

Summaries

A model of rural conflict: violence and land reform policy in Brazil

LEE J. ALSTON, GARY D. LIBECAP AND BERNARDO MUELLER

Since the mid 1980s the Brazilian government has been attempting to reduce the high levels of land ownership concentration through a land reform program based on expropriation of unproductive private property for the creation of settlement projects for poor landless peasants. But the number of candidates to become beneficiaries of the land reform program has always been much higher than the governments ability to redistribute the land. Rather than waiting their turn to be settled several well-organized groups of landless peasants realized that they could increase their chances of being served by INCRA, the federal land reform agency, by invading private farms. This tended to work because the commotion caused by the invasion and the attempts of the landowner to evict the squatters created a situation where the path of least resistance for INCRA would be to expropriate the land from the farmer and let the squatters stay on it.

This paper tries to analyze the incentives faced by the several groups involved in a typical land conflict in Brazil taking into consideration the formal and informal rules which govern land ownership. The squatters are faced with a choice of whether or not to invade a property. The potential benefit of invading is that this increases the chances that they will receive land and become beneficiaries of the land reform program. They are careful to choose land which they think INCRA will have a higher probability of expropriating, for example land which is not being productively used. On the other hand, invading is costly and dangerous and there is a good chance they will come out empty handed. The farmer is faced with the choice of whether to evict the squatters or not. A successful eviction may avoid the loss of the land, but on the other hand it is costly and dangerous and may be futile. Finally, INCRA has to decide whether it will expropriate a farm in a given conflict or whether it should dedicate its resources and efforts elsewhere. Because it has limited resources it cannot attend to all conflicts in the country. The paper analyzes how each of these players strategically make their decisions taking into account what each of

the other players will be doing. Within this analysis special attention is given to the role of the federal government, the local courts and the level of land tenure security of the land in question. It is shown that it is possible that the more effort that the government puts toward implementing its land reform program the stronger will be the incentive for the squatters to keep invading land. This suggests that rather than simply stepping up its targets and promises to settle ever-larger numbers of landless peasants, as has happened in the past decade, the government should adopt a new model of land reform which does not provide the perverse incentives which lead to conflicts.

Stochastic food prices and slash-and-burn agriculture

CHRISTOPHER B. BARRETT

This paper develops a model that shows how the mean and variance of food price distributions influence semi-subsistence farmers' incentives to clear forest to add to cultivated area when markets may be incomplete. Smaller farmers are more likely than larger farmers to engage in slash-and-burn cultivation for semi-subsistence food production, and they are often net buyers of the staple foods they grow. Where land is available primarily at the extensive margin, food insecure, net buyer agricultural households will rationally respond to an increase in either the mean or the variance of the staple food price distribution by allocating more labor to land clearing, not because of greater profit opportunities but rather due to decreased welfare and increased food insecurity. This qualitative result differs from that found in the existing literature linking farmer behavior and deforestation, offering an innovative interpretation of the vicious cycle relating smallholder poverty, risk coping, and tropical deforestation, three issues of considerable current interest to policymakers and researchers in tropical agrarian nations.

This issue has considerable relevance to contemporary policymaking because those countries whose tropical forests are of greatest concern to conservationists (e.g., Brazil, Côte d'Ivoire, Indonesia, Madagascar, Peru and the Philippines) have also been liberalizing food price policy over the past decade and a half, and have considerable populations of semi-subsistence farmers. It has been well established, across a broad range of countries, that previous state control of marketing channels, trade, exchange rates, etc., generally reduced the mean and variance of food price

