Crowdfunding Defense

**Abstract:** National defense is the hard case for the voluntary provision of public goods because without recourse to taxation it is difficult to overcome the free rider problem, much less provide defense superior to that of government provision because of the tremendous costs associated with national security and war-making. The theoretical explanations for how collective action problems can be privately solved have generally not been applied to national defense despite being applied to other public goods. I use the theoretical solutions to the collective action problem provided by Olson and by Hirshleifer to understand the extensive private provision of national defense by Ukrainian citizens in their war against Russian-backed separatists. By reducing the size of the population in question and focusing on “weakest-link” types of military capital, private defense charities attracted enough in donations to supply critical funding and military materiel in places the Ukrainian government had failed to do so.

**Keywords:** Public Goods · Voluntary Provision · Crowdfunding · National Defense

**JEL Codes:** D74 · D82 · D83
1 Introduction

Between February and March of 2014, Russia invaded and annexed Crimea from Ukraine, stoking the flames of pro-Russian movements in Ukraine’s eastern region of Donbass. Responding to these movements on April 9th, 2014 Ukraine’s acting Interior Minister declared that pro-Russian separatist protests would be brought to an end within forty-eight hours, either through negotiation or force. Twenty days later the separatists had captured their second regional capital, and as of August 2018, they still hold large swaths of the Donbass region. The political and military leadership of Ukraine had failed to carry out the most critical of the state’s duties: the provision of national defense. Given the externalities created by defense a lack of government provision of it should have resulted in a lack of defense overall (Samuelson 1954), and yet private Ukrainian citizens have contributed over $14.4 million ($6.6 million directly to the Ministry of Defence and 7.78 million to private military charities) to their common defense between 2014 and 2016. This paper addresses how they were able to solve the collective action problem and provide large-scale defense, something usually considered to be the purest example of a public good.

Ukrainians managed to mitigate the free rider problem by leveraging two solutions: reducing the size of the population receiving the public good of defense and facilitating donations to free-rider resistant public goods known as “weakest-link” goods. While the use of these solutions was common across Ukrainian military charities, their use is most pronounced in the Kickstarter-like Ukrainian defense crowdfunding website “People’s Project.” Donation records from People’s Project document the various forms these two solutions took as well as rates of success compared to not using these solutions. Vehicles for donations that reduced the size of the population receiving the public good and that offered weakest-link goods
outperformed those that did not and helped to contain the advances of insurgents receiving support from an aggressive foreign state. While the voluntary provision of defense did not replace government provision of defense, a Ukrainian government-sponsored defense think tank published a study stating that defense in Ukraine, especially in the early phases of the war, was mostly provided by volunteer soldiers and charitable donations (Gorlov and Korniesky 2015).

The existing literature often treats defense as the most obvious example of a public good (Samuelson 1976, Buchanan and Flowers 1975, Head and Shoup 1969, Coyne and Lucas 2016). The claim that a good is a public good depends in part on the institutional and consumptive context in which it is considered (Cowen 1985, Engerer 2011, Coyne 2015), and the efficiency of government versus voluntary provision of public goods depends in part on the costs and benefits of creating the government provider (Leeson 2007a). Private provision of public goods can be accomplished through “warm glow” mechanisms (Andreoni 1990, Bagnoli and Lipman 1992), but non-preference-based mechanisms exist in the form of reducing the size of the population receiving the public good (Olson 1965) and in leveraging weakest-link technologies (Hirshleifer 1983). Successful voluntary provision was demonstrated in goods such as lighthouses, lightships, firefighting, roads, policing, and law (Coase 1974, Candela and Geloso 2017, McChesney 1986, Klein 1990, Sklansky 1998, Benson 1989). Evidence from the laboratory on the viability of private defense provision is mixed (Arce et al. 2011, Harrison and Hirshleifer 1989). Real world evidence so far suggests voluntary donations to defense are limited in practicality to individual level wartime adventures rather than larger scale operations (Grove 2017). Alternative methods of voluntarily creating deterrence were explored by Leeson (2007b and 2008). The free rider problem plagues the production of national offense just as it does national defense and this reduces the amount of national defense necessary compared to that
required when facing a theoretical optimal level of national offense (Leeson, Coyne, and Duncan 2014, Leeson, Coyne, and Duncan 2016).

This paper contributes to the existing literature by applying theories of voluntary provision of public goods developed by Olson and Hirshleifer to make sense of voluntary defense provision in Ukraine’s war against separatist and Russian aggression. In doing so, it adds the hard case for public goods to the growing literature on the voluntary provision of public goods. Leeson (2014) argues that some cases of voluntary coordination are harder than others. Lack of ultimate recourse to the state in case of disputes makes voluntary provision hard, and the hardest case would be to show voluntary provision which outperforms government provision. The Ukrainian case shows voluntary provision of defense without recourse to government enforcement and which is superior to government provision on important margins, and it does so while expanding the scale of defense from the level of the individual or tribe to the level of the nation. I rely on Olson’s and Hirshleifer’s theories of voluntary public good provision because they best match the forms such provision took in Ukraine. Successful charities found multiple ways to reduce the size of the population consuming the public good. Additionally, out of a vast array of military capital that could have been funded, charities all tended to fund military capital intended to bolster the strength of infantry units which were the weak link in Ukraine’s defense apparatus.

