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Rent Seeking: The Social Cost of Contestable Benefits

Abstract

A major contribution of the public-choice school is the recognition by Gordon Tullock that contestable rents give rise to social losses because of unproductive resource use. Contestable rents usually are politically assigned privileges. Contestable rents can also be found outside of government decisions. We describe the example of rents in academia in different cultures. The primary empirical question regarding rent seeking concerns the magnitude of the social loss from the contesting of rents. Direct measurement is impeded by lack of data and indeed denial that rent seeking took place. Contest models provide guidance regarding social losses. We provide a generalized contest model. Social losses from rent seeking are diminished in high-income democracies because rent seeking usually takes place by groups seeking 'public good' benefits. Rents are also less visible in democracies, because political accountability requires that rents be assigned in indirect non-transparent ways. These restraints are not present in autocracies, where rent seeking is also facilitated by corruption and by the need to influence a smaller number of decision makers. Ideology can influence whether rent seeking is recognized to exist.

JEL-Codes: H000.

Keywords: rent seeking, contests, political discretion, academic merit, ideology, political correctness.

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Contents: (1) The social loss from contestable rents; (2) Reality and rents; (3) Rent seeking in academia; (4) The non-observability of contests; (4) Political institutions; (6) Collective benefits; (7) Rent dissipation; (8) A basic integrated model; (9) Ideology

1. Introduction

The recognition of social losses from contestable rents is one of the most significant contributions of public choice to economics and politics. A substantial literature, both theoretic and applied, has followed the observation by Gordon Tullock (1967) that there is a social loss when rents are contested. A rent is a privileged benefit (Tullock 1989) and the contest is one of persuasion or a quest for influence over the decision who will have the privilege to benefit from the rent. Government is the primary source of privileged benefit. We use the example of rents in academia to illustrate that privileged benefit also exists outside of government.[1]

[1] For literature on contest models, see Congleton, Hillman, and Konrad (2008), volume 1 on theory and models, and volume 2 on applications. Konrad (2009) provides an overview of contest theory. See also Hillman (2013) and Long (2013). For surveys of different aspects of rent seeking, see the papers in Congleton and Hillman (2015). Anne Krueger (1974) gave the name 'rent seeking' to the contesting of rents. There is a literature on design of contests for rent creation and rent sharing that is not part of our concern. Our focus is on social loss from contestable benefits.

2. The social loss from contestable rents

Figure 1 shows a usual monopoly that maximizes profits by choosing price P_M and quantity Q_M when MR=MC. The triangle ABC is a deadweight loss known as the Harberger triangle (after Harberger 1954) compared to the competitive market equilibrium at price P_C and quantity Q_C. In traditional presentations, monopoly profits given by the rectangle P_MABP_C are an income transfer from consumers to the owners of the monopoly. Gordon Tullock (1967) proposed, however, that monopoly profits represent social loss if the profits are contestable. The profits are a rent or privileged benefit that a competitive market would not provide. Competitive entry would eliminate the monopoly rent. With monopoly persisting, resources can be expected to be attracted into displacing the incumbent monopolist and becoming the beneficiary of the monopoly profits. Resources will also be used by the monopolist to defend the monopoly position. If the monopoly is politically designated, the resources will be used in political persuasion or lobbying. If the monopoly exists because of physical deterrence of competitors, the resources will be used in a war over who will be the monopolist. In either case, use of resources in contesting the monopoly profits replaces use of resources in competitive entry. There are therefore two sources of social loss from monopoly in figure 1, (1) the social loss due to the existence of monopoly (the Harberger triangle) and (2) a further social loss through resources used in contesting the monopoly rent, if the rent is contestable.[2]

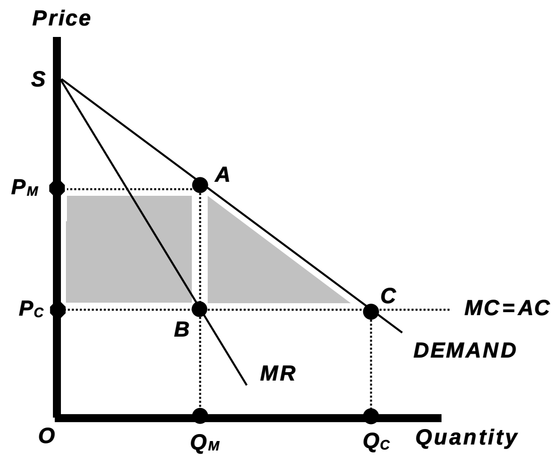

Figure 1

The social loss is precisely measured by the value of the monopoly rent in figure 1 if rent dissipation in contesting the profits is complete (if resources equal in value to the profits are attracted into contesting the profits) – but unless we know the value of the monopoly rent and we observe actual use of resources in contesting the rent, we cannot know whether the entire monopoly rent or a part is dissipated in the contesting of the rent. With Nash behavior, the social loss from contestability of the profits in figure 1 does not exceed the value of the profits. Behavioral assumptions (see Sheremeta 2015; Dechenaux, Kovenock, and Sheremeta 2015) are required for over-dissipation to occur (some type of emotional influence or

[2] There can be links between the two sources of social loss. See Kahana and Klunover (2014).

‘irrationality’ is required for more resources to be attracted to a contest than the value of the rent that is contested).

Tullock titled his 1967 paper ‘the welfare costs of tariffs, monopoly, and theft’. The contest could be to determine who benefits from protectionist rents created by tariffs. The addition of ‘theft’ made clear the competitive process underlying social loss. Thieves compete for other people’s money in seeking to become the successful thief among many thieves. Resources and time to plan and perpetrate theft are used before the identity of the successful thief is known. The social loss therefore occurs before the actual theft takes place. When the theft occurs, a redistribution of income takes place from the victim to the successful thief. The redistribution does not affect total income. Total income will however have declined in the course of the wasteful use of resources in planning and perpetrating the theft before the theft took place. Tullock’s description of theft as akin to seeking monopoly and protectionist rents makes clear the ex-ante nature of the social loss, which is incurred before the identity of successful thieves or successful rent seekers is established.

The theory of rent seeking stresses that the quest for influence in seeking rents is a rational personal response based on positive expected utility from participation in a contest for a rent – but the time and resources used in socially unproductive persuasion, lobbying, and influence-seeking have productive alternatives. Societies are therefore made poorer when contestable rents are present, or it is sufficient for unproductive use of resources that people believe that privileged rents can be obtained through political influence.

