DEBT AND AID, WAR AND PEACE:
POLICY TRADEOFFS IN CONFLICT-AFFECTED COUNTRIES

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A creditor can balance debt recovery and humanitarian goals within an optimal contract framework. The approach ties together two strands of literature that assume either creditor self-interest (Krugman 1988) or benevolence (Addison and Murshed 2003). A reservation utility for the debtor serves as a metric for creditor benevolence. The optimal hyper-incentive contract recognizes that the attainment of health, education, peace and the appeasement of foreign creditors may be conflicting goals. Forgiving debt to motivate paying creditors may therefore have the unintended effect of reducing effort devoted to winning a civil war. For a given reservation utility for the debtor, aid directly targeted towards ending a civil war is a substitute for debt forgiveness.

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INTRODUCTION

One quarter of the Highly Indebted Poor Countries (HIPC's) are classified by the IMF as conflict-affected (IMF and World Bank 2001). This is problematic, since these conflicts reduce the ability of these countries to reach their HIPC decision points. Furthermore, military operations draw badly needed resources away from basic social investment (health and education, in Figure 1).\(^1\)

In Angola, a staggering 20 per cent of GDP was devoted to military expenditure in 1997, compared with 4 per cent on health, averaged over the 1990s. (There are no reliable figures for education.) This economy could be stylized as having limited ‘peaceful’ production during its war. As events transpired, the 27-year long civil war ran its course, and a peace agreement was signed in April 2002. The rapid demobilization that followed, and the increase in urban population is a testimony to the resources tied up during the war.\(^2\)

The possibility of resources being ‘tied up’ in a civil war raises many questions about development policy. In particular, the debt overhang literature (descending from Krugman 1988) argues for debt forgiveness in order to motivate effort and reform. But what happens if effort in

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one area leads to lapses in effort in other areas? What happens if the repayment of foreign creditors and the attainment of peace—which both require government effort—are substitutes, at least over the timeframe relevant for policymakers?

For example, Afghanistan is a country whose government faces enormous barriers—both military and economic—to any attempt to gain control of lawless areas.4

“An atmosphere of despair prevails in the village of Shinwari, close to Nangahar province’s border with Pakistan. This year’s internationally-funded $860m blitz on Afghanistan’s opium industry produced a 96% drop in the poppy hectarage in the province, the best result amid a 21% overall reduction nationwide. But farmers in Shinwari say that along with the poppy went 60-90% of Nangahar’s rural economy, a void not being filled by promised “alternative livelihood” schemes, which will take years and billions of dollars to take root. ---Corruption is rife within all Afghan government organs, and central authority is barely felt in the lawless south and south-west, where opium production rose several hundred percent in provinces such as Farah this year.” (Economist 2005)

A concerted effort to control these areas could arguably cost so much that it would completely curtail many other worthwhile activities in need government of funding, including the organization of repayment institutions. The Taliban successfully controlled almost all of Afghanistan, judging from their ban on opium cultivation imposed in 2000 (IMF 2003c), but presumably at a high opportunity cost.5

Already, the international financial community is taking steps to re-integrate Afghanistan. It may be included in the HIPC initiative, and the IMF has urged the authorities to keep track of debt repayments, and set up a functioning debt management system (IMF 2003c). But implementing this policy could hardly be imagined in scenario where government resources were completely tied up with a civil war.

In what follows, a model is set up where the attainment of peace and the repayment of foreign creditors are substitutes, not complements. Within an optimal contract framework (Menzies 2004) it is then shown that, for a given amount of creditor benevolence, aid to end a civil war is a substitute for debt forgiveness.
The rest of the paper is structured as follows: Section 2 outlines the micro foundations for a debt forgiveness framework. Section 3 derives the optimal ‘hyperincentive’ contract. Section 4 interprets the solution. Section 5 concludes.

