

# MEDITERRANEAN SOCIAL SCIENCES NETWORK

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Newsletter - No 5 - 1991



FOUNDATION FOR INTERNATIONAL STUDIES  
at the University of Malta, Valletta.





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*Newsletter*  
*No. 5 1991*



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## **E**ditorial

In the last issue of our Newsletter, we published three papers as part of the proceedings of the meeting of the EADI Working Group held in Malta at the Foundation for International Studies between the 3rd and 4th November 1989, with the theme "Development and Environment in the Mediterranean". The discussions evolved on two main streams, namely "Environmental Concerns" and "Economic Strategies". The papers published in the last issue dealt with the first aspects. In this issue, as preannounced, we are publishing the papers which focus upon the economic aspects of environmental problems in the Mediterranean.

I am pleased to communicate that the previous issue was very well received by our readers. It is therefore my pleasure to present the second group of papers to complete the proceedings of the seminar mentioned above.

This newsletter features the studies by Professor Oscar Garavallo (Italy), Dr. L. Istvanffy (Hungary) and Professor Maria Negreponi-Delivanis (Greece).

Professor Garavallo describes the Mediterranean environment as an international public good, to be safeguarded in a manner quite similar to that applicable for a national public good. As is well known, a public good cannot be profitably commercialized, due mainly to the existence of free riders, and choices regarding its supply are generally left in the hands of the public authorities. The author stresses that safeguarding the Mediterranean requires sophisticated economic, technical and administrative instruments.

Professor Garavallo's paper describes what is known as the "Polluter-Pays Principle" and considers this principle as a suitable basis for a Mediterranean environmental policy. One reason for this is that it is an efficiency principle in that it ensures that the polluter (a firm or an individual or a household) will seek out the least cost method in terms of pollution. The implementation of this principle would involve direct controls to reduce evasion as much as possible.

The second paper, by Dr. Lorinc Istvanffy, deals with a Macroeconomic framework for "Quasi-Market Economies" (QMEs). These economies are in the process of transformation from command economies to market economies. The author describes the similarities and the differences in Mediterranean QMEs, stating that two common characteristics are the lack of experience of how the market operates and the gross imbalances in different markets within these economies.



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*Editorial*

Dr. Istvanffy suggests a framework for an economic policy for QMEs, emphasising the important objectives of attaining a steady and stable growth in GNP, an acceptable balance between consumption and investment, an exchange rate which promotes a healthy balance of payments, and the control of inflationary pressures.

The paper is very thought provoking, and deals with a topical problem faced by a number of QMEs in the Mediterranean region. In such countries, the bureaucratic traditions and the lack of appropriate institutions work against the QMEs ability to avail themselves of the rapid increase in demand by the European Community.

As is well known, the underground economy is alive and kicking in many Mediterranean countries. Professor Maria Negrepointi-Delivanis writes on the underground economy in Greece, which has its own peculiarities, and its analysis therefore requires an understanding of the economic realities in Greece. The author presents an interesting model for estimating the factors influencing the growth of underground economic activity.

The method used in the paper to measure underground economic activity is somewhat unorthodox, since it relies on a production function parameter which is not actually measured for Greece, but is assumed and "imported" from the rest of the world. The results of the model indicate that government activity, in particular taxation, is one of the most important factors affecting underground economic activity. Although the results have to be interpreted with caution, the exercise is interesting and the paper adds to the literature on a topic which is being given more and more importance as time goes by.

An interesting aspect of the paper is the discussion as to whether or not it is desirable to eliminate the underground economy. One reason put forward in its defence is that such activity may be difficult to replace, since what is profitable as untaxed underground activity may not remain so when taxed. In such circumstances, the elimination of underground economic activity might lead to a fall in the total, as distinguished from the formal, GDP.

It is hoped that these studies will serve to further the discussion on such vital issues in the Mediterranean, and to open up new avenues of cooperation among researchers in the Social Sciences.

*Carmel Tabone O.P.*

# **S**afeguarding an International “Public Good”- the Mediterranean Environment: The Polluter-Pays Principle

**Oscar Garavello**  
Finafrica, Milan University

## **1. Introduction**

From an economic point of view, the Mediterranean environment can be analysed as a resource (asset-like stock) yielding flows of services to households and business. The material balance model shows how the environment interacts with the economy: there is a flow of materials from the Mediterranean environment to the countries concerned and the return flow of these materials back to the Mediterranean Sea as wastes or residual. This return flow has an adverse impact on the volume and quality of other environmental services.<sup>1</sup>

To provide the maximum possible benefits, the Mediterranean environment must be properly managed with sophisticated economic, technical and administrative instruments. Unlike most other kinds of resources, choices regarding environment cannot be left to individuals acting in unregulated and decentralised markets but must be properly and efficiently managed by the public authorities (local, regional, national and international).

Owing to its peculiar physical characteristics, the Mediterranean environment, more than other areas, is subject to various forms of misuse (over-exploitation of natural resources, pollution, etc.) so that, little by little, an originally public good is becoming a man-made public bad.<sup>2</sup>

This dramatic transformation of a public good is certainly not unknown in our modern world and more or less can be found in other geographical areas. But as far as the Mediterranean area is concerned, at least one aspect is rather new and worth analysing.

The Mediterranean Sea is an international public good (or bad) from which many



countries exploit its renewable and non-renewable resources. For example, for each country to discharge pollutants into the environment there is an external (extranational) diseconomy that does not enter into its costs just as the external diseconomy of a firm discharging pollution does not affect its rate of profit. The country polluting activities tend to exceed the level that is most appropriate when external costs are internalised: the final stage is the destruction of the environment on an international scale.<sup>3</sup>

The international character of this public good has interesting (economic, institutional and operational) implications as far as its management is concerned. The two extreme solutions (independent national policies and a common Mediterranean policy) are not valid. On the one hand, owing to the extra-national spillovers effects, the utilisation of this international public good cannot be left entirely to domestic environmental policies acting on the basis of their objectives and instruments. On the other hand, lacking, at least so far, a unique public authority governing the entire area, it is impossible to centralise all the necessary decisions (technical, economic, financial, etc.).

Very likely the best method for managing the Mediterranean environment, at least at the moment, is the application of a(some) general principle(s) for the national environmental policies. In this paper the interest is especially concentrated on a general principle - the polluter-pays principle (P.P.P.) - put forth by many international organisations. Little by little, national environmental policy makers can harmonise their objectives and instruments at least for the major intervention so as to open the path to the final stage of a common environmental Mediterranean policy.

The application of this principle to the Mediterranean Sea can be compromised by the fact that the countries on both sides of the Mediterranean are very different on a number of factors, such as for instance:

- (a) GNP and GNP per capita
- (b) types of productive specialisation (agriculture, manufacturing, fishing, tourism, oil production, etc.)
- (c) demographic aspects (density and rate of growth of population)
- (d) participation in or exclusion from international organisations (such as O.E.C.D. and E.E.C.)
- (e) geographical setting
- (f) degree of centralised political regimes
- (g) different degrees of administrative capacity.

Because of this heterogeneity in the Mediterranean region, the analysis of the P.P.P. must take into careful account not only the static (allocation) effects of the P.P.P. but also aspects associated with growth and development, as for instance the



allocation of investment, the creation of new sectors and goods, the diffusion of technological innovation, etc. For many Mediterranean countries dramatic problems have to be faced in the next decades (population increase, restructuring of the industrial sector, increasing request for social infrastructure, and so on) so that the compatibility of pollution control and growth-with-development must be carefully scrutinised.

On the other hand, special emphasis must be made on the effects of the P.P.P. on eliminating distortions in international economic relations so important in Mediterranean countries. In fact, divergencies in pollution control policies can have a powerful effect on international trade on goods and services and, to a lesser extent, on the international movement of factors of production (capital, technology, workers, etc.). Different costs of pollution abatement can relocate productive activities between countries with short run benefits to the host countries but probably at the expense of tomorrow's sound and equitable growth processes.<sup>4</sup>

In this paper only the economic aspects of the Mediterranean environment are considered on the assumption that the technical aspects of the solutions can be solved (easily or less easily) and that political conflicts do not emerge dramatically. The analysis is carried out with reference to relevant literature on welfare, growth and international trade that allows the consideration of the different characteristic of the Mediterranean countries.

## **2. The P.P.P. In Action**

### *2.1 International Organisations*

Two international organisations are of special interest for the application of the P.P.P. to the Mediterranean countries: E.E.C. and O.E.C.D. These two institutions, mainly concerned with developed area, comprise many countries on the northern part of the Mediterranean Sea. Spain, France, Italy, Greece are members of the E.E.C. and Spain, France, Italy, Greece, Turkey and Yugoslavia are members of the O.E.C.D. Moreover many special arrangements have been agreed upon between E.E.C. and O.E.C.D. and non-member Mediterranean countries.

The guiding principles concerning international economic aspects of environmental policies with particular reference to their economic and trade implications have been put forth in a recommendation adopted on 26th of May 1972 by the O.E.C.D. Council. The two guiding principles are (a) cost allocation: the Polluter-Pays Principle and (b) environmental standards. A recommendation adopted on 14th of November 1974 concerns more specifically the first principle "The Implementation of the Polluter-Pays Principle".<sup>5</sup>



The two principles are explicitly mentioned in many sectoral O.E.C.D. recommendations in relation to Air Pollution (June, 18, 1974), Environmental Consequences of Significant Public and Private Projects (November, 14, 1974), Traffic Limitation (November, 14, 1974), Noise Pollution (November, 14, 1974), Trans-frontier Pollution (November, 14, 1974), Waste Management Policy (September, 28, 1976), Tourism (May, 8, 1979), Prevention and Control of Oil Spill (April, 28, 1982), and others.<sup>6</sup>

## *2.2 Assistance by Public Authorities*

Starting from these sectoral recommendations, other more specific recommendations have been put forth for each of the categories above listed (tourism, air, noise, and so on).<sup>7</sup> As a general principle, public authorities should not assist the polluter in bearing the costs of pollution control. However some cases must be considered not (necessarily) incompatible with the P.P.P.:

- (1) in exceptional circumstances such as rapid implementation of a compelling and especially stringent pollution control regime that causes related socio-economic problems
- (2) aid given for the purpose of stimulating experimentations with new pollution control technologies and development of new pollution-abatement equipment
- (3) measures taken to promote a country's specific socio-economic objectives (reduction of serious inter-regional imbalances) that only incidentally constitute aid for the pollution-control purposes. The granting of this assistance to polluters by means of subsidies, tax advantages and other measures must comply with every one of the following conditions:
  - (a) it should be strictly limited
  - (b) it should be selective and restricted to the parts where severe difficulties would otherwise occur
  - (c) it should not create significant distortions in international trade and investment
  - (d) it should be limited to a well-defined transitional period.

If a country, in cases of exceptional difficulty gives assistance to new plants, the conditions can be even stricter than those applicable to existing plants; moreover the criteria on which to base this differentiation must be developed.

Since its inception, the P.P.P. has been the subject of gradual implementation by O.E.C.D. members. Its application is presently required for investment in, and operation and maintenance of, pollution abatement facilities and measures undertaken by the public and private sectors within each O.E.C.D. member country.

The P.P.P. does not at present apply to at least two cases especially important for



international aspects:

- (1) the case of investment within an O.E.C.D. country that gives rise to spillovers into the global common areas, unless an international agreement to reduce pollution from the source exists
- (2) the case of investment abroad that gives rise to spillovers from the country hosting the investment into countries neighbouring it or into the country hosting the investment. Notwithstanding these limitations, some positive steps have been taken: government should apply the P.P.P. and assign to the person or entity liable for the oil spills the costs of reasonable remedial action taken by public authorities after an incident.

### *2.3 The E.E.C. and Environmental Control*

The activities of the E.E.C. in the environmental control are particularly relevant for a number of reasons. Firstly, environmental control is a very sensitive issue for the high degree of pollution already attained and the ensuing high level of expectations for a better environment. Secondly, the main aim of the E.E.C. is the accomplishment of a common market of goods and factors of productions without distortions so that some methods to allocate depollution costs, accepted by all partners, must be found. Finally, from a practical point of view, the E.E.C. can intervene in a more specific, selective and binding way than other international organisations and national laws and regulations of the twelve member states must give full support to community actions.<sup>8</sup>

The Treaty of Rome gave no specific support for coherent and strategic environmental policy. When the problem, at the end of the sixties-beginning of seventies, became more acute in industrialised European countries, the Community environmental policy was based on some generic articles of the Treaty concerning the improvement of environment and of life conditions (Preamble, art. 2, art. 100 and art. 235).<sup>9</sup>

After the summit of the Heads of states and of governments (Paris, 1972) the E.E.C. Commission in November, 22, 1973 drafted the first programme for action on environmental control, adopted by the Council in the same year.

The P.P.P. was clearly stated along the lines accepted in O.E.C.D. recommendations and since then a number of directives, resolutions and recommendations have been adopted and applied by member states. Some of them are very specific and concern the application of the P.P.P. in many sectors such as for instance waste pollution (July, 15, 1975), trans-frontier pollution (December, 6, 1984), and so on.

Two recommendations of the Council raise sensitive issues for the application of



the P.P.P. These concern cost allocation and action by public authorities on environmental matters (March, 3, 1975) and the methods of evaluating the cost of depollution control to industry (December, 19, 1978).

