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Source: *American Journal of Political Science*, Vol. 35, No. 4, (Nov., 1991), pp. 951-969

Published by: Midwest Political Science Association

Stable URL: <http://www.jstor.org/stable/2111501>

Accessed: 30/04/2008 12:11

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*A Political Theory of the Origin of Property Rights: Airport Slots**

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We develop a theory of the origin of property rights by specifying the necessary conditions for them to emerge: (1) the underlying good must be scarce, (2) prospective right-holders must desire the right, and (3) right-grantors, that is, government officials, must perceive an advantage from enforcing respect for the right. Our theory, wherein the motive force is both holders' desire to possess and grantors' desire to grant, thus differs from neoclassical models, which omit government entirely, and from contractarian models wherein the motive force comes wholly from prospective holders. We illustrate our theory with an account of a newly granted right for airport time slots (1986), perhaps the only such grant for which there is enough surviving detail on its origin to allow for investigation of the significance of the several conditions for the grant.

Property rights enable private persons or groups to control resources that might otherwise be controlled politically. That these rights (to use, sell, rent, profit from, and exclude others from) exist and are recognized means that rulers allow persons other than themselves to exercise control over valuables. In the abstract this is a puzzling fact. Why should rulers, with their supposed monopoly of force, leave great treasure in hands other than their own? Yet they do, and, presumably, they have good reason to do so. To identify their reason is to provide a partial explanation, at least, of the origin of property rights.

Traditional justifications of property rights ordinarily include some reference to origins. Unfortunately, many descriptions of origins devised for justificatory purposes are not historically or scientifically convincing and thereby weaken the justifications. To remedy this weakness, we set forth a positive explanation of rulers' motivations to grant property rights and citizens' motivations to petition for them and to respect them. We illustrate our theory with a contemporary example so that it, unlike most other discussions of origins, can be checked against easily available detail.

But first a caveat. Our purpose is not to debate the philosophical justification of rights. We recognize, or course, that despite our self-imposed restrictions, our theory may have implications for these justifications that depend crucially on

*We thank the John M. Olin Foundation, which supported our research; Charles Plott, who gave us data he had collected; Christopher DeMuth, Lynn Helms, Randall Malin, Nestor Pylypec, Richard Yates, and many people in the government and the airline industry who helped us understand the issues; and academic critics who saved us from errors: David Austen-Smith, Larry Bartels, Randall Calvert, Henry Manne, David Meiselman, William Thomson, David Weimer, and Carl Wellman.

American Journal of Political Science, Vol. 35, No. 4, November 1991, Pp. 951–69
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incomplete descriptions of origins. But we do not explore this complicated possibility because we wish merely to describe the origin of property rights by placing one concrete instance in an analytical context.

Alternative Explanations

Our procedure thus differs from previous discussions that have lacked both concrete detail and a descriptive theory to organize the study of origins. We do not blame our predecessors for these lacunae because we know that detail about origins is elusive. Rights to trade goods apparently antedate written history, and for Europe at least, rights to land developed from feudal holdings in a process obscured in casually reported case law and unrecorded economic circumstances (Denman 1958). Recently, some detail on other creations of rights have, however, become available (Eggertsson 1990; Libecap 1989; Umbeck 1981).

In the previous absence of detailed knowledge, therefore, philosophers have depicted alternative origins with a broad brush. Theorists of natural rights have used the broadest brush of all, finessing the question of origins by positing that rights inhere in humans. This implies that rights always and necessarily exist, at least potentially. This postulate is vulnerable philosophically and historically. Against assertions that property is unnatural, proponents of natural rights can only appeal to authority, which is indecisive when authorities dispute. And if property rights "should" exist but, historically, do not, the claim that existence is potential begs the question because it offers no explanation of what realizes the potentiality. In contrast, our research concerns exactly what natural rights theorists evade, namely, the historical origins of the social embodiment of rights; and we have nothing to say about their moral bases.

Social contract theorists, for another example, explain the origin of property rights in a contract drawn between the people and the government or among the people severally (Buchanan and Tullock 1962; Umbeck 1981). Despite the analytical value of these theories for study of the consequences of rights or their normative value to justify enforcement, they are manifestly incorrect as descriptions of events. Governments have existed throughout recorded history, and all primitive societies today display at least a judicial system enforcing a customary law. Since, in known history, government of some sort has always existed, social contracts cannot have created governments and thus rights. In fact, as we shall show, the causal relation probably runs the other way: rulers themselves (legislatures, executives, judges) have generated property rights, hoping to encourage efficiency and, doubtless also, to increase tax income. We recognize, of course, that economists (e.g., Buchanan and Tullock 1962) and philosophers (e.g., Rawls 1971) have usefully inferred moral and legal principles from the social contract as an abstract ideal, wholly and properly unhistorical. This rhetorical device admits analytical interpretation while bypassing historical errors. Nevertheless, whether normatively useful or restrictive, the social contract explana-

tion of the origin of rights distorts description, and we want to eliminate that distortion.

Recently, Demsetz (1964, 1967) has, more convincingly, identified economic conditions under which property rights come to have value: scarcity and the need to internalize externalities. He pointed out that, when it is too costly to price them, goods may have a zero market price. But technological, demographic, or social change may bring about positive prices. Property rights then effectively allocate goods to avoid their misuse (as in pollution) or their overuse (as in the tragedy of the commons, Hardin 1968). Market allocations thus replace allocations by command or by initial possession.

Demsetz's explanation of "the emergence of property rights" is a considerable step forward, but it suffers from the typical defect of neoclassical political economy of specifying the conditions for and properties of an equilibrium, without specifying how those conditions occur in the real world. This defect is here clearly visible. Sometimes Demsetz's conditions are met, but property rights do not emerge, as we learn from frequent historical periods of protracted economic inefficiency (North 1981). This indicates that Demsetz's conditions are at best necessary, but not sufficient. Alchian and Demsetz (1973, 17, 23–27) have recognized this weakness and, therefore, have recommended further investigation of the emergence of property rights.

