Aggressive elites and vulnerable entrepreneurs

- trust and cooperation in the shadow of conflict

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Abstract

We explore the implications of having a divided society where group leaders have motives for aggression towards other groups but where entrepreneurs have a desire for cooperation and peace. We assert that it is members of the elites who start conflicts and wage wars while the entrepreneurs undertake the type of economic activities that they find most profitable given the circumstances. We derive implications for peace and conflict. We find conflict induced poverty traps with self-fulfilling expectations about conflict and we derive implications for peace building strategies.

JEL codes: C73, D72, D74

Keyword: Conflict, investments, trust, cooperation.

1   Introduction

Does poverty cause civil conflicts, or is it the other way around? One might wonder, for instance, whether Botswana is more peaceful than Rwanda because it is richer, or whether Botswana is richer because it is more peaceful. Both of

these small African countries have a majority group that constitutes around 90 per cent of the population—Hutus in Rwanda and Tswana in Botswana. While Rwanda has had several violent conflicts (1973, 1990-92, 1994), the four times richer Botswana has had no major conflict since independence.

Yet, in a development perspective, any single causation between conflicts and poverty, whatever way, does not make much sense. Across countries and over time, the tendency seems to be that prosperity and peace reinforce each other, as do poverty and civil conflict. In this chapter we discuss some reasons why. We emphasize how otherwise similar countries may end up either in poverty with serious group hostility and even violent conflicts, or in prosperity with more peaceful relationships and even high levels of social cooperation. We derive highly stylized, but plausible, mechanisms behind these reinforcements.

Since many power struggles and conflicts are over the rents in society, it is useful to start by distinguishing between rents that are vulnerable towards the outbreak of civil conflicts and rents that are not vulnerable to such social disruptions—what we call vulnerable and non-vulnerable rents (Mehlum and Moene 2010).

Non-vulnerable rents are associated with activities and resources that keep their value even in cases of serious conflicts. Typical examples are natural resource rents. Vulnerable rents, in contrast, are associated with activities with more cooperation and trust between groups that easily collapse in the case of conflicts. Typical examples are rents from modernization that requires trade, specialization and division of labor between groups.

Countries that follow a development path that makes them vulnerable to losses in case of hostilities, may avoid conflict, while countries that embark on more robust strategies may end up in conflict. This is a core result in the paper, following from two separate links between investments and conflict that we highlight throughout:

The conflict vulnerability of investments captures how investments in activities yielding vulnerable rents require confidence in peace to be undertaken.

The investments are highly risky and entrepreneurs and investors therefore need to be politically assured, in a credible manner, that social disruption and violence are not likely.

The conflict dampening of vulnerable rents captures how the presence of vulnerable rents may restrict how opposing groups compete for power. If political contests escalate into violent conflicts, vulnerable rents tend to disappear, implying that the rents over which the opposing sides fight are eliminated by the fighting. Non-vulnerable rents in contrast do not disappear in the fighting and their presence may therefore fuel conflicts.

In other words, a society with largely vulnerable rents have high implicit economic costs of disruption and violence, while a society with largely non-vulnerable rents may have much lower economic costs of disruption and violence. As long as part of the costs of conflicts are internalized by group leaders, these leaders become more reluctant to start serious conflicts in societies with vulnerable rents than in societies with non-vulnerable rents. How much vulnerable and non-vulnerable rents a society has, however, depends not only on its natural resources, but also on the innovation and investment behavior of its entrepreneurs. Innovations and investments again depend on the political stability and the confidence in peace.

Since the chance of conflicts in societies with largely vulnerable rents is low, investments generating such rents may become high. Conversely, since the chance of conflicts in societies with few vulnerable rents is high, investments generating vulnerable rents may become low. We study this kind of general equilibrium of potential conflict societies, incorporating both causes and consequences of the chances of civil conflict.

We therefore need to make explicit how investment behavior at the local level affect power struggles and the temptation to wage wars, and how the temptation to wage wars affects investments, which again affect the chances of conflicts. There may be multiple equilibria. Both prophecies of conflicts and stagnation, as well as prophecies of peace and prosperity may be self-fulfilling.

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To show this, we explore the two links outlined above within a simple model that may capture some essential elements for countries with an internal group division. Each group in the country, we assert, is potentially involved in similar production activities. The group leaders are political strongmen, who can either enter into compromises or conflicts with each other. In practice the group division can be based on regional, ethnic, religious or social cleavages.[1]

In the simple exposition we focus on the case with two groups. We derive the temptation of the challenger to deviate from peaceful cooperation. The temptation depends on the gains in the form of non-vulnerable rents, such as natural resource rents, that accrue to the winner, and on the costs in the form of lost vulnerable rents, such as gains from trade and cooperation, when conflict emerges.

In our discussion, the crucial members of each group is a small elite (denoted the leaders) and a larger population of entrepreneurs. We are interested both in the conflict between leaders of different groups, and in the common interests between entrepreneurs of different groups. In particular we are interested in the leaders' motives for aggression versus the entrepreneurs' desire for peace. We assert that it is members of the elites who start conflicts and wage wars. The entrepreneurs undertake the type of economic activities that they find most profitable given the circumstances. It is this interaction that determines the amount of vulnerable rents and the confidence in peace, or the lack of it.

Obviously there is a lot of uncertainty involved. For one, the cost of starting a conflict is uncertain. It may depend on the social situation in the country and the ease of mobilizing support. Specifying the stochastic elements enables us to derive a stylized representation of the probability of conflict—the probability that the expected gain from a violent encounter to members of the challenging elite is sufficiently large relative to the costs they bear.

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[1]If it is based on social class divisions between workers and capitalists, what we denote by leaders act as heads of union and employers associations with members as the rank and file of union locals on the worker side and as the member firms on the employer side.

The entrepreneurs are able to assess the temptations of the elite, and on that basis they calculate the chances for conflict and their confidence in peace. The higher the temptation, the more likely is a conflict, and the less the entrepreneurs engage in activities that are vulnerable to the outbreak of conflict.

