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Abstract

We try to explain why economic conflicts and illegal business often take place in poor countries. We use the concept of subsistence level of consumption (d) and assume a regular concave utility function for consumption levels higher than d . For consumption levels lower than d utility is constant and equal to zero. Under this framework poor agents are risk-lovers. This result helps to explain why economic conflicts are more likely to appear in poor economies and why poor agents are more willing to undertake illegal business.

Journal of Economic Literature Classification: D30; D74.

Keywords: Poverty, Income Distribution, Illegal Business.

1 Introduction

Many times risky activities are undertaken by poor people. In particular, economic conflicts and illegal business often take place in poor countries. We suggest an explanation for these facts based on the characteristics of the utility function. In particular, we consider a utility function such that when the consumption lies below a subsistence level the utility is zero and when the consumption lies above the subsistence level the utility is positive, concave and increasing in the consumption level. With this utility function poor individuals are risk lovers and, for this reason, are more willing to undertake risky activities.

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Las opiniones aquí expresadas son responsabilidad de los autores y por lo tanto no deben ser interpretadas como propias de la Facultad de Economía ni de la Universidad del Rosario

The empirical relevance of this kind of utility functions (convex below some consumption (\underline{c}) level and concave above \underline{c}) was noted by Friedman and Savage (1948) and has been tested by many authors in the field of experimental economics (Kahneman and Tversky, 1979; Edwards, 1996; Piron and Smith, 1995 among others).

Using this framework we can improve our understanding of old problems related to economic conflicts and illegal crops. In particular, we try to put some light in the explanation of the following facts:

1. In relation to illegal crops:
 - Plantations of coke, marihuana and poppy are located mainly in poor countries (Afghanistan, Bolivia, etc.).
 - Repressive efforts like fumigations haven't succeed reducing the planted area (for the case of Colombia, see the web page of the Inter-American Drug Abuse Commission)
2. In relation to economic conflicts:
 - Persistent and generalized economic conflicts arise only in poor countries (This is the case in Africa and some Latin-American countries).
 - Conflicts may persist even if there are high costs.

The study of these problems is not new in the economic literature. Many papers have been done in the field of conflicts and appropriative activities (Murphy, Shleifer and Vishny, 1993; Grossman, 1991; Grossman, 1994; Brito and Intriligator, 1992; Rodríguez, 1997; Skaperdas, 1992; Skaperdas and Syropoulos, 1997; and Zuleta, 2004 among others) but never relating poverty and illegal business trough the willingness to undertake risky activities. In the same way, the supply-side of Illicit Drugs has been deeply studied (Whynes, 1991; Flower, 1996; Burrus, 1999; Cussen and Block, 2000; Kennally, 2001) but not related with poverty and risk-loving behavior.

In the paper at hand we argue that the problems of illegal crops and economic conflicts are one result of the risk-loving behavior of the poor agents.

The paper is organized in 5 sections. In the second one the utility function is presented and explained. In the third section we analyze the relation between risky business and poverty. In

the fourth section we study the link between poverty and economic conflicts and finally we present the conclusions.

2 Utility Function

We consider a subsistence level of income above which utility is concave and increasing in consumption and below which - equal to zero. That is:

$$U = (c - d)^\beta \text{ if } c \geq d$$
$$U = 0 \text{ if } c < d$$

(1)

Where u is utility, c - consumption, d - subsistence level and β ($1 > \beta > 0$) indicates how risk averse the consumer is when his income is higher than the subsistence level.

