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**Infrastructures of transport and regional development: the  
rediscovered centrality of the Gioia Tauro container port in the  
Mediterranean**

by  
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**Introduction**

The European ports in the Mediterranean are today enjoying a renewed centrality along the world's most dynamic routes which link Europe with the Far East - Pacific. This central position comes from the 6-7 days advantage gained in navigation time compared with the other great Northern European ports of call.

The recent establishment of the container port of Gioia Tauro is proving to be one of the most important transshipment junctions in Southern Europe. This port will be able to reach its full potential if the right kind of policies are applied to the territory and the foundations for high-level logistics are laid.

This means setting up a suitable and advanced system of infrastructures of road and rail links in the national and continental hinterlands in terms of both technical level and solution-finding. Only in this way will it be possible to implement forms of competition among economic systems on a territorial basis rather than among individual productive units. In fact, after decades of sectorial interventions, the trans-European transport networks can start to be considered the first systematic attempt towards integrated actions between the European Community's transport policies and regional policies.

This paper aims to set the experience of Gioia Tauro within the framework of the Mediterranean's logistical evolution and the ambit of the territorial transformation now under way.

The impact on the economic system of an infrastructure which "potentially" constitutes a "structural break" in the territory-economy-transport system can be evaluated either through gauging a macro-economic analysis directed at estimating the "potential development", or through the evaluation of companies' attitudes towards the use of these infrastructures.

With regards to this prospect, on the one hand an evaluation of the impact of infrastructures on the per capita income will be proposed according to the approach of the function of quasi-production, which will be estimated by a regional cross-section.

Finally, with closer reference to the experience of the port of Gioia Tauro, the results will be proposed of a probit data model obtained from a survey carried out on the most important Southern Italian companies.

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As for the empirical side of the question, this paper has been largely written using the work which the authors have carried out within the ambit of ISFORT<sup>4</sup> research on the evaluation of the impact of the port of Gioia Tauro on the national transport system and on the regional economy.

### **1. The evolution of logistics and configuration of the territory**

Logistics can be defined as a complete system directed at handling the flow of materials in the productive/distributive process. In the last twenty years, this system has undergone several adjustments and modifications, so that today its improvement has brought about the creation of a new branch of industrial economy (Daganzo, 1996).

At first logistics was directed towards solving the financial problems connected with the excessive immobilization of supplies. But recently it has become more and more an instrument of production programming, so far as to encompass the whole area of goods handling which ranges from the incoming flows furnished by production suppliers to outgoing flows which furnish distribution (Bologna, 1998). In this accepted meaning, the area of influence of logistics is widened so far as to become an instrument which intervenes in the fundamental strategic choices of the company. In fact, the higher the degree of evolution of the logistics system, the greater it can be considered an important indicator of a company's technological level. In this sense, whole production sectors of mass consumer goods like the clothing industry, despite being considered of low tech content, are counted among the innovative sectors due to the fact that they use mainly high tech distribution systems.

The task of logistics becomes increasingly complex as the practise of outsourcing is extended and companies are organized as networks. The modernizing of transport services is accompanied by the gradual externalization of logistics functions which are delegated by the client to a new type of service, namely the logistics service providers (Johnson - Wood, 1996).

These are responsible for an extremely complex system requiring expensive infrastructures, automatized warehouses, efficient handling equipment, strictly pre-determined work cycles which, at the same time, are capable of responding to a sudden peak in demand. Briefly speaking, this system must be endowed with far more sophisticated means than those of the old shipping agents who only needed a few offices and a couple of sheds for storing and sorting the goods. Thus transport logistics represents only one segment, actually the smallest, which on average counts for about 8-10% of the total logistics costs.

The evolution of logistics has had profound consequences on the configuration of the territory, given that the choice of a logistics system almost always leads to decisions regarding the location of both productive plants and warehouses.

The reasons why a company decides to locate a production unit in a certain territory depend on various factors. These include saving on labour and infrastructure costs, the opportunity offered by local resources of raw materials, etc. Actually, with the development of logistics, and even more so with the development of integrated logistics service industries, problems of plant and installation location can be tackled separately with different and independent location logics.

One problem is where to set up a plant or a segment of a cycle, another is where to put a distribution warehouse or a logistics platform. If the logistics services are externalized, the problem of warehouse or platform location will no longer be part of the choices to be made by the company but of

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<sup>4</sup> The study has been directed by Prof. Carlo Mario Guerici.

those made by its provider. The location logic can change radically when functions are entrusted to outsourcing (Colin, 1991).

The expansion of the logistics service industries has brought about automatization in platform location choices, making the reading of the "network" on which they are based more complete/complex??.

Offering efficient transport infrastructures (ports, airports, railway lines, internal waterways, access and link roads) can become a competitive factor for a region, and even more so by offering high-level services of transport and integrated logistics. It seems clear that there is a close relation between logistics choices and location choices, what is less clear is the fact that, when we speak of location, we do not only mean location of production plants, but also of logistics installations.

