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Production, Rent Seeking, and Wealth Distribution

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I. Introduction

In this paper, we examine the relationship between initial wealth and occupational choice between rent seeking and productive activities. Rent seeking refers to all largely unproductive, expropriative activities that bring positive return to the individual but not to society (Krueger, 1974). The allocation of resources to rent seeking affects aggregate economic activity in several ways. First, to the extent that rent seeking activities, such as corruption and tax farming, lower incentives and opportunities for production and investment, aggregate economic activity is reduced.[1] Second, rent seeking can compete with productive sectors for scarce economic resources, resulting in a misallocation of labor, capital, and talent in the economy.

[1]For historical discussions on the role of rent seeking in explaining the differential economic performance of eighteenth century France and England, see North and Thomas (1973) and North (1981). Empirical studies by Magee, Brock, and Young (1989) and Murphy, Shleifer, and Vishny (1991) also provide some evidence to suggest that countries with more rent seeking tend to grow more slowly.

In many countries today as well as historically, people choose the government bureaucracy, army, and other rent seeking activities over productive and entrepreneurial activities. Historical evidence and casual observation from developing countries, however, suggest that often it is the wealthy who are the rent seekers---exactly those who might otherwise become the first capitalists. Baumol (1990), for instance, notes that in China under the Mandarins and in medieval Europe, government service with its attendant ability to solicit bribes and dispose of tax revenue for one's private benefit was the principal career choice for many wealthy individuals in society. In a historical study of seventeenth century France, Braudel (1982) notes that the purchase of government offices and tax farming was commonplace among wealthy landowners and members of the bourgeoisie. Levi (1988) states that an important prerequisite for engaging in tax farming in Republican Rome was the availability of sufficient capital that enabled wealthy Roman citizens to advance funds to rulers and to collect taxes.

More recently, Wade (1984) finds that individuals pay thousands of dollars for positions with the power to allocate supposedly free water to farmers in India, since these jobs give them monopoly rights to charge for water. In some developing countries, it is common for government officials to own businesses run either by themselves or by their relatives, and to protect such businesses from bribes and other forms of appropriation by virtue of their government positions. One example is the establishment of state trading monopolies by government officials in which one has a stake either directly or through relatives.

Why is it that the rich choose to engage in rent seeking rather than productive activities? This paper provides a theoretical explanation for the relationship between the distribution of agents' initial wealth and their occupational choice between rent seeking and production. It determines endogenously the allocation of agents between the two occupations, the subsequent distribution of income and wealth, and the overall income of the economy. We show that persons with initial wealth above a certain threshold become rent seekers and the rest become producers, and examine the role of bequests in determining initial wealth in society.

The general framework we adopt is a modification of Diamond's (1965) overlapping generation model with the absence of labor and credit markets. Agents in this model have identical preferences and abilities and differ only with respect to their initial wealth. We assume that agents can operate in one of two sectors in the economy: rent seek-

ing and production. Entry into rent seeking, however, requires the payment of a lump sum cost. Payment of this cost enables rent seekers to appropriate some portion of the surplus generated by productive economic activity, while allowing them to protect their wealth from expropriation by others. This latter activity can be regarded as hoarding. In the model, rent seeking and production are assumed to be mutually exclusive activities, with the return to hoarding being lower than the return to production.

The mechanism whereby initial inequality in wealth influences individuals' choice of occupation is as follows: by virtue of being a rent seeker an individual can protect himself against expropriation from other rent seekers. This incentive is relatively stronger for the wealthy who have more to lose from expropriation than individuals with lower wealth. In the absence of credit markets and with a lump sum entry fee for rent seeking, only the wealthy will have enough capital to pay for this right. The payment of the lump sum fee can be viewed as analogous to the purchase of weapons used both for protection and for offense. In this interpretation, arms enable agents to protect their wealth from appropriation by others but also to extract rents from other agents.[2] Hence, when property rights protection is poor or ineffective, wealthy agents have an incentive to buy arms (i.e., paying the entrance fee to rent seeking). The purchase of these arms, however, also enables them to prey on the wealth of other agents in the economy.

