

# Bounties, Grants, and Market-Making Entrepreneurship<sup>1</sup>

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The dynamics generated by government intervention can impel superfluous discovery in the entrepreneurial process (Kirzner 1985, Ikeda 2005). We describe one form of superfluous discovery: market-making entrepreneurship. Specifically, we examine cases in which government authorities sets a positive price on a resource *for which no market previously existed*. By attaching enough value to an item previously viewed as undesirable, an intervention may transform a non-economic good into an economic good, encouraging entrepreneurs to create a market in the new good. Our argument explores how entrepreneurs respond when interventions transform resources that were not previously traded for a positive price into economic goods that are traded for a positive price. We illustrate the broad relevance of these market-making dynamics by presenting five diverse cases: rats in colonial Vietnam; feral pigs in Fort Benning, Georgia; tuberculosis in South Africa; homelessness in the United States; and soldier remains in Southeast Asia.

Keywords: market-making; entrepreneurship; superfluous discovery; dynamics of interventionism

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In an anecdote originating during British rule of India, colonial leadership sought to reduce the number of cobras—highly venomous snakes—in Delhi by offering a bounty for cobra tails to reduce their supply. Initially, wild cobras were hunted, and all appeared well. When a suspiciously large stream of tails was redeemed for payment, however, the government discovered that local entrepreneurs were breeding cobras for profit and immediately disbanded the reward system. In response, the breeders released their cobras, increasing Delhi’s serpent population dramatically. The incident is the presumptive basis for the term “the cobra effect”: instances where government efforts to solve a problem exacerbate it.<sup>4</sup>

While this story’s historical validity is unclear, economists and laymen alike have used it to illustrate the unintended consequences generated by perverse incentives.<sup>5</sup> Although many interventions fail, the cobra effect is arguably the most striking instance of government failure: the state encourages what it attempts to counter. A cursory understanding of the cobra effect focuses on antithetical *outcomes* generated by perverse incentives; however, the *process* by which these perverse outcomes emerge has received scant attention. We suggest that the above story illustrates a specific dynamic of intervention, beginning with the state’s commodification of previously non-priced goods. This gives rise to opportunities for creative individuals—i.e., entrepreneurs—to discover ways to supply the resource, even leading to the emergence of new markets in the commodified good. As entrepreneurs supply the new commodity, the intervention is undermined.

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<sup>4</sup> This term was coined by Siebert (2001).

<sup>5</sup> As described below, the term has also been employed to describe other, historically-validated government failures in pest control.

We analyze instances of intervention where the state sets a positive price on a resource for which a market did not previously exist. Our argument explores how entrepreneurs respond when interventions transform resources that were not previously traded into economic goods. For instance, in the story above, wild cobras previously existed, but they were not traded until the intervention. The state itself transformed cobras into a positively-priced resource; in response, cobra breeders exercised entrepreneurship to supply that resource.

Our analysis contributes to two strands of literature. The first is the literature on “dynamics of interventionism,” which integrates the traditions of public choice and Austrian economics to provide insights into the consequences of government intervention (Mises [1929] 1977; Rothbard 1970; Kirzner 1985; Ikeda, 2002, 2005). This literature explores the dynamic characteristics of intervention into the market process. In contrast to a comparative statics approach that illuminates only snapshots of an intervention at given points in time, the dynamic view highlights the sequence of adjustments that diverse individuals undertake in response to an intervention. This work emphasizes that myriad individual adjustments to intervention can be both unintended and undesirable from the standpoint of the intervener.

Scholars in the Austrian tradition have applied these theoretical insights to a host of situations. For instance, Boettke, Coyne, and Leeson (2008) and Coyne (2008, 2013) analyze top-down reconstruction and development efforts. Coyne and Hall-Blanco (2014) discuss how foreign interventions can “boomerang” back to erode domestic freedoms. Redford and Powell (2016) explore how state antidrug policies spurred a series of unintended consequences in the nineteenth century, marking the beginning of the United States’ “war on drugs.” Fuller (2016) applies Kirzner’s (1985) framework to analyze how digital privacy regulation impedes and redirects the entrepreneurial discovery process.

Ikeda (2005) emphasizes that an important aspect of the dynamics of interventionism is the effect of regulation on the entrepreneurial process. One category of unintended entrepreneurial consequences of intervention is the “wholly superfluous discovery process,” first introduced by Kirzner (1985). In this superfluous discovery process, “the imposition of regulatory constraints and requirements tends to create entirely new, and not necessarily desirable opportunities for entrepreneurial discovery” (Kirzner 1985, 144). This paper contributes to the literature on the dynamics of interventionism by focusing on one expression of the superfluous discovery process: entrepreneurs responding to the state’s transformation of economic goods by unintentionally creating a market for those goods.

Our paper also contributes to the literature exploring how institutions direct entrepreneurial activity into undesirable avenues. Baumol (1990) writes that the nature of entrepreneurial activity depends on the relative payoffs to productive, unproductive, and destructive entrepreneurship. In his trichotomy, both unproductive and destructive entrepreneurship involve reallocation via transfers. Boettke and Coyne (2003) and Coyne and Leeson (2004) emphasize how institutions fundamentally determine these payoffs. Building on this insight, Coyne et al. (2010) argue that “non-productive” entrepreneurship—involving the transfer rather than the creation of wealth—is the driver of economic stagnation and decline. These authors detail an undesirable dynamic where non-productive opportunities arise from previous non-productive opportunities; for example, non-productive entrepreneurship can generate “new non-productive niches for profit” (*ibid.*, 338). Coyne et al. (2010) illustrate a process where lobbying for redistribution to and protections for entrenched interests generates new opportunities for lobbying by additional interest groups. We address a process where

government intervention spurs an entrepreneurial response that can even lead to new opportunities in private exchange, suggesting the broader applicability of their insights.

