Rwanda's involvement in Eastern DRC: A criminal real options approach

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Abstract
This paper applies an alternative model to analyze criminal behaviour by countries based on real option models. Criminal options incorporate a richer framework than traditional cost-benefit models and allow examining the optimal timing of a crime as criminals have the possibility but not the obligation to commit a crime in the near future. From the model, we show how criminal states can actively manage their criminal options. More importantly, we show how the international community can optimally intervene pro-actively, by reducing the incentives for criminal states to execute their criminal options. These novel insights are then applied to two episodes of criminal behaviour by Rwanda in the Democratic Republic of Congo (DRC): the massive killing of Hutu refugees by the Rwanda Patriotic Army (RPA) in late 1996-early 1997 and the illegal exploitation of Congolese resources from August 1998 onwards. This article describes and assesses these activities from this real option perspective.

Keywords: criminal behaviour, real options, criminal state, Rwanda, Democratic Republic of Congo (DRC)

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0. Introduction

In this paper, we assess Rwanda's involvement in Eastern DRC (Democratic Republic of Congo) from the perspective of the literature on criminal behaviour. Just like individuals, other entities, such as states, can engage in criminal activities, making choices they consider rational. How do these countries' decisions to commit crimes come about? Why and when do they lift the criminal option? And how can the so-called international community influence these decisions in a similar way as the police and the judicial system in a domestic criminal context?[1] Over the years, a large literature has emerged that tries to fit answers to these questions within a framework of rational, optimal (criminal) decision making.

Traditionally, criminal behaviour is thereby analyzed within an expected utility framework (Becker, 1968). Within this framework, a 'criminal' is only expected to commit an offense if the expected profits exceed the expected costs. The expected profits are the gains that result from the offense. The expected costs are the result of the probability of conviction and the level of punishment (Cooter and Ulen, 2000). Both parameters are supposed to have a deterrent effect. As the probability of punishment increases or the severity of punishment augments, the total number of offenses will be reduced.

The calculation of this expected net-gain of a crime is similar to cost-benefit calculations in economics. For instance, it is the traditional criterion to analyze the profitability of projects in capital budgeting. The economic literature recognized the limitations of this approach only recently. In particular, traditional models cannot capture the value of flexibility to adapt an investment decision in response to uncertainty. This gave rise to a large body of new literature, and a new class of models usually referred to as 'real options' models. Real option theory

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[1] We use the expression "so-called", because the "international community" does not really exist. Is it its institutional translation, namely the United Nations? Or does it refer to specific countries with a particular interest in a given situation or the press or vocal NGOs attempting to influence international public opinion? The international community is all of the above, and the notion lacks clarity and allows the actors to escape their responsibilities. However, after this caveat, the expression will be used throughout this article.

combines the simultaneous existence of uncertainty, irreversibility of investment and some freedom on the timing of the investment. In this way, a more dynamic framework to evaluate investment projects has emerged. For instance, postponing an investment project to take a better informed decision in a turbulent environment avoids being trapped in an irreversible loss-making investment project. Real option models have already been applied in a variety of business contexts, such as natural resource investments, land development, flexible manufacturing, R&D and others.

Engelen (2004) pioneered the application of real option reasoning to criminal behaviour, i.e. criminal options, as a similar problem arises with respect to conventional economic analysis of criminal behaviour (see infra). We apply this criminal real option approach to the way in which Rwanda has intervened in the Democratic Republic of Congo (DRC) since 1996. We study two episodes of criminal behaviour: the massive killing of Hutu refugees in late 1996 and early 1997, and the illegal exploitation of Congolese natural resources since 1998.

The article is organized as follows. After explaining the concept of real options in section one, an overview of the general real option framework for criminal behaviour is given in sections two and three. This model will then be applied to Rwanda's behaviour in the DRC. Section four examines this criminal option from the point of view of both Rwanda and the international community. The central question addressed here is how country-level criminal behaviour can be restricted based on the insights of a real option model. Section five describes two cases of Rwandan criminal behaviour and analyses the real options calculations of the Rwandan regime. Section six contains the conclusions.

1. The concept of real options

Allocating resources through investment opportunities is traditionally evaluated using a cost-benefit approach. The inherent limitations of such approach are well-documented. It assumes a now-or-never decision and assumes the decision-maker to follow a rigid path once the investment decision is taken (Feinstein and Lander, 2002). In reality, in a competitive environment with uncertainty and change, projects will not crystallize in the same shape as the decision-maker has initially envisioned. During the lifetime of the project new information might arrive or certain sources of uncertainty might be resolved, making it valuable to adjust the strategy (Trigeorgis, 2000). The cost-benefit model cannot handle operational flexibilities such as delaying, scaling-up/down, shutting down/restarting or

abandoning a project (Guerrero, 2007). Furthermore, it cannot handle strategic dimensions of projects either (Kester, 1984). This is the case when a project consists of different phases which are not independent of each other. Such capital budgeting decisions are better handled using a real option framework. Active real option management allows to improve the upside potential of projects, while excluding downside losses.

In general, an option can be defined as the right, but not the obligation, to buy (call-option) or sell (put-option) the underlying asset at an agreed price (strike price or exercise price) during a specific period or at a predetermined expiration date. Typical examples are stock options, index options, interest rate options, currency options or options on commodities. Having the flexibility to exercise such a financial option clearly has value in financial markets. In contrast with financial options, real options refer to the application of the options concept to physical investment opportunities. Any investment project can be viewed as an option whereby the firm has the right to obtain all the underlying cash flows from the investment project at a known price. This price is the investment cost of the project and is analogous to the exercise price in financial options. When the firm decides to go along with the investment project, it executes the option.

Within this context, these kinds of options are conventionally labelled as real options. Different theoretical types of real options have been developed in the early literature: options to delay (McDonald and Siegel, 1986), scale options (Trigeorgis and Mason, 1987), options to abandon (Myers and Majd, 1990), switch options (Kulatilaka and Trigeorgis, 1994), growth options (Amran and Kulatilaka, 1999) and sequential options (Carr, 1988). The later literature applied real option models to investment decisions in different sectors, such as natural resources (Paddock et al, 1988), internet companies (Schwartz and Moon, 2000), the service sector (Jensen and Warren, 2001), the entertainment industry (Amran, 2003), pharmaceutical R&D (Cassimon et al, 2011a) and mobile payment systems (Cassimon et al, 2011b).

2. Modelling criminal behaviour

In this section we compare the conventional cost-benefit approach of criminal behaviour (section 2.1) with the real option approach to crime (section 2.2).

2.1. Criminal behaviour within an expected utility framework

According to the classic economic theory of crime and punishment, criminal behaviour is analyzed within an expected utility framework (Posner, 1998). Within this framework, the total number of offenses in a society will be influenced by the probability of punishment represented by parameter *p* and the severity of punishment represented by parameter *f* (Becker, 1968). As the probability of punishment increases or the severity of punishment augments (*p* or *f* increase), the total number of offenses in society will be reduced.

A person is only expected to commit an offense if the expected profits exceed the expected costs. The expected profits are the gains (Y) that result from the offense. The expected costs are the result of the probability of conviction *p* and the level of punishment *f*. Put simply, the expected net-gain is thus $Y - p.f.$ [2] This conventional decision rule is very simple:

- if Y > p.f : a crime is committed   [1]
- if Y < p.f : no crime is committed

This traditional calculation of the expected net-gain is therefore a *now-or-never decision*. One could argue that criminals continually update their analysis whether to commit a crime or not, but this is in fact an *implicit* application of option thinking, which falls outside the scope of the traditional models.

