Butter, Guns and Ice-Cream:

Policy Implications of Economic Theories of Conflict

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Abstract

The classical assumption of theoretical models of conflict implies the trade-off between productive activities (butter) and unproductive activities (guns). As guns increase, butter must decrease; there is no alternative allocation for available resources. The implicit assumption is that all productive activities are subject to appropriation. In reality, parties involved in a conflict have some income and wealth secure from appropriation. Consider an economy characterized by two sectors: one uncontested, the other contested. Using such a distinction, it is possible to define three possible allocations of resources, namely (i) guns, (ii) butter; and (iii) ice-cream, where 'ice-cream' denotes all productive activities not under threat of appropriation. In such a case, the opportunity cost of conflicts is related not only to the contested production (butter), but also to the production of goods not subject to appropriation (ice-cream). This distinction is empirically verifiable in many LDCs affected by the "resource curse" and suffering long and bloody conflicts. Improvements in productivity in the uncontested (ice-cream) sector constitute a criterion for designing economic policies able to cope with the existence of conflicts. This paper discusses the theoretical implications of this two-sector conflict model, and then uses the discussion to infer preferred economic policies in war-torn countries.

1. Production and Appropriation: Butter and Guns

In recent years, economists have paid increasing attention to the recurring phenomena of conflicts, wars and revolutions. Conflict, as a rational activity, plays as large a role in economic development as do production and exchange, though only the latter have traditionally been considered the classical domain of economic science. The argument for the inclusion of conflict is straightforward. You can buy something, but you can also steal it. You can appropriate, confiscate, grab, plunder instead of producing, contracting or exchanging. A definition which embraces the main characteristics of conflict might be: *a conflict is a destructive interaction which involves strategic, interdependent decisions in the presence of coercion and anarchy* . By 'destructive,' I mean that some resources which could be allocated to more productive ends are wasted because of a conflictual interaction between certain parties. In the eyes of the economist, this tradeoff is the main interest. In fact, in any society there are some resources allocated to productive activities, such as production of useful goods, and others which are allocated to unproductive activities, such as the efforts devoted to the seizure of goods produced by others. This dichotomy was first emphasized by Vilfredo Pareto in 1902 when he stated:

> The efforts of men are utilized in two different ways: they are directed to the production or transformation of economic goods, or else to the appropriation of goods produced by others. (Quoted in Hirshleifer [1994])

The first – productive activities – are beneficial for society, whilst the latter – unproductive, and even destructive – are detrimental to welfare and development.

It was Nobel Prize-winning economist Paul Samuelson (1948) who first labeled productive and unproductive activities 'butter' and 'guns' respectively. In coining the terms, Samuelson had the experience of Nazi Germany in mind, where the government was committed to increasing military expenditures ('guns') at the expense of civilian production and consumption ('butter). That is, the choice between butter and guns was a matter of economic policy. Needless to say, investments in guns are detrimental for welfare and national income[1]. In some cases, implicit to the argument is that rivalry between nation-states could have emerged as a negative externality of excess investments in 'guns'.

In recent years, the late economist Jack Hirshleifer (1988) proposed a novel analytical theory of conflict in the form of a general equilibrium model that could be applied to a wide variety of conflicts. The basic idea surrounding the work of Hirshleifer and his epigones is that rational agents struggle over the

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[1] There is a never-ending literature showing the negative impact of military expenditures on economic growth. However, a simple but brilliant theoretical contribution is Arrow (2000).

distribution of a joint output, so that they also make a choice in the allocation of a positive endowment of resources between 'butter' and 'guns'. Individuals, groups and organizations can acquire income by means of entrepreneurship and production of economic goods or by seizing and appropriating wealth and goods produced by other parties.

There are three common results in this literature. First, whenever the warring parties are largely asymmetric in terms of their resource endowments, the poorer party will invest all its endowment in guns. This is what Hirshleifer defined the paradox of power. Such a paradox explains why individuals, who live under the subsistence level and have almost 'nothing to lose' from conflict more readily take part in bloody conflict – the opportunity cost is very low. Second, the relative advantage of one conflict technology over another must be negligible to produce cooperation between parties. In other words, whenever technological capabilities in fighting of warring parties are largely asymmetric, a dominance of one party over the others is predictable. Third, the eventual outcome of a conflict and the resultant allocation of resources will depend upon the two points. Specifically, given a comparative advantage in guns, allocation of the combined pot of resources is distorted in favor of guns. The economic theory of conflict then predicts that shifts in military technology determine the economic incentives that may emerge in the presence of peaceful agreements. In other words, the more advanced the military technology, the fewer disincentives there are to starting a conflict.