The model also has implications for the distribution of wealth in society. An extension of the model to allow for altruistic dynastic bequests demonstrates how differences in bequests determine the initial wealth of agents in society. Income and occupational differences are perpetuated in equilibrium from parent to child as in Galor and Zeira (1993), Banerjee and Newman (1993), Aghion and Bolton (1994), and Greenwood and Jovanovic (1990). These papers rely on the assumptions of imperfect credit markets and indivisible inputs to show that occupational choice and the resulting level of aggregate economic activity depend on initial conditions (particularly, initial wealth or income). Our paper illustrates this imperfection with the special case of no credit

[2]This is in contrast to Grossman and Kim's (1997) analysis of the relationship between weapons used either for predation or for defensive fortifications. An important distinction between our paper and theirs is that, here, predation and the deterrence of predation are viewed as complementary activities.

markets at all. We model the indivisibility as a lump sum cost, as in Greenwood and Jovanovic (1990).

The link between the relative rewards to rent seeking and productive activities is examined by Baumol (1990), Murphy, Shleifer, and Vishny (1991), Acemoglu (1995), Acemoglu and Verdier (1998), Mehlum, Moene, and Torvik (2000), and Baland and François (2000). These papers focus on the relative returns to engaging in production and rent seeking as a determinant of the allocation of agents between the two activities. They do not, however, examine the relationship between occupational choice and the level of initial wealth in society.

The paper proceeds as follows. Section II specifies the basic model and examines the properties of equilibrium. Section III examines the role of bequests in determining initial wealth in society. Section IV considers extensions to the basic model, and Section V concludes.

II. The Model

Environment and Technology

Consider an economy consisting of a continuum of agents living in two periods distributed over the interval [0, 1]. Agents are assumed to have identical preferences and abilities and differ only in their initial wealth. The preferences of each agent are described by a twice-continuously differentiable quasi-concave utility function $U(c_1, c_2)$, where c_1 and c_2 denote consumption of the economy's single good in each period of life. The arguments of the utility function are gross substitutes with $\lim_{c_i \to 0}[u_i(c_1, c_2)] = \infty$, and u_i represents marginal utility in period i, $i = 1, 2$.[3] Each agent is endowed with $w > 0$ units of the consumption good when young. The initial distribution of goods endowment in the economy is represented by the cumulative distribution function $\Gamma: R_{++} \to [0, 1]$.

There are two sectors in the economy: production and rent seeking. Each agent operates in one of these two sectors in his lifetime. Each producer has access to a standard concave production technology that yields $f(i)$ units of the consumption good in period two of his life to an investment of i units when young (period 1), where $f(0) = 0$ and $f'(0) = \infty$. Producers, however, face appropriation of some share of their market production by rent seekers. Let $0 < \gamma < 1$ denote the proportion

[3] A sufficient condition for gross substitutability is a separable utility function and a coefficient of relative risk aversion less than one.

of market production that can be extracted from each producer in the form of bribes, taxes, or outright expropriation.[4] We assume that the probability of dealing with a rent seeker is equal to the proportion of rent seekers in the economy, n. Therefore, the expected second period return to a producer is given by $(1 - n\gamma)f(i)$.

Entry into rent seeking requires payment of a lump sum fee of θ units of the consumption good when young. Payment of this cost allows rent seekers to tax market production in the second period of their lives. Agents are assumed to be unable to borrow to finance entry into rent seeking. The payoff to rent seeking depends on the likelihood of obtaining rents from producers. We assume that the amount collected by each rent seeker is given by a function $R(n, \gamma)$, with $R_n < 0$, $R_\gamma > 0$, $R_{\gamma\gamma} \leq 0$, $R_{nn} \leq 0$ and $R_{n\gamma} \geq 0$. The expected rent to a rent seeker is given by $(1 - n)R(n, \gamma)$. The assumption that the return to rent seeking is decreasing in n captures the idea that rent seekers crowd each other out. We also assume that the first rent seeker can appropriate the maximum potential rent, which is given by $\gamma f(i)$. This assumption implies that $\lim_{n\to 0} R_n(n, \gamma)dn = \gamma f(i)$ (which implies that $R_n(0, \gamma) = \infty$).[5]

