In region I, on the other hand, club A is protected from intense competition since club B, because of its budget constraint, is not able to offer high ranking candidates a level of utility via the combination of old members' average status and the entrance fee that exceeds club A's. As a consequence, club A yields some surplus. Because of part *(v)* of Proposition 1 club A cannot completely exploit the candidate, however, leaving some surplus generated by entry with the candidate. In region II, competition for the candidate is most intense: no club is protected from very competitive bids of the other club, which lets the candidate enjoy a share of surplus generated from entry that increases in her own status.

The intuition of Proposition 1.*(v)* is that the "losing" club j neither has an incentive to ask for a lower fee than the most competitive fee (this would violate $s_{j,min}$ and make $\Delta_j^{m_j} < 0$) nor to ask for a higher fee (this would make membership in club j even less attractive for the candidate and would not change m_j's surplus of zero). Given this strategy of the losing club, the "winning" club's best response, according to the arguments above, is to ask f_B^E, f_B^+ and $\tilde{f}_A$ in the respective regions III to I.

3.3 Convergence of clubs, winning bids, and reduced preferences for status

As a direct consequence of Proposition 1, we have:

Corollary 1 *In equilibrium, there is no convergence of clubs with respect to status levels, rather the difference in average status levels across clubs is perpetuated.*

This is due to the fact that, generally speaking, the best candidates (with $s^C \geq s_{A,min}(f_B = 0)$) join the best old members in club A, whereas lower ranking new candidates join related old members in club B, or even do not gain access to any club at all. Similarly, as a direct consequence of Proposition 1 we have:

Corollary 2 *The highest ranking new candidates (in region I) pay* higher *fees than some candidates with relatively lower status (the best in region II).*

In other words, top ranking scientists, for instance, according to our model, would prefer to join a top ranking faculty for comparatively low remuneration (= higher entrance fees), and scientists with lower status join lower ranking faculties for a comparatively high salary. Figure 3 displays the "winning bids" function that is paid by the new candidate in equilibrium (in regions II and III to club B, in region I to club A). As we plotted $f_B^E > \tilde{f}_A$, here we assume the status of the highest ranking old member of club A to be sufficiently high ($\bar{s} > N + 1 + \frac{n_A}{2}$).[15]

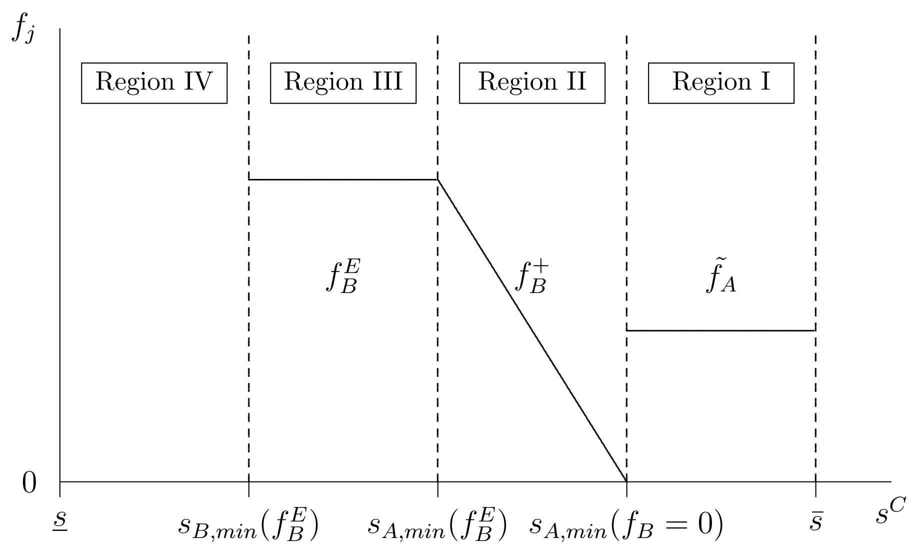

Figure 3: Entrance fees in equilibrium (for $\bar{s} > N + 1 + \frac{n_A}{2}$)

What is the effect of declining relative preferences for status over money in the economy?[16] Altering θ in the equilibrium values for the borders of Proposition 1's regions and the winning bids reveals:

[15]If that inequality does not hold, $f_B^E \leq \tilde{f}_A$. f_B^+ in region II would adjust accordingly starting from the level of f_B^E at $s_{A,min}(f_B^E)$ and decreasing linearly to a value of zero at $s_{A,min}(f_B = 0)$.