Engelen (2004) shows that the conventional approach ignores the aspect of uncertainty, which may ultimately lead to the crime becoming profitable. Indeed, the conventional approach cannot deal with the simultaneous existence of uncertainty, irreversibility of the criminal act and flexibility in the timing when to commit the crime. Combining irreversibility with uncertainty over the future behaviour of variables affecting the value of the crime leads to the following intuitive reasoning. Suppose there is some leeway in delaying the crime until more information about the uncertain future becomes available. It may then be optimal to wait some time before committing the crime. It is clear that waiting to commit the crime implies risks (e.g. entry of other criminals) and foregone profits, but it may prevent the criminal from being trapped in an irreversible crime, which may turn out to be very costly when the adverse future materializes (when being caught).

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[2] More formally, a criminal will maximize the following expected utility function (Becker, 1968): $EU = pU(Y-f) + (1-p)U(Y)$, with EU expected utility, *p* the probability of punishment, *U* the criminal's utility function, *f* the severity of punishment, *Y* the income if undetected, and *Y-f* the income if punished.

2.2. Criminal behaviour as a real option

A crime that satisfies these three characteristics (uncertainty, irreversibility of the criminal act and timing flexibility) is best treated as analogous to holding a financial call-option. For some specific time period, a criminal has the possibility, but not the obligation, to pay a certain 'price' in return for an asset that has some value. When the criminal decision is made, the option is exercised, and that is an irreversible decision. As long as the benefits from the crime are smaller than the costs of the crime, the criminal will not exercise his criminal option. Once the benefits of the crime exceed the costs of the crime, a criminal can consider exercising the criminal option and thus committing the crime.

Two scenarios are possible. First, the criminal has no possibility to delay his decision. In that case, it is a now or never decision. If the net expected benefits are positive, he will commit the crime, in the other case, he will abstain from it. Second, there is some flexibility in the timing of the crime. If the criminal exercises his option, he will receive the intrinsic value of the option $Y - p.f$. But, by exercising the option, he loses the time value of the criminal option which values his flexibility to keep his future open.[3] If there is no opportunity cost of waiting, the criminal will not commit the crime before its time to expiration.[4] Only if the criminal faces an opportunity cost by waiting, early exercise is a feasible strategy. Early exercise therefore depends on the trade-off between losing the time value (flexibility) and the amount of the opportunity cost (δ) (see infra).

Analogously to conventional option models we can map the different value drivers of a criminal option model. Table 1 provides a synthetic overview of the different determinants of the value of the option, together with its expected impact on the option value. For instance, the expected benefits of the crime, the volatility of the return, the lifetime of the option have a positive impact on the option value, while the severity of punishment and the probability of punishment have a negative impact on the option value. Appendix 1 presents a more technical presentation of the conventional Black-Scholes (1973) formula and its components.[5] The appendix also includes the actual formulas how to determine changes in the value of the

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[3] The time value of an option is the difference between the market value of the option and the intrinsic value.
[4] This is analogous to holding an American call option alive before the maturity date despite the fact that it can be exercised on any moment.
[5] Real-life real option modeling often requires more sophisticated models such as compound option models (Cassimon et al, 2011a, 2011b) or numerical approaches. An overview of such models is beyond the scope of the article.

criminal call-option as a reaction to the change in one of the underlying variables (the first derivatives).

Table 1. Value drivers of a criminal option

Components	Symbol	Impact on C
Benefit of the crime (i.e. present value of criminal proceeds)	Y	>0
Cost of crime, i.e. the product of	$p.f$	<0
- the probability of 'conviction'	p	*<0*
- the level of 'punishment'	f	*<0*
Volatility of the benefit of the crime	σ	>0
Lifetime of the criminal option	$T\text{-}t$	>0
Risk-free interest rate	r_c	>0
Opportunity cost	δ	<0

3. The Optimal Timing of a Crime

One of the consequences of viewing the criminal decision as exercising an option is the problem *when* to commit a crime. This can be illustrated most simply by referring to the conventional economic analysis of crime: the direct payoff from committing the crime now is given by *Y-p.f*. When this payoff is positive (*Y-p.f* > 0), it is worthwhile to commit the crime. However, once the crime is committed, the flexibility is gone. Therefore, we can apply the general category of options to delay to this criminal option to analyze this situation. Should the criminal commit the crime now or wait until more information is available so that his criminal decision can be made under less uncertainty? For, by committing the crime, the option expires. So, the value of the option today (C_0) must be compared with the payoff of committing the crime immediately. Hence the optimal crime criterion is modified into:

- $Y - p.f < C_0$: wait to commit the crime
- $Y - p.f > C_0$: commit the crime (now)

Another way of indicating the same criterion is stating that the value of the crime (Y) must exceed the cost of the crime (*p.f*) by at least the value of the option (C_0) in order to decide to commit the crime now:

- $Y < p.f + C_0$ or $Y < Y^*$:   wait to commit the crime
- $Y > p.f + C_0$ or $Y > Y^*$:   commit the crime (now)

This minimum-acceptable crime value can be called the 'threshold value' of the crime, in the following denoted as Y^*. In option pricing jargon, the option is said to be 'out of the money' in the case of 'waiting' and 'in the money' when the underlying value of the crime (Y) exceeds the option value plus the cost of the crime. As such, the basic criminal decision to take is not *whether or not* to commit the crime (as indicated by the conventional economic analysis of crime), but rather *when* to commit the crime, i.e. determining the optimal moment of exercising the criminal option.

Figure 1. Criminal decision making from a real option perspective (ROA) and a conventional cost-benefit analysis (CBA)
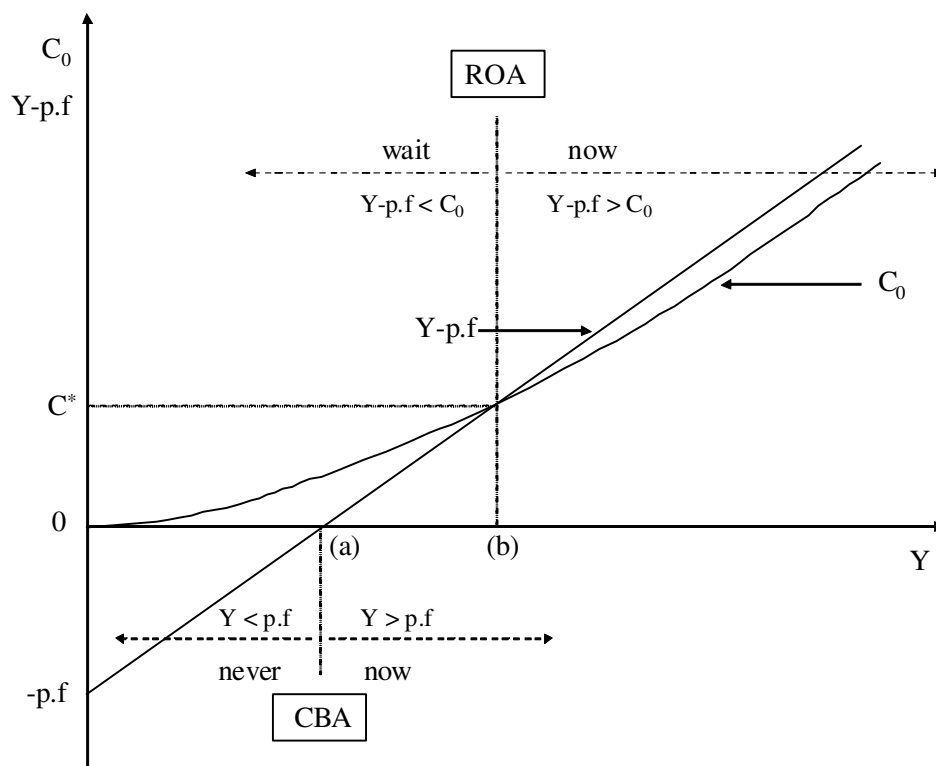
This intuitive reasoning is graphically represented in Figure 1. The linear curve shows the conventional cost benefit approach to crimes, being the Y-p.f payoff. According to this rule the crime will be committed when the underlying value (Y) is at least the value indicated by point (a) in Figure 1. When it is lower, the criminal will refrain from committing the crime. However, under the real option approach, the decision criterion changes. Even when the value of Y is larger than point (a), it can be optimal to wait. The criminal will only commit the crime now, meaning executing his criminal option, when the net benefit is sufficiently positive to

compensate the value of keeping the option alive, as represented by the option value curve C_0, in other words, from point (b) on. From that moment on, it is no longer optimal to wait any longer: committing the crime now provides the criminal with a higher anticipated pay-off than that of waiting any longer.