Our explanation of conflicts follows the conflict literature in pointing to the usual suspects: Societies are conflict-prone when there is a lot to fight for, such as non-vulnerable rents from natural resources, and when the cost of fighting is low due to poverty. Low incomes means low opportunity costs of fighting and poverty thus raises the temptation to fight (Collier and Hoeffler 2002, Collier et al 2003, Fearon and Laitin 2003, Miguel, Satyanat and Sergenti 2004).

High resource rents make fighting more intense and wasteful due to a higher prize to the winner (Skaperdas 2002, Mehlum and Moene 2002), more lasting due to available financing (Collier and Hoeffler, 2000), more attractive than production inducing more entry into expropriating activities (Moene and Mehlum, 2002).

The view that "the extent of primary commodity exports is the largest single influence on the risk of conflict" (Collier and Hoeffler 2000, p. 26), is nevertheless challenged by several empirical studies (Elbadawi and Sambanis 2002, Fearon and Laitin 2003). In stead, 'lootable' resources such as oil, precious stones, and minerals seem to be more important. The suggested measures include being rich in oil (Ross 2001, Fearon and Laitin 2003); onshore, but not offshore, oil production (Lujala 2005); point resources such as minerals (Auty and Gelb 2001); secondary diamonds (Lujala, Gleditsch and Gilmore 2005)—see Ross (2004) for an overview.

Our paper is also in line with most of the conflict literature in emphasizing that "poor resource-abundant countries are more likely to end up with conflict, while rich resource-scarce countries are more likely to end up as democracies" (Aslaksen and Torvik, 2006). Democracy tends to be more fragile in poor countries than in developed societies (Przeworksi 2009, Benhabib and Przeworski 2006, Przeworski 2005). The choice whether to comply with the outcome of

elections or to launch a struggle for dictatorship is central (Przeworksi 2009, see also Fearon 1995, Slantchev 2003, Powell 2004, Rosendorff 2001, Torvik 2002, Aslaksen and Trovik 2006, Acemoglu and Robinson 2000, 2001, 2006).

The logic of all these useful models suggests that an elite chooses not to concede as long as the expected net gains of fighting is higher than the expected net gains of conceding to the policy preferred by decisive voters. Clearly, while natural resource rents and poverty make fighting more tempting, as the elite can keep more of it without democratic concession, a fixed cost of fighting makes fighting less tempting. As we return to shortly, these models are less explicit when it comes to the reverse link from conflict to economic development.

We deviate from some of the papers, for instance those by Acemoglu and Robinson, by not focusing on the historically important case with a single ruling elite that fights to keep its privileges by not conceding to popular demands. Some of the most important conflicts in recent history, it seems, are not class wars like this. They occur between competing elites. Recent examples include the conflicts between hindus and muslims in India, between hutus and tutsis in Rwanda and Burundi, between Croats and Serbs in the former Yugoslavia, between UNITA and MPLA in Angola, FRELIMO and RENAMO in Mozambique, ZANU and ZAPU in Zimbabwe. They relate to struggles over cessations such as the war in Sri Lanka between the government and the Tamil Tigers, the Biafra war in Nigeria, and the Eritrean war in Ethiopia.

We follow the seminal papers by Esteban and Ray (2008, 2010) in stressing intergroup conflicts. In their setups, both the ethnic and income distribution of the population are the key factors explaining which alliances form. But "in the absence of a bias favoring either type of conflict, ethnicity will be more salient than class." (Esteban and Ray 2010)

Both investment behavior and allocation of activities are strongly affected by civil conflict (Collier 1999, see also Gates et.al 2010 for a general empirical assessment of the consequences of conflict). The breakdown of trade and trust

is central. Both in South Africa and in Bosnia[2], for instance, the combination of political uncertainty and the hesitation to rely on mutual cooperation at the ground level lead entrepreneurs to avoid investments in specific activities that would be destroyed or at least seriously delayed by conflicts.

In this manner, risk of conflict can block certain types of innovations and economic development, as we show more clearly below. This echoes an important result in Acemoglu and Robinson (2006), where the blocking is caused by a political replacement effect: "political elites will block beneficial economic and institutional change when they are afraid that these changes will destabilize the existing system and make it more likely that they will lose political power and future rents" (Acemoglu and Robinson 2006).

In their case, government policies shape economic incentives with a first order impact on development. In our case, with more independent entrepreneurs, the roles of trust and cooperation in order to achieve beneficial developments becomes more important. Blocking is then indirect, caused by a higher level of competition for non-vulnerable political rents that increases the probability of conflict and reduces investments and the vulnerability to conflicts.

When peace appears to be fragile, the typical incentive would be to avoid products or technologies that are intensive in trade or transactions. In this respect, our approach can also be interpreted as part of the larger literature on the interaction between trade and conflict with contributors, such as Skaperdas and Syropoulos (2001 and 2002), Martin, Mayer, and Thoenig (2008),

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[2]In South Africa the mutual dependence between blacks and whites after apartheid was evident: " [S]eparate economies would harm blacks and whites alike. Understanding of this interdependence remains widespread. Some consider it the result of colonial indoctrination, while others attribute it to a long learning process of mutual contact." (Adam and Moodley, 1993, p. 208).

The willingness to fight, and the unwillingness to invest, are also affected by unequal opportunities. Even in ethnically integrated societies, interdependence does not preclude extreme brutality: "The economic inequity toward Bosnian Serbs ought to have been evident; nonetheless, the lack of security that Bosnian Serbs felt toward their own future was aggravated by both the lack of economic opportunity available to them and the lack of economic interaction with Croat and Muslim factions. This insecurity and lack of economic interaction also prevented the sense that such ethnic factions could live peaceably together in a future mixed society." (Liotta, 2001, p.44).

Garfinkel Skaperdas, and Syropoulos (2009), and Guiso, Sapienza, and Zingales (2009).

In sum, our paper combines the conflict vulnerability of investments with the conflict dampening of vulnerable rents in a general equilibrium of potentially conflictual societies. Entrepreneurial choices depend on the willingness of the elites to start a conflict, and the elite's choice of peace versus conflict depends on the investment behavior of entrepreneurs. This speaks to Blattman and Miguel's (2010) warning to treat any direct causal line from poverty to conflict with caution (as we return to in the conclusion). In contrast to most of the literature, we also consider incentives to undertake types of coordination, within the challenging group, within the ruling group, and across groups—and how investment coordination affects the probability of civil conflict.

