

Entrepreneurship All the Way Down: A Theory of Property Rights

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1. Introduction

Which came first: the market, or the property right? Demsetz (1967) argues compellingly that markets themselves generate property rights. This occurs when transaction costs – the costs of establishing and enforcing property rights (Allen 1991) – fall below expected gains from privatization. Mises (1920) argues that profit and loss accounting is only possible against a backdrop of private property rights. If true, however, this implies that Demsetz’s privatizers have no quantitative knowledge to motivate their decision to define and enforce property rights. In other words, Demsetz and Mises give us a chicken-egg problem: Demsetz maintains that economic calculation generates property rights, but Mises claims that property rights are a requisite for economic calculation.

We believe that both are essentially correct, and reconcile the apparent contradiction by contextualizing each economist’s respective claim. We reach a synthesis in which we sketch a theory of the institutional origination of property. Our argument contributes to two literatures. First, we contribute to literature discussing the emergence of property rights (e.g., Demsetz 1964, 1967; Alchian and Demsetz 1972; Anderson and Hill 1975; Umbeck 1977; Barzel 1997; Eerkens 2004; High 2009; Hornbeck 2010) by offering a general theory of their origin. Second, we contribute to scholarship on entrepreneurship (e.g., Schumpeter [1911] 1934; Ronen [ed.] 1983; Kirzner 1985; Boettke and Coyne 2009; Piano and Rouanet 2018). Our theory identifies ways in which entrepreneurs rely on qualitative feedback to make decisions in the absence of accounting feedback.

In Section 2, we discuss the tension between Mises’ impossibility theorem and Demsetz’s theory of property rights. In Section 3, we draw on Piano and Rouanet (2018) and High (2009) to articulate a theoretical solution. We argue that economic calculation is necessary for economizing

in an advanced industrial society, but economizing without calculation is possible in certain primitive contexts. Thus, a kind of non-calculative economization can be used to establish property rights, and thus markets. These in turn allow calculation, facilitating advanced industrial society and the further privatization of common-pool resources. Section 4 fills in some of the gaps in High (2009) and identifies a range of conditions under which a non-calculating entrepreneur might economize to generate private property rights. Section 5 points in some directions for further research.

Throughout, we rely on Barzel's (1997) definition of *economic* property rights, as distinct from legal property rights: a person has an economic property right if and only if he has de facto control over a resource. Since, obviously, everyone maintains some level of de facto control over his immediate physical space, the kind of rights we are interested consist in the extension of that control to commonly owned or unowned spaces, and the general recognition of others that the once-unowned space has become someone's property. That is, we are interested in how society moves from a pattern of communal ownership to one characterized by sophisticated defense/enforcement mechanisms that extend the individual's claim to control over and against the claims of others. We conclude with the observation that, since property rights are contingent upon entrepreneurial activity, markets both generate and are generated by entrepreneurs. Economies, in other words, are entrepreneurship all the way down.

2. Mises and Demsetz

2.1—The impossibility of rational calculation under socialism

In 1920, Ludwig von Mises published his now-famous critique of socialism, arguing that rational economic calculation under socialism is impossible, by which he meant that no extensive division of labor economy was possible under central ownership of the means of production.

Surprisingly simple in retrospect, Mises' argument has generated a century of debate. As summarized by Boettke (1998), Mises' initial argument consisted of three parts:

“Without private property in the means of production, there will be no market in the means of production; without a market for a means of production, there will be no monetary prices established for the means of production; without monetary prices, reflecting the relative scarcity of capital goods, economic decision makers will be unable to rationally calculate the alternative uses of capital goods” (p. 134).

As a result, central planners will be incapable of identifying, among the array of technologically feasible projects, those which are economically viable.