The emerging economic-territorial universe is, therefore, far more difficult to represent than the old inter-regional and international mosaic (Veltz, 1996). One of the first noteworthy features comes from the growing interaction between local and global. We no longer live in times when, with Braudel, a clearly stratified economic world could be described in which only the great urban centres articulated short-range and slow-rhythm economies with remote flows of economy-world and faster rhythms of big business and finance. Today everything takes place as if these long-superimposed layers were mixed together and interpenetrated almost everywhere. The interdependence of large and small scales can no longer be separated. One of the most worrying aspects of this mixing is the increasing priority given to temporal variables in the hierarchization of spaces over the traditional spatial ones of distance. The modern economy generates increasing needs for synchronization which adapt to the general trend of a reduction in temporal production cycles. They are derived, for example, from the logistics tables of organization of operations and from the flows which, quite clearly, are increasingly ignoring the usual structures of proximity and favouring certain large poles of centralization and irradiation (see airport hubs, the new port structure, tied to the standardization of maritime transport, etc.)

## **2. The new intercontinental maritime routes and the centrality of the Mediterranean**

It is clear from what has been stated above that global economic competition is becoming more and more a competition among economic systems on a territorial basis rather than among individual units (Porter, 1990). The cardinal points on which this competition is based are made up of transport, information and formation systems, of networks of relations among companies, of their capacity to imagine forms of public-private collaboration, in order to set up large, innovative infrastructural and territorial projects.

Therefore, the present day centrality of the Mediterranean is to be set within the framework of the international economy of traffic and global economic competition. This has been characterized for years by a massive transfer of the epicentres of international economy towards the Far East. These shifts of activity are accompanied in the same direction by the main sources of maritime traffic, so that about 50% of the world's 20 most important shipping groups for container transport is now located there (Uniontrasporti - Metis, 1998, a). Moreover, given that important traffic flows towards Europe have been generated from these very locations, it follows that the Mediterranean appears as one of the most attractive areas, both in terms of production and investment, and as an important area for traffic and the sorting of goods.

Thus the European ports in the Mediterranean and the regions which gravitate around them are faced with a historical opportunity to improve and develop their territory due to the 5-7 day advantage in terms of navigation time compared to the Northern European ports along the most dynamic routes which link Europe and the Far East. In this sense, the initiatives taken to create transshipment ports of call in the Mediterranean, connected along, or near, the "Round the World" routes, which cross directly between Suez and Gibraltar, are of utmost importance. Gioia Tauro, Cagliari, Damietta, Malta, Algeciras and perhaps Taranto represent the most noteworthy of these initiatives.

These initiatives, undertaken by shipping and terminal operator groups situated and with headquarters in Italian maritime areas, were not created to take away traffic from the Italian continental ports of call in the Mediterranean, but to capture "Round the World" traffic along those routes and to organize maritime "feederage" services with ports in both Southern and Northern Europe (Uniontrasporti - Metis, 1998, b). As seen from Table 1, through the "feederage" service guaranteed by the container port of Gioia Tauro, there has been a sharp increase in container traffic in the Adriatic and Tyrrhenian ports of the Italian peninsula.

<b>Regione</b>	<b>Destination</b>	<b>Origin</b>	<b>Total units</b>	<b>%</b>
<b>Adriatic</b>	2854	2299	5153	1.03
<b>Adriatic - Italy</b>	11380	2154	25534	4.72
<b>Northern Italy</b>	1100	2456	3556	0.72
<b>Southern Italy</b>	32598	14767	47365	9.5
<b>Tyrrhenian - Italy</b>	15710	22669	38379	7.7
<b>Italy - Total</b>	63642	54345	117987	23.68
<b>Rest of the world</b>	188135	192117	380252	76.32
<b>Total</b>	251777	246462	498239	100

**Source: based on MCT data**

To the opportunity offered by the volume of traffic from the Far East, the presence of the American landbridge (Los Angeles - New York) must also be added. This could further strengthen or, on the contrary, curb Europe's potential, depending on its capacity to attract traffic from the macro-region of New York, the North Atlantic coast and the North East of the USA. This represents the greatest concentration of economic activity in the world, therefore the creation of the Los Angeles - New York "land - bridge -freeway", which allows traffic to avoid the Panama Canal, can constitute either a limit or a further opportunity for the development of Mediterranean ports. In fact, the post-panamax ships, over the 5000 teus limit imposed for the Panama Canal crossing, were designed with greater width, and through this they have gained in stability and computerized manipulation of land-sea containers. Therefore, these new horizons may create a limit to the opportunities which are opening up in the Mediterranean by taking substantial volumes of traffic towards the Pacific and the American landbridge (macro-region of New York), or they may present an opportunity for European ports, in that the Pacific - Colombo - Red Sea - Mediterranean - N. European ports - Atlantic route is of the same length as the American landbridge route: 21-22 days.