Changes of the different value drivers will have an impact on the optimal timing of executing the criminal option, as shown in Figure 1. First of all, as Figure 1 is expressed in terms of Y, an increase in the benefits of the crime (Y) means a shift rightward on both curves, which increased chances of execution being the optimal decision. Second, an increase in the level of punishment (f) or in the probability of conviction (p), implying an increased cost of the crime, will result in a right downward shift of both curves, resulting in a shift of points (a) and (b) to the right, and thus a higher chance of postponing the crime. The other value drivers only occur in the real option model, with changes affecting only the option value curve (C_0). An increase in the volatility of the return of the crime will make the option more valuable (an upward shift of the option value curve), resulting in a rightward shift op point (b). An increase in the lifetime of the option (and also, but negligibly, an increase in the interest rate) will have a similar (though relatively smaller) effect on point (b). On the other hand, an increase in the opportunity cost will result in faster execution of the option (a downward shift of the option value curve moving point (b) to the left).

As a consequence, it is important for the criminal to try to influence the parameters that determine his decision making to his/her advantage by means of a pro-active management of the criminal option. On the other hand, it shows a range of possibilities by prosecutors or the international community to engage in actions that reduce the pay-off for the criminal, not only by playing on the conventional cost-benefit determinants of a crime, but also by influencing the additional determinants identified in the criminal option framework.

4. Pro-active management by the criminal state and the international community

The previous sections showed that analyzing crimes through real options models offers a richer framework which takes into account the flexibility the criminal has to commit the crime at an optimal moment in the future. Once a criminal holds a criminal option, he can actively increase its value as long as the option does not mature. He can develop specific strategies with respect to one or more of the value drivers of the criminal option in order to increase the

upside potential of the crime, while always being able to cut-off the downside loss. On the other side, the prosecutor can develop strategies to decrease the criminal option value. This section applies this model to pro-active management in general terms, both from the point of view of a criminal state and from the viewpoint of the international community. Section five will offer two concrete illustrations.

Table 2 provides an overview of actions, both by the criminal state (column three) and the international community (last column), in order to pro-actively influence the pay-offs of the criminal option and the value of the option. By affecting the values of the underlying variables (value-drivers) the decision of the criminal state will be influenced. In column two, we first provide a number of concrete examples of these value drivers of criminal action.

Table 2. Pro-active management of the criminal option

Components	Criminal state		Elements of active management of the international community
	Concrete example of a value driver	Elements of active management by criminal state	
Benefits of the crime (present value of the criminal proceeds)	Extension of territory Access to resources Averting a threat	Increase rate of extension or access to resources	International Law, Codes of Conduct, Certification procedures
Cost of crime, i.e. the product of (a) probability of 'conviction' (b) level of 'punishment'	Political and financial loss Judicial condemnation Cost of occupation	Strategic alliances, Expert judicial council support, Seeking up-front clearance	Sanctions, International judicial mechanisms (ICJ, ICC), Withdrawal of political and financial support
Volatility of the return of the crime	Resistance to invasion Possibility of counter action	Strategic alliances, Explore growth options	Resilience of other states and the international community
Lifetime of criminal option	Time frame of the opportunity	Make as long as possible	Reduce by threat of action
Risk-free interest rate	Largely exogenous		Largely exogenous
Opportunity cost	Territory not occupied No access to resources Threat remains	Strategic alliances, Eliminating competitors, Reduce threat	Supporting the victim state or the aggressor's adversaries

4.1. (Pro-)active management by the criminal state

If a state uses a criminal option model to determine whether (or when) to take a certain action, this approach can have major implications for the enforcement policy. Instead of passively monitoring the criminal option, an active management of the six value-drivers can increase

the option value. In order to maximize the criminal option value, the criminal state can pursue different strategies (see Table 2):[6]

-Lever 1: Concrete examples of the benefits of the crime can be the extension of territory, access to additional (natural) resources, or aversion of a threat. In order to increase the expected proceeds, the criminal state can try to increase this rate of extension, or the amount of additional resources, possibly by engaging in strategic alliances with other (potential criminal) states, or by combining different types of benefits.

-Lever 2: Concrete examples of the cost of a crime can be political or financial costs, judicial condemnation or the costs of occupation. To decrease the cost, criminal states can try to engage in actions decreasing the probability of punishment (p) or decreasing the level of punishment (f). Examples include finding strategic alliances, trying to exploit loopholes in international law by seeking expert judicial council on this, trying to divide the international community, or by seeking up-front clearance for the act from key international players.

-Lever 3: Uncertainty about the rate of resistance to invasion, or uncertainty about the value of additional resources reaped, are examples of the volatility surrounding the rate of return. Criminal states can try to influence this by seeking support (strategic alliances), or by considering new (criminal) options that arise once the first option is lifted (so-called growth options).

-Lever 4: The criminal state can try to increase the lifetime of the option, by keeping options open as long as possible; and

-Lever 5: The criminal state can try to decrease the opportunity cost, i.e. value lost by waiting to commit the crime. Typical examples here are the additional resources foregone as long as the crime did not take place, or the continuation of a threat. Ways by which the criminal state can try to limit this is by seeking alliances, by eliminating potential competitors that might also be interested in committing the same crime, or in case of a threat, by trying to reduce it. Each of the above strategies will be illustrated by concrete examples in section five.

4.2. The point of view of the international community

A thorough examination of the sensitivity of the different value-drivers of a criminal option is also important in order to establish an adequate international enforcement policy. Once the most valuable parameters of a particular kind of criminal option are identified, the enforcement policy can occur more efficiently by focusing on these parameters. Just as

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[6] The sixth lever (the risk-free interest rate) is largely exogenous and will be left out of consideration.

criminals can actively manage their (portfolio of) real options, the prosecuting authorities can actively manage the enforcement of criminal options. Instead of passively monitoring crimes, an active enforcement policy based on the six value-drivers of criminal options can be pursued. Whilst criminals can develop strategies to increase the real option value, the point of view of the enforcement policy is just the opposite. Prosecuting authorities need to develop an adequate policy to decrease the value of the criminal option by using one of the six parameters. The international community has the following strategies with respect to criminal states:[7]

-Lever 1: To decrease the expected benefits of the crime, by clear signals of threatening to take action, for instance by supporting the potential victim or, more generally, by enforcing international law; in case of criminal capture of natural resources, certification procedures might be helpful in particular cases (e.g. diamonds). Instruments include the UN sanctions regime and the OECD Guidelines for Multinational Enterprises.

-Lever 2: To increase the cost, by increasing the probability of punishment (p) or an increase of the level of punishment (f). This can be by severe sanctions, or the threat to withdraw political and financial support (aid, etc.). Another example is the improved working and jurisprudence of international courts and other international judicial mechanisms. Instruments also include individual prosecutions before the International Criminal Court (ICC).