2 Our basic set-up

With entrepreneurs acting in anticipation of conflict, and with elites observing the entrepreneurial choices before deciding on conflict, the following timing is assumed:

1. Based on expectations about the peace prospects, entrepreneurs decide on the choice of technology (and thus determine part of the cost of conflict).

2. Uncertainty about the direct costs of conflicts related to popular mood and truly exogenous factors such as 'rainfall' is resolved.

3. Given the known cost of conflict, a game is played between the challenger and the ruler whether to start fighting or not.

4. In case of conflict the winner is determined by a probabilistic process, where the probability of winning increases with own effort.

2.1 High or low productivity activities

To derive the conflict vulnerability of investments we first consider a large number of entrepreneurs within each group. The entrepreneurs of a particular group consider the peace prospects when deciding on the production technology to employ. If a situation with peaceful coexistence with the other group is expected to prevail, the entrepreneurs will choose technologies that are productive and that rely on interaction and trade with the other group.

The entrepreneurs can chose to produce with a wide range of production technologies. Each technology (an activity) has a revenue part A that is immune to conflicts, and a revenue part Δ that vanishes in case of conflict. Here Δ includes not only physical destruction, but also delays and impasses in obtaining the revenues as long as the conflict lasts. In either case, Δ represents incomes foregone in the case of conflicts. Thus, the realized return is

$$
r_c = \begin{cases} A + \Delta & \text{in peace time} \\ A & \text{in war time} \end{cases} \tag{1}
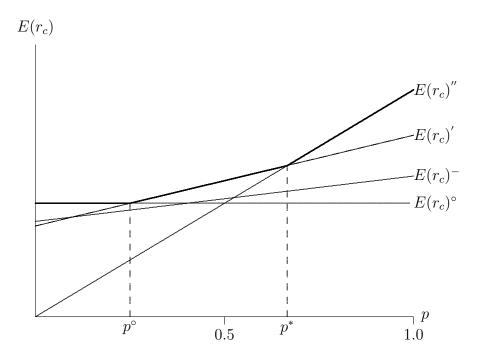$$

Here $\Delta > 0$ may capture products or technologies intensive in trade or transactions that are vulnerable to the outbreak of conflict. (There are cases with $\Delta < 0$ where the illegality of conflict opens up for profitable opportunities that would be lost if peace emerges. One example is opium production in Afghanistan.)

For a given technology, the expected revenue $E(r_c)$ is thus a linear function of the confidence in peace p (where $(1 - p)$ is the probability of conflict):

$$
E(r_c) = A + p\Delta \tag{2}
$$

There are in principle a large number of technology pairs $\{A, \Delta\}$ to choose from. An example of the expected returns for different technologies are given in Figure 1. Here $E(r_c)'' = A'' + p\Delta''$ is a case with $A'' = 0$ and a high Δ'',

Figure 1: Probability of peace and expected return
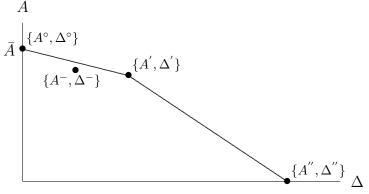

while $E(r_c)^\circ = A^\circ + p\Delta^\circ$ is a case with $\Delta^\circ = 0$ and a positive A°. The case $E(r_c)' = A'' + p\Delta''$ is an intermediate case with a $A' < A^\circ$ and with $\Delta' < \Delta''$. The bold line gives the highest return among the technologies for all p between 0 and 1. When p is close to zero $(0 \leq p < p^\circ)$, $E(r_c)^\circ$ is the technology with the highest return. When p is close to one $(p^* < p \leq 1)$, $E(r_c)''$ is the technology with the highest return, while when p is in between $(p^\circ < p < p^*)$, $E(r_c)'$ is the technology with the highest return. The example also contains the technology $E(r_c)^-$. This technology is one that is inferior for all p. Only the technologies that constitute the frontier for some p are the relevant technologies to consider. The frontier is shown in Figure 1.

The frontier can be described by the following relationship

$$A = \bar{A} - a(\Delta) \tag{3}$$

where $\bar{A}$ is a constant, and where the function $a(.)$ starts in zero and is increasing and convex. Formally, the conditions for the piecewise linear function

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Figure 2: Technology frontier

$a(.)$ are

$$a(0) = 0, \quad 0 \le a'(\Delta_1) \le a'(\Delta_2) \text{ when } \Delta_1 \le \Delta_2. \tag{4}$$

An illustration of equation 3 is given in Figure 2. In this particular case, which represents the same technologies as in Figure 1, $\bar{A} = A^\circ$. In this example it is also the case that the frontier starts at $\Delta = 0$ and continues until $A = 0$. This need not generally be the case and later we will work with a case where the minimum Δ is strictly positive.

When the entrepreneurs of a particular group are choosing technology on their own, each takes p as given and chooses the technology that maximizes $E(r)$. By combining equation 2 and 3 we get

$$E(r) = \bar{A} + p\Delta - a(\Delta) \tag{5}$$

The entrepreneurs' problem is then to to maximize 5 with respect to Δ. The first order condition is

$$\frac{\partial E(r)}{\partial \Delta} = p - a'(\Delta) = 0 \Rightarrow \Delta = \Delta(p) \tag{6}$$

This first order condition is equivalent to (i.e. picks the same technologies

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as) the algorithm yielding the frontier in Figure 1.[3] The function $\Delta(p)$ follows when solving the first order condition with respect to p. This function picks the optimal Δ for all p.

As $a(.)$ is convex it follows from 6 that $\Delta(p)$ is weakly increasing in p. It then follows from 3 that A is decreasing in p.

We have the following result:

- Confidence in peace induces vulnerable technologies: As the confidence in peace increases, the technology choice for each entrepreneur will be more peace dependent (higher Δ and lower A), and thus more vulnerable. In addition, the expected return increases with the probability of peace.

The latter part of the result is in a sense trivial. Formally it follows from differentiation of 5 in combination with the optimal choice as given by 6. From these it follows that at the optimum

$$\frac{\partial E(r)}{\partial p} = \Delta \tag{7}$$

$$\frac{\partial^2 E(r)}{\partial p^2} = 1/a''(\Delta) \tag{8}$$

Hence, Δ is increasing in p while A is decreasing. Building on the example in Figure 2 the result is illustrated in Figure 3. The general pattern is that Δ is increasing while A is decreasing in p.