The opportunity depends on the construction of an efficient freeway connecting the Mediterranean ports (Gioia Tauro) to the Northern European ports: the greater competition derives

from the advantage in distance of about one third of the European stretch compared to the North American one, as costs per kilometre by land are far higher than those by sea (European Commission, 1996). This has led to the increasing recent emphasis placed on the Singapore - Northern Mediterranean and Northern Europe - North America "pendulum route", in competition with the Pacific - Los Angeles route and, on both these route combinations, in competition with the all-sea "Round the World" services.

### **3. The impact of the port of Gioia Tauro on the regional economy**

The centrality of the port of Gioia Tauro (GTP) in the Mediterranean area and in the logistic services implies two different outcomes at the level of regional economy. The changes in the structure of relations among trade areas may, in principle, have partial effects on the economy surrounding the port. The need of enforcing the infrastructural links between the port and the rest of the European economy may envisage a significant change in the endowment of the entire area at least in the long run. The increasing endowment of infrastructure may be a potential "attractor" for firms willing to exploit advantage deriving from structural conditions and policies in the area close to the port. All these reasons have driven our research in the field of evaluation of the impact of changes in transport infrastructuring on the economy and on factors that may explain firms localization in the area of GTP.

It should be remembered and underlined how GTP takes on the particular characteristic of a "structural break", with respect to past conditions, in the Calabrian and, to a certain extent, in the Southern Italian context. This is true not only from the point of view of "infrastructure", but in a more general way. The impact can be characterized in two ways: as macro-economic on the performance of income, and as micro-economic on the performance of a firm. Two methods have been chosen to evaluate the impact, the first borrowed directly from literature on the function of quasi- production and aimed at evaluating regional potential for certain explicatives which we consider peculiar in evaluating the role of the new infrastructure. In the second case, in order to study the question of demand, the replies to a questionnaire carried out among selected top companies in Southern Italy were analyzed using a logit/probit model. This model allowed us to deal rigourously with the qualitative information collected, and to have an instrument for classifying and forecasting the probability of use of the GTP area, both from the point of view of logistics and of industrial re-location.

## **4. The relationship among infrastructure, growth and development**

### **4.1 Brief references from literature**

Literature on the relation between infrastructures and income has involved various areas of research. In particular, the literature on endogenous growth is undoubtedly an important theoretical

reference for anyone studying regional differentials of development. This paper does not intend to re-examine the literature<sup>5</sup>, although it is important as a point of reference, as well as for the theoretical development bound to the relation between infrastructures and income performance. The studies in question were normally applied to cross-section analyses of industrialized or developing countries and, in other cases, to cross-section studies of context, characterized by regional sub-divisions. Another dominating theme in the literature on growth is the relation among growth, employment and productivity. In one of his fundamental articles, Solow (1957) suggests the well-known explanation of growth rate in terms of capital and work, as well as a third variable of multifactorial productivity growth, otherwise known as "Solow's residues", and not directly attributable to either of the two production factors in question. It is also necessary to remember the ample space dedicated to the analysis of the relation between productivity and public investment in this literature. A recognized and significant relation exists between public capital, one of the most important ingredients in the definition of the function of quasi-production, and per capita production levels. Among the most important recent studies, both Aschauer (1989) and Munnell (1990) show conclusively the existence of a significant link between productivity and public investment. It is not easy to quantify it, and, at the same time, different results are obtained by different studies with an elasticity which ranges from 0,15 to 0,35 of output compared to public capital. There is no evidence of the same type in the works of Holtz-Eakin (1992) and Holtz-Eakin-Schwartz (1994), nor in Picci's more recent study applied to Italy (Picci, 1995a). The relationship between output and infrastructure is weaker and it seems to be limited to a short-term phenomenon regarding demand, that is, to the impact of public spending on demand.

Finally, Italian literature has dedicated a wide space to the problem of the convergence of economic growth among Italian regions. Starting from the seminal work by Barro-Sala-i-Martin (1991, 1992), the validity of the "beta-convergence hypothesis" has been proved in various contributions. From Mauro-Podrecca (1994) to Ferri-Mattesini (1997) and Fabiani-Pellegrini (1997), through several studies by Paci-Pigliaru (1995, for example), the analysis proposed at the base of the "beta-convergence" and "sigma-convergence" has been studied to such a depth so as to cover the relation between growth and infrastructure. On the whole, numerous cases remain in which the importance of the impact of infrastructures on the performance of income is very weak, or the signs of relations are not those expected, especially in the south<sup>6</sup>.