This failure of the neoclassical approach rests on its complete exclusion of political structures (Riker 1988). As Demsetz himself explained, he deliberately excluded politics in order to understand the economic features of perfect competition. But if, in that model, "the legal system and government [are] relegated to the distant background by the simple device of stating the resources [are] 'privately owned' " (Demsetz 1982, 7), it follows that the model can say very little about the excluded political features. In real economic activity, which is embedded in political activity, law and government have much to do with the origin of property rights. We simply cannot avoid politics. Following North, we think that property rights influence the operation of an economy as much as technology, demography, and competition (North 1981, 1). Therefore, we wish to study the origin of rights in a more realistic context than the neoclassical model permits.

A Political Model

We begin with an interpretation of rights. Following Hohfeld (1919), we think of rights as a combination of duties and claims, of which the content is what a right-holder can claim and what a duty-bearer should respect. When a right (say, land ownership) exists, the bearer owes a duty (e.g., not to trespass) to the holder, and the holder has a claim on the bearer to perform the duty owed. In order to locate these first-order relations of duties and claims within the social system, there are second-order relations that serve as operations on the first-order

relations. These second-order relations are power, which concerns the ability to change the rules about duties and claims, and immunity, which the right-holder possesses if the first-order relations are unalterable (Sumner 1987). With this vocabulary we restate our initial question: Under what circumstances does a power-holder grant a right-holder a claim on duty-bearers to respect the granted right?

The first-order relations can characterize right-holders' claims coming from any source—nature, custom, “social contract.” Potential holders may claim rights and duty-bearers may customarily respect them for reciprocal gain. But claims enforced only by reputational incentives are at best contingent rights, which may be ignored if duty-bearers perceive an advantage in doing so. Hence, follows the importance of the second-order relations of enforcement and immunity. These relations are political, so at some point, whatever their justifications, property rights are politically determined. Our question is, then: at what point?

To answer we set up a model with testable hypotheses. The actors are potential right-holders who desire property rights, officials who make rules about them, and duty-bearers who respect them. The postulates for the model are

POSTULATE 1: Political actors maximize utility.

This postulate subsumes the usual axioms of rationality and covers officials, right-holders, and duty-bearers. Rulers maximize toward some goals, which include the possession of resources, tax income, the authority and emoluments of office, and even sometimes benevolent public service. To achieve their goals, they need popular support, which they acquire by ideological appeals and by various forms of grants including (1) money (e.g., subsidies, welfare, pork barrel); (2) chances for rents (e.g., monopolies, regulation); and (3) property rights. Our concern here is with the third category.

For right-holders, postulate 1 implies that scarcity is necessary for the emergence of rights. If goods are free, rational holders forgo ownership, if possible. But when goods, like land or liberty of speech, are scarce and hence worth possessing, holders seek rights over them. For duty-bearers, the postulate means that they respect the right if the net benefit of respecting, if any, is greater than the net benefit (including the cost from punishment) of not respecting it.

POSTULATE 2: Public officials have more resources (military, acknowledged legitimacy) than other actors.

Government is said to have a monopoly of force—an exaggeration. Still, either government can defeat challengers or challengers can become the government. Postulate 2 means that, as the strongest (and legitimate) force, public officials can obtain any scarce goods, provided they have not chosen to acknowledge the immunity of other right-holders.

Given these assumptions, what are the necessary conditions for the emergence of a right? We have already inferred one condition.

CONDITION 1: Scarcity. The content of the right is scarce, driving its value above enforcement costs. Without such value, control is pointless.

Further necessary conditions are that private property is to actors' advantage.

CONDITION 2: Right-holders desire the right. If this condition is not satisfied, holders do not seek the right; hence, it does not emerge.

CONDITION 3: Rule makers desire to recognize the right. This condition is necessary because a right unproclaimed by enforcers is not ultimately enforceable.

Since rule makers are (by postulate 2) the enforcers, they must wish to establish and maintain the right to obtain their net benefits of enforcement (i.e., tax income and the gratitude of right-holders and others who consciously gain from efficiency, less the costs of enforcement). Condition 3 is crucial to differentiate our theory from a strictly economic one like Demsetz's, in which scarcity is sufficient. According to our theory, even with scarcity, rights do not emerge unless officials are advantaged by them.

CONDITION 4: Duty-bearers respect the right. This is a necessary, but often unnoticed, condition.

In one sense it is not logically independent but merely a qualification to condition 3. Rule makers cannot successfully proclaim rights if duty-bearers do not respect them. Thus, duty-bearers are merely a cost of enforcement. Since this cost is often negligible, many analysts neglect this condition. Yet in a deeper sense, this condition is indeed logically independent. Rights acquire the acquiescence of most participants, which may be extremely costly if duty-bearers must be militarily coerced. So one must distinguish between the will of the officials to grant the rights and the will of the duty-bearers to respect them.

We summarize our model by stating explicitly our theory of the emergence of rights: rights originate in a historical event. As such there are identifiable actors with identifiable motives, who create rights. Rule makers grant a right to grantees, the Hohfeldian right-holders. By so doing they guarantee the right-holders a permanent claim over the content of the right, and they impose on the duty-bearers the duty to respect the holders' claim. Since the grantor thereby commits itself to police continually, it undertakes this obligation only if the gain from tax income and gratitude exceeds the cost of enforcement. Similarly, right-holders value the right only if the benefit from the enforced right exceeds the

cost in taxes and gratitude. And duty-bearers respect the right only if enforcement eliminates the marginal benefits of not respecting it.

We acknowledge, of course, that this explanation of the origin of rights has a long history. Thomas More expressed it (for liberty of speech) as early as 1523 (Riker 1990; Roper 1935); and even in the heyday of natural rights, Blackstone (1765) effectively reiterated it (for land). In the United States, we find it in Hamilton's remark (*Federalist* no. 84): "... bills of rights are . . . stipulations between kings and their subjects, abridgements of prerogative in favor of privilege." But while the grantor-grantee explanation is perhaps the oldest one, it has not been carefully formulated, which is our task here.

