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**NORTH-SOUTH ENVIRONMENTAL DEBATE:  
STRATEGIC PRICE DISTORTIONS AND CAPITAL FLOWS**

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# **North–South Environmental Debate: Strategic Price Distortions and Capital Flows**

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## **Abstract**

When governments set their environmental policies they take into account the impact of these policies on international flows and prices. We consider a world of two regions, North that is capital abundant, and South that is not. Under perfect competition and free mobility of capital, the North has incentives to increase the pollution levels over the efficient ones. These have to do with strategic distortions in the price of capital exports. Softer environmental conditions at home induces scarcity in the international market which results in a higher return for the Northern capital exports. Under quite general conditions, the South responds with dirtier policies too.

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# 1 Introduction

There is in economics an increasing interest for the relationships of environmental policies with other aspects of economic policy. Perhaps the most extensively studied of these relationships has been that of trade policies and environmental policies. Thus, and led by practical concern in the wake of regional integration, we now understand the need of coordination in environmental policies when pollution is transboundary (see, for instance, Markusen, 1975, and Hoel, 1997), but also the way trade incentives affect the strategic setting of environmental policies when governments try to win a competitive edge for their firms (see, for instance, Kennedy, 1994, Barrett, 1994, Burguet and Sempere, 1998, and especially Ulph, 1996, for an excellent survey).

Also associated with trade, a branch of the literature has explored the issue of where should we expect dirtier activities to locate, in particular whether poorer (Southern) or richer (Northern) countries will house these activities. Here the common theme is comparative advantages in terms of productive factors (Copeland and Taylor 1995, 1997). These same authors had discussed the same issue assuming that Northern countries are human capital abundant with respect to Southern countries, and that production intensive in human capital was cleaner. The result is then that Southern countries pollute more.<sup>1</sup>

There is, however, an issue that has been overlooked when considering

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<sup>1</sup>Also related to productive factors, Chichilnisky (1994) points to ill-defined property rights of environmental resources in the South as a reason for more depletion of environmental resources in these countries.

the strategic implications of environmental policies, which is the possibility of using them to influence the relative prices of mobile factors. This is precisely our goal in this paper: to show that environmental policies, through their effect on factor productivity, can influence the allocation of mobile factor, like capital. In this sense, even if international treaties eliminate all barriers to the flow of capital across borders, seemingly following a productive efficiency motive (Diamond and Mirrlees, 1971), there is still room for the strategic manipulation of capital prices through environmental policies.

Thus, we present a model of perfect competition with two regions and environmental damage associated to production. The North is capital abundant relative to the South. Contrary to Copeland and Taylor, our focus is on the incentives to distort prices that this "market power" provides the Northern government. By allowing higher emission levels, the North improves the productivity of capital at home, which in turn increases the world interest rate. This is the basic intuition, and directly implies that the North pollutes more than the South, other things equal. Whether the South itself reacts to this higher interest rate on its borrowing by reducing pollution or by allowing higher emissions depends on whether these emissions are strategic substitutes or complements. We show that under very general and plausible conditions the South will respond by increasing emissions in an attempt to minimize the loss of foreign capital.

Our work is complementary to that by Ludema and Wooton (1994). They have also shown how environmental policies can be an instrument to alter relative prices in traded goods. It is also complementary to that of Markusen, Morey, and Olewiler (1995) who study the competition for attracting firms

to the respective territory. One could think of their model as competition for quantities (employment, output), whereas our model focuses on distortion of prices associated to "market power" in terms of national factors.

The rest of the paper is structured as follows. The next section presents the model. Section 3 then analyzes equilibrium policies set by governments and show how capital price concerns distorts these policies. Section 4 compares the policies set by Northern and Southern governments to the globally efficient ones. Some concluding remarks close the paper.

## 2 The Model

Consider a world composed of two countries, North and South, respectively,  $n$  and  $s$ . In each of these countries there is a representative consumer. Time is decomposed in two periods: present (period 1) and future (period 2). There is only one good that can be consumed or used as an input (capital) in future production.