[16]Refer to the utility function in (1).

Corollary 3 *If preferences for status are reduced in the economy, then (i): the borders of the regions of Proposition 1 are not affected, i.e.* $s_{B,min}(f_B^E)$, $s_{A,min}(f_B^E)$, *and* $s_{A,min}(f_B = 0)$ *do not depend on* θ. *(ii): the winning bids in regions I-III are reduced almost everywhere, i.e.* $\frac{\partial f_B^E}{\partial \theta} > 0$, $\frac{\partial f_B^+}{\partial \theta} > 0$ *and* $\frac{\partial \tilde{f}_A}{\partial \theta} > 0$ *for all* $s^C \neq s_{A,min}(f_B = 0)$.

Part *(ii)* of Corollary 3 is due to the fact that in all three winning bids θ serves as multiplier of a positive value. Hence reducing θ reduces the winning bids linearly. This effect, however, cancels the factor $\frac{1}{\theta}$ in the values of the borders. That explains part *(i)*.

The intuition of Corollary 3 is that, for decreasing θ, membership in a club is less valuable for the candidate in terms of money. Therefore, the clubs can only charge lower entrance fees. This also explains why Corollary 3.*(ii)* makes an exemption at $s^C = s_{A,min}(f_B = 0)$, where the outside option of the candidate, f_B, cannot be reduced further. Hence, at that point the winning bid, $\tilde{f}_A$, does not have to be reduced, too. Because of the fact that decreasing the relative value of status in the economy affects both clubs equally (which hinges on the $s_{j,min}$), allocation of the candidate is not altered and the borders of the regions remain unchanged.

4 Alternative Voting Schemes

In this section, we alter our majority voting rule by allowing for veto rights of all old members of one or both clubs.[17] Basically, this gives us three alternative settings. In the first one, all members in club A have veto rights, whereas majority voting prevails in club B. In the second setting, we reverse this order. Finally, we look at a situation with veto rights for all members in both clubs.

[17] In the appendix, we briefly discuss two other voting schemes, *meritocracy* (in A.1) and *unanimity with side-payments* (in A.2).

4.1 Competition with Unanimity in Club A and Majority Voting in Club B

Let us begin with the first alternative. You will recall that, according to equation (6) and the discussion thereafter, the utility differential of the k-th old member in a club via entry of a new member is strictly increasing in his own status, s^k. Therefore, a lowest ranking old member should be a priori more reluctant to allow access of a new member than his fellows with higher status.

In club A unanimity prevails, whereas club B decides by a majority voting rule. This implies that in club A the old member with the lowest status position is decisive, while in club B we once again have to consider the situation of the median voter (member). Hence, the behavior of club B remains unchanged. The same is true with respect to the potential new member wanting to join one of the two clubs.

In contrast to our basic model, in club A the member with the lowest status position (being located at n_A) maximizes:

$$\Delta_A^{n_A} = \theta \frac{\sum_0^{n_A-1} s^i + s^C}{n_A+1} + \alpha \frac{f_A}{n_A+1} - \theta \frac{\sum_{i=0}^{n_A-1} s^i}{n_A} \tag{19}$$

subject to the binding indifference condition and the restriction $\Delta_A^{n_A} \geq 0$.