Figure 1

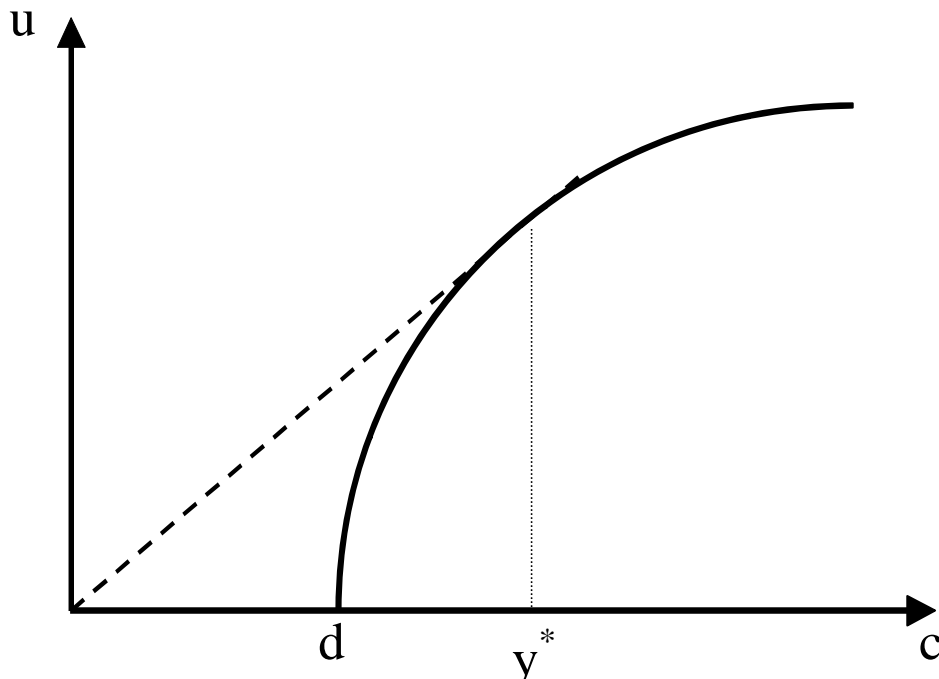


Figure 1 represents the utility function from equation 1. Note that the function is not concave for low values of c . Therefore, agents with low income levels may be risk lovers.

To illustrate this point compare any lottery with a positive probability of an income bigger than d with a sure income lower or equal to d (even around d): The lottery is preferred.

The dashed line in Figure 1 represents the expected utility of all the lotteries which give with some probability the outcome y^* and with some probability the outcome zero. The exact value of y^* can be derived knowing that the slope of the straight line (dashed line) is equal to the marginal utility evaluated at y^* .

$$\left. \frac{\partial U}{\partial c} \right|_{c=y^*} = \beta (y^* - d)^{\beta-1} \quad (2)$$

Thus, the slope of the dashed line is constant and equal to $\beta (y^* - d)^{\beta-1}$ so its value when it is evaluated at y^* is $y^* \beta (y^* - d)^{\beta-1}$ and must be equal to $U(y^*)$.

$$y^* \beta (y^* - d)^{\beta-1} = (y^* - d)^\beta$$

Rearranging,

$$y^* = \frac{d}{1-\beta} \quad (3)$$

In general, with this utility function, there exists an income level y^* such that whenever the income of a consumer is below y^* , the consumer prefers a lottery which delivers a quantity higher than d or zero (both with a positive probability) than the expected value of such lottery for sure.

This simple framework helps to understand why poor agents are more willing to work in risky activities. Now, since illegal activities are characterized by high risk, *ceteris paribus*, poor agents are more willing to work in illegal activities than rich agents.

3 Risky Business

In this section we offer two propositions that help to explain why poor people are willing to undertake illegal risky businesses even if the expected value of those business is not very high.

3.1 Risky business

Assume that an agent has to choose between two different activities A and

B . Those activities are described as follows:

- A is risk-less and its return is equal or lower than y .
- B is risky and its return is yh with probability p and yl with probability $(1-p)$, where $yh > yl$.
- $y = p(yh) + (1-p)(yl)$.

Proposition 1: *If $y < d < yh$ and $p > 0$ then the risky option A is preferred.*

Proof. The proof is straightforward because $U(y) = 0$ and $U(yh) > 0$.