2. Butter, Guns and Ice-cream

The implicit assumption of Hirshleifer-style theoretical models of conflict is that all the productive activities are subject to appropriation. The trade-off is simple: as guns increase, butter must decrease. There is no alternative allocation for available resources – produce or predate. However, in reality, parties involved in a conflict have some income and wealth secure from appropriation. Hence, there must be a relationship between the choice of resources to be allocated to conflict and the choice of resources to be allocated to secure production.

To illustrate the reasoning, we can consider an economy characterized by two sectors. In the first sector, call it the uncontested sector, each party holds secure property rights over the production of some goods. This security of property may stem from institutional guarantees, or could be the effect of geographic or technological barriers to would-be predators. Such secure production can assure the holder of a predictable income stream and level of consumption. In the second sector, call it the contested sector, agents struggle to appropriate the maximum possible fraction of a contestable output. With a contested-uncontested distinction, it is possible to state that there are at least three

possible allocations of resources, here termed (i) guns, (ii) butter, and (iii) ice-cream. Butter and guns denote the classical trade-off between production and appropriation. Ice-cream denotes all the productive activities which are not under threat of appropriation – in other words, all the business activities which are not directly affected by the existence of a bloody conflict. In such a case the opportunity cost of conflicts would be related not only to the contested production but also to the production of goods which are not subject to appropriation (see Caruso, 2008 for an analytical treatment). Namely, in our terminology, the opportunity cost of conflicts is related not only to the production of butter but also to the production of ice-cream.

Fitting examples could be drawn from many developing African countries experiencing the sadly-famous 'resource curse', in which poor countries 'blessed' with an over-abundance of natural resources are more likely to descend into internal violent conflict. In many territories, the government and various warlords or rebel groups compete over the appropriation of rents flourishing from exports of natural resources. This often leads to violent conflict, followed by social unrest and civil war. A few examples of conflict-fueling resources on the African continent include diamonds in Sierra Leone and Angola; timber and diamonds in Liberia; gold, copper and diamonds in the Democratic Republic of Congo; and oil in Chad and Nigeria, to name only a few. In fact, it is now fully acknowledged that emergence of civil wars is positively related with the exploitation of rents flourishing in some resource-dependent sectors. Such sectors are clearly contested, in our terminology. However, in many cases, bloody conflicts are localized in mineral-abundant regions, while other territories are not greatly affected by war and predation. In less developed countries, agriculture and small manufacturing presumably constitute a large portion of economic activity of these uncontested territories. As such, such sheltered sectors can also be included within the class of ice-cream.

In this two-sector model, welfare and national income depend upon butter, guns and ice-cream. Moreover, all else equal, a society with a higher proportion of resources devoted to ice-cream could be considered preferred. Whenever a higher proportion of resources is allocated to the uncontested sector, fewer resources will be allocated to the contested sector. Such a shift in allocation of resources could be driven by productivity in the production of ice-cream. In fact, whenever the returns emerging in the ice-cream sector are sufficiently high, a higher level of resources will be allocated to this uncontested production. In a nutshell, in war-torn and post conflict societies, investments in the production of ice-cream can raise the opportunity cost of conflict.