A preliminary quest may be to persuade political decision makers to choose policies that create rents. Resources are by prospective beneficiaries to influence the rent-creating decision, perhaps cooperatively, and a deadweight loss is incurred when the monopoly or protectionist rent is created. In a further contest, the rent created is contested non-cooperatively by the potential beneficiaries. Katz and Tokatlidu (1996) described on such two-stage contests. Contests can also involve prerequisite success: Hillman and Ursprung (2000) described two-stage contests in which political 'outsiders' compete to become political 'insiders', who have direct access to contests in which rents can be secured. Baik and Kim (1997) described delegation in contests. Contests can be for an indivisible rent or a share of a rent: risk aversion matters because risk-averse individuals are not indifferent between a given probability of winning an indivisible rent and winning a corresponding proportion of a rent with certainty (Long and Vousden 1987). Rents can be contested by groups rather than individuals. The rent to be won by a group can be a private benefit to be allocated among group members based on a sharing rule (see Flamand and Troumpounis 2015). The rent can be a public good for members of a successful rent-seeking group, in which case of course no sharing rule is required. Contests with rents as public goods prize have been studied by Ursprung (1990), Katz, Nitzan, and Rosenberg (1990), Gradstein (1993), Riaz, Shogren, and Johnson (1995), Baik and Shogren (1998), and Baik (2001). Political-economy applications of rent seeking in general involve groups seeking rents that collectively benefit members of the group (Ursprung 1990 describes rent seeking for a public good in a model of political competition).

We expect rents to be created with the intent of rent creators sharing in the rents. In high-income countries, rent sharing takes the form of political exchange, with rents created in return for political support provided through votes or campaign contributions. Political support is for example provided in return for creation of protectionist rents (Hillman 1982, 2015a) or protection can be modelled as 'purchased' from a political 'seller' of protectionist policies (Grossman and Helpman 1994). Rents can be created to be shared at different levels of the government bureaucracies, with contesting of the rents taking place at each hierarchical level as lower-level officials pass on a share of the rents, obtained initially as bribes, to higher-level officials (see Hillman and Katz 1987; rent-seeking in hierarchies has also been studied by Konrad 2004). Bribes as the source of rents for rent seeking are also present when promotion within a bureaucracy requires payment to superiors (see Kahana and Liu 2010).

Resources are used in avoiding being the source of rents and in rent protection. There are models in which consumers attempt to countervail the quest for monopoly or protectionist rents (models with opposition to rent seekers by losers from rent transfers include Appelbaum and Katz 1986, Cairns and Long 1991, Ellingsen 1991 and Fabella 1995).

Sabotage in rent seeking contests has been studied (Konrad 2000 and Amegashie 2012); in the case of sabotage, there are public-good and externality aspects, because using resources, or undertaking the risk to sabotage, benefits all others against whom the sabotaged contenders compete. Sabotage is the converse of 'doping' to improve performance: 'doping' provides private benefit (doping in contests has been describes by Berentsen 2002 and Kräkel 2007).

The monopoly rent in figure 1 is a value at a point in time whereas rents in general endure over time. The present value of the rent may not be the 'prize' contested. The rent-seeking model has been amended to include the possibility that rents may need to be re-contested in the future or may disappear when public policy changes (Aidt and Hillman 2008).

3. **Reality and rents**

Rents are pervasive. Rent creation, rent sharing and rent seeking, which in general occur together (Hillman 2015b), are involved in public finance (Park, Philippopoulos, and Vassilatos 2005, Brooks 2015), international trade policy (Hillman 2015a; Cassing and Hillman 2017), industry regulation (Shughart and Thomas 2015), national resources (Deacon and Rode 2015), and environmental policy (MacKenzie 2017). Rent seeking is also involved in development aid (Hagen

2015). Tullock (1971) reported how beggars in low-income countries made themselves more attractive beneficiaries in contests for receiving 'transfers'. Incentives of governments in low-income countries to keep their populations poor (or holding their populations 'hostage') to obtain aid resources have correspondingly been observed (Easterly 2001). Rent seeking also takes place in and through the bureaucracies of international organizations (Vaubel 2015). 'Welfare coalitions' that are a majority of the population have been identified as successful rent extractors in the welfare state (see Paldam 2015 on a majority welfare coalition in Denmark). In low-income countries, populations can be trapped in a society in which corruption creates extensive rents and attracts people to rent seeking through employment in unproductive government bureaucracies from which rents can be extracted from the public. Endemic rent seeking is thereby associated with endemic corruption, or a culture of corruption (see Liu and Peng 2015 on China, Levin and Satarov 2015 on Russia, Mbaku and Kimenji 2015 on sub-Saharan Africa, and Marjit and Mukherjee 2015 on India). Aidt (2016) has studied the nexus between corruption and rent seeking.

Migration involves rent and rent seeking, through people seeking (and often risking their lives) to extricate themselves from predatory societies in which they provide the rents for rent extractors (see Epstein, Hillman, and Ursprung 1999 on 'the king never emigrates'). Immigration is a form of rent seeking when immigrants seek out welfare states where they will become beneficiaries of income transfers from government (Nannestad 2004, 2007).

Rent seeking is associated with gender issues. Men may compete for attention from women and correspondingly women may compete for attention from men. In such cases, models with asymmetric valuations have applicability (Hillman and Riley 1989; Nti 1999, 2004). Sabotage in contests can also apply (all being fair in love and war).

Rent seeking is endemic when payment with money is absent and favors are required for benefits. When markets with monetary payments are absent, decisions about a person's benefits or costs are made by other people. There are incentives to use resources in influencing the decisions that other people make. Without markets, as in a socialist system, the only way to benefit or to avoid costs is to please another person.[3]

4. **Rent seeking in academia**

Rent seeking occurs in academia. Rent seeking as a topic of investigation was given significant impetus by a collection of papers in a volume edited by Buchanan, Tollison, and Tullock (1980). The volume showed the relevance of 'rent seeking' for a wide range of activities. The volume contained a paper by Brennan and Tollison

[3] See Hillman (2009). Rents have been present in the transition from socialism. Privatized state assets have been objects of rent creation and rent seeking through privileged purchase at artificially low prices. See Gelb, Hillman, and Ursprung (1998) on rent seeking in the transition as a 'distraction' from productive activity.

on ‘rent seeking in academia’. Brenan and Tollison focused on the presence of rents in academic salaries and internal university-department rent extraction and reassignment. Rents are also facilitated in academia by absence of unambiguous objective criteria setting out measurable attributes for judging the merits of a ‘good’ paper. Subjectivity therefore enters the judging of the merits of academic papers (we refer to the circumstances of the discipline of economics, although the situation in other disciplines is presumptively similar). Some reviewers might even judge a paper by the number of times they are cited and whether the authors are friends, or whether the authors have in the past reviewed and accepted their own papers. Career benefits and ego-rents are incentives for competition for rents through submissions of papers for publication and through time used and initiative directed at revisions to satisfy editorial and reviewer requirements (Frey 2003 observes that authors are prepared to do nearly anything to satisfy editor and reviewer requirements and presents a view of ‘publishing as prostitution’). Rents are created when citation clubs form around a topic or ideological viewpoint. On citation clubs or academic cartels, see Franck (1999). Jeong-Yoo Kim, Insik Min, and Zimmermann (2011) describe opportunism and strategic behavior in citations in economics. Political correctness and self-interest combine to deter protest by ‘outsiders’ against opportunistic reviewers or unreasonable grounds for rejection of papers; outsiders hope that they will become ‘insiders’ through eventual admission to a privileged club. Opportunities for privileged benefit are particularly great when the papers published in a journal are primarily invited, which can occur even when journals are published by a broad inclusive professional body such an economic association. The rent-seeking contest is then to become an editor. There are also rents from being in a 'top' department, through reluctance of editors to offend 'elites' in the profession; hence the benefit from being in a 'top' department goes beyond the prestige and ego-rents.