-Lever 3: To decrease the volatility and uncertainty surrounding the return of the crime, by showing unanimous resolve (e.g. among permanent members of the UN Security Council).

-Lever 4: To reduce the lifetime of the option, by intervening early.

-Lever 5: To increase the opportunity cost, i.e. value lost by waiting to commit the crime, by supporting the victim state or the aggressor's adversaries.

Apart from political condemnations, the international community has two (potentially) powerful instruments at its disposal. The first is the sanctions regime enshrined in Chapter VII of the UN Charter. Its objective is not primarily punitive, but aims at modifying states' behaviour by influencing its criminal option decisions. Over the years, sanctions have become "smarter", i.e. more individual and targeted, thus limiting the collateral damages that resulted from earlier general or comprehensive sanctions. This instrument can be combined with the second one, namely judicial action. The old interstate dispute settlement mechanism, the International Court of Justice (ICJ), has in recent years been joined by jurisdictions where

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[7] The previous footnote also applies here.

individuals can be tried for violations of international criminal law. After experiments with *ad hoc* tribunals and mixed courts, this evolution has led to the establishment in 2002 of the ICC. For instance, in the cases of Sudan and Libya more recently, the threat of prosecutions before the ICC complemented decisions under Chapter VII. Again, the prospect of individual prosecutions of persons occupying state functions may alter their calculation of criminal options.[8]

5. Rwandan criminal behaviour: Two illustrations

We now study two episodes of criminal behaviour by Rwanda in the (now) DRC. The first occurred in the Fall of 1996 and the Spring of 1997, when the Rwanda Patriotic Army (RPA) massacred Hutu refugees at a massive scale. The second episode started in August 1998, officially ended in September 2002, but continued afterwards in a covert fashion. This episode involved the widespread looting of Congolese natural resources. We first briefly describe these criminal activities and then analyse the real options calculation from the perspective of the Rwandan regime.

5.1. The massacre of refugees

5.1.1. Criminal activity

Although the Rwandan civil war formally ended with the victory of the RPF (Rwanda Patriotic Front) in July 1994, the flight to (then) Zaire of the defeated army, the militia and over one million civilians exported the conflict. As these insurgent forces were intent on resuming the war, the situation that developed just a few kilometres across its borders was Rwanda's affair, and a vital one at that. Already in 1995, Kagame told journalist François Misser that "if another war must be waged, we shall fight in a different fashion, elsewhere. We are prepared. We are ready to fight any war. And we shall contain it along the border with Zaire" (Misser, 1995: 121). Officials from the US and The Netherlands, two countries close to the new Rwandan regime, confirmed that they had to dissuade Kagame on several occasions from "breaking the abscess" of the Rwandan refugees in Zaire the hard way[9]. During a visit to the US in August 1996, a month before the start of the "rebellion" engineered by Kigali,

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[8] It should be noted that this threat also affects persons other than those occupying state functions, such as rebel leaders.
[9] The EU Special Representative for the Great Lakes Region Aldo Ajello has confirmed this information.

Kagame told the Americans that he was about to intervene[10], the more so since, according to some sources[11], the ex-FAR (*Forces Armées Rwandaises*) were preparing a large-scale offensive against Rwanda from Goma and Bukavu. Faced with the obvious unwillingness or inability of the international community to tackle this problem, Kigali's patience had reached its limits.

From October 1996 onwards, the RPA systematically attacked the refugee camps, first under the guise of the so-called "Banyamulenge rebellion" and later hiding behind a proxy rebel movement, the AFDL, which was created in Kigali (for details, see Reyntjens, 2009). Elements of the RPA systematically shelled numerous camps in South and North Kivu, where massacres were also committed with light and even bladed weapons. Thousands of refugees, most of them unarmed civilians, were killed. These attacks continued and intensified as the refugees moved westwards. The most important massacres occurred between Shabunda and Kingulube, at Shanji, Walikale, Tingi-Tingi, Kasese and Biaro, and finally between Boende and Mbandaka. The report of a UN joint mission referred to information received on 134 sites where atrocities were committed. At the end of May 1997, the UNHCR found that 246,000 refugees were unaccounted for. On 8 July 1997, the acting UN High Commissioner for Human Rights stated that "about 200,000 Hutu refugees could well have been massacred". After detailed calculations, Emizet arrives at a death toll of about 233,000 (Emizet, 2000: 173-179). The report of a UN investigative team later concluded that the RPA had committed large-scale war crimes and crimes against humanity. It went further by suggesting that genocide might have occurred. However, this needed additional investigation: "The systematic massacre of those (Hutu refugees) remaining in Zaire was an abhorrent crime against humanity, but the underlying rationale for the decision is material to whether these killings constituted genocide, that is, a decision to eliminate, in part, the Hutu ethnic group" (UN Security Council, 1998: para 96). More recently, a major report of the UN High Commission for Human Rights confirmed and complemented the data on RPA abuse in the DRC. It found that "[s]everal incidents listed in this report, if investigated and judicially proven, point to circumstances and facts which in a court could infer the intention to destroy

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[10] According to the then U.S. Ambassador to Kigali Robert Gribbin, already in March 1996 Kagame told him that "if Zaire continues to support the ex-FAR/*Interahamwe* against Rwanda, Rwanda in turn could find anti-Mobutu elements to support", adding that "if the international community could not help improve security in the region, the RPA might be compelled to act alone" (Gribbin, 2005: 144-145).
[11] The existence of this project was later confirmed by documents discovered in November 1996 in Mugunga refugee camp, where many ex-FAR had regrouped.

the Hutu ethnic group in the DRC in part" (United Nations High Commission for Human Rights 2010: para 31), a reference to the genocide convention.

5.1.2. The real options calculation

Benefits of the crime

The operation conducted by the RPA in Zaire allowed Rwanda to eliminate the actual threat posed by the presence of armed elements across its border. In a second stage, the extermination of as many Hutu refugees as possible was, in part, a retaliation for the genocide of Tutsi in 1994 and, in part, the elimination of a potential future threat. The second stage was an option opened by exercising the first criminal option.

Costs of the crime

These were fourfold. The direct financial cost was limited. The RPA initially operated close to its own bases, and it was essentially infantry-based, with soldiers mostly moving on foot. Logistics and communication needs were covered free of charge by the US (Reyntjens, 2009: 66-79). Rwanda learned in 1996-1997 that waging war in Congo was cheap, and even profitable, and this was later to lead to another war, motivated by plunder rather than by security concerns (see *infra*).

The second cost related to international law. The operation in Zaire was indeed a clear violation of that country's territorial integrity. This is why it was conducted under the guise of a domestic "rebellion" and why Rwanda consistently denied having troops in Zaire, despite all indications to the contrary. When, on 29 January 1997, Belgium stated publicly what everyone knew, namely that thousands of Rwandan soldiers fought alongside the rebellion, this met with an acid rebuttal. Claude Dusaidi, advisor at the Rwandan presidency, immediately stated: "I believe that Belgium has gone senile (…). It looks like they don't know where the borders are, nor do they distinguish between Zaireans and Rwandans" (AFP, Nairobi, 29 January 1997). The next day, the Rwandan Foreign Minister called the Belgian accusations "erroneous and partisan" (AFP, Nairobi, 30 January 1997). Only after the war did Kagame himself unveil the public secret in an interview with *The Washington Post* of 9 July 1997 (Pomfret, 1997). He said that "the Rwandan Government planned and directed the

rebellion", that "Rwandan forces participated in the capture of at least four cities" and that "Rwanda provided training and arms for (the rebel) forces even before the campaign to overthrow Marshal Mobutu began last October".