I will proceed as follows. Section 2 will examine Olson and Hirshleifer’s theories of voluntary public goods provision and tailor them to the case of national defense. Section 3 will use those theories to explore and make sense of Ukraine’s voluntary efforts at national defense in the Donbass region. Section 4 will conclude with implications for the provision of defense.
2 Theories of Voluntary Provision of Public Goods Applied to National Defense

In theory, public goods will be underprovided because rational actors will prefer to free ride on the provision by others of a good that is non-rivalrous and non-excludable. If all actors behave this way the good will go unprovided, and if only some actors behave this way the good will be underprovided relative to the theoretical welfare maximizing level. The level of under-provision can depend on a variety of factors, one of the most important of which is the size of the population enjoying the public good (Olson 1965). Under voluntary provision the level of public good provision increases as population size increases, but the proportion of contributors decreases because the marginal impact of an individual contribution falls more quickly than the total population rises. This results in greater under-provision as population rises under the assumption that larger populations require higher levels of the public good than do smaller populations. The larger and more dispersed positive externality created by increasing the amount of a public good is more difficult to capture for any given individual. Conversely, as population size shrinks marginal contributions become proportionally more important and the positive externality created becomes easier to capture, helping smaller populations come closer to the lower level of public good that corresponds to their theoretical welfare maximizing level. A smaller population, and therefore a smaller requisite amount of the public good, also makes it more likely that a single actor or small group of actors will approach the socially optimal level of provision in the process of providing the good for their private consumption. Differences in willingness to pay for the public good of national defense in such actors can be attributed to having local investments that increase the marginal benefit of the public good to the investor, or to an increase in the marginal cost to the investor of failure to provide defense for their investments.
The extension of this concept to defense is more straightforward than the typical treatment of national defense suggests. First, externalities from defense may spread to an entire nation, but they are usually more concentrated around the particular cities or regions that aggressors have actually invaded or are likely to invade. Second, this reduction in the size of the population enjoying defense may result from the limited goals of the offense (acquisition of a province rather than a country, small punitive raids, etc) or the increasing marginal costs of extending an offense further into enemy territory (fuel, communications, rear security). Whatever the reason, anything that limits the threat to a smaller population requiring a lower level of defense should also encourage a greater proportion of that population to make the necessary donations to national defense.

Additionally, the cost of monitoring voluntary contributions and how they are spent falls as population size falls because there are fewer potential donors and coordinating agencies to track. This reduction in transaction costs reduces the overall cost of providing the public good and thus makes voluntary provision more viable. Monitoring costs in combat were explored by Tullock (1982) and Piano and Carson (2018), but monitoring costs are also an issue in non-combat voluntary contributions to defense. In the case of a missile shield that defends an entire nation the monitoring costs involved in ensuring that every citizen has contributed their part to the shield and in supervising the research and procurement process would be enormous. Altering the context to the defense of a particular city, however, reduces the size of the population enjoying the public good and therefore the associated monitoring costs. Monitoring costs can be further mitigated by focusing on monitoring the actions of the handful of private military charities that emerge to collect and distribute donations. By focusing on monitoring a comparatively small population of charities, the likelihood of detecting corruption goes up, and
therefore the cost of engaging in corruption for those charities goes up as well. As a result, donors can have a greater confidence in those charities that survive in this system and are likely to donate most heavily to charities that show they are trustworthy. The cost of monitoring voluntary contributions is further reduced where contributors reap additional benefits from the very act of contributing. This helps align their personal goals with the goal of providing national defense. For instance, a business may gain comparatively cheap advertising by donating and then making their charitable act known to patriotic potential customers.

Hirshleifer developed three categories of public good to reflect different constraints on provision: summation technologies, best shot technologies, and weakest link technologies. These different technologies help to explain variation in the free rider problem between different types of public goods. Summation technologies are provided in the usual way with the level of provision determined by the sum of all contributions. Voluntary provision of a summation technology results in under-provision relative to the theoretical welfare maximizing level because self-interested free riders reduce their contributions as population size increases, reasoning that doing so will have little effect on their personal consumption of the public good. A best-shot technology is one in which the level of provision depends on the maximum contribution made. For example, success in intercepting an incoming intercontinental ballistic missile effectively depends on the best missile interceptor fired at it. Best-shot technologies suffer the most of Hirshleifer’s three categories of public good from the free rider problem in the context of voluntary provision because as the size of the population grows new contributions are more likely to be closer to the previous average contribution rather than in excess of the previous maximum contribution. Imagine a population of $n$ where each individual $i$ in $n$ randomly contributes a value between 1 and 100 to the public good. If the previous best shot contribution
was valued at 95 then under-provision relative to population size as $n$ increases is very likely as contributions from any new $i$ are more likely to be valued between 1 and 95 rather than between 96 and 100.

A weakest-link technology is one in which the level of provision depends on the minimum contribution made. For example, a chain is only as strong as its weakest link. Another useful example is that of a pair of people consisting of a hunter hunting for meat and a gatherer gathering wood to cook the meat with. The level of the cooked meat is determined by the minimum contribution of the two. Adapting this constraint to defense, tanks can be dangerous weapons but often require support and screening by infantry units to prevent being surveilled and attacked by opposition infantry armed with anti-tank weapons. This is a simple example of what the military calls “combined arms operations” which produce a level of defense that is greater than the sum of its parts. In this context, the level of combined arms operations possible depends on the minimum contribution between tanks and infantry units. Infantry becomes the weakest link when there are too few soldiers to screen for all the tanks, leaving some tanks vulnerable. Weakest-link technologies suffer the least of the three categories of public good from the free rider problem in the context of voluntary provision because new contributions are more likely to be closer to the previous average contribution rather than below the previous minimum contribution. Again, imagine a population of $n$ where each individual $i$ in $n$ randomly contributes a value between 1 and 100 to the public good. If the threshold for successful provision is a minimum contribution of 5 then under-provision as $n$ increases is very unlikely as contributions from any new $i$ are more likely to be valued between 5 and 100 rather than between 1 and 4. The lower the minimum threshold the more affordable the public good becomes and the more likely it is to be successfully provided even by lower income societies.
When under-provision relative to the theoretical welfare maximizing level of provision does occur it can have several effects. In Hirshleifer’s best shot example of a missile interceptor, the difference between satisfactory provision and under-provision is stark: satisfactory provision results in the preservation of a city and under-provision results in the loss of a city. However, other possibilities exist. In the weakest-link example of a chain, under-provision of chain strength need not result in the destruction of the chain the way under-provision in the missile interceptor example resulted in the loss of a city. If the chain becomes weaker after the addition of a weaker link then, for example, it may no longer be strong enough to hold the anchor of an aircraft carrier but it may be sufficient to hold the anchor of a cruiser. In this sense, under-provision occurs relative to the preferred form or use of the public good and causes a shift to a less preferred alternative form or use. One possible shift is between different methods of warfighting. The Taliban, who initially resisted Coalition Forces with conventional methods and military capital, were forced to switch to less preferred insurgent methods and improvised explosive devices after discovering they lacked the resources necessary for their preferred form of national defense (Wood 2018).

