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Violence amidst virus: A Game-theoretic exploration of conflict during a pandemic

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VIOLENCE AMIDST VIRUS: A GAME-THEORETIC EXPLORATION OF CONFLICT DURING A PANDEMIC

ABSTRACT. This paper explores how the COVID-19 pandemic is affecting conflicts worldwide. On one hand, confrontation would expose both states and violent non-state groups to contamination, potentially causing massive loss of human lives. Moreover, attacks aimed at signalling discontent or making bigger demands, are unlikely to generate media and diplomatic attention at the level it otherwise would have, sans the pandemic. Hence there might be a mitigation in the intensity of conflicts. On the other hand, the capacity of the states to retaliate will, to a large extent, be compromised, since huge financial and human resources will have to be dedicated to fighting the widespread health and economic effects of the pandemic. Hence the belligerent groups may have greater incentive to launch attacks. This paper attempts to game-theoretically study these various issues and incentives facing the conflicting parties, under the threat of COVID-19. We consider the simple conflict model by Hirshleifer (2) and augment it by introducing possible effects that a raging pandemic might impose on the conflicting parties. Specifically, we introduce positive and negative externalities that a pandemic may impose on an existing conflict and explore parametric conditions under which it is likely to aggravate or mitigate. We find that conflicts are generally likely to lessen but may increase under specific circumstances. We present some narrative evidence on how conflicts seem to have ameliorated in a pandemic-stricken world.

1. INTRODUCTION

“The fury of the virus illustrates the folly of war”. (UN Secretary-General António Guterres, March 23 2020)

The current COVID-19 pandemic has ushered in a paradigm shift in our thinking and predictions about almost all events, including conflicts. On one hand, confrontation would expose both states and violent non-state groups to contamination, potentially causing massive loss of human lives. Moreover, attacks aimed at signalling discontent or making bigger demands, are unlikely to generate media and diplomatic attention at the level it otherwise would have, sans the pandemic. Hence there might be a mitigation in the intensity of conflicts. On the other hand, the capacity of the states to retaliate will, to a large extent, be compromised, since huge financial and human resources will have to be dedicated to fighting the widespread health and economic effects of the pandemic. Hence the belligerent groups may have greater incentive to launch attacks. This paper attempts to broadly study these various issues and incentives facing the conflicting parties, under the threat of COVID-19.

In a recent journalistic account, the apprehensions were well expressed by the following:

Syria, Libya, Yemen, Afghanistan, the Sahel... with the great powers focused intently on the COVID-19 virus, will armed conflicts across the world

decrease in the severity or intensify? Experts, as well as diplomats at the United Nations, say there is a serious risk of the latter¹.

They go on to explain the reason for why diplomats and experts fear an increase in conflicts - when governments, and international organizations are all preoccupied managing the outbreak of a pandemic of such proportions, the level of diplomatic attention and potential retaliation to incidences of violence, will be seriously compromised to say the least. Incidences of violence that would otherwise have drawn widespread international criticism and condemnation, are likely to generate lesser attention and flak, now that greater perils are to be dealt with.

For guerrilla fighters and extremist groups, “it’s a clear godsend,” said Bertrand Badie, a specialist in international relations at France’s Institute Political Studies (Sciences Po)².

Other scholars have had similar apprehensions (see Yüksel et al. (6), for example) that many conflictual situations will see an aggravation in conflict. However, contrary to apprehensions, not all violent conflicts in the world have aggravated and in fact, in some instances, there has been a definite move towards its amelioration. In a long-standing conflict in Yemen, Saudi-Arabia has called for a ceasefire. An India-China standoff along the border got settled non-violently. And Israel, has for the time being deferred its plan for annexation of parts of Palestine.

In this paper, we consider the potential impact of a pandemic on conflict and explore parametric conditions under which a conflict is likely to aggravate and those under which it is likely to mitigate. We consider the simple conflict model by Hirshleifer (2) and augment it by introducing possible effects that a raging pandemic might impose on the conflicting parties. The way we do so is as follows: conflict under a pandemic can potentially pose two kinds of externality - positive and negative.

Negative externality involves any and all kind of spread of disease in one’s own territory that are brought about by engagement with one’s opponent (and appropriation of an aggregate, part of which is contributed by the opponent). On the other hand, since the opponent also suffers from the same fate of having to cope with the disease and has possibly invested in medical supplies, R& D to develop vaccines, etc. in fighting the disease, appropriation of its resources would mean gaining access to some of those as well. In other words, other than

¹ “Will coronavirus slow the world’s conflicts or intensify them?” AFP, United Nations, March 22 2020, <https://www.deccanherald.com/international/will-coronavirus-slow-the-worlds-conflicts-or-intensify-them-816448.html>. (Accessed on July 14 2020)

²Ibid reference in footnote (1).

what usual conflict involved, there is now the possibility of both a good and a bad spillover occurring.

