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Europe '92. Environmental Policy in an
Integrated Market

by

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The Kiel Institute of World Economics

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Europe '92. Environmental Policy in an Integrated Market.

Horst Siebert

1. The main intention of the initiative for the completion of the Common Market in '92 is to abolish segmentations between national markets. These segmentations are caused by

- border controls due to differences in the systems of indirect taxation (and due to statistical reasons),
- border control as a means of national regulation with respect to product norms,
- differences in market entry conditions among European countries, and
- other factors such as market distortions through subsidies.

A larger market will provide more opportunities of cost minimization for firms; it will allow firms to exploit economies of scale and economies of scope; it will improve the international division of labor including intra-industry trade, and it will stimulate economic growth in Europe. Moreover, the EC-initiative will make it harder for national regulations to persist.

2. From the perspective of environmental quality, the problem arises whether the economic stimulation through integration will be connected with a loss of environmental quality. The Cecchini Report stresses the stimulative aspects of economic integration, but it neglects the environmental dimension.

I. Institutional Competition

3. As a general principle, the completion of the European Market will not be attempted by prior harmonization of national regulations, but by a competitive process among national institutional settings. The main reason for the open ended competitive approach is that prior harmonization has proven to be impractical in the past. Moreover, a competitive process will be more imaginative than a pure planning process.

4. For the commodity market, the Crème-de-Cassis verdict of the European Court has set the stage for a competitive process: A product legally brought to market in one country can be sold in any other country. The rule of the country of origin can be applied to different rates of value added taxes if border controls no longer exist and if the value added tax is no longer reimbursed for exports within Europe. The country with a high rate of a value added tax competes with a country with a lower tax rate. In principle, the country of origin principle also relates to the market entry of firms. A firm being licensed in one nation is allowed to operate in other nations as well. This philosophy of the rule of the country of origin will be extended to the service industry (banking, insurance, transportation). A firm of the service industry being allowed in one market also has access to the other national markets. This means that the regulation of the country of origin is applied to a firm operating in another country.

5. The advantage of the country of origin principle is that households and firms will react to differences between national regulations. The common market will provide many opportunities for arbitrage, for instance for consumers having the option to buy in different countries or for the location of firms. Arbitrage, however, will put pressure on national regulations to be revised and to be harmonized in an open political process. Arbitrage of households and

firms is an important ingredient of the process of institutional competition.

II. Decentralizing Environmental Policy

6. Can the country of origin principle be applied in the case of environmental policy and can we rely on a competitive process between national environmental regulations? The advantage of such an approach would be that

- ex ante harmonization of environmental regulation on a European scale would not be necessary,
- environmental policy can be implemented in a decentralized way which is appealing to the federalist organizational structure of Europe and
- the subsidiary principle can be applied allowing for different national preferences and better information at the lower organizational level.

7. It should be noted that a decentralized environmental policy can mean two different things (Siebert 1985):

- A differentiation in the environmental quality as a target among the individual nations.
- A differentiation of environmental policy instruments expressing environmental scarcity even if identical quality targets prevail.

A differentiation of environmental quality among European nations may be combined with a common minimum European quality target allowing stricter national targets.

With respect to environmental policy instruments we have to distinguish between a short-run and a long-run analysis. In the short run, environmental scarcity reflects the industrial mix of a region, the state of art of abatement etc., and then environmental policy instruments may differ

between regions due to a difference in environmental scarcity. In the long run, firms may relocate, abatement technology may change and policy instruments may be similar between regions.

8. The answer to the role of a decentralized approach of environmental policy in Europe depends on the casuistics of the environmental problem at hand. We distinguish the following main cases (Siebert 1987, p. 19,20).

- Emissions from production (stationary sources) where the environment can be treated as a purely national good. The environment is used as a national receptacle of emissions as well as a national public good of consumption.
- Emissions from consumption (stationary sources).
- Waste disposal activities.
- Vintage damages.
- Emissions from non-stationary sources.
- International spillover. Pollutants are diffused via environmental systems (air, rivers, biodiffusion) across national borders.
- Global environmental systems (of a more or less European or even world-wide scale) such as the Mediterranean or the North Sea. National emissions are discharged into a public good common to more than one nation.
- Pollutants contained in consumption goods and directly affecting the consumer.
- Environmental accidents of the Seveso type.

III. Continuous Emissions from Production and Consumption: Stationary Sources

9. As far as the environment can be treated as a purely national good - for instance a river system specific to one country - the country of origin principle can be applied.