Having developed the core characteristics of these three technologies Hirshleifer then posited a number of possible modifications to how they may operate in practice. Rather than depending on a singular minimum or maximum contribution the level of provision may depend on a range of maximum or minimum contributions. For instance, altering the minimum contribution needed for successful provision of a weakest-link technology from a value of 5 to instead be a range of contributions with values 5 through 10 does not change the fact that weakest link technologies suffer comparatively less from under-provision, only the degree to which they do. Using a range of contributions allows for switching into cheaper near substitute
inputs to the production of the public good without constantly having to shift between alternative forms and uses. To illustrate, the Russian AK-74U carbine is a cheaper close substitute for the American M4 carbine and the T-64 tank is a cheaper close substitute for the T-80 tank. Variation within a range of contributions may determine the model of gun or tank purchased without changing the overall method of warfighting.

Hirshleifer allows for other modifications to the core logic of his three technologies such as the level of provision being determined by the sum of contributions within a maximum or minimum range or by the average of contributions in those ranges. Another useful modification would be a requirement that a critical mass of contributions falls within a given range in order to ensure supply of the public good at the desired level. The critical mass requirement prevents a single below minimum donation from shifting the level of provision to a less preferred alternative while still allowing that shift to occur if a sufficient number of donations fall below the minimum threshold, preserving the core logic of a weakest-link technology. In the voluntary provision of defense, a single low contribution may not cause a shift from conventional war to guerilla war (especially given that offense also suffers from problems of under-provision) but a shift in the critical mass of contributions could have this effect.
Figure 1: An example of a range of possible methods of warfighting with associated minimum thresholds on a range of possible contributions between 0 and 100. Say a critical mass of contributions falls into the range necessary to fund conventional warfare. If the critical mass of contributions were to fall below the given threshold then the community of donors to the public good of national defense could shift to insurgent tactics or even to non-violent resistance before having to fully accept outsider rule.

The theories explored here help explain the peculiar ways in which Ukraine voluntarily provided defense. Donations mostly flowed to charitable activities that were able to limit the size of the population receiving the public good and to charities that demonstrated good faith in disbursing funds. Donations also flowed more to weakest-link types of military capital such as weapon accessories and personal armor, weak links in Ukraine’s production of combined arms operations. When the demand for defense proved to be greater than the level of defense provided by the Ukrainian government, private actors made up the difference in ways best explained by Olson’s and Hirshleifer’s theories.
3 Voluntary Provision of National Defense in Ukraine

Before going further, a brief bit of context is required to better understand why private Ukrainian citizens turned to voluntarily providing the kinds of defense that a government would normally provide.

3.1 Corruption and Failure to Provide Defense

Ukraine had hovered around the top 30-50 most corrupt countries in the world since 2008 and its legacy of corruption extended back to its history as a part of the self-dealing bureaucracies of the Soviet Union (Transparency International 2014, Akimenko 2018). The culture of corruption extended deep into Ukraine’s military, an area of government with a strong claim to secrecy which could easily be used to hide scandalous behavior. The Ukrainian military made extensive use of the “free” labor provided by their conscript soldiers to conduct repairs on their superior’s apartments, or to build houses for them. Falsifying housing contracts and rigging the bidding process for construction of housing for soldiers proved to be a profitable area for corrupt military officials. Bribes for selection to higher education within the military, or to potentially lucrative material management positions in peacekeeping operations were another common occurrence (Polyakov 2012). One of the worst avenues for corruption was the military’s “special fund.” The special fund was a way for the Ukrainian parliament to pass off up to half of the cost of funding the military on to the military itself which would make up the difference by selling off land and equipment (Akimenko 2018). The special fund, which still exists, suffers from extremely low oversight, poor bureaucratic management such that resources that could be sold are not, and from enabling the pursuit of kickbacks in the form of understating the sale price of the resources that do get sold (Polyakov 2012).
The result of this extensive corruption was not surprising. The Ukrainian military had withered by the time Russia moved on Crimea in 2014. One Ukrainian general described the Ukrainian military at the time as totally destroyed and demoralized (Torba 2017), with up to 75% of its equipment being technologically obsolete or in poor repair (Akimenko 2018), and this weakness signaled an opportunity to pro-Russian separatists in the East of Ukraine. The draftees Ukraine sent into the Donbass region to defend it were routinely issued little more than a rifle and would have to spend thousands of their dollars, or beg their families for thousands of dollars, to purchase items like armor plates, uniforms, weapon accessories, and winter gear (Lapko 2014). Without this kind of gear the ability of Ukrainian soldiers to perform their basic combat duties was severely inhibited.