The socialist producer will never know what the relative values of his inputs will be. In this respect, the socialist central planner – one thinks of scribbling mathematicians in Soviet bureaus – is in a rather pitiable situation. He may know what his consumers want, and he must combine inputs in various ways to create and distribute that output. But he has no analytical tool that can help him organize inputs in an efficient way. Should he produce with steel, aluminum, or plastic? Should he use a large number of laborers in place of capital in one industry, and vice versa in another, or should they have roughly equivalent amounts of labor and capital? On what land should he build the factory? In a market, prices communicate all this information: build the factory on the least expensive land, use labor and capital in profit maximizing proportions, produce with the lowest cost inputs that are equally serviceable for output. But *there are no* least-expensive-lands, profits, or lowest-cost-inputs without money prices.

Capital prices only “aid... crucial producer evaluations” when they arise from “the rivalrous competition over alternative uses of production goods” (Lavoie [1985] 2015). Thus, “Just because no producer good will ever become the object of exchange, it will be impossible to determine its monetary value” (Mises 1920, 4). As a result, the socialist planner has no rational means of allocating resources, and his decisions are arbitrary at best.

It is important to note that Mises explicitly makes clear that calculation is essential for economizing in an advanced, industrial economy. It is unnecessary for economizing in a primitive, barter-based economy. This will be important for our argument, which will elaborate on the mechanisms by which non-market economizing occurs.

2.2—The theory of property rights

Demsetz foreshadows his 1967 contribution with remarks in an earlier paper. He writes that in “zero-priced parking at shopping plazas... unpaid- for benefits exist insofar as shoppers, in the prices they pay, confer benefits on nonshopping parkers” (1964, 14). Nonetheless, Demsetz reasons that we have no reason to think that the situation is inefficient. The efficiency of first producing and then enforcing parking-spot-rights, and restricting use to mall shoppers with sufficiently high budgets, varies from case to case. In many instances, “[w]e may end up by allocating more resources to the provision and control of parking than had we allowed free parking because of the resources needed to conduct transactions” (14). So not all externalities are by their nature inefficient, because it is costly to produce and enforce property rights. Relying on the price mechanism to allocate some resources is inefficient. Of course, Coase (1937) used the same argument to explain the existence of business firms.

It is a short step from recognizing that property rights are costly to recognizing that they are produced, and, if produced, then subject to efficiency evaluation in terms of costs and benefits. This is exactly the point Demsetz (1967) makes. Early records of French trappers indicate that the Montaigne Indians, who traded beaver furs to the French, did not privately own the animals, nor was the land on which the Montaigne hunted privatized. A tragedy of the commons persisted, in the sense that there were no prices to communicate the scarcity of beavers and no incentive to reduce beaver consumption in order to maintain long-run capital accumulation. Journal records

quickly changed tune – later trappers record that beavers and land *were* privatized by the Montaigne. Demsetz argues that, since the value of furs increased (due to exposure to the demand in European hat markets), “the scale of hunting activity rose sharply” (352), and both these facts taken together “increased considerably the importance of externalities associated with free hunting” (352). That is, the gains from privatizing – removing the externality – were sufficiently increased that transaction costs fell below gains, and so private property rights were established. Demsetz sees this as an instance of a general theory: “property rights arise when it becomes economic for those affected by externalities to internalize benefits and costs” (354).

Presently, Demsetz’s theory is widely accepted in a variety of forms. Pejovich (1972) endorses and attempts to generalize Demsetz’s argument. Hornbeck (2010) argues that land privatization in the American West was facilitated by the technological innovation of barbed wire – which developed precisely because the costs of cattle encroachment on farm land rose higher than the costs of investing in barbed-wire fences. Anderson and Hill (1975) find that all kinds of property rights on the American frontier – land, water, livestock – were defined and enforced as a result of this Demsetzian cost/benefit analysis. Umbeck (1977) applies a similar argument to explain the proliferation of mining claims in the absence of state government during the California Gold Rush.¹

2.3—The central tension

Demsetz and his followers maintain that property rights become defined and enforced after a cost/benefit analysis indicates the efficiency of internalizing some externality. But Mises argues that a cost/benefit analysis cannot be conducted in money terms without the prior existence of