Our analysis is important for several reasons. First, while the unintended consequences of the cobra effect have been discussed in a static context, little has been said about the dynamic adjustments underlying this tendency. We do not claim that the mechanism described here applies to every case of unintended consequences; yet, our analysis is the first to our knowledge to specifically emphasize the entrepreneur as a driver of cobra effect outcomes. Second, governments have intervened to transform untraded resources into economic goods throughout much of history and continue to do so. To the extent that market-making entrepreneurship contributes to government failure of this type, focusing on the phenomenon is worthwhile. Third, and relatedly, market-making entrepreneurship is an expression of superfluous discovery that we believe to be relevant to a wide range of interventions. To illustrate this variety, we apply our theoretical analysis to five diverse cases of state intervention: rats in Vietnam; feral pigs in Fort Benning, Georgia; tuberculosis in South Africa; homelessness in the United States; and soldier remains in Southeast Asia.

We select our cases for two reasons. First, they illustrate the robust nature of our theory. These cases are spatially diverse, as they relate to many different governments and populations. They also vary temporally, suggesting relevance in contexts with differing tastes, norms, and technologies. In addition, the cases deal with surprisingly dissimilar goods (from rat tails to human bones) and unique policy ends (from controlling a pest population to providing shelter for the homeless population). Second, each case involves novelty on some margin (e.g., by reinterpretation of an existing case using the dynamics of interventionism framework or by the introduction of a case to the scholarly literature). The rat case in Vietnam has been noted by a

single historian but has not been discussed in the economics literature.<sup>8</sup> The feral pigs instance has been identified in popular discourse but has not, to our knowledge, been discussed in the scholarly literature. While economists have explored the perverse incentives facing the homeless (see, for instance, Troutman et al. 1999) and rent-seeking in the homelessness industry (Lucas 2016a), none to our knowledge have explored the market-making entrepreneurship associated with homelessness interventions. Neither the human spit trade in South Africa or the market for soldier remains in Southeast Asia have received scholarly treatment to date.

In the next section we present a theoretical lens for understanding market-making entrepreneurship in the context of the dynamics of intervention. This is followed by five cases illustrating our theoretical framework and a discussion of their implications.

#### Market-Making, Superfluous Discovery, and the Dynamics of Interventionism

Little more than neoclassical theory is required to account for the price-theoretic insight that subsidization increases output. However, neoclassical insights provide no mechanism by which a new market comes about.<sup>9</sup> For this, a theory of entrepreneurship is required. Our account explicitly highlights the relationship between intervention and market-making entrepreneurship. To do this, we bring a range of insights from Austrian economics to bear, including the theory of the market process, entrepreneurship, and the dynamics of interventionism.

Many theories of entrepreneurship involve “market-making” as a key feature. Schumpeter ([1911] 1982) includes the opening of new markets as one of five types of innovation that characterize the entrepreneurial act. As Casson states, “...one of the most important forms of entrepreneurial activity is to identify changes in patterns of demand and to

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<sup>8</sup> Nor has the specific mechanism of market-making been identified as the primary driver of the perverse outcome in this case.

<sup>9</sup> Relatedly, the transition from one equilibrium to the next is essentially a black box (Kirzner 1997).

create new markets to meet those demands” (2005, 335). The market process view of entrepreneurship, expounded by Israel Kirzner, emphasizes both the equilibrating function of the entrepreneur in “the market” (i.e., the entire network of voluntary exchange) and the entrepreneurial function of bringing about new “markets” for particular goods and services. For instance, Kirzner’s (1985) conception of entrepreneurship includes “introducing new products” and “striking out in new territory to identify new markets for one’s product” (1985, 6). Alertness plays a central role in Kirzner’s theory of entrepreneurship; as such, the profit opportunities to which entrepreneurs are alert need not be limited to existing markets. While market-making is thus acknowledged in the market process view, we explicitly connect this entrepreneurial function to the wholly superfluous discovery process, an important aspect of the dynamics of interventionism.

Kirzner (1985) emphasizes that intervention alters the entrepreneurial process by creating new discovery opportunities. This superfluous discovery process entails profit opportunities that would not exist absent regulation and can be undesirable from the viewpoint of the intervener. Kirzner attributes the creation of these new profit opportunities to a mismatch between regulatory constraints and unhampered equilibrium conditions (1985, 144). The superfluous discovery process begins with “the replacement of one set of (unregulated) prices by another set of (partly regulated) prices” (1985, 144). This particular peril of regulation has thus been viewed as the result of *price divergence* imposed by regulation: a difference between the regulated and unregulated price of a good.

Consider the examples of superfluous discovery offered by both Kirzner (1985) and Ikeda (2005): bribery and corruption. In Kirzner’s discussion, for example, these phenomena are the result of “arbitrary restraints on otherwise profitable activities” (Kirzner 1985, 145). This

language implies that in the absence of regulation, the unhampered market process would generate exchange over the regulated good (i.e., a “market” for that good). Stated differently, the superfluous discovery process has been largely considered in the context of existing markets.

Rather than price divergence, we consider *price formation* as a source of the superfluous discovery process to explore how intervention can generate otherwise nonexistent markets. The markets we consider emerge because of the state-imposed price on an otherwise non-economic good. Consider the original cobra effect example. Dead cobras were not traded at any price-quantity configuration that would commonly be understood as a “market for cobra tails.” Hoping to reduce the cobra population, the state set a price on cobra tails, a previously untraded good. This intervention initiates a wholly superfluous discovery process: the emergence of cobra breeders, market-makers who were alert to the profit opportunities generated by intervention.