Rent seekers are assumed to save only through a simple technology that returns x goods in period 2 of their lives to an input of s when young (period 1). The inputs of rent seekers are assumed to be unobservable, which implies that rent seekers cannot coordinate their saving decisions. Unobservability of a rent seeker's inputs also implies that a rent seeker cannot expropriate the goods controlled by another rent seeker. Therefore, one may think of x as the return on hoarding that allows rent seekers protection from theft by others. We assume that $x < (1-n\gamma)f'(i)$ $\forall i$ and n. Thus, the marginal productivity of the production technology is higher than the return on hoarding.[6]

Equilibrium

In this section we describe individual decisions. First, consider the optimization problem faced by an agent who chooses to become a rent

[4]Here γ can be regarded as a tax on the proceeds of market production, or, alternatively, the cost of engaging in production in a rent seeking society. In reality, this fraction may depend on the effectiveness of the rent seeking technology or the level of development of an economy.

[5]This assumption gives us a unique equilibrium in production and rent seeking.

[6]Note that the same results follow if x were equal to $(1 - n\gamma)f'(i)$ for any $\theta > 0$. If x is assumed to be greater than $(1 - n\gamma)f'(i)$, this leads to the uninteresting case of rent seeking always being profitable for individuals.

seeker. The budget constraints faced by a rent seeker in each period of his life, are

$$w - \theta - s = c_1 \tag{1}$$

$$(1 - n)R(n, \gamma) + xs = c_2, \tag{2}$$

where s represents the savings of the rent seeker. The first order condition for utility maximization for a rent seeker is given by the Kuhn-Tucker condition:

$$-u_1^R + xu_2^R \leq 0 \text{ for } s \geq 0. \tag{3}$$

If the agent's initial endowment w is sufficient to provide all desired consumption when young, equation (3) is always satisfied with equality. Suppose this is the case. Define as $V^R(w)$ the maximum utility attained by an agent if he chooses to engage in rent seeking given an initial endowment w. When instead the agent chooses to become a producer, he solves

$$V^P(w) = \max_{c1,\, c2} U(c_1, c_2) \tag{4}$$

s.t.

$$w - i = c_1$$

$$(1 - n\gamma)f(i) = c_2, \tag{5}$$

where $V^P(w)$ denotes the maximum utility attained by a producer taking w as given. The first order condition for utility maximization for a producer is

$$-u_1^P + (1 - n\gamma)f'(i)u_2^P = 0. \tag{6}$$

An equilibrium in this environment is given by an allocation of the population between rent seeking and production and values of s and i such that each agent maximizes his lifetime utility taking as given w, x, θ, and γ. To study the allocation of agents between rent seeking and production, we examine the relationship between $V^R(w)$ and $V^P(w)$ as a function of n, the proportion of rent seekers in the economy. The derivatives of $V^R(w)$ and $V^P(w)$ with respect to n are given by

$$\frac{\partial V^P}{\partial n} = -\gamma f(i)u_2^R < 0 \tag{7}$$

$$\frac{\partial V^R}{\partial n} = u_2^R [- R(n, \gamma) + (1 - n)R_n] < 0. \tag{8}$$

Therefore, both curves are downward sloping. The following lemma shows that a corner solution with only rent seeking does not exist.

Lemma 1. *There does not exist an equilibrium in which all agents engage in rent seeking (that is, $n \neq 1$).*

Proof. At $n = 1$, for a given w, the expected rent accruing to each rent seeker, $(1 - n)R(n, \gamma)$ is zero. Because the return to hoarding is less than the return to production, the maximum utility attained by a producer exceeds the maximum utility attained by a rent seeker. That is, $V^R(w) < V^P(w)$ at $n = 1$. Therefore, there cannot be an equilibrium in which all agents choose to engage in rent seeking. Q.E.D.

Consider now an equilibrium in which there is no rent seeking. For such an equilibrium, it is necessary that $V^R(w) < V^P(w)$ at $n = 0$.[7] That is, the maximum utility from production is greater than the utility from being the only producer. In what follows, we assume that γ is sufficiently high and/or θ is sufficiently low such that at $n = 0$, the maximum return to rent seeking exceeds the return to production.

Assumption 1. $V^R(w) > V^P(w)$ at $n = 0$.