The trade-off between environmental quality as a public consumption good and as a receptacle of emissions from production is then a purely national problem similar to the endowment with other factors of production. Then, environmental qualities may differ among countries, and environmental policy instruments may differ as well.

Environmental policy instruments such as emission taxes or pollution licences represent a cost factor and can be interpreted as a production tax for pollution-intensive activities. The country undertaking environmental policy will negatively affect its comparative price advantage and its absolute price advantage. Clearly, the loss of comparative advantage represents an opportunity cost to the country undertaking environmental policy. It can be left to the political preferences of the individual European country to what extent it wants to reduce its absolute and comparative price advantage. The principle of the country of origin can be applied. (Siebert 1987, Chap. 10).

10. Location arbitrage - an important ingredient of the single market - implies that pollution-intensively producing firms will move to the country with lower environmental restraints increasing environmental stress there.

However, the relocation of firms will not imply a competing down of environmental quality for a number of reasons. The nation negatively affected in its environmental quality by attracting industry can use environmental policy instruments in order to protect its environment. Since marginal damages rise progressively with the level of pollution, the country will quickly have an incentive to undertake environmental policy. Moreover, the countries attracting new industries should prevent the mistakes that were made in the polluted regions. For instance, a country may not fully utilize the assimilative capacity of its environment in order to allow the location and expansion of firms in the future. Thus, it may place an option value on

assimilative capacity, not being used at a specific moment of time. Finally, countries would be well advised to explicitly consider the risk of environmental degradation including irreversibilities in the sense of a preventive principle.

Thus, only if one takes the position that the political process of revealing national preferences is deficient one can claim that the European Community would have to take care of national interests. Only if there is a national policy failure can Europe paternalize the national interest. Of course, the presumption would be that a European approach prevents the policy failure.¹⁾

Moreover, the location arbitrage of pollution-intensive firms will imply a harmonization of the level of environmental policy instruments by a competitive political process. Emission taxes will rise in areas attracting pollution-intensive activities or licences will be harder to get. Thus, the incentives to avoid emissions will tend to become similar in Europe. This also holds if there are strong differences in environmental preferences between European nations.

The subsidiary principle is consistent with the polluter-pays-principle allowing a national evaluation of environmental damages and determining the trade-off between environmental damages and costs of abatements. Also, the principle of preventive policy can be clearly applied by the individual countries.

¹⁾ Such a presumption seems to be rather arrogant since the democratic legitimization of European policy decisions is - at the moment - rather small.

Box 1:

Figure 1 in Box 1 illustrates the case of a difference in abatement technology (and of marginal abatement costs, MC) and in the level of initial pollution (OS). Country I has both a higher level of emissions and more unfavorable abatement cost. For simplicity, both countries have the same marginal damage function (MD). Country I has to apply a higher price for emissions (OT instead of OT^{*}).