This allows us to compute the critical status position, below which club A is not willing to let new candidates in:

$$s_{A,min}^{veto} = \alpha \cdot \frac{\sum_{n_A+1}^{N} s^i}{N-n_A} - \frac{\alpha}{\theta} f_B + \left((1-\alpha) + \frac{1}{n_A} \right) \cdot \frac{\sum_{i=0}^{n_A} s^i}{n_A+1} - \frac{s^{n_A}}{n_A} \tag{20}$$

Comparing (13) with (20) reveals that

$$s_{A,min}^{veto} - s_{A,min} = \frac{1}{n_A(n_A+1)} \sum_0^{n_A} s^i - \frac{s^{n_A}}{n_A} > 0$$

With unanimous decision making club A becomes more restrictive which is very intuitive. In the presence of veto rights the member who gains least becomes crucial. Since the status position of the new member is positively incorporated into this member's utility function, a higher status is required in order to assure a utility gain through the affiliation of the new member.[18]

The decisions of club B are only indirectly affected by club A's more stringent selection process. Substituting f_B^E (which remains the same) in (20) gives us:

$$s_{A,min}^{veto}(f_B^E) = \left((1-\alpha) + \frac{1}{n_A}\right) \cdot \frac{\sum_{i=0}^{n_A} s^i}{n_A + 1} - \frac{s^{n_A}}{n_A} > s_{A,min}(f_B^E) \qquad (21)$$

In the same manner we find:

$$s_{A,min}^{veto}(f_B = 0) = \alpha \cdot \frac{\sum_{n_A+1}^{N} s^i}{N - n_A} + \left((1-\alpha) + \frac{1}{n_A}\right) \cdot \frac{\sum_{i=0}^{n_A} s^i}{n_A + 1} - \frac{s^{n_A}}{n_A} > s_{A,min}(f_B = 0) \qquad (22)$$

The distance between the two boundaries remains the same. However, since f_B enters linearly into $s_{A,min}^{veto}$ (see (20)), region II remains of the same size but shifts upwards. For any given s^C, since club A has become even more exclusive in its selection process, club B can charge higher entrance fees, f_B^*, for $s^C \in [s_{A,min}^{veto}(f_B^E), s_{A,min}^{veto}(f_B = 0))$. Since $s_{A,min}^{veto}(f_B = 0) > s_{A,min}(f_B = 0)$, region I shrinks, implying that fewer potential members actually join club A. Due to the fact that the critical status level, below which club B is not willing to offer affiliation to potential new members, remains the same, region IV stays the same, whereas we observe an expansion of region III. We summarize these findings in:

Proposition 2 *i) If club A switches to unanimity voting while club B sticks to the majority voting rule, club A becomes more selective and demands a higher status position for its new intakes while club B does not alter its required minimum status position. ii) In turn, this implies that more entrants*

[18] The same mechanism can be used to easily explain another voting scheme, *meritocracy*. Refer to appendix A.1 for a brief discussion.

enter club B. iii) The increased competitive situation of club B allows a higher degree of appropriation of surplus of club B. iv) Because of (i) club A loses surplus in total.

Figure 4.(i) depicts Proposition 2's intuition.