Property in Slots

We now examine an illustrative instance: the creation of property in time slots at four heavily used airports. Slots are rights to land or takeoff during a well-defined time period, typically one-half hour.¹ Slots are not a widely held property, and technically they are limited by reservations; nor is their survival as property assured. But they are a real right and a recent creation, so we can investigate them. Our program, organized around the four conditions, is to show that scarcity led government and potential right-holders to create common property, which turned out to be highly inefficient. After considerable internal dispute, government, with little help from potential right-holders, then created what amounts to private property in slots.

Scarcity, First Phase

Prior to the invention of the airplane, no one claimed property in airspace. But in the Air Commerce Act of 1926, the United States claimed its airspace, which became a kind of common asset, for which over the next 50 years, an allocation procedure developed. As traffic increased, Congress passed the Civil Aeronautics Act of 1938 (revised 1940, 1958, and partially negated in 1978), which assigned control of airspace to the Civil Aeronautics Authority, later Board (CAB). The purpose was to promote the industry by regulating routes, airports, prices, oligopolies, and safety. Air traffic took a quantum leap forward in the early 1960s with jet motors; airlines became quite profitable (James 1982, 186, 192); and signs of scarcity appeared: congested airports, especially LaGuardia, Kennedy, O'Hare, Washington National, and Newark. The congestion hurt airline profits (*Aviation Week*, 4 January 1970). In 1968 the industry, encouraged by the CAB, which gave carriers immunity from antitrust laws, established "scheduling committees" to allocate slots in congested airports.

¹For example, between 8:45 and 9:15 A.M., 20 slots might be defined. We discuss only the rights to instrument operations for domestic trunk carriers, excluding visual operations, slots for commuter, business, and recreational aircraft, and slots for foreign trunk carriers, all of which are regulated differently.

The Federal Aviation Authority (FAA), as supervisors of air traffic, subjected (3 December 1968) these airports to a High Density Rule (HDR) that limited the number of landings and takeoffs allowed (i.e., defined the number of slots to be allocated) under instrument flight rules for four airports (LaGuardia, Kennedy, O'Hare, and National). Airports operated under this arrangement from 1969 to 1985, each with a scheduling committee that semiannually adjusted slot allocations. Two "general aviation" groups opposed this settlement: the National Business Aircraft Association and the Aircraft Owners and Pilots Association. Both sued, arguing correctly that the HDR allowed scheduled carriers privileged use of federally funded facilities. But the court dismissed the owners' suit holding that the FAA had exercised its discretion properly.²

This allocation procedure was the first large step toward private property. Previously the United States, the communal owner, controlled usage by "open skies," which meant a queue: first come, first served. The HDR permanently reserved for scheduled carriers (the Hohfeldian right-holders) a right over the slots (the Hohfeldian content) and required other aircraft owners (Hohfeldian duty-bearers) to respect the reservations. Thereby slots became quasi-permanent rights, almost private property.³

The property was incompletely private because the slots were not salable; but the carriers had permanent possession, short of bankruptcy or the FAA's technically necessary seizure. This is analogous to the intermediate stage between feudal tenure and land ownership. Initially, the lord granted fiefs to military subordinates for the period of their service. Gradually the fiefs became heritable, then alienable, so feudal tenure became ownership (Palmer 1985). The scheduling committee system amounted to inheritance, substituting the corporation for the family. Salability, the remaining step, was taken in 1985.

This first response to scarcity satisfied the three rationality conditions. Condition 2: the carriers (potential right-holders) clearly desired to relieve congestion and cooperated to do so. Condition 3: the rule-making FAA and CAB clearly desired to improve their stewardship; so they granted carriers immunity from antitrust and promptly promulgated the HDR. Condition 4: the other users (duty-bearers), while clearly opposed, nevertheless acquiesced, which illustrates both our postulate about governmental resources and the trivial way in which condition 4 is usually satisfied.

Scarcity, Second Phase

The scheduling committees worked smoothly, though probably inefficiently (Grether, Isaac, and Plott 1981a, 1981b), as long as the CAB cartelized the

²*Aviation Week and Space Technology*, 27 January 1969; *Aircraft Owners and Pilots Association vs. Volpe*, U.S. Dist. Ct., D.C., 14 May 1969 civil action no. 927-69.

³Against Braniff's claim that slots were property distributable in bankruptcy, the fifth circuit

industry. But in the 1970s, public and politicians alike lost confidence in regulatory cartels. On a theoretical level, a revived appreciation of competition replaced enthusiasm for a managed economy. On a practical level, intrastate carriers in California and Texas (i.e., outside the national oligopoly) showed that competition generated a mass market at low prices. Consequently, Congress required the CAB to phase out both itself and the cartel.

Within the CAB cartel, airlines could compete only on services, which increased average costs. Furthermore, the CAB provided "fair returns to investment," which generated an upward price spiral. Once the CAB ceased to regulate prices and allocate routes, intense price competition led carriers to adopt the efficient "hub and spoke" system, which concentrated passengers at the hubs (James 1982, 81). Since the high density airports were also hubs, scarcity in slots increased.

This second round of scarcity might have been alleviated by several expedients, but none were attempted.

1. *Additional airports.* New construction required cooperation among carriers, several levels of government, and airport neighbors. Yet carriers had no incentive to increase competition; governments had no incentive to pay the costs; and neighbors had no incentive to accept noise pollution.

2. *More hubs and better schedules.* From 1978 to 1985, the FAA preferred this solution.⁴ Under the principle of "open skies" when carriers wait in queues, the rational response is to shift to less dense airports, just as rational herdsmen shift from overgrazed commons to more remote parts. But "open skies" failed. Why? The efficient cause, in Aristotelian terms, was that, under deregulation, air transport turned into mass transit faster than the industry could expand facilities. The formal cause was that "open skies" entailed the "tragedy of the commons," in which users consume a free resource until it is gone—here gridlock.