The general result states that the behavior of entrepreneurs leads the expected return to go up and the vulnerability to conflict to go up together with the confidence in peace. If one compares two societies, with the same technologies available, but where one has a higher probability of peace than the other, the expected return to entrepreneurs is higher in the peaceful society. In addition, the return in case of peace is much better in the peaceful society.

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[3]Note that $a(.)$ is not differentiable throughout and the condition $a'(\Delta) = p$ should be seen as a shorthand for the condition $a'(\Delta - \epsilon) \leq p$ and $a'(\Delta + \epsilon) \geq p$. Alternatively one could thing of $a(.)$ as the function resulting from the faceted frontier by "rounding" the corners.
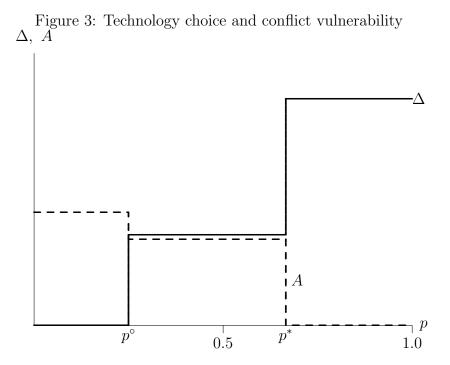
However, in the unlikely event of conflict, the generally peaceful society will suffer a larger loss. In a society where conflict is anticipated, however, the production structure would be more robust and the loss associated with conflict would be lower.

The result also echoes insights from the literature. It is in line with some of the insights from Özler and Rodrik (1992), who discuss the depression of investment incentives in an economy where workers and capitalists may end up in conflict over how the proceeds from production should be split.

It is in line with some of the discussion in Collier (1999). Using national accounts data for Uganda, he investigates the following prediction regarding economic consequences of civil war: "To summarise, activities with any of four characteristics tend to contract: those which are intensive in either capital or transactions, and those which supply either capital or transactions."(p.178) Collier indeed finds such a pattern for Uganda. His interpretation is that as the conflict continues, there is a shift in the production technology away from the vulnerable and over to the more robust ones. In our simple static set-up, this prediction bears out as anticipation of conflict affecting the production choice.

Other results in Collier (1999) also support our anticipation effect. "Empirically, if a civil war lasts only a year, it was found to cause a loss of growth during the first five years of peace of 2.1% per *annum*, a loss not significantly different from that had the war continued."(p.181) Hence, the economic cost of conflict is not primarily that related to destruction, but rather that related to reduced willingness to invest in a politically unstable environment.

Now that we have established the production choice as a function of the peace probability, we can move on to the determination of the peace probability itself. Peace prevails only as long as no party is tempted to attack.

Figure 3: Technology choice and conflict vulnerability

2.2 To attack or not to attack

To derive the conflict dampening of vulnerable rents we consider the temptation of the challenger to start conflicts. The amount of non-vulnerable rents is given by R. During peace time the challenger elite gets a return of

$$\pi_c = \mu R + \theta r_c$$

The peacetime share of non-vulnerable rents R that the challenger group gets is μR. The share μ is a known and fixed parameter that captures to what extent the challenger group is discriminated against in the current societal arrangements. We return to a discussion of the determination of μ below. In addition, the challenger elite appreciates, with a factor $\theta \in [0, 1]$, the return to the challenger entrepreneurs. The value of θ represents the elite's identification with its group.

The challenger elite can be tempted to wage a war in order to obtain the non-vulnerable rents R in its entirety. In the case of conflict, each of the elites may try to increase their probability of winning by spending resources

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on violent activities. In the simple case we consider, the challenger elite makes a discrete choice between starting versus not starting a conflict with a given intensity. The amount of resources spent in case of conflict is assumed to be a fixed number denoted z_c.

The two groups in isolation decide whether or not to attack the other. For the elites attacks are costly in terms of fighting effort, but also in terms of losses for the group's own entrepreneurs.

After an attack, the winning party can grab the entire rent R. There are four possible combinations of choices: No party attacks [NN], both the challenger and ruler attacks [AA], unilateral attack by challenger [NA], and unilateral attack by ruler [AN]. The game can be presented by the following matrix.

$$
\begin{array}{|l|c|c|}
\hline
\diagbox{\textbf{challenger}}{\textbf{ruler}} & \textbf{no attack} & \textbf{attack} \\
\hline
\textbf{no attack} & \text{[NN]} & \text{[AN]} \\
\textbf{attack} & \text{[NA]} & \text{[AA]} \\
\hline
\end{array}
\tag{9}
$$

We focus primarily on the choice of the challenger of whether or not to attack, while we assume that the ruler attacks if and only if expecting to be attacked. This simplifies the analysis, but illustrates most of the main results. The analysis can with some effort be generalized to the case where both parties might be tempted to attack. This is done in Mehlum and Moene (2010). Formally, this implies that the following ranking of alternatives holds for the ruler

$$
\text{Ruler: } [NN] \succ [AA] \succ [NA] \text{ and } [NN] \succ [NA]
$$

We also assume that the challenger attacks when expecting to be attacked,

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while allowing for the possibility that he would benefit from a unilateral attack.

$$\text{Challenger: } [NN] \succ [AA] \succ [AN]$$

$$\text{Challenger: } \begin{cases} [NN] \succ [NA] & \text{unilateral attack not tempting} \\ [NN] \prec [NA] & \text{unilateral attack tempting} \end{cases} \tag{10}$$

Under these conditions a Nash equilibrium is always found on the main diagonal. The case where both parties attack is always a Nash equilibrium. The case where both parties abstain from attacking may be an equilibrium, but only if the challenger is not tempted by a unilateral attack.

In the following we can therefore focus on the payoff for the challenger. The expected payoff to the challenger, π_c, is

$$\pi_c = (\text{share of rents})R + \theta r_c - (\text{cost of fighting effort}) \tag{11}$$

Here the share of rents is either the peacetime share or, in case of conflict, the probability of winning. The appreciation of the return to the challenger entrepreneurs is given by θr_c and the elite will take into account the loss for own entrepreneurs when considering an attack. Finally, the cost of fighting effort is zero when the challenger does not attack and a positive number if it attacks.