### *Consumers*

Consumer  $i$  ( $i = n, s$ ) care about both consumption in period 1,  $C_1^i$  and consumption in period 2,  $C_2^i$ . Each consumer has initial resources  $W^i$  that she can consume in the first period or save. The return of these savings will add to her second period consumption. We will assume that the North is richer than the South in terms of the initial resources so  $W^n > W^s$ . Let  $S^i$  denote savings by consumer  $i = n, s$ . Consumers also (inelastically) provide labor in the second period. The wage revenue will also add to the second period consumption. We will assume that consumers are price takers, so that

they take both wages and interest rate as given. In particular, when deciding how much to save, they don't take into account how these savings may affect their wages in period 2.

Thus, we let consumers' preferences be represented by the utility function  $u^i(C_1^i, C_2^i, E^i)$ , where is an index  $E^i$  of environmental quality, which consumers take as given. We assume

(A.1)  $u^i(C_1^i, C_2^i, E^i)$  is twice differentiable, quasiconcave, increasing in present and future consumption, and in  $E^i$ . Moreover,  $u^i$  is separable in consumption and environmental quality. We will normalize  $E^i$  so that  $u^i$  is linear in  $E^i$ . That is,  $u_{q3}^i = 0$  for  $q = 1, 2, 3$ . Then, let

$$u^i(C_1^i, C_2^i, E^i) = U^i(C_1^i, C_2^i) + E^i$$

This last, simplifying assumption means, in particular, that savings are independent of the environmental quality, for fixed interest rate. Obviously this assumption will make income effects, as those discussed in Copeland and Taylor (1997), disappear. This will allow us to concentrate in the capital market distortion effects. Then, consumers' budget constraints when taking their consumption and savings decisions are

$$C_1^i + S^i \leq W^i,$$

$$C_2^i \leq S^i(1 + r) + w^i l^i + \pi^i,$$

where  $\pi^i$  represents the profits of firm  $i$ . Substituting the second constraint in the first we obtain from utility maximization and price taking behavior

that the intertemporal rate of substitution is, as usual,

$$\frac{U_1^i}{U_2^i} = 1 + r. \quad (1)$$

This defines each country's savings function  $S^i(r)$ . Let  $S^T(r) = S^n(r) + S^s(r)$  be the total savings function.

### *Production*

There is a single firm in each country that produces the consumption good for the second period using capital and labor. Firms borrow their capital from consumers' savings. We assume no barriers to capital mobility across borders, and price taking by firms also in the capital market. Denote by  $k_i^j$  the amount lent by consumer  $i$  to the firm in country  $j$  (for  $i, j = n, s$ ). Then  $S^i = k_i^j + k_i^i$ . Let  $f^i$  represent the technology available to firm  $i$ . Then, firm  $i$ 's output is given by  $f^i(l^i, k^i, E^i)$ , where  $l^i$  and  $k^i = k_i^i + k_j^i$  are, respectively, labour and capital used in production by firm (country)  $i$  for  $i = n, s$ . Production generates local pollution as a by-product. Thus, we represent by  $E^i$  an index of environmental quality. The higher this environmental quality, the lower the output that can be obtained using the productive inputs, capital and labor.<sup>2</sup>

We make the following functional assumptions:

(A.2) The production function is twice differentiable, concave, and also satisfies that  $f_3^i < 0$ ,  $f_{13}^i \leq 0$ , and  $f_{23}^i \leq 0$ .

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<sup>2</sup>Notice that we model pollution (or its complement environmental quality) as an argument of the production function as in Copeland and Taylor (1994, 1995, 1997) or Hoel (1997). However in those models pollution was a variable freely chosen by the firms. In this model, instead, it will be chosen by the governments and regarded as a parameter by the firms.

Here  $f_j^i$  denotes the derivative of the production function with respect to the  $j$ th argument, and  $f_{jk}^i$  is the cross derivative of  $f^i$  with respect to the  $k$ th and  $j$ th arguments. Apart from the traditional decreasing returns, the idea behind the sign of the derivatives in (A.2) is that for each additional unit of labor and/or capital that is used in production some part of it must be used to keep the environmental quality constant, and this part is larger the larger this environmental quality.

The motivation of (A.2) comes from the existing empirical evidence <sup>3</sup> about the impacts of environmental regulation on factor productivity. These studies show that more regulated plants tend to have lower productivity levels and slower productivity growth. For instance, Gray and Shadbegian's (1995) calculations using plant-level productivity data for three industries show that a plant with 1 dollar higher abatement costs tends to have the equivalent of 1.74 dollars lower productivity in paper, 1.35 lower in oil, and 3.28 lower in steel.