3. *Scheduling committees.* While this system worked well for allocations among cartel members, it collapsed when applied to allocations among competitors, including new entrants. This failure led ultimately to privatization.

At each high density airport, the committee consisted of a representative from each using carrier, a chairman from the Air Transport Association, and regulatory observers. These committees semiannually allocated slots by unanimous decision, usually after much compromise and straw votes on entire allocations until they found one on which all could, perhaps reluctantly, agree. In

held (*In re: Braniff Airways*, 1983, 700 F 2d 935) that they merely restricted airline usage. Still, the court approved the FAA's promise to return them to Braniff if it recovered.

⁴Grether, Isaac, and Plott (1981b) report (n. 2, p. IV-8) that Langhorne Bond, FAA administrator (1976-81), favored this solution. Lynn Helms, FAA administrator (1981-84), told us in 1988 that he liked "open skies." So did Harvey Safeer, the FAA official immediately responsible for policy on slots, 1982-85.

the abstract, unanimity seems designed to produce deadlock, and ultimately, it did so. But before deregulation (1978), indeed before the controllers' strike (1981), the committees usually agreed. Why so? As Grether, Isaac, and Plott point out (1981b, IV-7), the equilibrium allocation was determined by the airlines' fear of default (i.e., the failure to agree). (In this context an equilibrium allocation is an allocation such that, for each carrier, it is at least as good as default, and perhaps better, and there is no other allocation that is preferred by all.) Since the FAA never announced a default rule, the carriers could only speculate among grandfathering (existing allocations), "open skies" (queues), FAA assignment, lotteries, auctions, and markets. Except for grandfathering, carriers were fearful of all possibilities. "Open skies" and lotteries would take away their slots. Auctions would make them pay for what was now free. FAA assignment would be much influenced by Congress and hence unpredictable. Since grandfathering seemed unlikely, the carriers wanted the best agreeable allocation, which is the Grether, Isaac, and Plott equilibrium (1981a).

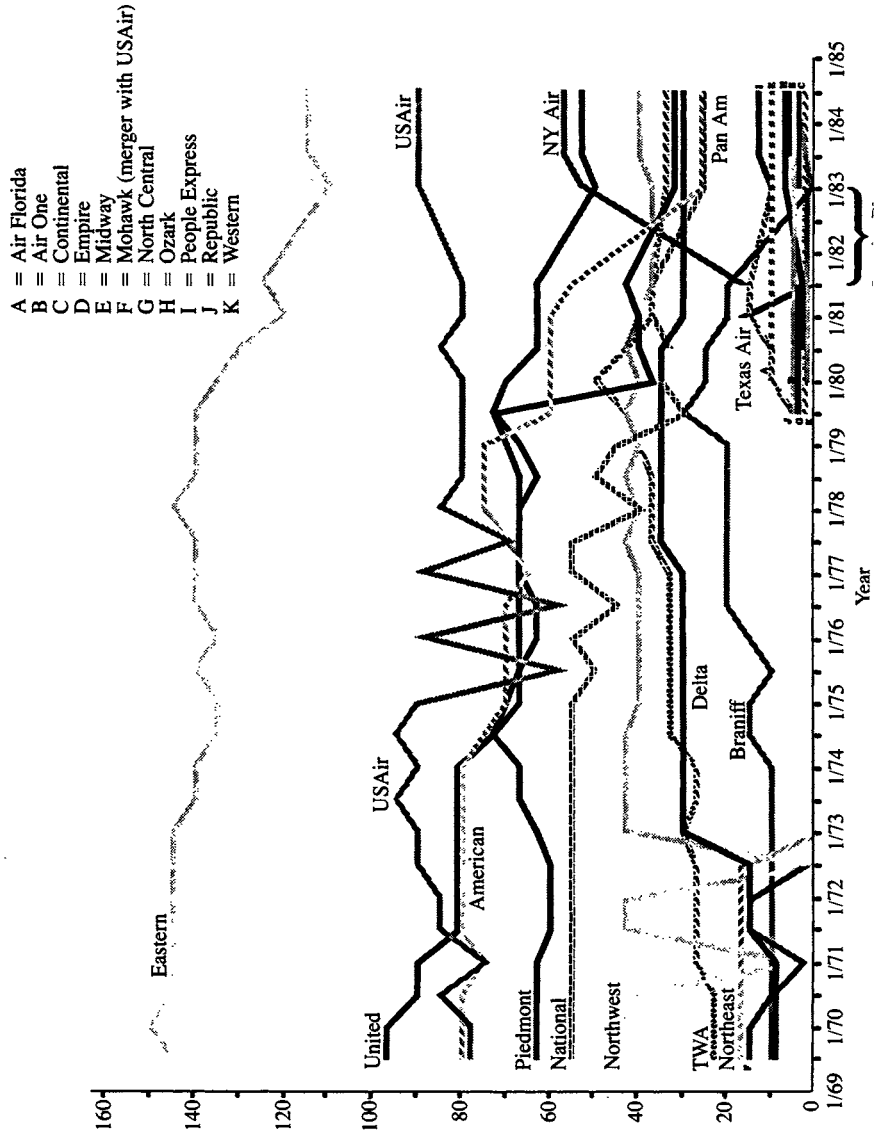
Unfortunately for the committee system, this equilibrium gradually approached the worst, until default itself was the best allocation. New entrants claimed slots that old carriers had to give up. Small carriers claimed slots from large ones, but failed to get enough to become efficient. While initially committee meetings had been friendly and fast, by 1979 they displayed deadlock, acrimony, and frustration (Grether, Isaac, and Plott 1981b).