By acting so blatantly in violation of international law, Rwanda took the risk of a political and a legal cost. The potential political cost was international condemnation by both individual states and by the UN Security Council. However, it felt –rightly as it turned out– that it was sufficiently covered by the great powers, and by the US in particular. As seen earlier, the US military supported the Rwandan operation on the ground, and the Rwandans were convinced that Washington approved its intervention, although that may well have been a misunderstanding[12]. Zairian protests fell on deaf ears, and the issue was not debated in the Security Council. A legal cost could have occurred had Zaire taken the matter before the International Court of Justice (ICJ), but it did not[13]. At any rate, it later turned out that the legal risk was limited, as the ICJ decided that it could not entertain a complaint lodged by the DRC against Rwanda in 2002, because the latter did not recognise the Court's jurisdiction (see *infra*).

The third risk concerned the fallout of the massacre of refugees committed by the RPA in Zaire/Congo. We have seen earlier that a UN investigative team (and indeed many other sources) established that crimes against humanity and war crimes, and possibly genocide, were perpetrated at a massive scale. Although these crimes are imprescriptible, the ICC was not competent at the time they were committed, and the Rwandans could therefore hope that they would remain unpunished. However, they only narrowly escaped, at least for the time being. Indeed, on 13 July 1998, the Security Council condemned the crimes and requested the Congolese and Rwandan governments to run inquiries and punish the guilty. By demanding a report on the steps taken by 15 October at the latest, the Council kept its options open, as it envisaged, if need be, to take the "additional measures" necessary to judge the culprits. Without saying so explicitly, it thus left the possibility to take them before an international tribunal, an option suggested by the report of inquiry. However, 15 October was to pass

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[12] U.S. Ambassador in Kigali Gribbin believes that Kagame's August 1996 visit to Washington ended in a misunderstanding: "Kagame judged that he was honest about Rwanda's intent to dismantle the camps in the absence of an international undertaking to do so. In turn Secretary of Defense William Perry thought he laid down a clear marker that unilateral action was not advisable. Kagame thought he got an okay. Perry thought he had quashed the idea. Each went away happy" (Gribbin, 2005: 175-176).
[13] As we shall see later, it (unsuccessfully) did during the second war.

without the issue returning to the agenda, and it has not done so since. The situation was indeed very different by then, as the second war had started in the meantime (see *infra*). The risk has not disappeared, though. The report of the Mapping Exercise, released by the UN High Commission for Human Rights in October 2010, contains detailed accounts of war crimes, crimes against humanity, and possibly genocide, committed by the RPA[14]. It recommends judicial prosecution, and this matter could land on the Security Council's table again. In addition, in early 2008, a Spanish court issued indictments and international arrest warrants against forty officers of the RPA for war crimes committed i.a. in the DRC. This judicial action not only considerably limits the freedom of movement of the officers concerned, but it also keeps the issue of RPA crimes on the agenda, making it increasingly difficult for the regime's international backers to continue providing cover[15].

The fourth potential cost was linked to risks two and three. Rwanda is one of the most aid-dependent countries in the world[16], and it could ill afford to lose (part of) the incoming ODA as a result of donors scaling down their aid in reaction to the aggression. However, Rwanda was very well covered by the US, as seen before, but also by the UK and The Netherlands, considered "Friends of the New Rwanda". While before the genocide, France, Belgium and Germany were the main bilateral donors, France and Belgium were increasingly surpassed by the new providers of aid, in addition to the great multilateral donors that, by and large, maintained their commitments. Next to the Americans' robust support, Dutch Development Co-operation Minister Jan Pronk and both the UK's Secretary of State for Development Co-operation Lynda Chalker and her successor Clare Short explicitly endorsed Rwanda's geopolitical behaviour. Therefore, the risk of sanctions was very limited, and they did not materialise at the time (however, they did later, see *infra*).

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[14] The report does not just point an accusing finger at Rwanda, but at other players (such as the armies of the DRC, Angola and Uganda, and nonstate armed groups) as well. However, the crimes committed by the Rwandan army were the most serious and widespread.

[15] Thus, for example, did *The Washington Post* of 3 October 2008 carry a story about the support of the US for the renewal of the contract of one of the indicted officers as deputy commander of the peacekeeping force in Darfur. The article argues that this support was in breach of US legislation outlawing "assistance to human rights violators". The executive director of Human Rights Watch is quoted as stating that the US position prevents "any effort to hold a senior Rwandan officer accountable for serious atrocities". Obviously, for Washington this sort of debate raises the issue of the political price it is willing to pay for its support for the Kigali regime.

[16] During the period 2003-2008 period, on average ODA amounted to 26% of GDP and slightly more than 50% of the state budget. Of total ODA, budget support type of aid interventions (sector and general budget support as well as HIPC debt relief funds) amounted to slightly more that 40% on average. For details, see ODI/Mokoro (2009, p. 13-14).

Uncertainty of the illegal return

As soon as it was clear (i) that the international community was not intent on acting credibly against the threat emanating from the refugee camps and (ii) that the cost of acting was limited, the benefit of lifting the criminal option was quite secure. One uncertainty of aggressing a neighbour to be taken into account would usually be the reaction of that country's army, and the ensuing risk of defeat and casualties in the invader's ranks. However, the Rwandans knew what everyone knew, i.e. that the Zairian army was the mirror of a collapsed state, and that it was no match for the Rwandan army, one of the most effective in the region. This reckoning proved right, as the Zairian army put up virtually no resistance, and the only fighting forces the RPA was confronted with was the former Rwandan government army FAR. The RPA had defeated the FAR in 1994, and it could be confident that it would do so again, which it did.

Opportunity cost of not acting

The threats posed by the insurgent forces across the border increased throughout 1995-96. In particular the three western *préfectures* were affected by commando operations that came, at least in part, from Zairian territory. By mid-1996, the former FAR appeared to be preparing a large-scale offensive against Rwanda from their camps near Bukavu and Goma. For the Rwandan regime it was vital to keep the threat outside its borders and to avoid the civil war from resuming on its own territory. It had become clear at the same time that the international community was unwilling to address this security issue, and that the US was going to look the other way in case of a Rwandan attack. In other words, while Kagame had expressed increasing concern over the last year, he could ill afford to wait much longer. At any rate, he had been preparing for this war, and by the summer of 1996 the instrument he had been building up –the so-called "Banyamulenge rebellion"– was in place. Everything therefore converged to convince the Rwandans that the opportunity cost of waiting any longer would be considerable. The optimal time to lift the criminal option had come.

5.2. Plunder in the DRC

5.2.1. Criminal activity[17]

On 2 August 1998, Rwanda and Uganda again invaded the DRC, and –just like during the previous war– they acted hiding behind a Congolese "rebel movement", the RCD (*Rassemblement Congolais pour la Démocratie*) which was put in place in Kigali. Rwanda put forward security concerns similar to the ones raised in 1996, but the main motive soon became the exploitation of Congolese natural resources. A UN panel put in place in 2001 published a number of increasingly detailed reports on the criminal practices of "elite networks", both Congolese and from neighbouring countries, and identified elements common to all these networks. They consisted of a small core of political and military elites and business people and, in the case of the occupied territories, rebel leaders and administrators. Members of these networks co-operated to generate revenue and, in the case of Rwanda, institutional financial gain. They derived this financial benefit from a variety of criminal activities, including theft, embezzlement and diversion of "public" funds, under-evaluation of goods, smuggling, false invoicing, non-payment of taxes, kickbacks to officials, and bribery. International players were closely involved in this criminal economy, as the local and regional actors drew support from the networks and "services" (such as air transport, illegal arms dealing, and international transactions of pillaged resources) of organised international criminal groups (United Nations Security Council, 2002)[18]. Thus, two different UN panels pointed out that Viktor Bout[19], a notorious and internationally sought arms dealer and transporter featuring prominently in illegal activities in the region, operated from Kigali, among other places (UN Security Council, 2000: para.26; UN Security Council, 2002: paras 72-73)[20].