Given price taking behavior by all agents and free mobility across borders, there will be a single interest rate in the world capital market,  $r$ , which measured in terms of the consumption commodity will be determined by equal productivity of capital, that is, equilibrium capital demand in each country  $k^i(r, E^i)$  is given by

$$(1 + r) = f_2^n(l^n, k^n, E^n) = f_2^s(l^s, k^s, E^s). \quad (2)$$

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<sup>3</sup>See Gollop and Roberts, 1983, Gray, 1987, Barbera and McConnell, 1986, and Gray and Shadbegian, 1995, among others



Labor, on the other hand, cannot be traded internationally and is supplied inelastically. Thus, any change in labor demand in each country will be translated to only changes in the wage rate.

*Private agents' equilibrium*

Equations (1) and (2) plus the capital market equilibrium equation

$$S^T(r) = k^n(r, E^n) + k^s(r, E^s), \quad (3)$$

define the savings, capital, and interest rate, for given levels of environmental quality. Consumers of both countries will determine total amount of savings  $S^n$  and  $S^s$ . Equilibrium conditions in capital markets will determine the allocation of these savings to capital across countries,  $k^s$  and  $k^n$ , as a function of  $E^n$  and  $E^s$ , given  $l^n$  and  $l^s$ .

### 3 Environmental Policies

The last type of agent that we consider is the government. We assume that governments both in the North and the South take decisions on their domestic environmental index  $E^i$ . This is the only policy instrument for the governments. This will be equivalent to having governments set environmental instruments (for instance, environmental taxes, emissions standards, etc) so that the desired level of environmental quality is attained. Also, we assume that the South is small in the world capital market, so that the government of the South takes the interest rate  $r$  as given.

### 3.1 Non-Strategic Policies

Let's analyze first what the savings, consumption, and environmental decisions would be in the absence of strategic country interaction. For that, we consider the "autarky" case, that is, the case in which each country is isolated from the other (no capital flows). In that case, the government would choose the level  $E$  so as to maximize  $u$ , taking the decisions implied by equation (1) as given. From the government point of view,  $C_1 = W - S(r)$  and  $C_2 = f(l, S(r), E)$ . Then, the first order condition that defines optimal environmental quality  $E$  is

$$-U_1 S' \frac{dr}{dE} + U_2 [f_2 S' \frac{dr}{dE} + f_3] + 1 = 0$$

which substituting equation (1), and since in equilibrium  $f_2 = (1 + r)$ , can be written as

$$U_2 f_3 + 1 = 0 \tag{4}$$

This equation, together with equation (1), would then define the savings level  $S$  and environmental quality  $E$  (and then consumption too) under autarky. In particular, the level of  $E$  would balance the positive effect that a less stringent environmental policy has on the second period consumption through an increased output ( $U_2 f_3$ ) with the direct utility impact of the worsen environment. The savings level  $S$  would simply equate marginal rate of substitution between consumption today and consumption tomorrow with the relative cost, the productivity of capital. As we will see below, this "autarky solution" coincides with the one that would prevail under price (interest

rate) taking behavior by the governments, except that then the interest rate would be common to both countries. The goal of the next subsection is to analyze the incentives introduced by the fact that the Northern government can affect the world interest rate using its environmental policies.

### 3.2 Strategic Equilibrium Policies

We now turn to the possibility of capital imports and exports and its influence on the governments policies. Notice that the consumption in the second period by each consumer is now equal to the level of output in her country net of interest payments across borders. Thus,

$$C_2^i = f^i(l^i, k^i, E^i) + (1 + r)(k_j^i - k_i^j)$$

In equilibrium, only one country will be exporting capital. In general<sup>4</sup>, the North will be a net exporter, with  $k_n^s = S^n - k^n$ , and  $k_s^n = 0$ . Then, the objective function of the  $s$ 's government is

$$u^s(C_1^s, C_2^s, E^s) = U^s[W^s - S^s, f^s(l^s, k^s, E^s) - (1 + r)(S^n - k^n)] + E^s, \quad (5)$$

where we are taking into account the interest payments for imports of capital from  $n$ . Likewise, the objective function of  $n$ 's government is

$$u^n(C_1^n, C_2^n, E^n) = U^n[W^n - S^n, f^n(l^n, k^n, E^n) + (1 + r)(S^n - k^n)] + E^n. \quad (6)$$