**MICRO-FOUNDATIONS FOR A DEBT FORGIVENESS SETUP**

Two distinct strands of the debt forgiveness literature are brought together by ‘hyperincentive’ contracts (Menzies 2004). At the risk of some caricature, one strand assumes that creditors are selfish, in that they forgive in order to maximize repayment, while the latter strand assumes creditors are gracious. The Selfish Creditor strand descends from Krugman (1988). There, debt forgiveness addresses a ‘debt overhang’, whereby the economy’s ‘effort’ is too low. Forgiveness provides the incentives required to make the creditor better off. An example of the Gracious Creditor strand is Addison and Murshed (2003). Using game theory, they ask if debt relief could reduce the level of conflict. They arrive at a tentative ‘yes’ but remain concerned about the ability of those pursuing peace to remain in power, and, the effectiveness of any fiscal transfer to the rebels.

A hyper-incentive contract connects the two strands by parameterizing creditor graciousness. It allows the attainment of optimal-for-the-creditor effort (the selfish disposition), yet builds in a ‘safety net’ in the form of a guaranteed minimum well-being for the debtor (the gracious disposition). The size of the safety net on offer serves as a metric for creditor benevolence. The approach is consistent with the shift in attitudes towards creditor graciousness, courted for two decades by Jubilee 2000 (and other NGOs), and consummated by the HIPC initiative. A statement of this is found in Eaton (1990):

‘The response to the debt crisis in poor countries should be framed in terms of overall foreign aid objectives and policies. The argument for relief is primarily humanitarian...’ (page 45, my italics)

It is noteworthy that ‘primarily’ is not the same as ‘solely’. Rightly or wrongly, official creditors are interested in eventual repayment, albeit of reduced amounts, provided certain humanitarian goals are met. As was noted earlier, the IMF has encouraged Afghanistan to move towards organizing a system of debt repayments.

The model is now outlined.

*Period 1*

A Creditor lends 1 unit of debt and announces the required repayment for the second period. After observing $a$, the debtor exerts production effort $e$. In the spirit of Hirshleifer (1995) the economy is divided into two territories—safe and disputed. The safe territory provides the resources for foreign debt repayments, and is under the control of the government. A proportion $p$ of the disputed territory comes under the control of the rebels leaving the government with $1-p$. The output of the disputed sector does not contribute to debt repayments. It will be helpful to refer to the actions of the government in the safe territory as the actions of the ‘government-as-debtor’.

Without loss of generality, the proportion of the disputed territory that comes under the control of the rebels is $p=e/2\lambda$. That is, the government-as-debtor faces an implicit effort
constraint, so that devoting effort to production in the safe sector reduces the effort available for holding territory. This pivotal assumption of the model is consonant with the experience of Angola referred to in the introduction. The parameter $\lambda$ represents other aid designed to diffuse the conflict. A higher value of $\lambda$ exogenously reduces the area held by the rebels. That is, the government can reorientate resources towards production (i.e. expend less effort on holding territories) without losing any land. Increases in $\lambda$ could represent extra foreign military aid, foreigners paying out the aggrieved rebels, or, by foreigners somehow relaxing the effort constraint (perhaps by providing expertise or resources). These internal political themes are not pursued with the same finesse as Addison and Murshed (2003); instead we focus on the view from the creditor’s vantage point.

Period 2

Nature draws a uniformly distributed error $h$ over $(-h, h).$ For simplicity, output $y$ in both territories is assumed to be identical, and to depend additively upon peace effort $e,$ and $\eta,$ according to $y = e + \eta.$ In the safe territory, output is greater than the required repayment, the government-as-debtor keeps this excess. If not, we implicitly assume that a gunboat technology transfers $y$ from the safe territory to the creditor.$^{10}$ In the disputed territory the government controls the share $e/2\lambda$ of $y = e + \eta.$$^{11}$

**A HYPER-INCENTIVE CONTRACT**

I now create the first-best optimal contract (Menzies 2004). In the safe territory, the government-as-debtor is allowed an incentive parameter $b$ by the creditor (who designs the repayment regime).