¹ Umbeck believes that Demsetz fails to account for the increasing costs of privatization that follow from the improved value of the resource. This might be so, but it is not relevant to Demsetz’s conclusion, nor to our argument here. On both Demsetz’s and Umbeck’s models, property rights are defined and enforced when the benefit exceeds the cost, i.e., as the result of economic calculation.

property rights. This argument is consistent with Demsetz's case study: the Montaigne privatized after engaging with the European beaver-fur *prices*. So Demsetz's theory, while true, cannot be a general theory. Put another way, his theory accounts for the origination of some property rights but not for the "institutional origination" – the "emergence of... [the] institution *per se*" (Beaulier and Prytchitko 2006, 50).

For his part, Mises initially took the stance that property rights have always existed. Beaulier and Prytchitko argue that that Mises thought "de facto private property rights over consumer goods must exist in order for human action (the selecting of scarce means to attain sought-after ends) to occur" (55). But later, Mises himself offered an account similar to, and in fact anticipating, Demsetz's: when "people began to consider such predatory methods wasteful" – the "predatory methods" being resource extractions that produce long run externalities (Mises cites erosion) – they likewise begin to "consolidate the institution of private property in land" (Mises 1996 [1949], 656). Thus, "[a]lthough his is a story of the "emergence" of private property rights, the emergence he addresses is one of *institutional diffusion* rather than institutional origination" (Beaulier and Prytchitko 2006, 55).

So neither Mises nor Demsetz offer a general theory of property rights. Moreover, they both tell an economization story to explain the proliferation of property rights, but Mises also successfully argues that calculation depends on the prior existence of private property. No explanation of institutional origination has been offered, and no calculative explanation may justly purport to be an explanation of origins. Below, we offer a non-calculative economization story to explain the origination of property rights.

2.4—Criticisms of Demsetz

While Mises' Impossibility Theorem seems vindicated by history, Demsetz's theory still faces some controversy. In what follows, we will take the opportunity to show how our general theory accounts for some of the explanatory gaps in Demsetz (1967).

The Demsetz hypothesis has been criticized as a "black box explanation" (Foss and Foss 2002). Demsetz offers no "process by which the movement from here (scarcity of a resource) to there (the establishment of property rights) takes place" (Beaulier and Prytchitko 2006). This is perhaps unsurprising, as the typical movers and shakers of equilibrium points in economic analysis are entrepreneurs, whose analytical function Demsetz (1983) famously denied.

Additionally, as Banner (2002) writes, "The difficulty with this account...is that it fails to specify the mechanism by which the transition actually occurs" (S360). This is functionally an extension of the "black box" criticism, but one that asks two pressing questions: 1) how are collective action problems overcome? and 2) why are property regime transitions always or generally efficient? This last question is especially important in light of the fact that "[e]vidence from studies by anthropologists and others undermines the idea that common property is always inefficient" (Acheson 2015, 41).

Our theory will provide a space for an entrepreneurial privatizer. Analysis of the means by which this entrepreneur conducts allocative decisions will enable us to comment on these questions.

3. A new theory of property

3.1—Entrepreneurship and institutions

The role of the entrepreneur and his relationship to institutions is a fraught matter in economics. We wish fervently to not here entrench ourselves in this debate, but we would be remiss to ignore it altogether. It seems clear that Demsetz's explanation of the development of property

rights relies on some actor(s) to perceive the shifts in the value of a resource and the costs of its privatization. Demsetz admits to this but argues that there is no unique entrepreneurial function; that is, economizing is what all people at all times and all places do, so no action is non-entrepreneurial.

This may be so, but it does not extricate his story from the “black box” criticism. The question is: what would *cause* someone to become aware of the shift in gains from privatization? Kirzner’s (1979) concept of *alertness* is useful here. Garrison (1995) argues that there must be, at the bottom of all economic activity, some non-priced good. That is, if everything is supply and demand all the way down, then economists confront an infinite regress of prices that have no starting point, which is logically troubling, to say the least. There must be some “given” substrate that operates unsubjected to prices. Garrison thinks Kirznerian alertness fits the bill, and we follow him on this point.