The following matrix gives the payoffs to the challenger elite in the various constellations.

ruler challenger	no attack	attack
no attack	$\mu_c R + \theta(A + \Delta)$	$0 + \theta A$
attack	$R + \theta A - \alpha \bar{z}_c$	$1/2R + \theta A - \alpha \bar{z}_c$

(12)

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If neither party attacks, the challenger is left with the peace time share of rent μR. The entrepreneurs get the no conflict return $A + \Delta$, which enters the elites payoff with weight θ. If there is unilateral or full conflict, the stability and trust sensitive part Δ is lost and the entrepreneurs' payoff declines to A. In case of unilateral attack by the challenger, he collects the entire rents R with certainty and lay down effort $\bar{z}_c$ at unit cost α_c. In case of unilateral attack by the ruler, the challenger gets no rents and lay down no fighting effort. Finally, in case of attack by both, we assume that the probability of winning is fifty percent for both, hence the expected share of rents is $1/2R$.

When measuring all gains and losses relative to the peace payoff $\mu R + \theta(A + \Delta)$, the challenger elite's payoff matrix is

ruler⟍ challenger	no attack	attack
no attack	0	$-\mu R - \theta\Delta$
attack	$(1 - \mu)R - \theta\Delta - \alpha_c \bar{z}_c$	$(1/2 - \mu)R - \theta\Delta - \alpha_c \bar{z}_c$

$$(13)$$

Here Δ is the challenger group's peace dividend (the gains in terms of higher production if there is no attack).

We have assumed that the challenger always prefers to counterattack when attacked ($[AA] \succ [NA]$). Formally this implies that

$$1/2R > \alpha_c \bar{z}_c \tag{14}$$

The challenger will not be tempted by unilateral attack if $[NA] \prec [NN]$. From the matrix above this condition can be expressed as

$$\theta\Delta > (1 - \mu)R - \alpha_c \bar{z}_c. \tag{15}$$

Hence, the challenger is not tempted by an attack if the costs of attacking are high relative to the net gains. The net gains depend on the peacetime share

of rents μR. The total cost is made up of the cost of effort $\alpha_c \bar{z}_c$, but also of the losses from conflict for the entrepreneurs Δ. The value of Δ in turn depends on the fragility of the production choice of the producers. The cost of an attack $\alpha_c \bar{z}_c$ is assumed to depend on the current state of the economy and it is considered uncertain ex ante.

If $\alpha_c \bar{z}_c$ is distributed with a cumulative density function $F(\cdot)$, the probability that the challenger group does not attack is
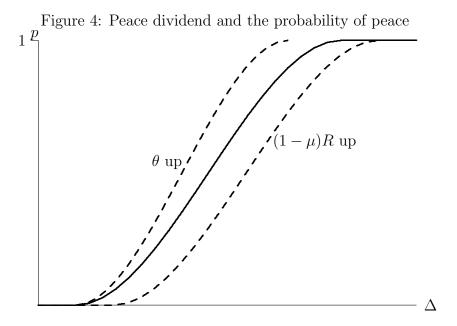
$$p = 1 - F\left((1-\mu)R - \theta\Delta\right) \equiv P(\Delta, R) \qquad (16)$$

Several features follow immediately from 16 :

- Higher rents make peace more fragile, as a higher R makes the challenger group more likely to attack. This effect is compensated if the challenger group gets a larger share, μ, of the rents.

- Higher losses of attacking make attacks less tempting, and a higher Δ makes it less likely that the challenger group attacks.

- A higher concern for own group members makes their elite less aggressive, as higher θ reduces the chance that the challenger elite attacks.

These features are illustrated in Figure 4. The solid line illustrates how p increases with Δ. The peace assuring effect of an increase Δ is stronger the larger the θ, since the elite cares more for losses of the entrepreneurs when θ is high. An increase in the excess rents that can be captured in case of successful attack $(1-\mu)R$, increases the temptation of unilateral attack and shifts the probability of peace downwards.

These results are illustrated in Figure 4. Here the solid line shows one example of (16). When Δ is small, the probability of peace goes to zero, while the probability of peace goes to one when Δ is large. For a given $F(\dot{)}$ the curve may shift up if R increases or if μ decreases. Both these effects make it more

Figure 4: Peace dividend and the probability of peace

tempting to start a conflict as the difference between peace time resource rents and rents in case of unilateral attack goes up.

The curve shifts down when θ increases. The reason is that the entrepreneurs' peace dividend has a higher weight in the utility of the ruler. This effect is stronger the larger the Δ, while the effect is zero when Δ_c is zero, hence the probability curve turns downwards as θ increases.
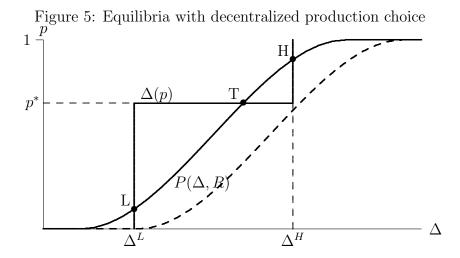
2.3 The equilibrium probability of maintained peace

The probability of conflict depends negatively on the peace dividend. The peace dividend in turn is determined by the perceived probability of conflict. The main focus now is how the anticipation about a conflict affects the production choice of the members and how the production choice in turn determines the probability of conflict.

From (16) we know that

$$p = P(\Delta, R)$$

As Δ from the production choice is an increasing function of p, while p from the

Figure 5: Equilibria with decentralized production choice

conflict choices is an increasing function of Δ, vicious circles, virtuous circles, and multiple equilibria are all possibilities. For simplicity we focus on the case where there are only two efficient technologies to choose from. These two are denoted H and L with $\Delta^H > \Delta^L$. The critical peace probability for which entrepreneurs switch from L to H is denoted p^*. Combining the technology response with the peace probability mechanism, two locally stable equilibria may result: One at L in Figure 5 where both p and Δ are low, and one at H in Figure 5 where both p and Δ are higher.