We find that under most of the parametric restrictions, conflict is likely to have fallen below pre-pandemic days, though it could increase in certain cases. We discuss some narrative evidence on cases where conflicts have fallen post-pandemic like in Yemen and along the India-China border recently.

1.1. Related Literature. From a general perspective, this paper would fall within the purview of the literature looking at various kinds of conflicts. To the extent that it relates to issues of spill-over in conflict, it resonates closely with the huge literature on terrorism, especially those that look at transnational terrorism, having cross-country spillovers (see Sequeira and Sandler (4), for example or Chang et. al. (1) which explores conditions under which ‘territorial conflict between two parties is less likely to persist indefinitely’).

From a modelling perspective, it directly builds on Hirshleifer’s (2) model and uses standard political economic tools (see Persson and Tabellini (3), for example) like contest success functions (see Skaperdas (5)). A fuller literature review is not presented here in the interest of space and with the view to keeping the paper short.

The rest of the paper is organised as follows: Section 2 presents the model, section 3 presents the narrative evidence and section 4 concludes.

2. THE MODEL

2.1. The Basic Conflict Model. We first outline the basic Hirshleifer (2) set-up and then compare it with the augmented model in the next subsection. Two players are contending each other to divide some aggregate output. Specifically, player $i = 1, 2$, must divide its exogenously given resource $R_i, i = 1, 2$, between productive effort E_i and fighting effort F_i , such that $E_i + F_i = R_i, i = 1, 2$. The productive technology is summarised by an Aggregate Production Function that combines efforts E_1 and E_2 to generate aggregate output that is up for divide between the players. Let the Aggregate Production Function be given by³:

$$(1) \quad I = A(E_1 + E_2).$$

Hence the production function exhibits constant returns to scale. And A is the technological productivity factor - with technical progress, as inputs become more productive, A increases.

³In Hirshleifer (2), the formulation is $I = A(E_1^{1/s} + E_2^{1/s})^s$. Hence the production function exhibits constant returns to scale and constant elasticity of substitution. However, in the analytical solution arrived at thereafter and analysed, s is assumed to be 1, an assumption we make right at the outset.

The technology of conflict is laid down by the Contest Success Functions (CSFs), that translate the fighting efforts to the distributive shares p_1 and p_2 , given as follows⁴:

$$(2) \quad p_1 = \frac{F_1^m}{F_1^m + F_2^m},$$

$$(3) \quad p_2 = \frac{F_2^m}{F_1^m + F_2^m},$$

such that $p_1 + p_2 = 1$. Finally, the incomes accruing to the two contending players are given by

$$(4) \quad I_1 = p_1 I,$$

$$(5) \quad I_2 = p_2 I.$$

Hence all generated income falls into a common pool and is up for grabs by the players, according to the CSFs.

Player 1's problem is thus to: $\max I_1$ subject to $E_1 + F_1 = R_1$. Similarly for player 2. Assuming interior solutions and equal resource endowments ($R_1 = R_2$), the symmetric Cournot-Nash equilibrium (where $F_1 = F_2$), say F_H (H denoting the basic Hirshleifer setup), would be given by:

$$(6) \quad F_1 = F_2 = F_H = \frac{Rm}{1+m},$$

where $R = R_1 + R_2$.

2.2. The Conflict Model Under a Pandemic. We augment this standard Hirshleifer setup to include possible repercussions of a raging pandemic. At the risk of overly generalising several complexities, conflict under a pandemic can potentially pose two kinds of externality - positive and negative. Negative externality involves any and all kind of spread of disease in one's own territory that are brought about by engagement with one's opponent (and appropriation of an aggregate, part of which is contributed by the opponent). On the other hand, since the opponent also suffers from the same fate of having to cope with the disease and has possibly invested in medical supplies etc. in fighting the disease, appropriation of its resources would mean gaining access to some of those as well. In other words, other than what usual conflict involved, there is now the possibility of both a good and a bad spillover occurring - one is likely to appropriate the virus as well as the means to fight it. We model this as follows.

⁴Such contest success functions have been widely used in the conflict literature, see for example, Skaperdas (5).