In particular the first recommendation is of major importance for its technical implications, which are sometimes neglected in O.E.C.D. recommendations.

The European Communities at community level and the member states in their national legislation on environmental protection must apply the P.P.P., so that natural or legal persons governed by public or private law who are responsible for pollution must pay the costs of such measures as are necessary to eliminate that pollution or to reduce it so as to comply with the standards or equivalent measures which enable quality objectives to be met or, where there are no such objectives, so as to comply with the standards or equivalent measures laid down by the public authorities.

#### *2.4 Identifying the Polluter*

If identifying the polluter, in the chain of causes and effects, proves impossible or too difficult and hence arbitrary, the cost of combating pollution should be borne at the point in the pollution chain or in the cumulative pollution process, and by the legal or administrative means which offer the best solution from the administrative and economic points of view and which make the most effective contribution towards improving the environment.

The major instruments of action available to public authorities for the avoidance of pollution are *charges* and *standards*.

*Charges* must encourage the polluter to take the necessary measures to reduce the pollution he is causing as cheaply as possible (incentive function) and/or to make him pay his share of the costs of collective measures (redistributive function). The charges should be applied according to the extent of pollution emitted on the basis of an appropriate administrative procedure. Charges should be fixed so that primarily they fulfill their incentive function.

*Standards* include environmental quality standards, product standards, standards for fixed installations (sometimes called process standards) such as emissions standards, installation design standards and operating standards.

In order to avoid distortions of competition affecting trade and the location of investment in the Community, it will undoubtedly be necessary to harmonise more and more closely at community level the various instruments where they are applied



in similar cases. Until this is achieved, the question of the allocation of anti-pollution costs will never be entirely resolved at community level.

### 2.5 Exceptions

Exceptions to the P.P.P. may be justified in limited cases:

- (1) where the immediate application of very stringent standards or the imposition of substantial charges is likely to lead to serious economic disturbances
- (2) where, in the context of other policies (e.g. regional, industrial, social and agricultural policies or scientific research and development policy) investment affecting environmental protection benefit from aid intended to solve certain industrial, agricultural or regional structural problems.

The following shall not be considered as contradicting the P.P.P.:

- (1) financial contributions for the construction and operation of public installations for the protection of the environment, the cost of which could not be wholly covered in the short term from the charges paid by polluters using them
- (2) financing designed to compensate for the particularly heavy costs which some polluters would be obliged to meet in order to achieve an exceptional degree of environmental cleanliness
- (3) contributions granted to foster activities concerning research and development with a view to implementing techniques, manufacturing processes and products causing less pollution.

The second recommendation fixes the principles, definitions and methods for the evaluation of the cost of pollution control in industry.

The pollution control costs to be evaluated in the industries concerned should relate to measures based on environmental considerations contributing to the prevention, elimination or reduction of water pollution, air pollution, noise or vibrations, solid or liquid waste.

The actual collection of cost data should be preceded by a technical survey of the industry concerned in those sectors where a survey seems desirable. Such a survey would result in a catalogue of different technical pollution control measures. For each of these measures, in so far as these are considered relevant by the competent authorities for the pollution under consideration, the cost data should then be collected.

Cost data concerning the cost of pollution control measures should be collected in such a way that an evaluation of each of the following cost categories is available separately for each pollution control technique: expenditure on the construction or



acquisition of plant and equipment, on the construction and acquisition of buildings, on the acquisition of land and/or the market value of land already owned, on improvements, on loss of output during transition running costs, on labour, on energy, on materials other than energy, on services, on rents, and on repairs.

### **3. The Economics of The P.P.P.**

#### *3.1 Some basic principles*

From an economic point of view the P.P.P. allocates costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment. The principle seems not only efficient from a rational allocation of resources but also fair at ethical level and very simple in its applications.<sup>10</sup>

In concrete terms the principle means that the polluter should bear the expenses of carrying out the measures decided by public authorities to ensure an acceptable state of the environment. The external costs are internalised because the emitter either reduces pollution by taking certain measures e.g. making investment and so pays less in charges or he pays the charges in full and thereby offsets the external costs. The prices of goods must depend on the quality and/or quantity of environmental resources so to reflect more closely their relative scarcity inviting agents to react accordingly.<sup>11</sup>

The P.P.P. is not an optimum principle to abate pollution along "Pigouvian" or welfare economic lines. For many reasons it is impossible to determine the optimum level of pollution, namely the point where marginal control costs equal marginal benefits from control.

In fact the P.P.P. in itself says nothing about what the acceptable level of pollution ought to be so that each country must determine its own environmental standard. Centrally there is the adoption of the notion of an "acceptable state" decided by public authorities through a mechanism of public choice that is outside the P.P.P. These standards can differ among countries for many reasons: different pollution assimilative capacities of the environment, different social objectives and priorities, different degrees of industrialisation and population densities, and so on.<sup>12</sup>

The P.P.P. is an efficiency principle in the sense that it ensures that the polluter (firms or individuals) will seek out the least cost method for controlling the quality of what is discharged. As a general rule the countries should not assist the polluter in bearing the costs of pollution control either by means of subsidies, tax advantages or by other measures. In case of subsidies and other facilities, the discharger would



have no incentive to reduce his costs.<sup>13</sup> The P.P.P. can be interpreted as a no-subsidy principle where the term subsidy includes the situation when the polluter has no sufficient incentive to abate his pollution and when the implementation of control is delayed.<sup>14</sup>

### *3.2 The instruments*

In environmental policy a number of instruments are compatible with the P.P.P. each one having merits in respects to the sector concerned, the objectives and the efficiency/equity criteria. The selection of a policy instrument among those politically feasible and economically efficient must take into account the implementation aspects that in some countries can be very difficult to attain. These include simple and straight forward rules and regulations, the presence of an adequate technical staff, the availability of monitoring and control of the results, the minimisation of the administrative costs, including the costs of obtaining information and the costs of adjustment in the direction of the optimum.

It would be too long to list all the instruments, proposed and/or accepted in the context of the P.P.P. and this is not be surprising owing to the different forms of pollution, the nature, size and power of the polluter and the specific objectives to be attained. The instruments must have a specific influence on polluting activities so to increase the price of the intermediate inputs, of natural resources, of the final goods, and to reduce the value of a property.

The instruments more frequently suggested are the so-called economic instruments more suitable for a decentralised, incentive-oriented economy such as for instance indirect taxes on polluting goods<sup>15</sup>, charges on effluent, auction of pollution rights.<sup>16</sup> A more general approach can be proposed involving the restructuring of the indirect taxation system so that all final commodities bear a tax that is related to the pollution caused by their production and consumption.<sup>17</sup> Of course government intervention can also be developed in a direct manner: building up plants for collective treatment of the effluents and charging different firms with a tax in order to share the cost of anti-pollution activities.

The P.P.P. involves not only economic instruments but also direct controls based on the principle of an absolute obligation to comply with the standard fixed by law at national, regional or local level.<sup>18</sup>

The polluting activities must comply with regulations directly enforceable by means of legal measures and not through the operation of economic instruments. These include, for example, standard on effluent emission, the average quality of the receptor body or the characteristics of the product.<sup>19</sup>



Direct controls have been hastily labelled as old instruments, valid only in a command-and-control bureaucratic economy. This conclusion can be accepted. It is true that direct controls are difficult to administer, expensive for checking, sanctioning and monitoring and difficult to convey new information. The temptation for the polluter to evade standards is very strong also since the infringements are as a rule punished by fines that are too low, sometimes delayed if they are collected at all. Besides these aspects, economic efficiency is reduced since the standards are not necessarily attained at least cost. Finally direct controls can hardly be considered as incentives since each polluter desires not to improve the standard but only comply with the regulations.<sup>20</sup>

However some counter-arguments can be advanced against the previous statement about direct instruments. Firstly, direct controls can be consistent with the P.P.P. if each polluter must pay directly for equipment and running costs necessary for complying with the standards.

Secondly direct controls are indispensable since they are the surest means of preventing irreversible effects or unacceptable pollution. When we are dealing not with the question of more or less but of absolute zero, of great uncertainty, of very long effects, etc. the incentive system is too complex for pollution control (for instance new chemicals, carcinogen substances, mercury and cadmium pollution, etc.). Finally direct controls are sometimes preferred by polluter and public authorities. It must be remembered that in many countries laws and regulations are based on hierarchical command-and-control techniques, historical heritage of a complex set of interests and compromises. The old system can be substituted but the transition must be gradual to avoid costs, inefficiencies and social conflicts.

### *3.3 Who pays?*

It is normally possible to find the final (or physical) polluter such as a household consuming a final good or a firm utilising an intermediate input. Some difficulties can emerge if the effects of some materials and goods on the environment are doubtful and depend on other pollution or on the changing state of the environment. The diffusion of the pollution among a large number of consumers and firms create other major difficulties.

The responsibility of the final polluter is still more debatable: often the final polluter is a passive agent since he does no more than use the product the characteristics of which do not depend on him.<sup>21</sup> For instance, equipment and machinery have been developed for countries with a given degree of temperature, humidity, etc. and only in these conditions they can operate properly. Secondly, they operate efficiently only in adequate state of maintenance which in some countries is unattainable



because of the heavy expenses involved, and lack of spare parts.<sup>22</sup> Thirdly, some activities are polluting not *per se* but owing to the lack of adequate infrastructure, information network, control devices, etc. normally provided by governments. In these cases the final polluter is a partially responsible polluter and the extent of responsibility depends on a number of factors (technical, dimensional, geographical, social, and so on).

Even if the (final) polluter is entirely responsible for environmental damages, the public intervention must not necessarily be directed against him.

The P.P.P. must be applied to those who have effectively the economic and technical capacity to combat or prevent pollution. Normally taxation will have very different results depending on whether it is applied to the producers or to the consumers. Action should therefore be taken against the agent who has effective power to abate pollution costs so that it may lead to a prevention of the disutility rather than seeking merely to compensate the "victim".

The P.P.P. means a partial or total internalisation of the external costs which pollution imposes on society. The cost of pollution abatement should be borne at whatever point is most effective and convenient. If charges are levied on the producer, the cost can be absorbed by the producer or passed on, wholly or partially, in higher prices for the goods or services produced.

### 3.4 What to pay?

From a theoretical point of view, the optimum amount of intervention for environmental purposes can be determined knowing the social marginal cost of pollution and the marginal cost of depollution.

The starting point is the function of the real (physical) damages through which the effects of pollution on men and resources expressed in quantitative terms can be assessed. Through the utilisation of indirect market indicators and/or direct evaluation of the demand of the environmental quality, it is possible to shift from real to monetary costs. This damage function (social marginal cost of the pollution) probably increases more or less rapidly with the level of pollution. The second function (marginal cost of depollution) shows the amount of national resources subtracted from other economic activities: the marginal cost of depollution control is a decreasing function of the level of pollution.

The optimum level of pollution will be determined by the intersection of the two functions. At this level the marginal costs of the damages caused to the environment equals the marginal costs of depollution measures. The preferences of society in



terms of two broad categories of goods (environment from one side and traditional goods and services from the other side) would be absolutely respected. The pollution will be pushed only to the point where what society gets out of it is just offset by what it costs society.<sup>23</sup>

There may be various ways of achieving this result: the method introduced by Pigou more than fifty years ago is to impose a tax on the producer equal to the "price" at which the marginal social costs of pollution abatement equal the marginal social damages from pollution.

In more concrete terms the amount to be paid can be based on the following principles:

1. the polluter is to be charged with the cost of the operations needed to prevent pollution: incentive levies equal to the cost of waste treatment operations, mandatory standards which oblige potential polluters to take preventive measures.
2. besides direct pollution control and prevention costs, other heavy expenses can be involved in environmental control such as administrative costs of implementing an anti-pollution policy, costs of the measuring and checking arrangements, costs of research and development in anti-pollution technology and so on. According to the strict application of the P.P.P., the polluter would have to pay also the additional costs but probably a large part of the administrative costs will be paid by the taxpayer.
3. the polluter can be asked to pay for the damages caused to the environment and through it to individuals.<sup>24</sup> These damages can be produced by (a) accidental pollution<sup>25</sup> (b) gross negligence or malicious intent of the polluter (c) impossibility to implement total or partial prevention measures.

The assessment of the damages of pollution is very complex. First of all, in case of irreversible effects true compensation is meaningless. Secondly the damages can be assessed normally only for the first round of effects and in the short-run.<sup>26</sup> Thirdly the compensation is made in monetary terms so that the physical or human damages must be converted into monetary terms - a procedure which is always to an extent based on subjective criteria. Finally pollution causes the so-called residual damages even when the polluter has complied with the standards fixed by public authorities (this level cannot be normally considered the optimum level).

According to the P.P.P. the polluter must be charged with the cost of depollution so that the accepted state of the environment may be restored or maintained. However in this case the internalisation of the cost of pollution is just partial leaving aside the residual damages. The internalisation will be total only if the polluter compensates the polluted for the residual damages through, for instance, direct monetary payments or, indirectly, through the provisions of free services (parks, libraries,



etc.). This method of internalisation is more economical than the first since from zero pollution to the optimum level, compensation is less expensive (in real terms) than anti-pollution measures.