The first equilibrium is Point L where low confidence in peace and low production is the result of a self-fulfilling prophecy. In this equilibrium group members allocate their resources to less productive activities, because their perceived probability of peace is below p^*, and elites are highly tempted to start a conflict because the perceived costs of war is low. Therefore in L:

- the fear of confrontations between the challenger and the ruler makes citizens reluctant to invest in productive activities that can be lost in the likely event of conflict and the peace dividend Δ becomes low

- conflicts become less costly to the elites and strongmen may be tempted to start conflicts

- political tensions magnify in the sense that private initiatives based on

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perceived political tensions at the top may create the conditions for the conflicts to emerge with a high probability, confirming the initial beliefs of the citizens that the country is prone to conflicts

The other equilibrium is Point H, where high confidence in peace and high production is the result of a self-fulfilling prophecy. In this equilibrium group members allocate their resources to highly productive activities, because their perceived probability of peace is higher than p^* and the elite is not tempted to start a conflict because the perceived costs of war are high.

The high cost of war follows from the high Δ. This commitment to peace can, at an abstract level, be seen as an example of "specific investments" as "strategic commitment" along the lines of Chung (1995). Discussing investments as a commitment device in business partnerships, he writes"..specific investments have a much higher value inside the contractual relationship than outside. The more specific investments the breaching party makes, the greater is the switching cost that he must incur when he breaches the original contract." (p.441)

In H it is also the case that breach of the "peace contract" is particularly costly for the challenger. Therefore, in H:

- confidence in peace induces citizens to invest in productive activities even though these can be lost in the unlikely event of conflict

- conflicts become more costly to the elites and even hostile strongmen can become more tempted to compromise peacefully

- political stability mitigates as private initiatives based on perceived political stability create the conditions for the peace to emerge, confirming the initial beliefs of the citizens that the country is protected against conflicts.

The figure also contains a dashed curve which indicates a situation with increased rents R. In this case the Δ^H equilibrium disappears altogether and

only the low Δ^L remains.

The point L fits well with Collier's (1999) analysis of post conflict societies. "Despite these severe effects of civil war the restoration of peace does not necessarily produce a peace dividend. Peace does not recreate either the fiscal or the risk characteristics of the pre-war economy: There is a higher burden of military expenditure and a greater risk of renewed war."(p.181) . Collier points to the causality from the high risk of new conflict to the small peace dividend. Our model also postulates that the small peace dividend itself explains the high risk of continued conflict.

A movement to point H is only possible if the entrepreneurs see H as a credible and viable alternative. In addition, some coordination is needed, as a wait and see strategy may be the most sensible strategy in an uncertain and risky environment.

In order to achieve a shift from conflict to peace, it is essential that the economy moves beyond the tipping point T. In the simple static model it implies that a fraction of entrepreneurs coordinate on a technology choice that brings the Δ beyond T. As soon as all agents are confident that p is beyond p^*, they will all choose the high return technology.

In reality Δ may need quite some time to adjust. If that is the case, a history of conflict may be difficult to turn around. If Δ grows in coordinated anticipation of peace — but only gradually — the challenger may be tempted by violence before Δ has reached a level sufficient for challenger restraint.

Hence, coordination can move the economy from one equilibrium to the other. This result is similar to that of Rodrik (1991) in his analysis of investment in an economy after business friendly reforms. If the reform is seen as credible by most entrepreneurs, they will invest and the reform is not reversed. If there is no investment response, however, the reform might be reversed. Thus, there is a problem of self-fulfilling failure. The problem of coordination shows that when the agents do not internalize the full effect their choice of technology has on the probability of peace, the agents show too much

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restraint in the risk taking. If they could get together, they could agree on a coordinated move to the H equilibrium. They could in fact do even better and in the following section we discuss the ultimate incentives for the various actors, starting with the challenger group's entrepreneurs.

3 The group incentives

In this section we consider the impact of social cohesion in the form of coordination gains. First we consider the incentives of the entrepreneurs in the challenger group to coordinate their investment activities in order to affect the behaviors of their own elite and the ruling groups elite.

3.1 Group incentives for the challenger's entrepreneurs

Imagine an association of entrepreneurs in the challenger group who could take into account the feed-back effect that the choice of technology has on the probability of conflict. For such an association, playing safe is not attractive as this is exactly what prepares the ground for conflict. An association will maximize 2, taking into account both 16 and 3, yielding the objective function

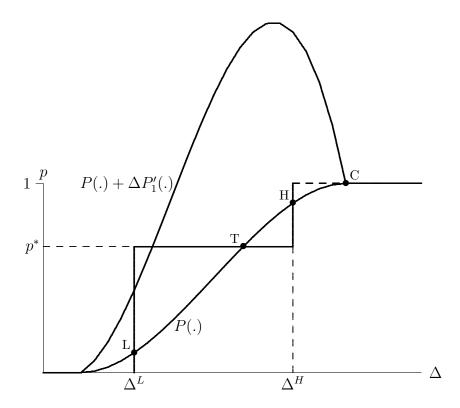$$E(r) = \bar{A} + p(\Delta, R)\Delta - a(\Delta) \tag{17}$$

Assuming from now on that $a(.)$ is continuous and properly differentiable, the first order condition is

$$\frac{\partial E(r)}{\partial \Delta} = p(\Delta, R) + \Delta p_1'(\Delta, R) - a'(\Delta) = 0 \iff \tag{18}$$

$$p(\Delta, R) + \Delta p_1'(\Delta, R) = a'(\Delta) \tag{19}$$

For the association of the challenger's entrepreneurs, the difference between private return and social return of increasing Δ is captured by the term $\Delta p_1'(\Delta, R)$. A marginal increase in Δ increases p by $p_1'(\Delta, R)$ and the valua-

tion of this increase is given by $\Delta p_1'(\Delta, R)$. The social return for challenger's entrepreneurs is illustrated in Figure 6. Here the solid humped curve shows the left hand side of (19). The social gain is always above the private gain. Therefore a decision maker coordinating the entrepreneurs would, if possible, want to achieve a higher Δ than the decentralized decision makers.