distributions. If removal or reduction of those same state controls—the thrust of liberalization efforts worldwide—increases both the mean and variance of food price distributions, as limited empirical evidence suggest has been the case, this raises an intriguing hypothesis: do market-oriented reforms that increase the mean and variance of food prices inadvertently stimulate deforestation in low-income economies in which a sizable proportion of farmers are net food buyers? The irony, of course, is that the very international organizations and donors most vigorously sponsoring market-oriented agricultural policy reforms have been simultaneously working hard to improve tropical forest conservation. In the absence of explicit coordination between the two activities or of models to understand how they might relate to one another, the former may be working at cross-purposes with the latter. While data are not available with which to test the model's hypotheses directly, empirical evidence from Madagascar is consistent with this story. Interventions that stimulate rural labor markets (and thereby wage rates), provide safety nets for net food buyers, or both (such as food-for-work schemes), may effectively mitigate the negative deforestation externalities perhaps created by food price liberalization.

Market based instruments for environmental policymaking in Latin America and the Caribbean: lessons from eleven countries

RONALDO SERÔA DA MOTTA, RICHARD M. HUBER AND
H. JACK RUITENBEEK

This study investigates the use of Market Based Instruments (MBIs) for environmental management in Latin America and the Caribbean (LAC), covering Barbados, Bolivia, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico, Peru, Trinidad and Tobago, and Venezuela. Issues investigated include water supply/abstraction, water quality, air quality, energy, solid and liquid waste management (including toxic substances), noise and agriculture.

The literature lists hundreds of individual MBIs, ranging from traditional 'command and control' (CAC) regulations to *laissez-faire* approaches that use consumer advocacy or private litigation as incentives. In between are 'tax and subsidy' approaches and mechanisms relying on traded property rights.

In theory, MBIs are economically efficient and environmentally effective; they have lower private compliance costs and can provide

government revenue. In practice, however, the costs of administration, monitoring and enforcement of MBIs may be as high as for CAC.

This study defines an MBI more generally as an instrument which reduces externalities by aligning private costs with social costs. The 'strength' of an MBI depends on the degree of *flexibility* that a polluter has in achieving a given environmental target. 'Flexibility' refers to the degree to which social (or state) decisions are transferred to the private (individual) level. 'Weak' MBI use regulations, and are usually denominated as CAC in the literature, whereas 'strong' MBI use mainly market forces to decentralize decision-making and are those commonly referred as typical MBI.

Key findings are that:

There has been substantial experimentation with MBIs in LAC. MBIs across a wide range of mechanisms have been developed and applied in all of the countries investigated. But systems based solely on control-oriented approaches impose high private costs and are often not enforceable given existing institutional capacity.

The primary historical role of MBIs in LAC is to raise revenue. A major impetus behind using many of the MBIs in LAC has been revenue generation. Other potential objectives—such as reduction of environmental impacts or improving the cost-effectiveness of regulations—have been under-emphasized or not attained. A strong need exists to *channel revenues to local authorities* to assist in building institutional capacity.

Public awareness is low and uncertainty is high. Weak participation among stakeholders, largely inherited from authoritarian regimes of past decades, poses a real constraint to the rapid implementation of complex MBI mechanisms.

Institutional constraints to MBI implementation remain pervasive. In most of the countries surveyed, existing legislation has established environmental institutions and provided for the use of economic incentives in environmental management. While the groundwork is in place for the use of MBIs, their effective implementation is limited by institutional weaknesses such as underfunding, inexperience, lack of political will or unclear jurisdiction. Since the scope of MBIs must match the institutional capacity to implement them, MBI approaches that introduce *gradual and flexible reforms* are more likely to be consistent with ongoing institutional changes.

Administrative requirements of MBIs remain stringent. MBI requirements for monitoring, legal design, public consultation and enforcement or collection are not always noticeably different from strict CAC approaches. MBIs are therefore not a substitute for weak institutions or for CAC; some regulatory elements are inevitably required and a strong institutional base is a prerequisite to MBI implementation.

'North-south' information flow remains pervasive. To date, most of the information flow regarding MBIs has been of a north-south variety. An important opportunity has been missed to share environmental management experiences among LAC countries. Increased *information sharing* in a 'south-south' dialog will benefit all parties.