Despite the pressure to win a war, the level of corruption in Ukraine remains high. It is the 50th most corrupt country in the world (Transparency International 2017a), and corruption in the military likewise remains high. For instance, military procurement officials were charged with embezzling funds through oil contracts (Reuters Staff 2017), with purchasing faulty ambulances for use on the front lines (Higgins 2018) where corruption had prevented proper mobile surgical units from being built and deployed (Peterson 2017), and with “losing” expensive night vision device mounts in the process of delivering them to the front lines (Transparency International 2017b). Ukraine’s nationalized defense industrial conglomerate, Ukroboronprom, has been the source of many scandals for Ukraine (Krushelnycky 2017, Peterson 2017, Ponomarenko 2017) and as of December 2017 Transparency International’s Independent Defense Anti-Corruption Committee has refused to continue to engage with Ukroboronprom due to lack of cooperation in establishing an independent supervisory board for the conglomerate (Transparency International Defence and Security 2017b).
Corruption led to a level of defense that was lower than it otherwise could have been and lower than official estimates implied. Ukrainian military assets held on paper did not necessarily reflect assets that could be used in an actual conflict. Several examples are relevant here.

Ukrainian tanks were, and mostly still are, either designs from the Soviet era or modifications to designs from the Soviet era. In addition to being old these tanks are known for breaking down at a high rate, suffering from comparatively high rates of engine fires, using dangerous and faulty auto-loaders, and a variety of other problems (Cockburn 1983, Perret 1987). Ukrainian infantry fighting vehicles, intended to quickly and safely move troops to and through combat, are likewise of old Soviet design. Problems with these designs included thin aluminum armor that was prone to melting when hit by heavier munitions or if the vehicle’s fuel reserves were struck, and a lack of proper ventilation that threatened passengers with overheating and allowed gasses from weapons fired from the relative safety of the vehicle’s interior to accumulate and poison passengers (Cockburn 1983). Infantry fighting vehicles were so dangerous to ride in that Soviet soldiers, and the Ukrainian soldiers unlucky enough to still use them today, preferred to ride on top of them fully exposed to enemy fire rather than ride inside them (Roblin 2017). These vehicles have repeatedly proven to be highly vulnerable to simple infantry units equipped with hand-held anti-tank weapons, rocket-propelled grenades, and even Molotov cocktails (Lengel 2017). When Russian forces attempted to take Grozny in December of 1994 the Chechen rebels they faced managed to destroy 225 Russian vehicles (including 62 tanks) in the first month alone using infantry equipped with these weapons (Grau 1997). Separatist forces in the Donbass region have been able to impose losses on Ukrainian armor in a similar fashion with their own infantry based anti-armor weapons (Ricks 2015). The Ukrainian Air Force, which like the rest of the Ukrainian military was poorly equipped and trained, lost nearly half its aircraft to a combination
of disrepair and separatist infantry equipped with surface-to-air missiles in the first year of conflict (Axe 2015). By February 2015 the Russian-backed separatists had forced the Ukrainian Air Force to cease operations over the battlefield (Daadler et. al. 2015) by leveraging surface-to-air missiles (Jane’s 2017). Appropriately equipped separatist infantry proved to be a serious challenge for the Ukrainian military, especially given that they were fielding under-equipped infantry to attempt to support their own military vehicles and counter separatist infantry with. Additionally, Ukrainian communications equipment, a weak link connecting different units to one another and thereby facilitating combined arms operations, was underfunded and often hacked or jammed (Daadler et. al. 2015, Ricks 2015).

These examples help demonstrate that despite the annual expenditure of billions of dollars (for example, $3.5 billion in 2015 and $3.4 billion in 2016) on defense the Ukrainian government is not producing an amount of defense commensurate with their investment. In fact, their focus on paying for expensive armor and aircraft and their failure to raise an adequate number of infantry units and to equip those units with basic gear and anti-armor weapons (70% of Ukrainian infantry fired anti-armor missiles did not work as of early 2015) produced a military that seemed capable on paper but was dysfunctional in practice (Lapko 2014, Daadeler et. al. 2015, Klein 2015). Without a functioning core of infantry to support them Ukrainian military vehicles proved highly susceptible to separatist forces. In order for voluntary provision of defense to improve on government provision of defense with a budget of only millions that money would have to be spent on the correct types of military inputs, the kinds of gear that enable a higher level of combined arms operations and prevent the rapid loss of more expensive inputs like military vehicles.
It may be argued that voluntary provision along these lines, even if successful, is irrelevant in the face of significant escalation by a large foe like Russia. This logic also allows for the dismissal of defense provision by the Ukrainian government which has a smaller economy and military than Russia, but more importantly it ignores the costs associated with escalation. Sufficient escalation may draw an international response in reprisal for violation of norms or because it creates favorable conditions for opportunistic third-party nations (Leeson, Coyne, Duncan 2014) and these reasons appear to be enough to cause Russia to and mask its support for the separatists. However, there are also enormous costs associated with occupation as attested to by the failed Soviet occupation of Afghanistan as well as American failure in Vietnam and the poor forecasts for efforts in Iraq and modern-day Afghanistan despite trillions of dollars spent. These experiences suggest escalation to levels of defense where voluntary provision of the type discussed here may become ineffective also comes with prohibitively high costs imposed by a shift to combating insurgents.

This brief history of corruption in Ukraine’s military and defense industrial sector, which has persisted even in the face of the incentives provided by war to reform, gives context to Ukrainian citizen’s voluntary contributions to their defense. In the face of government failure to provide defense, Ukrainians found an opportunity for institutional entrepreneurship. By creating organizations that were capable of channeling Ukrainian willingness to donate to their common defense while avoiding the slow bureaucratic processes of acquisition and distribution, as well as the corruption associated with those bureaucracies, a system of voluntary provision of defense was able to emerge.