Figure 1 depicts the allocation of slots for Washington National, 1969-85. (Charles Plott gathered these data, and we thank him for them.) In 1969 there were 11 carriers, leaving nine when Northeast and Mohawk disappeared in mergers. By 1985 deregulation produced 17 carriers. Ignoring seasonal variations and the constant allocations after the 1983 deadlock, Figure 1 strikingly depicts large carriers' loss and small carriers' gain. Eastern went from 147 to 107; United from 96 to 34; American from 82 to 30. Among the large carriers, only USAir, Piedmont, and Northwest kept their positions. Delta and TWA, neither large at National, also held constant. After deregulation, 10 small airlines appeared, but only New York Air became large. In general, after 1978, the large carriers either lost or held constant, while entrants, except for New York Air, did not get enough slots to compete seriously. So the best outcome for both large and small became default.

4. *Peak load pricing or a market.* However economically desirable, these alternatives were politically infeasible. Peak load pricing, based on airport control of slots, had many enemies: carriers and travelers feared monopoly prices; general aircraft owners feared exclusion; the FAA feared losing control of airspace. No wonder that only economists recommended peak load pricing (Levine 1969; Hahn and Kroszner 1988). As for a market, based on carrier ownership, carriers disliked the loss of current rents, and the FAA disliked losing control.

Thus, in the second phase of scarcity, there was no acceptable solution. So

Figure 1. Slot Allocation by Carrier in Washington National



here at least, Demsetz's conditions (i.e., scarcity and externalities) were perhaps necessary but certainly not sufficient. Extreme scarcity existed, but property did not emerge. But when officials took the lead in granting rights, private property did emerge, which suggests that political conditions are also necessary, and, together with scarcity, are sufficient.

The Grantor: Staking out Ideological Positions

While one might expect the carriers to seek property in slots, it seems to us that, in the 1979–85 phase of scarcity, the government initiated ownership. The carriers, who could use but not transfer slots, presumably calculated their expected gain from privatization (i.e., the prospective market value less the loss of the current rent) and found it was negative. So they refused to petition for ownership. When the grantor promised grandfathering, the calculation changed to positive for most carriers, who then petitioned.

The Grether, Isaac, and Plott report (1981b) initially frightened the carriers from seeking ownership. This study, though commissioned by the CAB, was simply a scholarly analysis, not official policy. The carriers feared, however, that its proposal of auctions would sharply increase costs. (During the six-week buy/sell experiment, prices of some slots reached \$1,000,000, Bailey 1986, 295.) With about 4,500 slots at the four airports, carriers could reasonably visualize costs of at least \$1 billion in an industry with about \$9 billion capitalization (James 1982; Brenner, Leet, and Schutt 1985, chap. 5). Consequently, most people in the industry pejoratively characterized the study as academic (Bailey 1986).

So, as the committee system deadlocked, the government rather than the carriers took the initiative. The Department of Transportation (DOT) asked for alternative procedures (45 FR 17236, 10/27/80). Soon thereafter, President Reagan required (Executive Order 12291) that administrative rules be based on cost-benefit analyses and assigned the enforcement to the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and the Budget (OMB). OIRA Administrator Christopher DeMuth and his assistant Wayne Liess firmly believed in privatizing slots.

Before serious discussion, however, the controllers' strike (August 1981) intensified scarcity. While training replacements for the discharged strikers, the FAA sharply reduced operations pro rata. The FAA then adopted a bimonthly lottery of slots that became available as newly trained controllers came on duty. This mechanism was not satisfactory. New entrants and small carriers failed to win enough slots for successful operation; large existing carriers used all their slots, sometimes even unprofitably, because they feared that they would forfeit unused slots under the "use-or-lose" rule (Bailey 1986, 299; OMB internal memo 08/17/84).

OIRA staff believed that this mechanism violated Executive Order 12291; so they tried to revise it. DeMuth reports their hardest job was internal: David Stockman, chief of OMB, wanted an auction, for income; but DeMuth persuaded him that, ultimately, a prosperous industry would generate more revenue than auctions. Transportation Secretary Drew Lewis, sympathizing both with OIRA goals and with his FAA subordinates, compromised on a “buy/sell experiment” for six weeks, beginning 10 May 1982. This experiment succeeded because, according to CAB member Elizabeth Bailey (1986), the trades “made sense.” Still the FAA wanted to retain its politically valuable activity of allocating slots, so it suspended the experiment (47 FR 114, 06/14/82 and 6/24/82, 25508–10) until 1986. It still permitted barter, which provided some market efficiency, but entrants and small airlines had little to trade.

So matters stood until spring 1983, when the FAA had trained enough controllers. It then reactivated the committees, “letting,” as Administrator Helms wrote, “the industry participants solve their own problems” (Internal memo, DOT, 05/25/83).

Carriers: The Reluctant Right-Holders and Condition 2

Despite Helms’s suggestion, the industry did not solve its problems, and from 1983 there was deadlock. When the scheduling committee at National defaulted, the FAA allocated the status quo (1983), which signaled that default was costless. While this pleased the large carriers, they were unwilling as a group to seek rights. Nevertheless, they were individually eager to obtain competitive advantage: by trading slots in many ways and by administrative allocation which, as USAir complained, violated the FAA’s own rules (Hearing 99-33, 1985, 310–33). The carriers made no agreement to solve their problems, until brought together by government, because they did not agree on what they wanted. Our condition 2 provides that potential owners petition to privatize only if their expected gain from the asset exceeds the loss of present rent. So the eager lobbyists were committee losers in Figure 1 (like American) or aggressive rent seekers (like NY Air). But committee gainers in rents (like USAir) supported the status quo. Consequently, the carriers did not act jointly. While group lobbying was unlikely because of divisions on the value of the status quo, for most carriers the cost of lobbying on their own probably exceeded immediate benefits.