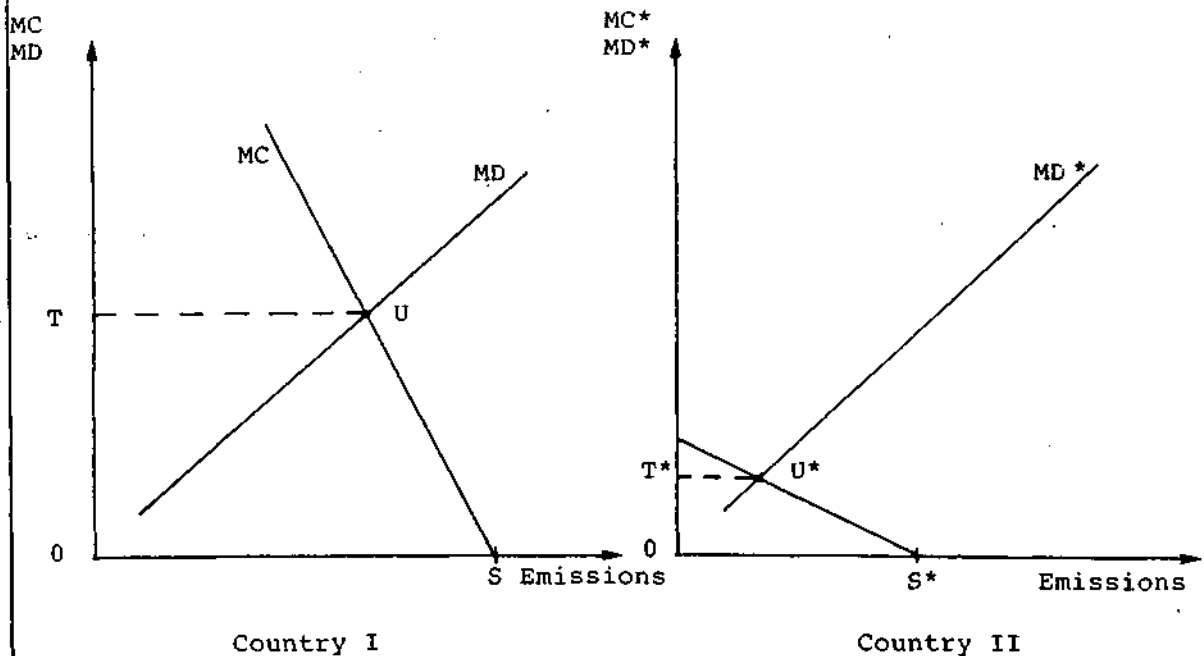


Figure 1

Figure 1 represents a snapshot of a given situation, i.e. a short-run analysis. Over time, pollution-intensively producing firms will migrate to country II. Moreover, country II has a comparative advantage in pollution-intensive activities so that more emissions will be generated. Thus, OS^{*} will be increased and the marginal cost curve of abatement in country II will shift to the right. In country I, pollution-intensively producing firms will leave the country or reduce their outputs. OS will be reduced and the marginal cost curve of abatement will shift to the left. In the long run, there is a tendency for equalizing the emission tax (Figure 2).