Garrison notes Shmanske’s (1994) contribution to the discussion which seemingly moots Kirzner’s analysis: alertness *does* have a price. It can be invested in, bought, and sold. Garrison’s solution is to distinguish the *development* of alertness from the *exercise* thereof. To invest in the human capital necessary to become entrepreneurially alert is a costly activity for which prices exist. But the exercise of that alertness, once developed in any capacity, is costless.

It seems, however, unlikely that Kirzner gives us a complete picture of entrepreneurship. Schumpeter’s (1945) creative destruction also has a role to play: entrepreneurs cannot merely be moving us toward equilibrium along given supply and demand curves, but also generate altogether new equilibrium conditions. While we certainly do not wish to be painted as accepting the whole of Schumpeter’s analysis, a discussion thereof is far beyond the scope of what we intend to accomplish here. We thus follow High (2009) in affirming that entrepreneurship is characterized

by some combination of mere alertness and creative destruction, and wish to emphasize (following Mises [1945]) that it is forward-looking. It contains an essentially non-priced component. This latter feature is essential for reconciling the Mises-Demsetz tension.

3.2—Levels of calculation

In markets, producers must make decisions on two levels. They face first what we might call the obvious problem: they must decide how much output to produce, what inputs to use, and what prices to sell at. But they must also decide whether to produce their own inputs or to purchase them from someone else, and whether to hire full-time employees or contract laborers for particular jobs. While the market prices generated by negotiating for inputs and contractors allow for calculation, and thus the efficient coordination of resources according to their relative scarcity, it is costly to use the market price system. Thus, firms, in which resources are allocated by fiat rather than price, exist to coordinate resources where the costs of using the market exceed benefits (Coase 1937). In short, then, producers must not only decide how to solve their firms' production functions, but also where the boundaries of their firm are to be drawn. Synthesizing the transaction cost literature with insights from the economic calculation debate, Piano and Rouanet (2018) call the former kind of (Misesian) calculating "primary calculation", and the latter (Coasean) "secondary calculation".

Under secondary calculation, the entrepreneur must use his judgment without reference to the price structure to allocate resources. For instance, when allocating assets within a firm, he has no prices to tell him which employees should be assigned which tasks. Instead, by knowing his employees personally and forming observations about their characters, dispositions, abilities, and weaknesses, he can perform secondary calculation.

Secondary calculation is in some ways crude, compared to market calculation. But it is by no means irrational. An entrepreneur can make informed, plausible, reasonable judgments without recourse to prices in some cases. The fact that flourishing markets dominated by firms exist attests to this. Piano and Rouanet (2018) conclude that “[t]he job of an entrepreneur in a context where only secondary calculation is available will be for a good part to put resources in the hands of those who he estimates can use them most efficiently despite the absence of primary calculation” (14).

Entrepreneurs thus face the task of determining what inputs to employ and how to employ them, *without the insight of prices*. While ultimately their decisions are capitalized in stock prices and income statements, entrepreneurs do not have access to the stock prices that will manifest as a result of a given decision, antecedent to that decision’s being made. Moreover, if loss or collapse in stock value is observed, the entrepreneur does not thereby know where resources were misallocated. Primary calculation tells him whether he succeeded or failed; it is only by successfully employing secondary calculation that he comes to know why.

This distinction is helpful in formulating our solution. For if entrepreneurs have access to some means of economizing without economic calculation, they may be able to rationally generate private property rights without recourse to money-price calculation, thus resolving the Mises-Demsetz tension. But the primary/secondary distinction cannot be the whole solution, for secondary calculation occurs in the broader context of a marketplace. Piano and Rouanet note, “As long as they do not live in a simple autarkic economy, however, entrepreneurs will never engage in projects where they can neither use primary nor secondary calculation” (15).

3.3—Property predates markets.