2.2.1. *Positive externality.* Let each player, other than investing their resources into E and F , additionally now have to invest in D (say, doctors, medicines, medical supplies, R&D to research labs to develop vaccines, etc.). In other words, investments in D does not lead to increase in distributive probabilities (p), nor does to translate into additional income (I), and hence, for modelling purposes, count in as neither F nor E . That is D , represents a third channel in which investments now have to be made, necessitated, say, by a medical emergency such as a pandemic. Let $D_i, i = 1, 2$, be the investments made in this regard by the two players. Utility depends positively on D , and for simplicity we assume that it enters the utility function linearly. That is, if 1 employs D_1 number of doctors say, utility increases exactly by that amount. Investing in D_1 however, is costly and costs are given by some standard cost function (increasing and convex), C , which is assumed to be the same for both the countries, and which represents a deduction in utility.

2.2.2. *Negative externality.* Moreover let V_1 be the ‘amount’ of virus-infected in player 1’s territory and V_2 be the same in player 2’s territory. Nobody likes infection and hence they contribute strictly negatively to each country’s utility. We assume these are given for a player, since if not, each country would optimally choose 0 ‘amount’ of infection.

2.2.3. *Utility Function.* Hence, let the utility function that accrues to player 1, be as follows:

$$(7) \quad U_1 = I_1 + D_1 + p_1 \alpha_1 D_2 - C(D_1) - V_1 - p_1 \beta_1 V_2$$

$$(8) \quad = p_1(I + \alpha_1 D_2 - \beta_1 V_2) + D_1 - C(D_1) - V_1.$$

where I_1 is as given in (4). Reiterating, we specifically make the model amenable to a pandemic situation, by introducing an externality/spill-over in the utilities of the two opponents. The idea can be motivated as follows: if one of the countries do very well in fighting the pandemic, then the benefits spill over to the opponent too. For example, if a country employs many doctors, develop indigenous technologies to supply masks, gloves, PPEs (Personal Protective Equipments), ventilators etc., then in the event of a neighbour appropriating its income/resources, it will also enjoy the benefits of the investments made in this front, possibly at a different rate, say α . Specifically, with probability p_1 , player 1, not only captures income I (as in the basic conflict model) but also D_2 (2’s investments in doctors etc.) at the rate α_1 . Here α_1 can be interpreted to be the efficiency with which 1 can actually utilise 2’s resources/investments in D . Similarly, 1 is also likely to appropriate some of the virus cases from 2, at the rate of β_1 , with the probability of p_1 . Hence $\beta_1 V_2$ is the total amount of transmission/affected in some sense and 1 is likely to contract p_1 fraction of it. In other words, country 1 appropriates $\beta_1 V_2$ amount of total transmission with probability p_1 .

2.2.4. *Optimisation.* Assuming $C(D_i) = D_i^2/2, i = 1, 2$, substituting for the CSFs, and assuming, interior optima, the FOCs for player 1 are given by:

$$(9) \quad AF_1(F_1^m + F_2^m) = mF_2^m(A(E_1 + E_2) + \alpha_1 D_2 - \beta_1 V_2);$$

$$(10) \quad D_1 + \frac{F_1^m}{F_1^m + F_2^m} A = 1.$$

Similarly, those of player 2 are given by:

$$(11) \quad AF_2(F_1^m + F_2^m) = mF_1^m(A(E_1 + E_2) + \alpha_2 D_1 - \beta_2 V_1);$$

$$(12) \quad D_2 + \frac{F_2^m}{F_1^m + F_2^m} A = 1.$$

From equations (9) and (11), we get,

$$\frac{AF_1(F_1^m + F_2^m)}{mF_2^m} - \alpha_1 D_2 + \beta_1 V_2 = \frac{AF_2(F_1^m + F_2^m)}{mF_1^m} - \alpha_2 D_1 + \beta_2 V_1.$$

As in the Hirshleifer model, here too there is no convenient general solution to the above equation. Hirshleifer assumed equality of endowments, $R_1 = R_2$, to arrive at the symmetric solution given in (6). In our case however, we do not need equality of resources - instead we need $\alpha_1 = \alpha_2$ and $\beta_1 V_2 = \beta_2 V_1$, for there to be a symmetric solution. Hence, let $\alpha_1 = \alpha_2 = \alpha$ and $\beta_1 V_2 = \beta_2 V_1 = T$ (total transmission). Then $F_1 = F_2 = F_P$ (where P indicates pandemic) is a solution to the FOCs. And at these values, $D_1 = D_2 = 1 - A/2$. Solving, we get the following fighting effort during a pandemic (F_P):

$$(13) \quad F_P = \frac{m}{2(m+1)} \left[R + \left(1 - \frac{A}{2}\right) \left(\frac{\alpha}{2} - 2\right) - \frac{T}{A} \right].$$