Figure 6: Equilibria with centralized technology choice

Given the two technologies that entrepreneurs can choose from in the figure, Δ^H is the preferred technology for such an association of entrepreneurs. Also, in Δ^H there is a substantial gain from further increase in Δ. This gain is measured by the height of the social return curve for $\Delta = \Delta^H$. This distance shows the willingness to pay for a further increase in Δ.

Given that Δ^H is the highest available level of Δ, further increases in Δ would only be possible by manipulating the technology in H, making it more fragile. For the sake of the argument, one could imagine that Δ could be increased one for one with a corresponding decease in A. In that case, $a' = 1$,

as illustrated by the dashed extension to the stepwise $a'(.)$ schedule. Given this possibility of making the technology artificially even more fragile, the technology choice will be in C with $p = 1$. That the optimal p is $p = 1$ is not surprising, as trading a decrease in A one for one for an increase in Δ is costless as long as peace can be assured with certainty.

- If a technology can be made more fragile simply by shifting production one for one between the robust part and the fragile part, a central decision maker will do this until peace is assured with certainty.

This result hinges on the possibility of getting p all the way up to one. If there is residual probability of conflict so that $p(\Delta, R)$ never reaches one, the optimum seen from a centralized decision maker will be one where $p < 1$ such that (from (19))

$$\Delta p'_1(\Delta, R) = 1 - p(\Delta, R) > 0 \tag{20}$$

The centralized choice will nevertheless always differ from the individual choice as the individual entrepreneurs will never prefer the more fragile technology when $a'(\Delta) = 1$.[4]

The difference between the social and private valuation of an increase in Δ, stems from the positive effects it has on the probability of peace. The strength of this effect depends on the parameters of the model and in particular on the amount of rents R available. If the rents increase, the immediate effect is to lower the probability of peace, thus lowering the private return from a Δ increase. This is illustrated by the downward shift in the "private valuation" curve in 7 and, as we saw in Figure 5, the decentralized equilibrium may move downwards as a result. In line with the private returns also the "social valuation" move outwards. In the example, social valuation also move upwards for high Δ. The reason for this is that the marginal effect on the peace probability

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[4]Unless $p = 1$, in which case the entrepreneurs are indifferent.

is higher when p is low. This result holds generally for p close to one as long as there is a bell shaped density over the shocks that determine the P-function.
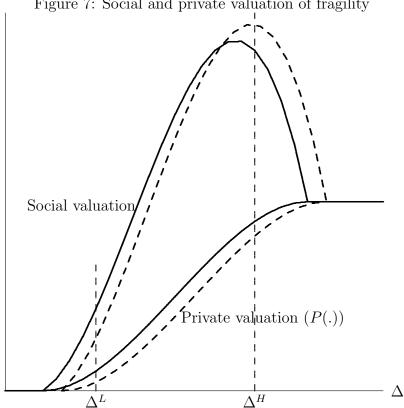
Figure 7: Social and private valuation of fragility

3.2 Group incentives for the challenger elite

To consider the group incentives for the challenger elite, it should be recalled that conflict erupts if the challenger has incentives for unilateral aggression in order to win in a surprise attack. If that is the case, the economy ends up in a conflict situation where resources are wasted in conflicts and where productive potential is foregone, as the technology choices of agents are geared towards safeguarding against loss in the case of conflict.

This conflict outcome may be an undesirable outcome for all agents of the economy, and the agents typically have incentives to influence the entrepreneurial choices. One case is where the challenger elite prefers peace to

conflict. Going back to (13), conflict will be the outcome if

$$\alpha \bar{z}_c + \theta \Delta < (1 - \mu)R$$

If also

$$\alpha \bar{z}_c + \theta \Delta > (1/2 - \mu)R$$

then the equilibrium of the game between the two elites is a prisoners dilemma outcome. Then the challenger will try to find a way to commit to the no attack strategy. One way to achieve that is to stimulate an increase in Δ. By getting the entrepreneurs to coordinate on the high Δ in the case of two equilibria, the challenger elite is much less likely to be tempted to start a destructive conflict. The elite could also find it in its own interest to pay for Δ over and above the level that entrepreneurs would choose for themselves.

Another way to achieve credible peace is for the challenger elite to somehow increase the θ. The parameter captures to what extent the elite feels an affinity with his group members. One recipe to credibly increase θ is to include the entrepreneurs among the inner circles of the challenger elite. A fear that the elite should act in stark opposition to the interest of the entrepreneurs is then avoided, and a process may start where Δ also increases endogenously, strengthening the commitment to peace even further. Democratization might increase θ and our result is in this respect similar to that of Acemoglu and Robinson (2000, 2001).

Yet even under favorable circumstances commitments to collective group interests can be difficult to assure for most elites. For instance, ex ante the challenger elite can put weight $\theta = 1$ on its own entrepreneurs and thus may act in the total interest of the challenging group. Nevertheless the elite may know that faced with prospects of large rents later on, the weight on the entrepreneurs interests might be pushed down by self serving preference changes.

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This may be the result of political weakness of will or of a power struggle inside the elite where the aggressive more self serving elements may get the upper hand in the decision making. If there are such elements of time inconsistencies, ex ante the challenger elite would maximize

$$\bar{A} - a(\Delta) + p(\Delta, R)(\Delta + \mu R) + (1 - p(\Delta, R))(R/2 - \alpha \bar{z}_c) \qquad (21)$$

where the elite internalizes all entrepreneurial gains, but still acknowledges that the relevant probability of peace, the $p(\Delta)$ function, is governed by a a reversion to $\theta < 1$. The first order condition is

$$p(\Delta, R) + (\Delta + (\mu - 1/2)R + \alpha \bar{z}_c)\, p_1'(\Delta, R) = a'(\Delta) \qquad (22)$$

Comparing with equation (19), we see that when the elite's payoff also is brought into the picture, the valuation of increased peace probability is increased if $((\mu - 1/2)R + \alpha \bar{z}_c) > 0$. This inequality is satisfied unless μ is much less than $1/2$ or if R is high. Hence, the challenger elite may go even further than the entrepreneur association in wanting to stabilize the peace by stimulating fragile activities. Again the optimal solution could be to increase Δ so much that p is brought all the way to one.