All this indicates that the P.P.P. is not a method for payments up to the optimum level and for the total internalisation of the cost.<sup>27</sup> So the P.P.P. seems a little less fair from an ethical point of view than at first glance: not only the first polluter is not the final and the responsible polluter but also what he pays is not strictly correlated to the damages caused to the environment and to the person living in this environment.

### *3.5 Technical Aspects*

The P.P.P. is not so easily applicable as might appear at a first glance. There are many practical problems associated with the implementation of these environmental taxes. These include, for instance, monitoring difficulties, geographical difference in charge structure, iterative search for appropriate charge levels, and others.<sup>28</sup>

The main problem is the determination of the tax base. Should pollution taxation be based on pollutant emissions or ambient concentration?<sup>29</sup>

Two solutions can be suggested. A uniform tax on emissions or a tax variable with the emitter's contribution to concentrations. The two alternative solutions would lead to the same result only in the special case in which the effect of a given level of emission on ambient concentration is the same for all emission sources.<sup>30</sup>

From a practical point of view a perfect discrimination of the tax rate might be extremely costly to achieve so that a compromise is often suggested: this is the so-called zonal price and standards system. The territory concerned is partitioned into zones with standards and uniform taxes for each.

A corollary of the previous reasoning seems very important in many cases when a number of sources of pollution are present within the relevant region such as a river basin or the Mediterranean Sea. In this case a uniform tax will lead some to reduce pollution to a greater extent, others to a lesser extent depending on the marginal benefits for polluting in each case. A uniform tax for all polluters will not achieve the efficient result.

Of course an efficient tax must vary not only over space but also over time, for instance for changing weather conditions. In these cases additional problems arise from the necessity of frequent adjustments in response to changing weather patterns



and for time lag of environmental control in response to changing taxes. Direct controls more than economic instruments may be the best solutions in integrated programmes of environmental protection.

In a growing economy, tax rates would probably have to be frequently adjusted to maintain environmental standards. The growth process in the economy influences the two functions previously mentioned (social marginal cost of pollution and marginal costs of depollution) both for economic reasons and for the modification of the objectives of societies. Of course, the tax rate can be changed but it is difficult to find the new level lacking inside information. In this case, pollution rights are more appropriate than environmental taxes. The price of pollution rights on this specific market varies, as in other more traditional markets, according to the level of demand and supply of depollution control. The decisions are not centralised but depend on a large number of choices made independently by households and firms in a rational way so to reflect their basic choices.

Sometimes the difficulties for charging the polluter come from the ignorance of the effects of the products and these difficulties are increased by the continuous variations of the products and their characteristics. A case in point is D.D.T. the negative effects of which have been detected long after its appearance, just when other products could substitute it.<sup>31</sup>

Another point of great significance can be made at this stage. For a number of reasons the application of the P.P.P. must be gradual so that not only the final objective but also the optimum path to the proposed objective must be chosen. The adjustment period can be very long even in industrial countries so that the search for a maximum degree of (static) efficiency must be balanced with more dynamic considerations.<sup>32</sup>

#### **4. Economic Effects of The P.P.P.**

##### *4.1. The Side Effects*

The reasons for depollution interventions is to protect the environment but important side effects on strategic variables (public revenues, output, prices, etc.) both in short and long-term run are also important.

To determine the final effects of environmental policies, a careful analysis is needed along the lines well known in public finance. In a decentralised economic system, final effects depend on a complex set of interrelationships between prices of goods and factors of production at micro, sectoral and macroeconomic level. The process is of course different depending on whether the polluting goods are final goods



or intermediate inputs or, in other words, on whether the agents interested are households or firms (large, middle or small, in competitive or oligopolistic markets).

The instruments utilised for environmental protection put in motion a complex chain of actions and reactions determined by relative price changes. The changes in relative prices between polluting and non-polluting goods modify consumption patterns at the households level and output-mix and production techniques at the firm level. All these substitution processes are usually studied under competitive markets of goods and factors of production, without disruptive (non-market) governmental interventions, in profit-maximising production units, with active and innovative entrepreneurs, etc.

In real life, substitution processes are not so simple as each public finance textbook teaches us. Reality of course is very different from the idealised hypothesis above mentioned so that the outcome of environmental policies can be partial, delayed or, in some cases, perverse.

Two approaches must be clearly distinguished, namely (a) a short-run approach where the substitution process comes from changes in relative prices induced by environmental instruments along a given set of consumption goods and production techniques and (b) a long-run approach when substitution process comes from technical progress, new goods, and organisational innovation indirectly induced by environmental policies. Instruments for pollution control ought to be chosen not only for their static, allocative effects but also (and especially) for their dynamic, innovative influence on the economic system.

At least in the short-run the process of substitution must be decomposed in two sub-processes. Firstly, there are the effects of environmental policies on the prices of polluting goods and secondly there are the effects of price changes on the final or intermediate utilisation of polluting goods.<sup>33</sup>

The first scenario refers to a total and instantaneous translation of environmental taxation on the prices of polluting goods. This hypothesis can be easily accepted in competitive situations since the entrepreneur cannot absorb the increasing production costs by reducing extra profits.<sup>34</sup> Even in this situation the substitution process can be prevented or delayed by some characteristics of the polluting goods.

Final or intermediate demand of polluting goods can be fairly rigid so that environmental instruments may have limited effects on their utilisation. In this case, the price mechanism would not work and it would be impossible to prevent pollution from utilising economic instruments. Taxation would increase public



revenues but the main objective is not attained. Administrative instruments must be devised and implemented with the usual inefficiencies, lack of stimulus for innovations, and necessity of rigid controls. A large number of factors would have to be considered to analyse and explain the low price-elasticity of the demand of polluting goods. A few factors will be considered here.

At the household level one major determinant is the share of the expenses on polluting goods in the family budget. If this share is small, no significant effect of environmental taxation would be detected on the final consumption of polluting goods. Demand elasticity depends also on the category of the goods taxed: for example if many polluting goods belong to the same category (for instance agricultural goods) demand elasticity is very low owing to the lack of substitution among the goods concerned. Of course in this case a rather strong negative income-effect can be expected from environmental taxation of agricultural (polluting) goods. However the results on the final consumption are uncertain and sometimes perverse if the polluting goods concerned are primary goods (possibly with a negative income-elasticity of the demand).

The problem is much more complex if we turn to the firm level when polluting goods are utilised as intermediate inputs or are a by-product of the production process. Of course firms have greater financial resources, technical ability and a more rational approach to the substitution process in comparison to the households but constraints are not lacking. The substitution process is always difficult in the short-run not only for factors of production (capital and labour for instance) but also for intermediate inputs (either primary or manufactured goods).

Probably relative price changes of polluting goods vis-a-vis non-polluting goods and traditional factors of production induce some changes in input-mix. For instance an increase in the price of pesticides and fertilizers can accelerate the introduction of other non-polluting intermediate inputs (new seeds, biological "killers") or of more accurate plowing and harvesting utilising more capital and labour. But this is not so simple, taking into account the traditional structure of production and of organisational rigidity. Probably in the short-run, taxation of intermediate polluting goods causes just a generalised increase in the prices of final goods with scarce effects on the quantity sold.<sup>35</sup>

A second scenario must be taken into account: taxation of the polluting goods does not increase prices in some market structures. In these cases the effects of the instruments on the environment are more uncertain and delayed.

Firstly an environmental taxation can be absorbed by the entrepreneurs affecting negatively their (marginal) rate of profit. The prices of polluting goods remain



constant so that the total demand cannot be affected. However, the fall in profit rate can modify output and input-mix so to shift total output towards non-polluting (or less polluting) goods.

Secondly, the extra-cost can be passed back to the factors of production through for instance a slower growth of nominal wages and an acceleration of productivity increase. This happens quite frequently in sparsely industrial areas, in informal (black) labour markets and in small-scale production units. The changes in relative remuneration of the factors of production push labour and capital from polluting to non-polluting sectors.

Thirdly, firms would operate in a strictly controlled economic environment largely subsidised by the state. In this case, a taxation of the final goods or the intermediate inputs have no other effects but an increase of government subsidies. These subsidies are the counterparts of the revenues accruing to the public authorities from environmental taxation. A particularly relevant example can be found in many agricultural products, largely subsidised and with low price-elasticities.

Finally, sometimes the prices are fixed by the state in view of maximising the difference between selling prices and costs: state monopolies for goods whose social costs are greater than private costs. In this case an environmental taxation decreases the rents gained by monopolies but does not affect prices and quantities sold unless a new regulation of the objectives of the firms is carried out.

#### *4.2 Oligopolies*

It should be clear, from the preceding observations, that for a useful analysis of the effects of the environmental policies it is necessary to leave the hypothesis of perfectly competitive markets, of traditional behaviour of producing firms, and of deterministic changes of the main variables in response to external shocks. For these reasons the activities of the oligopolies deserve attention for their widespread presence in large part of our modern economies. It is also probable that oligopolies are responsible for a large part (at least for some kind) of the pollution.

Oligopolistic behaviour varies depending on the various situations and unfortunately is not adequately analysed. Sometimes oligopolies are collusive on internal and international markets through informal agreements, market sharing and so on. The lack of competition makes the prices rather sticky for long periods and renders adjustment in the production structure difficult and delayed. Moreover oligopolies can influence directly or indirectly governments against increasing environmental taxation or fixing the optimum level of taxation. Information about the effects of pollution on environment can be made scanty and incomplete so that checking and



monitoring activities are lacking.

In other situations, oligopolies can be innovative, competitive and long-sighted. In the mix of economic and social objectives the prevention and the control of pollution can be largely accepted. Provided that a fair rate of profit can be maintained, oligopolies try to maximise social consensus so that adjustment in output mix and in production inputs can be more successful than in a strictly competitive environment.

Political aspects cannot be disregarded because environmental control is the outcome of a bargaining process between public authorities and oligopolies. If the government takes a very strong and determined environmental stand, oligopolies can easily comply with this objective beyond the strict economic calculations expecting that this (economic) effort will be compensated sooner or later through for instances fiscal facilities, loans at concessional rates of interest, import duties, and other benefits. In this situation environmental objectives are achieved but at some costs for the society as a whole: the bargaining process between public authorities and oligopolies causes a misallocation of economic resources so that the trade-off between traditional economic objectives and environmental targets is impaired.<sup>36</sup>

#### *4.3 Technical Progress*

Some final comments must be advanced as far as dynamic aspects of the P.P.P. are concerned.

As all economic activities, pollution control requires capital goods, infrastructure, technical abilities, organisation efforts and so on. But in the case of pollution control, the need for technical innovations is perhaps more pronounced. Technical progress is needed to minimise the cost of the traditional methods of abating traditional pollution, to introduce new techniques of controlling traditional pollution and to discover new methods for new types of pollution (nuclear pollution for instance).

Besides these sectoral aspects, technical progress is necessary to safeguard the environment from the continuous increase of polluting goods and services consumption, from massive exploitation of non-renewable resources, from the growth of population and urbanisation and so on.

The problem is therefore to assess if the P.P.P. is suitable not only as the least-cost method to abate today's pollution but also to influence positively the rate of technical innovation and diffusion. This new approach shifts the emphasis from



welfare to growth economics with exhaustible resources or in other words from static, short-run resource allocation to dynamic considerations addressed to the adaptations of the production structure to the environment.<sup>37</sup>

Taking account of these effects, it is widely accepted from a theoretical point of view that economic instruments (environmental taxation and similar techniques) show a great advantage in comparison with alternative control mechanism: technical change is stimulated by the provisions of decentralised incentives. Also empirical evidence suggests that an appropriate system of pollution taxes could effectively stimulate the powerful market forces of competition on behalf of environmental protection.

The innovations are directly profitable to polluters since they reduce costs. For example a firm that discovers a less expensive way to control its discharges could employ this technique to reduce its discharges yet further. The active entrepreneur could benefit in two ways: on the one hand he reduces pollution control cost and on the other hand he decreases tax bill as a result of lowering the level of waste emissions.<sup>38</sup>

## **5. The Last Step: From Sectoral to Macroeconomic Aspects**

So far, environmental policies have been discussed within a partial equilibrium (disequilibrium) approach on the hypothesis that the resources utilised, and the regulations enforced for depollution had no substantial effects on the macrovariables. Probably this approach was necessary or unavoidable in the past years owing to the difficulties of integrating the non-renewable resources in other markets (goods and services, labour and capital) in the framework of the neoclassical, Keynesian, monetarist, neo-classical and other models. But now the situation is rapidly changing so that the macroeconomic aspects of environmental policies must be carefully analysed and empirically tested. The economic framework, the statistical instruments and the empirical documentation are not lacking so that the next step is to close the gap between the sectoral and the macroeconomic approach.

From a more practical point of view, the analysis is at present urgent since the resources spent for environmental protection are quite substantial and the regulations adopted can have a very strong effect on the stability and growth of modern economies.

Among the many macroeconomic effects of depollution, there are some which are especially important as for instance the effects on inflation, balance of payments, employment, rate of productivity growth, rate of increase of total output, fiscal revenues, and so on.