Table 1. Contributions to GDP in selected countries (values expressed in %)				
		Agriculture	Manufacturing	Mining
Angola	*1995*	7.4	4.05	59.9
	2006	8	3.7	58.8
Nigeria	*1995*	32.34	10.2	40.2
	2006	33.11	3.52	39.5
Chad	*1995*	36.8	11.9	0.6
	2006	21.3	6.7	46.2
Mozambique	*1995*	33.9	7.4	0.6
	2006	21.5	13.0	5.9
Source: Unctad				

Table 1 reports sectoral contributions to gross domestic product (GDP) for Angola, Chad, Mozambique and Nigeria. Angola, Chad and Nigeria are resource-dependent economies and are commonly included among countries affected by the *resource curse*. All of them are dependent upon oil, whereas Angola is also dependent upon diamonds. Though by no means a perfect proxy, for the sake of argument, consider the mining sector to be the contested sector, and the manufacturing sector to be the uncontested sector. As you can note, the manufacturing sector contributes to GDP less than mining and agriculture, and its contribution has decreased dramatically over time. Fewer resources are allocated to ice-cream. The economies of these countries are characterized by dominance of contested butter. All of them experienced violent internal conflicts. In 2002, Angola's long-running internal conflict between the ruling party the MPLA and UNITA ended. Nigeria is plagued by an endless war in the oil-rich Niger Delta. Chad, among the poorest countries in the world, experience two civil war onsets, the first in 1965 and the second in 1994. By contrast, Mozambique in spite of a prolonged civil war that ended in 1992, experienced a smooth expansion of productive sectors as manufacturing. Even the mining sector expanded but it did not turn to be so large as to become detrimental for the whole economy.

How do economies become contested and provoke long-lasting civil wars? First, there is an interaction between the abilities of warring parties in fighting and the allocation of resources. More precisely, when warring parties are relatively balanced in their war-making capabilities – as is often the case in developing countries – and asymmetric in their productive structure in the production of ice-cream, the allocation of resources and efforts will depend upon also the short-term

evaluation of the outcome of conflict. It can be demonstrated that: (a) as the productivity in the ice-cream increases, a party will prefer to allocate more resources to it; and (b) whenever the warring parties do not sufficiently value the losses from foregone production and destruction in the short-term, they have fewer incentives to allocate resources to the uncontested sector. Incentives for conflict are then higher than those of investing in the production of ice-cream.

The good news, however, is that productivity in the ice-cream sector is a powerful force countervailing the incentives to fight. This reasoning can be drawn out by considering the existence of a government able to collect taxes and implement economic policies. It can easily be shown that given sufficiently high levels of productivity, the government can foster economic growth and enhance welfare by putting taxes levied toward the production of ice-cream. Contrariwise, in the presence of a kleptocratic or predatory government, national income and wealth decrease. That is, a redistributive government can decrease the incentives to conflict by means of a fiscal policy that sustains productive sectors. In the short-term, and given an economic policy that favors the production of ice-cream, resources are predicted to shift to ice-cream production.

3. Policy Implications for Post-Conflict and War-Torn Economies

What are the policy implications implied by the theoretical propositions described above? Specifically, is it possible to design economic policies capable of mitigating the risk of civil wars in developing countries? Reducing this risk should be the first priority of poor, resource-dependent economies. I want to outline some deeply interrelated insights, advocating for their integrated adoption into comprehensive economic policy frameworks. They emerge directly from the previous theoretical propositions, and address some crucial points for post-conflict and war-torn societies. Clearly, the cooperative management of contested resources – what we have termed butter – is the most important issue. I will not rehash the copious literature on this point. Instead, I will stress other points which can be considered to minimize the risks associated with a large contested sector:
1. reducing arms spending;
2. providing economic incentives to ice-cream production;
3. improving productivity in the long run;
4. managing the debt burden and a introducing novel conditionality for debt relief.

3.1.   Reducing Arms Spending and Promoting Gun Control

By "reduction of arms spending," I mean a reduction in the amount of resources devoted to unproductive activities in a society. When considering a country plagued by long-standing conflict, the first policy priority should be the smooth reduction of government military spending. A common but erroneous belief is that government should increase military spending in order to ensure the stability of social order and guarantee security (a policy often adopted by post-conflict governments). Two theoretical points counter this idea. First, it is clear that military spending has an adverse effect on economic growth by crowding out private productive investments. Second, social systems based upon threats and deterrence are intrinsically unstable (Boulding, 1962). In addition to more recent empirical evidence (Collier and Hoeffler 2004, among others) and examples of unrespected ceasefires and stalemates, it is illustrative to recall the arms race in medieval Genoa. In that case, the strategy of mutual deterrence adopted by rival clans continuously generated increases in military might on both sides. In the long run this equilibrium became unstable, leading Genoa to social unrest and then civil war (Greif, 2007).