#### **4.2 The use of a model based on the function of quasi-production**

There is a different kind of contribution in literature which can be more typically associated with the concept of estimating the function of quasi-production. This approach has been studied by Biehl (1980, 1986), Biehl D., Bracalente, Di Palma and Mazziotta (1990), just as previously by Bracalente-Di Palma (1982) and, recently, by Latella (1994). These studies propose in different ways the problem of capturing structural elements by estimating functions of quasi-production, which are structured differently, but are referable to an equation of the type:

$$Y = f(I, S, A, C)$$

in which Y is an indicator of regional development, I an indicator of infrastructuring, S of sectorial structure, A of agglomeration and C an indicator of socio-economic conditions. These models

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<sup>5</sup> See Solow (1994)

<sup>6</sup> See Ferri-Mattesini (1997)

have been developed as cross-section analyses. In the study by Bracalente and Di Palma, Y stood for a synthetic indicator of regional development which combines the the gross domestic product per inhabitant, the GDP for each employed person, the activity rate of the labour force and the participation rate of the population in the labour force.

The indicator of infrastructuring is the result of a complex evaluation process of all the standardized infrastructures, that is, related to the regional surface (in the case of infrastructures of networks), and to the population (in the case of single infrastructures). Afterwards, the different indicators relative to the different types of infrastructures were turned into a-dimensional numbers through a normalizing process and, finally, put together with an unweighted sum of the different values. The procedure followed is synthesized by Biehl-Bracalente-Di Palma-Mazziotta, later revised by literature<sup>7</sup>, and it has been used again recently by Marino (1996). The series of infrastructural indicators for the Italian regions has been borrowed from the latter source.

The indicator of sectoral structure is the synthesis of the quotas of employment in industry and in service industries. The agglomeration indicator is the population density and the quota of the population resident in the biggest regional towns.

Finally, the indicator of socio-demographic characteristics is the quota of working-age members of the population or the quota of the female labour force.

In choosing the models used for our purposes, the functional form proposed by the quoted authors was agreed upon, but a specification of the model which best suited the data available was sought.

First of all, it should be remembered that the period chosen lasts from 1989 to 1993. In order to keep the analysis reasonably simple, an average value for all the variables used was estimated for the five-year period (deflated as necessary for monetary variables). The analysis is carried out with an estimated infrastructural indicator at the beginning of the period, that is, the economic performance for a certain initial infrastructural endowment is evaluated with the hypothesis of keeping the actual endowment unchanged during those years. This hypothesis is certainly convincing, even if this is not part of the aims of this research and the alternative in literature can be found in Picci (1995b), who, however, reaches paradoxical conclusions regarding the infrastructural endowment of Southern Italy<sup>8</sup>.

In specifying the model, it was also decided to deliberately "avoid" evaluating agglomeration, meant as an indicator of population density. Alternatively, and in addition to this indicator, physical distance indicators were used (location in Biehl's analysis, 1986). This involves trying to include in this model an element connected to spatial models and, anyway, to incorporate a strengthening element of demand. We avoided this objective, aware that we would be violating one of the theoretical hypothesis of quasi-production, in order to keep the whole description "within" a framework of the evaluation of supply and the regional production potential . The indicators of population density cannot be used efficiently if the regional dimension is used (which is still a "high" level of aggregation/disaggregation), if we consider a highly diversified economic and industrial system like ours, in which whole areas are greatly dependent on the rest of the country, while others are completely independent of the local

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<sup>7</sup> In particular, see Picci (1995b,c)

<sup>8</sup> In particular, it is claimed that overall Calabria has an indicator equal to 134,6 while Lombardy has an indicator equal to 102,2 and, for the railway, the difference between the two regions is of 159 to 152,2 in Calabria's favour, while for road the advantage is of 126 to 98,3. This result is not reached, as might seem, by evaluating endowment in relation to use, but by applying a more complex method known in literature as the permanent inventory which favours the relation between what has been spent and what there is.

dimension because they are oriented towards markets different from the local ones. At the same time, no relation can be found any longer between development and endowment of human resources in a purely quantitative sense. All these reasons, well-worth studying but not part of our research, have led us to change our approach with respect to the traditional one found in literature.

We have therefore used an "anomalous" indicator to capture the dimension of sectoral structure and agglomeration, considered as an evaluation of productive efficiency. After using only the data of sectoral structure and wishing to concentrate on the development indicator, considered as a gross per capita product, we decided to use labour productivity in industry as a synthetic agglomeration indicator in a broad sense, that is, as an indicator of relative efficiency, capable of constituting an element of attraction from the point of view of supply and, at the same time, as a sectoral structure indicator.

It should be borne in mind that labour productivity in industry takes into account as a whole the production of industry, and therefore its weight on the economic system, employment in industry and, finally, in its relative dimension, the productive efficiency differential. Obviously this is a synthetic indicator, but it is certainly no less efficient compared to the others proposed. Finally, it must be pointed out that in Italy productivity in industry measures a precise dimension of the system's efficiency. One problem that can arise from the choice of this indicator for synthesizing the characteristics of supply is the hypothetical correlation with the infrastructure indicator. In fact, although the relation usually studied is the one between global productivity and infrastructures, the latter must then have undeniable importance in industrial productivity. But it is probably less striking with respect to the overall productivity.

In our model the socio-economic conditions are also synthesized by the global activity rate and, in the most reliable specification, by the female activity rate. The higher quality of the data regarding female activity rate reveals the even greater sensitivity of the selected indicators. From this point of view, the framework implemented in this model is a long way from being consistent.