Also, the South takes  $r$  as given, whereas the North considers the effect of  $E^n$  on  $r$ . Note that increases in the environmental quality in the North will

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<sup>4</sup>This requires "relative" capital abundance. For instance, and for similar technologies, a larger per capita savings in the North.

have a negative effect on the interest rate. Indeed, differentiating in equation (3) we have

$$\frac{dr}{dE^n} = \frac{\partial k^n / \partial E^n}{S^{T'} - \partial(k^s + k^n) / \partial r},$$

where we omit arguments of the functions for simplicity, and  $S^{T'}$  is the derivative of the total savings with respect to  $r$  according to equation (1). Now, substituting for  $\partial k^n / \partial E^n$  and  $\partial(k^s + k^n) / \partial r$  (from equation (2)), we obtain

$$\frac{dr}{dE^n} = f_{23}^n G \frac{1}{1 - S^{T'} f_{22}^n G} < 0,$$

where

$$G = \frac{f_{22}^s}{f_{22}^s + f_{22}^n}.$$

The sign comes from the fact that  $G > 0$ ,  $S^{T'} > 0$ , and  $f_{22}^i, f_{23}^n < 0$ . The effect of  $E^s$  on  $r$  would have a similar expression, substituting the superscript  $n$  for  $s$  and vice versa. However, for the South to be a price taker, the denominator would have to be very large. This would be the case if  $S^{T'}$  is very large with respect to  $f_{23}^n$ . That is, if the South is indeed small in the world capital market. Summarizing the above discussion we have:

**PROPOSITION 1:** *If a country (the North) is large in the capital market, increases in its environmental quality will lead to decreases in the interest rate.*

The interpretation of this effect is simple. As country  $i$  increases environmental quality, the productivity of capital at home decreases by  $f_{23}^i$ . However, this creates an imbalance in the productivity of capital in both

countries which will generate a flow of capital to the other country until the marginal productivities are equalized again, which reduces the original impact. The measure of this capital flow has a direct component: recovering the balance would take a flow proportional to the relative responsiveness of the marginal productivity of capital in the foreign country to changes of the capital, which is measured by  $G$ . It also has an indirect component related to the response of savings (total capital supply) to the change in productivity conditions: a flow away from the country would increase the productivity of capital thus increasing the total capital supply  $S^T$ . Then, the total capital flow away from the country (measured in terms of capital units) that would restore the balance in productivity is just  $G/(1 - S^T f_{22}^s G)$ . This tends to reduce the original impact of  $E$  on the productivity of capital (for a small country, in fact the original impact is completely eliminated).

This effect is the origin of the strategic behavior of the Northern government when setting its environmental policies. Indeed, taking interest payments into account, and also taking into account (1) and (2), the first order conditions for optimal environmental indexes, that is, for maximization of (5) and (6), this last for exogenous  $r$ , are respectively,

$$U_2^s f_3^s + 1 = 0 \quad (7)$$

and

$$U_2^n \left[ f_3^n + \frac{dr}{dE^n} (S^n - k^n) \right] + 1 = 0 \quad (8)$$

Compare these equations with equation (4) above. The difference in (8) is the second term in the parenthesis. That is the incentives of the government

to manipulate the interest rate so as to influence the revenues associated to capital exports. At least if the governments' objective functions are concave in the corresponding instruments,  $E^i$ , that implies that the Northern country has incentives to set lower environment standards (quality) so as to improve the returns of its capital exports.

The first order conditions above have an intuitive interpretation. When increasing the level of environmental quality in its country, government  $i$  considers the positive, direct impact in utility, as measured by  $U_3^i = 1$ , and the decrease in local output that the higher level of environmental quality produces, as measured by  $U_2^i f_3^i$ . These are the non-strategic incentives, as we can call them. However, on top of these, the Northern government has an incentive to manipulate the marginal productivity of capital, that is, the interest rate. Indeed, the government of country  $n$ , which is a net exporter of capital, will have an additional incentive to lower environmental quality, which improves the global productivity of capital,  $\frac{dr}{dE^n} < 0$ , and therefore the price foreign borrowers pay for the Northern capital. These strategic incentives are represented by the second term in the left hand side of the corresponding first order condition above.