In academia, rents and rent seeking arise through proximity to and friendship with deans and department chairs, and through tenure and dismissal decisions that suggest different rules for different people. Rent seeking has been associated with tenure through the incentive of incumbent academics to protect their academic positions. Tenure gives a senior academic an incentive to hire a good young academic, whereas, in the absence of tenure, the senior academic would fear loss of rents through dismissal and replacement by the young more successful scholar.

Institutions and culture affect the forms of rent seeking in academia. In high-income societies, we can presume that rent seeking in academia does not involve money changing hands. Money however changes hands in other societies. Levin and Satarov (2015) describe a market in which advanced theses are purchased and payment is made for favorable evaluation of the theses that are acquired. Altbach (2009) and Liu and Peng (2015a,b) provide evidence on payment of bribes for college admission. Rumyantseva (2005) reviews prior evidence more broadly across low-income countries on paying for college admission, paying for grades, and buying diplomas and degrees. She also notes the phenomenon of students paying for conservations and consultations with instructors. The rents result in academic positions being valued and contested because of the income from bribes. For students, rent seeking replaces learning. With academic merit compromised as a criterion for admission to study, or with advanced theses having been purchased, there is a social loss in that successful completion of studies is not expected to be correlated with personal ability and personal comparative advantage.

5. **The non-observability of contests**

The empirical question for rent seeking is the magnitude of social loss. The resources used in a contest are not generally observable. Successful rent seekers will moreover in general attribute their rents to their effort and competence, rather than to their success in rent seeking (Hillman 2009). With data unavailable to allow computing of the value of resources used in rent seeking, and with denial that creation and rent seeking occurred, indirect methods have been used for measurement of the social losses due to rent seeking (Del Rosal 2011). The other approach to measurement has been to turn to the theory of contests, initiated by Tullock (1980). The contest models can be used to judge in which circumstances complete rent dissipation might be a reasonable expected outcome, in which the value of a rent can be taken to indicate the magnitude of social loss. Complete rent dissipation was the assumption in the early expositions of the social cost of contestable rents (Tullock 1967; Krueger 1974;

Posner 1975); hence the use of the term 'Tullock rectangle' (Tullock 1997) for social loss associated with the profits in figure 1.

In general, however, rent dissipation need not be complete. Tullock (1972, 1989, 1993) noted that less rent seeking was observed than might be predicted, and that complete rent dissipation did not seem likely, given the large values of rents that could be contested and the limited actual rent seeking that tended to be observed. Tullock proposed two reasons for why the 'Tullock rectangle' might overstate rent seeking, (1) political institutions obliged rent creation by inefficient indirect means and (2) prevalence of rent seeking by groups seeking public-good type benefits (for elaboration on Tullock's reasons, see Hillman and Ursprung 2016a).

6. **Political institutions**

Tullock observed that, in high-income democracies, if governments are to provide privileged rents, the means of creation and assignment of the rents cannot be too transparent, because politicians and government officials are subject to accountability of voters. Although voters can be subject to rational ignorance about public-policy decisions, voters may vote expressively to punish political rent creation ('you cannot give away public money at will'). In democracies, political decision makers are also monitored by a free (although not necessarily unbiased) press. Under such conditions, there are political incentives for rents to be sought and dispensed in indirect and inefficient ways. Tullock gave the example (Tullock 1989) of bus drivers driving near empty buses on economically non-justifiable routes; it would be efficient to give the bus drivers increased incomes directly and thereby avoid the wasteful use of the bus drivers' time and unnecessary use of the buses. Direct transfer of rents to the bus drivers for doing nothing would however attract scrutiny that could make the transfers politically infeasible. Non-transparent means are therefore used to create and dispense the rents. The objective is to hide rents but the social loss because of the indirect rent creation is increased (because of the bus being driven around empty). Another example of inefficient indirect means of rent creation is the use of international trade policies to dispense rents. Governments can provide rents to import-competing industries directly and more efficiently than protectionist policies through direct subsidies from the government budget. The use of protectionist policies avoids a role for government in the rent transfer (not the rent creation) because consumers directly pay domestic producers a price inclusive of the protectionist rent (Hillman 2009 [2018]). Import quotas are an example of indirect non-transparent dispensing of rents; the quotas create and distribute rents that are not readily measurable (Hillman 2015, Cassing and Hillman 2017).

In autocracies, because of absence of democratic accountability, non-transparent means of rent creation and designation are not required. Rent seeking in autocracies is also facilitated by the need to convince only the ruler or a member of the ruler's close entourage to create or provide rents. In democracies, rent seeking is diminished by the need to persuade groups of politicians in committees to provide rents (Congleton 1984).

Tullock's second reason for low observed cost of rent seeking was that rent seeking in high-income democracies is usually conducted by interest groups whose members seek a collective benefit rather than individuals or groups seeking private benefits. With groups seeking a public-good collective benefit (a favorable policy or a highway to a town), free-riding incentives within groups reduce individuals' rent seeking effort.

Tullock's approach to political distribution can be compared with that of Gary Becker (see Hillman and Ursprung 2016a on 'where are the rent seekers?'). Becker (1983, 1985) noted that there could be wasteful use of resources in rent seeking (Becker, 1985, p. 335) but focused his attention on the deadweight losses associated with tax-financed redistribution. For taxpayers, because of a substitution effect that underlies the excess burden of taxation, the loss due to a dollar paid in taxes is greater than a dollar. In contrast, but similarly because of a substitution effect, recipients of the dollar value the dollar at less than a dollar (whether the transfer is in-kind such as through food stamps or in money) (see Hillman 2009 [2018]). In Becker's model, groups compete by exerting 'political pressure', which depends on gains and losses from redistribution inclusive of deductions for the deadweight losses incurred in paying or receiving income transfers. Political competition between groups in the Becker model thus favors redistributive policies with low deadweight losses. This reasoning, coupled with the neglect of real resource costs in rent-seeking, enabled Becker to propose that political income redistribution in response to pressure-group competition is efficient in minimizing deadweight losses of political income transfers.