One precondition for market-making activity is thus the transformation of a non-economic good (or economic bad) into an economic good. Menger writes, “the difference between economic and non-economic goods is ultimately founded on a difference... in the relationship between requirements for and available quantities of these goods” (1871, 101). “Requirements for” goods relate to the causal-realist relationship between the good and the ends that good is believed to satisfy. “Available quantities” of goods refers to its relative scarcity. Changes in local circumstances in either of these two categories can lead to transformation between non-economic and economic goods. In the unhampered market process, transformations tend to occur efficiently and are backed by consumer preferences.

The hampered market process, however, can lead to the transformation of economic goods in a manner inconsistent with consumer valuations. If the state sets a bounty on an

untraded resource, this artificially changes the “requirements for” that good.<sup>10</sup> In such an instance, “goods that would not possess an economic character artificially become economic goods for the consumer” (Menger 1871, 104–105).<sup>11</sup> Artificially transformed economic goods will be economized by individuals, and entrepreneurs will seek ways to produce these new goods. Market-making entrepreneurship can constitute either supplying the new good directly to the state or facilitating private exchange in the new good.<sup>12</sup>

A second precondition for market-making entrepreneurship is that the state set the bounty in a range where production is economically feasible. The existence of a price *per se* is insufficient to generate new production of a good; entrepreneurs may be constrained because production beyond the existing supply is not economical. For example, state governments successfully reduced the wolf population by setting bounties for them throughout the 19th century (White 1967).<sup>13</sup> While entrepreneurs hunted the wolves, no evidence of wolf breeding exists; technological and resource constraints presumably precluded entrepreneurs from exploiting profitable breeding opportunities at the bounty price. However, there is plausibly some price—say, \$1 million dollars—the government might have set at which entrepreneurs would have found ways to increase the wolf supply. There is typically some price range in which it becomes profitable for entrepreneurs to make a market in a newly commodified good. We would only expect a bounty to generate superfluous market-making when the benefits of doing

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<sup>10</sup> Often, this may be directly related to an attempt to alter the available quantity of the good, as in the case of the Delhi cobras.

<sup>11</sup> Relatedly, the resource may be an economic “bad”—involving private exchange over the item’s removal—prior to the positive price set by the state. Although this intervention initially seems qualitatively consistent with the consumers’ positive valuation of the resource’s removal, the price of the resource is still distorted. This also creates profit opportunities for suppliers of the new commodity.

<sup>12</sup> We use the term “higher order market” to denote private exchange in the new good occurring for the purpose of subsequent exchange with the state. The tuberculosis case below illustrates this possibility.

<sup>13</sup> White (1967) remarks of the bounty system that, “nothing in zoological history ever wiped out wolves as fast as that law” (1967, 84, quoted in Brownlow 2000, 147).

so outweigh the costs. In the cases we consider, the state set a price sufficiently high to generate profitable market-making opportunities.

Even when the price set by the state precludes profitable production of the good itself, however, market-making entrepreneurship may still occur as an unintended consequence of intervention. For instance, the existence of the bounty may incentivize fraudulent production. “Imitation goods” may be produced and even traded among private actors. If government actors cannot reliably distinguish real from imitation goods (say, because inspection is costly), profit opportunities to supply imitation goods may also be generated. This is evidenced in some of the cases below. While the activity initiated in these cases may or may not directly worsen the problem the intervention is designed to address, this dynamic still constitutes a waste of resources and thus increases the cost of intervention beyond the directly observed effects.<sup>14</sup>

Government involvement is not necessary for fraudulent imitation goods to be produced—as any purchaser of a “knockoff” purse or wrist-watch can attest. However, there are at least three advantages that private actors possess relative to public actors with respect to susceptibility to fraudulent exchange. First, private actors are the residual claimants to their purchases. As a result, they incur the costs of being rooked. Public actors, lacking residual claimancy to the resources they control, do not. Second, private actors have access to clear feedback mechanisms: prices and profit-loss signals. These feedbacks enable and incentivize swift adjustments to errant purchases. Third, private actors rarely act on the same scale as do their public counterparts. Because governments are territorial monopolists, their actions often

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<sup>14</sup> In general, the extent of fraudulent activity is influenced by the number of parties to a contract. When a government purchases fighter jets, for instance, the contract is typically between the government and a single firm. Under such bilateral conditions with well-specified contracts, asymmetric information and monitoring costs are likely to be less problematic. In a traditional bounty situation, by contrast, multilateral contracting conditions suggest that asymmetric information and monitoring costs will tend to be exacerbated.

apply to an entire region or country. Private actors tend to face direct competition, while public actors usually do not. This suggests that when public policies do backfire, the consequences are likely to be more far-reaching than private action.

Market-making entrepreneurship requires the initial absence of a market.<sup>15</sup> Furthermore, market-making entrepreneurship is not the only source of the cobra effect. Intervention may generate perverse outcomes simply because individuals revise their plans under new constraints. For example, imagine that the government mandates new auto emissions standards to reduce the total quantity of air pollution. Compliance requires auto manufacturers to install a costly device. This raises the price of new cars relative to old cars, which are not subject to pollution controls. Consumers postpone purchasing new vehicles at the margin, opting instead to drive their older cars. With more older cars on the road, air pollution increases in the short run. The cobra effect outcome—an increase in that which the intervention was aimed at decreasing—is present, but the mechanism for this perverse outcome is not market-making.<sup>16</sup>

Like all other forms of entrepreneurship, market-making entrepreneurship is intimately related to institutions (Boettke and Coyne 2003). The productivity (or lack thereof) of entrepreneurship depends on the institutional environment. As Boettke and Coyne (2009) highlight, institutional context matters, because it shapes entrepreneurs' incentives and

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<sup>15</sup> Interestingly, one of the arguments raised in support of state bans on the exchange of certain goods is the “commodification” argument (Radin 1996), which asserts that “pricing” things that have non-pecuniary ethical or social value leads to the erosion of that ethical or social value. Prohibitions of prostitution, adoption markets, and the sale of human organs have been defended on these grounds. Banning commodification is an illustrative foil to our characterization of market-making entrepreneurship. In the former case, the objects of intervention are goods exchanged on the market but for prohibition. Here, our analysis relates to things that *would not be economic goods but for intervention*. While market-led commodification is banned in one case, state-led commodification is enabled in the other.