### **4.3 The main results of the model**

In its final version the model has been estimated as follows:

$$\log Y = \alpha + \beta \log I + \gamma \log Prind + \delta \log Taf$$

where Y is the GDP per capita of the 20 Italian regions, I is an overall indicator of infrastructuring, Prind is the regional productivity indicator and Taf the female activity rate.

It must be pointed out that, in order to measure the sensitivity of the estimate used for the various indicators, alternative estimates were carried out considering:

- the infrastructuring indicator regarding transport only, on which we concentrated in the end, due to its obvious greater importance;
- the industrial productivity indicator evaluated in terms of regional differences;
- the socio-economic indicator using the overall activity rate:

Finally, let us consider that, if estimated in a version close to the Biehl-Bracalente-Di Palma-Mazziotta formulation, the model shows a high multi-collinearity which can be identified by high "goodness of fit" and low values of the t test.



Below the main results obtained are presented<sup>9</sup>, distinguishing two types of model at the end:

1) with infrastructoring indicator referring to overall endowment and with infrastructoring indicator referring to transport infrastructures only;

2) with indicator of activity rate referring to the whole population or to the female component only.

The results have been corrected for “heteroschedasticity” using White's methodology (1980), and implemented with E-views econometric software.

The variables are all estimated in logarithms.

<b>MODEL WITH TRANSPORT INFRASTRUCTURES (ITRAS) AND ACTIVITY RATE FOR THE WHOLE POPULATION (TE)</b>				
Dependent variable Y				
Number of observations 20				
Variable	Coefficient	SE	t-statistics	Probability
Constant	-6,119035	1,472201	-4,156385	0,0007
ITRAS	0,071094	0,021118	3,366439	0,0039
TA	2,250493	0,227020	9,913182	0,0000
PRIND	0,801068	0,098506	8,132144	0,0000
$R^2$	0,958827	Dependent variable mean	16,89845	
$R^2$ adjusted	0,951107	Dependent variable standard deviation	0,273708	
Regression S.E.	0,060522	F-statistics	124,2000	
Residual sum of squares	0,058607			

The model seems to work well, except for the activity rate which has an unrealistic elasticity coefficient, as it is higher than 2. For this reason, the female activity rate was chosen as the "principle" model with the following results.

<b>MODEL WITH TRANSPORT INFRASTRUCTURES (ITRAS) AND FEMALE ACTIVITY RATE (FER)</b>				
Dependent variable Y				
Number of observations 20				
Variable	Coefficient	SE	t-statistics	Probability
Constant	-2,420197	3,031162	-0,798438	0,4363
ITRAS	0,115924	0,040225	2,881885	0,0108
TAF	0,851892	0,178077	4,783846	0,0002
PRIND	0,892606	0,190097	4,695519	0,0002

<sup>9</sup> A wide number of results and estimates are available in the final report of ISFORT Research.

$R^2$	0,891877	Dependent variable mean	16,89845	
$R^2$ adjusted	0,871604	Dependent variable standard deviation	0,273708	
Regression S.E.	0,098706	F-statistics	43,99333	
Residual sum of squares	0,153903			

As can be seen, the model is of good econometric reliability and parameter values sufficiently in line with those expected.

## **5. A probit model on the port's exploitation and on the relocation of firms**

### **5.1 Methodological premise and description of research**

The estimate of the function of quasi-production constitutes an analysis focused on supply, that is, how rich the area is in production and quasi-production factors and, therefore, its capacity to offer a favourable environment to economic development and the setting up of new companies. In this section, however, we would like to carry out an analysis focused on demand factors, that is, to find out which factors induce companies to use GTP at present, which factors might encourage them to use it in the future and which might encourage them to re-locate near GTP.

In the economic literature, different methods are available to reach this objective. In particular, the most interesting for our aims seem to be those based on a discriminating analysis and on probit and logit models. Through these models and also in the presence of dichotomous answers, it is possible to go back to the motives and causes of these answers, thus allowing a sort of discrimination among the agents' performance. In our case it seemed important to study the micro-data provided by field surveys carried out using these micro-techniques to analyse the motives and causes which lead companies to choose to re-locate near GTP, or choose to use the port in future. This selection process of alternatives can be considered a process of maximization of a kind of random utility and can be estimated very well in a logit or probit specification.

The data source is made up of the results of interviews given to a panel of the 50 top companies in Southern Italy. To construct the probit model variables deducible from a survey done via fax on the top 150 companies in Southern Italy were used<sup>10</sup>. A first selection of the variables was made choosing the most significant ones for our study. Particular attention was paid to the variables which describe the quantity of transport by ship, the cost of raw and of semi-manufactured materials, the use of GTP. The model results have shown much higher levels for the above-mentioned variables, so it can be reasonably claimed that it is possible to construct an interpretative hypothesis of behaviour, which looks into the attitude of Southern Italian companies towards the port of Gioia Tauro.