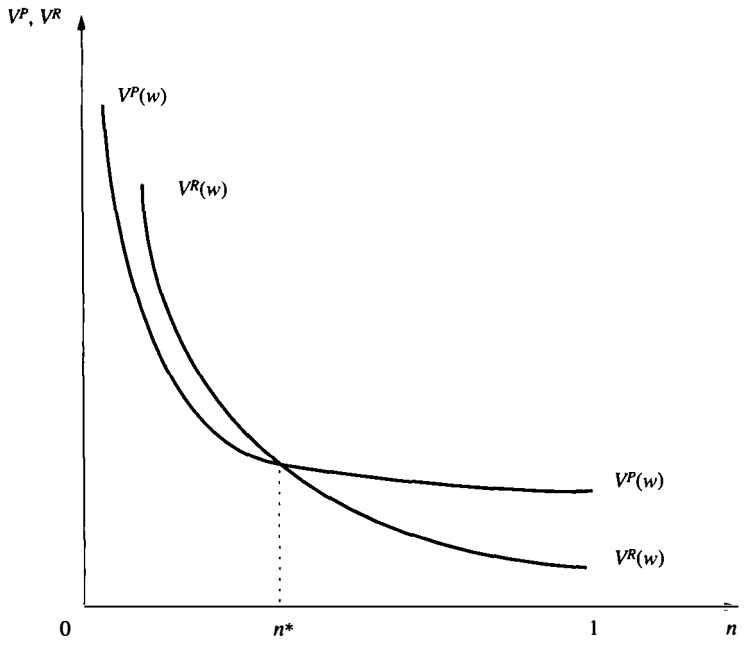
Lemma 1 and Assumption 1, along with the continuity of the utility functions, yield Proposition 1 (Figure 1).

Proposition 1. In equilibrium, there is a positive measure of agents engaging in rent seeking and of agents engaging in production.

Note that if Assumption 1 does not hold, and if both V^P and V^R are downward-sloping curves, they can have more than one intersection, giving rise to the possibility of multiple equilibria. If, for instance, $V^P > V^R$ at $n = 0$, and there exists some $0 < n < 1$ for which $V^R > V^P$, the relative position of the two curves is illustrated by Figure 2. These conditions imply that if there is no rent seeking, the return to rent seeking is lower than the return from production, and that there exists some range over which the return to rent seeking exceeds the return to production. In this case, there can be multiple equilibria in rent seeking and production and our model then delivers qualitative outcomes comparable to

[7] A sufficiently high θ or a sufficiently low γ makes this equilibrium more likely.

Figure 1. Unique Equilibrium in Production and Rent Seeking



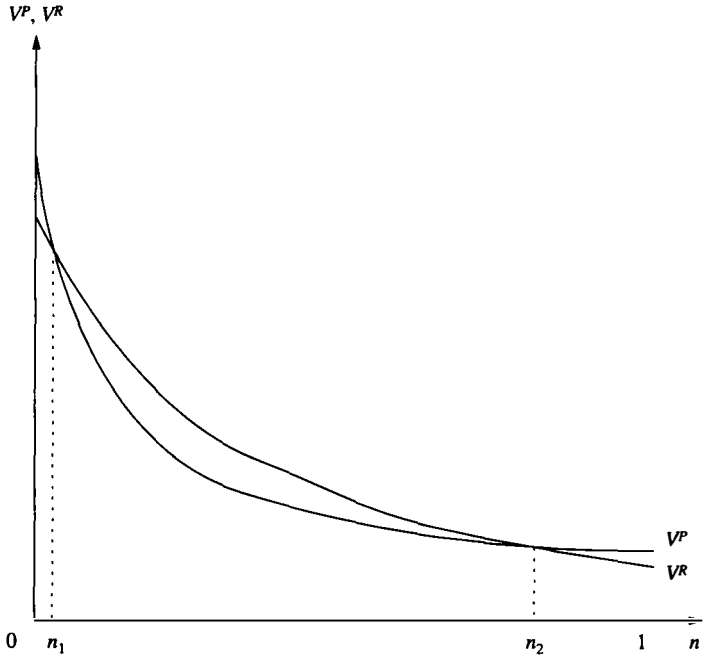
Murphy, Shleifer, and Vishny (1993), Acemoglu (1995), and Baland and François (2000). In this paper, we deliberately abstract from multiple equilibria in order to focus on the relationship between agents' initial wealth and their choice between rent seeking and production.