The following proposition summarises:

Proposition 1. *Assuming interior optima, and letting $\alpha_1 = \alpha_2 = \alpha$, $\beta_1 V_2 = \beta_2 V_1 = T$, the symmetric Cournot-Nash equilibrium of the conflict model under a pandemic (in section 2.2) are given by the following:*

$$(14) \quad F_1 = F_2 = F_P = \frac{m}{2(m+1)} \left[R + \left(1 - \frac{A}{2}\right) \left(\frac{\alpha}{2} - 2\right) - \frac{T}{A} \right];$$

$$(15) \quad D_1 = D_2 = D = 1 - \frac{A}{2}.$$

Observation 1. Note that since $D_1 = D_2 = D > 0$ (being investments in doctors, medicines etc.), we must have $A < 2$. That is, the technological progress factor is constrained at 2. In other words, there cannot be great productivity increases (technological progress, that more than doubles output given productive efforts, is ruled out). Moreover the only parameter it depends on is A and $\frac{\partial D}{\partial A} < 0$. That is D depends negatively on technological advancement. We can interpret this as follows: As technology progresses, investment in E 's (and F 's, as we will see in observation (3) below) becomes more attractive and that in D falls.

Observation 2. As with the fighting efforts in Hirshleifer’s model (given in (6)), fighting efforts in the pandemic model, also increases as m , the decisiveness parameter⁵, increases. That is, we can compute $\frac{\partial F_P}{\partial m} > 0$.

Observation 3. Fighting efforts in Hirshleifer’s model (6) does not depend on aggregate productivity factor A . He concludes therefore that an “increase in overall economic productivity leaves the proportionate allocation of resources between producing and fighting unchanged. Intuitively, an increase in A raises the marginal profitability of productive activity and of conflictual activity in the same proportion.” (Pg. 181, Hirshleifer (2))

However, that is not true in the case of fighting efforts in the pandemic model. Here, we get

$$(16) \quad \frac{\partial F_P}{\partial A} = \frac{m}{2(m+1)} \left[1 + \frac{1}{A^2}(T - \alpha) \right],$$

which is > 0 for $T > \alpha$, which is likely to be true. Hence fighting efforts are likely to increase with increase in technological productivity increases. This is because, unlike in the basic model, here there are other avenues of investment of resources and increase in productivity possibly increases the stakes for grabs in these avenues as well and hence the increase in efforts to capture them.

Observation 4. Again as with the fighting efforts in Hirshleifer’s model (6), fighting efforts in the pandemic model, also increases as R , aggregate resources, increase. That is, $\frac{\partial F_P}{\partial R} > 0$. Hence as aggregate resources to be appropriated increase, the fighting efforts also increase.

Observation 5. Interestingly and as expected, $\frac{\partial F_P}{\partial T} < 0$, since part of the affected gets transmitted, fighting efforts actually decrease as total transmission T increases, a fallout of the negative externality of the pandemic.

Observation 6. Again pertaining to the externality of the pandemic, $\frac{\partial F_P}{\partial \alpha} > 0$, where α represents the positive externality of the pandemic. That is, expectedly again, when the rate of getting benefitted from appropriation increases, fighting efforts increase.

Note that observations (5) and (6) particularly refer to the effect of externalities of the pandemic on fighting efforts.

⁵“On the one hand the rich *can afford to* devote more effort to fighting, on the other hand the poor *are motivated to* fight harder.” (Pg 184, Hirshleifer (2)) The decisiveness parameter m determines the balance between the two influences. Please refer to Hirshleifer (2) for details.

2.3. Comparing fighting efforts from Hirshleifer's model and the pandemic model:

Comparing F_H and F_P , we find that

$$(17) \quad F_P = \frac{1}{2}F_H + \frac{m}{2(m+1)} \left[\left(1 - \frac{A}{2}\right) \left(\frac{\alpha}{2} - 2\right) - \frac{T}{A} \right].$$

A priori, it is not obvious how F_H and F_P compare. Algebraic simplification yields the following condition:

$$(18) \quad F_H \geq F_P$$

$$(19) \quad \iff R \geq \frac{(2-A)(\alpha-2A)}{2A} - \frac{T}{A}.$$

Observation 7. As T tends to ∞ , $R > RHS$ of (21) always holds. In other words, as the total transmission from opponents becomes astronomically large, players will refrain from increasing fighting (relative to pre-pandemic Hirshleifer's levels).