<sup>16</sup> Consider a different type of intervention to which our framework does not apply: bans on exchange. In addition to stifling entrepreneurial discovery, bans can also redirect entrepreneurial activity (e.g., black markets may emerge for banned goods). While the market process is significantly altered by prohibition, it is altered relative to an existing unhampered market. The dynamics discussed in this paper do not apply to cases where the state intervenes to prohibit exchange; instead, our analysis is restricted to cases where the exchange itself emerges from intervention.

opportunities (see also Coyne and Leeson 2004). In the context of prices, profit and loss, and property rights, entrepreneurship tends toward productive outcomes. The competitive discovery process of the market yields profit opportunities for individuals who best anticipate future market conditions, supplying goods that consumers value. Without these institutions, the entrepreneurial discovery process may be redirected into non-productive avenues, e.g. government may create opportunities for rent seeking (Coyne et al. 2010).<sup>17</sup>

Market-making entrepreneurship described herein occurs specifically within the context of state intervention. This indicates a link between our analysis and the literature on political entrepreneurs: private or public actors who seek to achieve their ends through the political process (DiLorenzo 1988, Wagner 1966). Martin and Thomas (2013) describe how political entrepreneurs act on multiple tiers to achieve their ends; when unable to secure favorable policies, entrepreneurs may look to a higher tier to change the rules of the game.<sup>18</sup> Similarly, the dynamics of interventionism literature identifies myriad avenues by which intervention redirects entrepreneurship. For example, antitrust regulation, ostensibly passed to enhance a market's competitiveness, is frequently leveraged by incumbent firms to strangle entrants (Armentano 1986). Entrepreneurship is still present in this case—entrepreneurs are acting to exploit the newly profitable opportunity arising from the regulation—but profit does not signal the satisfaction of consumer demands. Note that the superfluous discovery engendered by this law occurs in the context of an already-existing market. Similarly, a steel producer lobbying for protectionist measures seeks to maintain or enhance its pre-existing market share.

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<sup>17</sup> The assumption of rationality underlies the argument that entrepreneurship is redirected. All that is required is that some people are alert to changes in incentives and exploit these new opportunities.

<sup>18</sup> In another related paper, Simmons et al. (2011) discuss how the existence of potential political coalitions—Yandle's (1983) bootleggers and Baptists—generates profit opportunities for political entrepreneurs.

By pricing a previously untraded resource, intervention distorts the institutional prerequisites of productive entrepreneurship in the unhampered market process: property rights, prices, and profit and loss. As a result, market-making involves both planned and unplanned features that undermine government policies. Entrepreneurs may intentionally supply artificially priced commodities to the state, and their actions can also lead to the emergence of higher order markets in the commodified good. Prices and profit and loss are distorted as this exchange occurs, and property rights are reallocated for the purpose of obtaining government transfers. Thus, the superfluous discovery process of market-making entrepreneurship initiated by intervention engenders both individual and institutional change.

The superfluous discovery process highlighted here is intrinsically unproductive because the market hinges on transfers rather than value creation. Government acts as a consumer of something that consumers themselves do not demand, purchasing goods with funds generated by taxation. In such cases, the associated profit opportunities depend on the government's willingness to purchase the good.<sup>19</sup> Should the government change course, the good no longer will be exchanged. For example, once the colonial government disbanded its bounty scheme, the market for cobra tails disintegrated, and breeders released their cobras into the wild.

### 3. Case Studies

We explore the role of market-making entrepreneurship in the dynamics of interventionism by presenting a number of cases where this mechanism can help explain the failure of an intervention. The entrepreneurial response need not be the sole driver of the perverse outcomes described; the dynamics of interventionism framework itself eschews such mono-causal

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<sup>19</sup> Even when private parties voluntarily exchange the transformed goods, they do so for the purpose of then exchanging with the state (in a transfer).

explanations. This mechanism should be viewed as complementary to a host of unintended consequences associated with a specific intervention. Yet, market-making entrepreneurship is a sufficiently important feature in each case to suggest that its role is worth highlighting.

### Rats in Hanoi

French rule of Vietnam in the early 20th century exhibited a veneer of sophistication, but it encountered formidable resistance from one segment of the native ecosystem: sewer rats. So pervasive were household pests such as mosquitoes, cockroaches, and rats that one daughter of a colonial administrator referred to them as the true “native government” and suggested that the French abandon their attempts at eradication in favor of co-existence with the resilient pest population, as historian Michael Vann, an expert on French colonial rule of Vietnam, documents (2003). However, when a prominent French official learned of the link between rats and disease transmission, the rats became the focal point of French efforts to eliminate native pests.

In 1902, the French government began dispatching teams of Vietnamese into the sewers to hunt rats. The initial campaign appeared successful, as the workers killed staggering numbers of rats daily. June 12th, 1902, for instance, saw a total of 20,114 rats exterminated with numbers also in the tens of thousands in the days preceding and following (Vann 2003). After months of apparent failure to reduce the rat population, the colonial administration implemented a one-cent bounty for each rat tail presented to authorities. Why not require the entire rat corpse be presented? It was decided that the handing in of an entire corpse would present too great a “burden” for the already overworked municipal authorities (Vann 2003).