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If these macroeconomic effects are detected in a quantitative way, a big step forward will be taken for a better strategy of economic policy. This analysis will show the short and long-run trade-off between traditional economic objectives and the conservation of the environment. So far, the trade-off functions have been empirically studied mostly for economic objectives (inflation and employment, capital accumulation and income distribution).

Of course knowledge of these trade-off functions is not enough to determine the economic resources (men, capital equipment, physical infrastructures, R. and D. expenditure, and so on.) that must be devoted to the environment. In this regard, cost-benefit analysis has to take account of, on one side, the costs of depolluting activities and, on the other side, the benefits from a better environment. Unfortunately this kind of economic analysis is still in its infancy especially when we shift from generic considerations to more precise and quantitative conclusions.

It is now high time for the economists to intensify their efforts on environmental economics and for governments, entrepreneurs, trade-union leaders, public opinion and so forth to give greater attention to problems associated with the economics of the environment.

The old fashioned economist trying to minimise the amount of resources devoted to the environment so as to increase the goods and services sold on the markets is now, and probably for ever, gone. The new challenge is to utilise rationally the scarce economic resources to attain ever increasing environmental standards in the context of a balanced set of more traditional targets widely accepted in our modern, more or less industrialised, economic systems.

### NOTES AND REFERENCES

1. See Freeman, A.M., Haverman R.H. and Kneese A.V., *The Economics of Environmental Policy*, Krieger P.C., Malabar, Florida, 1984, pp. 7 for the services that an environment (asset or a kind of non-reproducible capital good) can produce for men: tangible (such as flows of water and mineral), intangible (a beautiful landscape) or functional (such as removal, dispersion, storage and degradation of wastes or residuals). The services of the environment for the economy can be grouped as follows: 1. dispense, storage and assimilation of the residuals generated as a by-product of economic activity, 2. support of human life as a hospitable habitat for men and other forms of life, 3. provisions of amenities in which a part of our leisure time can be spent and 4. source of material inputs used as final consumption or an intermediate goods for a large set of activities.
2. Pollution can be defined as the introduction by man, directly or indirectly, of substances or energy into the environment resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and impair or interfere with amenities and other legitimate uses of the environment.



3. These international aspects are analysed in Baumol W., "On International Problems of the Environment", Wicksell Lecture, 1971; Walter (ed.), *Studies in International Environmental Economics*, New York, Wiley, 1976, WALTER (ed.), *International Economics of Pollution*, London, MacMillan, 1975.
4. Only the domestic effects, as distinguished from the international effects, of the P.P.P. are here considered. See in O.E.C.D., *Problems of Environmental Economics*, Paris, 1971 the papers by Majocchi, Klotz, D'Arge, Cumberland, Scott. When the analysis refers to countries at different level of development, besides trade and investments aspects, other sensitive issues (as for instance the role of M.N.C. and international aid) must be taken into consideration.
5. For the role of this organisation, see O.E.C.D., *O.E.C.D. and Environment*, Paris, 1986.
6. See O.E.C.D., *The Polluter-Pays Principle*, Paris, 1975, O.E.C.D., *An Assessment of the Implementation of the Polluter-Pays Principle*, Paris, 1981 and E.R.L. (Environmental Resources Limited), *Economic Instruments and the Polluter Pays Principle*, London, November 1986.
7. Of great importance for our purposes are O.E.C.D., *Problems of Transfrontier Pollution*, Paris, 1974, O.E.C.D., *Economics of Transfrontier Pollution*, Paris, 1976, O.E.C.D., *Legal Aspects of Transfrontier Pollution*, Paris, 1978 and O.E.C.D., *Transfrontier Pollution and the Role of States*, Paris, 1981.
8. See Lauria F. and Castelli S., *Codice comunitario dell'ambiente*, Napoli, Editoriale Scientifica, 1986.
9. Recently, after the approval of the Single European Act a Title VII on the environment has been added to the Treaty in which the acceptance of the P.P.P. has been reiterated (see art. 130 R, 2).
10. Other principles are the so-called:
  - (a) *polluted-pays principle* - sometimes proposed in the economic literature mainly on theoretical grounds (Coase Theorem). In some circumstances it might be cheaper in resource terms for the victim to avoid the pollution than for the polluter to reduce it. From the point of view of policy authorities, it can be profitable to economise in the use of clear resources by charging the consumer than reducing demand by spending more money eliminating pollution from the polluted resources. Sometimes the preference given to the polluted-pays principle depends on responsibility aspects in the sense that the extent of damage is dependent on consumers as well as producers behaviour.
  - (b) *society-pays principle* - when firms, households, social communities, public bodies, etc. have an absolute right to pollute leaving the anti-pollution activities to the state or other public authorities. Environmental problems are so divided artificially in two aspects: ex-ante for polluting activities and ex-post for depollution control.
  - (c) *nobody-pays principle* - when pollution is free and no anti-pollution activity is provided neither from polluters nor from the states. The largest part of the costs probably will be paid by the next generations whose income will be reduced for the extra-pollution costs and/or when some non-renewable resources have been improperly used or wasted.
11. The different methods of internalising external economies and diseconomies (of pollution in particular) are analysed in Bard J. P. and Gerelli E., "Economia e politica dell'ambiente", Bologna, *Il Mulino*, 1977. For more general aspects see Fisher A.C. and Peterson F.M., "The Environment in Economics: A Survey", *Journal of Economic Literature*, March 1976.
12. Measuring the economic gains from investing in the environment is complicated because so many of the benefits cannot be evaluated in markets. See BOHM P., "A Note on the Problem of



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Estimating Benefits from Pollution Control", in O.E.C.D., *Problems of Environmental Economics*, op.cit. Pearce D. and Markandya A., *Environmental Policy Benefits: Monetary Valuation*, O.E.C.D., Paris, 1989, show how these benefits might be measured in money terms and assesses the role of monetary valuation of the environment in the wider context of decision-making.

13. Financial aid has perverse effects on cost minimisation for depollution activities as for instance over-equipment and disincentive to technical progress. In terms of efficiency and incentive, financial aid as applied in most O.E.C.D. countries does not show the advantages of the other economic instruments. See Opschoor J.B. and Vos H. B., *The Application of Economic Instruments for Environmental Protection in OECD Member Countries*, Paris, 1989. For a more theoretical analysis Zerbe R.O., "Theoretical Efficiency in Pollution Control", *Western Economic Journal*, December 1970.
14. According to Murargo G., "On Bribes and Subsidies for the Control of Externalities", *Rivista internazionale di scienze economiche e commerciali*, aprile 1978, it is possible to find regulatory schemes for the use of bribes or subsidies that work reasonably well, in particular when they are combined with charges within a redistributive system.
15. For the variety of environmental charges and taxes see for example Marquand J. and Allen D.R., *A Note on Some Aspects of the P.P.P. and Its Implementation in O.E.C.D.: The Polluter-Pays Principle*, op.cit. and Osculti P., *La tassazione ambientale*, Cedam, Bologna, 1979, chap.2.
16. For pollution rights the classical work is Dales J., *Pollution Property and Prices*, University of Toronto Press, Toronto, 1968.
17. See for instance Victor P.A., *Economics of Pollution*, London, Macmillan, 1972.
18. See for a balanced view Schultze C.L., "Environment and the Economy", in *Economic Impact*, no. 2, 1979 and Opschoor J.B. and VOS H. B., *The Application of Economic Instruments for Environmental Protection in OECD Member Countries*, op.cit., for the analysis of over 150 instances of the application of economic instruments in fourteen countries (France, Germany, Italy, the Netherlands, Sweden and the United States are examined in depth).
19. Regulatory approach-either to create new laws and regulations or to adapt existing legislation has considerably expanded over the past fifteen years. Pollution control for air and water, waste management, noise abatement, development of new hazardous substances, new technology and products are the main responsible factors for this development.
20. According to Oates W.E., "Should Pollution Be Taxed?" *Economic Impact*, no.4, 1988 the existing studies of U.S. programmes for the management of air and water quality find that control costs to polluters range from double to more than 10 times the least-cost outcome. The traditional command-and-control programs in pollution control often result in across-the-board requirements for control measures that fail to take account of the particular circumstances of individual polluters.
21. The difficulties of applying P.P.P. for agricultural products are highlighted by Bresso M., *Pensiero economico ed ambiente*, Torino, Loescher, 1982. For a more general review of the problem of pollution in the primary sector see O.E.C.D., *Water Pollution by Fertilizers and Pesticides*, Paris, 1986 and O.E.C.D., *Agricultural and Environmental Policies: Opportunities for Integration*, Paris, 1989.
22. Of course the pollution comes frequently not from the product itself but from the process of production. For instance in L.D.Cs capital goods consist of second-hand equipment already discarded in industrial countries utilising intermediate goods and domestic factors of production



not well suited to the equipment.

23. For optimum rate of pollution see W. Becherman, *The P.P.P. Interpretation and Principles of Application in O.E.C.D., The Polluter-Pays Principle* (op.cit.) and Barde J. P. and Gerelli E., *Economia e politica dell'ambiente*, op.cit., chap.4.
24. The P.P.P. can be utilised for the implementation of the two main strategies of environmental control: react-and-cure and anticipate-and-prevent policies. What is needed for our principle is that the cost of react-and-cure or of anticipate-and-prevent policies must be sustained by the polluter.
25. For the case of accidental pollution see Smets H., *Environmental Accidents: The Polluter Now Pays*, in *The OECD Observer*, October-November 1989. The O.E.C.D. Council has now adopted a recommendation dealing expressly with accidental pollution originated from fixed hazardous installations. It provides that the potential polluter is the operator of such an installation and that he should bear the cost of all reasonable measures taken to prevent accidents. If an accident should occur in spite of these measures, the person who must pay, quickly, for any control measures taken by authorities after the event is the person "at the origin of the accident".
26. The residual damages can be carefully studied with the analytical apparatus developed by Beckerman W., *The P.P.P. Interpretation and Principles of Application*, op.cit., pp. figs. 1-3.
27. In real world, many other observations can attenuate the principle of the payment to the polluter. In a democratic society those who pay the charges have a say in the level of the charges. Normally the level of charges depends on the ability to pay by the poorest especially if the polluters are small scale. But if the final polluters are the industries the level of charges is determined by an interplay of actions and reactions and no simple rule can be detected from a partial equilibrium approach. There is no benevolent dictator that can fix the taxes and oblige them to pay.
28. In the presence of producer-to-producer externalities bargaining and merger become an efficient method of pollution control since the costs of bargaining are not prohibitive. Suppose that two firms are polluting each other and that their marginal costs are functions of each other's output as well as of own output. The interactions between the two firms may prevent the efficient pollution point from being reached. In this case the recommended principle is merger: see Kneese A.V., *The Economics of Regional Water Quality Management*, J. Hopkins Press, Baltimore, 1964. According to several writers (Coase, Buchanan and Stubblebine, Davis and Winston, Demsetz, Worchester and others) bargaining holds greater promise for a socially efficient allocation of resources than government interventions: see Worchester A., "A Note on the "Postwar Literature on Externalities": An Interpretative Essay, in *Journal of Economic Literature*, March 1972. If, on the contrary, environmental pollution represent interactions between very large numbers of economic agents many of whom are not firms but individuals, bargaining and merger procedures are impossible or very costly.
29. For these aspects see for example Baumol W.J., "On Taxation and the Control, of Externalities", *American Economic Review*, June 1972 and the criticism by Tietenberg T.H., "On Taxation and the Control of Externalities: Comment", *American Economic Review*, June 1974 and Thompson E.A. and Bathcelder R., "On Taxation and the Control of Externalities: Comment", *American Economic Review*, June 1974.
30. See, e.g., Baumol W.J. and Oates W.E., "The Use of Standard and Prices for the Protection of the Environment", *Swedish Journal of Economics*, March 1971, Baumol W.J. and Oates W.E., *The Theory of Environmental Policy*, Englewood Cliffs, N.J., Prentice-Hall, 1975 and Brumm H.J. and Dick D.T., "Federal Environmental Policy and R&D on Water Pollution Abatement", in *American*



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*Economic Review*, May 1976.