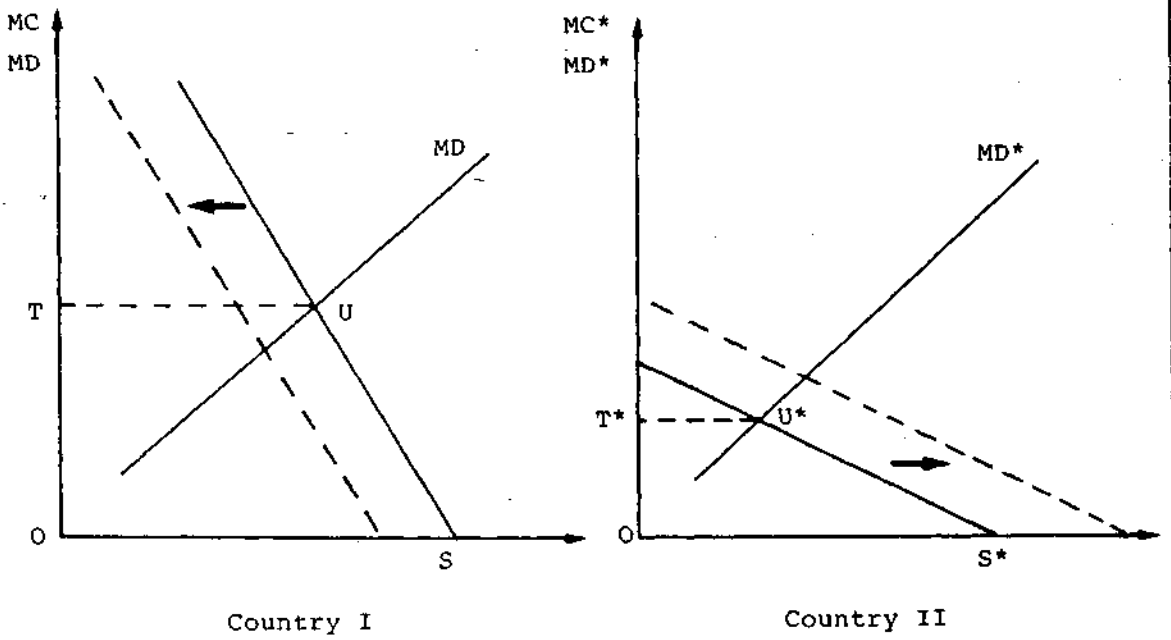


Figure 2

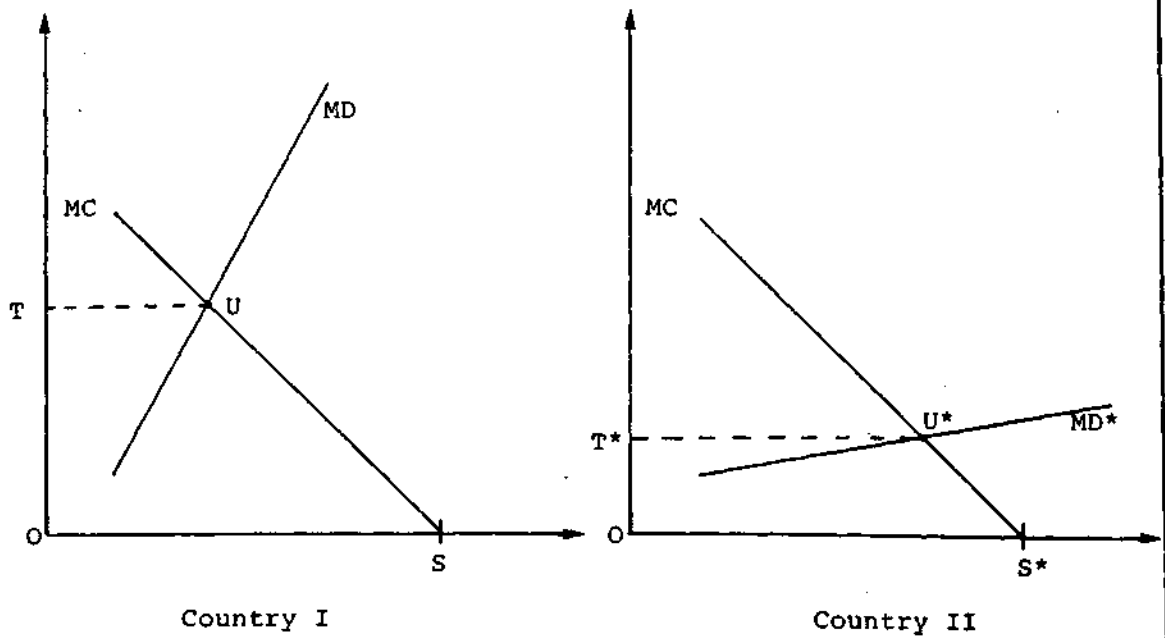


Figure 3

Note again that location arbitrage will reduce the level of pollution in the heavily polluted country; pollution in the so far less polluted country will increase. Eventually, the price for emissions will equalize.

If both countries have the same initial level of pollution and the same abatement technology, but a different evaluation of environmental quality (Figure 3), again a differentiation of the price for environmental services is necessary. Country I places a higher value on environmental quality. This implies a higher price for environmental services. Over time, firms will migrate to country II and country II will specialize in the production of pollution-intensively produced commodities. Emission taxes will tend to equalize.

11. With national environmental policy for continuously flowing emissions from production, the market for abatement technology may be somewhat segmented. This, however, depends on the policy instrument being used. If licencing is the main policy instrument, differences in bureaucratic settings are a factor of market segmentation. If prices for environmental use such as emission taxes or transferable discharge permits are applied, we only have a difference in a price of an immobile factor (as a wage difference for immobile labor). However, it can be expected that the best practice of abatement will spread through Europe. Besides, the abolition of the segmentation of the market of abatement technologies seems not to yield sufficient benefits to compensate the utility losses from an unnecessary harmonization.

12. The question arises whether Europe needs a common minimum ambient quality of the environment. It seems to me that in the case of emissions continuously arising from production and consumption activities, it can be left to

the European nations to specify the ambient quality that they want to have in their regions. It should be noted that even assuming identical ambient quality standards the policy instruments are not necessarily identical. Different explicit or implicit prices for environmental use reflect different scarcities of the environment. For instance, a heavily polluted area requires higher emission taxes.

If one decides in favor of a common lowest denominator for environmental quality in Europe, the individual country still must have the option to strive for an environmental quality higher than the common European minimum level. Clearly, the policy instruments used in such a case by the individual nation will differ. Again, differences in licencing represent a stronger segmentation than differences in prices for emissions (emission taxes, prices for transferable discharge permits).

13. Emissions from stationary sources in the case of consumption activities (heating homes) can be treated in analogy to emissions from production. However, with the amount of emissions at the individual source being rather small, emission taxes and transferable emission licences tend to be impracticable due to high monitoring costs. Product norms for chimneys etc. are more likely. Product norms, however, create trade barriers if they differ between European nations, and markets are segmented. Consequently, there is need for harmonization and the philosophy of the country of origin principle cannot be applied.

IV. Waste Disposal

14. Waste disposal activities are subject to the law of comparative advantage. A specific country may have a comparative advantage in waste disposal for instance due to a lower population density or due to geological conditions. Insofar, national comparative advantage and specific

national preferences can play. Again, environmental policy can be decentralized unless one takes the position that environmental policy in a country does not sufficiently express the national interest, including the opportunity costs for future generations. Thus again, only a national policy failure may be possibly a reason for Europe to paternalize national policy.

15. Vintage damages represent the mistakes of the past. In the sense of the polluter pays principle, each nation should take care of its vintage damages, for instance by a national super fund.