Properties of Equilibrium

In this section, we examine the relationship between agents' wealth and their choice between rent seeking and production. In the presence of the lump sum cost in the rent seeking sector and in the absence of credit markets, it can be shown that only wealthy agents will choose to engage in rent seeking. The following lemma states that the earned income (second period) of a rent seeker is higher than the earned income of a producer.

Lemma 2. *Each agent enjoys a greater earned income if he engages in rent seeking than in production.*

Figure 2. Multiple Equilibria



Proof. Because producing has a higher marginal product than hoarding ($x < (1 - n\gamma)f'(i)$), if an agent with a given endowment w chooses to become a rent seeker, it must be the case that $u_2^R < u_2^P$. Q.E.D.

Lemma 3. *For a given endowment w, if an agent is just indifferent between rent seeking and production, it must be true that* $u_1^R > u_1^P$.

Proof. At the point where agents are just indifferent between rent seeking and production, $V^R(w) = V^P(w)$, for any given endowment w. It follows from Lemma 3 that the earned income of a rent seeker is higher than the earned income of a producer, for any given w. Therefore, $u_2^R < u_2^P$ implies that $u_1^R > u_1^P$.

Lemma 3 states for a given w, at the point where agents are indifferent between rent seeking and production, the consumption of a rent seeker when young is lower than the consumption (period 1) of a producer. This result occurs due to the presence of the lump sum cost required to enter into rent seeking. Let $\Omega(w)$ denote the differ-

ence between the utility of an agent with endowment w if he chooses to engage in rent seeking and his utility if he chooses to become a producer.

$$\Omega(w) \equiv U(w-\theta-s^*, (1-n)R(n, \gamma)+xs^*)-U(w-i^*,(1-n\gamma)f(i)), \quad (9)$$

where s^* denotes the value of saving that satisfies with equality the first order condition for a rent seeker (equation 3) and i^* represents the value of a producer's saving that satisfies his first order condition (equation 6). Therefore, $\Omega(w)$ represents the difference between the maximum utility obtained from rent seeking, $V^R(w)$, and the maximum utility obtained from production, $V^P(w)$.

The derivative of $\Omega(w)$ with respect to w is given by

$$\Omega'(w) = u_1^R - u_1^P, \quad (10)$$

where u_1^R and u_1^P represent the marginal utility from engaging in rent seeking and in production, respectively. From Lemma 3 we know that at the point where agents are indifferent between the two occupations, the marginal utility of consumption when young is higher for a rent seeker than for a producer, so that $u_1^R > u_1^P$ and $\Omega'(w) > 0$. Because in equilibrium some agents must follow each career path (from Proposition 1), there must exist some borderline endowment $\bar{w}$ defined by $\Omega(\bar{w}) = 0$. The above analysis indicates that $\Omega(\cdot)$ has a positive slope at $w = \bar{w}$; that is, when rent seeking and production offer nearly the same utility, the relative attractiveness of rent seeking to production is increasing with a higher initial wealth. Therefore, Lemma 3, along with the continuity of the utility functions, ensures that $V^P(w)$ and $V^R(w)$ have a single crossing.

We can now characterize the allocation of agents between rent seeking and production. There exists a unique level of endowment $\bar{w} > 0$ such that for $w \geq \bar{w}$ agents will choose to engage in rent seeking, and for all $w < \bar{w}$ will choose production. This result is summarized in Proposition 2.

Proposition 2. In equilibrium, the greater the initial income of an agent, the more attractive is a career in rent seeking relative to producing.

Proposition 2 states that the rich become rent seekers. Rent seeking is limited to agents with high enough initial income due to the presence of the lump sum cost required to enter this sector. Note that it is not the

higher wealth itself that creates incentives for wealthy agents to enter into rent seeking but the ability to protect the return from their own wealth that a career in rent seeking affords them. Payment of the fixed cost enables rent seekers not only to extract some portion of the proceeds from market production but also ensures protection of their wealth from appropriation by others. The rich, by virtue of their higher initial income, therefore, have a greater incentive to engage in rent seeking.