The remark about autarky is telling. Since secondary calculation governs intrafirm decisions in a market, exchange is a prerequisite for secondary calculation. Allocating resources

outside any system of exchange at all likewise cannot be an instance of secondary calculation. Thus, the kind of allocative decisions performed in autarky are based in different institutions and mechanisms than either primary or secondary calculation.

But it is precisely to autarky to which we must turn. If exchange occurs, the parties involved necessarily have control over the exchanged goods, i.e., they have private property rights. So the entrepreneurs who initially define and enforce property rights in the absence of any prior property institution must be acting in an environment in which exchange does not take place. Further, we must recognize that when property rights become established, exchange will often follow. In short, exchange cannot predate property rights, and property rights do not necessarily, but often contingently, cause exchange. Thus the answer to our question, “How do property rights form in non-calculative environments?” also describes how it is that societies move from autarky to market.

Returning then to the central problem, we must ask: what considerations will rationally motivate autarkic entrepreneurs to invest in the provision of private property? And can this be described as economizing?

3.4—Autarkic entrepreneurship

Jack High (2009) has taken the initial steps in answering this question. Drawing on archeological literature (Eerkens 2004), High notes that around 1400 C.E., California natives transitioned their economy from one in which all food was shared into one in which individual families owned food – i.e., the society spontaneously generated property rights, apparently without reference to any external money prices. High explains this by telling a plausible story in which one family realizes it can produce more if it reserves its gathered plants for itself, and then other families, seeing the nutritional advantage this withdrawing from the public pool confers, follow

suit. One reason a family might increase production by privatizing its gatherings is that, when a society grows to a certain size, monitoring costs increase such that shirking becomes sufficiently extensive to noticeably reduce the common pool of gathered food.

High calls this action entrepreneurial, extending Schumpeter's (1934) and Kirzner's (1985) definitions of entrepreneurship: "In this wider sense, Schumpeter's entrepreneur is someone who introduces new combinations into social life... Kirzner's entrepreneur becomes someone who is alert to opportunities for economic gain" (High 2009, pp. 6-7). Thus, privatizing families are relevantly like the operators of firms: they alter features of their economic context in order to maximize wealth. In this case, property rights are a technology, adopted for its productive advantages. Entrepreneurship thus may predate markets in exactly the sense that High describes.

High admits his theory is incomplete. First, it fails to analyze the role of coercion in establishing institutions. Second, his theory only applies to the actions of individuals, not groups. In addition to these admitted shortcomings, he has also devoted insufficient attention to the general features of entrepreneurship, i.e., he has not described abstractly the relevant ways in which a decision to privatize might be rational or irrational. Entrepreneurs in a marketplace have access to the ready feedback mechanism of profit and loss. Pre-market entrepreneurs, if they are to be called such, must also have means of knowing whether they have increased their economic gain. Thus, below, we generalize High's argument, providing a brief abstraction of rational decision making, and entrepreneurial accounts of property formation that fill in the gaps.

An essential feature of economizing is feedback; that is, *it is possible for a person to determine if he has made a correct decision in the allocation of resources if he receives some independent feedback that either verifies or condemns his decision*. When entrepreneurs use primary calculation, that feedback just *is* profit and loss. Feedback in secondary calculation is more

complex. The profit and loss mechanism remains, of course. An entrepreneur who inefficiently allocates resources within a firm will see that inefficiency reflected in his bottom line. Unfortunately, that is the only information that accounting imparts to him. From the fact that he has suffered a loss he may conclude only that he has allocated resources wrongly – he cannot determine *which* resources were misallocated. If he continues to produce, he must identify *by means of some insight other than profit margins* where the misallocation occurred and how to rectify the problem. For this, entrepreneurs rely on myriad feedback mechanisms. Consumer reviews, performance evaluations, observation of employees, maintenance on machinery, and a hundred other methods of identifying successes and failures play a role in the entrepreneur's secondary calculation. In short, feedback in secondary calculation remains ultimately informed by the price structure, but also is a function of qualitative analyses conducted by the entrepreneur.