However, reduction of arms cannot be limited only to government and rival fighting groups. It is well-known that small arms tend to proliferate among the citizens and residents of war-torn countries. This phenomenon can increase "garden variety" violence, which, even if it is not committed to overthrowing the ruling government, nevertheless negatively affects economic and social development. A civilian disarmament plan should be implemented, followed by the enforcement of strict gun control laws. This is not a novel notion. The most famous historical example is the Japanese *sword hunt* (*katana-gari*), which occurred in 1588. The sword hunt was a pivotal moment in the evolution of Japanese government institutions (Aoki, 2001). Before the hunt, civilians were free to carry weapons for personal defense. By limiting the right to carry weapons to nobles (samurai), the hunt effectively prevented recurrent peasant uprisings. It consolidated state authority, and unifying the feudal states under a central government. Historians disagree about the impact of this policy, though there is evidence that the Japanese peasantry achieved an improvement in living standards due to the development of a more productive agrarian economy and rural industry. However, the process of barring civilians from carrying arms took a long time. Begun in 1588, the final step took place only in 1876, when even the samurai themselves were forbidden from carrying swords and other weapons.

However, violent seizure of weapons could be also counter-effective. A sword hunt (disarmament) policy can be sustained if and only if the government is sufficiently credible. Credibility, trust and legitimacy take time to root themselves in the public consciousness. Therefore, in order to sustain such a plan

in the short-term, a policy of monetary compensation favoring voluntary disarmament should be adopted.

3.2.   Economic Incentives for Ice-Cream Production

Incentivizing ice-cream production implies a broad spectrum of policies favoring and encouraging the development of businesses not directly affected by conflict – that is, the whole set of businesses and sectors which I defined as *uncontested*. In the long-run, this policy can shape the whole structure of the economy. A discussion about evaluation criteria for investment in the uncontested sector exceeds the scope of this brief paper. The main point, though, is that government should avoid making investments in the contested sector, requiring a thorough diagnosis of which businesses are likely to be contested. In this respect, civil war scholar Michael Ross compares the cases of Nigeria and Indonesia. Whilst the Nigerian government has focused on development of the petroleum sector, thus undermining entrepreneurial activities in the small manufacturing sector and agriculture, the Indonesian government has been committed to supporting these very sectors. Consequently, Indonesia avoided the crowding-out of productive sectors such as manufacturing and agriculture.

3.3.   Productivity Improvements

As noted earlier, productivity in the production of ice-cream can be considered as a force countervailing the incentives for conflict. However, productivity improvements do not take shape suddenly, but rather develop over a long time. Education, interpreted as an investment in human capital, is commonly recognized as the main source of improvement in labor productivity. Hence, improvement of education at all levels is needed. This is particularly true in war-torn countries where children and youth may have had their primary and secondary educations truncated.

However, in less-developed countries, investments in education do not suffice. In particular, it is widely understood that malnourishment has a detrimental impact on both current and future productivity. Needless to say, a starving (or ill-nourished) laborer is less productive than a well-nourished one. Moreover, ill-nourished children will develop fewer cognitive skills to be translated in productive activity in the future. In many regions, public policies of education and health cannot be postponed.

The necessity of enhancing productivity in productive sectors is also strictly linked to the reduction of military spending. In fact, one of the channels through which military expenditures affects negatively economic growth is a continuous loss of productivity. For instance, Economics Nobel Prize winner

Lawrence R. Klein and Kanta Marwah demonstrated that military expenditures induced a decrease in total factor productivity over the period 1971-1991 in five countries of Southern Cone region. Of course, heightened military spending is a particularly detrimental policy in less-developed (or undeveloped) economies. In developed economies, innovative entrepreneurship and R&D investments can partly offset the productivity lost due to military spending. But this is not the case in developing countries, where productivity of civilian sectors is presumably very low, innovation plays less of a role, and thus the crowding-out effect is much more effective.