Military engagement and illegal economic activities became intimately interwoven. Indeed pillaging no longer was an unfortunate side effect of war, but economic interests rather

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[17] This section builds upon Reyntjens (2005) where more details can be found.

[18] The Panel produced another "Final Report" in October 2003 (see *infra*).

[19] After Bout's companies started providing logistical support to US forces in Iraq, he disappeared from the radar screen. Under US pressure, his name was taken off a draft UN list of mercenaries and arms dealers (Godoy, 2004). Cynically enough, Bout was arrested in Thailand in March 2008, on the basis of a US warrant issued for weapons deals with the Colombian FARC rebels.

[20] Aircraft owned by Bout and his frontmen continued to operate in the region during 2004 (UN Security Council, 2005, paras 67, 69, 73, 151).

became its prime driving force. Dietrich has drawn attention to the dangers inherent in what he calls "military commercialism", whereby a stronger state deploys the national military in a weaker neighbouring country, supporting either the sovereign power (as did Zimbabwe and Angola) or insurgents (in the cases of Rwanda and Uganda), in exchange for access to profits (Dietrich, 2001, 2002). Under these circumstances, economic criteria invade military decision-making, for example with regard to troop deployment and areas of operation[21]. In addition, if domestic resources are scarce or cannot be illicitly mobilised as a result of the scrutiny of the international community, cross-border predatory behaviour, out of sight and/or hidden behind political and military concerns, provides an alternative resource. Finally, when control over resources has become a military objective in itself, this is a strong disincentive for troop withdrawal, simply because the "expeditionary corps" and those they support, whether rebels or governments, need each other.

Nowhere is this as clear as in the case of Rwanda, a small and very poor country with little natural resources[22], but with an elite needing to maintain a lavish lifestyle and possessing a large and efficient army. In 2000, the revenue collected by the RPA in the DRC from coltan alone was believed to be US$ 80-100 million, roughly the equivalent of official Rwandan defence expenditure, which stood at US$ 86 million (Sénat de Belgique, 2003: 72). In a similar vein, a UN panel report found that in 1999-2000, "the RPA must have made at least US$ 250 million over a period of 18 months" (UN Security Council, 2001: para. 130). Marysse calculated that in 1999, the total value added of diamond, gold and coltan plundered in the DRC amounted to 6.1% of Rwanda's GDP[23], and to 146% of its official military expenditure (Marysse, 2003: 88). The Kigali economy, which is virtually disconnected from the Rwandan economy as a whole, was largely dependent on mineral

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[21] Several reports point to the direct link between the exploitation of resources and the continuation of the conflict. The UN Panel notes that the control of mineral-rich areas "could be seen primarily as an economic and financial objective rather than a security objective for Rwanda" (UN Security Council, 2001, para. 175); "Most of the fights between Rwandan soldiers and mai-mai have occurred in the so-called 'coltan belt'" (*idem*, para. 176). Under the title "Rwanda's unusual tactics", the Panel found that "attacks (by the RPA) seem to coincide with the period when coltan has been extracted and put in bags for evacuation by the mai-mai. Attacked, the mai-mai abandon their coltan, which is then taken away by small aircraft" (*idem*, para. 177).
[22] In 2003, Rwanda produced about 120 metric tonnes of columbite-tantalite concentrates, 284 metric tons of cassiterite, and 109 metric tons of wolframite. These are very small volumes. However, exports amounted to 861, 3,553 and 156 metric tons respectively, still quite small figures, but showing the gap between production and (re-)export (*US Geological Survey Minerals Yearbook 2004*).
[23] This may seem a modest figure, but in light of the structure of the Rwandan economy, it is gigantic. Indeed in that same year, the production of export crops (mainly coffee and tea) only accounted for 0.4% of GDP (International Monetary Fund, 2004: 80).

and other extraction in the DRC (as well as on international aid). Pillaging the Congo not only allowed the Rwandan government to beef up the military budget in a way that was invisible to the donor community[24], but also bought much needed domestic elite loyalty. This is what Jackson calls the "economisation of conflict": a process whereby conflicts progressively reorient from their original goals (in the case of Rwanda: securing its borders) towards profit, and through which conflict actors capitalise ever increasingly on the economic opportunities that war opens up (Jackson, 2002: 528)[25].

The Rwandan military and civilian elites thus benefited directly from the conflict[26]. Indeed a UN Panel[27] noted a great deal of interaction between the military apparatus, the state (civil) bureaucracy and the business community. It found that the RPA financed its war in the DRC in five ways: (i) direct commercial activities; (ii) benefits from shares it held in companies; (iii) direct payments from the RCD-Goma; (iv) taxes collected by the "Congo Desk" of the external military intelligence office ESO (External Security Organisation)[28], and other payments made by individuals for the protection the RPA provided for their businesses; and (v) direct uptake by soldiers from the land (UN Security Council, 2001: para. 126). In sum, the Congolese funded their own occupation by neighbouring countries' armies. Local coltan diggers were even forced out of the market in 2001-2002, when Rwanda used its own forced labour, i.a. under the form of prisoners "imported" from Rwandan jails. After officially withdrawing its troops from the DRC in September 2002 as a result of discreet but intense international pressure, Rwanda therefore changed tactics by seeking alternative allies on the ground and sponsoring autonomist movements, in order to consolidate its long-term influence in eastern Congo and make the most out of the Kivu

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[24] Of course, it was not really invisible, but the international community preferred to turn a blind eye to these practices.

[25] This is a very clear example of what in option theory is called a *growth option*, i.e. an option to do a crime that, once committed, may give rise to other criminal options with additional potential net returns.

[26] Marysse (2003: 89) added that "as military spending … was limited as a condition for access to financial flows provided by the Bretton Woods institutions, … wartime plunder has helped finance the conflict". He denounced the "ostrich policy" of a number of bilateral donors and the International Financial Institutions which, by continuing to fund the invading countries (Rwanda and Uganda) in the knowledge that their aid is fungible, indirectly supported the continuation of the war.

[27] The UN "Panel of experts on the illegal exploitation of natural resources and other forms of wealth in the Democratic Republic of the Congo", also known as the "Kassem Panel", has been criticised on account of its methodology and even political bias. However, the facts mentioned in this article are established beyond reasonable doubt and corroborated by several other sources (see e.g. Jackson 2003; Global Witness 2009).

[28] The "Congo Desk" had an office called "Production" which oversaw the economic aspects of Rwandan operations in the DRC.

region (International Crisis Group, 2003). In addition, even after its official withdrawal, Rwanda maintained a clandestine military presence in the DRC[29].

The unpublished part of the UN Panel's final report of October 2003 (UN Security Council, 2003) is particularly revealing[30]. At the request of the Panel this section was to remain confidential and not to be circulated beyond the members of the Security Council, as it "contains highly sensitive information on actors involved in exploiting the natural resources of the DRC, their role in perpetuating the conflict as well as details on the connection between illegal exploitation and illicit trade of small arms and light weapons"[31]. The findings showed an ongoing presence of the Rwandan army in the DRC. It had, the Panel found, continued shipping arms and ammunition to the Kivus and Ituri, provided training, exercised command, supported North Kivu Governor Serufuli's militia, and manipulated ex-FAR/*Interahamwe* by infiltrating RDF officers into them. The "Rwanda Network" was considered by the Panel "to be the most serious threat to the Congolese Government of National Unity. The main actor in this network is the Rwandan security apparatus, whose objective is to maintain Rwandan presence in, and control of, the Kivus and possibly Ituri" (UN Security council, 2003: para. 2 of the unpublished section V). Rwandan support for dissident forces went on throughout 2004, while the DRC was engaged in its delicate and fragile political transition. A later UN Panel was concerned that "the territory of Rwanda continues to be used for recruitment, infiltration and destabilisation purposes" (UN Security Council, 2005: para 185), and it observed a "residual presence" of the RDF (Rwanda Defence Forces, the new name of the RPA) in North Kivu (UN Security Council, 2005: paras. 199-200).