From this we may make an important observation about Mises (1920). His criticism of socialism remains devastating, for the socialists sought to reduce the entire economy to a single firm. While no entity could make the kinds of qualitative judgments to assign by fiat all final goods, land, labor, and capital goods at each stage of production in a nation, it is a much simpler problem to allocate a few capital goods and laborers within a firm based on subjective, qualitative performance analyses (Coase 1937). In summary, then, economizing is impossible without prices when the relevant allocations are sufficiently large in number; but economizing with secondary calculation is possible when the allocations that must be made are sufficiently small in number.

It is easy to see that feedback may remain in priceless environments. Because the entrepreneur has no price feedback, he faces a much more difficult problem. All information about every good must be relayed without a medium of exchange. This means that the range over which an entrepreneur can make rational decisions is dramatically smaller than that of the one employing

secondary calculation, who must only make a small fraction of these allocative decisions by fiat. The difficulty does not entail impossibility. Given a sufficiently small number of resources to allocate, it is conceivable that an entrepreneur could receive enough feedback so as to economize. The head of an early tribal (or familial) society which a) has a small number of consumers and b) employs *very* few capital goods could conceivably aggregate consumer preferences, identify all possible production options, and employ them so as to maximize the happiness of each constituent member of his group. In the case above, the larger supply of food for the individual family, and ultimately for the tribe as a whole, may be seen as a feedback.

While this kind of non-calculative allocation is virtually irrelevant to the functioning of any economy today, it both solves our puzzle and fits nicely with our recognition of an autarkic world as being the only one which neither property nor prices yet exist. With High's theory of entrepreneurship thus abstracted to describe feedback mechanisms, we can see how feedback might operate to define property rights in large-scale group interactions and in coercive situations.

Section 4—Conditions for origination

4.1—Collective action problems

It goes without saying that classic collective action problems, like the Prisoner's Dilemma, may be a barrier to spontaneous adoption in some cases. Additionally, sociologist Helmut Schoeck finds that "in a great many situations the object of human activity is a diminution... [R]egularly occurring modes of human behaviour have as their object the lessening of assets..." (1969, 59). Schoeck argues that envy is a common motivator among humans, especially in pre-industrial societies, and thus that the excess prosperity of one individual or family relative to the group may be seen as a crime. Thus it may be that the California natives are anomalous; in most places, it may not be possible to remove goods from the common pool. A realistic anthropology that includes

envy as a social motivator augments the collective action problems that a Demsetzian analysis must account for.

4.2—Spontaneous emergence: when collective action problems fail to apply

Autarkic entrepreneurs must decide how to allocate resources without the guidance of prices whatsoever. Robinson Crusoe invests in defenses when he encounters dangerous natives. Additionally, Crusoe might perceive acts of nature as a threat to the security of his control over resources (Barzel 1997). Thus, he takes steps to provide additional security without reference to market prices.

If this kind of autarkically produced and enforced property right conduces to some kind of market exchange, then we have a clear instance in which an autarkic entrepreneur is incentivized to establish property rights, and thus enable the formation of a market. Suppose that a society consists of two members, Crusoe and Friday. Resources are sufficiently scarce such that competition over the control of resources becomes necessary. Each thus produces property rights for himself autarkically, i.e., he stakes a claim over certain resources and defends it. If both parties perceive that the risk associated with violating the other's claim is high, then trade may take place – when force is costlier than exchange as a means of acquiring a good, and other conditions hold (inverse preferences, etc.), two parties will exchange. Thus, it is conceivable that market activity will arise.

This situation is more likely than one might initially suspect, and it need not rely on the two parties being of equal strength, or even perceiving each other as such. Smith et. al. (2014) show that conflict over a resource can generate “destruction costs”; that is, the conflict may damage the resource in dispute, thereby reducing its value, thereby causing the party with superior strength to refrain from engaging in violence despite certain victory. Leeson and Nowrasteh (2009) show

that, historically, conflict is so costly that terms of surrender can be made before a conflict occurs. Privateers would strike “plunder contracts” with the captains of ships they attacked: instead of taking the ship, destroying value in the process, they would contract for the proceeds of the cargo.