31. On a theoretical basis other aspects are very interesting: for instance Henry C, *Microeconomic Policies for Public Policy*, Clarendon Press, Oxford, 1989 that considers also public goods subject to crowding and pollution caused by non-traceable sources.
32. According to Lefrou C., in O.E.C.D., *Environment and Economics*, Paris, 1985 in the French experience of water pollution control, taxation rates are made progressive and government provides assistance to the poorest firms in the transition period: the process toward the final equilibrium took 10 years to be completed with no government assistance and the cost of anti-pollution measures to be incorporated fully into manufactured goods.
33. The effects of environmental taxation on the prices of polluting goods should be analysed not in a partial equilibrium approach but in a more general equilibrium (disequilibrium) model utilising for instance input-output techniques: the results on the relative price of polluting goods are not so simple and clear as might appear at a first glance.
34. See Majocchi A., "Econometric Methods for Measuring the Shifting of Pollution Control Costs on Prices and the Ensuing Effects on Exports", *Rivista internazionale di scienze economiche e commerciali*, 1975 for an analytical framework for measuring the shifting on prices of changes in costs due to pollution control in an industrial sector. Two context are considered: (a) an industry model in a competitive framework where the goal of the firms is to maximise profits, (b) an oligopolistic industry where prices are determined by technologies, factor prices, the absolute size of the market and overall demand elasticity. See also for this second model Fazio A.G. and Lo Cascio M., "Evaluation of the Economic Effects of Anti-Pollution Public Policy: Proposal for an Econometric Analysis Model", in O.E.C.D., *Problems of Environmental Economics*, op.cit.
35. For the case of investment, an impact evaluation is absolutely necessary as shown in O.E.C.D., *Environmental Impact Assessment: Analysis of the Environmental Consequences of Significant Public and Private Projects*, Paris, 1979.
36. For an interesting view about the "non-market failure" of the public policy in applying effluent charges, see R.D. White, *The Anatomy of Non-market Failure: An Examination of Environmental Policy*, in *American Economic Review*, May 1976.
37. See for instance Lloyd Orr, "Incentive for Innovation as the Basis for Effluent Charges Strategy", *American Economic Review*, May 1976, Rosenberg N., "Innovative Response to Materials Shortage", in *American Economic Review*, May 1973, Solow R., "The Economics of Resources or the Resources of Economics", *American Economic Review*, May 1974 and Brumm H.G. and Dick D.T., "Federal Environmental Policy and R&D on Water Pollution Abatement", in *American Economic Review*, May 1976. For a useful synthesis of many theoretical and empirical works Osculti F., *La tassazione ambientale*, op.ct., chap. 5.
38. Only the internal effects of pollution control have been considered. For other effects on international scale see, e.g., Duerksen C. and Leonard H.J. "Environmental Regulations and the Location of Industries: An International Perspective", *Columbia Journal of World Business*, Summer 1980 and Pearson C.S., "Multinational Corporations, Environment and the Third World": *Business Matters*, Duke University Press, 1987.



# **F**ramework of a Macroeconomic Policy in the Quasi Market Economies: Possibilities and Necessities

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## **I. Introduction**

As it is well known the European Community has worked out a plan to form a single internal market by 1992 by removing all barriers which hinder the free circulation of productive factors - goods, services capital and labour forces. The aim of creating a totally free European market is to promote specialisation in the Community and so to strengthen the world market position of the national economies in the member states. Increasing efficiency requires free competition in all sectors and branches. Since there are countries in the Mediterranean region which are full members of the Community, and others that are non-members but are strongly connected with the European Community, economic policy in this region has to tackle all tensions and imbalances that will be ushered in after 1992. Demand within Europe is expected increase rapidly, but the Mediterranean countries would only be able to avail themselves of this new and extended demand only if they are competitive in structure, quality and prices.

The region shows a very mixed picture. Among the Mediterranean countries there are highly developed market economies, full members of the EC, low or middle income developing countries, with very different potential to improve their economic performance. The annual growth rate of the GDP was between 1.5% in Yugoslavia and 6.8% in Egypt. As to the Resource Balance all countries have shown a deficit as a result of their poor net export results. Due to the chronic deficit of the trade balance and almost continuous deficit in the current account, external financing plays a key role in these countries.

Since foreign credits have always been the most important way of external financing and the countries in question could hardly rely on foreign direct investments, their indebtedness has risen continuously over time. Foreign direct invest-



ment in the region accounted for only \$1.2 billions in 1980 and \$0.8 billion in 1987, while the value of new disbursed credits reached the level of \$23 billions. Two countries of the region belong to the so called highly indebted countries, but there are others whose financial position - in spite of their preserved "solvency" - is very weak as well. With the exception of the highly developed market economies - namely France and Italy - the Mediterranean countries are confronted with a very serious problem: how could they transform their economic policy, the whole system of macroeconomic management in order to improve their world economic position, to prevent the further weakening of their position when the single European Market will be established.

Economic philosophers emphasise that each crises has some positive element. Frequently crises compel policy makers to take the necessary measures which were resisted in the past. In the socialist countries for example, the transformation of the economies is now being accepted, but the task is not easy. This is also to an extent true of Mediterranean developing countries trying to transform their economies to take advantage of the post 1992 expansion in demand.

These countries are being forced to adopt qualitative changes in their policy. They have to apply totally new instruments which they have never operated and have to carry out a qualitative transformation of their administrative-bureaucratic economic control.

There is no absolutely certainty as to the effects of the policies being adopted. All economic measures have some risk. To what extent and when a given economic measure has a desirable effect on the economic processes can be estimated only within a considerable margin of error.

## **II. General Aspects of Macroeconomic Policy**

Macroeconomic policy is at present in a difficult situation. There are countries with highly developed economies and others with a low level of development. More and more countries are confronted with problems which cannot be solved by measures deriving from the "classical" economic theories. The crises of economic policy and the disappointment with traditional economic theories have become a world phenomenon. Although the severity of the problem and perhaps their manifestations differ, all countries throughout the world have to seek answers to the following general questions: Which are the most important tasks of economic policy? How can economic policy makers summarise them in a clear form? What should be the targets of economic policy? What are the best forms in which to express quantitative targets? How can the targets set be consistent with the economic realities of the country? What should be the main instruments of economic policy?



Should the market instruments be mainly financial ones or administrative ones? What role should international relations play in forming economic policy?

The answers to the above questions are strongly connected with the kind of economic system under discussion. From an economic point of view the following groups can be outlined:

- 1. Economic management:**
  - a. market economies
  - b. bureaucratic-administratively controlled economies
  - c. "quasi" market economies
- 2. Participation in world economy:**
  - d. open
  - e. closed
  - f. partially opened

Different combinations of 1. a, b, c and 2. d,e,f, exist side by side in the present world economy. The most important and commonly used groupings are the following:

- open market economies (a and d)
- bureaucratic-administratively controlled closed economies (b and e)
- partially open quasi market economies (c and f)

### **III. Characteristics of Quasi Market Economies**

Market and quasi market economies (QMEs) differ from each other in that the latter group of countries employ more limited market instruments to reach their targets. Since QMEs tend to be relatively undeveloped with a primitive market structure, administrative measures are essential - but because of the administrative control of these economies, markets cannot develop and operate fully. As long as direct, bureaucratic market intervention by the governments remains extensive, the development of markets has a disturbing unbalance and some markets develop faster than others. This makes the task of policy makers even more difficult.

Developed open market economies as well as less developed QMEs have their own special difficulties as to the optimal form of policy control. The former, in spite of their long experience and wide range of financial instruments, must struggle with forces which are difficult to control and fine-tune. This is especially so because domestic markets in developed open economies are interrelated with international markets.

QMEs have additional problems associated with the fact that resource allocation tend to be more insensitive to market forces. Economic agents - households and



entrepreneurs - are unused to responding to such "fine" signals like a small change in the interest or exchange rate. Either they simply fail to notice it, or they hope for some official compensation.

However in some cases, the reaction of market agents is far more in QMEs than in developed economies. The backward stage of market development, the insufficient knowledge of market forces and control or simply the mistrust in them, may easily lead to totally irrational and unexpected reactions. The use of administrative instruments, state subvention on a case-by-case basis, state subsidies in prices, extra bonus for exchange rate fluctuations may be the cause of seemingly irrational behaviours in QMEs.

Moreover market economies typically have to cope with problem of oversupply, while QMEs have to tackle chronic excess demand, giving rise to shortages. Fundamental imbalances characterise both types of economy, but in different directions. Which situation is worse than the other could be debated, but the chronic tendency of excess-demand definitely calls for a special economic policy.

In the case of developed market economies, the theoretical base for deriving an "optimal" framework of macroeconomic control more or less exists. The theory of macroeconomic policy for QMEs, which are in a transitional phase, moving from centrally planned, totally administrative management towards an economic system based on the relatively free play of market forces, is however rather poor. Furthermore the logic, the sequence of ideas, the conceptual system of these theoretical constructs are totally different from those applied in developed market economies. As previously mentioned a given type of economic management or economic system has a fundamental influence on economic policy, its targets, and instruments, their combination and importance.

The most important and special characteristics of QMEs are the following:

- there is a significant difference in the level of development of different domestic markets for goods, money, capital, labour and foreign exchange, even though these are interdependent;
- due to serious imbalances both in the domestic economy and in external relations, the development of national markets cannot follow the same path as that followed by developed countries in the past. In the classical market economies the development of markets was a gradual process, following the real financial and credit needs of the goods markets. The strengthening of all other markets was a logical consequence. In the QMEs there is what may be termed as an artificial movement towards market liberalisation giving rise to an corresponding need for liberalization of trade and payments, as well as the opening of exchange markets. This means that exchange markets are being opened in spite of the undeveloped



stage of capital markets of QMEs.

In such countries, market forces prevail only to a limited extent during the transitional period. Their effects are often suppressed or compensated by administrative measures, and the market agents expect the existence of such official compensation.

Financial policy has no real tradition in such countries, and no information is available as to the behaviour of market participants. The correlations among the different aggregate economic variables are practically unknown. Policy makers must tackle uncertainties simultaneously on all markets. This, coupled with the political uncertainties in such economies, leads to a very dangerous situation with too frequent changes in the policy instruments and the continuous temptation to return to administrative measures when the market fails to deliver.

The transitional period in QMEs is generally characterised by serious political tensions. The increased reliance on market forces requires not only a fundamental change in economic thinking, but a change in the relationships among political, ideological and economic factors. Debate related to these changes tends to be strongly connected with political and ideological discussions sometimes encouraging more radical economic changes, and sometimes preventing even the minimum economic programme. In some instances, a gradual approach may easily become an empty phrase, causing delays in the liberalisation of market processes.

The necessity of change in economic management arises generally at a time when economic results are not encouraging. In case of QMEs the total qualitative transformation of economic policy becomes necessary in a crisis situation. Rigidities which had accumulated for decades, sometimes have to be dismantled quickly.

#### IV. Framework for Macroeconomic Policy in the QMEs

The main characteristics of disequilibrium in the QMEs can be represented as follows:

- a. Over-expenditure:  $C + I + G > Y$
- b. Savings Shortage:  $I + G > S$
- c. Trade Deficit:  $M > X$
- d. International Debt:  $C_M = M + D_S + X$   
but  
 $\Delta D_S > \Delta X, \Delta Y$
- e. Stagflation:  $PY_{t1}/PY_{t0} > 1$  but  $\Delta Y < 0$   
where symbols with sign  $\Delta$  indicate growth rate of the variable.



During the last decades  $C+I+G$ , i.e. domestic absorption ( $A$ ) was generally higher than real output. This was the result of different factors. Net expenditure of the government budget deficit and private expenditure on consumer goods played a significant role in the steady imbalance. Although there were periods when a great deal of investment was halted, the proportion of expenditure on investment fluctuated and because of the stagnation or decrease in the real output itself, this cut in investments did not result in the decrease of overconsumption. The value of  $G+I$  usually exceeded the given value of  $S$ ; partly due to the low level of domestic saving, partly to the considerable rise of  $G$ .

Government expenditure in general, but especially the net value of it, compared to  $Y$ , had a strong upward tendency. Export income did not finance imports, which necessitated a continuously growing external financing of trade deficit. External financing was mostly available through borrowing. Foreign direct investment, contrary to all efforts from the beginning of the 70's, played a more limited role in offsetting the deficit on current account. The continuous rise of debt ( $D_e$ ) inevitably led to serious weakening of the solvency or international liquidity of the countries in question.

A dynamic investigation of the general economic situation would show an even more critical situation.  $Y$  was stagnating or sometimes decreasing owing to the temporary restrictions of  $I$  and  $C$ . The efforts to restrict domestic demand did not give rise to an improvement in the trade balance and the relative growth of net  $X$ , but to the inevitable stagnation or decrease of real output.

Growing imbalances in the domestic markets, i.e. rising shortage of goods and services and money and labour, together with the simultaneously strengthening "overconsumption" and the strong decrease of real wages and salaries testify to the urgent need of economic policy changes.

The failure of bureaucratic economic management can be proved by the fact that the huge amounts of foreign debt had hardly eased the structural tension between demand and supply. Therefore administrative restrictions in domestic absorption have not led to a significant export expansion. The volume of "potentially" exportable goods rose, but actual export income lagged far behind expectations.

As a natural consequence of excess demand and or permanent overconsumption, inflationary pressure has generally strengthened. Irrespective of whether inflationary pressure was accompanied by the increase of the price level, or was administratively suppressed - inflation has become the most serious problem. Inflationary pressures, together with a stagnation/decrease of  $Y$ , manifest clear symptoms of stagflation, well known in the developed market economies as well, during the 70's.



Economic policy in QMEs must tackle the following problems:

*A. Domestically*

- how to abolish overconsumption, or in other words the optimalisation of the relative values of C, I, G;
- how to ensure the stable and steady growth of output, i.e. the optimalisation of the absolute levels of C, I, G;
- how to combat inflationary pressure without further restriction of economic growth;
- how to stimulate domestic capital accumulation and promote its rational allocation;

*B. Internationally*

- how to preserve solvency, to fulfill debt obligation;
- how to optimalise debt management policy;
- how to encourage foreign direct investments in order to assure the stable rise of Y and to cover capital shortage;
- how to assure improvement of the trade balance, supporting X by an active trade policy;
- how to introduce a liberalised import system in order to achieve real competition on the domestic market and to avoid further worsening of the trade balance;
- how should current payments be liberalised and which form of convertibility is necessary and possible in the given situation.