$$S = \begin{cases} \text{by} & -a & \text{If } y > a/b \\ 0 & \text{If } y \leq a/b \end{cases}$$

The amount owed is $a/b$—this parameterization just ensures that the payoff is zero when output is exactly equal to the amount owed.$^{12}$

$$E(S) = \int_{a/b}^{e+h} (-a + by)(\frac{1}{2b})dy \quad \text{if } e - h < \frac{a}{b} < e + h$$  \hspace{1cm} (1)

Total expected utility is the sum of the utility derived from the two sectors. In the safe sector, (1) describes the utility that accrues from export revenues (together with any incentive payments). The utility that derives from the disputed sector is the output under the government’s control $E(D) = e(1-e/2\lambda).$ The optimal $e$ is then obtained by differentiating the sum of the utilities:

$$E(Ug) = E(S) + E(D) = \int_{a/b}^{e+h} (by - a)(\frac{1}{2b})dy + e(1 - e/2\lambda)$$

with respect to $e,$ and solving for a maximum.
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\[
e = \frac{(bh + 2h - a)\lambda}{2h - b\lambda}
\]

Note that the optimal \(e\) depends upon both \(a\) and \(b\). It is decreasing in \(a\) and increasing in \(b\). If \(b\) exceeds unity, it defines a hyper-incentive. Since the participation constraint binds with equality (Menzies 2004), the sum of the utilities is differentiated with respect to \(b\).

\[
\text{cake} = 2e[b] - \frac{e[b]^2}{2\lambda} - 1
\]

\[
\frac{\partial \text{cake}}{\partial b} = e'[b](2 - e[b]/\lambda) = 0 \quad \Rightarrow \quad e[b] = 2\lambda
\]

The second order condition holds at the optimum (i.e., given that \(2 - e[b]/\lambda = 0\)). The parameter \(b\) is chosen by the creditor to make it privately optimal for the debtor to set \(e\) equal to \(2\lambda\) and \(a\) is chosen satisfy a participation constraint. The full solution thus involves equating (2) and (3), meeting a participation constraint with equality

\[
E(U_g) = E(S) + e - \frac{e^2}{\lambda} = um m > 0
\]

and solving. The resultant expressions for \(b\) and the payment threshold \(a/b\) are the key parameters of the hyperincentive contract.\(^{15}\)

\[
\begin{align*}
\frac{b}{u_{\min}} &= \frac{h}{u_{\min}} \\
\frac{a}{b} &= h - 2um m + 2\lambda
\end{align*}
\]

Before examining the tradeoffs implicit in this solution, it is worth describing what a hyper-incentive contract might look like in practice. As an example, let us consider the case of Angola. It has a booming oil (and diamond) sector standing side-by-side with severe poverty. Although the economy is growing at 15 per cent per annum, at least two-thirds of the population live below the poverty line and the country faces a serious humanitarian crisis (IMF 2003b). In a hyper-incentive contract, creditors tie repayments to oil export revenues \((y)\), since the government effort is a significant determinant of exports.\(^{16}\)

The debtor agrees to export a certain amount to pay a (realistically forgiven) tranche of debt \((a/b)\), given by (4). If revenue is less than the required repayment, the creditor takes the oil revenues \((y)\), and writes off the rest of the tranche. If oil revenues exceed the required repayment \((y > a/b)\), the debtor keeps the excess of oil revenues over the agreed amount \((y-a/b)\), and, they receive a bonus payment back from the creditors in proportion to the size of the excess \(((b-1)(y-b/a))\), where \(b\) is also given by (4). The particular form of effort is left in the hands of the national authorities, perhaps with guidance from the World Bank or the IMF. For example,
the Fund has already highlighted some potentially inefficient quasi-fiscal operations of Sonangol, unrelated to profit maximization (IMF 2003d).

**INTERPRETING THE SOLUTION**

Having derived the hyper-incentive contract, we note that the threshold to be cleared \((a/b)\) in (4)) is increasing in \(l\) and decreasing in the safety net \(umin\). The latter is the parameterization of graciousness referred to in the introduction. The more gracious the creditor is, the more is forgiven \((a/b)\) falls).