Observation 8. Similarly, as A tends to 2 (it cannot exceed 2 by observation 1), $R > RHS$ of (21) always holds. In other words, in possibly highly technologically advanced nations (where increase in inputs is likely to increase output by almost double), investments are more likely to be in productive uses rather than in fighting during a pandemic, and so players again refrain from increasing fighting relative to pre-pandemic levels.

Observation 9. Again, for given values of T and A , if R is very large, in that case too $R > RHS$ of (21) is likely to hold. Recall $R = R_1 + R_2$. Hence both countries rich in endowments or at least one of them so, is also unlikely to push fighting efforts higher than pre-pandemic levels.

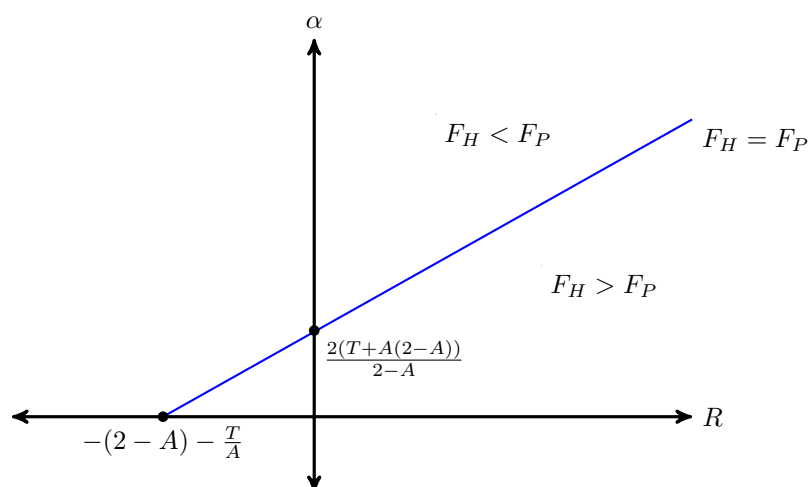
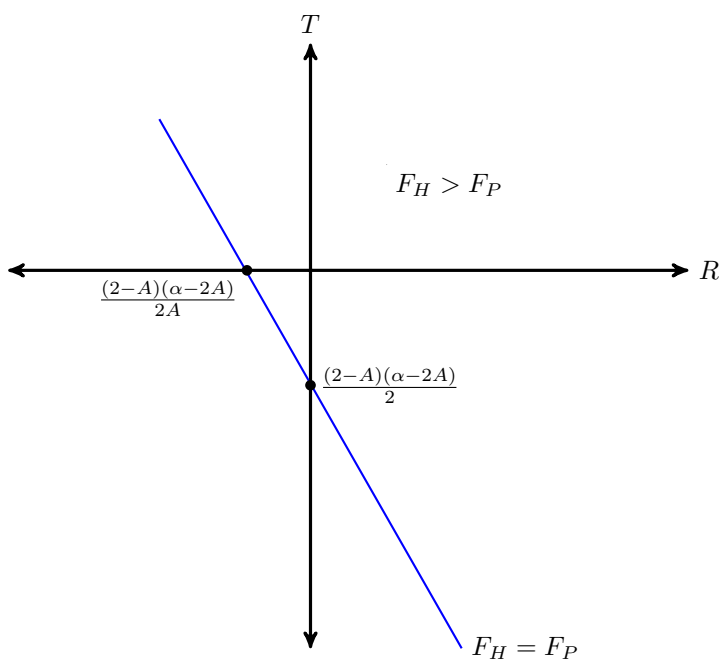
Observation 10. In fact if $\alpha = 0$, that is there is no positive spillover from contest, then $R > RHS$ of (21) will always hold, and in which case, $F_H > F_P$. That is, if there is no positive externality in conflict, that is there is no positive repercussion in appropriating one's opponent's resources, then conflict should fall with pandemic.

Hence observations 7, 8, 9, 10, lay down conditions under which conflicts are likely to fall with a pandemic and we see that the conditions are very likely to be fulfilled. In fact, we see de-escalation of several conflicts in the world which can potentially be explained through this channel (see section 3 below). However for moderate values of R, T, A , it is possible that $R < RHS$ of (21) holds, in which case, we are likely to see an increase in fighting efforts under a pandemic situation. We depict the inequality regions in Figure 1.

To gain a different perspective on the intuition behind change in fighting efforts, let us rewrite condition (21) keeping T on LHS, to get the following inequality:

$$(20) \quad F_H \geq F_P$$

$$(21) \quad \iff T \geq \frac{(2-A)(\alpha-2A)}{2} - AR.$$

FIGURE 1. Fighting Efforts in the $R - \alpha$ planeFIGURE 2. Fighting Efforts in the $R - T$ plane when $\alpha < 2A$

Now, if $\alpha < 2A$, then $F_H > F_P$ for all positive T and R , as depicted in Figure 2. That is, fighting efforts fall with the onset of pandemic when the rate of positive spillover of the pandemic is relatively small (relative to the rate of technological progress in some sense).