3.2 Voluntary Donations to Public and Private Charities
Ukrainians were not especially known for their charitable contributions before war broke out in 2014. Of 135 counties analyzed in Charities Aid Foundation’s World Giving Index 2013 Ukraine ranked 102\textsuperscript{nd} overall, and 122\textsuperscript{nd} in monetary donations. According to Gorlov and Korniesky (2015), the biggest charitable movement in Ukraine before the outbreak of war was a swell of volunteers for the 2012 European Football Championship. After losing Crimea and facing violent separatists in the East, however, charitable contributions rose significantly. According to the World Giving Index 2017, Ukraine ranked 90\textsuperscript{th} in overall giving and 58\textsuperscript{th} in monetary donations.

Within days of Russia moving on Crimea the Ukrainian military was pleading for 5 UAH (fifty cents) donations through a mobile texting campaign, which allowed for multiple donations, from Ukrainian citizens anywhere in the country. These donations would directly support combat operations against Russia and the growing insurgency in the East (BBC Monitoring 2014). The texting campaign started off strong on March 18\textsuperscript{th}, 2014 pulling in over two million dollars in donations within the first 5 days, and that total rose to over 4 million dollars by May 7\textsuperscript{th}, 2014 (Ministry of Defence of Ukraine Facebook 2014). The total level of donations increased at a decreasing rate throughout the life of the campaign, totaling $6,566,983 million by May of 2015 and increasing only to $6,624,475 million by November of 2015 when reporting on the campaign stops (Ministry of Defence of Ukraine 2015a, Ministry of Defence of Ukraine 2015b). It is surprising that Ukrainians donated to an organization known for its corruption, though they likely held out hope that facing a real threat would align the military bureaucracy’s interests with their own. The sharp falloff in the rate of donation after May 2014 is the expected outcome given that corruption proved resistant to the shock of war. Donations to both public and private charities have fallen off as the war has reached a low intensity stalemate and as formal defense
spending in Ukraine has risen, but while donations to public defense charities appear to have ceased in 2015 donations to more reputable private charities continue to this day.

Besides how lucrative it is, one other factor has made military corruption difficult to stamp out in Ukraine. Ministry officials stationed in Kiev (over 700 kilometers West of the fighting) were unlikely to suffer the consequences of their sapping of Ukrainian defense capabilities, especially because the separatist movement is concentrated among the areas with the largest populations of ethnic Russians. Violence in the service of ethnic separatism tends to depend on having large and concentrated groups of the ethnicity seeking to alter borders (Shughart 2006). Given that pro-Russian separatists have fewer ethnic Russians to try to recruit the further West into Ukraine they move, corrupt officials had some assurance that they could continue to externalize the costs of their corruption onto citizens in the East who are directly impacted by the fighting.

Before considering the impact of donations to private organizations, it is worth noting that donations by individuals to the text campaign accounted for slightly less than one quarter of total donations with the other three quarters coming from Ukrainian businesses (Boeselager 2014). This kind of disparity in giving between individuals and businesses is in keeping with Olson’s theory of voluntary provision wherein differences in local investments cause certain actors to receive greater utility from the public good in question and therefore to provide more of it than other actors. In this case, businesses owners made larger investments in threatened areas than non-business owners in those areas and therefore had a larger pool of wealth to protect. The larger donations to Ukraine’s national defense made by business owners, even though non-business owners and non-donors were able to free-ride on them, were actually a rational response to the greater losses war would impose on them. The greater losses I refer to here are not in
proportional terms. Wealthy business owners are more likely to have diversified investments and therefore are better able to absorb the loss of any one investment. The sheer amount of money they would be willing to spend to protect something like an industrial site with a high net present value, however, represents a far larger contribution than that made by a poorer citizen whose contribution is a larger proportion of their wealth because they are comparatively heavily invested in the threatened area. This disparity is reflected by the especially large donations made by Ukraine’s wealthiest citizens, many of whom had large and valuable investments such as factories and ports in the war torn areas (Sefarin 2015). One billionaire, Igor Kolomoisky, spent ten million dollars a month funding a personal army of two thousand active fighters (with another twenty thousand fighters in reserve) to help secure the city of Dnipro (Hirst 2015).

Data on total donations made by citizens across Ukraine to private organizations funding their defense is hard to come by. Some organizations do not make their financial reports publicly available, some are incomplete, and most miss valuable contributions in the form of volunteer labor (vehicle mechanic services, sewing of ghillie suits, transportation of gear, etc…). Those records which are available show that between 2014 and 2016 donors contributed 7.78 million (2018) dollars (Cruicshank 2016, Ukrainian Freedom Fund 2018, Army SOS 2018, Sister-Mercy 2018, Come Back Alive 2018) to private agencies. Unlike the military’s text campaign, donations to private charities are still made to this day. However, I only consider donations made between 2014 and 2016 for purposes of direct comparison to the text campaign funding government provision of defense. Increased access to records, including records from major medical efforts, and better accounting of the full range of volunteer efforts would show a level of support for private organizations which is even higher. That donations to private organizations outpaced direct donations to the Ukrainian military is a predictable consequence of two factors.
First, the extensive corruption in the Ukrainian military decreased the probability that a donor’s money would actually go towards defense and therefore reduced their expected payoff of donating through the text campaign. Second, the text campaign lacked mechanisms for reducing the size of the population receiving the public good and for better encouraging donations by offering choices in the types of military capital funded. While even a full accounting of private donations would show levels that are only a fraction of formal defense spending, the fact that private spending was not severely hampered by corruption or the excessive purchase of expensive and vulnerable capital helped to effectively shrink that gap.

With this historical context in mind, the theories explained in section 2 will now be used to help explain evidence from People’s Project, the largest of the private organizations making donations to Ukraine’s defense efforts. People’s Project alone accounted for $5.36 of the $7.78 donated between 2014 and 2016, is still in operation, and provides clear and powerful support for the theories articulated by Olson and Hirshleifer.

3.3 Limiting the Population Receiving Defense
Figure 2: A map of Ukraine’s provinces with the ATO stretching across the provinces of Luhansk, Donetsk, and Crimea outlined in black. As of August, 2018 Ukraine, has not attempted to retake Crimea. ATO borders were taken from liveuamap.com, and the map comes from d-maps.com.