Thus, despite the fact that agents are ex ante identical in terms of preferences and abilities, two classes of agents emerge in equilibrium. It is the initial income (w) of an agent that determines his decisions whether to engage in rent seeking or production, and how much to consume and save. Hence, the initial distribution of endowments determines aggregate output in the economy and the measure of agents engaged in rent seeking

$$\int_{\bar{w}}^{\infty} d\Gamma(w) = n \tag{11}$$

and in production

$$\int_{0}^{\bar{w}} d\Gamma(w) = (1 - n). \tag{12}$$

Given that hoarding has a lower marginal product than production, the greater the proportion of rent seekers in the economy, the smaller is aggregate output. Hence, the total level of output in the economy is negatively related to the size of the rent seeking sector.

III. Bequests and Income Classes

The analysis in the previous sections assumed that the distribution of wealth in society was exogenous. But where does this initial distribution come from? In this section, we show that the initial distribution of wealth may represent bequests received from an agent's parents when young. The important question then is which sort of parent will leave larger bequests to induce their children to choose a career in rent seeking versus production? We, therefore, examine equilibrium behavior in the face of a bequest motive on the part of parents.

As in Barro (1974), we assume that parents value the utility of their children, such that an individual born at time t has the utility function:

$$V_t \equiv u(c_{1,t}) + u(c_{2,t+1}) + \beta V_{t+1}, \tag{12}$$

where $0 < \beta < 1$. The budget constraints for producers can be written as:

$$w_t - i_t = c_{1,t} \tag{13}$$

$$(1 - n\gamma)f(i_t) = c_{2,t+1} + w_{t+1} \tag{14}$$

and, for rent seekers as:

$$w_t - \theta - s_t = c_{1,t} \tag{15}$$

$$(1 - n)R(n, \gamma) + xs_t = c_{2,t+1} + w_{t+1}. \tag{16}$$

Assume that bequests are nonnegative (parents cannot extract goods from their children). For both agents, the first order maximization condition with respect to the choice of bequest, w_{t+1}, is given by

$$-u_{2,t} + \beta u_{1,t+1} \leq 0 \text{ for } w_{t+1} \geq 0 \tag{17}$$

with the other conditions remaining the same as in Section II.

Lemma 4. *Agents will leave larger bequests if they are rent seekers than producers.*

Proof. If no bequests are received (i.e., $w_{t+1} = 0$), we know from Lemma 2 that $u_2^R < u_2^P$. From equation (17), this implies that, for any given value of $u_{1,t+1}$, a rent seeker having a lower marginal utility of consumption when old will choose to leave a larger bequest. Q.E.D.

Proposition 3. In a stationary equilibrium where both agents leave bequests, rent seekers will only engage in hoarding if the amount expropriated from producers is sufficiently low.

Proof. In a stationary equilibrium with positive bequests, equation (17) implies that $u_1/u_2 = 1/\beta$.[8] Since both rent seekers and producers must leave positive bequests to finance their children's consumption when young, the assumption that $x < (1 - n\gamma)f'(i)$ implies that either

[8]Notice that saving from youth to old age requires that $u_1/u_2 = (1 - n\gamma)f'(i)$ for a producer and $u_1/u_2 = x$ for a rent seeker.

(i) $u_1/u_2 = (1 - n\gamma)f'(i) = 1/\beta$ and $x < 1/\beta$ or

(ii) $u_1/u_2 = (1 - n\gamma)f'(i) > 1/\beta$ and $x = 1/\beta$.

From Lemma 3 we know that agents will leave larger bequests if they are rent seekers than producers. Therefore in a stationary equilibrium, (i) suggests that for $\theta > 0$, the expected rent expropriated from producers, $(1 - n\gamma)R(n, \gamma)$, is sufficient to provide all desired consumption when old and to leave larger bequests than producers. As a result, the rent seeker does not need to engage in hoarding ($s = 0$). However, if the rent expropriated from producers is low, due to a low proportion extracted (γ) relative to the degree of crowding out among rent seekers, (ii) implies that a rent seeker must hoard to consume when old and leave a bequest. Q.E.D.