So deadlock continued, until DeMuth of OIRA mobilized the carriers on an occasion provided by Charles Plott, a professor of economics and the New York Air representative on a committee established to discover mechanisms to break deadlocks. Though he had previously recommended auctions, Plott perceived that carriers, fearing them, would support buy/sell only with grandfathering. So he wrote to DeMuth, pointing out that the industry perceived OMB as favoring periodic auctions for revenue, while the industry itself was strongly opposed to

them. He asked DeMuth's opinion of a market wherein carriers would keep their current slots, which would be salable (Plott to DeMuth, 14 April 1983). DeMuth responded (26 May 1983):

. . . Periodic auctions were first proposed by the Department of Transportation . . . on October 21, 1980. This proposal, . . . under a previous administration, . . . does not reflect this Administration's position. Our dominant interest is efficient allocation of slots, not merely raising revenues. . . .

We are intrigued by your proposal, which has several evident advantages. . . . first, it uses private markets to ensure that the limited existing slots are used most efficiently, eliminating the transaction costs and uncertainty of the scheduling committees as well as the possibility of administrative allocation by the FAA. Second, it would use the price system to allocate any new slots to their highest-valued uses. Third, the grandfathering of current slots, while perhaps continuing short-term inefficiencies, could provide a smooth transition from scheduling committee allocation to market allocation, minimizing the dislocations inherent in an initiating lottery or auction. . . .

This letter was widely publicized and appreciated in the industry, so most carriers came to favor a market. Condition 2 was thus satisfied, but not because the carriers initially sought rights, although one carrier did employ Plott. Rather, some officials wanted the presumed efficiencies and changed the payoff structure to satisfy condition 2.

The Grantor: FAA versus OMB

To realize potential rights, by condition 3 government must declare them. In our story so far, however, the administration has been divided. Although officials benefit from declaring rights, the calculation is confused when the manager of the common resource (FAA) and the advocate of privatization (OMB) are different persons. The managers lose jobs and gain nothing, while the advocates lose nothing and gain credit. So to satisfy condition 3, OMB somehow had to disarm FAA, as analyzed in this internal OMB memorandum (5 August 1983):

The [scheduling] committee [of National] collapsed, throwing the allocation to DOT. . . . This memo provides background. . . .

Nearly all airlines serving National support buy/sell, but there are divisions over the initial allocation mechanism. . . . There is strong support for grandfathering and a slot market in DOT; however, the FAA unconditionally opposes. . . . The Secretary has not spoken yet on buy/sell, but she appears to be leaning against it.

Strategy: . . . Our strategy is simple: [to] get a slot market proposal NPRM [Notice of Proposed Rule-Making] out for comment. The airlines who support it should help carry it from there.

Dr. Charles Plott . . . helped us dispel the airlines' belief that OMB's . . . interest is balancing the budget. . . . [He] circulated our response to the airlines. As a result, their knee jerk rejection of slot markets has been replaced with conditional support. . . .

Secretary Dole. . . . The Scheduling Committee failure may . . . force her to issue an NPRM for slot allocation to which . . . buy/sell [could be attached].

DOT (Policy Office and General Counsel) must draft the NPRM and Final rule . . . and try

to win over the Secretary. No NPRM will be forthcoming without the Secretary overruling Helms. [The Policy Office] at DOT must coordinate this effort. They must also pull and cajole the airlines. . . .

The NPRM should elicit support . . . and divide opposition. . . .

OMB must . . . prevent Helms or the airlines from end-running us to the White House. . . .

Inside DOT Secretary Dole, for whom slots were only a minor issue, was cross-pressured. People in the Office of Policy liked buy/sell, while FAA officials opposed it strongly.

Externally, the cross-pressure was even worse: general aviation lobbyists were powerful antagonists because their clients, often politically active, lived in nearly every congressional district and feared that a market would limit their runway access, which the FAA had usually protected. Furthermore, Secretary Dole's husband was senator from Kansas, where Beech and Cessna, two main producers for general aviation, are located. On the other hand, given Executive Order 12291, the secretary could not resolve congestion without the OMB, which insisted on markets.

Thus, cross-pressured, DOT temporized. Nearly a year after deadlocked carriers petitioned for a market (Jenkins, Gomez-Ibanez, and Meyer 1987, 3), the DOT published Notices (84-6, 84-7) of Proposed Rule-Making (49 FR 23788 and 23806, 06/07/84). In response, most carriers, including commuter lines, supported buy/sell (Dockets 24105, 24110). Among large carriers only USAir and Delta opposed.

The main ideological objection concerned grandfathering without auctions, presumably a windfall profit. The practical rejoinder was that auctions would disrupt the system until the carriers could match slots with schedules. The rejoinder in economic theory was that the windfall occurred in 1969, when the slots became carriers' economic capital, through not accounting capital. The 1985 proposal would merely liquefy some illiquid capital (Hearing 99-59, p. 267).

Summarizing the NPRMs for Secretary Dole, Matthew V. Scocozza, assistant secretary for Policy and International Affairs, wrote (20 December 1984): "The options that merit the most serious consideration are (a) the enhanced dead-lock breaking mechanism . . . and (b) the buy/sell. FAA favors the [first] while the Policy Office . . . [the second]." He specifically rejected auctions because of industry opposition and because they would require major legislation.

Thus passed 1984. In 1985 the secretary asked her general counsel, Sam Podberesky, "to convince OMB that the FAA's position was the right position" (Jenkins, Gomez-Ibanez, and Meyer 1987, 10). Of course, this effort was doomed to failure. Congressmen became impatient. The secretary could temporize no more. In February, Representative Shultze (R-PA) introduced HR 984 providing for an aftermarket. In September, Representative Mineta (D-CA), after Hearing 99-33, 1985, urged the secretary to decide. She did, and a buy/sell rule was issued.