Cautiously optimistic, administrators quickly became even more hopeful as the bounty incentivized Vietnamese residents to bring in thousands of rat tails daily. Observers on the streets, however, soon noticed a new oddity: rats without tails. Before too long, authorities

realized that resourceful rat-catchers were trapping the rats, severing their tails, and releasing the rats back into the sewers where they could breed, providing the catchers with the next generation of profitable rat-tails. Even worse, health inspectors soon discovered an additional development in the Hanoi suburbs: rat farms springing up in direct response to the increased profitability of supplying rat-tails to the authorities (Vann 2003). Vann comments that, “Evidently this was not what the French had in mind when they encouraged capitalist development and the entrepreneurial spirit in Vietnam,” (2003, 198).

Interestingly, the strategy of paying bounties in attempt to eradicate rats in Southeast Asia has re-emerged more than a century after the colonial Vietnam debacle. The city of Petaling Jaya, Malaysia recently instituted a rat bounty, as have governments in Olongapo City, Philippines and Jakarta, Indonesia. Whether or not these programs have avoided the unintended consequences of market-making entrepreneurship remains to be seen.

#### Feral Pigs in Fort Benning

Feral pigs are highly-destructive creatures roaming 39 US states (Nordrum 2014), comprising an estimated US population of six million in 2013 (*The Economist* 2013). They are among the most destructive species in the United States (Vitousek et al. 1996). Some areas have had particularly dense populations of these pests. In 2008, the military base at Fort Benning, Georgia housed 120,000 military personnel as well as several thousand feral pigs. In July of 2007, the military base had authorized over 2,000 military personnel to kill the pigs, offering a bounty of between \$25 and \$40 per pig tail. The program was expected to be cheaper than hiring a professional exterminator (Associated Press 2008).

Known as the “Pig Eradication Program,” the bounty program functioned similarly like that in Hanoi. All that was necessary to collect the bounty was the presentation of a pig tail to the

authorities; the rest of the carcass could simply be left to rot. In Hanoi, it was not long before casual observers were able to “smell a rat” in the form of tail-less vermin scurrying around the city’s streets, but in Fort Benning, the problem was not as apparent. There, it took the keen eye of wildlife sciences Ph.D. student, Robert Holtfreter, to detect anomalies in the ways that pig kills were being reported.

First, Holtfreter began tracking the density of pigs in the area. A year after the bounty was instituted, records indicated that roughly 1,500 pigs had been slaughtered, but the pig density in Fort Benning had increased dramatically. Next, Holtfreter began investigating the paperwork surrounding the pig slaughter. To collect the bounty, pig-killers were required to submit paperwork detailing how, when, and where each pig was killed. Upon inspection, Holtfreter, an expert on pigs, concluded that the numbers being reported were too large for the areas where the pig kills were being claimed. Furthermore, his knowledge of the military base itself lead him to conclude that pigs were likely not being killed in areas where the military conducted significant practice routines—but such spots were routinely claimed on the paperwork as prime pig-killing locations (Freakonomics 2012).

Interviews of local butchers revealed that shortly after the bounty program was instituted, calls were made inquiring about excess tails they might be planning to discard. Some butchers indicated that individuals even targeted domestic pigs for their tails. Such is an instance of entrepreneurs supplying “imitation goods,” or goods with physical characteristics similar enough to the good in question that inspection is prohibitively costly. Additionally, domestic piglets—which often sold for \$5–10—became a target for their tails. Interviews of local butchers and taxidermists revealed them to be relatively tight-lipped, but one comments on the possibility of

fraud that, “Oh, I’m sure everybody did.” The interviewer responded, “...I wouldn’t be surprised with all the tail fever if you could start a tail business” (Freakonomics 2012).

In addition to this market-making activity, locals began to devise techniques for attracting pigs from the woods. Hunters spread cafeteria slop along the edge of the woods. When the pigs came to feast, the hunters would pick off a few while the rest retreated to the forest more well-fed than ever. An intelligent species, the pigs quickly adapted to the ploy, often only emerging after dark.<sup>20</sup>

Holtfreter estimates that the pig population in Fort Benning grew from under 2,000 to slightly above 6,000 in the first six months of the program alone (Holtfreter n.d.). The policy proved an abject failure. After three years and \$125,000 in bounties, military administrators ended the Pig Eradication Program (Freakonomics 2012).

#### Tuberculosis in South Africa

We have outlined instances of unproductive market-making entrepreneurship in pest control. One might be led to infer from the account thus far that the dynamics we describe only apply to the animal kingdom. However, governments have commodified a much wider range of economic bads, and the tendency of the entrepreneurial response has proved resilient across space and time. A less obvious instance of this phenomenon is governmental attempts to control microbial pests: specifically, tuberculosis (TB) in South Africa.

TB is a serious and potentially fatal disease. The World Health Organization (2016) calls it a “top infectious disease killer worldwide.” Although preventable and curable, the disease still

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<sup>20</sup> As Holtfreter comments, providing the pigs with a significant caloric intake boost is a key input into their ability to reproduce quickly. Coupled with very quick (sometimes as early as 3 months) sexual maturation (Extension 2012), the strategy proved disastrous for the bounty program in Fort Benning.

claimed over 1.5 million lives in 2014 across 9.6 million known cases. The Millennium Development Goals feature the reduction of TB as a key target (United Nations 2015).