According to Olson’s theory of voluntary public goods provision, there should be more public goods provided in areas where the population is smaller and, therefore, the externality and monitoring cost generated are smaller. By reducing the scale of defense from the national level to the level of the region, city, or even city subsection the public good of defense can take on the characteristics of excludability and rivalry in consumption.

The war in Ukraine centers on the Luhansk and Donetsk provinces of the Donbass region, specifically the eastern portions of those provinces. The area actively being fought over
by Ukrainian armed forces and Russian-backed separatists is known as the Anti-Terrorist Operation (ATO) zone. The rough borders of the ATO have grown, shrunk, and shifted over the course of the conflict but these changes have been tracked through the news media and resources such as Liveuamap (2017), the Institute for the Study of War’s Ukraine Project (2017), and the Center for Strategic and International Studies’ Ukraine Crisis Timeline (2017). For Ukrainians directly affected by the fighting the tracking of where fighting is occurring can be done by first-hand knowledge of local events, word of mouth, and social media. Having access to free information provided by third parties and or having access to reliable local information helped donors know when to increase their contributions as war spread to areas that disproportionally affected them. Knowing in detail the boundaries of the fighting made it possible to reduce the question of Ukrainian national defense down from the defense of 24 total provinces to just the 2 provinces actually threatened, and to identify which Ukrainians could be reasonably excluded from receiving defense. This concentration of benefits was reinforced by the fact that pro-Russian separatists depended heavily on having support from the larger ethnically Russian populations found in Ukraine’s East (Fisher 2013), and on the limited ability of separatist forces to expand too deeply into Ukraine. This latter reason results from the separatist’s limited access to military capital and the difficulty separatist armor has in safely massing for offensive maneuvers (Fiore 2017).

All this information was critical for donors wanting to ensure that their donations went towards funding defense efforts in the ATO and not military forces in non-threatened areas of Ukraine, to forces engaged in international military exercises, to international peacekeeping operations, or to administrative requirements and corrupt military officials. People’s Project offers donors and project managers a variety of ways to shrink down the population receiving the
public good and the positive externality created by it, allowing donors to take advantage of excludability and rivalry in consumption to solve their collective action problem.

Since the ATO represents a much smaller portion of Ukraine, and since smaller populations tend to manage the free rider problem better, more funding went towards projects funding units operating somewhere within the ATO than to units fully or partially outside of the ATO. Projects funding needs outside the ATO could have gone to Ukrainian military units in unthreatened provinces, or to units serving in international peacekeeping operations, or to administrative units, all of which would have been undesirable for donors seeking to increase defense in the provinces of Donetsk and Luhansk. Of ninety-six military-related projects surveyed on People’s Project, only 8 could potentially fund units or activities outside the ATO. These projects included items such as tablets loaded with topographical maps and first aid literature, combat boots, and field hospitals. These items were very likely intended for use within the ATO but were not counted as such because the project descriptions did not explicitly say so. Of the ninety-six projects surveyed, twenty-seven were explicitly stated to be for efforts within the ATO in general (People’s Project 2018). That the number of successful projects providing inputs into defense more than tripled when donors could be properly assured that their resources would go towards creating a more easily captured defense externality is in keeping with Olson’s theory of voluntarily provided public goods.

The number of successful projects grows when the area being defended shrinks down further. Where funding for inputs to defense headed for the ATO could be sent anywhere within several hundred square kilometers, funding provisions for a particular military unit or for the defense of a city better concentrates the externality donors create. There are no broad projects intended to provide defense for the province of Donetsk or the province of Luhansk, but there are
projects devoted to the defense of particular cities or locations within those provinces. The city of Donetsk, the airport outside of the city of Donetsk, and the city of Mariupol have all had successful projects started in their name (People’s Project 2018). Projects for particular locations are one way to capture some of the externalities created by defense, but projects for individual military units proved to be the more commonly used method.

People’s Project facilitated the flow of funds to individual military units by listing the names of those units directly in the project’s name or description. Unit names alone do not tell someone wishing to donate to the unit providing defense they could benefit from where in the ATO that unit is, but it does give critical information that can then be used to find that unit’s location. Using resources such as “The Order of Battle of the Ukrainian Armed Forces” (Holcomb 2016), The Ukraine Crisis Timeline (Center for Strategic and International Studies 2017), People’s Project News Feed (People’s Project 2018), news media reports from sources such as The Independent, Ukraine Today, the Kiev Post, and social media (Cohen and Green 2016), interested parties could track the location of units in their area and thereby more precisely target their donations to better capture any externalities created. The majority of the military-related projects posted to People’s Project list the units that will receive the funds raised. Of the ninety-six projects analyzed, forty-three featured the name of the brigade, battalion, training command, ship, or other unit receiving support. If the number of projects limited to supporting military operations in the ATO more broadly are combined with the number of projects supporting specific locations or specific units with known or discoverable locations, then 72% of all projects analyzed utilize some technique for increasing excludability by reducing the size of the population (People’s Project 2018).
Additionally, most projects have a project coordinator that concerned donors can contact directly through People’s Project’s website. This offers another avenue for discovery of where capital and supplies will flow to as the project receives funds, even when a location or unit name is not explicitly given.

3.4 Ways in Which Monitoring Costs Were Reduced

Monitoring of charitable organizations related to defense is a chief concern for Ukrainians seeking to crowdfund their security. While Ukrainian billionaires acted as both principal and agent in raising and distributing their funds to secure their desired level of defense, average Ukrainian citizens depended on pooling their wealth with one another and giving it to third parties who promised to distribute it according to their wishes. The opportunity for corruption in the provision of defense was already well known to Ukrainians by the outbreak of the war. To attract donations, then, private crowdfunding organizations could differentiate themselves by being transparent and thereby lowering monitoring costs for potential donors (Cruicshank 2016). Since transparency is desirable to donors, who unlike taxpayers can withhold funding from organizations known to misuse funds, private crowdfunding organizations have an incentive to make records of the money they receive and how they spend that money available for scrutiny.