*Main Targets of Economic Management*

The main targets of the "New Keynesian Framework for Macroeconomic Policy" for developed open market economies can be summarised as follows:

- a steady stable growth path for the money GDP by maintaining a suitable level of total monetary expenditures on the country's products;
- a target value for national wealth, for wealth accumulation, for the suitable distribution of the country's products between current consumption and capital formation;
- exchange rate target, whereby the rate is not fixed but adjusts to prevent excessive swings in the foreign balance of goods and capital flows.

Evidently, these are final goals for any economy. If they are successfully attained, real incomes would rise steadily, with a promising future in terms of capital formation and exchange rate adjustment mitigating external shocks. The question as to whether or not such targets can be attained by QMEs is however debatable.

The problem is that these targets alone are not enough. Economic targets have a



double function: they set the course of policy making and help the society to keep government policy under an objective and steady control. To successfully carry out these functions, QMEs need to supplement these final targets with "intermediate" ones.

Taking into consideration the special characteristics and problems of the QMEs the following intermediate targets can be proposed:

- Balanced growth of domestic absorption
- Control of Government and Consumption Expenditure
- Price changes should not exceed growth of output
- A healthy debt servicing ration
- Liberalization of imports
- Control of exchange rates

The need for intermediate targets is clear. Economic policy needs a fixed aim, a so called target on each area, which forms an essential precondition for the final targets.

Thus it is essential to control domestic expenditure so that overconsumption is avoided. Overconsumption which accumulated during the past years has led to the unbearable debt burden of QMEs. It is also clear, that the fulfilment of this target in itself cannot guarantee an improvement of the economic situation.

It is also essential to identify the elements of domestic absorption causing the problem of overconsumption. It must be clearly stated how much "sacrifice" private consumers, investors and the government need to make, with particular emphasis on the government target. Social obligations of the government should be fulfilled but in combination with a full structural reform of the budget.

The target for the relative level of inflation may give rise to debate. Why not place the control of price changes ( $\Delta P$ ) as a target, why is it proposed to control price increases in relation to output increases? In other words why focus on the ratio  $\Delta P / \Delta Y$ ?

As suggested previously, QMEs are struggling with stagflation. While real output stagnates, or decreases,  $P$  is steadily increasing. In this situation a simple price index target is not really helpful, because by itself it does not say anything about the results of anti-stagflationary policy. This can be assessed only in relation to the growth rate of  $Y$ . The success of economic management depends not only on the anti-inflationary actions, but on the effect it has on aggregate output. A decrease in  $P$  and an increase in  $Y$  is more encouraging than a decrease in the rate of inflation combined with a further decrease in  $Y$ . The main point is that the target should give



some real information about the achievements of anti-stagflationary policy.

The debt-service to export ratio ( $D_s/X$ ) target is related to the efficiency of debt management policy, in connection with export results. This target determines a limit above which the relative value of  $D_s$  must not rise to avoid further external financial shocks. In case of highly indebted countries one of the most important task of the government is to avoid insolvency. But it must not result in justifying a policy which maintains solvency "by all means". It goes without saying that a country which usually has a trade deficit, - taking into consideration long term interests of the economy - cannot tolerate a very high debt service ratio. There is no general rule of course as to what value this ratio should take, since this would depend on the special circumstances of particular economies.

The target for import liberalisation is required in the special circumstances of QMEs. The opening of the relatively undeveloped markets to international competition is an urgent need of outward oriented economic policy. In view of the chronic Balance of Payments deficit, a gradual process in import liberalisation is however essential. Otherwise there is the risk that import demand may rise at too fast a pace.

Should importers receive a clear promise from the government as to the schedule of import liberalisation expressed in a concrete target, then there is a chance that the market would remain much more quiet. Some increases in the value of imports and so a growing temporary imbalance between  $X$  and  $M$ , cannot be excluded, especially at the beginning. But the danger of a sudden and drastic rise in the import value will surely be reduced.

Exchange rate targets are of basic importance. With respect to the serious Balance of Payments problems of QMEs, the continuous control of actual exchange rate is one of the most effective instruments the governments should resort to during the process of increased reliance on market forces.

Controlling exchange rates may in some ways be easier and in some ways more difficult than in the market economies. It may be easier because there is no market with undesirable exchange rate movements for the official policy to fight against. The difficulty originates from the absence of market information about the exchange rate elasticity of domestic demand for foreign currencies. Prices on the black markets or abroad - if any- do not give reliable guidance to the real value of the home currency. Even if exchange markets are highly developed, governments may and should intervene in some restricted way to avert extreme fluctuations in the exchange rates. This need is even stronger where the markets are in an initial stage.



## V. Reaching the Targets

The intermediate targets are not independent preconditions of the final targets. There are very strong cross-relationships among the different short and longer term aims. A given target combination does not imply an exclusive direction which the policy measure is to be aimed at. The value of each target and instrument change has to be planned with utmost care in respect of subsequent direct or indirect effects.

The investment share target ( $I/Y$ ) can be considered as a qualified precondition for the final targets. There is a direct link with national wealth and an indirect link with real incomes (money GDP). It is therefore of crucial importance whether and how the necessary level of  $I/Y$  can be assured. How could the structure of domestic expenditure be changed in favour of investments? Which measures promise the decrease of net government expenditure and the prevention of a rise in consumption?

In case of QMEs monetary policy actions do not seem to be the most suitable form of attempting to control the economy. Decreasing the rate of interest may increase planned investment, nevertheless  $C$  and or  $G$  may remain unchanged. If  $Y$  stagnates neither  $C$  nor  $G$  would fall to a significant degree, necessary to compensate for the rise of  $I$  so as to avoid overconsumption and a further rise in trade deficit. On the other hand it must be emphasised that the required restructuring of domestic absorption does not mean automatically that  $\Delta(C+G) = \Delta I$ . Rather it must be based on  $\Delta G = \Delta I$ . Of course demand restructuring has to affect the level of  $C$  as well but in the case of QMEs the government has to take the "lion's share" of the cut.

This requirement arises from the fact that QMEs tend to have a relatively high level of  $G$ , which derives mostly from the system of wide scale state subsidies. The reduction in  $C/Y$  is necessary to avoid a general crises of confidence in the government policy. In many QMEs, state subsidies on a large scale, compensate the low profitability of the (mostly) state owned enterprises and have in themselves an anti-market character. If increased reliance on market forces is a real policy aim, not an empty slogan only, the decrease of  $G/Y$  is fundamental. The extensive use of subsidies - accompanied, of course, by a very high level of taxation - work against market forces and basically hinder economic efficiency. With widespread subsidisation of production, it is not possible to verify whether and to what extent a given line of production is profitable or not. Very frequently the end product is inefficiently produced in terms of price and quality.

Although there is a significant overdemand in QMEs, the solution does not lie in restricting but in restructuring it demand. Interest rate policy, if applied in QMEs



would not probably be sufficiently effective, since its impact on the main culprit, namely the share of G, would not probably be significant. Fiscal policy is more promising towards this end.

### *Fiscal Policy*

To assure an expected rise in the value of  $I/Y$  - basically at the expense of G - a complex fiscal policy may be required. It must be emphasised however that control must be operated on both sides of the budget account.

Fiscal instruments, devised to change the relative weight of C, I and G, naturally concern government expenditure and revenue/tax policy as well. The QMEs' most important economic problem lies in the budget where the composition and the level of government expenditure are matters of concern. The extraordinary high level of expenditures, together with the very high level of its absolute value devoted to "economic" activity do not promote liberalization. There is an urgent need in QMEs for the governments to cut their expenditures, primarily on direct economic activities. There is no need to cut government expenditure at the expense of social welfare only. State subsidies to companies at a loss and the costs of the huge central administration and defence expenditure, assure a sufficient buffer which could leave social expenditure relatively untouched and may even result in an increase in this area.

On the other side of the coin, tax policy can significantly assist in the realisation of the targeted change in the structure of domestic demand. The adjustment of all tax rates is an appropriate instrument in controlling demand structure. Since the cost-push element of wage setting is not so strong as in case of the developing market economies, a rise in the tax rates would not necessarily lead to an equal increase in inflationary pressure on wages and prices. However, the specific economic conditions in QMEs may not permit an increase in tax rates. On the contrary, most probably selective cuts in tax-rates may be a better option to attain certain demand structure targets. Consequently fiscal policy through tax changes alone would not probably bring about the necessary changes in the demand structure. Changes on the expenditure side of budget account are also necessary.

A general cut in the expenditures and selective changes in the rate of different taxes are the tasks fiscal policy must fulfill. The necessary tax measures intended to stimulate an increase of I and  $I/Y$  - would clearly result in a lower level of government income. For this reason the decrease of the government expenditures is essential. In the circumstances in which QMEs find themselves, fiscal policy is of extreme importance for stimulating investment only if it involves a reduction of the  $G/Y$  ratio.



The target of  $\Delta P / \Delta Y$  plays a central role in the economic management. It is a fundamental precondition of all other targets, and at the same time it is the function of all the targets given. The positive difference between the growth rates of the price level and output must be gradually diminished. Inflation outpacing economic growth implies a steady excess demand, which real output can reach. Owing to special reasons in QMEs, excess demand sometimes occurs with an actual fall in output.

As already stated, the QMEs are characterised by a continuous excess demand, causing ever increasing inflationary pressures. What factors are responsible for the inability of QMEs to raise their output to the level of domestic demand? There are a number of possible answers, generally related to the rigidities caused by administrative-bureaucratic factors and to capital shortage. Because of these factors it is difficult to expand the productive capacity in the necessary measure, in an efficient manner and at the right time.

It should also be pointed out that the imbalance between supply and demand has a strong structural character. Should the structure of supply adjust itself to the determinants of demand, disequilibrium on the goods market would be eliminated. But in QMEs, production is not guided by those market forces which in developed economies give rise to relatively fast response of supply to changes in the structure of demand.

In QMEs the profit made in certain lines of production does not reflect demand conditions, due to artificial support by the government or to insensitivity to market forces. Consequently a decrease of income, either from the lower prices or from the reduced sales, may not prompt the producers to adjust accordingly. Under real market conditions, and with a suitable monetary control, structural imbalance in the goods market would not lead to a continuous and steadily rising inflationary pressure. The relative absence of these factors in QMEs is the major source of the growth of excess demand and inflationary pressure in such economies.

The major task in such countries is therefore to moderate the disequilibrium between demand and supply by (a) controlling the further growth of demand and (b) stimulating the necessary structural changes in output.

The  $\Delta P / \Delta Y$  target requires economic control both on the demand and on the supply side of the market; quantitative control of demand and basic structural changes on the supply side. It would be totally unrealistic if economic policy were to aim at immediate and full stabilisation. The task requires a targeted gradual decrease of inflation relative to the actual growth of the real output. In this way, reaching the desired level of  $\Delta Y / \Delta P$ , economic policy can fulfill the final target of a non-



inflationary steady growth path of money GDP.

Fiscal policy is often considered attractive because of its direct effect on quantitative and structural control of aggregate domestic demand. Although, as already noted, the scope of Monetary policy may be more limited in QMEs, it can also have a role in helping QMEs to achieve the targets related to  $\Delta P/\Delta Y$ .

Monetary policy has a two-fold function namely:

- (a) to reduce inflationary pressures and
- (b) to stimulate structural change and quantitative growth in Y.

Generally speaking we cannot be sure beforehand whether a change in interest rates is going to be inflationary or anti-inflationary. The effects of such changes depend on the given circumstances and on expectations.

During the 80's empirical evidence in the QMEs shows that the rise of interest rates did not ease inflationary pressure. When the traditional low and stable level of interest rates began to rise, there were changes in the velocity of money, as money holders considered rising rates as a sign of alarm.

Interest rate policy could however play an important role in restructuring the economy. A selective credit policy could be introduced in order to achieve the necessary structural changes in Y. This can be coupled with policies related to the minimum reserve ratio and credit ceiling policies.

### *Capital Shortage*

QMEs tend to suffer from capital shortage. A significant part of this shortage was created by the system of subsidies, which enabled producers to obtain finance even if their profitability was very low and the enterprises were loss-makers. There was therefore gross misallocation of investment resources, with potential profit making ventures remaining unserved.

The changes of relative interest rate (compared to its previous level) would influence credit demand. Although interest rate elasticity of credit demand is steadily changing and can only be estimated with a considerable margin of error, it can be stated that as interest rates increase credit demand would decrease if market forces are allowed to operate. If there are severe disturbances in the operation of the credit markets, one can hardly speak about any real correlation between the two factors.

As to the efficiency of investments, the real consequences of interest rate changes



cannot be evaluated in isolation, since other factors, such as the tax structure, have to be considered. A lowering of interest rates may not stimulate investment if taxation is unduly prohibitive. In QMEs this is a very serious problem. Accounted profits are fully misleading, and owing to the complicated system of state intervention (subsidies and different taxes) even the most thorough investigation cannot give a realistic picture about effectiveness.

The combined use of interest rates and domestic credit controls have to serve two seemingly contradictory purposes to reach the target rate of  $\Delta P/\Delta Y$  namely (a) deflation, i.e. controlling  $P$  (restraining its rise) and (b) reflation stimulating a rise in  $Y$ .