We therefore have quite contrary conclusions by Tullock and Becker regarding the efficiency of political redistribution. Ideological attractiveness also differs. Becker presented a socially efficient view of political redistribution. Tullock proposed that political accountability leads governments to devise purposefully inefficient means of redistribution and that there is in addition a social loss through resources used in rent seeking. Becker's view is more favorable than that of Tullock when judged by advocates of 'social democracy', or by believers in the benevolence of government (although believers in government benevolence might prefer no mention at all of political discretion in distribution).

7. **Collective benefits**

Since the group that wins a contest for a public good cannot prevent non-contributing members from enjoying the benefits, there is little incentive for individuals with relatively low valuation of the public good to contribute effort to the group's objective. In the special case in which effort costs are linear, only the individual with the highest valuation of the public good will contribute positive effort. With costs that are strictly convex, and with zero marginal cost at zero effort, all members of the group contribute, and an increase in the size of the group increases the group's aggregate effort. This outcome is contrary to a presumption (Olson 1965) that larger groups tend to be less effective suppliers of public goods. If a group can punish members who fail to contribute, then free-riding problem can be resolved or mitigated. Often the assumption is that groups have effectively solved the free-riding problem. Becker's theoretical result of politically efficient redistribution was derived on the assumption that all competing groups were organized to overcome the internal-group free-riding problem. Similarly, Grossman and Helpman (1994), in describing 'protection for sale', view industries as organized as interest groups that have solved the free-rider problem and as politically active, while other groups (consumers in particular) are unorganized and are not politically active. Following Olson, the assumption can be that a small group (such as producers in an import-competing industry) can obtain favorable political outcomes, even though in representative democracy more voters lose from protection of an industry than gain (Hillman 1982). The internal non-cooperative Nash equilibrium for firms' political contributions to an industry lobby can readily be derived (for example, Hillman and Ursprung 1988; Hillman, Long, and Soubeyran 2001).

8. **Rent dissipation**

In the initial contest model of Tullock (1980), in which individuals compete for a rent that provides private benefit to the successful rent seeker, the contest-success function makes investing in rent seeking similar to buying lottery tickets, with amendment through a scale parameter that determines if there are increasing, constant, or decreasing returns from purchase of the tickets. The Tullock contest-success function does not determine who actually wins the contest, only the likelihood of winning (the function is non-discriminating – see Hillman and Riley 1989). A contest rule that the highest rent-seeking outlay wins (also known as an all-pay auction because rent seekers' investments are lost irretrievable whether they win or lose a contest) has an equilibrium in mixed strategies in which rent dissipation is on average complete for any number of participants in a contest (Hillman and Samet 1987). Thus, if we knew that the contest-success rule was that the highest rent-seeking outlay wins, a justification would be provided for associating the Tullock rectangle with social loss. Quite generally, for any general contest-success function for which the probability of success increases with own outlays and decreases with outlays of others in the contest, rent dissipation is complete in the limit as the number of rent seekers, which requires no barriers to entry into the contest (Hillman and Katz 1984). If we knew that there was free entry into rent-seeking contests, there would therefore be another basis for complete (or near-complete) rent dissipation.

Low rent dissipation is predicted when contenders have different valuations of the rent. In the case of the 'highest outlay wins' contest success function, only the two-highest value contenders compete and the high-value contender outlays no more than the valuation of the low-value contender (Hillman and Riley 1989).

Low rent dissipation is also predicted when, as described above, rents are contested by groups and the rent is a public good for members of the group. With Nash behavior, substitution effects due to increases in group size result in free-rider behavior that limits total contributions to seeking to benefit from the public good. If there are no income effects, there is only the one-to-one substitution effect when others increase contributions (see for example Ursprung 1990).

Risk aversion affects rent dissipation (Hillman and Katz 1984, Long and Vousden 1987). Also, in general, in a rent-seeking contest, contenders do not know how many other contenders there are in a contest, but uncertainty about the number of contenders affects rent dissipation (Münster 2006; Myerson and Wärneryd, 2006; Lim and Matros 2009; Kahana and Klunover 2015, 2016).

The many elements in rent seeking make it cumbersome to include all possibilities in one simple model. In next section we set out a basic model that incorporates many of the considerations involved in rent dissipation. The model contains the Tullock lottery model and the all-pay auction model (in which the highest rent-seeking outlay wins) as special cases.

9. A basic integrated model

9.1 Basic assumptions

There are n individuals or firms that compete for a rent that we call a 'prize'. Valuations of the prize can differ. Let V_i denote individual i 's valuation. Let $V_1 \geq V_2 \geq \cdots \geq V_n > 0$. Let e_i denote individual i 's outlay in the contest. Each individual has a technology f_i that transforms e_i into effective influence on the outcome of the contest. Effective influence is denoted by z_i, with $z_i = f_i(e_i)$. We follow Myerson and Wärneryd (2006) and call the function $f_i(e_i)$ the *impact function*. We assume that it is increasing, with $f_i(0) = 0$. Let Z denote the sum of the z_i in a contest. We assume that, if this sum is strictly positive, the probability that individual i wins the prize is $p_i = z_i/Z$, and if $Z = 0$, then all individuals have an equal probability of winning. There is common knowledge (each individual is fully aware of the valuation and transformation technology of other individuals). We can now study the Nash equilibrium of a simultaneous-move game of rent seeking. A pure strategy Nash equilibrium is a profile of outlays $(e_1, e_2, \dots, e_n)$ such that no individual can improve his or her expected payoff $W_i \equiv p_i V_i - e_i$ by choosing another outlay. A mixed-strategy Nash equilibrium is a profile of cumulative probability distributions of outlays $(G_1, G_2, \dots, G_n)$ such that no individual can improve his or her expected payoff by choosing a different probability distribution for his or her outlay.

Let us consider the case where the function $z_i = f_i(e_i)$ takes the form $z_i = e_i^{\beta}$ where $\beta > 0$. Here β is a scale parameter, indicating increasing, constant, or decreasing returns as β is greater than, equal to, or smaller than unity. With this specification, the probability that individual i wins the prize is

$$p_i = e_i^{\beta} / \left(e_i^{\beta} + \sum_{j \neq i} e_j^{\beta} \right). \tag{1}$$

This expression is known as the Tullock contest success function. Upon re-arrangement, we obtain

$$p_i = \frac{1}{1 + \sum_{j \neq i} \left(\frac{e_j}{e_i} \right)^{\beta}} \tag{2}$$

Notice that if $e_i > e_j$ for all $j \neq i$, in the limiting case where β tends to infinity, each of the terms $\left(e_j / e_i \right)^{\beta}$ tends to zero, and thus p_i tends to unity: the individual with the highest outlay then wins. Consequently, as the return to scale parameter β becomes very large, the Tullock contest is equivalent to the first-price sealed-bid all-pay auction: all bidders pay their bids, and the highest bidder wins (Hillman and Samet 1987).