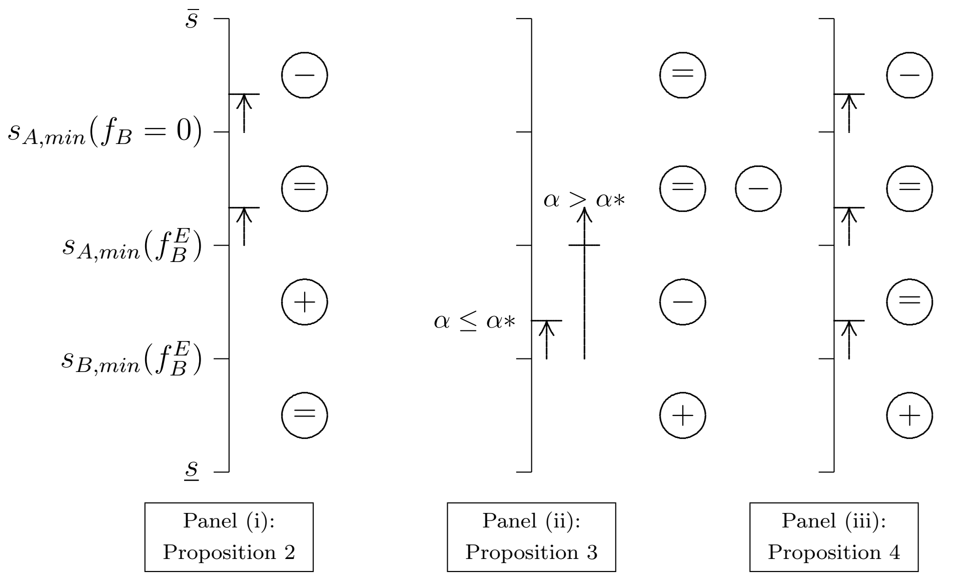

Figure 4: Propositions 2 to 4

4.2 Competition with Unanimity in Club B and Majority Voting in Club A

In the next step we reverse the decision rules which apply in the two clubs: majority voting in the more exclusive club A and unanimity in club B. In this case, the behavior of club A is just the same as in our benchmark analysis. In line with the argument in the previous subsection, the member with the lowest status position in club B (being located at N) is decisive. The relevant utility differential is (see (6)):

$$\Delta_B^N = \theta \frac{\sum_{n_A+1}^N s^i - s^N + s^C}{N - n_A} + \frac{\alpha f_B}{N - n_A} - \theta \frac{\sum_{n_A+1}^N s^i - s^N}{N - n_A - 1} \tag{23}$$

The restriction $\Delta_B^N \geq 0$ holds for

$$s^C \geq \frac{\sum_{n_A+1}^N s^i - s^N}{N - n_A - 1} - \frac{\alpha}{\theta} f_B \equiv s_{B,min}^{veto} \tag{24}$$

As in the previous setting we find by comparing (15) and (24):

$$s_{B,min}^{veto} - s_{B,min} = \frac{\sum_{n_A+1}^N s^i - s^N}{N - n_A - 1} - \frac{\sum_{n_A+1}^N s^i}{N - n_A} = \frac{\sum_{n_A+1}^N s^i - s^{m_B}}{N - n_A - 1} > 0 \tag{25}$$

In comparison to majority voting, unanimity leads to more stringent selection procedures. Club B will increase the threshold level for potential entrants' status requirement. Therefore, region IV increases, whereas region III shrinks. The open question is, however, whether the latter disappears completely and, more generally, whether club B is able and willing to take in any new candidates at all, that is, whether regions II and III still exist.

If $s_{B,min}^{veto} > s_{A,min}$, all new candidates that club B is interested in, will also receive a membership offer by club A—and, while letting the indifference condition hold, club A will attract the candidate. Then, club B would receive no new members meaning that regions II and III would disappear. $s_{B,min}^{veto} > s_{A,min}$ equals:

$$\frac{\sum_{n_A+1}^N s^i - s^N}{N - n_A - 1} - \frac{\sum_0^{n_A} s^i}{n_A + 1} + \alpha \cdot \left\{ \frac{\sum_0^{n_A} s^i}{n_A + 1} - \frac{\sum_{n_A+1}^N s^i}{N - n_A} \right\} > 0 \tag{26}$$

Since the sum of the first two terms is strictly negative, the LHS is negative for $\alpha = 0$. In contrast, with $\alpha = 1$, we have: $sgnLHS = sgn(\frac{\sum_{n_A+1}^N s^i - s^N}{N-n_A-1} - \frac{\sum_{n_A+1}^N s^i}{N-n_A}) = sgn(\frac{\sum_{n_A+1}^N s^i}{N-n_A} - s^N)$ which is positive, given the uniform distribution of status positions. Since the LHS is continuous and strictly increasing in α, a unique α^* exists so that for all $\alpha > \alpha^*$, $s_{B,min}^{veto} > s_{A,min}$.