The question now is how this strategic distortion in the Northern environmental quality influences the Southern levels  $E^s$ , as compared to a non strategic solution in the North. Indeed, even if the Southern government cannot influence the interest rate in the world market, it certainly can influence the inflow of capital from abroad, by manipulating the domestic productivity conditions with the environmental variable. To answer this question, we differentiate totally the first order condition for optimal  $E^s$  with respect to

both  $r$  and  $E^s$  to obtain

$$\frac{dE^s}{dr} = - \frac{f_3^s [-U_{21}^s S^{s'} + U_{22}^s (\frac{d(1+r)S^s}{dr} - k^s)] + U_2^s \frac{df_3^s}{dr}}{U_{22}^s (f_3^s)^2 + U_2^s \frac{df_3^s}{dE^s}}. \quad (9)$$

Notice that for  $u^s$  to be quasiconcave, both  $U_{22}^s$  and  $U_{21}^s$  must be negative. That is, both an increase in consumption in the first period and in the second reduce the marginal utility of the consumption in the second period. Equation (9) describes the effect induced on  $E^s$  by a change in  $r$ . This effect can be seen as the change that would balance the product  $U_2^s f_3^s$  back to its level of  $-1$ . The original change in  $r$  implies an increase in the savings by the consumer in the South, which reduces consumption in the first period then increasing the marginal utility of consumption in the second period. On the other hand, these higher savings and interest rate imply higher revenue in the second period, but the firm's profit is also lower, due to higher interest payments, which means lower revenue. If the country is small in initial resources (high capital imports), we expect this second effect to be larger unless the responsiveness of savings to interest rates is extremely high<sup>5</sup>. Then, the induced lower second period consumption increases the marginal utility of this consumption too. Finally, as the interest rate grows and capital in the South decreases, the (negative) effect of the environmental index is reduced. That is,  $f_3^s$  becomes larger:

$$\frac{df_3^s}{dr} = \frac{f_{32}^s}{f_{22}^s}.$$

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<sup>5</sup>If we analyze discrete changes in the interest rate, as would actually follow from strategic incentives by the North, this responsiveness is bounded by initial resources and then can never be too high.

These effects are the ones that appear in the numerator of equation (9). Except this last one, we expect these effects to be negative (since  $f_3^s$  is negative). Thus, unless the productivity of capital is very responsive to the environmental variable and very unresponsive to the level of capital itself, the effect of  $r$  on  $U_2^s f_3^s$  should be negative. How should  $E^s$  change in order to compensate for this? First, a change in  $E^s$  reduces output in the second period, and then increases the marginal productivity of consumption in that period. However, the effect of  $E^s$  on  $f_3^s$  is less clear. The direct effect of  $E^s$ ,  $f_{33}^s$ , could be partially compensated by the reduction of capital that the lower productivity induces:

$$\frac{df_3^s}{dE^s} = f_{33}^s - \frac{(f_{32}^s)^2}{f_{22}^s}.$$

These effects are the ones that appear in the denominator. Again, unless the productivity of capital is very responsive to the environmental variable in the South and not very responsive to changes in the level of this capital, the denominator is negative. Then, the environmental index has to be reduced in order to compensate the higher interest rate, i.e.,  $\frac{dE^s}{(1+r)} < 0$ . That is, the South will also reduce the environmental standards as a response to the lower standards set by the North. That is, their policies are strategic complements. The total effect is a global decrease in environmental quality, as the next proposition states.

**PROPOSITION 2:** *For moderate values of  $f_{22}^s$  and  $f_{23}^s$ , the strategic distortion that capital exports introduces on the Northern environmental policies makes both the North and the South dirtier.*



The South responds to the lower environmental quality in the North by also decreasing environmental quality so as to compensate the capital fly from the South. We should consider the possibility that a higher interest rate induces a very large increase in savings in the South, so large as to increase the consumption in the second period in this capital importing country. Then the only possible exceptions to the Proposition would require high responsiveness of the productivity of capital to the environmental variable and/or low responsiveness to the level of capital so that one of the following two cases, but not the other, occurs:

1) The increase in interest rate causes a large decline in the level of capital in the South ( $\frac{1}{f_{22}^s}$ ), which reduces drastically the negative effect of the the environmental quality on output ( $f_{23}^s$ ).

2) Tougher environmental regulations reduce drastically the level of domestic capital ( $-\frac{f_{23}^s}{f_{22}^s}$ ), so the marginal effect of these regulations on output ( $f_3^s$ ) is lower for tougher regulations.