V. Emissions from Non-Stationary Sources

16. Emissions from non-stationary sources (transportation) require harmonization if the non-stationary sources can move across borders. This is especially relevant because of the deregulation of the transportation industry and the resulting traffic flows. Here product norms for transportation equipment is the relevant policy means. These product norms have to be harmonized within Europe.

A specific issue is again to what extent it can be left at the discretion of the individual country to apply environmental policy instruments specific to its area. Apparently, nationally differentiated product norms for cars, planes etc. would impede European traffic; moreover, trade barriers would be introduced. However, in addition to harmonized product norms in Europe we cannot exclude national taxes for pollution-intensive products (or national subsidies for environmental - friendly products) if we accept national preferences as a basis in a federalistic structure. Note, however, that national taxes or subsidies only influence the stock of national transportation equipment and cannot affect the movement of vehicles across borders.

VI. International Diffusion

17. Many environmental problems caused by stationary sources are transfrontier problems (Rhine pollution, air pollution like SO_2). Then, unidirectional or two-directional interactions between countries exist. Environmental policy in Europe has to establish an incentive mechanism that takes account of international spillovers.

Incorporating international spillovers is relevant for two reasons:

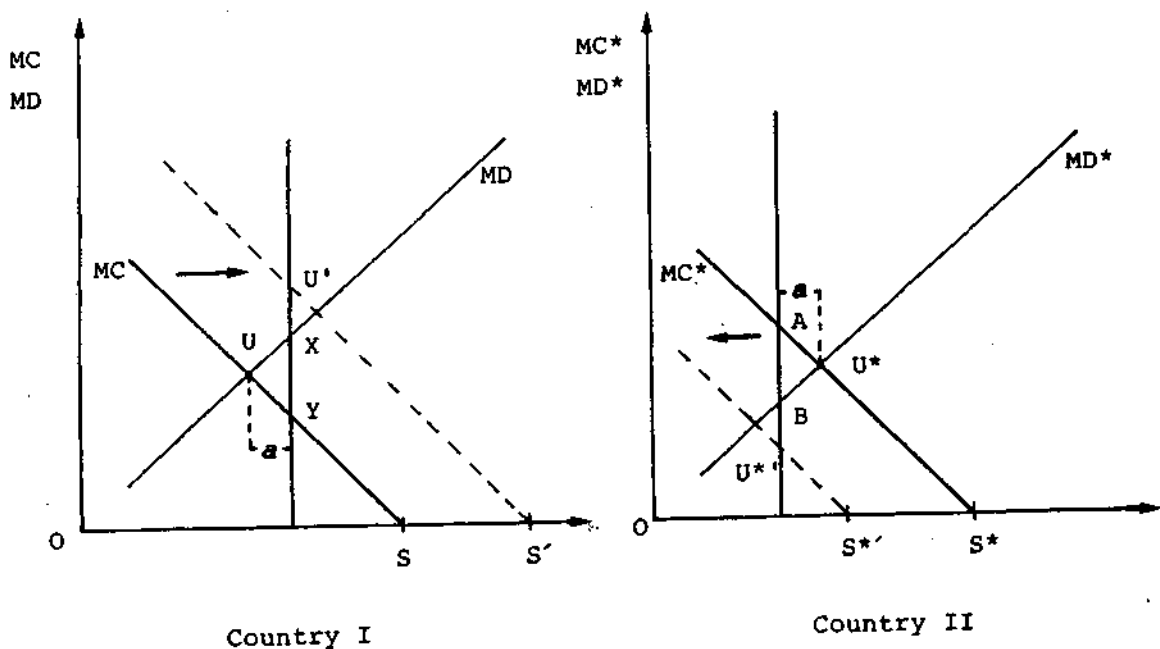
- The case of emissions from production (and consumption) lends itself to regionalize environmental policy because ambient levels of environmental policies in principle must be defined for spatially limited environmental systems. Spillovers, however, no longer allow a decentralization.
- The relocation of industry adds to the potential of international diffusion. Firms leaving one country in reaction to stricter environmental policy may locate at its border and send pollutants back to their original country of residence via environmental media.

In the case of international spillovers, we have a clear "externality". Consequently, institutional competition and the country of origin principle cannot be applied. The originator of damage shifts costs of abatement on the country receiving the emissions and thus enjoys an artificial advantage. Clearly, transfrontier represents a distortion.