This is driven by the following trade-off: First, as is obvious from comparing $s_{A,min}$ and $s_{B,min}$ ((13) and (15)), these are equal for $\alpha = 1$, i.e. if there is no friction between the candidate paying the entrance fee and the old club members receiving it. The spread increases with growing distortion $(1 - \alpha)$ reflecting the fact that in this case old club A members value status dilution higher than monetary gains and, therefore, become more restrictive. This effect is restricted to club A because only this club has to satisfy the indifference condition which expresses the relative value of status and fees for new members. Second, as shown above, a decisive old member with lower status is more restrictive concerning new candidates' acceptance than a member with higher status. Hence, a change in club B's control structure from the median to the lowest ranking old member leads to a less liberal acceptance policy.

For $\alpha = \alpha^*$, these two effects are equal. For $\alpha < \alpha^*$, the first effect dominates. Region III shrinks but still exists, while regions II and I are unaffected. For $\alpha > \alpha^*$, the second effect dominates. No candidates will enter club B meaning that region III will disappear. The same is valid for region II if club B sets $f_B = 0$. For higher levels of f_B the upper part of region II (down to $s_{A,min}(f_B > 0)$) is served by club A. Region I remains constant. In both cases, region IV grows larger.

We summarize our findings, which are depicted in Panel (ii) of Figure 4, in

Proposition 3 *i) With competition between club B deciding by unanimity and club A opting for majority voting, club B will apply more stringent selection rules relative to the case where it applies the majority voting rule as well, thereby taking in fewer candidates. ii) For sufficiently low distortions $\alpha > \alpha^*$ club B becomes so restrictive that it will not be able to acquire any new members. New candidates will either join club A or no club at all.*

4.3 Unanimous voting in both clubs

Finally, we analyze the situation, in which both clubs use unanimous voting. We know from our analysis above that in this case each of the clubs becomes more selective. The minimum status levels contained in (20) and (24) apply. This implies that fewer potential entrants will join either of the two clubs (since $s^{veto}_{B,min} > s_{B,min}$) and fewer entrants will join club A.
Since

$$s^{veto}_{B,min} - s_{B,min} = s^{veto}_{A,min} - s_{A,min}, \tag{27}$$

the ranges along the status line of new candidates actually joining club B move upwards but have the same size as with competition under the majority voting rule.[19] The result is that regions II and III remain the same size, region I decreases, and region IV increases (see Panel (iii) of Figure 4). This implies

Proposition 4 *In comparison to the case with majority voting in both clubs, i) with competition based on unanimity in clubs A and B, both will apply more stringent selection rules. ii) Less candidates join club A which decreases A's total surplus. iii) The number of candidates joining club B remains constant leaving B's total surplus constant, too.*

5 Welfare

Which implications does our model entail for a social planner who strives to maximize total surplus of the economy? If the candidate joins a club, the net gain in total surplus is:

$$\Delta TS \equiv \sum_{i=0}^{n_A} \Delta^i_A + \sum_{i=n_A+1}^{N} \Delta^i_B + \Delta^C = \theta s^C - (1-\alpha) f_j \tag{28}$$

[19] Calculations are facilitated as our linearity assumption in the status distribution allows to use $\frac{\sum_0^{n_A} s^i}{n_A+1} = s^{m_A} = \bar{s} - m_A = \bar{s} - \frac{n_A}{2}$ and $\frac{\sum_{n_A+1}^{N} s^i}{N-n_A} = s^{m_B} = \bar{s} - m_B = \bar{s} - \frac{N+n_A+1}{2}$.

If the candidate joins neither club, the net gain is zero. (28) captures a trade-off: since the candidate cannot make use of his status if he is left without club membership, his entry creates value worth θs^C. On the other hand, without entry the candidate derives utility f_j from his monetary resources. Entry shifts this sum to the old members of a club and reduces its value by the inefficiency factor $(1-\alpha)$. As f_j is an endogenous variable, it is obvious that, for any given status of the candidate s^C, a first-best allocation is reached by requiring an entrance fee of $f_j = 0$ and granting the candidate access to an arbitrary club.[20] The latter reflects the fact that, from the point of view of the old members, it is more efficient to allocate the new entrant to club B,[21] whereas the new entrant prefers joining club A. In total, the two effects just balance.