Proposition 2: *If the expected outcome of activity A is equal to the expected outcome of activity B , $yl = 0$ and $d < y \leq yh$ then the risky option A is preferred.*

Proof.

1. The expected outcome of activity A is equal to the expected outcome of activity B so $pyh = y$ and $p = y/yh$
2. $yl < d$ so $U(yl) = 0$ and the expected utility of activity B is given by,

$$E[U(B)] = p(yh - d)^\beta = \frac{y}{yh} (yh - d)^\beta$$

3. The expected utility of activity A is given by, $U(A) = (y - d)^\beta$. Since $yh > d$ and $y < yh$ then $\frac{y}{yh} (yh - d)^\beta > (y - d)^\beta$.

From 1, 2 and 3 it follows that $E[U(B)] > U(A)$.

These propositions help to understand why illegal crops are grown in poor countries and why the efforts of different governments to increase the risk in such activities do not seem to reduce the planted area. According to our result there are three ways to curb incentives to undertake risky business:

- i) Reduce the probability of success. This policy is often hard to implement. On the one hand, the income in case of success may be positively correlated with risk. For example, the price of coke goes up after repressive policies. On the other hand, if the income derived from the legal activity is close to the subsistence level the only way to reduce the incentives is setting the success probability equal to zero ($p = 0$).
- ii) Reduce the high outcome (yh) of the risky business. If the income derived from the legal activity is close to the subsistence level ($y \approx d$) any reduction in the high outcome of illegal business (yh) would be useless unless the new outcome is equal or lower than the outcome of the legal activity ($y \geq yh$).
- iii) Increase the outcome of the risk-less business (y). This type of policy might be successful by itself if the new outcome is higher than y but can also be a complement to the first two policies. Thus, a successful policy should include not only a repressive action against the illegal business but also an effort to increase the return to legal business.

4. Conflict

In this section we address the problem of economic conflicts. We consider an economy with two agents (1 and 2) where both of them consume the same good and each have an initial endowment. Each agent can consume his (her) endowment or enter into a conflict with the other agent. In case of conflict an agent has a positive probability of winning the other agent's endowment and a positive probability of losing his own.

To analyze the incentives of the agents let us define some concepts:

e_1 : Endowment of agent 1

e_2 : Endowment of agent 2

δ : Probability of winning for agent one

1- δ : Probability of winning for agent two

Lottery: Game in which agent 1 (agent two) can have an endowment equal to e_1+e_2 with probability δ ($1-\delta$) and an endowment equal to zero with probability $1-\delta$ (δ).

Proposition 3: *If the endowments of agents 1 and 2 are such that $d < e_1 + e_2 < 2d$ then for any allocation there exist a lottery such that at least one agent is better off and no one is worse off.*

Proof. First consider the case without lottery, where each agents consumes his (her) own endowment. The utility for agent 1 is given by,

$$U_1 = (c_1 - d)^\beta \text{ if } c_1 \geq d \quad \text{and} \quad U_1 = 0 \text{ if } c_1 < d \quad (4)$$

and the utility for agent 2,

$$U_2 = (c_2 - d)^\beta \text{ if } c_2 \geq d \quad \text{and} \quad U_2 = 0 \text{ if } c_2 < d \quad (5)$$

Since $e_1 + e_2 < 2d$ then: If $e_2 > d$ then $e_1 < d$ and if $e_1 > d$ then $e_2 < d$. So either $U_1 = 0$ or $U_2 = 0$.

Now, consider a lottery such that agent 1 gets e_1+e_2 (agent 2 gets nothing) with probability δ and zero with probability $1-\delta$ (agent 2 gets $e_1 + e_2$). The expected utility is given by $E(U_1(L)) = \delta (e_1 + e_2 - d)^\beta$ and $E(U_2(L)) = (1-\delta) (e_1 + e_2 - d)^\beta$.

