



The power of money: Wealth effects in contests [☆]



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ABSTRACT

The relationship between wealth and power has long been debated. Nevertheless, this relationship has been rarely studied in a strategic game. In this paper, we study wealth effects in a strategic contest game. Two opposing effects arise: wealth reduces the marginal cost of effort but it also reduces the marginal benefit of winning the contest. We consider three types of contests which vary depending on whether rents and efforts are commensurable with wealth. Our theoretical analysis shows that the effects of wealth are strongly “contest-dependent”. It thus does not support general claims that the rich lobby more or that low economic growth and wealth inequality spur conflicts.

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“Pecunia nervus belli.”

1. Introduction

1.1. The general motivation

As popularized by Frank and Cook’s (1995) best-selling book “The Winner-Take-All Society” many competitive situations take the form of a contest. Examples include political lobbying, research and development, marketing, promotion, status-seeking, and litigation activities (Konrad, 2009). In this paper, we are interested in the effect of wealth in contests. In particular, the motivation for our analysis includes general questions such as: Do rich people lobby more? Does poverty lead to more conflicts? Does low economic growth and wealth inequality increase political activism?

The relationship between wealth and power has attracted attention for centuries (Marx, 1867; Wright Mills, 1956). The conventional wisdom suggests that the rich are more powerful than the poor.¹ Bartels (2005) and Gilens (2005) observe,

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¹ This is consistent with the beliefs of some prominent economists. For instance, Anne Krueger (1974), in her pioneering work on rent seeking argues that we can perceive the price system “as a mechanism rewarding the rich and well-connected”. Likewise Jack Hirshleifer (1995) stresses that “the half of

for instance, that US senators are more responsive to the opinions of their more affluent constituents. This idea has been extensively discussed in political science, often pejoratively referred as plutocracy. It is exemplified by [Hacker and Pierson's \(2011\)](#) recent book “Winner-Take-All Politics: How Washington Made the Rich Richer—and Turned Its Back on the Middle Class”.

Nevertheless, in contrast, casual observation suggests that low wealth induces greater participation and effort in contest-type situations. People involved in highly predatory and competitive activities, such as thieves or athletes for instance, typically come from poorer segments of society. More corruption is also typically observed in poorer countries ([Aidt, 2009](#); [Gundlach and Paldam, 2009](#)). Some groups (e.g., farmers), although often relatively poor, are well-known to be politically powerful. Poverty has also been found to be a robust factor in explaining violent crime and civil conflicts ([Collier and Hoeffler, 1998](#); [Fajnzylberg et al., 2002](#); [Fearon and Laitin, 2003](#); [Blattman and Miguel, 2010](#)). Relatedly, it is often said that redistribution policies favor political stability and social peace. Finally, a recent experimental study shows that wealth has non-monotonic effects on conflict intensity ([Baik et al., 2015](#)).

1.2. The model, and the basic effects

Although the above observations concern disparate issues, they suggest that wealth may have fundamentally different, and perhaps opposing, effects in contests. This further suggests that economic theory may help us pin down and examine the strength of these effects. Yet, wealth effects have received little attention in the (otherwise vast) theoretical literature on contests ([Tullock, 1980](#); [Garfinkel and Skaperdas, 2007](#); [Konrad, 2009](#); [Congleton et al., 2010](#)). Indeed, the “workhorse” model in this literature, often coined the Tullock contest model, is based on a strategic game in which wealth plays essentially no role. In this game, each agent has the following payoff function:

$$U_i = w_i - x_i + \Pi_i r, \quad (1)$$

in which x_i is agent i 's effort, $r > 0$ is the rent (i.e., the prize) for the contest winner and Π_i is the probability of winning the contest. Notice immediately then that individual wealth w_i enters separately in the payoff function (1), and thus has no effect on the agent's effort (hence, wealth is, without loss of generality, normalized to zero in the literature).

In this paper, we adapt this basic contest model in order to examine the effects of wealth. Namely, we introduce in model (1) a utility function $u(\cdot)$ that displays the familiar property of decreasing marginal utility of wealth, i.e. $u'' < 0$. Note immediately that this introduction requires to specify whether the rent r and efforts x_i can be expressed in monetary terms, and thus are commensurable with wealth w_i within the utility function. This specification is central. Indeed, it technically removes the separability of wealth with the rent and efforts in model (1). Moreover, it permits to pin down two basic effects that we believe should naturally arise in contests:

- First, wealth can reduce the marginal cost of effort. To illustrate, note that it is marginally less costly for a rich person than a poor person to offer a monetary payment to, e.g., a politician, in order to obtain some privilege. The rich can thus relatively more easily afford costly expenditures in a contest than the poor, other things being equal.
- Second, and in contrast to the first effect, wealth may decrease the marginal benefit of winning a contest. To illustrate, note that it is marginally more beneficial for the poor to obtain the monetary reward associated with victory in a contest. We may thus regard the poor as being relatively more motivated to exert effort in a contest than the rich, other things being equal.

Although these effects are simple, their analysis is not trivial because of strategic considerations. If a change in wealth affects the level of effort of one player, the other player is expected to react to this change, which in turn affects the initial player and so on. There is thus a need to carefully examine the overall impact of wealth on the players' equilibrium efforts using the standard tools of game theory.

1.3. The contest success function

In strategic contest games, the probability Π_i is usually coined the contest success function (CSF). This function defines the contest “technology” and it strongly affects the properties of the game. In our two-player game ($i = a, b$), we will often denote the probability of a winning as $p(x_a, x_b)$ such that $\Pi_b = 1 - p(x_a, x_b)$. We will assume throughout that the CSF has the power-logistic form ([Tullock, 1980](#))²: i.e.,

the population above the median wealth surely has greater political strength than the half below”. Paul [Krugman \(2010\)](#) similarly observes that “the rich are different from you and me: they have more influence”. Lastly, Daron [Acemoglu \(2013\)](#) declares that “the rise in inequality has created a class of very wealthy citizens who can use their wealth to gain more political power – partly to defend their wealth and partly to further their economic, political, and ideological agendas”.

² This CSF is a special case of logistic functions, $p(x_a, x_b) = \frac{\Phi(x_a)}{\Phi(x_a) + \Phi(x_b)}$. [Garfinkel and Skaperdas \(2007\)](#) and [Konrad \(2009\)](#) discuss the axiomatic foundations and economic illustrations for this special, but common, class of CSFs. Moreover, [Jia \(2008\)](#) shows that this CSF can also be motivated as the probability of winning a rank-order tournament (as in [Lazear and Rosen, 1981](#)), when the noise terms are drawn from the inverse exponential distribution (see also [Jia et al., 2013](#)). Under these conditions, the contests that we consider may therefore also be considered as rank-order tournaments.

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