South Africa suffers from an extraordinarily high prevalence of TB; the disease was the leading cause of death there in 2010. Unfortunately, the nation's 52 million people has not experienced the same TB relief as the rest of the world over the last two decades. While the world incidence rate (of new cases) of TB per 100,000 people decreased almost 20%, from 161 in 1990 to 136 in 2013, the South African incidence rate increased 175% over the same period, peaking at 977 new cases of TB per 100,000 people in 2007–2008 (World Health Organization 2015).

Though reasons for this disparity are complex and varied, the failure of TB prevention efforts in South Africa provides a fitting context for our next case. To combat the spread of TB, the South African Social Security Agency (SASSA) instituted disability grants for individuals with documented cases of TB which can be either temporary (up to one year) or permanent (over one year), and they require a demonstration of financial need including both annual income and asset limitations (SASSA n.d.). To qualify, South African citizens must be evaluated by a state-appointed doctor. A saliva test is sufficient to determine that an individual has TB, thereby qualifying for sizeable benefits—as much as R1,010 (about \$100 in January of 2009) a month (Nkuna 2009). With median monthly earnings of R845 in the bottom 10% of employees, the subsidy proved an enticing proposition for individuals in extreme poverty.

In 2005, South African officials made an unwelcome discovery: TB-infected individuals were selling their sputum to others who wanted a disability grant. In the town of Qumbu and surrounding areas in the Eastern Cape province, a market for infected spit had emerged. Media reports document the statement of provincial health spokesman Sizwe Kupelo: “There were

people from different villages who were selling their spit to people that are not suffering from TB because they wanted to apply for the disability grant” (Agence France Press 2005). Prices for sputum samples even emerged, with sellers charging between R10 and R30. Since doctors did not require the sputum to be produced on site, trade in the newly commoditized expectorate was effective and low-cost.

While officials attempted to increase monitoring stringency, the entrepreneurial response proved resilient. New reports surfaced in September 2009 of a similar phenomenon over 750 miles away in Khayelitsha, Cape Town. Here, infected sputum fetched prices between R50 and R100. Although the disability grant required the substance be provided in official government containers, these were easily obtained through theft or illicit trade. The limited evidence available suggests that the spit-trade was not restricted to a handful of one-off criminals; to the contrary, widespread competition led to the dissipation of the profits that incited market-making entrepreneurs in the first place. Nkuna (2009) reports one man’s disappointment regarding the downward pressure exerted on his product; business was bad since “so many people were infected with TB in the township, which meant he had a lot of competition.”

A dearth of data precludes more detailed assertions about the scope of the spit trade in South Africa. As of 2009, about 30,000 South Africans were receiving temporary disability grants.<sup>21</sup> Evidence of the causal impact of the spit trade on true cases of tuberculosis is also unclear. However, the spit trade certainly gave the bacteria of a deadly, infectious disease to a significant number of uninfected hands. At the very least, the risk of TB for fraudulent grant claimants was increased. Since TB is an airborne illness, this market also likely had harmful third-party effects even more difficult to quantify. Perhaps incidentally, the rate of new TB cases

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<sup>21</sup> TB is not the only condition that qualifies one for a temporary disability grant.

in South Africa climbed steadily from 1995 until about 2009, when the second wave of allegations over the spit trade surfaced in the South African media.<sup>22</sup>

The TB case outlined herein differs in interesting ways from the two prior cases of market-making entrepreneurship. The Vietnamese rat and the Fort Benning pig tails were purchased by the government alone. The making of the market required only the production of tails by prospective entrepreneurs. In South Africa, the government “bought” infected sputum in the form of disability grant funds. Since each individual was limited to claiming a fixed payment stream, two markets emerged rather than one. Infected entrepreneurs first supplied the product to enterprising individuals, who then obtained funding from the government for the sputum. The latter exchange is a form of rent-seeking but is entrepreneurial nonetheless. The former (infected sellers of sputum) requires spontaneous emergence of cooperation among *private* parties—even involving coordination among anonymous strangers.

TB illustrates that government commodification of economic bads is not limited to direct effects but can also produce indirect unintended consequences. Such intervention can lead to market-making entrepreneurship over exchange with the state as well as in higher order markets for the new good.<sup>23</sup> Furthermore, the intervention need not directly transform the good that the government attempts to reduce for market-making entrepreneurship to apply. In attempting to reduce TB, the government set a price not for TB-infected humans but rather TB-infected sputum. The market that emerged was therefore not directly in TB, the object of the intervention; however, the market for TB sputum nonetheless contributed to the South African government’s failure in TB prevention.

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<sup>22</sup> SASSA has made a concentrated push to root out and deter fraud across all of its social grants over the last several years, including the temporary disability grant (South African News Agency 2014). Whether or not the TB spit trade has survived is unclear.

<sup>23</sup> Menger’s (1871) insight on higher order goods suggest that the price for the new good in the secondary market is derived from the value of the lower order good artificially set by the government.

### 3.4 Homelessness in the United States

That entrepreneurs effectively made a market for bacteria-infected sputum in South Africa speaks to the applicability of market-making dynamics in government failure beyond the animal kingdom. The episode also revealed that the associated dynamics of interventionism can generate secondary markets beyond direct government activity. In subsidizing what was previously an undesirable condition, the state both encourages that condition and, importantly, creates profit opportunities for entrepreneurs who can supply that condition. This same logic can be applied to a final instance of market-making entrepreneurship in the dynamics of interventionism: the exacerbation of homelessness in the United States in the mid-20th century. Specifically, a series of federal mandates funding emergency food and shelter beginning in the 1980's led to a burgeoning supply of shelters, effectively creating a market for homelessness on a national scale.