Given that a welfare maximizer cannot dictate entry conditions and fees, does he comply with the market-based results? To obtain the second-best benchmark, let us note that ΔTS, as defined in (28), strictly increases in s^C. Using this and setting (28) equal to zero shows that the social planner prefers in a second-best (SB) world that all candidates characterized by $s^C \geq s_{SB,min}$ enter a club, where:

$$s_{SB,min} \equiv \frac{1-\alpha}{\theta} f_j \tag{29}$$

To compare the second-best with the equilibria derived above, recall that, according to Proposition 1, all candidates in regions I-III will gain access to a club, while candidates in region IV will be excluded from entry. Under majority voting, the marginal candidate allowed to enter a club is characterized by

$$s^C = s_{B,min}(f_B^E) = (1-\alpha)\frac{\sum_{n_A+1}^{N} s^i}{N - n_A} \tag{30}$$

[20]Consequently, some old members will suffer a net utility loss as their diluted status utility is not compensated for by a monetary fee.

[21]This is due to the fact that old members in club B, on average, gain relatively more from an entrant with high status and lose relatively less from an entrant with low status than old members in club A.

and pays a fee of f_B^E (see (16)). Inserting f_B^E in (29) reveals that, under majority voting, market-based competition among clubs leads to a second-best result, i.e. $s_{B,min}(f_B^E) = s_{SB,min}(f_B^E)$.

At the second-best entry-threshold, where $s^C = s_{B,min}(f_B^E)$, the candidate enters club B. Therefore, by definition, each club A member gains $\Delta_A^i = 0$, the candidate is completely exploited and hence gains $\Delta^C = 0$, and the pivotal (median) member in club B also gains $\Delta_B^{m_B} = 0$. Due to equation (6) and Lemma 1, old club B members with status levels below s^{m_B} will suffer from the candidate's entry (for them $\Delta_B^i < 0$). Because of our linearity assumption of the status distribution, however, their aggregate loss is exactly offset by the net gain of old club B members with status levels above the median (for them $\Delta_B^i > 0$).

When club B, while being the club accepting entry of the candidate with the lowest status of all accepted entrants in the economy, changes from majority voting to unanimity, its pivotal member switches from m_B to N. As the pivotal member will make sure to get at least a net gain of zero, he will grant access to less candidates than the median member (cf. (25)). This means that, if $s^C = s_{B,min}^{veto}(f_B^E)$, all other club B members (with $s^i > s^N$) will each gain $\Delta_B^i > 0$. That sum, from a welfare perspective, should be redistributed to compensate the pivotal member for granting access to the candidates with $s^C \in [s_{B,min}(f_B^E), s_{B,min}^{veto}(f_B^E))$.

Analogously, when club B switches from majority voting to meritocracy, i.e. the highest ranking member $(n_A + 1)$ becomes pivotal, its status requirement for new candidates declines.[22] As a consequence, all other club B members (with $s^i < s^{n_A+1}$) will each lose from entry of a candidate with $s^C \in [s_{B,min}^{merit}(f_B^E), s_{B,min}(f_B^E))$. We summarize these findings in:

Proposition 5 *(i): Market-based competition among clubs never leads to the first-best allocation.*

[22]See appendix A.1 for more details on the meritocracy regime.

(ii): Under majority voting in club B, market-based competition among clubs leads to a second-best result, i.e. $s_{B,min}(f_B^E) = s_{SB,min}(f_B^E)$.

(iii): Under unanimity voting in club B, market-based competition among clubs leads to overexclusion of candidates from club entry, i.e. $s_{B,min}^{veto}(f_B^E) > s_{SB,min}(f_B^E)$.

(iv): If club B employs the meritocracy regime, market-based competition among clubs leads to overinclusion of candidates, i.e. $s_{B,min}^{merit}(f_B^E) < s_{SB,min}(f_B^E)$.