In the framework of our criminal real options approach, it is important to point out that - contrary to the case of Uganda whose officers and businesspeople essentially sought personal gain in the DRC - Rwanda's involvement was mainly institutional[32].

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[29] Many civil society sources in North and South Kivu reported Rwandan troop movements, and MONUC openly suspected the presence of the Rwandan army on Congolese soil (see, for instance, IRIN, 2003).
[30] This unpublished Section V of the report is on file with the editors of this journal.
[31] Letter dated 20 October 2003 from Mahmoud Kassem, chairman of the Panel, to UN Secretary General Kofi Annan. Also this letter is on file with the editors of this journal.
[32] A few examples among many: the already mentioned unit with the telling name "Production" within the Congo Desk of the Rwandan External Security Organisation; the fact that Congolese minerals were exported by *Rwanda Metals* and *Grands Lacs Metals*, two companies controlled by the RPF/RPA and that foreign clients were contacted directly the Congo Desk (Willum 2001: 44); and the fact that the Rwandan embassy in Brussels contacted potential buyers for 32 tons of Papaine looted in the DRC (Willame 1997: 137).

5.2.2. The real option calculation

Benefits of the crime

The figures quoted earlier speak for themselves. Rwanda is an intrinsically poor country without much of a real economy. Before it engaged in the DRC, the country had exports worth US$ 62 million, of which US$ 43.2 million came from coffee (figures for 1996[33]). In 2001, at the height of its Congo operations, these figures were US$ 93.5 million and US$ 19.4 respectively. Interestingly, while the Rwandan Ministry of Finance provided a figure of 83 tons of domestically produced coltan for 2000, the National Bank of Rwanda reported that 603 tons of coltan were exported during the same year, amounting to a value of US$ 11.4 million[34]. This does not mean to suggest that the entire difference between production and export was based on illegal plunder in the DRC, as minerals could be brought legitimately into Rwanda for processing (there is a small smelting plant near Kigali)[35]. However, in late 2000-early 2001 Rwanda-controlled RCD rebel leaders acknowledged that they were sending some 100 tons of coltan to Rwanda every month (Willum 2001: 44). Returning to a figure provided by Marysse (see *supra*), in 1999 the total value of diamond, gold and coltan taken from the DRC amounted to 6.1% of Rwandan GDP, i.e. 15 times the part of coffee and tea, which were previously the most important earners of export proceeds.

Costs of the crime

In the words of US Ambassador Gribbin, "Rwanda had discovered during the first war that war in Congo was relatively cheap –even profitable (…) [W]ell connected Rwandans (…) could seize opportunities (…) to accumulate wealth" (Gribbin, 2005: 282-283). The figures quoted earlier confirm that assessment: the most telling, in terms of the cost of military operations, is Marysse's estimate that the total value added of diamond, gold and coltan plundered in the DRC amounted to 146% of Rwandan official military expenditure in 1999. So the war not only funded itself, but generated a considerable surplus. Put simply by

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[33] This was a structural feature, not linked to the decline as a result of war and genocide in 1990-1994. In 1989, the year before the war started, coffee accounted for US$ 59 million out of total exports worth US$ 97 million.
[34] For an analysis of these and other figures on the mineral trade, see Willum (2001: 24-60).

Samset, "war facilitates excessive resource exploitation, and excessive exploitation spurs continued fighting" (Samset, 2002: 477).

However, there were potential costs other than financial ones. The considerations related to international law were the same for this invasion as for the previous one (see *supra*). Although it was clear that the new "rebellion" was masterminded in Kigali, the aggression was again endorsed by the Americans: "The United States accepted Rwanda's national security rationale as legitimate. We also recognised that the RCD was a proxy, directed in many respects from Kigali" (Gribbin, 2005: 283). A Rwandan source told Ambassador Gribbin that "Rwanda would withdraw, once a responsible regime was installed (in Kinshasa)" (Gribbin, 2005: 279), and Kagame himself told him that Rwanda needed to act in order "to rectify the error of putting Kabila in power" (Gribbin, 2005: 280). The support of the U.S. was taken for granted to such an extent that Bizima Karaha, Kabila's former Foreign Minister who joined the new "rebellion", told Gribbin: "Ambassador, we are here again for another green light" (Gribbin, 2005: 281). In addition to the security rationale, Rwanda also justified its intervention on humanitarian grounds. This argument was well rendered at the end of August, when Rwandan Minister Patrick Mazimhaka accused Kabila of launching genocide against Congolese Tutsi and warned that Rwanda "would be drawn into the war (…) if the killing of Tutsi is not stopped"[36]. Coming from the Rwandan regime, with its specific and tragic background, this kind of argument was difficult to challenge for the international community. Just like in 1996, Rwanda had every reason to believe that it would escape international condemnation.

As the extent of both the violation of human rights and the plunder by Rwanda had become increasingly visible, on 28 May 2002 the DRC however filed an application in the ICJ against Rwanda for "massive, serious and flagrant violations of human rights and international humanitarian law (which) result from acts of armed aggression perpetrated by Rwanda on the territory of the Democratic Republic of the Congo in flagrant breach of the sovereignty of the DRC, as guaranteed by the Charters of the United Nations and the Organization of African

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[35] The UN Panel of Experts adopts a broad interpretation of the concept of illegality. This included all or some of the following: violation of sovereignty, of regulatory frameworks, of widely accepted practices in trade and business, and of international law including "soft law" (UN Security Council, 2001: para. 15).
[36] "Foreign Troops in Congo Fighting, Rwanda Levels Genocide Charges", DPA, 28 August 1998, quoted by Longman, 2002: 131. In this short sentence, Mazimhaka manages to lie twice: the Rwandan army was already in the DRC and the anti-Tutsi pogroms started *after* the beginning of the war, and indeed as a reaction to it.

Unity". As Rwanda did not accept the jurisdiction of the Court, the ICJ ruled that it had no competence to entertain the DRC's application and that it could therefore not take a position on the merits of the claims made by the DRC. It added however that "[w]hether or not States have accepted the jurisdiction of the Court, they are required to fulfil their obligations under the United Nations Charter and the other rules of international law, including international humanitarian and human rights law, and they remain responsible for acts attributable to them which are contrary to international law" (International Court of Justice, 2006: para. 127) –a sentence that could be seen as a warning addressed to Rwanda. But the country did escape formal judicial condemnation and avoided this potential cost[37]. At any rate, we do not believe that Rwanda included the risk of a lawsuit and the way it got away in its initial real option calculation.

Uncertainty of the criminal return

As far as launching a new war was concerned, Rwanda assumed that this was to be a remake of the first war, with an easy victory over a weak and unmotivated DRC government army. This proved a miscalculation, as a number of countries –most prominently Angola and Zimbabwe– intervened on the side of the Kinshasa regime, an occurrence which Rwanda did not anticipate. The result was military stalemate, political negotiations toward a political transition in the DRC, and the (official) withdrawal of the Rwandan army. The benefit sought here –the removal of the Kabila regime and its replacement by a friendlier one (cf. Rwandan statements to US ambassador Gribbin mentioned earlier)– did not materialise. Owing to its arrogance and lack of understanding of the geopolitical interests of the intervening countries, this outcome was never seriously taken into consideration in Kigali, which erroneously considered the benefit as certain.