Homelessness (in the sense of lacking a place of residence or lodging) has been a virtually ubiquitous part of human society for centuries (Snow and Anderson 1993, 7). Yet, with the exception of a brief stint during the Great Depression, homelessness only entered the United States' national political discourse in the 1980's (Burt 2016). The following decades have witnessed homelessness as the object of focused policy interventions at the federal level. Though data on the extent of homelessness have been unreliable and hotly contested throughout this period, the consensus is that "Despite the billions of dollars spent ... the number of persons experiencing homelessness has not changed significantly in the past 35 years" (Burnes 2016, 1).<sup>24</sup> Indeed, evidence suggests that homelessness has been exacerbated by the federal government's initiatives (Troutman et al. 1999; Lucas 2016b).

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<sup>24</sup> Note that the cobra effect suggests an increase in the phenomenon the state attempts to alleviate *relative to the counterfactual*. The historically limited extent of homelessness suggests that its modern

The modern homelessness epoch began in the early 1980's as media outlets, activists, and community leaders acknowledged what seemed like a sudden increase in the number of individuals living on the street. A myriad of complexly related factors appear to explain the initial (re)emergence of homelessness,<sup>25</sup> but not one of these reasons accords economic value to the condition of homelessness. A series of responses by the federal government, however, did just that. In 1983, the Emergency Food and Shelter Program was introduced as a part of that year's Job Stimulus Bill (Pub L. No 98-8) "to provide humanitarian assistance to the indigent and homeless" by funding non-profit shelters (Pub L. No 98-8). The result was the beginning of a federally-funded explosion of privately run homeless shelters operated by non-market entrepreneurs.

Organizations demonstrating the "ability to deliver emergency food and shelter to needy individuals" could expect significant federal funding (Pub L. No 98-8). So, entrepreneurs who could supply more homeless individuals could benefit. Enterprising individuals responded, creating a market for homelessness in the form of homeless shelters and soup kitchens.<sup>26</sup> A 1985 Government Accounting Office (GAO) report estimates that 3,650 shelters received over \$90 million in federal funding in the first two years of the program's operation. The report indicates that government provided 85 million additional meals and 13 million additional nights of shelter during this time (GAO 1985), all supplied through entrepreneurs in the emergent homelessness

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persistence corresponds to a positive treatment effect; complementary perverse mechanisms to those described herein are discussed in Lucas (2016a).

<sup>25</sup> Scholars suggest that the 1981-1982 economic recession was an important reason for the increase, and that reduced housing and welfare assistance in the Reagan administration exacerbated the displacing effect of these macro maladies (Burt 1992). Many also have asserted that deinstitutionalization of mental institutions across the country through the 1970's left many ex-patients unable to support themselves and lacking social assistance infrastructure. Others still argue that personal behaviors (e.g., the crack epidemic and alcoholism) were a key driver of the observed rise in homelessness (Baum and Burnes 1993).

<sup>26</sup> While some shelters and soup kitchens did pre-date the law, these were small, locally operated, and largely donation-driven. Thus, there was no "market" for shelter on a national scale until the federal legislation.

industry. One activist group was awarded \$5 million to start and operate a “model shelter,” serving between 800 and 1000 homeless individuals in Washington, D. C.

As the market for homelessness grew during the 1980’s, the extent of homelessness appeared to grow as well. Best estimates—unreliable as they are—suggest an increase from about 100,000 homeless in 1980 to 500,000–600,000 homeless in 1987 (Burt and Cohen 1987). Casual evidence also suggests changing demographics over the period; homelessness became less of an “elderly white male” phenomenon, affecting more women, minorities, youth, and families.<sup>27</sup> Some scholars attribute the increase to the perverse incentives facing the poor themselves; for instance, Jencks (1994) suggests that the increase in shelters lowered the cost of homelessness. Troutman et al. (1999) present empirical evidence that the federal funding for homeless programs in the 1980’s and early 1990’s was linked to greater homelessness. Note, however, that the individual choice to become homeless is made possible by the rapid expansion of emergency shelters supplied by entrepreneurs. Even without forcing individuals into homelessness, entrepreneurs could (and did) increase the supply of homelessness by making a market for shelters and soup kitchens that dramatically lowered the cost of homelessness during this period.

In light of increasing homelessness and a wave of popular support for a new federal response, Congress passed the McKinney-Vento Homeless Assistance Act of 1987. The Act (currently still the central standing homelessness legislation) greatly broadened the scope of federal funding for homeless programs. The act solidified entrepreneurial expectations that those supplying services and shelter to enough individuals could gain. One particularly insightful

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<sup>27</sup> This broadening of the demographic base is consistent with the hypothesis that entrepreneurs increase the supply of homelessness once the condition is commoditized. Note that this hypothesis is not at odds with the notion that individual recipients also respond to increased benefits available by becoming homeless; such an effect is little different from response of the purchasers of TB sputum.

Congressman, David Dreier, even warned, “We are creating a permanent homeless infrastructure in this country” (Congressional Quarterly Almanac 1989). This assertion informs the market-making activity associated with the funding of shelters; entrepreneurs were rewarded for having larger shelters that served more individuals.

Homelessness had been officially commoditized, and entrepreneurs still continue to supply this condition. In 1999, an Urban Institute study estimated that there were 40,000 homeless assistance programs nationwide across 21,000 locations (Burt et al. 1999). This market was federally sustained; 77% of private, secular nonprofit assistance programs received at least a quarter of their budgets from federal funds (Burt et al. 1999, 14–11). A decade later, the homeless services workforce was estimated to be as large as 202,300 to 327,000 full-time employees across public, private, and nonprofit organizations (Mullen and Leginski 2010). Federal funding for the homelessness infrastructure reached \$5.1 billion in 2015; meanwhile, the best available homelessness estimates suggest a population of 564,000 as of January of that year. Lucas (2016b) presents evidence that federal funding causally increased homelessness in 2013; the entrepreneurial response to federal funding appears integral to this cobra effect outcome. Throughout this epoch of a federally-led response, entrepreneurs have emerged to serve and house the homeless with public funds, and “homelessness remains the seemingly intractable problem it was a century ago” (Neale 1997, 53).