9.2 Equilibrium strategies in first-prize sealed-bid all-pay auctions

Clearly, the first-price sealed-bid all-pay auction has no Nash equilibrium in pure strategies. The intuition for this result is simple. Suppose there are two individuals, say Helen and Dan, with $V_1 = V_2 = V$. Given any candidate equilibrium pure-strategy profile (e_1, e_2) an individual can improve his or her expected payoff by a suitable deviation or change. For example, if $e_1 \leq e_2 < V$, then Helen can improve her expected payoff by deviating from e_1 and choosing some e_1'=$e_2 + \epsilon$ where ϵ is an arbitrarily small positive number. It can be verified that the only equilibrium is that each individual randomizes her outlay, using the uniform density function over the compact support $[0, V]$. More generally, with n identical individuals, all individuals will randomize their outlays using the cumulative distribution function $G(e_i) = (e_i/V)^{1/(n-1)}$ (see Hillman and Samet 1987). This implies that the expected aggregate outlay equals the common valuation V, i.e. the rent is entirely dissipated in an expectation sense for any given n. If however valuations differ among individuals, it can be shown that rent is not fully dissipated (Hillman and Riley, 1989). For example, suppose there are two individuals, Helen and Dan, with different valuations V_H and V_L where $V_H > V_L$. Then clearly the high-valuation individual, Helen, will randomize her outlay e_H using the uniform density function over the compact interval $[0, V_L]$, for there is no reason for her to bid more than Dan's valuation. Dan's best response to Helen's strategy is to set $e_L = 0$ with probability mass $1 - (V_L/V_H)$ and, with probability V_L/V_H, to randomize his bid with the uniform distribution. This equilibrium implies that the outcome is in general inefficient, in the sense that the prize may go to the individual who does not value it most. It is also easy to verify that the sum of their expected outlays is smaller than the lower valuation, indicating that rent is not completely dissipated. It can be shown that when there are only two contestants, the Nash equilibrium is unique (Baye, Kovenock, and de Vries 1996).

When there are n individuals with different valuations, the possibility of multiplicity of Nash equilibrium in mixed strategies arises. For example, if there are 4 individuals with $V_1 = V_2 = V_3 > V_4$, then in equilibrium the individual with the lowest valuation will bid e_4=0, while the other three individuals may either randomize identically, or one of them may simply drop out (Baye, Kovenock, and de Vries 1996).

The model of first-price sealed-bid all-pay auction has been extended to the case where individuals' outlay cannot be less than a floor level $c > 0$. Then, as shown by Hillman and Samet (1987), in the case of n identical individuals, each will choose to not to bid with probability $(c/V)^{1/(n-1)}$ and to randomize his or her bid $e_i \in [c, V]$ with the complementary probability. In this case, rent dissipation is complete. Congleton (1980) and Che and Gale (2000) consider another extension to the model: they suppose that there is a prescribed ceiling on individual bids, i.e., $e_i \leq \bar{e}$. Assume $V_1 \geq V_2 \geq \cdots \geq V_n > 0$. In the case in which $\bar{e} < (1/n)V_n$, in equilibrium everyone will bid $e_i = \bar{e}$. Rent dissipation is not complete in this case. In the opposite case, where $\bar{e} > (1/n)V_n$, we can consider a decreasing sequence of potential ceilings, $\bar{e}_2 \geq \bar{e}_3 \geq \bar{e}_4 \geq \cdots \geq \bar{e}_n$ where we define $\bar{e}_i = (1/i)V_i$ for $i = 2, 3, \dots, n$. Then, if the prescribed ceiling $\bar{e}$ is such that $\bar{e}_k > \bar{e} > \bar{e}_{k+1}$, where $k \geq$

2, only k individuals with high valuations will bid, and their bid equals $\bar{e}$. The rent is not completely dissipated.

9.3 Incomplete information

An important extension is to allow for *incomplete information*. An individual may not know the valuations of other individuals. To illustrate, consider a model of incomplete information with only two individuals, Anne and Bob. Anne does not know Bob's valuation V_b. She thus treats V_b as a random variable y and assigns to it a cumulative probability distribution $G(y)$, defined over some interval $[0, \bar{V}_b]$. Bob is in a similar situation: he treats $\bar{V}_a$ as a random variable, x, and assigns to it a cumulative probability distribution $F(x)$, defined over some interval $[0, \bar{V}_a]$. To find a Nash equilibrium for this game, suppose that Bob has a strategy φ that determines his outlay e_b as a function of his valuation. It is plausible to assume that this is an increasing function, with $\varphi(0) = 0$. Similarly, Anne has a strategy σ that determines her outlay e_a as a function of her valuation. Given Bob's strategy, if her valuation is x, Anne's expected payoff depends on outlay e_a:

$$W_a = xProb\{e_b \leq e_a\} - e_a = xProb\{\varphi(y) \leq e_a\} - e_a \tag{3}$$

That is,

$$W_a = xProb\{y \leq \varphi^{-1}(e_a)\} - e_a = xG\big(\varphi^{-1}(e_a)\big) - e_a \tag{4}$$

This yields the first order condition for Anne's choice of outlay

$$xG'\left(\varphi^{-1}(e_a)\right)\frac{d\varphi^{-1}}{de_a} = 1. \tag{5}$$

This equation determines Anne's optimal outlay as a function of her valuation, x, given Bob's strategy. We denote this function by $\sigma(x)$. Then the above first order condition can be written as

$$xG'\left(\varphi^{-1}(\sigma(x))\right) = \frac{de_a}{d\varphi^{-1}} \equiv \sigma'. \tag{6}$$

Similarly, Bob's optimization problem gives rise to the equation

$$yF'\left(\sigma^{-1}(\varphi(y))\right) = \varphi'. \tag{7}$$

Using this pair of equations together with the conditions $\varphi(0) = 0$ and $\sigma(0) = 0$ allows us to solve for the strategies φ and σ. In the special case where $\bar{V}_a = \bar{V}_b \equiv \bar{V}$ and the probability distribution functions $F(.)$ and $G(.)$ are identical, we can solve for the symmetric Nash equilibrium, where $\varphi(.) = \sigma(.)$ identically. Then $de/dV = VF'(V)$, and integration yields the Nash equilibrium bidding strategy,

$$\varphi(V) = \int_0^V xF'(x)dx \tag{8}$$

This equation shows that bids are increasing in individual valuations. Notice that $\varphi(\bar{V}) = E(V)$, that is, the equilibrium outlay of the contestant with the maximum possible valuation $\bar{V}$ is equal to the mean of the distribution. As an illustration, consider the case where the distribution function is uniform over the unit interval [0,1], so that $F'(V) = 1$. Then the equilibrium outlay strategy for each contestant is $e(V) = (1/2)V^2$, and the highest bid is $e(1) = 1/2$. A robust feature of the model is that the person with the higher valuation will bid more than the person with a lower valuation and will win the prize. Thus, the allocation of the prize is efficient.