In fact, the above dilemma may not be as impossible to solve as at first glance, since, as shown earlier, the correlation between interest rates and aggregate demand is very low. So any change in interest rates could be aimed at the reflation purpose without damaging the deflation purpose.

The use of interest rates in QMEs however may only have a limited effect. Since the actual credit market effects of interest rate changes are rather unpredictable, monetary control should rely more on selected domestic credit ceilings, instead of applying some interest rate rules. Domestic credit "limits" should be adjusted to the requested expansion of economic activity and interest rate changes assure that the credit limits should be used to the full.

### *Exchange Rates*

In connection with exchange rate policy economic requirements are rather contradictory. As liberalisation proceeds, the exchange rate affects more and more economic factors. The growing links between domestic and external markets gradually strengthen the relationship between home and international prices of goods, prices of money and capital.

Exchange rates influence the basic economic processes directly. In the transitional period, liberalisation of the market for goods and services probably reaches a more advanced level than that of money markets. From this point of view the exchange rate policy could be aimed at decreasing the relative rate of increase of domestic prices. It would mean some overvaluation of the currency or at least the stability of the real exchange rate, but not necessarily effecting the real exchange rate. Looking at the target with respect to the structure of domestic demand, certain requirements have to be served by an exchange rate policy. In order to stimulate investment activity, import requirements must be satisfied in volume and at suitable prices. Rising import prices due to a decrease of the real exchange rate would tend



to discourage investment.

Unfortunately, the export side requires a different exchange rate policy, it is often argued, competitiveness would improve with a decrease in the real exchange rate. If we accept the traditional "elasticity" approach, export income may rise following the fall of exchange rate. Although this is often stated in theory, there not much empirical support with respect to QMEs. If the deficit on foreign trade is of structural nature, declining exchange rate will not stimulate exports - they will only result in a worsening of the terms of trade, giving rise to a shrinking of Y and stronger inflationary pressures.

In case of the relatively undeveloped QMEs, the elasticity of exports and imports would tend to be very low, especially on the import side. The elasticity of import demand with respect to import prices would also be very low in QMEs due to the fact that the imported products tend to be essential and/or non-substitutable with domestic products. A devaluation, therefore, is hardly the right approach for reducing the trade deficit and promoting the growth of Y.

It is similarly questionable whether the lower real exchange rate would stimulate foreign capital owners to invest their capital in the given country.

All in all, the optimal level of exchange rate and the exchange rate target raise difficult questions. The price of the currency concerns all intermediate targets, which require therefore a compromise in the exchange rate policy. The exchange rate cannot be used exclusively for anti-inflationary policies or for promoting structural changes in Y; such aims would theoretically require some overvaluation. On the other hand, it cannot be stated with certainty that an overvaluation of the currency is desirable, because this would effect export competitiveness giving rise to a reduction in exports, even if only to a small extent. Therefore exchange rate targets must be in the zone which causes the least damage.

As to the exchange rate target, policy makers in the QMEs are confronted with three problems. The first is that for a long period exchange rate has played no economic role at all and this, coupled with the still deformed domestic prices system, renders it s extremely difficult to verify the level or even the zone at which to target exchange rate.

The second is related to the the special dilemma in QMEs which face inflation together with a trade balance and current account deficits. It is debatable which imbalance the exchange rate should be aimed at: domestic or external? In the QMEs, where structural problems play a far more important part in correcting the trade deficit than do prices, the choice is much more limited.



Should the authorities divert the exchange rate from its desirable level or zone, assuming that these are known, in order to help anti-inflationary efforts, they must be very cautious since a perceptible overvaluation might be inconsistent with the balance of payments problems.

Thirdly, even if the direction and extent of changes in the exchange rate have been decided, there is the question of the instruments to be applied. How and by which means could the target be achieved? This, at first glance appears to be a very easy task since there is only one officially determined exchange rate. In reality it is not so easy. Monetary authorities may dictate the exchange rate, but it is their task to meet fully the demand for currencies at the given prices. The gradual liberalisation of imports and the progressive evolution of exchange market characterise the transitional period. As soon as an exchange market comes into existence and a steadily growing proportion of foreign exchange transactions takes place on the market, the exchange rate target requires a very active intervention policy from the authorities.

In order to bring actual exchange market rates to the target level, QMEs cannot rely on interest rate policy in a direct way, as developed market economies do, since the money and capital markets tend to be less liberalised and therefore in the first stages of the transformation one cannot expect that exchange rates would respond to interest rate changes.

## **VI. Conclusion**

This paper has focussed on the special characteristics of Quasi Market Economies. It has been noted that the major difference between these economies and the developed market economies is that the policy options in the former economies are more restricted, principally due to the underdeveloped nature of their markets, the high degree of government intervention and the rigidities which are often structural in nature. Although quasi-market economies tend to face more severe economic problems than the developed ones, they have fewer instruments at their disposal to solve their problems. Some of the dilemmas encountered by the policy makers in QMEs were highlighted in the paper. It has been suggested that a principle objective of QMEs should be to control inflation and at the same time promote economic growth. Restraint in government expenditure coupled with changes aimed at stimulating investment and liberalizing the markets have been advocated as the basis for a macroeconomic policy framework for QMEs.



# **T**he Importance of the Underground Economy in Greece

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## **I. Introduction**

The growing interest on underground economy in capitalist economies goes hand in hand with the recent enrichment of the literature concerning it. Despite the fact that different studies have given it different definitions,<sup>1</sup> identified different causes<sup>2</sup> and used different estimation methods,<sup>3</sup> a few conclusion can be derived regarding this form of economic activity.

- The underground economy is the economic activity whose result is not included in national income<sup>4</sup>
- in spite of the large number and diversity of the causes leading to the existence of the underground economy or encouraging it, the main factors are, most probably, heavy taxation, on one hand<sup>5</sup> and government intervention in the economy on the other<sup>6</sup>
- to identify the factors encouraging underground economic activity,<sup>7</sup> the structure and characteristics of each economy have to be taken into account. Despite the fact that, generally, attitudes towards the underground economy are negative<sup>8</sup> there seems to be a slight shift in the literature in question<sup>9</sup>. This changing attitude towards the underground economy stems from the development of the prevailing theoretical views. This rising importance of supply economics and all that goes with it, stresses the importance of efficiency and competitiveness on the international level rather than the problems of tax evasion which are related to the underground economy.<sup>10</sup>

The aim of this article is to highlight the characteristics of the underground economy in Greece and to specify a model taking these characteristics into account.<sup>11</sup> The study also briefly discusses the positive and negative aspects of underground economic activity, considering the actual possibilities and weaknesses of the Greek economy.



## II. The Model

The obvious difficulty in specifying a model relating to the underground economy is primarily associated with the definition of the dependent variable which should, naturally, represent it. All previous models<sup>12</sup> are based on the attempt to estimate, directly or indirectly, the difference between the officially declared GDP and the real GDP, the latter being greater than the former. The methods chosen by various researchers in order to measure the underground economy, are more or less dependent on the characteristics of each economy; this may also be the reason why the application of these methods to different economies is rarely successful.<sup>13</sup>

The choice of the dependent variable in the following model was made with reference to the Greek economy. It consists of the difference between the official value of  $\alpha$  in the Cobb-Douglas function and that which would have ensured internationally acceptable standards (i.e.  $\alpha=0.75$  approximately). We call this variable UEA (Underground Economic Activity).

The dependent variable UEA represents a difference between the officially declared revenue and the real revenue. It does not resemble the measures of underground economic activity used in other studies,<sup>14</sup> but it nevertheless is within the same school of thought.<sup>15</sup>

### *The Size of the Underground Economy*

Using UEA, computed as described above, we can make tentative estimates of underground economic activity in Greece. It is shown in Table 1, that UEA constituted 4.5% of the civilian GDP in 1970 and 25% in 1985.

It, therefore, represents a value of little importance up to 1976 which, however, rises steeply since. On the basis of the data and calculations included in Table I, the civilian GDP of the Greek economy was 11% greater than the one officially declared on average during the period in question, by 15% greater on average during the period 1977-85 and by 22% greater on average during the last four years. If underground activity is included, productivity per person employed would be about 14% greater on average during the period 1970-85, than the official one.

Disposable income represented on average 84% of the official GDP during the period 1970-85. The average propensity to consume, on the other hand, is equal to 67% of the official GDP during the period in question. If we, now, attempt to re-estimate the average propensity to consume in the civilian GDP including the underground economy, this would be 28% higher than the official average propensity to consume, over the whole period.<sup>16</sup>



**Table 1. The Underground economy as % in the civilian GDP**

	(1) GDP Current Prices (million drchs)	(2) Agricultural GDP	(3) (1) - (2)	(4) UEA	(5) (4)/(3)
1970	258000	47058	210942	9498	4.50
1971	287422	52334	235088	5386	2.29
1972	329977	61467	268510	7477	2.78
1973	428216	87311	340905	0	0
1974	507328	100365	406963	11007	2.70
1975	593181	110971	482210	0	0
1976	728735	136204	599253	15166	2.55
1977	844628	141543	703085	88329	12.56
1978	1016709	177074	839635	168596	20.07
1979	1245187	198166	1047021	129157	12.33
1980	1523724	270058	1253666	137295	10.95
1981	1856745	329285	1527460	191009	12.50
1982	2288314	424415	1863899	363284	19.49
1983	2706100	462769	2243331	468783	20.89
1984	3317770	593421	2724349	627980	23.05
1985	4025537	700237	3325300	829819	24.95

Sources: (1) The Greek Economy in Figures; (2) OECD, Economic Surveys, Greece; (3) EUROSTAT; (4) Physical persons' declarations for taxation purposes.

### *Specification of the Model*

The model which covers the period 1968-85 has the following form:

$$UEA_t = a_1 + a_2 EMPS_t + a_3 CNSG_t + a_4 MIMP_t + a_5 I NVM_{t-2} + a_6 CBF\alpha_t + U_t$$

where:

UEA = the underground economy in period t measured as the amount which should be added each year to the officially declared revenues of the independent workers in order that the value of  $\alpha$  in the Cobb-Douglas function be equal to 0.75; this represents the dependent variable of the model;

EMPS = employment in the service sector in period t;

CNSG = public sector spending for consumption purposes in period t;

MIMP = imports of consumer's manufactured products in period t;

INVM = investment in the manufacturing sector (with a two year lag).

CBF $\alpha$  = the official value of  $\alpha$  in the Cobb-Douglas function in period t<sup>17</sup>

U = Error term



### III. The Variables of the Model

The adoption of UEA as the dependent variable of the model requires suitable independent variables to satisfy plausible theoretical causes and effects. The variables to be included in the model are related to governmental intervention and taxation, employment in the various economic sectors of the efficiency of economic activity and the dependence of the Greek economy on imports.

Table II shows the data for the dependent and independent variables of the model. In choosing the variables we sought to satisfy two conditions namely (a) that they are theoretically plausible explanatory variables and (b) that they are consistent with economic reality in Greece.

The dependent variable UEA, which, as stated earlier is taken to represent underground economic activity, has increased by 87 times during the period considered. The very high rates after 1981 may be explained in terms of a number of factors pertaining to the Greek Economy.

**Table 2. The Data**

	(1) UEA	(2) EMPS	(3) CNSG	(4) MIMP	(5) INVM	(6) CBF $\alpha$
1970	9498.00	1072.00	37742.0	200.700	10044.0	.795000
1971	5386.00	1103.80	39607.0	230.200	11198.0	.776000
1972	7477.00	1124.60	41851.0	271.000	13238.0	.789000
1973	0.00000	1334.60	44698.0	397.300	14457.0	.768000
1974	11007.0	1156.50	50096.0	400.300	14914.0	.780000
1975	0.00000	1178.00	56075.0	497.000	13132.0	.753000
1976	15166.0	1200.00	58953.0	569.000	13288.0	.838000
1977	88329.0	1224.00	62800.0	688.000	12599.0	.862000
1978	168596.	1253.00	65000.0	799.000	12244.0	.899000
1979	129157.	1297.00	68800.0	1016.70	13824.0	.820000
1980	137295.	1325.00	68940.0	875.000	14899.0	.821000
1981	191009.	1424.00	73640.0	883.000	13973.0	.855000
1982	363284.	1463.00	75330.0	954.000	13120.0	.906000
1983	468783.	1453.00	77400.0	883.000	12208.0	.924000
1984	627980.	1496.00	79760.0	834.000	12101.0	.958000
1985	829819.	1571.50	82000.0	954.000	11052.0	.973000

Sources: (1) OECD, Economic Surveys, Greece, EUROSTAT and physical persons' declarations for taxation purposes; (2) OECD, Economic Surveys, Greece, EUROSTAT; (3) The Greek Economy in Figures (current prices); (4) The Greek Economy in Figures (indices); (5) The Greek Economy in Figures (constant prices); (6) Same as 1.