As seen earlier, Rwanda discovered the economic potential of the occupation of eastern Congo during the first war, and it had every reason to believe that the outcome of its "exploitative business" was certain. It indeed put in place an office called "production" in the Congo desk of its External Security Organisation, which was in charge of intelligence and operations abroad. The putting into place of such a structure suggests that Rwanda knew in

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[37] Uganda was less fortunate. It accepted the ICJ's jurisdiction in a similar case and was found guilty of violating its obligations under a number of international legal instruments, and condemned to making reparations to the DRC (International Court of Justice, 2005).

which economic venture it was embarking and that it anticipated a benefit it considered certain.

Opportunity cost of not acting

Although the threat emanating from the Congo was certainly less important than during the period leading to the first war, the rapidly deteriorating relations between Rwanda and the DRC convinced Kigali that it was again going to face a hostile neighbour, whose territory could be used by enemy forces. After President Kabila replaced Rwandan Colonel Kabarebe as Chief of Staff of the Congolese army on 11 July 1998, on 26 July he ordered "the Rwandan and other foreign military" to leave the country. Hardly a week later, Rwanda reinvaded the DRC. As the preparation of such a large-scale operation takes time[38], clearly the decision had been taken well before, but the most recent Congolese decisions, seen by Rwanda as the confirmation of hostile behaviour, triggered the resolve to act at that moment. However, Rwanda could have afforded to wait and see, and to act only after violent actions against its territory took place or were clearly being prepared. As war had become inevitable anyway, it could have lifted the option at a later moment, but it decided to do so on 2 August, because there was no reason to expect the circumstances to be better during the following months.

6. Conclusions and policy implications

Looking at the length of time that the criminal option was open, it can be observed that Rwanda had been preparing the first war for some time, certainly as early as mid-1995. By the Summer of 1996, everything was in place for the option to be lifted. It is very likely that Kagame decided to move forward after his visit to Washington D.C. in early August 1996. He felt he got the green light at the State Department and he probably received assurances of active backing at the Pentagon. As the instrument to act was in place, and the threat he wanted to tackle had become acute, this was the right moment to lift the option.

The calculation was less clear cut when Rwanda embarked on the second invasion of the DRC. Although relations with the Kabila regime had increasingly soured, there was no immediate threat coming from the DRC. In terms of timing, Rwanda acted within days

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[38] Right at the beginning, it even involved a daring airborne operation in the Bas-Congo, west of Kinshasa, over 1,500 kilometres from Rwanda.

following the Congolese request that foreign troops leave the country, although it could have waited for (much) longer. The status of other value drivers of the criminal option too was much less clear than in 1996, and the military operation did not meet last time's success. Our interpretation is that, as a result of arrogance and misled by the ease with which the previous war was conducted, Rwanda was ill-informed about regional and international reactions. Had it taken its value drivers more carefully into account, it might have lifted the option later or not at all. On the other hand, Rwanda did successfully exploit Congolese resources during the second war, and got away with it, at least for the time being. However, it has probably paid a price in terms of international understanding and sympathy.

Our argument is reinforced by developments in late 2008 and early 2009. As seen earlier, Rwanda maintained a covert presence in the DRC well after its official withdrawal in September 2002. After the Rwanda-backed Congolese rebel movement CNDP led by Laurent Nkunda resumed fighting at the end of August 2008, the DRC government claimed that Rwanda was again involved, and it seized the UN Security Council in early October. Although Kigali bluntly denied the charges, pressure on it increased steadily: on 29 October, U.S. Assistant Secretary of State for African Affairs Jendayi Frazer told journalists: "We do believe that Rwandan territory is being used to support the CNDP"[39]; on 3 November, the UN claimed that Rwandan forces fired tank shells and other artillery across the border at Congolese troops engaged in battle with the CNDP[40]. On 12 December, the report of a UN Panel found that Rwanda continued to provide military and financial support to the CNDP (United Nations Security Council 2008). This was the proverbial straw: despite Kigali's denials, two countries considered "friends of Rwanda", The Netherlands and Sweden, immediately suspended part of their budget support, and influential voices in the UK suggested that Rwanda's main bilateral donor should follow suit[41]. In January 2009, Rwanda stopped supporting Nkunda, whom they arrested, and engaged in a joint operation with the Congolese army to neutralise its former ally, the CNDP. While Kigali continues up to this day to offer clandestine support to rebel movements in South Kivu, this u-turn shows that the cost of the crime had become too heavy, an assessment that prompted Rwanda to reverse the

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[39] "Congo rebels declare ceasefire, gunfire goes on", Goma, Reuters, 29 October 2008.
[40] "UN says Rwanda fired tanks at Congo", Goma, AP, 3 November 2008.
[41] Thus Richard Dowden, the director of the Royal African Society, published an op-ed in *The Independent* of 15 December 2008 under the title "Britain should cease its one-sided support for Rwanda". Early March 2009, Canada announced that Rwanda was removed from its list of bilateral beneficiaries (it did not however explicitly link this decision to the UN report).

option. It also shows that the international community has the capacity to discourage criminals from executing their criminal options, a weapon that it could and should have used in the past. The publication of the UN High Commission for Human Rights Mapping report (see *supra*) would again offer that opportunity, not just with regard to Rwanda but to other suspects of criminal behaviour in the DRC as well.

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Appendix 1: The Black-Scholes formula for call option valuation

The value of a criminal call option according to the Black-Scholes model can be calculated as:

$$C = V e^{-\delta(T-t)} N(d_1) - I e^{-r_c(T-t)} N(d_2),$$

where [A.1]

$$d_1 = \frac{\ln\left(\frac{V}{I}\right) + \left(r_c - \delta + \frac{1}{2}\sigma^2\right)(T-t)}{\sigma\sqrt{T-t}}$$ [A.2]

$$d_2 = \frac{\ln\left(\frac{V}{I}\right) + \left(r_c - \delta - \frac{1}{2}\sigma^2\right)(T-t)}{\sigma\sqrt{T-t}} = d_1 - \sigma\sqrt{T-t},$$ [A.3]

with
C = value of a call-option
V = present value of the expected proceeds of the crime (Y),
I = expected cost of the crime (*p.f*),
T-t = time to expiration (expressed in terms of years),
σ = annualized standard deviation of the criminal return,
r_c = continuous risk-free interest rate,
δ = opportunity cost (expressed in terms of years), and
N(d) = value of d under the cumulative normal probability density function.

The effect of a change in one of the parameters on the value of the call option (the so-called Greeks), i.e. the first derivative, is calculated as follows

Sensitivity of C to:	Name and symbol		Formula and sign of impact on C
Benefits of the crime (Y)	Delta	Δ	$e^{-\delta(T-t)} N(d_1) > 0$
Cost of the crime (p.f)	Psi	Ψ	$-e^{-r(T-t)} N(d_2) < 0$
Lifetime (T-t)	Theta	Θ	$\dfrac{-Y n(d_1)\sigma e^{-\delta(T-t)}}{2\sqrt{T-t}} - r(p.f)e^{-r(T-t)} N(d_2) > 0$ $+\delta Y N(d_1)e^{-\delta(T-t)}$
Risk-free interest rate (r)	Rho	ρ	$(p.f)(T-t)e^{-r(T-t)} N(d_2) > 0$
Volatility (σ)	Vega	ν	$Y\sqrt{T-t}\, n(d_1)e^{-\delta(T-t)} > 0$
Opportunity cost (δ)	Ksi	Ξ	$-Y(T-t)e^{-\delta(T-t)} N(d_1) < 0$

Note: The value N(d₁) is the derivative of the standard normal distribution function with respect to d₁