9.4 Equilibrium strategies in the standard Tullock contest

We now return to the contest success function (1), where β is a positive parameter that indicates decreasing, constant, or increasing returns to outlays, according to $\beta < 1$, or $\beta = 1$, or $\beta > 1$. We again begin with the case of constant returns, $\beta = 1$. This case has the advantage of analytical simplicity (see Ewerhart 2015 for a more complex case of the Tullock contest-success function). In the simplest case, two contestants, say Anne and Bob, have strictly positive valuations, V_1 and V_2 respectively. Clearly, in equilibrium, both contestants choose strictly positive outlays (or efforts). For any given level of Anne's effort, $e_1 > 0$, Bob must choose $e_2 \geq 0$ to maximize his expected payoff

$$W_2(e_2) = \frac{e_2}{e_1+e_2} V_2 - e_2 \tag{9}$$

The first order condition for Bob's optimal choice is

$$\frac{e_2}{(e_1+e_2)^2} V_2 - 1 \leq 0, \tag{10}$$

where the strict inequality holds only if Bob's optimal response to Anne's effort is at a corner, $e_2 = 0$. Thus, for all $e_1 > 0$, Bob's reaction function is

$$e_2 = max\left\{0, \sqrt{(e_1 V_2)} - e_1\right\} \equiv r_2(e_1) \tag{11}$$

Thus, if $e_1 \geq V_2$, Bob's optimal response is $e_2 = 0$, while, if $0 < e_1 < V_2$, Bob's effort will be strictly positive, and $r_2(e_1)$ is hump-shaped. It is important to note that, if $e_1 = 0$, then Bob's response is not well defined, because choosing $e_2 = 0$ would give him a winning probability of ½ , while choosing any number $e_2 > 0$ would ensure Bob's win with probability one. Thus, Bob's reaction function is defined only for strictly positive values of his opponent's effort e_1. Similarly, Anne's reaction function is

$$e_1 = max\left\{0, \sqrt{(e_2 V_1)} - e_2\right\} \equiv r_1(e_2), \tag{12}$$

which is defined only for strictly positive values of her opponent's effort e_2. The two reaction functions have a unique intersection in the interior of the positive quadrant: this is the unique Nash equilibrium in which both participants exert strictly positive effort. This argument shows that, in equilibrium, both contestants must choose some strictly positive effort level.

It is important to note that in games in which aggregate effort (or aggregate outlay) matters, there is a very useful alternative to using with reaction functions. This alternative approach consists of deriving from the first order condition of each individual a relationship between his or her equilibrium effort and the aggregate equilibrium effort (Long and Soubeyran, 2000; Cornes and Hartley, 2005). To illustrate, denoting aggregate effort by E , we can rewrite Bob's first order condition, equation (2), which must hold with equality in equilibrium, as follows:

$$\frac{E-e_2}{E^2}V_2 = 1 \tag{13}$$

This equation yields the following equilibrium relationship between e_2 and E:

$$e_2 = E - \frac{E^2}{V_2} \tag{14}$$

Similarly, using Anne's first order condition, we obtain

$$e_1 = E - \frac{E^2}{V_1}. \tag{15}$$

Adding these two equations, we obtain

$$E = \left(\frac{1}{V_1} + \frac{1}{V_2}\right)E^2 \tag{16}$$

from which we compute the equilibrium aggregate effort,

$$E = \frac{V_2 V_1}{V_1 + V_2} \tag{17}$$

Individual equilibrium effort can then be derived as

$$e_i = \frac{1}{V_j}\left(\frac{V_2 V_1}{V_1 + V_2}\right)^2 \tag{18}$$

Thus, the ratio of equilibrium efforts is proportional to the ratio of valuations, $e_1/e_2 = V_1/V_2$. The probability that contestant i wins the prize is

$$p_i = V_i/(V_1 + V_2). \tag{19}$$

It is straightforward to generalize the results to the case with n individuals, but one must bear in mind that when there are more than two heterogeneous individuals, in equilibrium some low valuation individuals may find it optimal not to take part in the contest. Again, we assume that $V_1 \geq V_2 \geq \cdots \geq V_n > 0$. Let $E_{-i} \equiv E - e_i$. The first order condition for individual i is

$$\frac{E_{-i}}{(e_i+E_{-i})^2} V_i - 1 \leq 0 \tag{20}$$

with strict inequality holding only if $e_i = 0$. Then, using $E = E_{-i} + e_i$, we obtain

$$\frac{E-e_i}{E^2} - 1 \leq 0 \tag{21}$$

from which we obtain the equilibrium relationship between the effort of contestant i and the equilibrium aggregate effort,

$$e_i = max\left\{0, E - \frac{E^2}{V_i}\right\}. \tag{22}$$

From this equation, we infer that, if in equilibrium there are only m individuals who exert strictly positive effort, then the inactive players must be the ones with lower valuation. Summing the efforts of the active players, we obtain

$$E = mE - E^2 \sum_{i=1}^{m} \frac{1}{V_i}. \tag{23}$$

Solving, we obtain the equilibrium aggregate effort, derived by Hillman and Riley (1989)

$$E = \frac{m-1}{m} H \tag{24}$$

where H is the harmonic mean of the evaluations of the active players, i.e.,

$$H \equiv \frac{m}{\sum_{i=1}^{m}(1/V_i)}. \tag{25}$$

Notice that the valuations of the inactive players satisfy the following inequality

$$V_{m+j} \leq E \tag{26}$$

In other words, the equilibrium number of active participants is the first positive integer m, such that V_{m+1} is smaller than $(m-1)/m$ times the harmonic mean of the preceding m valuations. In the special case where all individuals have the same valuation, we obtain

$$E = \left(\frac{n-1}{n}\right) V \; . \tag{27}$$

This indicates that aggregate effort is smaller than the prize, so the expected rent is strictly positive. In the limiting case in which the number of contestants tends toward infinity, the rent is completely dissipated.