On the other hand, if $\alpha > 2A$, then at relatively low values of R and T , $F_P > F_H$ while for higher values of both, $F_H > F_P$. This is depicted in Figure 3. That is, fighting efforts may actually increase with the onset of pandemic when the rate of positive spillover of the

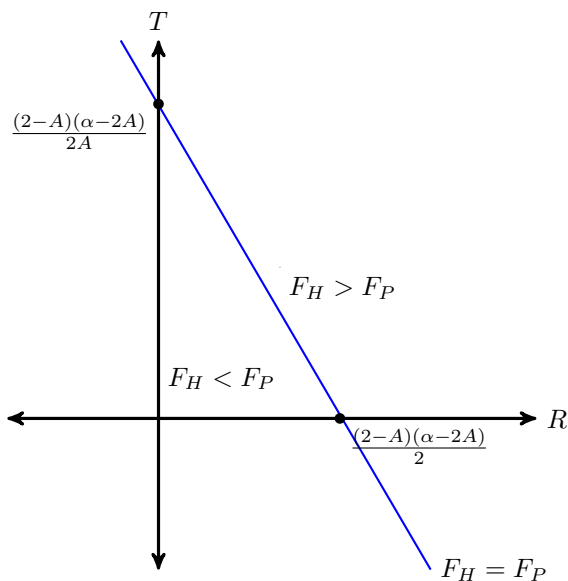


FIGURE 3. Fighting Efforts in the $R - T$ plane when $\alpha > 2A$

pandemic is relatively high (relative to the rate of technological progress). But when the pandemic worsens, and for relatively large enough R , post-pandemic conflict levels should again fall relative to pre-pandemic levels.

Hence the general conclusion more or less from all the observations above seem to be that conflict levels are likely to ameliorate and mitigate post-pandemic rather than increase, proving the apprehensions of many a scholar and diplomat, not quite correct.

3. NARRATIVE EVIDENCE

Evoking the “potentially devastating impact of Covid-19 in Idlib and elsewhere in Syria,” the UN undersecretary-general for political affairs, Rosemary DiCarlo, called on Twitter for all parties to show restraint. “If anyone - incredibly - still needed a reason to stop the fighting there,” she added, “this is it.”⁶

Despite apprehensions and rhetorics, in most cases, conflict is likely to have decreased or at least remained the same, and not increase with the pandemic. For a vast majority of parametric values, as predicted by the model, we should see that conflict is likely to remain same or decrease post-pandemic, rather than increase, which is what we see from journalistic accounts of conflict situations around the world. We look at two of them somewhat more closely - conflict in Yemen and the India-China standoff.

⁶Ibid reference in footnote (1).

3.1. Conflict in Yemen: Many scholars, specifically in the context of Yemen (see Yüksel (6), for example), had apprehended an increase in internal conflict and increased foreign interference during a pandemic situation. However that is not what we see in reality. Let us look at the conflict in Yemen closely to see how conflicts have fallen post-pandemic.

Background of Yemen. In spite of being resource-rich, Yemen is one of the poorest countries of the world⁷. More than 80 percent (2018) of the population lives in poverty and it ranks 165th (nominal, 2018) according to GDP per capita. At the time of writing this essay, the number of Corona affected in the country is 1,240⁸ (which is small compared to the affected in other countries). However, it is engaged in conflict with a Saudi-Arab led coalition, and the latter is a rich country⁹. And the number of Corona affected in the country is about 2 lakh¹⁰. Recall R in our theoretical model is the sum of the resources of the two conflicting players. Hence the parameter values that are most likely to be applicable to this case would be a high R , low A , moderate T ($\beta_1 V_2 \approx \beta_2 V_1$) and almost close to 0 α (since it is basically defending itself against Saudi-led attacks as described below). In any case, since the RHS of (21) is likely to be negative and $R > 0$, hence we should expect conflicts to at least not rise. And this is what we see in reality.

Civil War in Yemen. Yemen has been reeling under conflicts for decades¹¹ and faces one of the worst humanitarian crises. The civil war has internally displaced and killed several thousand people¹². The Iran-Saudi rivalry has also intensified over Yemen. Recently, in March, just around the spread of the Corona pandemic Yemen expressed their desire for a mutually acceptable ceasefire, followed by a ceasefire declaration from a Saudi-led alliance in April 2020.