3.3 Group incentives for the ruling elite

We have throughout assumed that the ruling elite prefers peace to conflict. Conflict is costly in terms of resources used, but also in terms of production lost for the entrepreneurs within the ruling group. Hence, when the last stage comes, the ruling elite will have incentives to pay off the challenger group by increasing μ discretionary. As already established, conflict erupts if

$$\alpha \bar{z}_c + \theta \Delta < (1 - \mu)R \qquad (23)$$

The ruling elite can thus avoid conflict by setting μ sufficiently high so as to turn this inequality around. Depending on the cost of conflict for the ruling elite, such a conflict-mitigating policy may be worthwhile. The resulting share of rents accruing to the challenger will be

$$\mu R = R - \alpha \bar{z}_c - \theta \Delta \tag{24}$$

As with other discretionary concessions, this conflict mitigating policy may, if anticipated, potentially affect the challenger group's own incentives. It may affect the challenger's entrepreneurs positively, as they will have higher confidence in peace, but it may lower the incentives for the challenger elite to contribute to peace. The ruling elite's concessions may in fact invite "hijack" strategies by the challenger elite. One illustrative case is the is the one where the ruling elite is fully committed to peace.

If the entrepreneurs of the challenger group have the impression that the ruling elite is committed to peace, they will set $p = 1$ in their own optimization problem and choose the overall optimal combination of Δ and A. This would heighten Δ and help in building the incentives for peace. As seen from (24), an increase in Δ endogenously lowers the need for transfer via increases in μR.

The challenger elite, on the other hand, acknowledging this would be tempted to play down their concern for their own entrepreneurs. If the ruling elite perceived that θ was indeed quite low, the need for transfer would be higher. In this way the challenger elite could force concessions from the ruling elite by strategic identification

- If the ruling elite is prepared to pay for peace, the challenger elite can gain by playing down its concern for own group members.

Such a strategy is similar to that of underplaying own weakness in order to be interpreted as a credible threat. This misrepresentation of the elites incentives may however not be credible. In that case, more substantial strategies (like burning retreat bridges) can be done to extract some extra rents. One

way would be to affect the technology choice for the entrepreneurs in a more robust direction by depressing Δ and stimulating A. In that way, the challenger elite can use the depression of own entrepreneurs to squeeze the largest possible rent out of the rulers.

Assuming that the ruling elite is committed to peace we can use the compensation condition (24). Then, by depressing Δ by a small number d, it follows from (5) and (11) that the challenger elite will lose $\theta d(1 - a'(\Delta))$. From (24) it follows that the need for compensation will increase by θd. Hence, if the ruling elite wants to avoid conflict, they will have to increase compensation by this amount. The challenger elites then has a net gain of $\theta d a'(\Delta)$. In this case, making the technology more robust destabilizes the situation and the challenger elite can extract more rents by playing on this. The compensation increases with reductions in the peace dependent part Δ but is unaffected by the robust part A and on the margin the tradeoff between A and Δ is given by $a'(\Delta)$.

4 Conclusion

In their recent survey of civil wars Blattman and Miguel (2010) write:

> "The outbreak of internal wars is commonly attributed by poverty. Indeed, the correlation between low per capita incomes and higher propensities for internal war is one of the most robust empirical relationships in the literature.[..] Yet claims of a direct causal line from poverty to conflict should be greeted with caution. One reason is that this line can be drawn in reverse. Conflicts devastate life, health, and living standards."(p. 2 and 3)

In this chapter we have shown how the missmatch between motives of elites and entrepreneurs may generate a two way link between poverty and conflicts, potentially generating a self-fulfilling prophecy of conflict and low growth. It

is not necessarily the low income levels per se that make poor countries prone to conflict, but rather unresolved group cleavages and a lack of confidence that simultaneously explain both poverty and conflicts. This result also echoes the insight in Blomberg and Hess (2002): "Economic conflict tends to spawn internal conflict, which in turn returns the favor. Moreover, the presence of a recession tends to amplify the extent to which internal and external conflicts self-reinforce each other" (p. 89).

Based on difficulties in establishing confidence and cooperation, an interesting pattern of self-fulfilling prophecies follows from our discussion.

First, the model shows how *political tensions magnify:* In situations where many citizens base their private initiatives on perceived political tensions at the top, they create the conditions for the conflicts to emerge for sure. The fear of confrontations make citizens reluctant to invest in productive cooperation activities that can be lost in the likely event of conflict. In this case, conflicts become less costly to the elites and even reasonable strongmen can become more tempted to start conflicts. This again confirms the initial beliefs of the citizens that the country is prone to conflicts.

Second, the model demonstrates how *political stability mitigates:* In situations where many citizens base their private initiatives on perceived political stability, they create the conditions for the peace to emerge for sure. The confidence in peace make citizens eager to invest in productive cooperation activities, even though these can be lost in the unlikely event of conflict. In this case, conflicts become more costly to the elites and even hostile strongmen can become more tempted to compromise peacefully. This again confirms the initial beliefs of the citizens that the country is protected against conflicts.

It turns out that trust between elites requires trust across groups at the ground level, while collaboration at the ground level require trust among elites. These mutual links are complicated by the extent to which elites have different interests than their group members. Elites' motives to start conflicts depend on their identification with own group members. This identification may again

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depend on elites' social care for own group members and by elites' ability to tax their own group.

Again, the pattern of self-fulfilling prophecies emphasized above is consistent with the robust empirical finding that poorer countries are more conflict prone than richer countries. Yet, according to our mechanism, it is not the low income levels that make poor countries prone to conflict. Violent conflicts and low incomes are both caused by the same "third factor" associated with unresolved group cleavages and a lack of confidence. This third factor simultaneously explains both poverty and conflicts: It leads to economic underperformance by inducing citizens not to invest in cooperation activities across groups, and it leads to conflicts by lowering elites' barriers against attacking as they have so little to lose. So it is equally true to say that poor countries are conflict prone because they are poor, as to say that poor countries are poor because they are conflict prone.

It has been said that war is development in reverse. Risk of war can thus be considered a risk of reversed development, an expected drag on profitability and beneficial developments. Unresolved social hostility in this way works as an absurd tax levied on high productive investments that are vulnerable to civil conflict and other types of collapse of cooperation—potentially creating a conflict trap.

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