Box 2:

Figure 4 in Box 2 illustrates the problem of international spillover. For simplicity, we have assumed an identical damage function and an identical cost of abatement function for both countries. U and U^* are the points of intersection of the damage and cost curves before an international spillover occurs. By a spillover, country II reduces its pollutants ambient in the environment by S^*S'' , and country I experiences an increase SS' . Country II improves its environmental quality at the disadvantage of country I.

An international diffusion norm would specify the allowable ambient quality of the environment at the border. In Figure 4, an international diffusion norm a is illustrated. The polluter has to agree to carry marginal net cost $MC^* - MD^* : AB$ and the pollutee experiences the marginal benefit $MD - MC : XY$. We know from the Coase theorem that an efficient solution requires that marginal net cost and marginal net benefit must balance. Figure 4 also illustrates the absolute gain to the pollutee (UXY) and the loss to the polluter (U^*AB). Here distributional aspects of the allocation of property rights become apparent.

**Figure 4**

18. In order to solve an international spillover, we propose to specify the allowable level of an international spillover, that is to establish an international diffusion norm. A transfrontier diffusion norm specifies the ambient quality of an environmental system (air, water) when it crosses the border.

Diffusion norms have been used in national water quality management for instance when the water quality of a tributary (in Germany the Emscher) is specified where it enters the main river (the Rhine). Thus, we have practical experience with interregional diffusion norms which can easily be extended to the European setting. Measurement problems of pollutants ambient in the environment "at the border" can be solved.

Once an agreement is reached, it can be left to the national governments what type of policy instruments they want to use in order to secure the international diffusion norm. International diffusion norms therefore are instrumental in decentralizing environmental policy in Europe. This is an important advantage.

19. Agreement on international diffusion norms requires a cooperative solution in which countries truly reveal their preferences. The diffusion norm is determined by the equality of the marginal benefit of the pollutee and the marginal cost of the polluter assuming that the polluter must pay.

Agreement on international diffusion seems extremely difficult in practice as the discussion on solving the transfrontier spillover in the Rhine shows. We have the typical free rider behavior of the upstream polluter (or of the polluter in the upwind location). Strategic behavior of the upstream polluter overstating the abatement costs and of the pollutee downriver overstating the damage usually

can be observed. We thus have the problem of establishing incentives to truly reveal information.

The polluter-pays-principle implies that not only the individual polluter pays but that the nation that pollutes the other nation pays. This principle may prove to be impractical in transfrontier pollution. Here the pollutee may have to make a transfer to the polluter to induce him to abate pollutants. Thus, some type of a victim-pays-principle may be mixed with the polluter-pay-principle.

20. If the governments of Europe cannot agree on international diffusion norms, the alternative approach is to reduce pollution generally in Europe in order to tackle the diffusion problem. This is a rather coarse approach implying a more centralized orientation of environmental policy. Assume, for instance, one were to raise emission taxes for SO_2 generally in Europe in order to reduce the level of pollutants ambient in the environment and thereby reduce the transfrontier problem. Then, abatement clearly would not be cost minimizing, and the costs of environmental quality would be too high. Definitely, such an approach would not be even second-best.

VII. Continental or Global Environmental Systems

21. In the case of international public goods such as the North Sea or the Mediterranean, environmental quality cannot be traced to individual polluters in the sense of uni- or two-directional diffusion functions. This makes solutions even more complicated.

A cooperative solution to an international public good requires:

- An agreement on the quality of the public good.
- An agreement on national permissible discharge quantities.

In order to determine the optimal quantity of an international public good, the countries must truly reveal their preferences and their willingness-to-pay has to be aggregated. This implies that the international environmental system is interpreted as a public good that is consumed in equal amounts by all nations. The individual nation does not behave as a free rider (Box 3). Once the quality target is fixed, one has to agree on the national discharge quantities.

Note that an agreement on national permissible discharge quantities is analogous to establishing international diffusion norms.

Box 3:

In Figure 5, the optimal use of an international environmental good is analyzed. It is assumed that two countries use an environmental system as a public good. The marginal willingness to pay and marginal abatement costs differ among nations. The cooperative solution is at $U(\bar{S})$ where the aggregated marginal costs and marginal damage curves intersect. If countries were to strive for the purely individual positions, country I would abate SS' and the *-country would abate $S^*S^{*'}.$ The total reduction ($SS' + S^*S^{*'}.$) is represented by point \bar{S} yielding a much lower environmental quality. Clearly, an uncoordinated approach is inefficient. In a coordinated approach the two countries would reach a higher environmental quality at \bar{S} . Moreover, if each country overstates its abatement costs or plays down its evaluation of the damage, pollution would even be higher than \bar{S} .