### Soldier Remains in Southeast Asia

The Vietnam War claimed the lives of nearly 60,000 US soldiers, stretching over three countries (Vietnam, Laos, and Cambodia) and twenty years. A famously unpopular conflict among much of the US populace, the war, all told, is estimated to have claimed the lives of well over a million

individuals<sup>28</sup> across all belligerent parties while the US was most heavily involved in the war (1965-1974) (Lewy 1980).<sup>29</sup> Over 2,000 US soldiers were never accounted for in the thick Southeast Asian jungles (Anderson and Van Atta 1990).

Many suspected that some of the missing soldiers remained POW's even after the de-escalation of conflict in the region. As a result, POW advocacy groups in the United States pressured Congress to offer monetary rewards to the Cambodian government in exchange for living POWs. Twenty-one members of Congress pledged a total of \$2.4 million in order to buy back the missing soldiers. However, this news got garbled somewhere along the way to Southeast Asia. In the war-torn regions of Southeast Asia, rumors began circulating that the US government would be paying for the remains of fallen soldiers that had not yet been recovered (Anderson and Van Atta 1990).

The result of the widely spread rumor was the emergence of a market in human bones. A 1990 news article recounts the raid of a store in Ho Chi Minh City where entrepreneurs were reportedly selling MIA skeletons. Inside, authorities found remains from over 400 corpses (Schmetzer 1990).<sup>30</sup> Cambodian, Thai, and Vietnamese bone-sellers apparently believed that they would be able to find eager American buyers, as they frequently solicited US tourists with bone fragments for sale. Previously, peasants had eagerly scavenged the countryside in search of valuable scrap metal from military equipment that had been abandoned or had crashed during the war. Instead, as another newspaper reports, the expectation of a government bounty incentivized

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<sup>28</sup> These estimates typically also include the hundreds of thousands of civilians that were killed during the war.

<sup>29</sup> Estimates regarding the number of slain vary dramatically (oftentimes by over a million), but virtually every estimate puts the total number at over a million dead.

<sup>30</sup> Of these, only three were of non-Vietnamese descent; it is unclear whether or not these were indeed soldiers.

many poor Cambodians and Vietnamese to redirect their entrepreneurial efforts toward scavenging for human remains (Anderson and Van Atta 1990).

Cemeteries were raided for femurs and skulls (Schmetzer 1990). The market in human bones was sufficiently enticing that individuals also began supplying pig and chicken bones in an attempt to fool buyers who thought they were purchasing the remains of fallen American GI's. Accompanying the animal bones, the market often also saw trade in fake military identification tags—tags to which no known soldier could be linked (Anderson and Van Atta 1990) or which were duplications of the tags of living veterans (Schmetzer 1990). Like the feral pigs case in Fort Benning and the spit trade in South Africa, this case affirms that when genuine goods are prohibitively costly to supply and monitoring is costly, entrepreneurs may supply fraudulent, “imitation goods” alongside the genuine product.

This case is particularly instructive because it demonstrates the sensitivity of alert entrepreneurs to potentially profitable opportunities. In the preceding four cases, entrepreneurs only responded after government had intervened, thereby pricing a good which was previously unpriced. Here, the *mere rumor*—generating expectations of future profit opportunities—of government intervention was sufficient to generate market-making entrepreneurship.<sup>31</sup> Though there is no record of the federal government of the United States paying anything to retrieve the bones of fallen soldiers, the expectation of intervention proved sufficient to impel superfluous discovery—in the form of exchange of previously untraded cadavers.

## Conclusions

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<sup>31</sup> The role of expectations in generating economic phenomena is widely acknowledged and finds canonical expression in Hayek's (1943) “The Facts of the Social Sciences.” The expectations of economic actors play a central role in Higgs' (1997) explanation of depressed private investment during the Great Depression, Leeson's explanation of a host of superstitious behaviors (see Leeson 2012a, 2012b; Leeson and Coyne 2012), and the Baker, Bloom, and Davis (2015) analysis of policy-induced uncertainty shocks.

Our analysis has two main implications. First, government failure can be engendered by market-making entrepreneurship. When a state planner's end is to reduce the prevalence of something, paying private actors to remove that thing seems intuitive. However, because government subsidy creates a rent, such an intervention may entail paying private actors to produce and expand the supply of that resource. Entrepreneurial alertness to rent creation is resilient, and market-making is another example of how entrepreneurship is an endemic response to interventionist efforts. A significant dose of humility should precede any decision to hamper the market process by setting prices on goods not priced through voluntary interaction.

Second, the diverse nature of the cases presented suggests that the dynamics are more common than previously appreciated. Many potentially relevant cases remain underexplored. For example, Van Buren (2011) discusses how the US occupying force in Iraq quickly confronted a major problem: mountains of uncollected garbage. This posed both a public health and public safety risk; insurgents often used trash piles to conceal Improvised Explosive Devices (IED's). To cope with the problem, the US military force began paying Iraqi trash collectors a wage that was very high relative to alternative lines of employment. Van Buren suggests that this led Iraqis to increase trash production rather than to collect existing garbage (2011, 60). Entrepreneurial market-making may help illuminate cases like this within the dynamics of interventionism framework.

Government intervention is ostensibly aimed at improving social well-being. However, as the opening narrative of the British colonial leadership's venomous misadventure illustrates, well-intentioned efforts to correct "social ills" may backfire. The entrepreneurial response to make new markets is yet another mechanism that raises the cost of interventions and can engender government failure.



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