Proposition 5.*(i)* is due to the fact that, in equilibrium, there is no single value of s^C where $f_j = 0$. $s^C = s_{A,min}(f_B = 0) - \epsilon$ comes close, but still a positive fee ϵ has to be paid from the entrant to club B.

6 Discussion

We will focus in this section on what we consider the driving assumptions of our set-up and its conclusions.

The main mechanism in our analysis hinges on the fact that club members with higher status gain relatively more from a new member than old members with a lower status. Technically, this stems from the fact that club members benefit from the average status of their fellow members (excluding their own) independent of the specific form of the utility function. The fact that old members with lower status gain less than old members with higher status depicts the fact that, in case of entry, they have to share the possibility to interact with higher status members with more fellows. In contrast, high status members gain relatively less from social interaction anyway. They benefit more from club facilities etc., i.e. from the monetary contribution of the new member. Given that we consider clubs as status organizations, in which social interaction matters and in which social status is vertically differentiated, this seems to be a quite natural and general mechanism.

To illustrate this, consider the following extreme example: a club consisting of a high and a low status member. The former communicates with the latter and gains rather little from social interaction whereas the low status member experiences significant gains. If a new member with an intermediate status level enters, the high status member even gains in absolute terms whereas the low status member suffers from a dilution effect. Obviously, this effect is most prevalent with a rather small number of club members and more and more disappears if club sizes increase. Therefore, we consider our main mechanism to be robust as long as we do not study clubs that are very large and accept the notion of status being a vertically differentiated value.

We consider in the main body of our analysis a one-shot game (entry takes place only once). Corollary 1 states our divergence result. What happens if we extent this one-shot game to a repeated game setting? If new entrants are stochastically distributed along the status line, the position of the median-voter in the two clubs remains the same over time. That is, the resulting equilibrium in every stage game is not changed, differences in status levels are perpetuated in every stage. There are two remaining issues in this respect. First, in a repeated game setting, the median-voter might foresee the impact his decision has on the subsequent stages. Letting a low status candidate enter now implies that the median-voter in the subsequent stage game is more restrictive. Hence, the present median-voter has an incentive to be marginally more liberal. But this effect turns in the opposite direction if the low status candidate is actually permitted. Therefore, we expect that in total the effect is negligible. Second, new entrants lead to an even number of club members. The resulting problem for the median-voter model could just be solved with a random choice mechanism leading on average to the same effect.

A third issue that we consider to be worth a broader discussion is our assumption of α being smaller than one. For our positive analysis, this assumption is analogous to assuming the utility function being concave in monetary transfers. Therefore, and because we think that club services are indeed not adequately modelled as public goods, we consider the inefficiency parameter $(1-\alpha)$ as a reasonable description. With monetary transfers and status being perfectly exchangeable ($\alpha = 1$), new entrants could (and would be willing to) perfectly compensate their lack of status by simply paying more fees. Consequently, club A would attract all potential new entrants ($s_{A,min} = s_{B,min}$). This extreme result, which is an immediate of the symmetry of the utility functions of all old members (see below) and the perfect exchangeability between status and monetary transfers, is avoided with $\alpha < 1$.

Finally, let us discuss the symmetry of the utility functions of all agents (existing members of both clubs as well as the candidate), which our results crucially depend on. Most notably, θ is identical across all agents. This implies that the marginal rate of substitution between status and monetary transfers is identical for all agents. A relaxation of this assumption has potentially strong, but in most cases quite obvious implications. The most interesting application is when the new candidate has a lower θ than the old club members, i.e. the new candidate values status less than money. In this case, the competitive advantage of club A decreases. The difference in fees becomes more important. This becomes most obvious with $\theta = 0$. Then only fees are relevant for the new candidate. At the same time, a new entrant with high status is relatively more attractive for club B than for club A (since the effect on average status is more pronounced for club B). Hence, with a low θ club B is able and willing to attract high status candidates leading to convergence of clubs. A potentially relevant application of this is when highly reputable professors prefer second-tier universities (making much more money there) than joining a top-university.