In these cases, environmental policies could be strategic substitutes and then the South would set more stringent regulations on the environment as a response to the lenient policies of the North. However, in general we expect the policies to be strategic complements and the South to respond with dirtier policies too.

## 4 Globally efficient Policies

One could also question what the strategic incentives imply with respect to policies optimally set. These would be different from autarkic ones, since

the countries are asymmetric in initial endowments, and then even a central authority would induce capital exports. To answer this question, assume one central authority can set environmental quality for both countries so as to maximize some social welfare function with weights  $\alpha$  and  $(1 - \alpha)$  for the Northern and Southern consumer respectively. Thus, the central authority sets  $E^n$  and  $E^s$  so as to maximize

$$(1 - \alpha) u^s(C_1^s, C_2^s, E^s) + \alpha u^n(C_1^n, C_2^n, E^n)$$

where consumption is given by consumers' utility maximization and savings are assigned through the capital market as before. Then, the first order conditions of this problem with respect to the environmental quality levels, and keeping the assumption of a small South, whose policies do not affect the interest rate ( $\frac{dr}{dE^s} = 0$ ), are:

$$(1 - \alpha) [U_2^s f_3^s + 1] = 0$$

and

$$\alpha [U_2^n f_3^n + 1] + \frac{dr}{dE^n} (S^n - k^n) [\alpha U_2^n - (1 - \alpha) U_2^s] = 0$$

Notice that the difference between these first order conditions and the ones solved by decentralized governments is the additional term in the condition for  $E^s$ :

$$-\frac{dr}{dE^n} (S^n - k^n) \frac{1 - \alpha}{\alpha} U_2^s > 0$$

This term represents the effect of changes in the interest rate due to Northern environmental quality on second period consumption in the South. That is,

when the North manipulates the interest rate, it does not take into account the negative effect that this manipulation implies on the second period consumption in the South. Then, evaluated at the decentralized solution, the derivative of the central authority's objective function is positive with respect to  $E^n$ . Again, under concavity (which locally should hold for the conditions above to describe the central authority's optimum), this implies a tendency of the North to set too low environmental quality as compared to (virtually) any social optima. Then, under the same conditions of Proposition 2, we have

**PROPOSITION 3:** *The decentralized strategic equilibrium environmental quality levels are too low with respect to globally efficient ones.*

Therefore, whether we compare with non strategic conditions or with efficient ones, the strategic incentives for the North to manipulate capital returns result in a dirtier global environment.

## 5 Concluding remarks

We have presented a model of perfect competition with two regions, North that is capital abundant, and South, that is not. Our results predict strategic incentives for the North to decrease the environmental quality levels under the efficient ones. The incentive has to do with strategic distortions in the price of capital exports. This is done through inducing scarcity of this capital via softer environmental conditions at home.

If South consists of small countries with respect to the effect their policies can have on the world interest rate, their environmental decisions would be

the ones corresponding to a non-strategic situation given the decisions of the North. However they would respond to the lower environmental quality levels in the North, and then higher interest rates, by decreasing environmental quality.

There are some simple extensions that can be accommodated in our model with no difficulty. The first is the case when there is unemployment. If there is unemployment, and governments are concerned by it, there is an incentive to increase labour productivity by relaxing environmental regulation. In our model this would change the first order conditions for optimal policies by including an additional terms representing this incentive. This would imply larger levels of pollution in countries with unemployment.

The second simple extension is transboundary pollution. This could be trivially accommodated in our additive damage function. Then the strategic levels of environmental variables would not change, but the globally efficient ones would be even higher. That is, the traditional externality would simply add to the price distortion effects. Of course, there is a second order effect: when the North increases the interest rates, it considers the response of the South, which in general will reduce environmental quality, therefore increasing pollution in the North too. This second order effect would be more important in cases similar to those analyzed by Ludema and Wooton (1994), where the Southern country is the main polluter and the North gets (values) most of the environmental damage.

The third extension is to include income effects as those discussed in Copeland and Taylor (1997). Obviously these would go in the opposite direction to our strategic effects, since one expects that richer countries value

marginally more the level of environmental quality.

In general, this paper has illustrated a simple result: environmental policies could be used as an instrument to distort factor prices when other ways (source-based capital taxation, for instance) are ruled out. The result is simply globally dirtier production.

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