### **5.2 The results of the probit model**

The data from the database described previously was elaborated according to the probit method. As this analysis is tied to the random utility theory, it allows the study of the "re-location probability"

<sup>10</sup> The study was carried out in the ambit of the quoted ISFORT research

of a group of companies, also highlighting the determinants of a certain type of behaviour. A suitable method was used for taking into account answers which were not given, preferring an estimate of maximum likelihood in relation to the data characteristics and in the end important values were obtained for the models, as shown in the following tables:

<b>Model: Probit regression</b>					
<b>Dep. var: V Loss: Max likelihood</b>					
<b>Final loss: 58.216759822</b>					
<b>Chi<sup>2</sup>(4)=18.457 p=.00101</b>					
	Const.B0	I	M	S	T
<b>Estimate</b>	-0.81062	-0.01683	-0.11534	0.095494	0.70485
<b>Std.Err.</b>	0.249383	0.008577	0.051679	0.03672	0.370291
<b>t(119)</b>	-3.25051	-1.96218	-2.23184	2.600595	1.903504
<b>p-level</b>	0.001498	0.052075	0.027497	0.010486	0.05939

The V variable describes the choice to re-locate near GTP, the I variable describes the percentage of raw materials shipped, M the transport costs of raw materials, S the transport costs of finished products and T the present use of GTP.

<b>Model: Probit regression</b>					
<b>Dep. var: U - Loss: Max likelihood</b>					
<b>Final loss: 70.712549262</b>					
<b>Chi<sup>2</sup>(3)=29.312 p=.00000</b>					
	Const.B0	M	S	T	
<b>Estimate</b>	-0.37357	0.05549	-0.04234	1.996806	
<b>Std.Err.</b>	0.211044	0.03071	0.031229	0.498567	
<b>t(120)</b>	-1.77009	1.806891	-1.35581	4.00509	
<b>p-level</b>	0.079252	0.073285	0.177707	0.000108	

The U variable describes the choice to use GTP in future, M the transport costs of raw materials, S the transport costs of finished products and T the present use of GTP.

## **6. Policies and alternative scenarios**

### **6.1 Territorial competition, ports and the set-up of an European landbridge “towards” Southern Italy**

As mentioned above, global economic competition has increasingly become competition among territorially based economic systems, rather than among individual productive units (Midoro, 1998). The cardinal points on which they are based concern:

- a - systems of transport, information and formation;
- b - informal networks of relations among medium and small-medium sized companies for innovation purposes;

c - the capacity to create forms of public-private collaboration in order to carry out large, innovative infrastructural and territorial projects.

In terms of maritime transport, this means that, rather than among individual companies, competition takes place among the major routes, traffic areas, port areas and systems. In particular, this means forms of competition: between all-sea routes and itineraries including land stretches; between major and minor traffic routes; between short- and medium-term routes (see "feederage" services in the ambit of intermodality) and all-land itineraries (road or rail with container transport chains and roll on /roll off motor vehicle-ferry service).

In this context the Mediterranean ports can become competitive on condition that: a - they undertake radical modernizing of regulations, technology and organization;

b - they find a suitable policy for the territorial structure and organization of the coastal and internal regions concerned;

c - the ports themselves become centres of high-level logistics systems, bringing professional methods and structures up-to-date;

d - they create advanced, high-level systems of rail and road link infrastructures with the common European hinterland.

All this implies:

a - large investments to increase the transport capacity of ships for intermodal transport and the connected scale economy of these ships;

b - the improvement in "yield" of loading dock operations (the rate of throughput in land-sea operations) in order to exploit the ship's scale economy;

c - the growing need for "limited" spaces in ports due to the high loading dock rates of throughput;

d - the necessity to create "networks", especially for containerized traffic, with interports, goods centres, internal terminals and internal transport;

e - an effort by the shipping companies to control the phases of port transport cycles and to offer transport "from internal junction to internal junction" rather than "from port to port";

f - the drawing up of agreements, the creation of consortiums, alliances, joint-ventures among shipping companies and groups to rationalize and perfect the means employed;

g - the materialization of agreements (slot arrangements) with a reduction in competitors and the consequent transformation of the maritime conferences system at least along major routes.

Only in this context can the bases and conditions be created to form the above-mentioned landbridge, especially for the railway.

