ABSTRACT for the Conference

"The Paradoxes of Happiness in Economics"

21-23 March 2003

Department of Economics - University of Milano-Bicocca

"Working too much in a polluted world: a North-South evolutionary model"

By

A. Antoci (University of Sassari)

S. Borghesi (University of Siena)

Abstract

Nowadays people spend increasingly more to protect against deterioration of the environment they live in. Environmental degradation, in fact, induces agents to replace consumption of "free" environmental public goods (e.g. meadows, unpolluted water, silence) with that of expensive private goods that may satisfy the same needs. This phenomenon is becoming more and more frequent in many industrialized countries. Consumption of mineral water, for instance, has increased in cities where tub water is non-drinkable. Similarly, many Northern countries have experienced an increasing consumption of double windows to protect against traffic noise. As Antoci and Bartolini (1999) have first pointed out, these environmental defensive expenditures may contribute to a self-enforcing growth process. Environmental degradation, in fact, induces individual defensive expenditures that raise the activity level which, in turn, may further increase environmental degradation.

This work intends to contribute to this line of research by extending the substitution mechanism of environmental with private goods to a North-South evolutionary context. To fix ideas, think of sea pollution in the North. The increasing level of pollution of many Northern beaches may induce agents in the North to work harder to afford an expensive holiday in some Southern country where beaches are still relatively clean. However, if the number of Northern agents that go on holiday to the South is relatively

high, this may increase the exploitation of natural resources and thus environmental degradation in the South. If so, Northern agents have a lower incentive to work high and go on holiday to the South. Each agent's decision on how much to work thus depends on what other agents will do and the substitution mechanism due to pollution in the North leads to an increasing interdependence between environmental quality in the two hemispheres. The dynamics emerging from this simple evolutionary model suggest that changes in the Northern production level may determine similar changes in the Southern production level. It is shown, moreover, that North-South interactions may generate limit cycles in the model and that both hemispheres may end up in a situation where everyone works "too much": people work harder to protect against pollution, but they might be better-off with a lower level of production and consumption. Finally, transferring the environmental impact of Northern production to the South may drive both hemispheres away from their maximum welfare level, leading them on a welfare reducing growth path.

Bibliography

Antoci A., Bartolini S., 1999, "Negative externalities as the engine of growth in an evolutionary context", Nota di Lavoro 83.99, FEEM, Milan.

Grossman G.M., 1995, "Pollution and growth: what do we know?" in Goldin I., Winters L.A. (eds.) "The economics of sustainable development", Cambridge University Press, pp.19-45.

Hirsch F, 1976, "Social limits to growth", Harvard University Press, Cambridge, USA.

Leipert C., 1989, "National income and economic growth: the conceptual side of defensive expenditures", Journal of Economic Issues, pp.843-856.

Weibull J.W., 1995, "Evolutionary game theory", Cambridge, MIT Press.