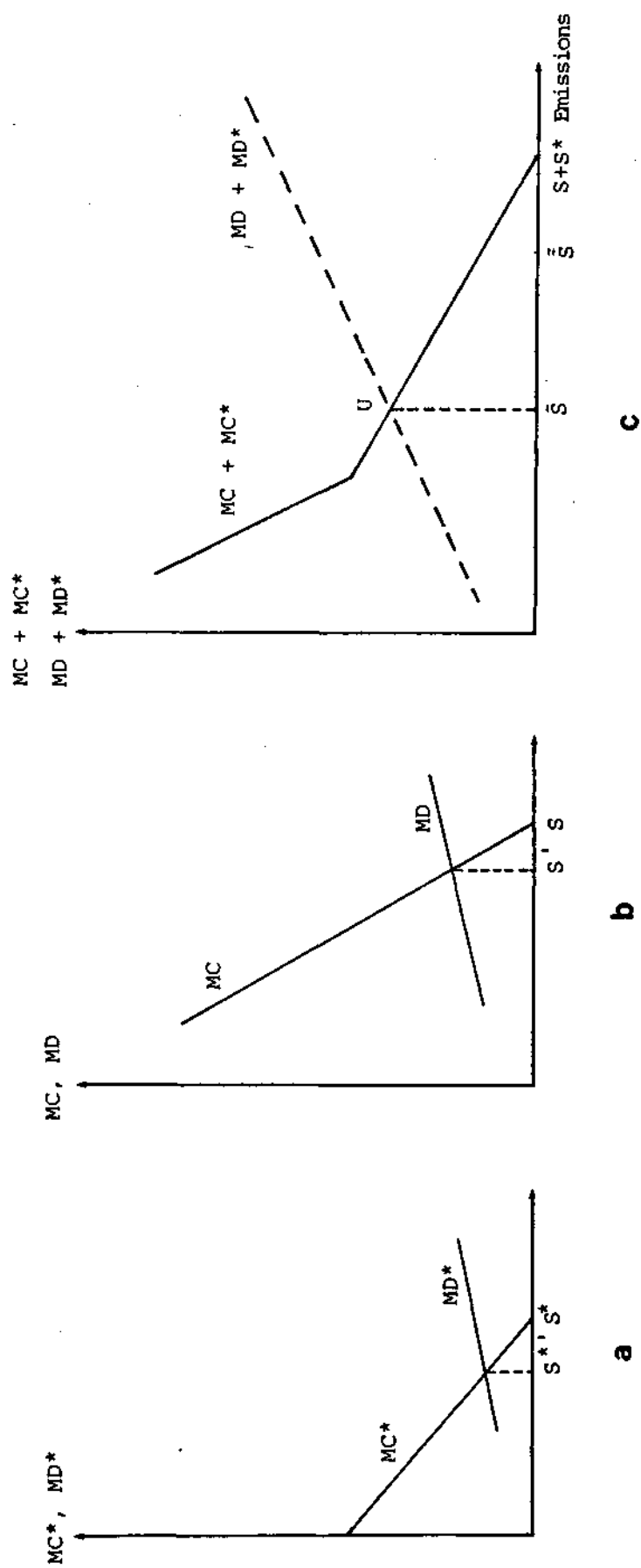


Figure 5

As a practical approach, if the marginal willingness to pay is not known, one could fix a quality target for the international environmental system and then allocate discharge quantities to the different countries. The allocation of these emission rights can take into account differences in wealth. Then, elements of the victim-pays-principle enter the picture. Transferability of the emission rights improves efficiency.

VIII. Pollutants contained in Consumption Goods

22. Environmental policy cannot only be treated as a problem to control pollutants arising from production and consumption activities. Pollutants may be contained in products to be consumed; then product norms are the relevant policy instrument. The potential for decentralization depends on the evaluation of the pollutant contained in the consumption good.

- In some cases, we may argue that information on the pollution content is sufficient to warn the consumer. Then, pollutants are basically a private good (or bad) and the Crème-de-Cassis verdict can be applied. We leave it to the German consumer to drink beer not produced according to the purity law of 1517. Why worry about non-purities in other goods?
- Toxic pollutants and pollutants causing severe health damages are another story. Here product qualities have to be established in order to protect the consumer unless one takes the position that it is the consumer's problem to be informed on such pollutants. Product norms represent market segmentation, and they have to be harmonized throughout Europe. Again the issue of a minimal quality in Europe and of a national deviation in favor of a higher product quality arises.