Unsurprisingly, the organization most successful in attracting funding was also the organization that pursued transparency most aggressively. People’s Project makes public records of its activity down to the level of individual projects and submits its tax forms for review by Ukraine’s Forum of Chairs and Ernst and Young. Each project has a report page with individual contributions tracked by donation amount and date. Spending on each item is similarly tracked, the percent of the project completed is given, and so is the contact information of the project coordinator. This approach helps donors know where their money is going and has helped
People’s Project earn the top award for transparency for charities giving over 10 million UAH to defense by the Forum of Chairs in 2015, 2016, and 2017 (People’s Project 2017a). These awards signaled trustworthy performance as evaluated by the third party independent auditors from Ernst and Young, one of the four biggest international accounting firms in the world. Having such recognition from outside auditors, combined with the recognition of the charity’s effectiveness by the Ukrainian government’s National Institute for Strategic Studies, helped to signal to potential donors that their money would be well used, reducing the cost of searching for reputable organizations to receive their donations.

Businesses have an incentive to donate to patriotic causes because of the positive news, and therefore advertising, this generates for them. Examples of businesses responding to this incentive can be seen operating in Ukraine with businesses receiving mention in reports or on People’s Project’s Facebook and Twitter pages (Koval 2016, People’s Project 2017b, People’s Project 2018), but some level of anonymity and safety seems to be more commonly preferred amongst donors. People’s Project also has a system built into its project report pages whereby donors could identify themselves to interested monitoring parties. The report pages on each project track donor information in the form of a randomly generated donor identification number emailed in full to the donor and which the last four digits of are displayed on the report page along with the date of donation and donation amount. This system could be used to aid in monitoring voluntary donations by checking the donation confirmation email against the report page while also helping to safeguard donors against the discovery of their identities by hostile forces, though at the time of writing I have been unable to find direct evidence that the system was used in this way.

3.5 Ukrainians Predominantly Funded Weakest Link Technologies
Another way Ukrainians increased the voluntary provision of public goods was to focus on funding weakest-link projects. Approximately 83% of the projects on People’s Project, whether intended for use across the ATO or for use in specific locations or with specific units, use their crowdsourced funds to purchase supplies and capital that bolster the weakest links in the provision of defense. Ukraine produces defense by combining a variety of heterogeneous human and physical capital, mitigating the weaknesses and amplifying the strengths of any particular input used. Combined arms operations are subject to the logic of a weakest-link analysis because, like Hirshleifer’s hunter-gatherer example, the level combined arms defense produced is limited by the least contributed to input. In practice, the weakest-link in the Ukrainian military was its infantry.

Defense analysts pointed to Ukraine’s lack of properly equipped infantry as a major factor in the ability of Russian-backed separatists to knock out two-thirds of Ukraine’s armored vehicles by the end of the Summer in 2014. Separatist success, in contrast, was attributed to their ability to use tanks, infantry, and artillery in an effective combination (Dorell 2015). When fighting broke out Ukraine only had 6,000 combat ready personnel from its nominally 24,000 strong joint rapid reaction forces. The remainder of Ukraine’s joint rapid reaction forces were only 20% manned and 60% equipped (Klein 2015). Provision of supplies for Ukraine’s under-equipped infantry was successfully taken up by private military charities, particularly People’s Project. This success was inhibited by legal restrictions against charities purchasing actual weapons, though it is reasonable to conclude that the voluntary provision of basic infantry gear relaxed the budget constraint on government provision of infantry weapons.

While many charitable projects are nominally different from one another, such as projects that raise funds for a unit of marines, or for paratroopers, or for the defense of an airport, in
reality they tend to raise funds for similar items. These items are usually the very things draftees found themselves having to purchase because of a lack of provision from Ukraine’s corrupt Ministry of Defence. This gear includes camouflage uniforms, winter gear like jackets and gloves, body armor, ammunition magazine pouches and other items necessary for a squad of soldiers to fight effectively (People’s Project 2018). These items represented a very low minimum threshold for a critical mass of donors to have to clear, with most pieces of gear priced between a couple of dollars and a couple hundred dollars. Provision of such cheap inputs was, therefore, easier to achieve under a scheme of voluntary donations.

The project “People’s AK Tuning”, raised funds for modular add-ons to standard issue AK-74s and AK-74Us. This single project provided over 2,000 upgraded rifle accessories and it was only one of many other projects that provided similar items. These upgrades improved the stability, sights, and magazine capacity of Ukrainian rifles and improved the ability of infantry units to use more sophisticated tactics and to challenge separatist infantry in cover dense urban environments like those being fought over in Eastern Ukraine. The project “Tactical Rifle Slings” alone provided over 1,000 rifle slings. Another charity, Wings Phoenix, provided 1,000 bulletproof vests to the front lines in the first two months of the war (Patrikarakos 2014). As described by Klein (2015), Ukraine’s rapid reaction forces being 60% equipped could mean that, for example, these forces were missing as many as 7,200 units of body armor. In this context, the contribution of thousands of units of critical gear goes a long way towards improving Ukraine’s under-equipped infantry.