Therefore, if $e_1 > d$ then $U_2 = 0$ and $E(U_2(L)) > 0$ so agent 2 prefers the lottery and if $e_2 > d$ then $U_1 = 0$ and $E(U_1(L)) > 0$ so agent 1 prefers the lottery .

Now suppose that $e_1 > d$. For agent 1 the expected utility of the lottery is higher than the utility without the lottery if the following inequality holds,

$$\delta (e_1 + e_2 - d)^\beta > (c_2 - d)^\beta \quad (6)$$

So whenever $\delta > \left(\frac{c_2 - d}{e_1 + e_2 - d} \right)^\beta$, at least one agent is better off with the lottery and no one

is worse off.

In the case where $e_2 > d$ it is easy to prove that whenever $1 - \delta > \left(\frac{c_2 - d}{e_1 + e_2 - d} \right)^{\frac{1}{\beta}}$ at least one agent is better off with the lottery and no one is worse off.

Proposition 3 tell us that poor agents are willing to take risks for free, that is, without any risk premium. For people with a consumption level close to the subsistence level the possibility of a higher income is enough to increase his (her) expected utility.

An economic conflict can be understood as a lottery. Two parties or two agents fight for some amount of wealth and for both parties there exists a positive probability to win and a positive probability to loose. Therefore, from proposition 3 it follows that for poor agents a conflict is a way to increase expected utility. In corollary 4 we explain the relation between conflict and poverty in a more formal way.

Corollary 4: If the endowments of agents 1 and 2 are such that $d < e_1 + e_2 < 2d$ and both have positive probabilities of winning a conflict then at least one agent has incentives to start the conflict. Moreover if $\delta > \left(\frac{e_i - d}{e_1 + e_2 - d} \right)^{\frac{1}{\beta}}$ for every i , both agents have incentives to start the conflict.

We can conclude that a successful policy to prevent economic conflicts should include not only a repressive action but also an effort to increase the income of the population and, in particular, the income of the poorest agents.

An important implication of corollary 4 is that if the income of the economy is very low any effort to redistribute is useless and the only way to avoid conflicts is increasing the income of the economy as a whole. Notice that in proposition 3 and corollary 4 we have assumed that conflicts are costless. However, conflicts demand resources that could be used in the production of goods. The existence of such costs may eliminate the incentives for economic conflicts.

Proposition 5: If the endowments of agents 1 and 2 are such that $d < e_1 + e_2$, $e_1 < d$ and the cost of a conflict (x) is lower than the difference between the endowment of the economy and

the subsistence level, that is, if $x < e_1 + e_2 - d$ then the cost cannot prevent the agents for going into a conflict.

Proof. If $x < e_1 + e_2 - d$ then $e_1 + e_2 - (x + d) > 0$ so $\delta(e_1 + e_2 - (x + d))^\beta > 0$. So for the poorest agent the expected utility under conflict is higher than the expected utility in peace.

From proposition 5, given the income of the poorest agent, the possibility of an economic conflict depends on two variables: the cost of the conflict and the income of the richer agent. In other words, inequality may play an important roll in the configuration of an economic conflict. Therefore, re-distributive policies can be useful to avoid economic conflicts. However, if the conflictive society is too poor, it is impossible to eliminate economic conflicts through redistribution of income.

5 Conclusions

We consider a utility function such that when the consumption lies below a subsistence level the utility is zero and when the consumption lies above the subsistence level the utility is positive, concave and increasing in the consumption level. With this utility function poor individuals are risk lovers and, for this reason, are more willing to undertake risky activities. Since poor agents are risk lovers and illegal activities are characterized by high risk, ceteris paribus, poor agents are more disposed to work in illegal activities than rich agents.

Using this framework we can extract some policy implications: A successful strategy against illegal activities should include not only a repressive action but also an effort to increase the return to legal business and guarantee a minimum income for the poorest agents.

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