The prevailing fiscal system in Greece was highly unsatisfactory. In fact, the 60% of public spending are financed from the taxes paid by the wage earner.<sup>18</sup> The average tax burden of the wage earners rose from 8.7% in 1973 to 11.9% in 1981 and to 15.2% in 1985. On the other hand, the contribution of merchants and entrepreneurs dropped from 41.4% in 1973 to 17% in 1985 and, finally, the contribution of liberal professions dropped from 13.2% in 1973 to 8.8% in 1985.<sup>19</sup> These developments which are not related to the changing relative size of wage earners to total employment, are mainly due to the governmental policy, which attempted to encourage investment without paying adequate attention to its effect on tax-evasion<sup>20</sup> and to undesirable distribution of income.<sup>21</sup>

The austerity policy followed during the last few years in Greece managed to freeze real wages although it did not succeed to control the revenues of the self employed. This may be the reason why this policy was not able to bring about a drop in the economy's propensity to consume and imports of manufactured goods.

The independent variable EMPS indicates a significant rise in employment in the services sector, not accompanied by a corresponding rise in the whole of the economy or the secondary sector. It may be hypothesised that increases in independent employment in the tertiary sector unrelated to that of the secondary sector is a factor associated with underground economy<sup>22</sup> and its growth<sup>23</sup>.

Table II shows a spectacular growth of public sector spending (CNSG). This variable may be taken as an indicator of tendencies associated with underground economic activity, including taxation<sup>24</sup>, government intervention<sup>25</sup>, a low degree of fiscal morality<sup>26</sup>, a high propensity towards tax evasion<sup>27</sup>, and a high rate of inflation.<sup>28</sup> Furthermore, this independent variable measures and includes certain complementary relationships, such as the relative importance of the private sector vis-a-vis the public one and its growth, the contribution of public spending to growth, the number of public workers, and the consequences of the application of an unsatisfactory fiscal policy.

The independent variable MIMP, namely imports of consumer goods has been included mainly to test the hypothesis that underground economic activity is a substitute to imported consumer goods. It might be possible that the underground economy can satisfy certain requirements which compete with imports - in other words, a decrease in underground economic activity can result in an increase in imports and vice-versa. In this case, a negative relationship between UEA and MIMP should be expected. We are interested in this hypothesis because the policy implications related to the Greek underground economy would be extremely important, given that the external balance deficit represents a constraint to the rapid growth of the Greek economy.



The independent variable INVM represents investment realised in the manufacturing sector and is measured with a lag of two years. We expect a negative sign on the coefficient of  $INVM_{t-2}$ . It is hypothesised that with the growth of underground economic tertiary activities compete for funds with the manufacturing sector. This is in keeping with the characteristics of the Greek economy, namely a low propensity to invest in the manufacturing sector, and an inability of this sector to create new employment opportunities. For this reason, when  $INVM_{t-2}$  drops, UAE is expected to increase.

The variable  $CBF\alpha$  is the calculated value of  $\alpha$  in the Cobb-Douglas function of the Greek economy, estimated for the period 1970-85 as described earlier. It is based on official data (i.e. it excludes underground economic activity). The coefficient on this variable is expected to have a positive sign, indicating that changes in underground economic activity are related to changes in the income of self employed persons - or to be more precise from those earning non-wage revenue.

Before proceeding to estimate the model, it should be noted that despite the possibility that the Greek underground economy is one of the highest in Europe, it has not, as yet, been adequately econometrically analysed.<sup>29</sup>

The following section gives the estimates of the model presented above and discusses some properties of the model.

#### IV. The Estimates of the Model

The estimated coefficients of the model are the following:

$$\begin{aligned} \text{UEA} = & \text{constant} + 645.682 \text{ EMPS}_t + 17.853 \text{ CNSG}_t + 0.126E + 07 \text{ CBF}\alpha_t \\ & (-4.4636) \quad (2.375) \quad (2.354) \quad (2.011) \\ & - 35.7742 \text{ INVM}_{t-2} - 629.347 \text{ MIMP}_t + U_t \\ & (-2.6159) \quad (-2.578) \end{aligned}$$

$$\text{No. of Observations} = 16 \quad R^2(\text{adj}) = .923 \quad \text{D.W.} = 1.761 \quad F = 36.967$$

The following remarks can be made on the results:

- The general fit of the model is quite satisfactory. This is indicated in the first place, by the high value of the coefficient of determination  $R^2(\text{adj})=0.923$ .
- All the independent variables included in the model are significant at the 95% significance level.
- The value of the F distribution is equal to 36.9666 while its critical value in our case is equal to 4.74.
- The signs of the independent variables can all be justified theoretically.
- The estimated model presents no first order autocorrelation as indicated by the



- value of the D.W. coefficient which is equal to 1.76089.
- f. Tests for the normal distribution and for homoskedasticity of the residuals do not indicate that we should reject the hypotheses that the residuals follow approximately the normal distribution and that the residuals are homoskedastic.
  - g. Finally, in the following table we may see the elasticities of each independent variable in relation to the dependent variable, as well as each one's explanatory power in the model.

<i>Variable</i>	<i>Coefficient</i>	<i>Beta Coef.</i>	<i>Elasticity</i>	<i>Partial R</i>
MIMP	-629.347	-0.707288	-2.15477	-.632
CNSG	17.853	1.05366	5.74825	.597
CBF $\alpha$	.126E+07	0.346787	5.58324	.537
INVM <sub>t-2</sub>	-35.7742	-0.312429	-2.32975	-.637
EMPS	645.682	0.391365	4.37309	.601

The elasticity of CNSG which shows a high degree of statistical significance in the model, indicates that a one percent increase in this variable brings about a rise of 5.74 percent in the underground economy. Its positive sign is in accordance with the theoretical view that attributes the existence of the underground economy, in the first place, to heavy taxation and extensive government intervention.

According to our estimates, a one percent increase in CBF $\alpha$  results in a 5.58 percent increase in UEA. This high elasticity naturally, stresses the relationship between self employment income and the underground economy. This need not negate however the possibility that a number of workers earn non wage income (apart from wages). It is a pity that the available statistical data in Greece do not allow such a distinction.

The elasticity of UAE with respect to EMPS is 4.37. The positive sign of EMPS as well as its elasticity in relation to UEA are to be expected since the growth of the tertiary sector feeds the underground economy.

The negative elasticities with respect to the independent variables INVM<sub>t-2</sub> and MIMP are also plausible for reasons discussed earlier.

As regards the negative relation between UAE and MIMP, it is, not possible, at this stage of the research to confirm that the imported goods and those provided by the underground economy are on the same indifference curve. They would be if they could be considered as substitutes. But are they? If the answer is found to be positive, the implications concerning the Greek balance of payments would be extremely important.



## V. Some Comments

According to the method used in this study, the underground activity accounts for approximately 25% of the officially declared civil sector GDP in 1985. Suppressing underground economic activity may therefore mean a large loss of income and employment.

Under these conditions, a policy aiming to fight against underground economic activity should solve, in the first place, the problem of its replacement. Apart from the fact that the actual economic structures do not seem to offer many alternatives, the elimination of 25% (and more) of the real civil sector GDP may usher in the danger of sharply increasing imports if, in fact, MIMP and UEA are substitutes.

Discussions on underground economic activity generally focus on the disadvantages of such activity. One disadvantage is that tax evasion gives rise to an unbalanced tax-burden on the wage earners, and in Greece this is giving rise to a highly uneven income distribution. However, eliminating underground economic activity without taking steps to replace would constitute a decline in the real (as distinguished from the official) GDP.

In some instance, the curtailment of underground economic activity may even mean a loss of relatively efficient production. In Greece, for example, Tourism, a major industry sector in this country<sup>30</sup>, has probably become more efficient and competitive, because of its numerous underground elements.

It can also be argued that a high ratio of underground to official activity has implications relating to the natural environment, since it may signify a higher percentage of small firms using little capital<sup>31</sup> in comparison to other countries with a lower ratio. In other words, underground economic activity may possibly give rise to a relatively lower degree of pollution.

## VI. Conclusion

Every economy has its own characteristics, and a model of the underground economy of a particular country should take into account the specific structures and stage of development of the country. The present study has sought to present a model for the underground economy, with special reference to the Greek economic reality.

It was argued that underground economic activity in Greece is the combined result of insufficient scope for industrialization and of excessive government intervention.



It is important to stress that one should distinguish between the undesirable consequences of the underground economy on income distribution the rate important role of such activity on the growth of real GDP. It is, therefore, vital to consider the phenomenon of the underground economy with no prejudices.

If the underground economy is, in fact, recognised as on balance undesirable, and a policy for its curtailment is adopted, the numerous structural particularities of the economy in question should be taken into account.

#### NOTES AND REFERENCES

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9. See S.M. Miller, "The Pursuit of Informal Economies", *Economic Impact*, 1988/2, p. 23; Gabriele Gaetani d' Aragona, "The Hidden Economy: Concealed Labour Markets in Italy", *Rivista Internazionale di Scienze Economiche et Commerciali*, 1981, p.p 282; M. Roy, "Le Travail Noir", *Le Point*, 12.11.79, pp. 77; L. Gazzo, "Travail Noir: Les Chomeurs voient Rouge", *Vision (Paris)*, Apr. 1977, p. 36; O.E.C.D. *op.cit.* p. 69.
10. See Maria Negreponi-Delivanis, "The economy of the Underground Economy in Greece", being prepared for publication by Papazisis (in Greek).
11. The underground economy in Greece has not up till now been adequately modelled. See the interesting study by P. Pavlopoulos, "The Underground Economy in Greece", IOBE No. 17, 1987, where the author reaches approximately the same percentage as in the present study far as the economic activity within the GDP is concerned, although he does so using a microeconomic method.
12. There are references to some in note 3 above.
13. In the case of Greece, any attempt to apply previous models in order to estimate the importance of its underground activity, has failed. Cf. P. Pavlopoulos *op.cit.* 1987, p. 161 and Maria Negreponi-Delivanis, *op.cit.* Part I, Ch. I.
14. See E.L. Feige, *op.cit.* 1979, V. Tanzi, *op.cit.* 1980, K. Macaffee *op.cit.* 1980, Michael Carter, *op.cit.* 1984.
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16. See M. Negreponi-Delivanis (in collaboration with V. Portaritou-Kresteniti) *What is the possible efficiency of the austerity policy applied in Greece*, Oikonomikos Tachidromos, 1986, (in Greek), where it is argued, among other things, that the average declared revenue on the part of all households represents 72.2% of their total annual purchases; (in other words, their spending for consumption is by 28% higher than their officially declared revenue). More precisely, it represents 70.0% in the case of households where the head is a wage earner, 63.2% for households where the head is boss and 59.6% in the case of households where the head is self employed.
17.  $\alpha$  is calculated as follows:  
(Salaries/Civil sector revenue)/(Wage earners/(Civil sector employment)).
18. These represent only 46% of total employment.
19. See A. Agapitos *Wage earners bear the tax burden*, Oikonomikos Tachidromos, 1986 (in Greek).
20. M. Negreponi-Delivanis (and collaborators), *op.cit.* 1986. p. 101
21. *Ibid*, p. 102 *et seq.*
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23. See M. Negreponi-Delivanis, *Analysis of the Greek Economy*, 2nd edition, Athens 1985, p. 246.



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27. See M. Negreponi-Delivanis, *op.cit.*, 1986b, p. 85 *et seq.*
28. See Raffaele de Frazia, *op.cit.* 1980, p. 555.
29. See M. Negreponi-Delivanis (and collaborators), "Measures for the encouragement of industrial investment", *KEPE* No. 16 1986, M. Negreponi-Delivanis (with the collaboration of V. Portari-tou-Kresteniti), *op.cit.* 1986b.
30. Argued by Eleni D. Delivanis in her D.Phil Thesis in progress at the University of York (U.K.).
31. An Interview With Robert E Litan, "The Need for Policy Reforms", *Economic Impact*, 1988/2, pp. 32-36.



## **A**ctivities of the Foundation for International Studies

The following is a list of a number of activities related to Mediterranean issues, organised by the Foundation for International Studies for the period April - December 1991,

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**International Seminar on Migrants and Refugees - Islamic and Christian Perspective and Practices.**
- 13-14 May        Mediterranean Academy of Diplomatic Studies / FIS.  
**The Mediterranean - Divide or Bridge**
- 12-25 May        Mediterranean Institute, University of Malta / FIS.  
**International Conference on Islands and Small States.**
- 27-31 May        UNESCO / FIS.  
**Environmental Education Training Seminar**
- 26-30 August    Mediterranean Academy of Diplomatic Studies / FIS.  
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- 4-6 November   FIS / University of Leipzig / University of Tampere  
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For further information please write to:

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## **A**nnouncements

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### **INTERNATIONAL CONFERENCE ON ISLANDS AND SMALL STATES**

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in collaboration with the  
**Mediterranean Institute of the University of Malta**  
23 - 25 May 1991

The three day conference will be held in Malta with the following aims:

- (a) to undertake a comparative study of the structure and performance of small economies;
- (b) to identify and analyze obstacles relating to the economic development of small countries in view of their size and to discuss policy implications associated with same;
- (c) to discuss and develop models for islands, incorporating economic, demographic and ecological variables.
- (d) to prepare a framework for the publication of a text book on the economies of small states.

The conference will be based on the following main topics:

- viability
- dependency on international trade
- political and economic integration
- Island eco-systems
- marine environmental problems
- planning and policy

Speakers of international repute will present papers on these topics and will lead the plenary sessions. Other participants will have the opportunity to present papers and exchange views during the panel sessions.

*Further Information may be obtained from*

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