Other projects contributed to raising the minimum level of defense in different ways. The project “People’s Blindage” raised funds for underground wood framed bunkers (People’s Project 2018). These blindages keep soldiers warm when they are not engaged in fighting, and
serve as a safe place to take cover during enemy bombardment. Wood blindages help soldiers meet their minimum needs for operability in the field at a lower cost than concrete or metal bunkers, an ideal combination for voluntary provision. The effect of such a project was to safeguard Ukraine’s crucial infantry forces so that they could combine with military vehicles to raise the minimum level of defense provided. The projects “People’s Ambulance” and “Bloodmobile” helped to do the same by remedying Ukraine’s lack of medevac capabilities for soldiers injured on the front lines. The project “Heaters for the Army” provided one hundred diesel heaters to keep frontline troops warm during harsh Ukrainian winters. The fact that so many nominally different projects actually funded Ukrainian infantry requirements is in keeping with Hirshleifer’s theory about which public goods succeed under a scheme of voluntary provision.

Also in keeping with Hirshleifer’s theory was the dearth of projects funding best-shot military equipment on People’s Project. Hirshleifer preferred the example of a ballistic missile shield but there are other best-shot technologies which would be highly valuable to Ukraine. As Fiore (2017) described, separatist forces are highly dependent on vulnerable command and control nodes. These nodes are essentially out of reach for all but the Ukrainian Air Force, which is currently too vulnerable to separatist air defenses to use. Ukrainian aircraft over the Donbass region are not challenged by separatist aircraft but rather separatist surface-to-air missiles, and survivability against these missiles essentially depends on the best countermeasures used. Stealth technology, which the American B-2 demonstrated is capable of bypassing heavy air defenses (Air Force 2015), suits this purpose. A more realistic option for Ukraine would be to outfit their Air Force with a sufficient number of flares and chaff, a technology they already possess. While People’s Project successfully funded two projects to help equip combat aircraft, the items funded
were flight uniforms and navigation systems rather than the countermeasures needed for defeating separatist air defenses (People’s Project 2018). A lack of projects for such critical equipment fits well within Hirshleifer’s framework.

4 Conclusion

Ukrainians also provided voluntary defense on other margins. Volunteer battalions, self-organized and equipped, operate alongside formal Ministry of Defense run battalions (Cohen and Green 2016) while websites that facilitated information sharing between private citizens created a decentralized and publicly available intelligence network (Stopterror 2018). The scope for voluntary provision of defense is larger than was previously understood in defense economics. Voluntary provision is not only an effective substitute for the public provision of defense by corrupt governments, it is also a viable means of resisting larger opponents in part because it signals an engaged citizenry more likely to wage a protracted and costly insurgency if violence escalates sufficiently. The potential for crowdfunding war is something both the economics profession and policymakers must consider, especially when evaluating the strength of the defending party as crowdfunding is more likely to be used by a citizenry motivated by their proximity to actual fighting. This analysis casts doubt on the ability to reliably estimate strength with proxy indicators like the defense budget, on the necessity of intervening on behalf of a weak state which may develop defense crowdfunding, and on the confidence with which invasion and occupation can be recommended against populations capable of defense crowdfunding.
References


https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104482/b-2-spirit/


http://armysos.com.ua/zviti


https://warisboring.com/ukraine-has-lost-half-its-warplanes/


BBC Monitoring, (2014). Ukraine: Army Raises $1m Via Text Appeals for Funds. BBC.


https://news.vice.com/article/ukraines-army-crowdfunds-over-2-million-to-use-against-putin


Center for Strategic and International Studies, Russia and Eurasia Program (2017). The Ukraine Crisis Timeline. Center for Strategic and International Studies.

http://ukraine.csis.org/index.htm#514


Come Back Alive, (2018), About the Foundation.
https://savelife.in.ua/about/


http://www.benning.army.mil/armor/eARMOR/content/issues/2017/Spring/2Fiore17.pdf

https://www.washingtonpost.com/news/worldviews/wp/2013/12/09/this-one-map-helps-explain-ukraines-protests/?noredirect=on&utm_term=.49e9dc411a76


https://fas.org/publications/issue-briefs/


http://www.understandingwar.org/sites/default/files/ISW%20Ukrainian%20ORBAT%20Holcomb%202016_0.pdf


http://www.understandingwar.org/publications?type%5B%5D=backgrounder&type%5B%5D=map&type%5B%5D=other_work&type%5B%5D=report&tid%5B%5D=300&field_lastname_value=&sort_by=created&sort_order=DESC


https://www.janes.com/images/assets/966/75966/Running_hot_and_cold_The_potential_for_a_frozen_conflict_in_eastern_Ukraine.pdf


https://www.foi.se/download/18.2bc30c9b157f5e989c3181f/1477482863677/RUFS%20Briefing%20No.%2027%20.pdf


http://forbes.net.ua/magazine/forbes/1416285-veryu-ne-veryu-bioteh-reabilitaciya-ranenyh


http://www.historynet.com/taming-chechnya.htm


https://liveuamap.com/


https://www.facebook.com/modukraine/photos/a.1420185801565046.1073741828.1420141588236134/1432948886955404/?type=3&theater


People’s Project, (2017a). *People’s Project has Been Named a Leader Among Charity Initiatives Again*. People’s Project News Page.

People’s Project, (2017b). *People’s Project Transmit High-Tech Equipment to Snipers*. People’s Project.


http://www.newsweek.com/ukraines-war-against-putin-backed-rebels-being-undermined-corruption-649756


https://www.forbes.com/sites/tatianaserafin/2015/03/02/cost-of-war-on-ukraines-billionaires-and-the-country/#3713d1f66a33


http://www.sister-mercy.com.ua/nasha-divalnist/zviti


https://stopterror.in.ua/

Torba, V., (2017). Victor Muzhenko: “There is a factor that the enemy did not expect. This is a Ukrainian character”. Day.

https://day.kyiv.ua/ru/article/podrobnosti/armiya-voyna-ekzamen


https://www.transparency.org/cpi2014

http://ti-defence.org/excessive-secrecy-weak-planning-undermine-effectiveness-international-assistance/