With regards to the former, for a given level of graciousness, there is an inverse relationship between the amount of aid given to end the civil war (Addison and Murshed 2003), and the optimal level of debt forgiveness.

![Figure 1: Debt Forgiveness and Aid to End War](image)

The gap between unity (the assumed amount of the debt) and the threshold represents the amount of forgiveness.\(^{17}\) So, the more aid is given to directly stem the conflict (increase in \(\lambda\)), the less forgiveness is needed. A higher value of \(\lambda\) exogenously shifts up the potential hold of a government over the disputed territory implying that the government could choose to expend more effort on production without losing territory.

The actual means of assisting the government to increase \(\lambda\) is left unspecified in the model. There is a continuum of responses ranging from redressing the grievances of the rebels, or seeking a military solution. Either way, the creditors in the model choose the optimalforthecreditor level of forgiveness, given the aid of other foreign parties.

At the risk of labouring the point, if the idea of an ‘optimal’ mix of aid and forgiveness seems contrary to humanitarian concerns, recall that the hyperincentive contract is set up to maximize creditor utility, *subject to a participation constraint*. Debt relief (and hyper-incentives) exist in combination to maximize creditor utility, *subject to this constraint*. Therefore, providing more resources in one way (increasing \(\lambda\)) allows the creditor to be tougher in another (cutting back on forgiveness). However, in cases of humanitarian emergencies, the acceptable level of expected well-being \((umin, the reservation utility)\) could be set at a high value. From (4) this will mean deeper debt forgiveness (a reduction in \(a/b)\). The concern of Eaton (1990) quoted above is only damaging for earlier debt forgiveness contracts without a participation contract.\(^{18}\)
DISCUSSION AND CONCLUSION

All governments, to a greater or lesser extent, spend money to attain health, education, peace and the appeasement of foreign-creditors. Each of these goals is presumably worthy, judging from governments’ efforts expended on them, even during times of hardship. Yet each of these goods is potentially in competition with each other; absent positive externalities, resources devoted to one cannot be devoted to another.

This paper joins the notion that debt forgiveness can increase repayment effort, with the notion that a government faces opportunity costs for expending effort on one of its many worthy goals. If these theoretical ideas both apply to a particular country, at least in a time-frame relevant for their policymakers, the repayment of foreign creditors becomes a substitute for the attainment of peace.

Undoubtedly, the victims of civil war would feel justified in claiming that peace should be sought at all costs. Tragically, ‘at all costs’ sits oddly with the resource constraints faced by many poor countries. The Afghan government, for example, had internal revenues of a mere SUS 350 million in 2004 (Economist 2005). Of all the things governments can do, maintaining good relationships with creditors is something of a priority. Future development is tied up with the willingness of creditors to lend, so their appeasement may be a good worth having.

Naturally, the analysis changes if ending a civil war jump-starts development, leading to the repayment of creditors. But this is not always the case. Returning to the example of Afghanistan, the government is ethically and legally forbidden to finance debt repayments from the (disputed) opium cultivation areas. In that sense controlling the disputed areas would not directly help the repayment of creditors, in keeping with the ‘dual-economy’ assumption made here. That is, the debt repayments come from the safe sector, so that devoting resources to gaining control of the disputed sector may indeed detract from efforts to reform the economy and repay creditors.20

Future research should focus on this question of positive externalities involved in bringing more territory under the control of the government. To the extent that an end to hostilities brings with it powerful externalities, especially inter-temporal ones, increased effort devoted to the civil war may indeed allow more to be paid to creditors. Probably, the existence of these externalities can only be decided on a case by case basis, with a key determinant being how decisively a conflict can be ended (Hirschleifer 1995).