The Buy/Sell Rule

The rule (50 FR 52180–52201, 12/20/85) provided at the high density airports for:

1. Allocation of slots to carriers and commuters holding them 12/16/85, the FAA to record the holdings, and sales to begin 04/01/86.
2. Return to the FAA of slots not used 65% of any two-month period (“use-or-lose”), carriers to report on usage.
3. Lottery for new and returned slots, in separate pools for carriers, commuters, and others.
4. Assignment, by lottery, of priority numbers to all slots for recall, if necessary, by the FAA to satisfy needs of Essential Air Service (mainly to small communities), international operations at Kennedy, and operations.

The rule also provided: “Slots do not represent a property right but represent an operating privilege subject to absolute FAA control. Slots may be withdrawn at any time to fulfill the Department’s operational needs” (Sec. 93.223). This provision permits, so we are told, the FAA to recall slots without activating the takings clause of the Fifth Amendment. It does not alter the fact that slot owners have excludable, alienable, universal property rights, though with reservations not theoretically different from zoning restrictions on land. In addition, owners can buy protection from recall by exchanging a low priority slot for a high one. We have evidence of trades that apparently were intended to achieve this goal.

The Duty-Bearers’ Response

Condition 4 for the emergence of rights is that duty-bearers respect them. Here the duty-bearers are citizens generally, carriers (including nonholders), and general aviation. It is easy to overlook duty-bearers, yet their acquiescence is necessary, especially those in general aviation. One of the forces that killed “open skies” was the resistance of duty-bearers, namely, airport neighbors who feared noise and accidents. When (by NPRM 83-2, 48 FR 13434, 03/31/83) the FAA proposed “open skies,” O’Hare neighbors sued to stop it. They lost (FAA Docket 22471), but their intervention discouraged the FAA.

Following the buy/sell rule, duty-bearers again objected. S.1966, rescinding the rule, was reported in the Senate (13 March 1986, Specter 1986a, 1986b); on 9 April it was attached, by 82-12, to S.1017, transferring National and Dulles from DOT ownership to a regional authority; and on 11 April S. 1017 passed, by 62–28. The House Subcommittee on Aviation, however, ignored S.1017 and inserted the airport transfer into an appropriations bill (Hearing 99-59, 1986) because, committee staffers tell us, members simply could not devise an alter-

native to buy/sell. Rumblings continued, led by Senator Kassenbaum, who like Secretary Dole's husband, represented Kansas (Hearing 99-746, 1986; 99-299, 1986). But the dispute now seems quiet, especially as airport ownership and landing fees have become an issue; so we believe property in slots will survive at the four airports.

Discussion

In this event all four of our conditions are satisfied. Furthermore, we confirmed some nonobvious inferences from these conditions. Thus, one of our main claims was that grantors must desire the right, implying that when grantors are bureaucratically divided, with some gaining and others losing, grantors dispute and delay the grant, as here the FAA and OMB disputed. Another example is our claim that potential right-holders must perceive an advantage, implying that those who perceive it lobby for the right and those who do not perceive it either do nothing or oppose, as here committee losers lobbied for and committee gainers against. So the detail of this event supports detailed inferences from the theory. We recognize, of course, that one event is limited evidence, and we look forward to similar tests in the future.

By way of conclusion, we compare our work with existing studies of the origin of rights. As against Demsetz, our most surprising and perhaps counter-intuitive observation is the pervasive role of government officials in creating rights. Most prospective right-holders waited passively for officials to thrust rights on them. This role for government surprised us until we reflected on the ways of politics. The generic method for politicians to obtain support is to give supporters valuable things, such as money, rents, and rights. Here the dominance of government is clear because the configuration of rights granted satisfied the grantor's interest (i.e., the OMB's interest after it defeated the FAA) rather more than that of the holders, most of whom were content to keep their rents and to avoid FAA's possibly arbitrary allocation. Furthermore, the creation of rights over slots necessarily partially deprived general aviation, without compensation, of customary privileges, which emphasizes that full government guarantees rather than merely customary trade practices are necessary for enforcement. Politicians have a special motive to create property rights. Unlike money transfers (subsidies, entitlements) and the deadweight losses of pork barrel and regulatory cartels, property rights increase efficiency by encouraging owners to use assets most productively. Efficiency makes for prosperity, which rebounds to politicians' credit. Hence, we expect ambitious and clever politicians to give bureaucrats career incentives to create rights. President Reagan did this with OIRA, and the new rulers of formerly Marxist lands are now creating property rights on a grand scale.

Neoclassical economic theory obscures the role of politics, appropriately so in a theory intended exclusively to explain economics. Nevertheless, politics do

matter, and so we corrected Demsetz's reliance on an unseen hand.⁵ As against the Lockean theory, the surprising and counterintuitive feature of our observations is the primacy of scarcity. Scarcity preceded possession. Carriers "mixed their labor" with slots, from the moment air travel began. They acquired rights, however, not because they had invested, but rather because of the political response to scarcity, the high density rule. So in our account, as in Demsetz's, scarcity, not investment, sets the scene for property rights. Locke's description is, in fact, exactly backward. He argued that possessors create government to protect their assets. Conversely, our theory, supported by our evidence, as well as, for example, evidence from the history of English land law (North 1981), holds that governments create rights to solve problems of scarcity. Locke, like many classical and neoclassical economists, believed that men in the agora force men on the acropolis to protect traders' interests. Conversely, we believe that men on the acropolis offer protection to men in the agora in return for support.

Thus, Demsetz ignored conditions 3 and 4, and Locke ignored conditions 1 and 3. Adequate description, however, requires all four, and omission of any one distorts the theory. While we have limited ourselves to a positive theory of the origin of property rights, we recognize that our description may put limits on possible justifications. Consequently, we hope that further investigation of comprehensive descriptions may improve moral reasoning. But positive investigation of the origin of property rights should continue, independently of moral considerations, for the sake of studying the operation of rights institutions. For example, such studies should help us to understand why governments sometimes abolish particular rights and place reservations on others. But most of all, positive investigation should improve our understanding of the role of government in the maintenance of the rights institutions on which our economic and social system depends.