History. The main conflict in Yemen is between the UN-recognised government of Mansour Hadi, supported by Saudi Arabia and the United Arab Emirates (UAE), and the Iranian-backed Houthis. The Houthis belong to the Zaydi sect of Shias, which constitute nearly 40 per cent of the Yemeni population. The Zaydis had ruled over Northern Yemen for almost a millennium before being overthrown in a coup in 1962. For next three decades, the Zaydis

⁷It contains oil and gas resources and has productive soil. See Wikipedia webpage ‘Economy of Yemen’ https://en.wikipedia.org/wiki/Economy_of_Yemen (Accessed on July 6 2020).

⁸See <https://www.worldometers.info/coronavirus/country/yemen/>.

⁹Refer to Wikipedia webpage ‘Economy of Saudi Arabia’ at https://en.wikipedia.org/wiki/Economy_of_Saudi_Arabia (Accessed on July 6 2020).

¹⁰See <https://www.worldometers.info/coronavirus/country/saudi-arabia/>

¹¹Please refer to the article “Conflict in Yemen amid COVID-19 Pandemic” by Meena Singh Roy and Prabhat Jawa (24 April 2020) available at <https://idsa.in/idsacomment/yemen-covid-19-msroy-pjwala-240420> (Accessed on 6th July 2020), for details.

¹²According to United Nations High Commissioner for Refugees (UNHCR), “Over 80 per cent have been displaced for more than a year.” In 2019, the death toll in Yemen had reached 100,000 since the war began five years ago, which includes 12,000 civilian casualties, as per the Armed Conflict Location and Event Data Project (ACLED).

who were at the top of the social order were marginalised both politically and economically by the government. Finally Mohammad Badr al-Din Houthi along with Muhammad Izzan started the Ansar Allah movement which carried out extensive military campaigns during 2002-09 in the hope of securing greater political participation.

The Houthis captured capital Sanaa in September 2014 and placed President Mansour Hadi under house arrest. In January 2015, President Hadi resigned and escaped to Saudi Arabia, where he pleaded to the international community to restore his elected government in Yemen. As a result, in March 2015, an alliance led by Saudi Arabia and UAE and comprising of several other Arab countries, with logistics and intelligence support from the US, commenced the military campaign against the Iranian-backed Houthi militia in Yemen.

Yemen has also become the centre-stage of the theatrics Saudi-Iran rivalry. The Saudi-led Operation Decisive Storm, often dubbed as Saudi Crown Prince Mohammad Salmans war, commenced in 2015 with massive bombing campaigns and naval blockade, and it was probably believed that it could securely reinstate Mansour Hadis government in Sanaa. Instead, Iran has supported the Houthis and they have put up a strong defence, prolonging the conflict with a continuous military stalemate in various provinces¹³.

COVID-19 in Yemen. In an already war-torn country, bloody with decades of civil war, the advent of COVID-19 has thrown life and preparations completely haywire. Moreover the US and World Food Programme have recently announced a cut in healthcare aid and other kinds of aid to Yemen owing to budgetary constraints, which are likely to affect several Houthi-controlled areas. Also the Donald Trump administration's move to halt funding to WHO would severely undermine WHO's efforts in Yemen. The UN Secretary-General has called for an "immediate global ceasefire in all corners of the world" and made an appeal "to put armed conflict on lockdown and focus together on the true fight" of human lives. COVID-19: UN chief calls for a global ceasefire to focus on the true fight of our lives, UN News, March 23, 2020 (Accessed April 17, 2020).

Driven by the seriousness of the crisis, the Saudi-led coalition¹⁴ announced a two-week ceasefire on April 09. Houthis welcome the move but is somewhat suspect and wants more guarantee from the UN. Despite the declaration of a "comprehensive ceasefire" by Saudi Arabia, Tehran is yet to make an official statement on the issue. However, given the impact of COVID-19 pandemic in Iran and its sanctions hit economy, it is unlikely that Tehran would have sufficient resources to actively stay involved in the Yemeni conflict. Riyadh too

¹³The Saudi-Iran conflict has also been dubbed as a Shia-Sunni conflict or proxy war. Over the last five years, Saudi Arabia has carried out extensive military campaigns that has only emboldened the Iranian support to Houthis - Iran is now said to facilitate the shipment of small arms to include heavy artillery, unmanned aerial vehicles (UAVs) and even small range surface-to-surface missiles (SSMs).