In summary, if two potential combatants perceive each other as being of equal strength, some kind of defined property rights will emerge. Even if this assumption is relaxed, property rights might still emerge, because the costs of conflict can be so high. In all these instances, we need not assume that the value of a disputed resource be measured in terms of money prices. Rather, each actor can subjectively evaluate the costs of conflict to himself. If property rights become established here, exchange may follow, leading to the development of money prices and thus secondary and primary calculation (and institutional proliferation for property rights).

It is then easy to extend this logic to group action. If one group controls a certain natural resource, it is possible for them to take steps to secure it against enemies and acts of god. They may not see themselves as intentionally defining property rights, but once a group successfully encloses or secures a commons for itself, they have done just that. Likewise, this logic may also be obviously generalized to potential conflicts between multiple parties.

This analysis could explain why the California natives in High (2009) fail to prevent the first families from extracting food from the supply. The costliness of conflict perhaps was greater than the perceived benefits of forcing families to remain in the common pool.

4.3—Explicit emergence: solutions to collective action problems

It is a widely accepted proposition in the anthropological literature that the Neolithic revolution, the emergence of private property rights, and the emergence of states are intimately connected (for an example and excellent literature review, see Bowles and Choi 2002). What is debated is the precise causal structure. A classic story argues that the transition to agriculture

generates food surpluses that allow the sustenance of a leisure class; thus, states begin and property rights are subsequently imposed (e.g., Diamond 1997; Fukuyama 2011). Even when agriculture is left out of the picture, the essentiality of states for property is still affirmed (Riker and Sened 1991). The foregoing analysis and the work of Bowles and Choi (2002) conversely see the emergence of property rights as co-conditions for the development of technologies like agriculture and even large game hunting (on this, see Winterhalder and Smith 1992); these and property must have developed in tandem.

We cannot substantively weigh in on the debate here, but our entrepreneurial analysis would suggest the plausibility of successful agriculture and property rights co-evolving. The conversion of Plymouth Colony from a regime of common to private ownership is illustrative here. Murray Rothbard writes that “in order to survive, the colony in 1623 permitted each family to cultivate a small private plot of land for their individual use” (1979, 151). After a regime of imposed communal ownership, which led to mass starvation during the first winter, Governor William Bradford deliberately privatized the land. The result was a substantive increase in agricultural output. Much production in Plymouth was, however, done for the purpose of monetary exchange, meaning it was undertaken with access to money prices (thereby failing to illustrate noncalculative economizing). Nonetheless, we think the logic may be generalized to true autarkies.

Consider the Neolithic revolution: the discovery of agriculture. A small hunter/gatherer tribe continues to return to the same land, year after year, where, thanks to their discarding of seeds in waste, an especially fertile crop has emerged (Diamond 1997). Eventually, they discover the mechanism by which the land yields such abundance, and settle down to farm it. However, as the food surplus allows for the expansion of their population, they confront shirking problems, similar to those in High’s (2009) account. Foreseeing benefits, a Neolithic Bradford might suggest and

effectively persuade others to convert from a common to private property regime. When productive benefits do, indeed accrue, the tribe may perceive this as feedback on the decision to privatize, thus effectively cementing the decision for future generations. Bowles and Choi (2013) argue compellingly that climate shifts increasing the viability of agriculture increased the payoffs of privatizing during the late Pleistocene. The Neolithic revolution in fact *reduced* the costs of privatizing, since farmland could be easily demarcated and defended (2013, 2019). So privatizing at once became easier with the advent of agriculture, as well as conferring productivity advantages from internalizing externalities. The archaeological record appears to bear out the theory that agriculture and private property developed in tandem (Bowles and Choi 2002, 2013, 2019; Svizzero 2014).