Since there are no obvious justifications of systematic differences in preferences, we stick to our symmetry assumption in the main body of the analysis.

7 Empirical Implications and Conclusion

In this paper we have investigated the development of already existing member-owned clubs and their competition for new members. Our model applies to a wide range of potential applications beyond our particular example of academic institutions. The defining characteristics are that the clubs under consideration are member-owned clubs (i.e. the old members possess the decision rights) and that members' utility depends on the status positions of the other members. Finally, some sort of membership fees should play a role in the admission process of new members. Against this background, it is quite obvious that our analysis applies not only to academic institutions but also to other clubs with a vertically structured status variable such as country clubs, internet clubs, conference organizations etc. In contrast, our model cannot be applied without adaptations to clubs with a multi-dimensional status variable, where members' preferences are not single-peaked.[23]

The main hypotheses emerging from our theoretical analysis which are empirically testable are the following: Assume status is a vertically differentiable, unalienable characteristic of an individual, and each person's status level is common knowledge (e.g. in the academic world by way of ranking young researchers according to the weighting of their publications) ...

1. ... then the best candidates entering the system should end up in the best clubs/ institutions (ref. Corollary 1) ...

2. ... but they should accept lower salaries than second-tier candidates who join lower ranking clubs (ref. Corollary 2).

[23] Current NATO members, for instance, when considering entry of new states into their club, could either have a preference for military power or for a certain geographical location of candidate states (e.g. being situated in Eastern Europe to serve as potential buffer against Russia). Old members' preferences could be horizontally differentiated in both dimensions, hence a unique ranking of potential candidates (and old members alike) along the status line would be impossible.

3. If a club's decision making process is switched from unanimous voting to majority voting, its acceptance policy with respect to new candidates should become more liberal, meaning that the marginal status requirement for candidates to get a membership offer should decrease. By switching to meritocracy we expect this process even to be accelerated (ref. Lemma 1 and Propositions 2(i) to 4(i)).

4. As clubs profit, on a cooperative basis, from becoming more liberal, we should expect trends towards more liberalism in time-series data of acceptance policies and not towards more restrictiveness—if altering decision making processes is feasible at all (ref. Propositions 2(iii) to 4(ii)).

There are a number of potential avenues for extensions: analyzing the implications of competition of investor-owned clubs (such as some professional sports clubs) would be a straightforward and particularly interesting one. As a first step in this direction it would be crucial to define the objective function of such an organization.

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A Appendix

A.1 Meritocracy

As mentioned in section 4, an obvious alternative decision design to voting by majority or unanimity would be meritocracy, i.e. the *best* old member of a club would hold final decision authority.

In club A, he is positioned at $n_i = 0$. According to equation (6), member 0 relative to his club fellows gains the most from a candidate's membership and hence will accept relatively lower s^C. Moreover, since we assume status to follow a uniform distribution, $\Delta_A^0 - \Delta_A^{m_A} = \Delta_A^{m_A} - \Delta_A^{n_A}$. This means that the extent to which club A becomes more restrictive by changing from median to unanimity voting equals the extent to which it becomes more liberal by moving from median voting to meritocracy. Because of this, a more detailed analysis of meritocracy would not yield qualitatively new insights.

A.2 Unanimity with side-payments (compensation)

A seemingly more sophisticated version of voting by unanimity is to maximize the joint utility differential of a club's old members and to allow those individual members gaining from the decision to share profits with less fortunate fellows.

However, due to our assumption of a uniform distribution of status, we have for club A $\sum_{k=0}^{n_A}(\Delta_A^k) = \Delta_A^{m_A}$. Thus, $s_{A,min}$ under this regime would equal $s_{A,min}$ under majority voting. Since determination of $s_{A,min}$ is the main driver for the remaining results, using a compensatory scheme is not different from using "regular" majority voting. Therefore, we refrain from discussing it in more detail.