Note that for a given $\theta > 0$, a rent seeker who does not save (engage in hoarding) enjoys higher consumption when young but has a lower second-period income than the case in which he allocates a positive amount of his initial wealth to saving. In the absence of credit markets, a higher initial income is of greater value to rent seekers than producers because it allows them to devote a positive amount of their endowment to hoarding while allowing them to finance a higher consumption when young. As a result, in an equilibrium with more pervasive rent seeking or a sufficiently low γ, which implies lower rents, a rent seeker will choose to save when young. However, if the rent expropriated from producers is sufficiently high or crowding out among rent seekers is not severe, by choosing not to engage in hoarding, he will enjoy a higher consumption when young.

We also know from Proposition 2 that those receiving a larger bequest are more likely to be rent seekers. Since the children of rent seekers are the ones to receive larger bequests, they will therefore become rent seekers themselves as they will be able to meet the lump sum cost required to enter into rent seeking. Similarly, the children of producers will choose to be producers themselves as the bequests they receive may not be sufficient to meet the lump sum cost to rent seeking. Therefore, the children of rent seekers will become rent seekers and the children of producers will become producers. We can, therefore, have a class structure of wealth and occupational choice between rent seeking and production that, in equilibrium, is self-generating and self-perpetuating.

IV. Extensions

Endogenous θ

The equilibrium allocations between production and rent seeking in our analysis so far relied on the assumption of a fixed cost θ of entering into rent seeking. However, the model could easily be extended to endogenize θ. In all cases considered below, it is assumed that there is a maximum potential number of rent seeking cases (P^*), which is ultimately a function of the existing set of rules and regulations and the degree of discretionary power of public officials. P^* is assumed to be at least as large as the maximum number of rent seeking cases in the economy, given the rent seeking technology and the number of rent seekers.

Consider a two-stage game in which a self-interested higher authority in the first stage decides on the size of the rent seeking sector n. In the second stage, there is free competitive bidding for the rent seeking positions, such that all successful bidders pay the same price and agents choose their profession. Assume that there is no taxation in the economy. The central authority then acts as a revenue maximizing Stackelberg leader, choosing the optimum n to maximize its revenues, $n\theta(n)$.[9]

Suppose instead, in the absence of a strong centralized authority a (relatively large) number of decentralized government units effectively have power to charge agents an entrance fee into rent seeking, each one in its own area, and the number of potential entrants into rent seeking P^* is the same as in the previous case. Each unit can grant one agent the right to engage in rent seeking and it acts independently of the other units. Hence it does not take into account the effect on the entrance fee θ of increasing the number of rent seekers. Intuitively, the number of rent seekers will be larger, and the equilibrium entrance fee and the threshold initial wealth level ($\bar{w}$) lower than in the previous case. In other words, the revenue-maximizing central authority will choose a smaller, more exclusive, and wealthier club of rent seekers.

This feature of a small "elite" of wealthy individuals engaging in rent seeking is observed in a number of developing countries as well as in medieval Europe. Examples of uncoordinated solicitation of bribes

[9]In the absence of effective monitoring and weak law enforcement, the central authority would essentially be extracting some of the rents that accrue to rent seekers. If, for instance, the specific source of bureaucratic inefficiency in the economy is corruption by tax collectors, then tax farming may be a preferred regime from the point of view of tax revenues raised.

and other forms of rent seeking by a large number of government units are seen in many African countries.[10] The large number of units with this power reflects their own low entrance costs into rent seeking. As noted by Shleifer and Vishny (1993), the resulting effect can be an even heavier burden on private producers of rent seeking, which is detrimental to private investment and economic growth.

In the above discussion, it is implicitly assumed that the free competitive bidding in the second stage raises the entrance fee θ to the level where the marginal bidder's excess utility from rent seeking relative to production is reduced to zero. Hence, if all agents had the same initial wealth (say, the same $\bar{w}$), there would be no rent seekers. This would be the case regardless of the higher authority's decision in stage 1 about the size of the rent seeking sector. Only individuals with initial wealth higher than $\bar{w}$ would have positive excess utility from rent seeking relative to production at that level of θ. In other words, an important implication of our model is that there must be initial inequality in wealth for any rent seeking to take place.