This may be the story in some cases; in others, a proto-state actor may indeed be the privatizing “entrepreneur”. In his theory of state formation, Mancur Olson (1993) envisions a pre-state world populated by farming villages and roving bandit gangs. Eventually, one of the gangs perceives that, instead of racing other bandits to plunder villages, they could maximize their wealth by starting up something like a protection racket instead. They transition from roving to stationary bandits and “tax” the village that they plunder on a regular basis. Olson notes that at this point, the bandits’ interests align more closely with the villagers’ than they had previously: both parties now have a vested interest in improving the total output of the village. If shirking or overconsumption problems arise, the bandits may forcibly impose a private property regime on the villagers. That is, they may perceive the imposition of private property as the least costly way of improving the village’s material output.

4.4—Efficiency considerations

The last matter to consider is the efficiency of the private property regime. Are transitions always in the direction of efficiency, as Demsetz seems to suggest? Introducing entrepreneurship into the Demsetz analysis allows us to answer affirmatively, at least from the perspective of the entrepreneur.

Our entrepreneurial account proposes that property rights begin when an economizing actor realizes he can maximize his wealth by investing in the definition and enforcement of private property rights. This decision occurs without money prices as a guide, meaning that the entrepreneur is handicapped in his decision-making. Importantly, however, he may still receive feedback, principally by observing the impact of privatization on raw material output and comparing it to his subjective evaluation of privatization costs. Thus, he is capable of rationally evaluating whether his decision increases or decreases wealth. The entrepreneur might err, but in that case, he will simply cease to invest in the production of property rights, in the same way any firm owner might choose to cease producing. Dynamically, then, privatization occurs in the direction of efficiency—private property persists as an institution because it maximizes its producer's wealth.

The important caveat to this is that social efficiency is far more complicated. When property rights are imposed forcefully, they may maximize agricultural output, but this may be unpreferred for the villagers. An increase in material wealth may not amount to an increase utility. Evaluating how, or if, coercion can maximize social utility is beyond the scope of what we hope to accomplish here. Since, however, as suggested above (Acheson 2015) there are non-efficient property rights regimes, this must be because the interests of the privatizer and the interests of those whose property is being rendered private diverge. Or, perhaps literatures speak past each other when speaking of efficiency. At any rate, there is yet more work to be done on this subject.

Section 5: Conclusion

We began by posing a question: which came first, market or property right? This question is motivated by an apparent contradiction between Ludwig von Mises (1920) and Harold Demsetz (1967). We resolved the contradiction by contextualizing the economists' respective claims. Economic calculation is indeed impossible without prices, but is only necessary for economizing in an advanced industrial economy. Consideration of changes in prices can only explain the institutional proliferation, not origination, of private property. Additionally, Demsetz's story is incomplete. Its three explanatory shortcomings have to do with entrepreneurship, collective action, and efficiency. Reintroducing entrepreneurship allows us to effectively synthesize the transactions cost literature with the calculation and entrepreneurship literatures. By dividing calculation into multiple levels—primary and secondary—Piano and Rouanet (2018) show how calculation operates in the assessment of transaction costs. From this, we abstracted feedback, a key feature of calculation, to describe how entrepreneurs in an autarky economize. We then show how feedback might vindicate an entrepreneur's decision to privatize. In this process, we illustrate theoretical and historical solutions to collective action problems, and discuss efficiency implications.

Private property thus can be explained as a technology adopted by entrepreneurs in order to maximize wealth. Public property becomes private when the gains from privatizing are perceived to outweigh the costs. The entrepreneur can receive feedback that either verifies or condemns his decision, absent money prices in primitive contexts. Property rights can either originate spontaneously or be exogenously imposed; in either case, the same principle is operative. Both entrepreneurial individuals and groups can privatize. Property does indeed precede markets, in the sense of exchanges with money prices. But entrepreneurship—the virtue of the

marketplace—precedes property. Market institutions are thus caused by entrepreneurship all the way down.

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