The paper has made an analytic distinction between aid targeted directly to end the conflict (\(\lambda\)) and aid targeted to provide incentives for debtors (forgiveness, and the hyperincentives). The separation was brought home most clearly by the fact that the only way to increase the government hold on the territories is to increase \(\lambda\). In practice, it may be not always be easy to maintain this distinction between these types of aid, if the government can reallocate expenditures to thwart any priorities of donors. This is not a problem particular to this analysis, however; the existing HIPC scheme has wrestled with how to make sure forgiven debt repayments find their way to health and education programs.

Two other issues relate to the semantics of the model. First, creditors who want some repayment, subject to humanitarian goals being met, need not be ‘selfish’ as in the above
caricature. Rather, they may see the building of debt repayment culture as being in the long term interests of the citizens of the debtor nation. Second, the use of the term ‘humanitarian’ for the safety net sidesteps a complex issue of the humanitarian status of payments to end the war, namely \( \lambda \). Clearly, the suffering of civil war in incalculable, yet the means of ending it may also bear its price tag of human misery. This issue, important though it is, lies beyond the scope of this paper.

Naturally, a concern of the creditors (including the International Financial Institutions) is that the hyper-incentive payments, just like debt forgiveness itself, might end up subsidizing the civil war. If this proved to be a realistic possibility in the political context, the withholding of payments proposed by the UK government (Brown 2000) may prove to be helpful.\(^{21}\) The paper has highlighted a ‘distraction’ downside to forgiveness, in addition to the wellunderstood dangers of financing war by lifting a budget constraint from the government.

This paper has been written to show how a creditor intending both the recovery of some debt and the attainment of humanitarian goals can balance these considerations within an optimal contract framework that recognizes this potential conflict between different policies, including the ending of a civil war. The ‘safety net’ in the form of a guaranteed minimum well-being for the debtor serves as a metric for creditor benevolence. The approach is thus consistent with the shift in attitudes towards creditor graciousness, espoused for two decades by Jubilee 2000 (and other NGOs), and embodied in the HIPC initiative.

The framework recognizes that policy tradeoffs exist for the debtor (i.e., pay the creditors or beat the rebels), but it also highlights tradeoffs for creditors. If peace is the objective sought, then resources should be directly applied to that problem, perhaps by redressing grievances. Debt forgiveness may be a blunt instrument at best, or it may even act against the attainment of peace.

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NOTES

1. The HIPC decision point is a point in time when a country has performed well enough to start receiving debt relief. In some cases the IMF has responded to conflicts with leniency—shortening the normal 3 year good-policy qualification period prior to the decision point, allowing the implementation of emergency relief to be counted as good policy, and reducing the requirements for the Interim Poverty Reduction Strategy Paper (PRSP) (IMF and World Bank 2001). For a general non-technical description of HIPC see http://www.imf.org/external/np/exr/facts/hipc.htm.

2. The graph includes some countries that have had a recent history of conflict, and a control group of peaceful sub-Saharan African countries.

3. Angola has been ravaged by the civil war. Disruptions in farming and transportation have increased the economy’s dependence on oil and led to an exodus of rural population, aggravating urban unemployment and social problems. Severe fiscal pressures have led to three hyper-inflation episodes and sizable domestic and external public sector arrears over the past ten years, and per capita income
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fell by 30 percent in this period. Given the urgent need for economic and social rehabilitation, the IMF believes that reduction of Angola’s heavy external debt burden is an essential element of the government’s medium-term economic strategy. (IMF 2000).

4. In June 2006, the IMF lent Afghanistan SUS 119 under its Poverty Reduction and Growth facility. The IMF board praised the government for its reform achievements—introducing a new currency, preparing banking laws, improving fiscal management and collecting statistics—amid an atmosphere of continued violence and instability. Private sector agriculture has recovered, and economic growth has strengthened. “The new economic program is meant to ….. help resolve outstanding debt issues, possibly in the context of the Heavily Indebted Poor Countries Initiative” (IMF 2006). An interim government was established in 2002 after 20 years of civil war.