- The importance of product norms can be reduced if liability rules can be established. With liability law, the consumer affected by pollutants in a product can go to court and court decisions will be anticipated by the originator of a damage. Moreover, an insurance market will develop; thus incentives are introduced to prevent damages. However, transaction costs of liability rules are high (Siebert 1989); harmonization of liability law in Europe seems to be necessary in order to prevent market segmentation, and this may prove to be extremely difficult.

The case for or against product norms when pollutants are contained in a product clearly depends on the concept of consumer sovereignty. If a consumer is well informed and if we can leave it to the consumer to be informed on product quality over the full range (including toxic material) we do not need product norms. If hazardous and toxic pollutants are evaluated as a matter of policy concern, then product norms become relevant. Product liability may be a substitute for product norms.

IX. Environmental Accidents

23. Environmental accidents (Seveso, Bhopal, Sandoz) represent another case in the casuistics of environmental problems. Then liability issues are involved (Siebert 1987a, 1989). If environmental accidents would have a national dimension, they could be left to national environmental policy. However, one aspect of environmental accidents is that they tend to have international repercussions. Then, some form of harmonization of liability rules become relevant.

X. Summary: The Need for Harmonization

24. Table 1 summarizes the interrelation between environmental problems and the level of harmonization.

Increasing Level of Harmoni- zation Environmental Problem	National Environ- mental Policy	Harmonization by Bilateral Bargaining	Harmonization at the European Level
Emissions from pro- duction (Stationary Sources) without International Spillover	Licencing, Transferable Permits, Emission Taxes		
Waste Disposal Activities	National Waste Dispo- sal Policy		
Vintage Damages	National Super Funds		
Emissions from Consumption			Product Norms
Emissions from Non-stationary Sources (Trans- portation			Product Norms
International Diffusion		International Diffusion Norms	

Increasing Level of Environ- mental Problem	National Environ- mental Policy	Harmonization by Bilateral Bargaining	Harmonization at the European Level
Continental Environmental System			Agreement on the Environ- mental Quality and National Discharge Quantities
Pollutants Contained in Consumption Goods	Crème-de- Cassis ("Impurities")		Product Norms for Toxic Pollutants
Pollutants Generated in Consumption Goods			Product Norms
Environmental Accidents			European Liability Law

25. In this paper, we looked at some issues of environmental policy in an integrated market. Environmental policy should avoid to create new segmentations of markets in Europe. Environmental policy may be a vehicle to segment the European market against the world economy. This danger is relevant especially when licencing and product norms are used because they discriminate against non-European competitors. Price instruments of environmental policy are less damaging to the international division of labor.

26. We can summarize the results as follows.

- When the environment is national as a public consumption good and as a recipient of wastes (continuous emissions from production, waste disposal, vintage damage), environmental policy can be decentralized in a single European market. Differences in environmental endowments and in political preferences will be reflected in different prices for environmental services.

- If the dominating policy instrument is licensing by a permit, national differences in licensing will segment the market for the abatement industry and possibly establish new market entry barriers. If prices for environmental services (emission taxes, transferable discharge permits, prices for disposal activities) are used, markets are not segmented. We only have a price difference for an immobile factor of endowment. Thus, European integration implies an advantage of market incentives in environmental policy.

- Transfrontier spillovers can be controlled by international diffusion norms. This allows a decentralization of environmental policy in Europe.

- Environmental European systems require a political agreement on environmental quality as a target and on maximum national discharge quantities.

- When product norms are the relevant policy instrument and when the Crème-de-Cassis philosophy cannot be applied due to externalities or due to a strong merit argument such as toxicity, harmonization on a European scale becomes necessary.

- Environmental policy in the integrated market of Europe should prevent the segmentation of national markets. But it should also not be an instrument to segment Europe from the world economy.

References

- Siebert, H. (1985), Spatial Aspects of Environmental Economics, in: A.V. Kneese and J.L. Sweeny (eds.), Handbook of Natural Resource and Energy Economics, Vol. 1, Elsevier Science Publishers B.V., Amsterdam, 125-164.
- Siebert, H. (1987), Economics of the Environment. Theory and Policy, 2nd ed., Heidelberg.
- Siebert, H. (1987a), Environmental Pollution and Uncertainty: Prevention and Risk Allocation, in F. Holzheu (ed.), Society and Uncertainty, Karlsruhe, 167-179.
- Siebert, H. (1989), Liability Issues in Pollution Control, Paper to be presented at the European Science Foundation Workshop on "Economic Analysis for Environmental Toxicology: Applications on Persistent Micropollutants", Noordwijk / The Netherlands, 24-25 May 1989.