Table 2. Priorities in Public Spending (% GDP)

	Public expenditure on health (%)	Public expenditure on Education (%)		Military Spending (%)	
	2004	1991	2002-2005*	1990	2005
Angola	1.5	-	2.6	2.7	5.7
Nigeria	1.4	0.9	-	0.9	0.7
Chad	1.5	1.6	2.1	-	1
Mozambique	2.7	-	3.7	5.9	0.9

Source: UNDP. Human Development Report 2007.
* data refer to the most recent year available during the period specified.

Unfortunately, war-torn economies generally do not follow the advice proffered above, as illustrated by public expenditure priorities of Angola, Chad and Nigeria in Table 2. In those countries, public expenditures on health and education are dismally low. Considering also that military expenditures are frequently underestimated, such patterns of public spending do not pave the high road for development characterized by productive activity and the reinforcement of a productive, long-run capital base. More illustratively, in September of 2008, the government of Chad pulled out of an agreement with the World Bank to use the projected revenues from a Bank-funded oil pipeline for health and education, instead siphoning the money toward military expenditures. Mozambique, on the other hand, seems to be committed to a long-run development. Since the end of civil war, military expenditures have been dramatically reduced and expenditures in health and education are sensibly higher than those in other countries selected.

3.4.   Managing the Debt Burden

As noted above, the total endowment of resources in a country must be allocated to butter, guns and ice-cream. However, not all endowments are positive assets. That is, economic theories of conflict rely upon the assumption that each society has some positive endowment which could be allocated either to productive or to unproductive activities. In reality, this assumption does not hold. Most countries have a negative endowment, i.e. the public debt burden. The effects of debt burdens can be particularly severe in countries plagued by internal and external conflicts. Most countries plagued by civil conflict in Africa are classified by the IMF and World Bank as HIPCs (Highly Indebted Poor Countries). Given this fact, many economists have suggested international debt-relief policies in order to create a more favorable investment climate in war-torn economies.

  Here again, the theoretical distinction between butter, guns and ice-cream turns out to be useful. A desirable debt-relief plan must be linked with economic policies stimulating the uncontested productive sector and reducing arms expenditures. In particular, the previous insights could pave the way for a new conceptualization of conditionality in international financial institutions such as World Bank and IMF. At this time, conditionality is based upon macroeconomic stability. Instead, it ought to be linked to the implementation of policies following the guidelines expounded above. This novel approach might focus upon the reduction of 'guns' (arms expenditures in both the government and private sectors) in the country. This is particularly important considering that in many cases, macroeconomic stability can be reached only through the exploitation of resources which are also the source of conflict. The PSI (Policy Support Instrument) introduced by IMF in 2005 or the PRGF (Poverty Reduction and Growth Facility) introduced in 1999 for low-income countries, seemed to be a first step in this respect even if the focus remains on macroeconomic policy measures.

4. Conclusions

The arena of economic policy design is always slippery ground. This is doubly true when analyzing post-conflict and war-torn economies. Causal mechanisms and interactions within societies affected by bloody conflicts are so complex that the best of economic advice may easily translate into policy failure. I emphasized the reduction of 'guns,' or military expenditure, as the main element of a recovery strategy. Along these lines, I suggested a novel form of loan conditionality applied by international financial institution such as the IMF and World Bank for debt relief.

Lessons from history have a lot to teach current economic policymakers with respect to conflict prevention and pacification. The framework suggested here is not very different from the philosophy underpinning the Marshall Plan in Europe after the World War II. No doubt the Marshall Plan was a great success. At that time, European countries were encouraged to shift from 'guns' to 'ice-cream'. At the same time, management of 'butter,' or contested resources, was regulated under the umbrella of the European Community of Carbon and Steel (ECCS).   In fact, the ECCS was founded in 1950 in order to promote reconciliation between France and Germany – two countries that had, in the course of just one century, made war three times, causing vast devastation across the continent. It is widely acknowledged that coal and steel industries have been the engines of wars between the two countries. Needless to say, the crucial point of the European recovery program was the reduction of guns. Given a sharp reduction of guns, economic development and further integration made the opportunity cost of conflict so high that nowadays, a war in Europe is simply unthinkable. This fortunate outcome can really be viewed as a novel development in a region where, before 1945 (only 54 years ago), the history of international relations was sadly a record of deaths, wars, battles, rapes and famines.

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