The existence and uniqueness of the Nash equilibrium of the Tullock contest with heterogeneous valuations can be generalized to the case where the scale parameter β is smaller than 1 (Szidarovszky and Okuguchi 1997). In the special case of homogeneous valuation, they obtain the following relationship between aggregate effort and valuation,

$$E = \left(\frac{n-1}{n}\right) \beta V \tag{28}$$

This shows that, with diminishing returns, i.e., $0 < \beta < 1$, the rent is not completely dissipated even if the number of contestants becomes arbitrarily large.

Finally, consider the case of increasing returns, $\beta > 1$. If all contestants have the same valuation, the second order condition for each contestant is satisfied if and only if $\beta \leq n/(n-1)$. When this condition is satisfied, aggregate effort is $E = \beta V((n-1)/n)$. If $\beta > n/(n-1)$, then generically there is no pure strategy equilibrium. Whatever the nature of the equilibrium, it can be shown that in equilibrium the expected aggregate effort never exceeds the prize (Ellingsen 1991).

9.5 Contests when the number of participants is unknown

So far, we have assumed that the number of participants in a contest is known to the participants. In many real world situations, we could not expect participants to have the information about the number of contenders against whom they are competing. Münster (2006) and Myerson and Wärneryd (2006) assume that the number of contestants is a random variable with a commonly known distribution. Given the Tullock contest success function (equation (1) above) where β is smaller than unity (implying diminishing returns from effort or outlays), they obtain the following interesting result. When the number of contestants n is random with mean μ, and is known to be at least one, then the aggregate equilibrium outlay is smaller than under a game where then number of contestants is known to be equal to μ. This result also holds if we replace e_i^β with any concave impact function $f(e_i)$ where f is non-negative and twice differentiable. This result is a possible explanation of why empirical studies seem to indicate that in many contests rent-seeking expenditure appear to be much lower than the Tullock rectangle.

Related studies by Lim and Matros (2009) and Kahana and Klunover (2015) reinforce this under-dissipation result by making specific assumptions about the distribution of the random number of contestants: the binomial distribution and the Poisson distribution.

The assumption that the impact function $f(e_i)$ is concave (or, alternatively, that the returns to scale parameter β is smaller than unity) seems crucial for the under-dissipation result in contests with an unknown number of players. In fact, in a recent note, Kahana and Klunover (2016) consider the opposite case, where β is greater than unity, but not too great to exclude the existence of pure strategy Nash equilibrium. Recall that if n is known with certainty, the second order condition of each contestant is satisfied if and only if $\beta \leq 1/\left(1-(1/n)\right)$. Kahana and Kunover (2016) allow uncertainty about n and show that, in the special case where β is exactly equal to $1/\left(1-E(1/n)\right)$, the rent will be completely dissipated. In addition, they assume that n is known to be at least 2.

9.6 A group contest for a public good

As we have noted, in many real-world situations, when a prize is won by a group of individuals, it is not possible to exclude any member of the group from the benefit. Assume for the moment that members of a group are homogenous and the benefit is a pure public for all members of the group: each member of group i has the same benefit V_i. The group cannot coordinate the effort contributions of its members. Members of each group have an incentive to free-ride within the group. What is the Nash equilibrium of this game? Free riding is a prominent feature of the equilibrium (see for example Ursprung 1990).

Suppose there are two groups, group u and group t, (for us and them), of size m_u and m_t respectively. Within each group, members are homogeneous.

Let E^i be the aggregate effort of group i, where $i = u, t$. Let e_{ij} denote the effort level of member j group i. Then

$$E^i \equiv \sum_{j=1}^{m_i} e_{ij} \tag{29}$$

If $E^u = E^t = 0$, then each group wins with probability ½ . Otherwise, the probability that group i wins is

$$p_i = \frac{E^i}{E^1+E^2} \quad . \tag{30}$$

Groups do not make decisions. Members of each group choose non-cooperatively their individual effort level. Let us define $E_{-j}^i = E^i - e_{ij}$. Each member j of group u takes as given both E^t and E_{-j}^u and chooses e_{uj} to maximize the expected payoff

$$W_{uj} = \frac{E_{-j}^u+e_{uj}}{E^t+\left(E_{-j}^u+e_{uj}\right)} V_u - e_{uj} \ . \tag{31}$$

The first order condition for the optimal e_{uj} is

$$\frac{dW_{uj}}{de_{uj}} = \frac{E^t}{\left(E^t+\left(E_{-j}^u+e_{uj}\right)\right)^2} V_u - 1 \leq 0 \quad (32)$$

where the strict inequality holds only if $e_{uj} = 0$. Similarly, for each member k of group t, we obtain the first order condition

$$\frac{dW_{tk}}{de_{tk}} = \frac{E^u}{\left(E^u+\left(E_{-k}^t+e_{tk}\right)\right)^2} V_t - 1 \leq 0 \quad (33)$$

It follows that we can determine uniquely the equilibrium aggregate effort of each group, namely

$$E^u = \frac{1}{V_t}\left(\frac{V_u V_t}{V_u+V_t}\right)^2 \quad (34)$$

$$E^t = \frac{1}{V_u}\left(\frac{V_u V_t}{V_u+V_t}\right)^2 \quad (35)$$

The individual efforts are however indeterminate. Interestingly, the size of each group does not have any influence on the group's aggregate effort.

What happens if group members have heterogeneous valuations? This question was raised in Katz, Nitzan, and Rosenberg (1990) and formally analyzed in Baik (1993). Let V_{ij} denote the valuation of member j of group i. Assume that in each group there is a member with highest valuation. Without loss of generality, call this person the first member of the group, so that $V_{u1} > V_{uh}$ for all $h = 2,3, \dots, m_u$ and $V_{t1} > V_{th}$ for all $h = 2,3, \dots, m_h$. Then it follows that, in equilibrium, we observe that, in each group, only the group member with the highest valuation will contribute, i.e., their first order conditions hold with equality

$$\frac{dW_{u1}}{de_{u1}} = \frac{E^t}{(E^t+E^u)^2} V_{u1} - 1 = 0 \tag{36}$$

and

$$\frac{dW_{t1}}{de_{t1}} = \frac{E^u}{(E^u+E^t)^2} V_{t1} - 1 = 0 \tag{37}$$

The first order conditions of other members their hold with strict inequality. Thus, for group u, in equilibrium, the first order condition of all members $h = 2,3, \dots, m_u$ is

$$\frac{dW_{uh}}{de_{uh}} = \frac{E^t}{(E^t+E^u)^2} V_{uh} - 1 < 0\ . \tag{38}$$

This is also true for group t. The equilibrium efforts are then

$$E^u = e_{u1} = \frac{1}{V_{t1}} \left(\frac{V_{u1} V_{t1}}{V_{u1}+V_{t1}} \right)^2 \tag{39}$$

and

$$E^t = e_{t1} = \frac{1}{V_{u1}} \left(\frac{V_{u1} V_{t1}}{V_{u1}+V_{t1}} \right)^2. \tag{40}$$

This result that only the member with the highest valuation contributes a positive effort level can be extended to more general contest success functions. Nti (1998) showed that the result holds for the case where

$$p_u(E^u, E^t) = \frac{g(E^u)}{g(E^u)+g(E^t)}\ . \tag{41}$$

Chowdhury, Lee, and Sheremeta (2013) modified the contest success function by assuming that it is the maximal individual effort within a group that counts. They find that free riding also prevails: at most one member in each group exerts effort, though it is not necessarily the member with the highest valuation. In an alternative formulation, Baik, Kim and Na (2001) assume that the group that makes the greatest effort will win with certainty. They find that if group members do not coordinate their efforts, members who do not have the highest valuation will not contribute at all.