The European "landbridge", combining different forms of land transport to create a landbridge in Europe, is much more articulated than the American one, due to the number of areas which can be used both in the Mediterranean and in the north of the continent .

a) There are several possible combinations of different railway segments, of road-rail combinations, or feeder service and rail combination

b) Some examples of Southern Europe - Mediterranean taking part in global economic competition between traffic routes and major port systems include:

1) The Ligurian Sea - High Tyrrhenian area with North - South link combinations within the European Community (Rhône Alps and Provence Alps Côte d'Azur), North - West with Lyons - Ligurian Sea - Rhine Valley - Lyons - Marseilles combinations

2) The Adriatic corridor and the extension towards East and North (Rotterdam)

3) The East-West European axis

d) these examples highlight better the functions and possibilities of transshipment points like Damietta, Malta, Gioia Tauro, Cagliari, Algeciras;

e) the same examples illustrate the different role of these Mediterranean ports, much nearer to the transboarding points - container terminal stations, but not identifiable with them;

f) This proximity can offer southern ports the possibility of a comparative advantage of location for the more immediate elaboration activities of semi-manufactured goods from PVS, or of manufactured products, or the production of services from transport-industry-network logistics.

g) Above all, because of the new scenarios in world circumnavigation, the South can be qualified as an area for productive industrial and post-industrial establishments;

h) and the same area could use co-development policies among European countries in the Mediterranean and PVS of North Africa and the Middle East to improve the complementarity between the two shores of the Mediterranean.

Most of the scenarios above cited will be reached as the result of infrastructural s at the level of Mediterranean sea. Those policies will affect the level of economic activity. Some predictions might be made by using a “quasi-production function” model.

## **6.2 GPT and regional development: the case of Calabria**

Through the implemented regional model, this concluding paragraph focuses on evaluating the potential relations among the variables involved after the development of GTP:

For this reason, we will try to synthesize certain elements of the future scenario of the Calabrian economy, hypothesizing that the institutional performances mainly reflect the intentions shown so far and the performances of the economic and social participants repeat some of the experiences under way in Calabria, with particular reference to industrial development.

First, a premise regarding the nature of the present-day infrastructure of GTP. It is a container terminal of notable dimensions (1,4 million teus handled in 1997), which is beginning to make its mark worldwide. Yet we are still a long way from being able to call it a real port, in the sense that most of the usual port activities have to be set-up along with the infrastructure needed to run them.

However, the attention of central and local government is focused around this area, especially the regional and provincial governments, as well as the expectations of private economic operators and trade unions.

Some objectives have been reached:

- the terminal has allowed the direct or induced employment of about 1800 working units;
- an area work pact has been drawn and set up which has in fact allowed the terminal operator to enjoy highly favourable conditions for the first three years of activity on the job market;
- the pact has been potentially extended to the whole province of Reggio Calabria;
- the regional government of Calabria has located the regional “interport” in the area, the provincial government has set up an industrial development company to promote the area and the three municipalities involved are committed to carrying out a process of administrative conurbation;
- the central government has set up a unit for co-ordinating initiatives for GTP in order to simplify procedures and to handle the expansion phase, also drawing up a master plan for the port area;

- law 488 provides for supplementary contributions of 50 billion lire for the GTP area and the European Community has granted global financial aid for the area;

- the government is expected to draw up an area contract for GTP, while the possibility of it being turned into a duty free zone is still being discussed.

From all these initiatives, it is possible to foresee at least three effects directly concerned with our model:

- firstly, a process of infrastructural upgrading to the new situation created by the increase in port activities is already under way in Calabria and will continue in future, and this will probably lead to the development of important logistics activity within the next five to ten years. This can be viewed also as the “regional dimension” of the logistics changes sketched out in the previous paragraph.

- secondly, a process has been undertaken to identify innovative instruments for the labour market, no longer regarded in the traditional form of the exemption from social security taxes, which has created so many problems for the development of a solid productive base in Southern Italy<sup>11</sup>, but which are linked with development processes organized from below, like the “area pact”<sup>12</sup> for MCT - the result of a national agreement conducted on a local level. The “area contract” and other, alternative forms of intervention, like “territorial pacts”, all lead in the same direction. In the medium-long term, all this should “free” the unrealized potential of a historically stagnant labour market like the Calabrian one and lead to an immediate increase in the activity rate;

- thirdly, the locating of economic activities of increasing quality should also raise the value of industrial productivity, activating an agglomeration/attraction process of economic industrial activities or advanced services. On the other hand, when Calabrian companies better understand the logistics advantages gained from the port infrastructures, capable of creating an export channel thanks to the intensive exploitation of GTP, they will be forced to adapt to higher production levels than the present ones. In the case in question, it would not be easy to give a predictable estimate of these changes. We have therefore preferred to think that, for Calabria, the goal of those who decide on economic policy can perhaps be estimated in reaching a level of per capita income as near as possible to the average of Southern Italian regions as objective 1 or, even better, of the Southern Italian regions about to leave objective 1, or of Abruzzo which has just left it.

This is obviously a simulation which uses the model estimates and which must be interpreted with necessary caution. In particular, it should be borne in mind that the simulated process of change does not only involve Calabria, but the whole of Southern Italy, especially for infrastructures. Therefore the model parameters could actually be different when the whole programme of infrastructural upgrading is implemented. Finally, these results must be given a precise interpretation of estimate under the hypothesis of stability of the model.

In the following table we show the average values of the different variables for the groups of regions compared.