Manuscript submitted 16 February 1990

Final manuscript received 20 December 1990

REFERENCES

- Alchian, Armen A., and Harold Demsetz. 1973. "The Property Rights Paradigms." *Journal of Economic History* 33:16-27.
- Bailey, E. Elizabeth. 1986. "Economic Models and Policy Reality: Lessons from Airport Access." In *Price Competition and Equilibrium*, ed. Maurice Peston and Richard E. Quant. Oxford: Philip Allan.

⁵In Demsetz's running illustration, property in land among Quebec Indians, rights emerge by common consent to conserve beaver. But Demsetz's sources flatly contradict the unseen hand theory. The Hudson Bay Company and later the government of Canada pressured for conservation by individual land occupancy (Leacock 1951). The Indians did not have private property, merely private occupancy, because their land was not salable (Witt 1987).

- Blackstone, Sir William. 1765. *Commentaries on the Laws of England*.
- Brenner, Melvin A., James O. Leet, and Elihu Schutt. 1985. *Airline Deregulation*. Westport, CT: ENO Foundation.
- Buchanan, James, and Gordon Tullock. 1962. *The Calculus of Consent*. Ann Arbor: University of Michigan Press.
- Demsetz, Harold. 1964. "The Exchange and Enforcement of Property Rights." *Journal of Law and Economics* 7:11–26.
- . 1967. "Toward a Theory of Property Rights." *American Economic Review* 57:347–59.
- . 1982. *Economic, Legal, and Political Dimensions of Competition*. Amsterdam: North Holland.
- Denman, Donald R. 1958. *Origin of Ownership*. London: Ruskin House.
- Eggertsson, Thrainn. 1990. *Economic Behavior and Institutions*. Cambridge: Cambridge University Press.
- Grether, David M., R. Mark Isaac, and Charles R. Plott. 1981a. "The Allocation of Landing Rights among Competitors." *American Economic Association Papers and Proceedings* 71.2: 166–71.
- . 1981b. *Alternative Methods of Allocating Airport Slots: Performance and Evaluation*. Pasadena: Polinomics Research Laboratories; reissued as *The Allocation of Scarce Resources: Experimental Economics and the Problems of Allocating Airport Slots*. Boulder, CO: Westview, 1989.
- Hahn, Robert W., and Randall S. Kroszner. 1988. "The Mismanagement of Air Transport: A Supply-Side Perspective." Working Paper, Council of Economic Advisors.
- Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science* 162:1243–48.
- Hohfeld, Wesley Newcomb. 1919. *Fundamental Legal Conceptions*. New Haven: Yale University Press.
- James, William George, ed. 1982. *Airline Economics*. Lexington, MA: Lexington Books.
- Jenkins, Vlad, A. Gomez-Ibanez, and John Meyer. 1987. "The Department of Transportation and Airport Landing Slots." Case Study N. C16-87-7810.0 of the Case Program of the Kennedy School of Government, Harvard University.
- Leacock, Eleanor. 1954. *The Montagnis "Hunting Territory" and the Fur Trade*. AAA Memoir 78. Washington, DC: American Anthropological Association.
- Levine, Michael. 1969. "Landing Fees and the Airport Congestion Problem." *Journal of Law and Economics* 12:79–108.
- Lipecap, Gary D. 1989. *Contracting for Property Rights*. Cambridge: Cambridge University Press.
- North, Douglass C. 1981. *Structure and Change in Economic History*. New York: Norton.
- Palmer, Robert C. 1985. "The Origin of Property in England." *Law and History Review* 3:1–50.
- Rawls, John. 1971. *A Theory of Justice*. Cambridge: Harvard University Press.
- Riker, William H. 1988. "The Place of Political Science in Public Choice." *Public Choice* 57:247–57.
- . 1990. "Civil Rights and Property Rights." In *Liberty, Property, and the Future of Constitutional Development*, ed. Ellen Paul and Howard Dickman. Albany: State University of New York Press.
- Roper, William. 1935 (1626). *Lyfe of Sir Thomas More*, ed. Elsie V. Hitchcock. London: Oxford University Press.
- Simpson, A. W. B. 1986. *A History of the Land Law*. 2d ed. Oxford: Oxford University Press.
- Specter, Michael. 1986a. "Rule Allowing Sale of Landing Slots of Airports Attacked." *Washington Post*, 31 March, 883, col. 1.
- . 1986b. "Soft Landing." *New Republic*, April 1986, 10–11.
- Sumner, L. W. 1987. *The Moral Foundation of Rights*. Oxford: Oxford University Press.
- Umbeck, John R. 1981. *A Theory of Property Rights with Applications to the California Gold Rush*. Ames: Iowa State University Press.

Witt, Ulrich. 1987. "The Demsetz Hypothesis on the Emergence of Property Rights Reconsidered." In *Efficiency, Institutions, and Economic Policy*, ed. Richard Pethig and Ulrich Schlieper. Heidelberg: Springer-Verlag.

Government Documents:

- Hearings 98-63. 1983. "Report of the Airport Access Task Force." Before the Sub-Committee of Investigation and Oversight/Committee on Public Works and Transportation, House of Representatives. 17 May.
- Hearings 99-33. 1985. "Government Policies on the Transfer of Operating Rights. . . ." Before the Sub-Committee on Aviation/Committee on Public Works and Transportation, House of Representatives. 10, 19 September; 22 October.
- Hearings 99-746. 1986. "Buying and Selling Airport Operating Rights." Before the Sub-Committee on Aviation/Committee on Commerce, Science, and Transportation, U.S. Senate. 6 February.
- Hearings 99-59. 1986. "Allocation of Slots at High Density Airports." Before the Sub-Committee on Aviation/Committee on Public Works and Transportation, House of Representatives. Second Session. 12 June.
- Report 99-299. 1986. "Operating Rights at Congested Domestic Airports." Submitted by Senator Danforth, Committee on Commerce, Science, and Transportation, U.S. Senate. 14 May.