The theoretical predictions that, in a Tullock contest, group size does not matter and only the member with the highest valuation contributes, is dependent on the assumption that the cost of effort is linear. If the marginal cost of effort is increasing in effort level, then clearly it is possible that all members contribute in equilibrium, notwithstanding their heterogeneous valuations (Epstein and Mealem 2009). Furthermore, in this case the contribution tends increase with group size. Esteban and Ray (2001) show that if the cost of exerting effort is sufficiently convex, Olson's paradox that larger groups are less effective in collective action can be reversed. Pecorino and Temimi (2008) find however that, if there is a fixed participation cost, a large group may fail to contribute to a public good. Topolyan (2014) shows that in group contests where outcomes are deterministic, it is possible that a continuum of equilibria exist in which all group members contribute. Allowing for effort complementarity (Kolmar and Rommeswinkel 2013), or using a contest success function that depends also on the minimum effort within each group (Lee 2012), also mitigates the free riding problem.

The contribution of effort within each group to win a prize is a special case of the model of voluntary contribution to a public good. For a given E^t, members of group u may regard $p_u(E^u, E^u)$ as a public good, and thus $p_u(E^u, E^u)V_{uh}$ as the utility that they derive from the public good. There is a large literature on voluntary contribution to a public good. The assumption that E^u is the sum of individual contributions implies that these contributions are perfect substitutes. For departure from the perfect substitutability assumption, see Hirshleifer (1983), Cornes (1993), Barbieri, Malueg, and Topolyan 2014). Allowing for imperfect substitutability provides an additional dimension to the problem of intra-group interaction.

While the literature on contests for a group-specific public good usually assumes complete information, there have been studies of the case in which group members do not know the valuation of other members. Wasser (2013) provided conditions for existence and uniqueness of equilibrium in Tullock contests with incomplete information. Barbieri and Malueg (2016) studied the best-shot all-pay auction with incomplete information. Each group's performance is measured by the best effort (best shot) of its members, and the group with the best performance wins the group-specific public good. In this framework, they find that group size matters.

A model of Tullock contest among groups, where all members have incomplete information about others' valuation has been proposed by Mercier (2016). The aggregate effort of each group is the sum of efforts of its members. It is assumed that each member's effort is either zero or one. Each person knows his or her own valuation of the prize, but has no information on others' valuation. Mercier shows that, in equilibrium, individuals use a threshold strategy: each chooses a threshold such that he would exert effort if and only if their valuation is above the threshold, otherwise the effort is zero. He finds that in equilibrium, all individuals select a strictly positive threshold. Individuals' expected efforts are strictly positive. In equilibrium, the threshold chosen by an individual depends on the number of individuals in the group and on the composition of competing groups. Mercier finds that the presence of large groups tends to reduce the average level of effort.

Finally, what happens if there is uncertainty about group size? Boosey, Brookins, and Ryvkin (2017) show that if players do not know the size of their own group, the equilibrium outlay is always lower than in a symmetric group contest where the same expected group size is commonly known. This result is consistent with the result of Myerson and Wärneryd (2006) and Münster (2006). In contrast, when players know the size of their own group but not that of the opposing group, Boosey, Brookins, and Ryvkin (2017) find that under some mild assumptions the expected aggregate outlay is invariant with respect to uncertainty about opposition's group size.

10. Ideology

We conclude with observations on the relation between ideology and the concept of 'rent seeking'. When Tullock proposed that there was a social cost to contestable rents, he was suggesting an answer to why empirical estimates of the social cost of monopoly and protection had been so low. The studies finding low social losses had measured and aggregated the Harberger triangles in figure 1. Another explanation for the low social losses put forward at the same time by Harvey Leibenstein (1966) was that monopoly led individuals to exert non-measured low effort. Leibenstein called his concept 'X-efficiency'. Both Tullock and Leibenstein submitted their papers around the same time to the American Economic Review. Tullock's paper was rejected by the editor on the grounds that the rent-seeking concept was unimportant: Tullock was informed by the editor that the idea of 'real resources devoted to establishing, promoting, destroying etc. monopoly ... does not seem significant enough.' Leibenstein's concept of X-efficiency was accepted for publication. The editor who made the decisions was an avowed Maoist. In Hillman and Ursprung (2016b), the possibility is pursued that ideology influenced the publication decisions, with consequences in the years 'in the wilderness' for Tullock's rent-seeking concept. Although Tullock was not making an ideological statement when he pointed to the social cost of contestable rents, nonetheless, given that the greatest source of contestable rents is public policy, a statement was being made about the behavior of governments in creating rents and overseeing rent seeking. A picture of government emerges as promoting inefficiency for political or personal advantage (including the political incentive to create rents in inefficient indirect ways that are not transparent). A view of government as catering to rent seekers contradicts the ideological requirement of political benevolence when an extensive role is sought for government (as is the case for adherents to Maoist principles or people finding virtue in a social-democratic welfare state). Ideology can therefore make 'rent seeking' a socially undesirable or politically 'incorrect' concept (Hillman 1998). Rent seeking has consequences for the merits of income redistribution through government. With rent seeking acknowledged, income distribution is not the outcome of benevolent governments maximizing social welfare, but is the outcome of contests in which political processes determine who can take from whom and how much. The concept of 'X-efficiency', in contrast to rent seeking, does not blame governments for inefficiency but blames people for shirking and 'not contributing according to their ability'. 'X-efficiency' was supportive of the idea, close to a Maoist's heart, that people needed to be reeducated to contribute to the common good. Tullock viewed people, including people in government, as self-interested (Tullock 2000), and as prospective rent seekers if rent-seeking opportunities presented themselves. Rent seeking was not a politically correct concept for some years after Tullock's originating paper (see Hillman and Ursprung 2016b) but eventually came to be accepted as vital for accounting for social losses when benefits are contestable, either through or within government, or in circumstances outside of government.

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