	<b>Y</b>	<b>ITRAS</b>	<b>INFTOT</b>	<b>PRIND</b>	<b>TAF</b>
<b>CALABRIA</b>	13449992,45	71	57,62	39669094,97	26,16
<b>SOUTH</b>	16270537	65,25	67,81	48013845,55	26,55

<sup>11</sup> See Del Monte-Giannola (1996)

<sup>12</sup> The “area pact”, the “area contract” and the “territorial pacts” are instruments of economic planning which are usually the result of an agreement among central and local government, entrepreneurs and unions, banks and financial institution to support local development in limited areas.

<b>REGIONS QUASI OBJECTIVE 1</b>	16363182,14	48	64,70	48372260,18	27,42
<b>REGIONS OBJECTIVE 1</b>	15669405,37	62	65,91	47190508	26,04
<b>ABRUZZO</b>	20478463,09	88	81,09	53780000	30,12

The squares below illustrate alternative estimates made for three different scenarios.

First of all, they concern Calabria reaching an index of infrastructuring equal to Abruzzo. This objective is to be considered minimal as Calabria starts from a situation in which the index of infrastructuring in the model is higher than that of other Southern Italian regions. A precise link between investment programmes under discussion, especially those illustrated in the Master Plan, and the variation of the infrastructuring index cannot be made at present. Alternatives have been estimated hypothesizing that industrial productivity and female activity rates will be realigned with the levels of the other Southern Italian regions (alternatively in scenarios 2 and 3), or to those of the objective 1 regions or those almost outside objective 1.

A grid of alternatives allows us to give a credible range of variations of the possible per capita product in the different situations:

- the minimal situation of realignment of infrastructures only on the level of Abruzzo is estimated at 8,54%;

- in the alternative situations we estimate variations of per capita income swinging between 26% (if Calabria aligns with the levels of industrial productivity and female activity rates of the objective 1 regions) and 34,9% (if Calabria is aligned with levels of industrial productivity and female activity rate of the regions almost outside objective 1).

## ALTERNATIVE SCENARIOS

**SCENARIO 1** = Calabria reaches Abruzzo's level of infrastructuring and is aligned with the three sub-groups indicated in industrial productivity and female activity rates.

	Y estimated	GARM***	GPRM***
ITRAS Calabria=ITRAS Abruzzo	14602673,1	1152680,657	8,57
Calabria=Mezzogiorno*	17535453,5	4085461,045	30,38
Calabria=Regions QO1*,**	18143831,3	4693838,887	34,90
Calabria=Regions O1*,**	16983841,9	3533849,46	26,27

Note\*: this means that Calabria is aligned with the regions in question for industrial productivity and female activity rate

Note\*\*: QO1 stands for the regions which could soon leave the objective 1 group and O1 for the whole group of objective 1 regions

Note\*\*\*: GARM = absolute gap from present average income; GPRM = percentage gap from present average income

**Scenario 2 = Calabria reaches Abruzzo's infrastructuring level, it is aligned with the sub-groups indicated in industrial productivity and with Southern Italy for female activity rate**

	Y stimati	GARM***	GPRM***
Calabria=Regioni QO1	17652248	4202255,548	31,24
Calabria=Regioni 01	17266801,2	3816808,785	28,38

**Scenario 3 = Calabria reaches Abruzzo's level of infrastructuring, it is aligned with the sub-groups indicated for female activity rate and with Southern Italy for industrial productivity**

	Y stimati	GARM***	GPRM***
Calabria=Regioni QO1	18023784,3	4573791,867	34,01
Calabria=Regioni 01	17248091,6	3798099,187	28,24

### **6.3 An interpretative hypothesis of the behaviour of Southern Italian companies towards the port of Gioia Tauro**

The probit model estimated on the basis of deducible variables from the survey carried out on companies allows us to make some important considerations which we will try to make clear in simple terms. The model provides a discrimination in the ambit of the variables, identifying those which are closely connected to the decision to use the GTP or to re-locate. In this sense, a certain behaviourist value is given to the individual variables which are then correlated with the factors which determine a particular choice.

In our case, for example, it is clear that the choice to re-locate is greatly influenced by the present exploitation of GTP, while the transport costs of raw materials and the percentage of maritime transport costs of raw materials bear little influence on this choice.

However, the choice to use GTP in the future is closely linked to transport costs of raw materials and to the present exploitation of the GTP, while the transport costs of finished products bears little weight.

What seems to emerge from the model therefore is that the companies' choice to re-locate near GTP is made in order to reduce the transport costs of finished products. This has two important consequences:

- 1) The sectors with a high incidence of transport costs for finished products will benefit by re-locating near GTP
- 2) The choice to re-locate is tied to a reduction in transport costs of finished products. The importance of this latter result can be seen in relation to the hypothesis of creating a duty free zone whose attraction to companies in the area would be in proportion to the reduction in costs.

The choice to use the port in future however remains tied to the transport costs of raw materials, as well as the present use, and in this sense it seems to be more a typical business choice of the reduction of internal costs to achieve greater efficiency and less a strategic one.



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