Differences in Ability

The model can easily be extended to assume differences in abilities across individuals leading to differing returns in each sector. The link between rent seeking and misallocation of resources in the economy is then reinforced by the finding that the most able persons become rent seekers.

Differences in ability can be incorporated in a number of ways in our model. Suppose that more able individuals have lower costs of entering into rent seeking (lower θ). Assume that an individual's ability a is drawn from a continuous density function $q(a)$, where agents with high a have a comparative advantage for rent seeking relative to production. In this case, it can be shown that the return to rent seeking becomes more attractive for individuals above some average ability a^* and less attractive for those below average ability.[11]

Suppose there exist productivity differences among individuals in both rent seeking and production such that persons with higher ability have higher productivity in both rent seeking and in production than

[10]See Fjeldstad (1999).

[11]This is similar to Acemoglu and Verdier (1998) but they assume that the decreasing cost of human capital investment applies to production.

less able individuals. We can formalize this by considering an amended production function, $af(i)$, and rent seeking function, $aR(n)$ as in Murphy, Shleifer, and Vishny (1991). Both rent seeking and production show increasing net returns to ability. This reflects the existence of a cost element in both sectors that is fixed with regard to variations in the level of ability (the entrance fee θ), whereas rents appropriated through rent seeking and output in production both vary with ability. If the elasticity of the net return to ability is higher in rent seeking than in production, rent seeking will be relatively more attractive for the more able individuals in society.

Therefore, the most able individuals will be attracted to rent seeking, resulting in a misallocation of talent in the economy. Aggregate production is decreased because the number of individuals, the amount of capital invested, and the average ability and productivity of persons engaged in production are lower.

V. Conclusion

This paper analyzes the role of initial wealth in determining the choice between engaging in rent seeking and productive activities. We show that in the absence of credit markets, only wealthy agents can overcome the nonconvexity in income-earning possibilities. The wealthy are, therefore, "born into rent seeking." We analyze a model in which rent seeking enables agents not only to extract some portion of the proceeds from market production but also ensures protection of their wealth from appropriation by others. Therefore, wealthy agents avoid the tax from rent seekers by becoming rent seekers themselves, a result that accords well with both historical evidence and casual observation from developing countries today.

The results of the model are robust to alternative specifications of the rent seeking technology. Allowing rent seekers to expropriate a proportion of producers' output simplifies our analysis, but does not affect any of the major results.[12] In the model, agents are assumed to be unable to finance their entry into rent seeking through borrowing. Credit markets in many developing countries are typically character-

[12]For instance, even if rent seekers extract a fixed fee instead of expropriating a proportion of market production, the model's implications concerning the relationship between initial income and occupational choice are unchanged.

ized by high collateral requirements. An agent seeking to obtain a loan to finance the entrance fee into rent seeking would need to have substantial capital to meet the collateral requirements. This suggests that even in the presence of capital markets, it is the relatively wealthy who will be able to obtain such loans.

The model abstracts from law enforcement as the rent seekers' probability of being caught and punished is implicitly set equal to zero. Clearly, effective law enforcement would reduce the attractiveness of engaging in rent seeking. Law enforcement can easily be captured in the model by making γ a decreasing function of the economy-wide resources devoted to enforcement. If, for instance, such enforcement is financed through a lump sum tax on producers, the larger the size of the rent seeking sector, the larger would be the tax required to finance a given level of enforcement. As a result, even with positive law enforcement, the implied trade-off for producers between lower expropriation and higher taxes suggests that rent seeking will not be eliminated in equilibrium.

The results of this model require two crucial assumptions, namely that there are nonconvexities in rent seeking and that rent seekers have access to a "protection" technology. These assumptions together ensure that the initial distribution of wealth determines the choice between rent seeking and production. The model also provides implications for this initial distribution of wealth. It is shown that if agents have an altruistic bequest motive, differences in bequests determine the distribution of wealth in society and can explain the perpetuation of rent seeking in society.

The model presented in this paper is essentially static in nature in that it describes the short-run equilibrium where income distribution affects occupational choice, output, and investment. An important extension would be to consider the dynamics of the relationship between wealth distribution and rent seeking as an economy develops. Such an extension would allow us to examine the relationship among income distribution, occupational structure, and economic growth.

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