5. The quality of the data the IMF used to make this assertion must be regarded with some skepticism, however.

6. Strictly, the level of well-being is fixed in expected value terms. That is, on average it will be attained. In contract theory, the participation constraint is the minimum acceptable expected utility (the reservation utility) that the debtor receives in a contract.

7. It is assumed that the output of the disputed territory is proportional to the land area. If this is not reasonable, nothing is lost by framing the argument in terms of economic output, rather than land mass.

8. Another country that bears testimony to resource constraints is the Democratic Republic of Congo. Fuelled partly by the inflow of Rwandan and Burundian refugees, a challenge to the government emerged in the late 1990s. Troops from Zimbabwe, Angola, Namibia, Chad and Sudan supported the government during a Rwanda and Ugandan backed rebellion. As of end-2002 some stability has returned to the country, but the withdrawal of foreign troops has required a large reorientation of government spending priorities towards the military and away from social spending (IMF 2003a).

9. The error is independent of the outcome for the control of the disputed territory. The parameter h just defines the variance of the uniform distribution.

10. The gunboat technology (implicit in Krugman 1988) sidesteps a major puzzle of the sovereign debt literature—namely, why is sovereign debt repaid at all? The literature offers the threat of trade sanctions and financial autarky as potential explanations (see Eaton 1993). Also, it has been suggested that debtor governments have multiple relationships, and that appearing untrustworthy in one relationship (by defaulting) will create difficulties in other relationships (Cole and Kehoe 1998).

11. The error draw in the two territories is uncorrelated.

12. Or, if the amount owed is called X, then S = by – bX guarantees S = 0 when y = X. As discussed after (3), the hyper-incentive contract has two constraints, individual rationality and participation, and two parameters a and b.

13. In reality, governments (in both developing and developed countries) have numerous noneconomic concerns, and the attainment of peace may be highly valued for its own sake. The model is somewhat in the spirit of Collier and Hoeflter (2004) which looks for economic motivation in civil wars. In favor of this class of models, it could be said that a strong presumption of a desire for peace does not explain the presence of wars.

14. The sign of the partial with respect to b follows from the second order condition.

15. It is straightforward to show that h>1, justifying the prefix ‘hyper’. We recall the requirements for an interior solution, from the inequality after E(S) in equation (1).

\[
\frac{a}{b} > e - h \quad \Rightarrow \quad h - 2um + 2\lambda > 2\lambda - h \quad \Rightarrow \quad h > a \text{ min}
\]
16. In common with many other developing nations, oil production is shared according to a Production Sharing Arrangement (developed in Indonesia in the 1960s) in which the developing country owns the oil and the installations, while the International Oil Companies provide the capital and expertise (IMF 2003d). In Angola’s case, the degree of state control is significant—around one half of 1998-2002 government revenue came from Sonangol, the State’s oil company. Since oil production is not in the hands of multinationals, it is meaningful to talk of government ‘effort’.

17. Nothing hinges on the assumption of unit debt. Whatever value the debt takes, the gap is decreasing in \( \lambda \).

18. In fairness to Krugman, his 1988 model was not focused on sub-Saharan HIPC countries. Participation constraints may not be as relevant for middle income countries.

19. Sovereign debt—which is not subject to repayment by force—would never be repaid at all if this was not widely believed.

20. However, a general equilibrium model would be required to make this statement categorically, since the disputed sector has huge impacts on the safe sector. On some estimates, Opium production accounts for 50 per cent of GDP, and, the relaxation of the Taliban’s 2000 ban on production has caused a construction boom in urban areas from the proceeds of black market sales (IMF 2003c). In terms of the model, the issue is whether there is an impact upon the safe area’s capacity to service debt if the government fully controls the opium areas. There is no direct effect, but, judging from the construction boom, there may be many indirect links.

21. On the 2nd December 2000, the Chancellor pledged that, for all countries still to secure debt relief because of civil wars, external conflict or the absence of a poverty reduction program, all debt payments will be held in trust for the day they can be returned to fund poverty reduction (Brown 2000).

REFERENCES