¹⁴The coalition includes UAE and Oman siding with Saudi-Arabia.

is exhausted with the war and deeply affected by falling oil prices in addition to its internal political problems. In such a situation, Riyadh may look for an honourable exit from Yemens war theatre. It can be argued that under present circumstances, both Iran and Saudi Arabia have sufficient number of reasons to make the ceasefire work¹⁵.

Undoubtedly, the ceasefire is a welcome development, but there are some serious doubts about the effectiveness of the ceasefire. Since 2015, the Yemeni conflict had been a saga of ceasefires and their relentless violations. Therefore, it is difficult to believe that this time it is going to be any different unless both sides adhere to it. However, the malaise of COVID-19 a common concern for all in the region may be a reason for some optimism.

3.2. India-China Conflict: Here we look at the India-China standoff, especially in the context of the recent flash point pertaining to the control of the Galwan valley¹⁶.

The neighbouring armies of India and China are engaged in the standoff in eastern Ladakh. And they are locked in a standoff, not just for territorial gains on land, but enhanced domination of the northern bank of Pangong Tso, a resource-rich lake. Pangong Tso or Pangong Lake is a lake in the Himalayas, and extends from India to the Tibetan Autonomous Region, China, where approximately 60% of the length of the lake lies within the Tibetan Autonomous Region. The lake is in disputed territory. The Line of Actual Control (LAC) passes through the lake. A section of the lake approximately 20 km east from the Line of Actual Control is controlled by China but claimed by India.

The standoff at Ladakhs Galwan Valley has escalated in recent weeks due to the infrastructure projects that India has undertaken in the recent years. India is building a strategic road through the Galwan Valley - close to China - connecting the region to an airstrip. China is opposed to any Indian construction in the area¹⁷.

¹⁵The cooperation of UAE, a partner of Riyadh in the coalition, would be equally crucial. The UAE, like Saudi Arabia, too seeks to end its direct military involvement in the conflict. In March, UAE had sent medical supplies to Iran amid the coronavirus crisis, followed by an official call between the foreign ministers of the two countries.²⁶ This signals a positive development that might serve as an opportunity for Tehran and Riyadh to bridge gaps through Abu Dhabi.

¹⁶Please refer to “Galwan Valley Clash”, June 29, 2020, [https : //www.drishtiiias.com/daily – updates/daily – news – editorials/galwan – valley – clash](https://www.drishtiiias.com/daily-updates/daily-news-editorials/galwan-valley-clash); (Accessed on 5th July 2020) and “Pangong Tso”, Wikipedia, [https : //en.wikipedia.org/wiki/Pangong_Tso](https://en.wikipedia.org/wiki/Pangong_Tso); (Accessed on 5th July 2020), for many of the facts in this discussion.

¹⁷The border, or Line of Actual Control, is not demarcated, and both the countries differ in their perceptions of the line, leading to regular border “transgressions.” Often these don’t escalate tensions and a serious standoff like the current one is uncommon, though not unseen - this is the fourth since 2013. Both countries troops have patrolled this region for decades, as the 2,200-mile border has long been contested, including leading to war in 1962.

Recently however, diplomatic talks have yielded positive results and we see disengagement of troops by India and China along the LAC, further corroborating the overall prediction of the model of lowering of conflict levels post-pandemic¹⁸.

4. CONCLUSION

“At a time when the world is struggling to fight a pandemic, the focus of the parties must shift away from fighting one another to ensuring that the population will not face even graver risks.”

(Martin Griffiths, the UN special envoy for Yemen;
Ibid reference in footnote (1)).

In spite of worldwide apprehension of an exacerbation of conflicts post-pandemic, given lack of monitoring and probable interventions by world organisation, we see, in many cases, that conflicts have actually fall. Above, we give examples of Yemen and the India-China standoff.

In Yemen, Saudi Arabia-led coalition of countries, that has been locked in conflict with the Houthis in Yemen for the last five years, has called a ceasefire. In the India-China standoff, after an initial show of hostilities, troops have started disengaging from the border in a significant de-escalation of conflict. If there is any remotely positive aspect of a pandemic of such proportions, it is probably in the slight amelioration of conflicts worldwide.

In this paper, we theoretically explore the possible effects of a pandemic on conflict by augmenting a standard conflict model with externalities. We look at parametric restrictions that would ascertain whether conflict is likely to gain momentum or lose so in when faced with a pandemic. We find that in a large number of cases, conflict is likely to fall, while in relatively smaller circumstance, it is likely to rise.

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¹⁸Refer to <https://www.thehindu.com/opinion/editorial/days-of-disengagement-on-india-china-lac-standoff/article32016057.ece>, for example.

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